

FORD OWNER and DEALER

NOT CONNECTED WITH THE
FORD MOTOR COMPANY

June 1921
15 Cents

"Hasslers" Offer Same Advantages as Your Ford!

YOU like your Ford Car because it is durable, efficient, economical; because it is an honest car. Hasslers are also durable, efficient and offer unusually good value. Hassler Shock Absorbers make your good Ford Car better—saving one-third of upkeep, tires and depreciation! Then, of course, there is the greater comfort. There are Hasslers for all models of Ford passenger cars and trucks.

ROBERT H. HASSLER, INC.

1501 Naomi St.
INDIANAPOLIS, IND.

Robert H. Hassler, Ltd., Hamilton, Ont.


TRADE MARK REGISTERED
Shock Absorbers
PATENTED

The Ford in Arabia

"All Right, Ma'am— I'll Be Right Out"



DEALERS:—The Milwaukee is now sold by 30,000 dealers and by 82% of all Automotive Supply Jobbers. Retail price, \$2.10 (west of Rocky Mts., \$2.25). If you're not stocked, ask your jobber.

"Five miles out and she can't get her Ford 'coop' started. That's another thing she can blame her husband for. I warned him he'd have trouble with that timer.

"There's a man who hangs \$200 worth of extras on his bus and then tries to get by with a cheap-John timer. Does he think a Ford engine runs on extras?

"I'll just take a *Milwaukee Timer* along—then probably the lady won't need a tow."

The *Milwaukee* is recommended by nearly all garage mechanics as the most dependable replacement timer. It represents 15 years' experience in the manufacture of fine ignition units. Simple design is combined with finest materials and scrupulous workmanship.

Your Ford won't give you any timer trouble all season if you put on a *Milwaukee* now. It assures quick starting, and even, full-powered pulling.

But be sure you get the genuine—look for the name "Milwaukee" on the shell. There are many imitations.

**Milwaukee Auto Engine
& Supply Co.**

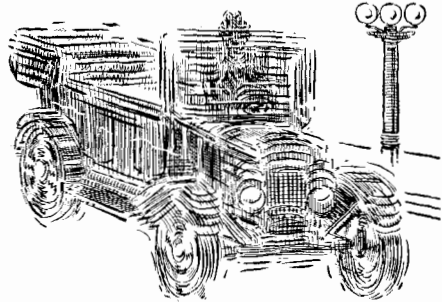
MILWAUKEE, WISCONSIN

MILWAUKEE TIMER *for* FORDS



BRUSH ASSEMBLY will outwear any other made. Solid bronze castings. Gauged and tested for absolute accuracy. Roller finished like a ball bearing—hardened, ground and polished to glass-like finish.

Blame the Brake Lining if your Ford acts this way



DON'T BLAME THE FORD if it RATTLES and CHATTERS. It's better **MADE** than most cars. Blame the brake lining.

ORDINARY BRAKE LINING GETS HARD, flinty, slick—hasn't any grip—grabs and slips every time you press the pedal. This shaking loosens nuts and bolts—makes the whole car rattle.

CORK INSERT STOPS THE SHIVERING AND SHAKING when you work the brake. Grips instantly, smoothly. No shaking or chattering. Never gets hard and slick.

WHY SHAKE YOUR FORD TO PIECES with hard, slick brake lining? If it's new, put in Cork Insert and keep it new. If it's a used car Cork Insert will make it work surprisingly smooth—free from rattle and vibration. Saves repairs to rear end and transmission.

BE SURE YOU GET GENUINE **ADVANCE CORK INSERT**. Your garage, repair or accessory man has it or can get it; every wholesale house carries it in stock.

REMEMBER: Cork Insert will save you relining expense—one set will outlast three sets of ordinary lining.

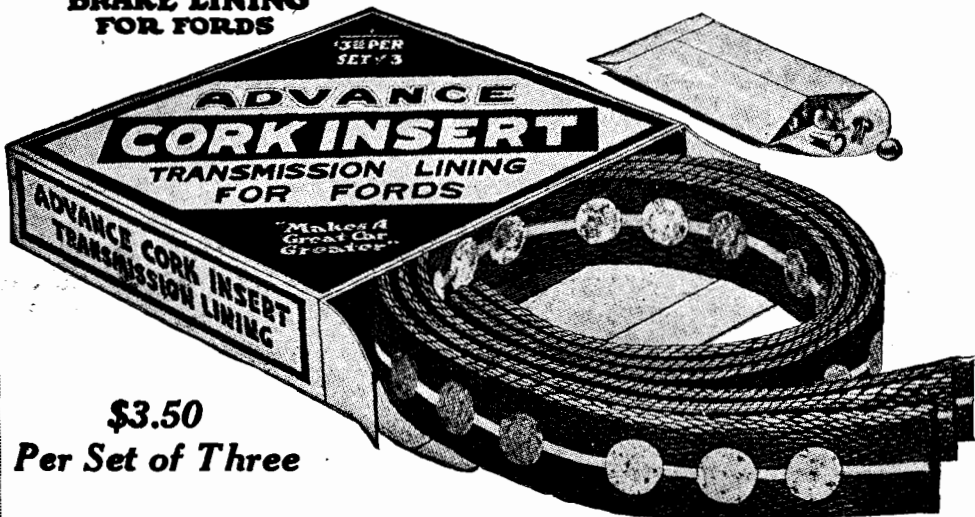
Use
**ADVANCE
CORK INSERT
BRAKE LINING
FOR FORDS**

Advance Automobile Accessories Corp.

1603 S. Michigan Blvd., CHICAGO.

PUBLISHERS OF "LET'S GO."

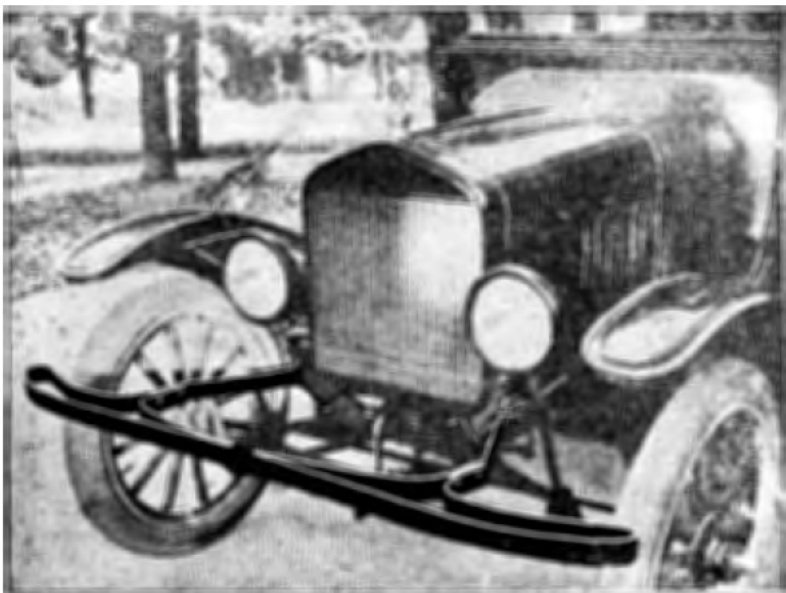
DEALERS:—Order from your jobber or write us direct.



**\$3.50
Per Set of Three**

HASTINGS

FORD SPRING BUMPERS

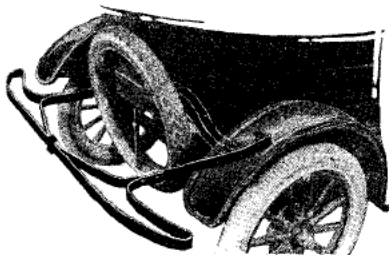


WE have a good proposition for you in these Hastings Front and Rear Spring Bumpers—New type construction which makes them very rigid—Will withstand severe bumps—They are attached so that there is no chance for them to vibrate loose or rattle.

Hastings Front and Rear Bumpers are sold with money back guarantee. Damaged parts or entire Bumper replaced free of charge when returned to Hastings factory prepaid, regardless of cause of damage.

They are \$15.00 value but do not cost that much. In black enamel, both front and rear are \$10.00 each. In nickel both front and rear \$12.00 each.

You may never have been in a smash-up, but you know that you are liable to bump someone or get bumped almost any time. Therefore, protect yourself with a Hastings Front and Rear Bumper without any further delay. Send in your order immediately. If they do not look like a \$15.00 value to you when received, return them to us by express collect.



DEALERS: We will be glad to send you a Front and Rear Bumper for your examination and if you do not find them a better value than any other Ford Bumper on the market today, simply return to us by express collect.

Hastings products are sold by more than three hundred good jobbers throughout the United States.

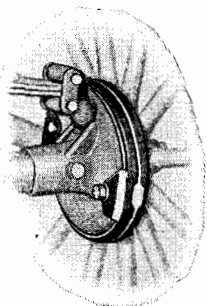
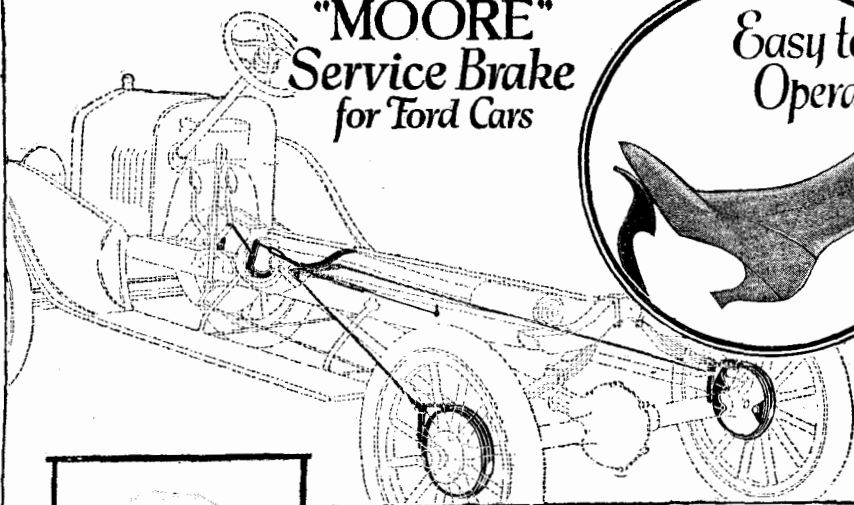
HASTINGS

MANUFACTURING COMPANY

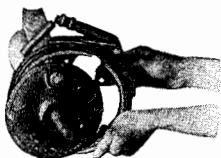
25 MILL STREET, HASTINGS, MICHIGAN

"MOORE" Service Brake for Ford Cars

Easy to
Operate



Rear wheel installation showing sturdy, oversized construction. Brake bands enclosed in housing which excludes mud and protects brake lining.



The MOORE BRAKE is easily installed. The mounting is practical and permanent. Does not interfere with anything on the Ford.

YOUR FORD WITHOUT

The MOORE BRAKE acts directly on the original Ford brake drum on the rear wheels—just like the brakes on the highest priced cars. Acting directly on the rear wheels relieves all undue strain from the rear system. This effectively stops all chattering, jerking and vibration.

Moore Brakes are backed by a guarantee of SATISFACTION and endorsed by thousands of users in all parts of the world.

Do your ordinary brakes need relining? Your bill for relining will be almost half the price of a complete new set of Moore Brakes that will last from four to six times as long as the regular brake.

**FOR COMFORT, ECONOMY, SECURITY
ORDER NOW.**

Tractor Train Co. of Indiana

10th and Conwell Sts.
CONNERSVILLE, INDIANA

HASTINGS FORD NECESSITIES



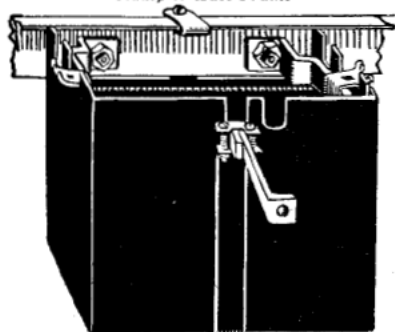
STYLISH GLOSS—REAR CURTAIN LIGHTS FOR FORDS

Give the top a distinctive refined appearance of style and value



Individually casted. Machined with micrometer accuracy. Nothing but perfect rings shipped. You can pay more money but you can't buy better rings.

Clamp to Auto Frame



Clamp to Battery Cradle

HASTINGS BATTERY BOX

Protects Ford Battery from damage by mud and water. Battery just as easy to remove.

DEALERS—Each item fills a real need. Quick turnover. Order from your jobber.

HASTINGS

MANUFACTURING CO.
25 Mill Street, Hastings, Michigan

When writing advertisers—Just say FORD OWNER and DEALER



Entered as second-class matter, January 29, 1915,
at the Post Office at Milwaukee, Wisconsin,
under the Act of March 3, 1879.

Contents Copyright 1921

Vol. 15

JUNE, 1921

No. 3

The FORD OWNER AND DEALER is an independent monthly journal having no connection with the Ford Motor Company. We are trying to serve the best interests of the dealers and owners of Ford Cars and propose to "hew in the line, let the chips fall where they may."

15 cents a copy, \$2.00 a year in U. S., Canada and Mexico. Foreign Countries, \$2.50.

Published Monthly by
THE TRADE PRESS PUBLISHING CO.

Montgomery Building
MILWAUKEE, WISCONSIN

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Frederick L. Goulston, Advertising Manager
Paul C. Treviranus, Business Manager
Harry J. Larkin, Managing Editor
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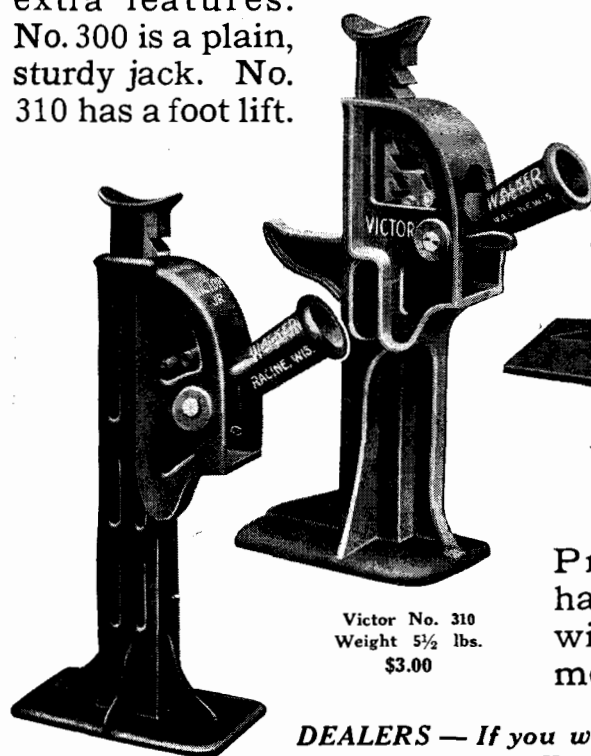
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Four Walker Jacks for Fords

The four jacks illustrated are right all the way. They are built to the rigid Walker standard---factory tested and guaranteed.

Walker Jacks work dependably—always—because they are built right. You need a good jack. One that is fault-free and trouble-free. You will quickly choose a Walker once you note its smooth, flawless action.

The price difference pays for the extra features. No. 300 is a plain, sturdy jack. No. 310 has a foot lift.



Victor Jr. No. 300
Weight 4½ lbs.
\$2.50

Victor No. 310
Weight 5½ lbs.
\$3.00

Badger No. 1
Weight 6½ lbs.
\$3.75

Badger No. 06
Weight 9 lbs.
\$4.75

No. 1 has a flip cap. No. 06 has a foot lift and a flip cap.

Practically every dealer handles Walker Jacks. Yours will be glad to show you the model you prefer.

DEALERS — If you want the right jacks for Fords or any other cars try Walker Jacks. They are stocked in every jobbing center in the United States and Canada.

Walker Manufacturing Company

Racine

Dept. 1006

Wisconsin

When writing advertisers—Just say FORD OWNER and DEALER

PEEL

Try one
with our
compliments



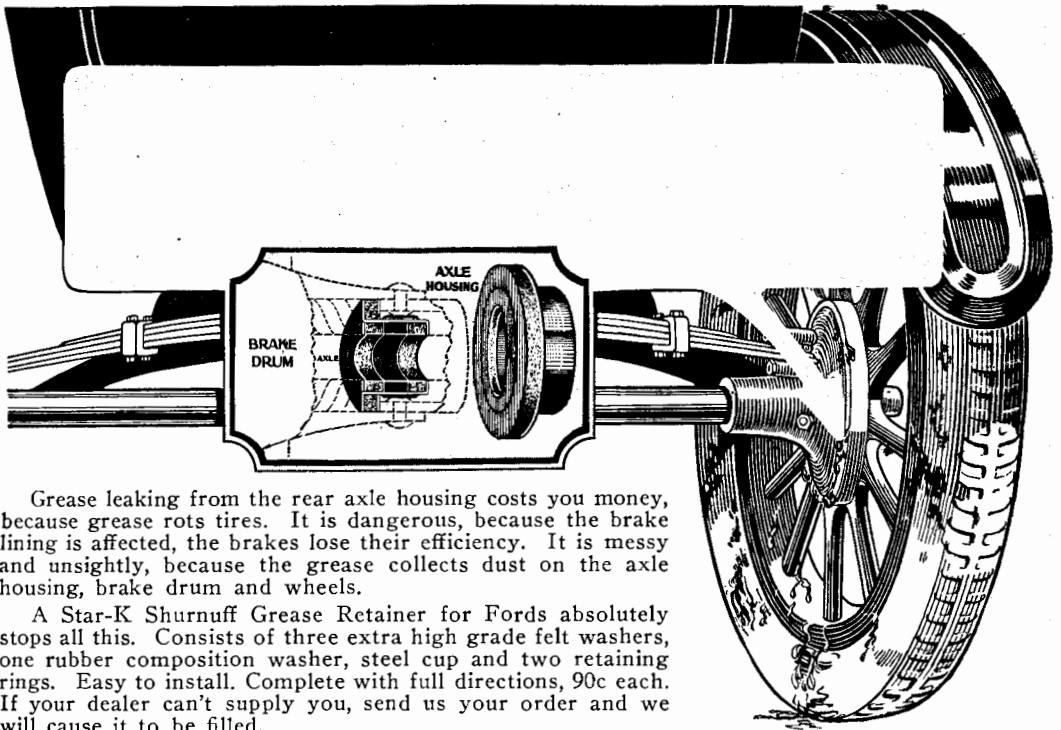
Laminated Shims are furnished ready-to-use for Ford crankshaft rear bearing, crankshaft front and center bearing, and connecting rod, in $\frac{1}{32}$ or $\frac{1}{64}$ inch thickness.

Address
"Ford Sample Dept."

LAMINATED SHIM CO., Inc.
14th St. and Governor Place, Long Island City, N. Y.
DETROIT: Dime Bank Bldg.
ST. LOUIS: Mazura Mfg. Co.
CHICAGO: 1118 So. Michigan Ave.

LAMINUM

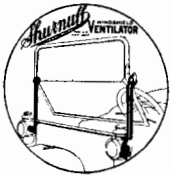
When writing advertisers—Just say FORD OWNER and DEALER



Grease leaking from the rear axle housing costs you money, because grease rots tires. It is dangerous, because the brake lining is affected, the brakes lose their efficiency. It is messy and unsightly, because the grease collects dust on the axle housing, brake drum and wheels.

A Star-K Shurnuff Grease Retainer for Fords absolutely stops all this. Consists of three extra high grade felt washers, one rubber composition washer, steel cup and two retaining rings. Easy to install. Complete with full directions, 90c each. If your dealer can't supply you, send us your order and we will cause it to be filled.

STAR-K SHURNUFF Ventilating Windshield



Makes lower part of Ford windshield movable and rainproof at sides and bottom, with disturbing lapping glass feature, providing ventilation where you need it most—at your feet. Easily installed.

PRICE, \$7.50

In ordering, state year car was made.

STAR-K SHURNUFF Running Board Support



Takes rattles out of Fords by preventing sagging of running board and excessive fender vibration. Easily installed without boring holes. Lugs attach to frame and bolts, supplied, replace front running board bolts.

PRICE, PER PAIR, \$3.90

STAR-K INLAND Spiral Cut Piston Ring



Highest grade. One piece spirally cut, special heat treated. They "follow the wear" by uncoiling like a spring against cylinder walls with equal tension all around.

PRICE, \$1.25 UP

Standard Width from 3-16 to 5-16 inclusive.

STAR-K OILESS PISTON RING—50c



Stop oil pumping with this great popular priced ring. Has two oil grooves—one in middle for lubrication; one on lower shoulder to scrape down excess oil. Velvet finish makes it "quick seating."

PRICE, 50 CENTS UP

Standard Widths from 3-16 to 5-16 inclusive.

STAR-K SHURNUFF JUNIOR SPARK PLUG. A well made, standard type plug at a popular price. 90 cents.

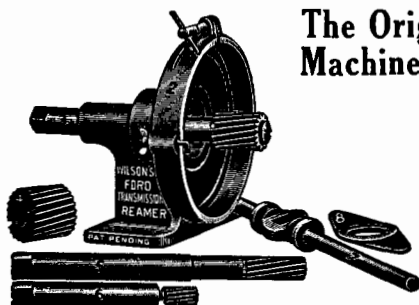
STAR-K SHURNUFF "BREATHER" SPARK PLUG is always clean because air sweeps out oil and gas. **\$1.50.**

STARK-INLAND MACHINE WORKS, Mfrs., St. Louis, Mo.

Branch Offices—New York, Pittsburgh, Chicago, Minneapolis, Kansas City, Los Angeles, Winnipeg, Toronto.

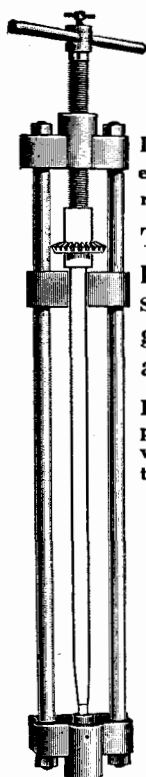
K. R. WILSON ^{OF} BUFFALO

Originator of
SPECIAL TOOLS
for AUTOMOBILE REPAIR SHOPS.
Save 75% on your labor costs



The Original Transmission Bushing Reaming Machine Over 4900 Ford Service Stations are using this machine every day—and that's the proof of its success.

The Special **SPIRAL FLUTED** reamers used with this machine are the only kind that will ream a straight true hole without chatter and leave a highly polished finish. Every reamer stamped with exact decimal diameter. Seventy-five dollars.



Rear Axle Pinion Gear Press

Indispensable for efficient Rear Axle repairs.

Takes off and puts on axle shaft drive gears quickly and easily.

Built for this one purpose, it is always ready for this job.

No Jigging Up.
No Damaged Parts.

FOR FORD
OVERLAND 4
CHEVROLET
GRANT 6
MAXWELL

\$23.00

Ford Repairmen!

Do you want to make as much in one year as you now do in five?

Other Methods, Common Tools
You get.....\$1.00 per hr.
Costs50 per hr.

Gross Profit.. .50 per hr.
or **K. R. W. Methods**
Special Tools

Hour
Flat Rate Prices....\$3.00
Cost50

GROSS PROFIT.. 2.50
Simple, isn't it, but are you doing it?

Every K. R. W. Tool is for a particular job. To do it quickly and more accurately—made for you by a **MAN WHO KNOWS.**

Send for Bulletin E-10—it will surely interest you.

Main Bearing Connecting Rod Reamer and Spotting-in Bar

a necessity with Burning in Machines. This reamer sizes up the bearings and when they start to Burn-in, all burn in at once. Used as a spotting-in bar, the three bearings are accurately checked up for alignment.

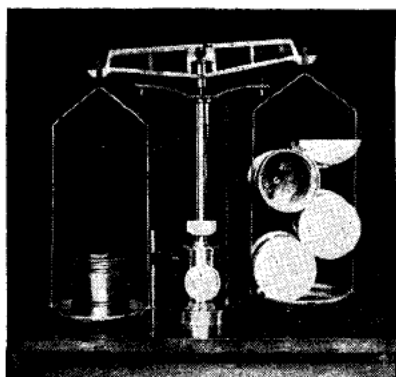
This reamer **SAVES HOURS OF LABOR** and a whole lot of uncertainty on every job. Made from a new steel, hardened glass hard, **SPIRAL FLUTED.** Pays for itself 40 times on 300 motors.

\$28.00

The New Combination Machine—"A Complete Shop"—Three-Sixty-Five
10-16 Lock St. K. R. WILSON Buffalo, N. Y.

Lightest-Weight Pistons of Dowmetal Give New Life and Speed to Ford Cars

Metal Pumped From Wells



Dowmetal one-fourth the weight of cast iron. Aluminum Alloys are 65 per cent heavier than Dowmetal.

This scientific discovery, the result of years of research in one of America's greatest chemical laboratories, adds enormously to the power and speed of your Ford. Dowmetal pistons lessen destructive vibration. They cut down gas and oil consumption. They save wear on bearings and minimize repair bills. They give pick-up, pep, flexibility and smoothness that approaches the ideal. Dowmetal is not aluminum. It is much lighter and stronger than aluminum. It is as different from aluminum as copper is from steel. It has the long sought for, wear-resisting and non-scoring properties that mean more perfect piston performance. Dowmetal is made from the chemical brine pumped from the company's wells and which is the raw material for the various Dow Chemical products. This newly discovered metal is so light that in the process of manufacture it floats on the surface of the pots.

Stop Destructive Vibration—Increase Power

By the saving of unnecessary engine labor in the pushing out and jerking back of excess piston weight, Dowmetal pistons lessen vibration.

By lessening vibration, Dowmetal pistons permit driving faster than you would dare run your engine if equipped with the usual heavy pistons.

Dowmetal pistons eliminate the choppy, jumpy motion of worn or ill fitting pistons and give a comfort and ease of control not fully appreciated until it is tried.

The power instead of being absorbed in driving heavy pistons is passed on to the connecting rods, giving an astonishing increase in speed with a minimum of strain on bearings and other parts.

Saves Oil, Gas and Repairs

Dowmetal pistons give greater mileage on gasoline and oil. Every bit of gas is used in driving the motor—not in driving heavy piston weight. There is no leakage around the piston into the oil to waste gas and destroy the lubricating properties of the oil. There is no pumping of oil into the combustion chamber to form carbon with all its attendant troubles. Dowmetal pistons never yet scored a cylinder. There is no permanent set or growth as in many of the make shift, light-weight pistons. Dowmetal pistons reduce carbon troubles and save costly repairs.



How to Get Dowmetal in Completely Equipped Pistons—Fitted to Your Ford

Dowmetal Ford Pistons are sold finished to size ordered and are completely equipped with bushings, wrist pin and piston rings, including special pressure retaining ring on each piston. There are no extras to buy—the pistons are complete and equipped to fit your particular car.

See your dealer or garage man; have him measure the cylinders in your Ford and send us the cylinder diameter with order for set of Dowmetal Pistons. Don't guess at cylinder diameter nor attempt to measure with a rule—always specify exact inside diameter of cylinder ac-

cording to micrometer or at least standard cylinder gauge measurement or else make a gauge of about 3/16" round iron pointed at the ends and send us this gauge filed to a length that will just go into the cylinder without forcing. If cylinders are out of round have them reground before measuring.

Dowmetal pistons retail at \$32.00 per set, completely equipped. We prefer to have you order through your dealer. If he will not supply, write us direct. Send for illustrated descriptive folders giving detailed information on Dowmetal Pistons. They make every Ford a Speed Car.

Terms Cash With Order or C. O. D.—F. O. B., Midland, Mich.

Special Terms to Dealers and Garages

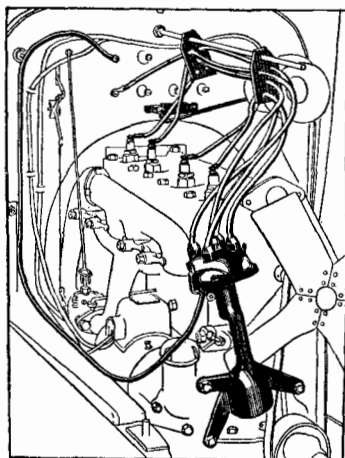
Address Inquiries to DOWMETAL Division

THE DOW CHEMICAL CO.,  Midland Mich U.S.A.

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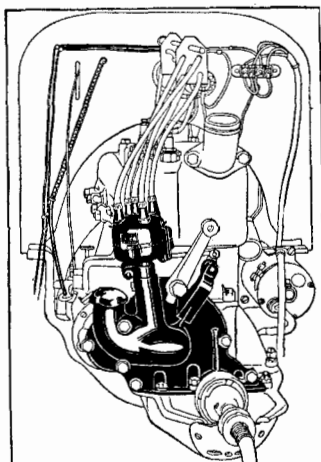
TWATER KENT

IGNITION OUTFIT FOR FORDS



Equipped with electric starting and lighting, 1919 and later models

ATWATER KENT ignition outfits for Ford cars are special only in that they are provided with all necessary fittings for mounting and installation. Otherwise they are of the same high quality that distinguishes all Atwater Kent equipment.



Non-Automatic Advance (Type CC) \$16⁰⁰

SPECIAL ADVANTAGES TYPE CC

Makes use of present coil box and coils—the vibrators are cut by screwing down the adjusting screws.

Gives you 3 spare coils for emergency use.

These modern scientific ignition equipments are easily and quickly applied to any Ford. Complete instructions, wiring and fittings furnished with each outfit.

Automatic Advance (Type CA) \$24⁰⁰

SPECIAL ADVANTAGES TYPE CA

An Atwater Kent heavy duty coil takes the place of the vibrator coils and coil box.

The Automatic Spark Advance produces maximum power at any speed without knocking—unnecessary to constantly shift spark lever while driving. Increases gas economy because spark is automatically timed right for maximum power at any speed.

System mounted on special cover plate which takes the place of the regular Ford cover plate—enclosing the hardened steel special gears, guaranteeing lubrication and quiet operation.

GENERAL ADVANTAGES OF ATWATER KENT IGNITION on the FORD

- 1—Eliminates inefficient, hard-to-get-at commutator by using same high-grade ignition instrument that is standard equipment on twenty-five of America's best cars.
- 2—Eliminates fussy, buzzy, hard-to-adjust vibrators.
- 3—Gives you a single hot dynamic spark per cylinder.
- 4—Hot spark makes starting easy, and prolongs life of battery.
- 5—Spark, perfectly synchronized, enables you to throttle down and run slower in high gear.
- 6—Smooth, rapid acceleration without knocking. (This is greatly increased when the Type CA automatic advance outfit is used.)
- 7—Utilizes present low-grade fuel to greater advantage, increasing mileage.
- 8—Only one contact point and two moving parts in entire system.

ATWATER KENT MFG. COMPANY, Philadelphia, 4937 Stenton Avenue

When writing advertisers—Just say FORD OWNER and DEALER

Stop Broken Lens Expense



Constant vibration, terrific road shocks are the chief cause of an enormous breakage of head-lamp lenses. Lenses must be well protected to prevent broken lens expense. Thousands of owners of truck-fleets and passenger cars have proven that head-lamp lenses are perfectly protected from breakage when equipped with shock-absorbing—

FLEXO Lens Protectors Prevent Broken Lenses

Shocks Absorbed by Soft Rubber

Being made of soft, live rubber, Flexo Lens Protectors absorb sledge-like blow of road-shocks, preventing broken lenses.

Lenses Do Not Touch Metal

Vibration is neutralized by lenses fitting snugly into groove on inside edge of Flexo Lens Protectors so that they cannot come in contact with metal.

Lenses Do Not Turn or Rattle

The lenses are gripped tight in the "soft" rubber gasket or Protector — preventing turning or rattling.

Makes Lamps Water-Tight

Flexo Lens Protectors fit tight in the front of the lamp and prevent water or dust from entering the lamp and dimming the brightness of the reflectors.

FLEXO LENSES: *Licensed—Registered*

The Flexo Lenses furnished with Flexo Lens Protectors give perfect satisfaction. The upper half is deeply sand blasted, throwing the clear, bright light on the road—not in the other fellow's eyes.

The Flexo Lens is approved by the Highway departments of Pennsylvania, New Jersey, Delaware, Maryland, New York, etc. Many large fleet owners have adopted the Flexo Lens Protector for their entire fleet of trucks, as have many owners of delivery and passenger cars.

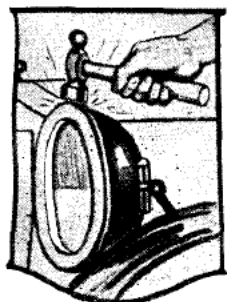
Retail Price **\$3** [Per Pair including Lenses]

The Flexo Protectors equipped with Lenses retail for \$3; Protectors in red or black. You will find a ready sale among Ford owners and other truck users. Liberal profits for the dealer. We have an interesting proposition for distributors and agents.

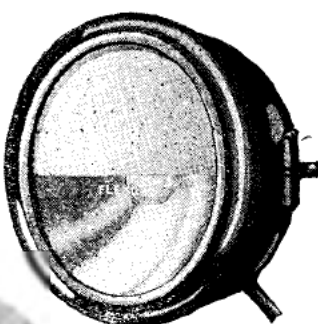
Flexo Lens Protector Co.

CAMDEN

NEW JERSEY



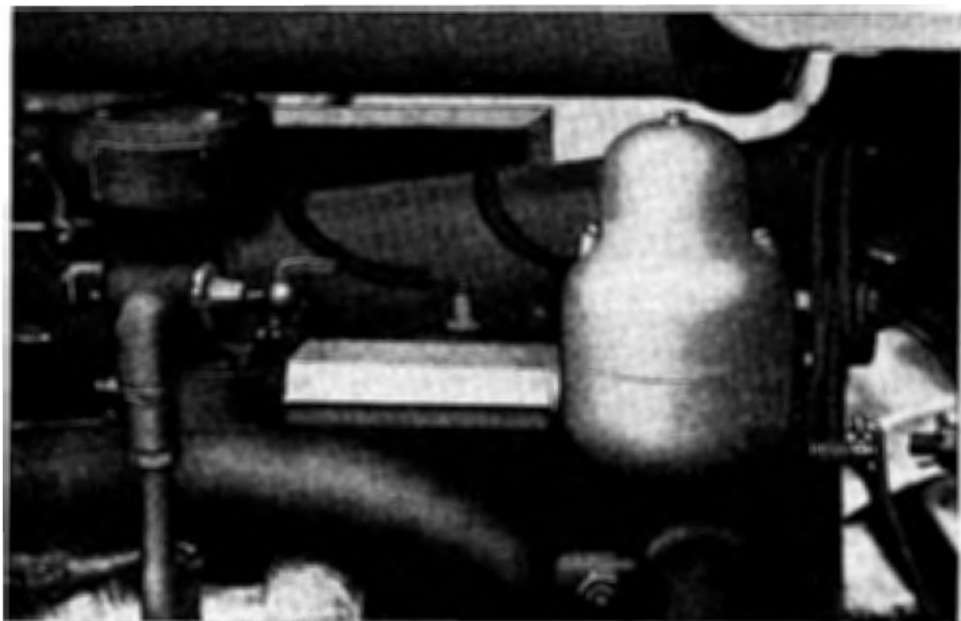
This shows the soft live rubber gasket alone. Note the grooves inside which the lens fits making it impossible to turn or rattle. No water or dust can creep inside to rust the reflector.



This shows a Flexo Protector and Lens installed in a head lamp. Easily installed in any lamp and the lens is protected forever against breaking by vibration or rough riding.

When writing advertisers—Just say FORD OWNER and DEALER

AN INSTANT SUCCESS WHEREVER SHOWN



The
Jennings Governor

for the

Fordson Tractor

An accurate governing device of the vacuum type

Simple — Compact — Efficient

Installed in one-half hour without drilling any holes or changing location of timer.
Does not in any way limit the maximum power output of motor. Guaranteed to function
properly when correctly installed.

Price \$30.00

F. O. B. DETROIT

Write for descriptive folder and trade discounts

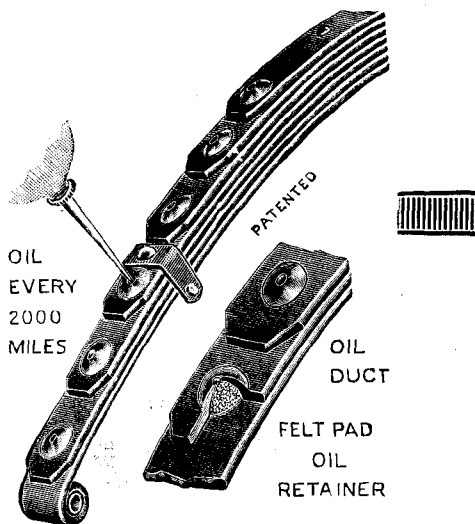
**The Jennings Engineering
Company**

504 Butler Building, Detroit, Mich.

STANLEY

Self-Oiling

SPRINGS

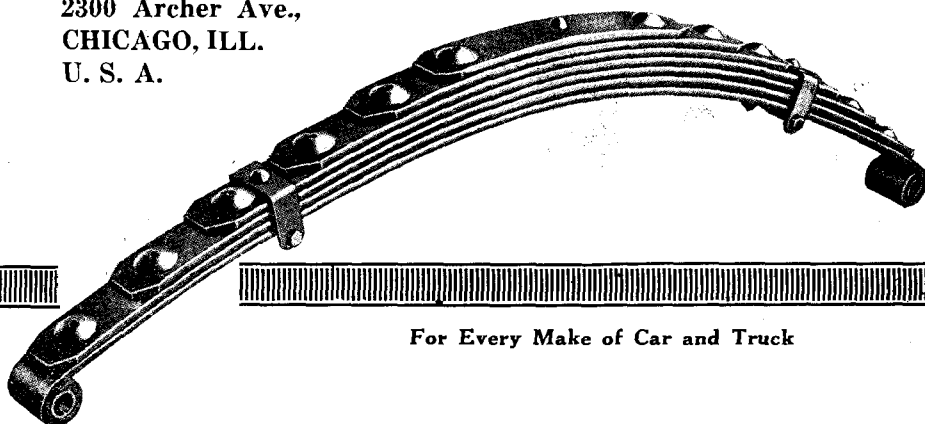


"You Float On Oil!"

LOOK at those oil cups—pressed in as an integral part of each Stanley Spring! And note the felt pads that retain the oil. Some idea, isn't it? And they sure do work. Oil up and you're good for 3000 miles of smoother riding without squeaks and groans. All you need is an oil can—no dirty, laborious greasing with a stick, no jacking up the axles. Stanley Springs never rust and seldom break (nearly all broken springs are rusted springs). They're 100 per cent better by actual test, than other springs, and will outlast the car. They add to the life of tires, and do away with the need for Pneumatics on trucks. They're the real thing. Everybody wants 'em. Splendid opportunity for good dealers and distributors.

GARDEN CITY SPRING WORKS

2300 Archer Ave.,
CHICAGO, ILL.
U. S. A.



For Every Make of Car and Truck

Keep your Ford from Overheating Get a **Cataract** Circulating Water Pump and double the life of your motor

DO YOU really know what overheating will do to your Ford motor?

Most so-called "motor trouble" is due to overheating which brings about conditions which greatly decrease the efficiency of the Ford motor.

When operated at the right

temperature, the Ford is one of the most efficient motors in the world—but once let it overheat and much of its power, snap and flexibility is lost.

Few Ford owners realize that their motor is overheating until the water boils over, which is after more or less damage has been done.

WHAT A CATARACT PUMP WILL DO

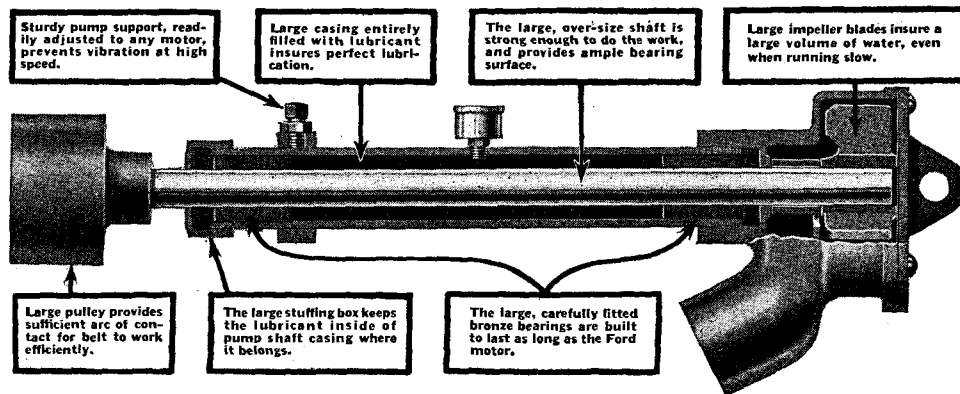
A Cataract will remove the cause of 90% of "valve trouble" and "spark plug trouble." It will help to give your motor more snap, pick-up and power on the hills than it ever had before. It will eliminate that mysterious loss of power and flexibility which comes from overheating which is not bad enough to boil the water. The Cataract will stop excessive exapora-

tion of water, and will greatly decrease the consumption of oil.

By doing away with overheating, the Cataract helps to prevent warped, pitted and burnt valves—helps to do away with loss of power through preignition, valve leakage and leaky rings, and eliminates the main cause of scored cylinders and pistons and burned-out rings.

ORDER A CATARACT TODAY

Put a Cataract on your Ford and you will wonder how you ever got along without it. Any owner can install one in less than 30 minutes. The saving in oil will pay for a Cataract in a few months' time. Order one today—mail the owner's coupon attached to this ad with a check or money order for \$9.85—the guarantee assures you satisfaction.





MORE DEALERS WANTED

The Cataract pump is the best circulating water pump made for Ford cars and trucks. It is the most substantial—the most efficient. It is perfectly lubricated and it is the only pump designed to last as long as the Ford motor itself.

Any dealer can sell the Cataract on sight, and with the assurance that

there will be no comeback, for it does everything we claim for it and more. Ford owners who have installed Cataracts wonder how they ever got along without them.

To active dealers who are in a position to deliver the goods in the way of sales, we can offer a very attractive selling proposition. Mail the dealer's coupon today.

THE CATARACT GUARANTEE

We positively guarantee the Cataract pump to eliminate overheating of any Ford motor. We further guarantee that the Cataract pump is the best built circulating water pump made for the Ford motor, and that it will render

satisfactory service as long as the Ford motor itself.

We will refund the full purchase price to anyone who is not satisfied that the Cataract will do everything we claim for it after a 10 day trial on his own car.

**F.R.LUECK
MFG.CO.
MILWAUKEE, WIS.**

F. R. LUECK MFG. CO., Milwaukee, Wis.

I am interested in the Cataract Pump. Send me details of your selling proposition by return mail.

Name..... F. R. LUECK
Address..... MFG. CO.,
Milwaukee, Wis.
Town..... Enclosed find money-
order (or check) for \$9.85
for which send me a Cataract
State..... Pump by return Parcel Post.

Name.....

Address.....

Town.....

State.....



**Dont Wait till
Your Car Is Stolen**

*TODAY is the time
to buy a*

HUGRO PERFECTION Ford Steering Wheel Lock

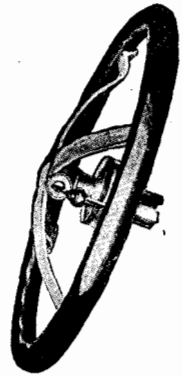
Once bought, the lock lasts as long as the car. You can't save any money by waiting—but you CAN lose your car.

The Hugro Perfection Ford Steering Wheel Lock is safe, positive and durable. It meets legal demands, is endorsed by underwriters, and cuts the cost of your insurance.

It also adds real steering wheel comfort—no more of that strained, elbows-in-the-air feeling while driving. The Hugro Perfection Lock includes an over-size aluminum spider with oversize corrugated and dished walnut rim—which provides easy, tireless, driving comfort.

You're going to buy a good lock someday. You can't afford to put it off.

Ask your dealer. Write us for literature, NOW.

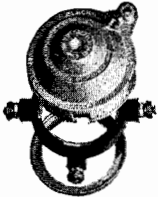


Hugro
MFG. CO.

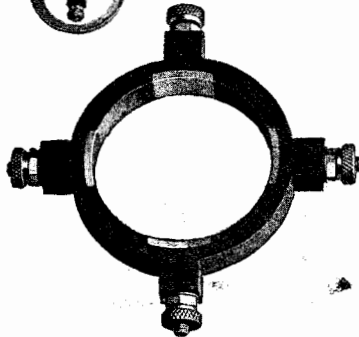
WARSAW, INDIANA.

A Hotter, Fatter Spark

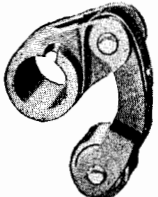
For Fords and Fordsons



The time shell is stamped with the colors of the wires. The contact plates are wider. The Life-Timer cannot rust.



This is the commutator in a "close-up." Note simplicity and accuracy. It is interchangeable at nominal cost. No other timer has this feature. Note how insulating material extends right through timer shell, absolutely eliminating "aborts."



This contact arm has hardened ball bearing races; 18 chrome nickel steel balls; hardened roller and clock steel spring. Its perfect contact with minimum wear means life to timer and to motor.

Saves 20% Gasoline
Adds 20% Speed and Power
Insures Easy Starting

LIFE-TIMER absolutely gives a hotter, fatter spark. This is due to superior design which brings ignition for Fords and Fordsons up a point of perfection never before attained.

Life-Timer is made so that it **cannot be late**. You save gasoline—20% saving over ordinary inefficient ignition.

See the **simplicity of Life-Timer in the illustrations**. Nothing to get out of order. And it is machined so accurately that it is **on time** to the one hundredth of a second.

Ends Timer Troubles
For All Time

LIFE-TIMER is more carefully designed for long service and more carefully made than anything previously known to the industry. It is the watch-dog of the Ford and the Fordson, guarding against loss of power, loss of speed and wear and tear on the power plant due to ordinary poor ignition.

Life-Timer has made records that owners find it hard to believe, until they see it actually done on their own cars. Ask us about these records.

DEALERS—Write for our Life-Timer proposition. We guarantee this timer, its simplicity and moderate price, together with the service it renders Fords and Fordsons, make it a ready seller; and it pulls **new** business, too. Our dealers have records as high as 25 new customers a month. We will ship sample at dealer's price if you say so.

Life Timer

For Fords and Fordson Tractors

\$3.50 Complete

MECHANICAL PRODUCTION CO.
Franklin & Fratney Sts., Milwaukee, Wis.

C. N. & F. W. Jonas

608 So. Dearborn St.

CHICAGO

EXCLUSIVE REPRESENTATIVES

CAR OWNERS' COUPON.

C. N. & F. W. JONAS,
608 So. Dearborn St.,
Chicago, Ill.

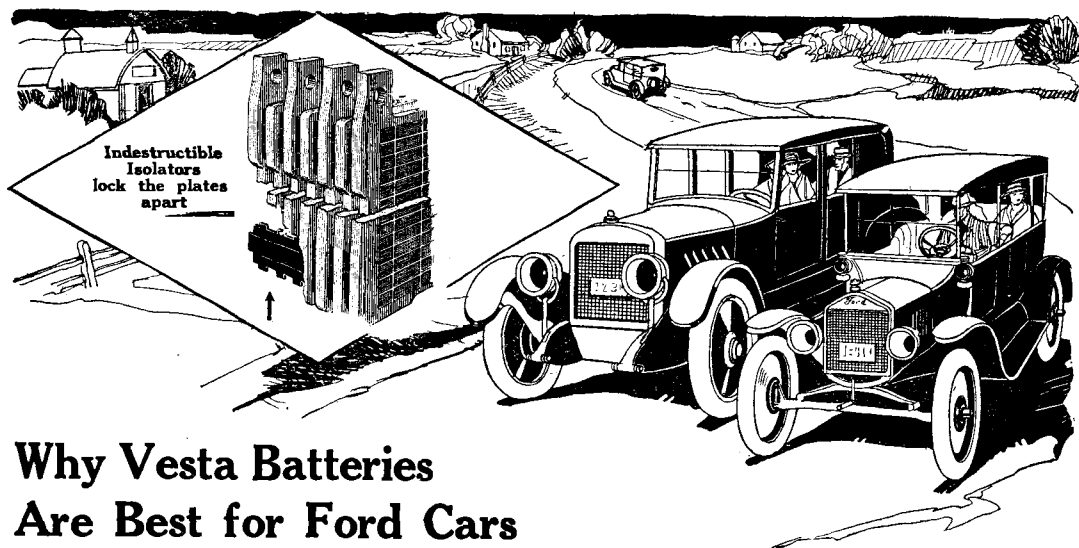
Gentlemen: My dealer has not yet received his stock of Life Timers. For the enclosed \$3.50 send me, postage prepaid, one Life Timer.

Name

Address

City State

Send your dealer's name.



Why Vesta Batteries Are Best for Ford Cars

BRANCH HOUSE SUBSIDIARIES

Vesta Electric & Supply Co.
Atlanta, Ga.

Boice Motor Equipment Co.
Boston, Mass.

Vesta Battery Sales Co.
Cleveland, Ohio

Vesta Detroit Battery Co.
Detroit, Mich.

Kansas City Battery &
Supply Co.
Kansas City, Mo.

Vesta Pacific Battery Co.
Los Angeles

Vesta Storage Battery Co.
New York City

Omaha Battery & Service Co.
Omaha, Neb.

Vesta Pittsburg Battery Co.
Pittsburgh, Pa.

Vesta Battery & Equipment
Co., St. Louis, Mo.

Auto Equipment Co.
Denver, Colo.

Reinhard Bros. Co., Inc.
Minneapolis, Minn.

VESTA Indestructible Isolators are one reason. They lock the plates firmly apart.

They keep the plates at an even distance from each other, no matter how much chassis vibration there is or how heavy the road shocks.

The plates cannot possibly touch to cause a short circuit in the battery.

Vesta Indestructible Isolators also eliminate all wear on the Vesta Impregnated Mats, another patented feature, which takes the place of the so-called separators in other batteries.

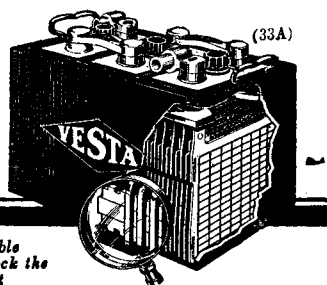
Vesta Poro Hard Plates which have unusual current capacity, and the use of Titanium which purifies the electrolyte are other reasons why the Vesta Battery gives longer service in the Ford car.

To the Ford owners as well as to other car owners the Vesta Slogan, "Costs Less Per Month of Service," has a real meaning.

VESTA BATTERY CORPORATION
2100 Indiana Ave., Chicago, Ill.

VESTA

COSTS LESS PER MONTH OF SERVICE



Indestructible
Isolators lock the
plates apart

When writing advertisers—Just say FORD OWNER and DEALER

A \$12.50 VALUE FOR \$9.00

The famous KINGSTON COMBINATION, including the Kingston Carburetor, list price everywhere \$7.50; the Kingston Preheater, list price everywhere \$1.50, and the new Kingston Fuel Protector, list price everywhere \$3.50.

THE KINGSTON CARBURETOR is known everywhere. More than a million are in daily use on Ford cars—insures Speed, Power and economy. THE KINGSTON PREHEATER means Instant Start and Getaway. THE NEW KINGSTON FUEL PROTECTOR insures Convenience and Protection.

THESE THREE IMPORTANT ACCESSORIES, all nationally advertised at the prices listed, all nationally known, all guaranteed to the limit, worth, everywhere, \$12.50, are yours for \$9.00 for the next 30 days. On sale by automotive accessory and hardware dealers throughout the United States, or send order direct to manufacturers.

TO DEALERS—Write or wire for our special, highly attractive proposition, giving name of your jobber.

BYRNE, KINGSTON & COMPANY

KOKOMO, INDIANA, U. S. A.

Branches—New York, Chicago, Detroit, Boston
San Francisco

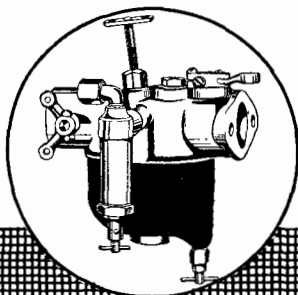


OUT OF GAS?

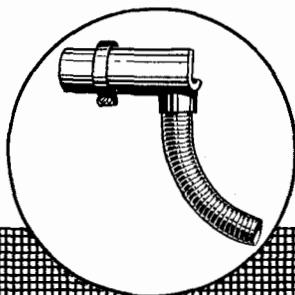
THE NEW KINGSTON FUEL PROTECTOR absolutely guarantees the driver against this mishap. Cleans and purifies fuel. Can be instantly changed from regular to auxiliary supply, or fuel supply may be shut off entirely from control at driver's seat. Most important Ford Accessory in years. Saves cost many times in single season. List price everywhere, \$3.50. FREE if taken with special 30 day offer.

Kingston Carburetors are Used by 80 Per Cent. of American Farm Tractor Manufacturers

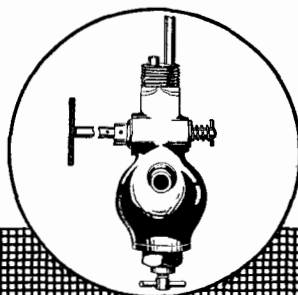
Famous Kingston Carburetor



Preheater



New Fuel Protector



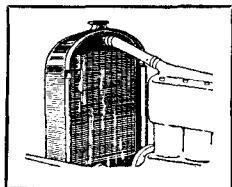
KINGSTON

COMBINATION

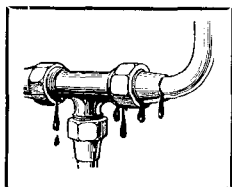
When writing advertisers—Just say FORD OWNER and DEALER

Six Reasons Why Your Motor Overheats —

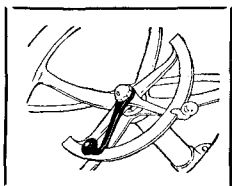
1.
LEAKING
RADIATOR



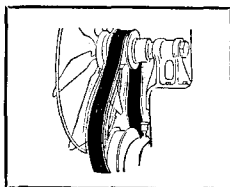
2.
LEAKING
OIL-PIPE



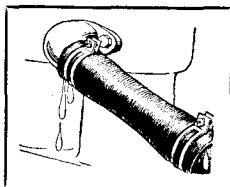
3.
RETARDED
SPARK



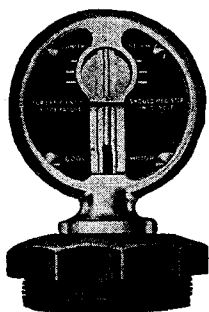
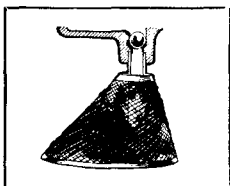
4.
LOOSE
FAN-BELT



5.
LOOSE HOSE-
CONNECTION



6.
CLOGGED OIL-
STRAINER



Special Model
for the Ford
\$3.50

“A Heat Motor requires a Heat Gauge”

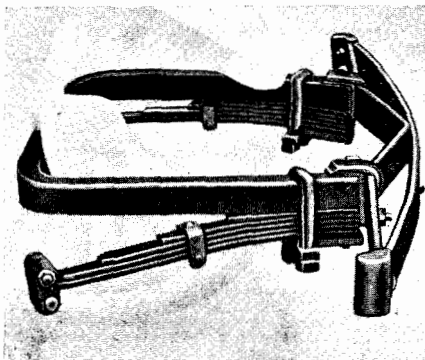
A dozen things may go wrong under the hood of your car but unless you have a heat gauge to keep you constantly posted on the thermal condition of the motor you must wait until the radiator is boiling over or until the knocking of the engine warns you of impending trouble. The Boyce Moto-Meter warns you instantly, 15 or 20 minutes before the most experienced driver could detect that trouble had started; it is the only certain way to prevent costly motor damages and premature wear.

THE MOTO-METER COMPANY, Inc.
LONG ISLAND CITY, NEW YORK
FACTORY BRANCHES, LONDON AND PARIS
THE MOTO-METER CO. OF CANADA, Limited
Hamilton, Ontario

BOYCE MOTO METER

When writing advertisers—Just say FORD OWNER and DEALER

TAKING THE "BUM" OUT OF BUMP



THE CANTILEVER SPRING SUSPENSION AND BUMPER replaces the Ford Spring, increases the spring base 18"—controls compression and prevents rebound. Relieves strain on radius rod. Eliminates side sway of body. The highest mechanical efficiency attaining "BIG CAR" riding and driving comfort. It introduces the only practical and satisfactory Bumper support as positive protection to the car. It adds distinctive value and pleasing appearance combined with a safety factor that makes the front system trouble-proof.

It is a single unit, eliminating the use of extra radius rods, steering devices and shock absorbers.

MR. FORD OWNER—The price is \$22.50 for the Spring Suspension and Spring Bumper complete ready to put on. We will send this outfit to any dealer for you to test for 10 days. If it is not entirely satisfactory to you it can be returned.

An Oil Bafolizer For Spark Plugs

Positively prevents excess cylinder oil from reaching the firing points.

Saves time cleaning plugs.

Saves time in starting.

Saves Batteries in start.

Saves power loss.

Saves loss in gasoline.

Protects the Spark Plug.

Increases explosive force.

Produces accurate firing.

Has removable thumb screw for priming and blow out.

Has baffle plates inside.

Adapted for Passenger engines, trucks and tractors.

Write For Full Details

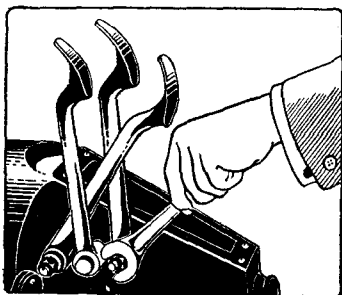


\$2.75 for a set of four. Sold on 10 days' trial. Fully guaranteed to work as described. 75c for one—price does not include spark plug.

THE PROTECTOMETER CO.

**4043 Ravenswood Ave.
CHICAGO, ILLINOIS**

The Practical Way to Adjust Brakes Instantly! From the Seat! No Soiling of Hands!



Action of the pedal is carried on by the bearing sleeve No. 2

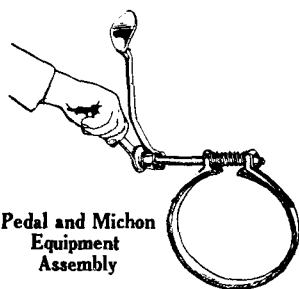
It is necessary to frequently adjust the brake and reverse bands on your Ford car.

But it is **NOT NECESSARY** to perform this job in the old, troublesome, dirty way.

The practical way to adjust transmission bands is with

Michon Outside Adjusters

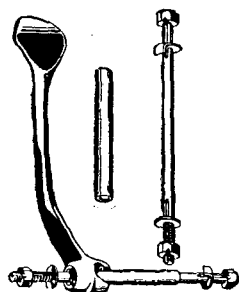
From the car seat—without any trouble—you adjust the bands quickly and to just the proper tension, which results in **ADDED SAFETY** and **LONGER LIFE** to the bands. This saving alone soon pays the cost of the adjusters.



Pedal and Michon Equipment Assembly

HERE IS HOW IT WORKS

Note Special Washer held in between the band yoke holding Adjusting Shafts from revolving when adjustment is being made. Also note that all oscillating movements actuated by the fore and back



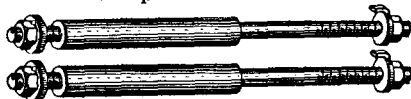
Here is the Equipment

- No. 1 Regular Ford Pedal pressed into Sleeve No. 2
- No. 2 Bearing Milled Sleeve
- No. 3 Adjusting Extension Shafts

Fits Ford Parts Perfectly

THIS IS WHAT DOES IT

- Michon Equipment consists of:
- 2—Adjusting Extension Shafts
 - 2—Bearing Milled Sleeves
 - 2—Special Lock Washers
 - 2—Special Milled Nuts

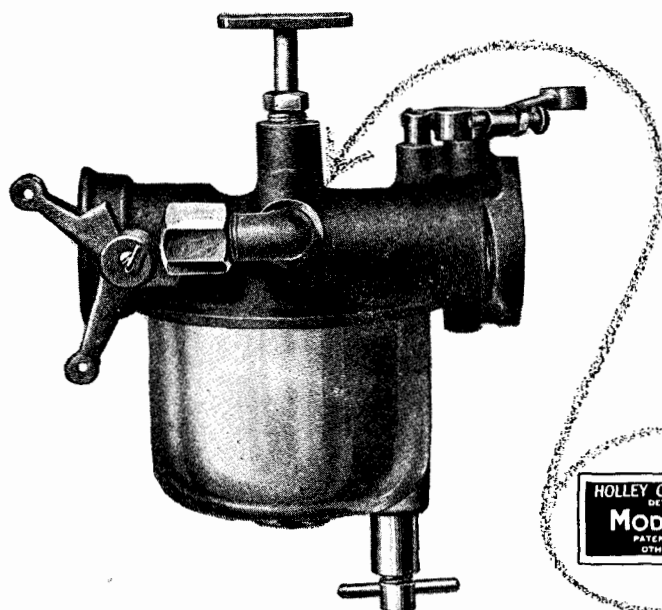


Michon Outside Adjusters can be installed in a few minutes. Retail price, **\$3.00** per set. Guaranteed to be entirely satisfactory.

DEALERS AND JOBBERS—A remarkable, practical seller and we have a proposition of liberal discounts.

MICHON MANUFACTURING CO.
TOLEDO, OHIO

Here's the Most Efficient Carburetor for Fords



*Our latest model bears
this nameplate; accept
no substitute.*

HOLLEY CARBURETOR CO.
DETROIT, MICH.
MODEL NH
PATENTED 9-8-1911.
OTHERS PENDING.

The most efficient carburetor ever designed for use on a Ford is the new Holley Model "NH."

In designing it Holley engineers considered every requirement of a Ford motor. As a result this carburetor is the best that can be attached to a Ford motor.

It is so constructed that cold gasoline is lifted off the nozzle and into the main air stream, insuring a quick start at all

times. This Holley model enables the driver to accelerate the car to its maximum speed almost instantly.

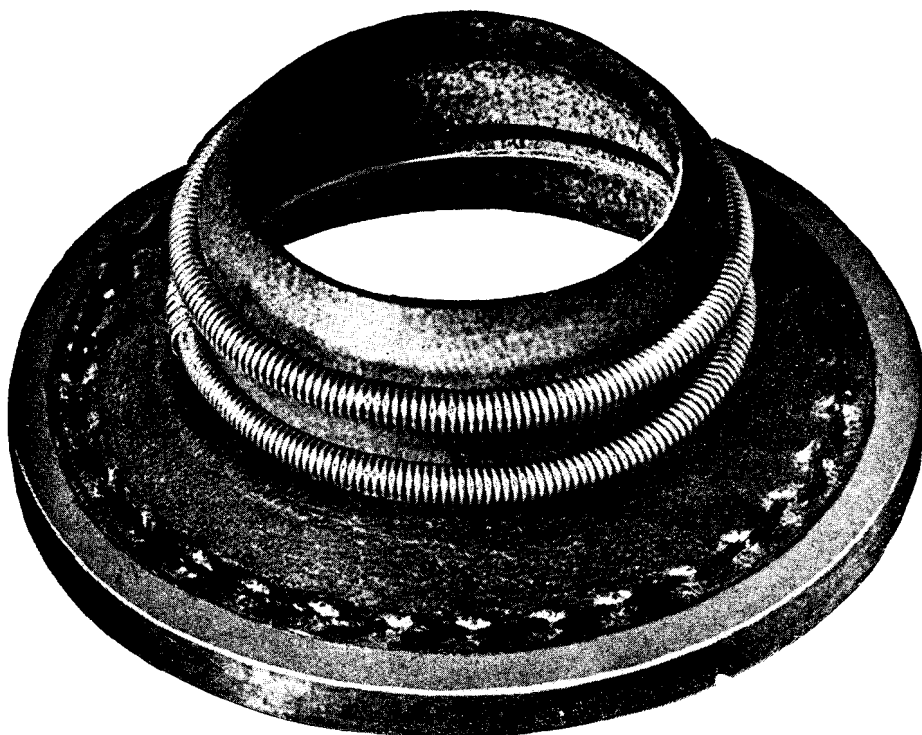
Smoothness of operation and increased mileage are assured cars equipped with this new Holley carburetor. It is not an experiment—long and successful tests prove it to be the best carburetor for a Ford.

Our descriptive booklet will be sent upon request.

HOLLEY CARBURETOR CO.
DETROIT

(46)

C & M OIL RETAINERS



Patented April 1, 1913—Jan. 9, 1917—Jan. 14, 1919

"MADE OF LEATHER"

"THEREFORE LEAK-PROOF"

OTHER C & M PRODUCTS

C & M TRADE MARK
PATENTED

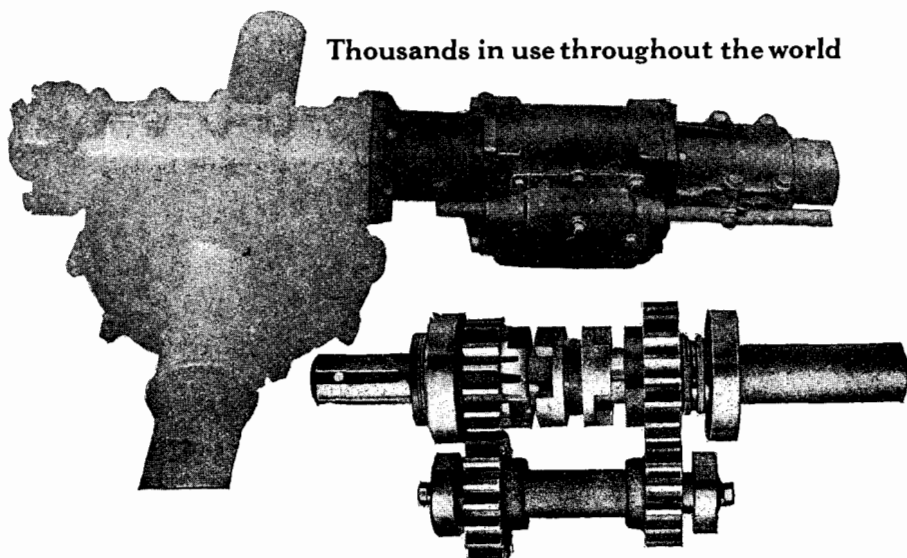


FORD REPAIRMEN AND AGENTS—WRITE TO US OR YOUR JOBBER

Cantrell-Miller Manufacturing Co Inc.,

1246-1254 Larkin Street,
San Francisco, Calif.

When writing advertisers—Just say FORD OWNER and DEALER



It Pays to Own a Langbein Equipped Truck

A truck's earning capacity is governed by its speed, load carrying capacity and operating radius. All three can be increased: speed, capacity and operating radius by equipping the Ford Truck with a

Langbein 4 Speed Compound Transmission

The Langbein Transmission is equipped with Hess Bright Annular Ball Bearings which cost three and one-half times more than bearings used in all other auxiliary transmissions. For every year of 223 working days the Langbein equipped truck earns \$600 more, and saves \$300 in repairs and upkeep. Total \$900.

How Speeds Are Arranged

OVER DRIVE TYPE				UNDER DRIVE TYPE			
Ford Low	Langbein Compound Intermediate	Ford High	Langbein Compound High	Langbein Compound Low	Ford Low	Langbein Compound Intermediate	Ford High
1st	2nd	3rd	4th	1st	2nd	3rd	4th
Miles Per Hour Up to 8	Miles Per Hour 8 to 12	Miles Per Hour 12 to 17	Miles Per Hour 17 to 30	Miles Per Hour Up to 5	Miles Per Hour Up to 8	Miles Per Hour 8 to 12	Miles Per Hour 12 to 17

The Bierlein Syndicate Ltd.

1142-44 S. Los Angeles St.

Los Angeles, California

A Wonderful Difference

In Easy Starting and Steady Firing

Easy Starting saves time — and nerves. And steady firing at the right instant means more power — more speed — more mileage — more pleasure in driving.

All this and more you can give your patrons in the

MARCH DISTRIBUTOR

For Fords and Fordsons

It's different. It does away with the ordinary timer. It times the spark with great precision and fires the engine with certainty. Because the March Distributor is mechanically and electrically **right**, it **can't help but fire right**. We guarantee it absolutely. As quickly and easily installed as any ordinary timer.

Regardless of the great superiority of the March Distributor the price is kept reasonable. It retails for \$5.00.

***"The March Distributor is the cheapest Ford timer
'at any price'"***

DEALERS, FORD AGENTS, JOBBERS

Car owners will forever thank you for INSISTING that they try the MARCH DISTRIBUTOR. A money-saver for them—a money-maker for you. Let us send you one to prove it.

American Metal Products Co.

53 W. Jackson Blvd.,

Dept. 26,

Chicago, Ill.

MAIL THE COUPON

American Metal Products Co.,
53 W. Jackson Blvd., Dept. 26, Chicago.

Send us one March Distributor at \$5.00, less regular discounts. Bill to us on usual terms of 2% 10 days, 30 days net. If we don't like it we will send it back.

Signed

Address

(Don't forget your Letterhead)

A Ford Truck in Chicago

was laid up after twelve different timers were tried on it during the past year, because it was so hard to start. It is now starting easy and running smoothly with a MARCH DISTRIBUTOR. Name and address of owner on request.

Safety Oiling System



Use It and Prevent Burned-Out Bearings on the Road

AVOID this expensive and annoying occurrence. It means an interruption of your pleasure trip, or your business trip, whichever it may be. To be towed in is costly, and the resulting repair bills are more so. Particularly, as a failure of your lubricating system generally means scored pistons and cylinders, as well.

**Will
SAVE
—Repair Bills
—Your Motor
—Your Brake
Linings**

—by installing Safety Oiling System, which will save you from fifty to seventy-five dollars for unnecessary repair bills. With the aid of a wrench, you can install it yourself, in five minutes' time. Safety Oiling System replaces your present transmission cover-plate. No drilling or tapping is necessary.

Its sharp teeth collect bits of brake-lining, flakes of carbon, or other foreign substances which collect in cylinder oil, and stop up the feed pipe. We have sold thousands, which are giving absolute satisfaction to owners in all sections of the country, by insuring an even and correct distribution of oil to every part of the motor.

Why spoil that trip you have been planning for the sake of saving Six Dollars? Why not have a quieter, smoother running car, free from overheating and smoking? Safety Oiling System will provide longer life for your motor and transmission bands, and prevent "chattering" when starting and stopping. Order today.

WRITE FOR CIRCULAR

SAFETY OILING SYSTEM

W. H. SIMON

824 N. BROAD STREET

PHILADELPHIA, PA.

THESE ACCESSORIES BECOME NECESSITIES

Once You Use Them

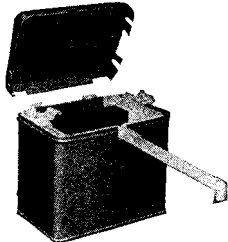
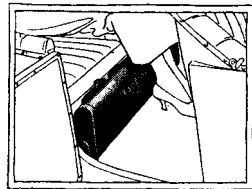


A Place for Every Tool

With the Victor Tool Box you have every tool in its proper place and right at your finger tips. This handy box fits against heel board of front seat where any tool may be had without moving. Holds all tools, tubes, patches, etc. Durably made of sheet metal, handsomely japanned. Can be locked.

Rolled, Clean Curtains—Quick!

When a rain comes up you don't have to rout out the passengers and dig under the back seat for your curtains if you use this handy Victor Curtain Holder. And when you get the curtains out they're not all torn and greasy, instead they are kept neatly rolled, always ready for instant use. Attaches to heel board of rear seat. Can be quickly installed.

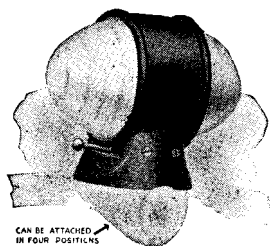


Your Battery Needs Protection

The Victor Battery Box for Fords protects the battery from mud, water, road oils, dust and dirt. Prolongs life of battery. Pays for itself in reduced repair and recharging bills. Durably made of drawn metal. Attached in five minutes' time.

Save Your Current

Why burn two headlights and tail light when you park your car at night? The Victor Parking Lamp gives the same protection and uses but 1/10th the current. Can be controlled by switch in the base or from dash. Has many exclusive features. Stop the drain on your battery—install a Victor.



DEALERS: There is a real demand for these accessories.
Get in Touch with your jobber.

The Corcoran-Victor Co.

710 Reading Road
CINCINNATI, OHIO



One Lever Control

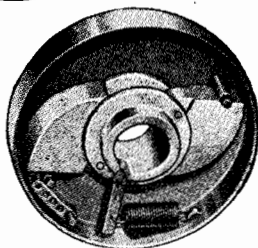
for Fords and Fordson Tractors

Few Ford Owners obtain the greatest efficiency from their motors due to lack of careful regulation of the spark lever. Every time you change the position of your gas lever, the spark lever should also be advanced or retarded to permit the motor to work efficiently. It saves gasoline to do so. This is taken care of AUTOMATICALLY by the

Wright Automatic Timer

Reduces Carbon

By automatically timing each cylinder correctly it avoids carbon, leaky valves, scored piston walls, high gasoline consumption, overheating of motor, knocking on upgrades or under load. Reduces strain on main bearings. Simplifies driving. Increases safety by one-lever control. Waterproof. Requires no attention after being attached. Installed in a few minutes without special tools. Will end your timer troubles at once.



Lasts Longer

We know cases where one Wright Automatic Timer has outlived a dozen others. In most cases will last as long as your car. Saves you money on timer replacements. Requires no cleaning—no oiling. Operates smoothly. Fires positively—at the right instant when the piston receives its greatest thrust. Means more miles per gallon. Prevents backfiring. Retards spark automatically for starting. Price \$7.50—pays for itself through long life and service.

Wright Automatic Timer Corporation

Main Office: 30 North La Salle Street
CHICAGO, ILLINOIS

Service Station: 2111 S. Michigan Ave.

DEALERS

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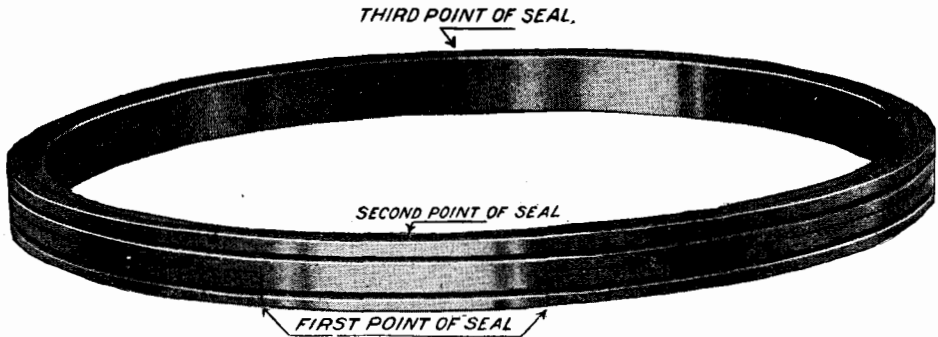
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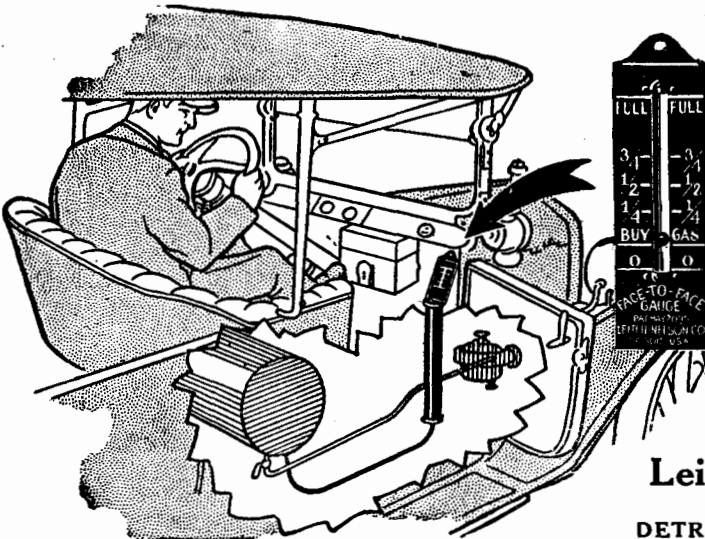
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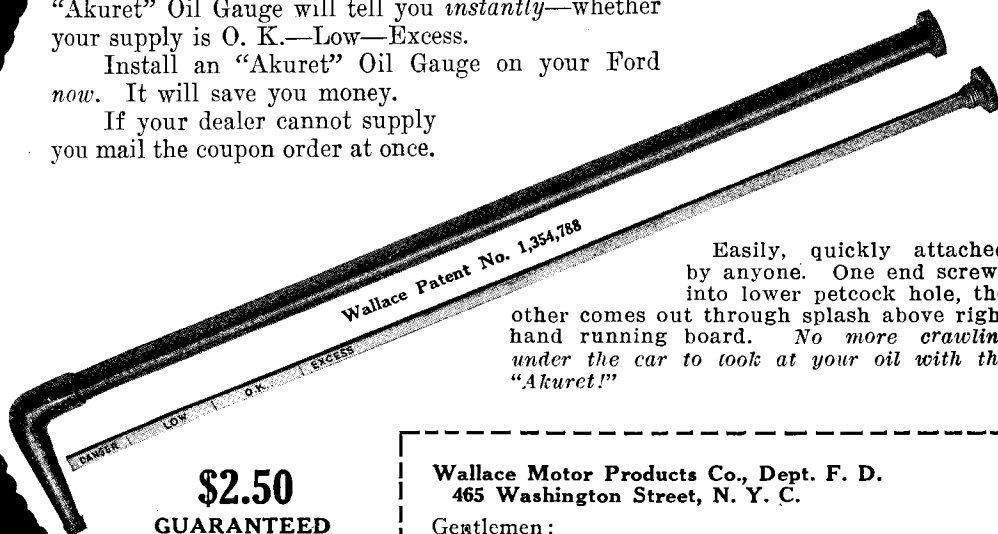
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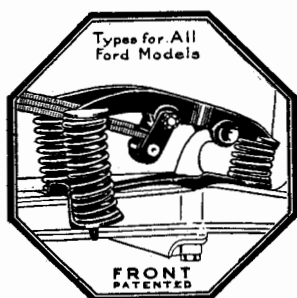
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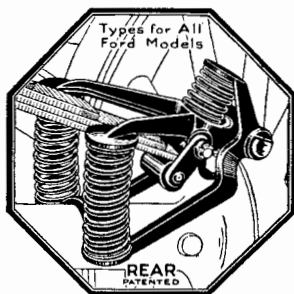
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The Ford springs do their part in taking the shocks of the uneven road surface but the FloatAforDs working with the springs, not against them, give an added cushion. The two coil springs soften the downward blow.

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The rebound is more to be feared than the downward thrust. The Ford spring is broken on the up-throw. This "third spring," found only in the FloatAforD Shock Absorber, is on guard—to prevent this spring breakage and check the rebound by resisting compression. It also stops the side-sway, giving you easier steering.

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VOL. 15

JUNE, 1921

No. 3

TOURING AS AN INVESTMENT

There may be some persons in the world who do not enjoy traveling, but we never have met them.

There is a bit of the vagabond in all of us; it is an instinct to which world progress owes much.

Because the impulse to travel is a natural one, to obey it is beneficial.

You who own Ford cars have at hand the means of travel. You owe it to yourselves to use it.

A touring trip is not an expense. It pays dividends in needed change of activity and scene; in relaxation and rest; the tonic of fresh air and sunshine; the mental stimulus of seeing new things and thinking new thoughts.

If you have spent a year at your work, it is not a question of whether you can afford to take a touring trip, but rather whether you can afford not to.

You are thinking of touring. Decide to make the trip. It will prove a real investment.

INSTALLMENT PLAN OVERHAULING

Going Over the Ford Without Removing Engine or Rear Axle

By Murray Fahnestock, A. S. A. E.

A little repairing now and then,
Is relished by the Henrimen.
But what is the sense, and what is
the use,
Of a complete overhaul, without
good excuse?

IN OUR May 1920 issue, we told how one should proceed to completely overhaul the Ford car. The article seemed to "listen well," as one sometimes says about women? And yet—

One day I was listening to one of our readers and he said "I suppose that you completely overhauled your Ford this winter, eh?"

"No," I admitted, "I didn't. And now, when I come to think of it, I wonder if the complete overhaul isn't almost as extinct as the Dodo?"

As a result of this new thought that was thrust upon us, it is our intention to consider the "annual overhauling" from a new standpoint this year. Instead of tearing all the guts out of the Ford, and scattering them from the roof to the cellar; it is the idea to consider the overhauling on the "bit-by-bit" or "installment plan"—rather than as one all-in-a-lump operation.

When a woman does the spring house-cleaning, she generally manages to maintain some sort of a "going concern" during the process. So that we have some where to eat, and somewhere to sleep; while the last little speck of dust is being carried from the snug little corner in which it has lain so comfortably all winter. There is no place like home—during house-cleaning time, with the possible exception of the "hot spot" presided over by his Satanic majesty.

Several years ago, when automobiles were not as well made as they now are, and when knowledge of cars was not so general; it was the custom of some garages to charge car owners for a "complete overhaul." But, as is now quite generally known, a complete overhaul is not usually necessary. And in many cases, cars develop knocks and other faults, after an overhaul, which they did not possess before the work was done. Leave well enough alone—is a motto that applies almost equally well to taking either people or automobiles apart.

Hitch Ford to Star.

When we consider such immense stars as Canopus and Betelgeuse, which are thousands of times larger than our mighty Sun, it makes us feel as small and tiny as a cheap car feels beside a Ford. When we have taken the Ford completely apart for an overhauling and are ready to put it together again, we often feel the same—or worse.

When it comes to a complete overhauling,

the average car owner may get the car apart—but that uses up all his enthusiasm. Then he becomes disgusted with the size of the task, chucks the parts together "any old way", and says "Never again!"

With due respect for human nature, that one of the best ways to get a good deed done is to make it as easy as possible. By coaxing the car owner into repairing **one part** of the car at a time, we believe that car owners can complete their mechanical education much easier.

In a general way, the articles which have been published in this magazine have offered, during the last few years, a complete, even if rather hap-hazard treatise on the subject of overhauling. But, as we have added so many subscribers during the year just past, and as envious friends have a tendency to borrow the magazine, we have decided to once more review the subject of overhauling.

Planning ahead is one of the principal elements in skillful overhauling. And many of us will do well to use our heads more and our hands less. By making out a list of troubles which have been experienced during the past year, one can determine which faults need to be eliminated. Often it is better—unless one possesses unusual skill—to leave well enough alone, and only inspect, rather than to **dissemble**, such parts as are already performing in a satisfactory manner.

Before starting the actual work of overhauling, we suggest that you procure from your local Ford Agent, a list of standard labor charges on Ford car repairing. Or else you can refer to the list which we published in our June 1919 issue.

By studying these labor charges, it will be found that some repairs can be more profitably made at the repair shop than by the individual car owner. Just which operations should be done at home, and which at the repair shop, depends on the skill and equipment of the car owner, and the time which he has available for doing the work.

Bunching Repairs.

Whenever possible, one should plan to "bunch" repairs, so as to do the work under the "group" system. In this manner, one dissembling often serves for the repair of several parts. If the magneto is weak, or if a "knock" indicates that the rear main bearing is loose, necessitating the removal of engine and transmission, then it is foolish to remove carbon,

grind the valves, or reline the bands. For when the engine is out of the car and taken apart, all these repairs can be "bunched" and more easily made at the same time.

In this particular article, we do not intend to cover "shop" repairs, such as overhauling the transmission, re-babbiting of main bearings, or reboring the cylinder block. Such repairs require more skill and equipment than is usually within the reach of the average car owner.

If you wish for more comprehensive instructions on the testing and straightening of connecting rods and crankshafts, or of such repairs as the babbiting and reboring of main bearings; then it is necessary for us to refer you to the back numbers of our magazine, some of which we can furnish you at 15 cents a copy, and some of which are now unfortunately out of print. Which proves that this magazine is not only worth reading, but it is worth saving as well, as many of our readers already know.

Well Planned Is Half Done.

One should adopt some general plan for overhauling the car. Even a poor system is usually better than none at all. It is not necessary that you take our system—for your own may be better. In considering a general overhaul, it seems more logical to begin at the front end of the car and work towards the rear axle. Though it is possible that some backward people might prefer to work in a contrariwise direction.

If the radiator leaks and requires soldering, this is most easily done while the radiator is off the car. While the radiator is off, this affords more convenient access to the engine for making adjustments and repairs. If the engine has to be taken out, this makes the transmission more accessible. And when the transmission is out, it is easier to pull off the rear axle.

We suggest that you divide the overhauling into three divisions. The first division includes overhauling the engine and transmission. Then the carburetor and fuel system. Then the wiring and coil units.

After putting the engine together again, and into running order, the cooling system should be checked up for leaks.

The second part is the overhauling of the chassis, beginning with the front spring, front axle and steering gear. And then overhauling the rear axle system, including the rear hub brakes and the universal joint. The front wheels can be adjusted and tightened greased, and the rear wheels tightened on the axle shafts.

The third part of the overhauling might include repairing the body and upholstery, and the top and side curtains.

Overhauling the Cooling System.

The first stage in overhauling the Ford car is the overhauling of the cooling system. This includes cleaning and repairing the radiator and cleaning out the water jackets of the cylinder block, replacing the rubber hose connections between the cylinder block and the radiator, and adjusting the fan belt.

If there are any leaks in any of the tubes of the radiator, especially on any of the inside rows of tubes, it will probably be necessary to remove the radiator from the car in order to effectually solder or replace these leaky radiator tubes. If the radiator needs to be replaced,

this affords a convenient opportunity for replacing the rubber hose connections, or obtaining more easy access to the engine, for removing carbon, grinding valves or making other repairs.

Ordinarily, however, it will only be necessary to drain out the radiator and wash it out thoroughly with clean, fresh water to remove any mud or sediment which may have accumulated. The repairing of Ford radiators has been considered in detail in a separate article beginning on page 46 of the April 1921 issue of this magazine. We are now ready to consider the cleaning of mud and sediment from the water jackets of the cylinder block. It is evident that, if these parts are clogged with mud and dirt, not only will the water fail to flow as freely as it should, but the water will have less opportunity of removing excess heat from the hot metal of the cylinder walls.

One method of cleaning out the water jacket involves dissolving about one pound of washing soda in hot water and placing this solution in the cooling system of the car; allowing this to stand for an hour or so, and then washing the radiator and cylinder block out thoroughly afterwards.

By knocking out the metal discs, in the valve side of the cylinder block; one can often remove dirt and sediment which has lodged around the valve ports. By using the nozzle of a garden hose to squirt a stream of water into the water jackets of the cylinder block, this part of the cylinder block can be more effectually cleaned.

The top radiator hose connection between the cylinder head and the radiator, most frequently needs replacing; owing to the fact that it is subject to considerable strain and vibration, as well as to the hottest water from the cylinder head, so that it is usually a wise plan to replace this rubber hose connection when overhauling the motor.

The two side hose connections, leading from the bottom of the radiator to the side of the cylinder block, do not receive so much vibration and are not subjected to so much heat or oil, and so do not require as frequent replacing. However, it is advisable to inspect these two rubber hose connections for any loose flaps of rubber which might impede the free circulation of the water through the cooling system.

If the fan belt shows signs of breaking soon, it will probably be advisable to replace it at this time. The new fan belt should be adjusted with just sufficient tightness so that the weight of one's finger, resting near the end of the blade of the fan, will be just sufficient to cause the fan belt to slip. If the fan continues to revolve for some time, after the engine has stopped; this is a sign of too loose a fan belt, and the adjustment should be tightened to take care of this trouble. If the fan belt is too tight, then excessive strain and wear will be caused on the fan belt itself and also on the bearings of the fan shaft.

The nut clamping the radiator to dash rod to the dash should be tightened and, if the threaded end of this rod is loose, where it fits into its socket on the radiator, a lock nut should be placed on the threaded end of the rod. Any looseness of this rod will tend to cause noise.

Naturally, one of the first things in overhauling the engine will be the removal of carbon and the grinding of valves, and for this pur-

pose, it will be necessary to remove the cylinder head.

To remove the cylinder head after the radiator hose connections have been removed, involves the taking out of the fifteen cylinder head bolts holding the cylinder head in place. After these bolts have been loosened with the cylinder head bolt and spark plug wrench, they can be rapidly spun out by the use of a speed wrench of the brace type.

When the cylinder head has been lifted off the cylinder head gasket should be carefully removed and placed to one side. If this cylinder head gasket has not been used more than a year or so; and if the cylinder head has not been off more than three or four times, it will probably not be necessary to replace the cylinder head gasket with a new one. Though if the gasket seems to have been pressed out of shape, or if shellac has been used to cement the gasket of the cylinder head, then it will probably be necessary to install a new cylinder head gasket. Otherwise, it will only be necessary to clean off the cylinder head gasket and see that there are no broken or loose places in the gasket where the gases might leak through when the cylinder head is replaced.

After removing the cylinder head, the carbon can be removed from the cylinder head by the use of a putty knife or a screw driver. Another helpful tool for this purpose is the use of a wire scratch brush, as was described in our article on tools used for overhauling.

After cleaning the carbon out of the cylinder head and placing the cylinder head to one side, we are ready to clean the carbon from the top of the cylinder block and from the tops of the pistons. For this purpose, the same putty knife and wire scratch brush can be used. The carbon should be scraped from the valves when the valves are in the closed position so as to avoid getting any more carbon on the valve seats than can be helped.

In order to avoid getting carbon down into the bolt holes of the cylinder head, it is a good plan to shove bits of waste, or bits of rags down into these bolt holes in the cylinder head. Then, when the carbon removal has been completed, these plugs can be pulled out and any carbon which has lodged into these parts will be removed.

In cleaning the carbon from the tops of the pistons, it is necessary to clean the sides of the pistons, up above the top of the cylinder head. Also to scrape the carbon from around the top edges of the cylinder walls.

After the carbon has been removed from the pistons, it is convenient to test the pistons for looseness and play. If there seems to be too much looseness, between the pistons and the cylinder walls; it may be necessary to fit oversized pistons in the cylinder block to eliminate "piston slap."

However, if the engine did not cause any knocks, except carbon knocks, and do not seem to have any "piston slap" or "sprung" connecting rods; then it will not be necessary to remove the pistons from the cylinders while doing the overhauling.

After inspecting the fit of the pistons, it is a good plan to examine the cylinder walls to see whether they have been grooved or scored by lack of lubrication or by overheating. If the cylinder walls are badly grooved, it may be necessary to have the cylinder block rebored.

This will necessitate taking the entire engine out of the car and will mean complete engine overhauling. If the cylinder walls are apparently in good condition, then no further attention need to be paid to this point.

We are now ready to examine the valves. To do this work more easily, some owners make a practice of removing the inlet and exhaust manifolds to permit of more easy access to the valve stems. By removing the four manifold clamp bolts, both inlet and exhaust manifolds can be easily removed, but before removing the inlet manifold, it is advisable to shut off the gasoline supply under the gasoline tank, and to disconnect the gasoline feed pipe at the carburetor. When taking off the manifolds, be careful not to lose the gaskets which fit between the manifolds and the cylinder blocks.

It is not necessary to loosen the connection between the exhaust manifold and the exhaust pipe, as the exhaust manifold and exhaust pipe can be simply pulled forward so that the pipe can be pulled off the muffler. Then these parts can be shoved back out of the way.

The first stage in grinding the valves is to remove the cotter pins from the ends of the valve stems. To do this work, it will be necessary to use a valve spring compressor to hold the valve springs compressed while the cotter pins are pulled out. After the eight cotter pins have been pulled out and carefully placed to one side, so that they will not be lost, then the valve stem washers and valve springs can also be taken out.

Before starting to grind the valves, it is a good plan to mark each valve so that one will be certain of getting the valves back in the same port as that which they originally occupied. One good way of marking the valves is to use a center punch to make one dot in the first valve, two dots in the second valve, etc., beginning of course with the valve at the front of the cylinder block, as that is always called number one.

In marking these valves one must be careful not to use the center punch on the valve head while the valve is raised off the cylinder block, as this would tend to bend the valve stem, and would probably cause leakage.

It will usually be found on inspection that the exhaust valves show the greatest signs of pitting and wear, due to the fact that these valves are subject to the hot exhaust gases, while the inlet valves are cooled by the cool incoming gasoline vapor. For this reason, it is often sufficient to lightly grind the inlet valves with a fine grade of valve grinding compound. But it is usually necessary to first give the exhaust valves a rough grinding with a coarse grade of rough valve grinding compound, and then finish it with the finer grade. As a general rule, the least amount of valve grinding which can be used to afford a gas-tight joint is the best.

Instead of grinding the valves, a better and faster process is by refacing the valves on a valve refacing tool, which can be used to true up the face of the valve and make a gas-tight fit, and an accurately centered valve in much less time than by grinding alone. Even when a valve refacing tool is used, it is often found advisable to make the final "touch-up" with a fine grade of valve grinding compound.

When using valve grinding compound, one

should smear a little bit of the compound on the face of the valve, and then use the valve grinding tool to rotate the valve about a quarter or half-turn with a reciprocating motion to avoid grinding grooves in the face of the valve, as would be apt to happen if a complete rotary motion would be used.

A valve seat reamer is another convenient tool for lessening the time required for grinding valves. Such a valve seat reamer is used to insure an accurate angle in the valve seat so that it will not require much time to grind the valve and the valve seat together.

After grinding the valves, one should be careful to remove all traces of the valve grinding compound from both the face of the valve and from the cylinder block. Great care should be taken that no valve grinding compound is allowed to get into the cylinder walls, as this would cause rapid wear of the cylinder walls and would cause scoring of both the pistons and piston rings.

After grinding the valves, the clearance between the ends of the valve stems and the tappets should be adjusted to from .022 to .028 of an inch. A rougher measurement is to say that the valve clearance should be between $1/64$ and $1/32$ of an inch. A minimum clearance of about .022 of an inch, for the inlet valve is rather to be preferred as giving quieter operation.

If the valve tappet clearance is made too small, then there is a possibility that the expansion due to heat will lengthen the valve stems and hold the valves off their seat, thus causing loss of compression after the motor has become warmed up. If there is too much clearance between the tappets and the ends of the valve stems, then the valves will open too late and close too early, thus not allowing sufficient fuel mixture to reach the cylinders and so cutting down the power of the engine.

After grinding the valves and removing the carbon, we are ready to replace the cylinder head, but before doing this, we should smear both sides of the cylinder head gasket with a thick grade of cup grease. This grease allows the cylinder head gasket to "bed down" more snugly between the cylinder block and cylinder head, and aids considerably in securing a compression and water-tight joint.

After replacing the cylinder head, we should put in the cylinder bolts, beginning with the bolt in the middle of the cylinder head and zig-zagging back-and-forth, first to the forward end and then towards the back of the car, down the middle row of cylinder bolts in order to tighten the cylinder head down smoothly and easily. If one tightens the cylinder head bolts at one end first, there is a possibility of springing the cylinder head so that water leaks or compression leaks are apt to occur.

Before replacing the spark plugs in the cylinder head, they should be taken apart and cleaned. After cleaning the porcelains of the spark plugs, these porcelains should be inspected for any flaws or defects through which the electric current might leak if the gap between the spark plug points were adjusted to too great a distance. The proper adjustment for the spark plug points, after the parts of the spark plug have been securely tightened, is little less than $1/32$ of an inch. The spark plug points should be adjusted with the side electrode bent upwards at an angle so that

the oil will drain off to the side of the spark plug, instead of collecting at the gap between the points.

The proper method of adjusting the coil units is by the use of a coil unit testing machine, as was described and illustrated in our January 1921 issue, and a coil unit testing machine is available at most well equipped Ford agencies. With such a coil testing machine, each coil unit should be adjusted to take from 1.4 to 1.6 of an ampere. Before making the adjustment for current consumption, the contact points of the coil units should be filed smooth and bright to remove any burned metal or pits which may have been burned in the points of these coil units due to the intense heat of the electric spark.

It often happens that, after considerable wear, it is impossible to get a smooth surface on these coil points without removing more than half the metal on the points. After about half the metal has been filed away, then it is impossible to secure a satisfactory adjustment, and it is necessary to install a new set of coil points to insure speedy action of the vibrators. If one does not have a coil unit testing machine available, then the coil unit points should be tested so that when the vibrator blade is pressed down against the core of the coil unit, there is a space of about $1/32$ of an inch between the vibrator point and the vibrator blade.

When this adjustment has been made, the U-shaped bracket to which the vibrator spring is attached, should be bent until the vibrator spring gives the proper "hum" and the coil gives a strong, hot spark.

After the car has been in use for a year or so, it often happens that the wiring harness or wire loom assembly becomes oil-soaked, or the insulation becomes worn off some of the wires, allowing short circuits and other electrical troubles to develop. In such cases, the worn parts of the insulation should be repaired by a covering of insulating tape, or else the entire wire loom assembly should be replaced. Sometimes a stray strand of wire may touch one of the metal parts of the car, thus causing the engine to kick and backfire, due to the spark occurring at the wrong time. For those who consider electrical troubles mysteries, it is better to replace the wire loom assembly than to have these electrical troubles develop unexpectedly.

The timer case should be removed and cleaned, and it will usually be found that the inside surface of the timer is either rough or wavy. In this case, the inside of the timer shell should be resurfaced with a timer refacing machine, or the entire timer shell should be replaced.

While the timer shell is off, the roller brush assembly should be inspected. If the roller appears rough or grooved, a new roller brush assembly should be installed. Before removing the old roller brush, one should notice the position of the old roller brush assembly so that the new roller brush can be installed in the same position.

On the new-style Ford cars, the hole for the cotter pin holding the roller brush assembly is only drilled through one side of the camshaft, thus making it impossible to get the roller brush assembly incorrectly located, but on the old-style Ford cars, this hole was

drilled entirely through the cam-shaft so that it was possible to get the roller brush assembly turned 180 degrees away from the correct adjustment. When this occurs, the engine will backfire and spit from the carburetor through all four cylinders. If the engine only backfires in only one or two cylinders when one attempts to start it; then it is probable that the wires leading to the timer terminals have been mixed and that the wrong connections have been made.

When installing a new timer shell, the easiest plan is to notice which binding posts the old wires are connected to, and then to connect the new wires to the same relative binding posts on the new timer shell. For detailed instructions in regard to timer adjustment and assembly, we suggest that you look in our April 1921 issue.

Engine Crank Case.

If the engine has a connecting rod or main bearing knock, then it will be necessary to tighten and adjust the connecting rods and the main bearings. A connecting rod knock is generally made evident by a light "rattle" when the car is descending a slight down grade at a speed of about 20 miles an hour with the throttle almost closed. A connecting rod knock is also frequently made evident by running the engine fairly fast when idling, and then suddenly closing the throttle.

Main bearing knocks are usually made evident by a heavy "thud." And such knocks most frequently occur when the engine is pulling hard. If there is a main bearing knock, this most frequently occurs at the rear main bearing, because the rear main bearing has to support part of the weight of the transmission, as well as the thrust from the connecting rods.

If the car has a loose connecting rod, it will be desirable to tighten the connecting rod bearings, and this can be done through the crank case cover door. In a previous part of this article, we told how one could remove carbon and grind valves and accomplish the repairs at the top of the engine, and we are now about to describe the manner of making the necessary repairs and adjustments to the lower part of the engine, looking upwards through the crank case door and working under the car. This work can be most conveniently done in comparatively warm weather, when it is cool and shady beneath the Ford.

To remove the crank case lower cover, one should remove the 14 cap screws which hold this lower cover in place. There is a little speed wrench made for this purpose, which is a very convenient tool. But few individual car owners possess such a tool, and they can remove these cap screws with an S-wrench of the proper size.

Before removing the lower cover, it is advisable to remove the drain cock from the bottom of the crank case under the fly wheel, and to drain out all the old oil from the engine. When taking off the crank case lower cover, there will still be some oil in the pockets of this lower cover, and one should be careful to tilt the crank case cover off to one side so that the oil will not splash down on the face of the operator.

After removing the lower cover, the four connecting rods are made accessible and, by

grasping the connecting rod and seeing if it moves freely on the crank shaft, or by lightly tapping these connecting rod bearings with a hammer, one can determine whether or not the connecting rods are loose. As a rule, it will be advisable to tighten the connecting rods after about five thousand miles of service. For tightening the connecting rods, a special form of connecting rod wrench is advisable, as such a wrench will save much time when doing this work. These connecting rod bearings should be tightened one at a time, so that one can tell when each connecting rod has been correctly adjusted, before tightening up the next rod. Beginning at the front connecting rod bearing one should examine the bearing cap to make sure that it is "marked." If there is no mark on the bearing cap, then one should use a center punch to make a mark or "dot" on the bearing cap on the side towards the cam-shaft. The second bearing cap should be marked with two dots and so on, for the four connecting rod caps.

After removing the first connecting rod cap, file off or grind off a slight amount of metal, or remove one or more shims, if any of these have been placed between the cap and the connecting rod. We are now ready to replace the bearing cap, making sure that the "marked" side is towards the cam-shaft in the same position that it was before removal. Now the bolts can be tightened, but the cotter pins should not be replaced just yet.

We are now ready to test the tightness of the front connecting rod by turning the starting crank. While it should be possible to turn the starting crank, the connecting rods should be a noticeably tight fit so that the starting crank will be a little stiff to turn. If one cannot turn the starting crank without undue effort, then the connecting rod cap should be removed and one or more shims should be replaced between the cap and the connecting rod, until the desired tightness has been attained. If the connecting rod is not tight enough, then still more metal should be removed from the cap, until the desired adjustment is secured.

OVERHAULING THE FUEL SYSTEM.

As Ford fuel tanks give little trouble from leakage, the chief detail in overhauling of the gasoline tank is to see that it is securely fastened to the chassis frame. This eliminates "noise" occurring at this point, and also eliminates much "vibration," which might tend to cause breakage of the connections for the fuel pipe.

The second point in the overhauling of the gasoline tank is to clean out any water or sediment which may have accumulated in the tank, and which might reach the fuel pipe and clog the fuel line or the carburetor. By closing the valve under the gasoline tank and draining out the sediment bulb, any dirt or water which may have accumulated at this point will be disposed of. An inspection, through the filler opening of the gasoline tank, is usually sufficient to disclose whether there is any dirt or water still remaining in the fuel.

If the joints of the fuel pipe appear to be "moist," this is an indication of slow leaks around the fuel pipe. And the joints be-

tween the pipe, and the gasoline tank and the carburetor, should be packed with hard soap or cotton string. Then the nuts on these couplings should be securely tightened, care being taken not to strip the threads of these brass nuts by the use of undue force.

If there are any leaks in the gasoline feed pipe itself, it is usually the best policy to replace the entire pipe, as a soldered repair will seldom prove effective for any great length of time, and there is no use in risking the reliability of the entire car, or taking a chance of a disastrous fire, by having a gasoline feed pipe that is not in perfect condition.

When examining the gasoline feed pipe, one should inspect the pipe for places where it may have been rubbing against the chassis frame or other parts of the car. If the gasoline pipe appears almost worn through in some places, it will probably be advisable to either cover these places with solder, or to install a new feed pipe, taking care that the same abrasion does not occur when the new feed pipe is installed. By wrapping the feed pipe with tire tape where it is subjected to rubbing against the side members of the chassis frame, and by so bending the pipe that it does not vibrate and strike against parts of the car, most trouble due to leaky fuel lines will be avoided.

The overhauling of the carburetor is such a comprehensive subject that it can hardly be considered in detail in an article of this kind. But there are a few brief points in the overhauling of the carburetor which we might mention. If the carburetor leaks and if the bowl of the carburetor appears moist when the engine is not running, this is usually due to a leaky gasoline inlet valve part No. 4453-A, and it is sometimes necessary to replace both this gasoline inlet valve and the float valve seat part No. 6048, in order to obtain a really gasoline-tight fitting at this point.

Sometimes this valve can be made tight by simply revolving the gasoline inlet needle against the seat, but without using any abrasive. Even the very finest grade of valve grinding compound must not be used, as this will cause scoring and cutting of the soft metal of these parts, and make it necessary to replace them.

Another part of the carburetor which sometimes has grooves or scores worn in the point is the gasoline inlet spray needle. When the point of this needle is worn or grooved, then the even distribution of the fuel spray is interfered with, and the gasoline does not vaporize as freely and evenly as it should, thus increasing the fuel consumption and tending to cause a poorly running engine. If the point of the spray needle is scored, it is best policy to replace this part, No. 4452-A.

If the carburetor does not allow the engine to run smoothly and easily at slow speeds, this may be the fault of the carburetor or it may be due to the valves or ignition not being properly adjusted. It is better not to attempt the final adjustment of the carburetor until the other parts of the engine have been properly checked up.

After the correct adjustment for the front connecting rod has been secured, the bolts on this front connecting rod cap should be loosened a couple of turns, so that one can test the second connecting rod more accu-

ately. We are now ready to fit and adjust the second connecting rod in the same manner as the first rod was tightened.

The fourth connecting rod is the 'hard' one and is generally allowed to go until the last. Then after it has once been tightened, there will be no need of loosening and tightening it again. In order to tighten the fourth connecting rod, some form of socket wrench, such as the Walden No. 5810 or a Bilmont Master wrench, is very desirable.

When we have fitted the fourth rod and cap, and tightened the bolts, then the cotter pins should be placed in the bolts and the ends of the cotter pins should be slightly spread, so as to keep the cotter pins from dropping out of the bolts.

One should be very careful not to drop any broken cotter pins or bits of metal down into the crank case, where they might get into the magneto and cause a short circuit, and the complete failure of the ignition system.

If the engine has shown main bearing knocks, an experienced mechanic can often locate a loose main bearing by gently tapping the bearing caps with a hammer. A certain 'hollow' sound is given if the bearing caps are loose, while a "solid thud" shows that the bearings are accurately fitted to the crank shaft.

If the front main bearing cap or bearing is loose, then it is possible to loosen the nuts on the bolts holding this bearing cap in place, and, by reaching in through the bottom of the crank case, one can sometimes pull out one or more shims, and then the bearing can be tightened by pulling up on the bolts. Be careful not to pull out too many shims at one time, as it is almost impossible to replace them, if too tight a fit of the front main bearing is secured. If there are no shims in the front main bearing, then it will be impossible to tighten the front main bearing without removing the engine and transmission from the car. And such a repair is not within the scope of this article.

The middle main bearing can be easily tightened and adjusted by working through the crank case lower door, and this bearing should certainly be adjusted if it seems at all loose.

The rear main bearing of the crank shaft is almost impossible to tighten, without removing the engine and transmission from the car; unless one follows the instructions given in the January 1920 issue of our magazine, in which detailed instructions were given for removing the rear main bearing cap, after removing a couple of the cap screws from the flywheel and doing this work through the crank case lower door. However, this is a rather difficult 'stunt' and is not advised for the average amateur repairman. Even many professional repairmen claim that it is impossible. But nothing is impossible which is being regularly done by some of our readers.

After adjusting all the main bearings, we are ready to replace the drain plug in the bottom of the crank case and then to refill with clean, fresh oil, up to the level of the lower test cock on the crank case.

TRANSMISSION REPAIRS.

On another pleasant day we are ready to take up the subject of transmission repairs, which will occupy a pleasant afternoon, or perhaps all day if one is not speedy with the tools. If possible, we advise those who have not done this work before to start the work in the morning, so that it will be done by night.

The first stage in transmission repairs is to remove the transmission covers. This involves first removing the exhaust pipe. And then removing the wire leading to the magneto contact terminal, and also the metal plate in the dash. Then the removal of the $\frac{3}{8}$ inch bolts which hold the transmission cover to the crank case.

Before removing the transmission cover however, it is a good plan to take off the transmission cover door. This only involves the removal of six round head machine screws, and it will be necessary to have this door off, in order to adjust the transmission bands after the transmission cover has been replaced. With this transmission door removed, one can loosen the slow speed band, and the adjusting nuts of the brake and reverse, thus making it easier to pull off the transmission cover. As the transmission cover is a very dickens to remove, it is advisable to facilitate the work in every possible manner, especially for the in-experienced owner who is overhauling his car for the first time.

When removing these $\frac{3}{8}$ inch bolts, it is convenient to have some of the special sockets for holding the bolts while the nuts are being spun off, as described in our article on "Tools for Overhauling" which was published in the May 1921 issue. When taking out these bolts, the most convenient way is probably to use a Tee-wrench and to work under the car. If one has a helper to hold these bolts while taking off the nuts, then the work will be greatly facilitated.

When pulling off the transmission cover, the best method is to stand over the drive shaft with one's feet on the ground and to grasp the slow speed pedal with one hand and the slow speed adjusting screw with the other, and to pull the transmission cover up and off the crank case.

The work of removing and replacing the transmission cover is made much easier if one removes the two cap screws holding the universal ball cap to the crank case. It is suggested that these two bolts be removed before attempting to remove and replace the cover.

After removing the transmission cover, this makes the entire transmission accessible and the transmission bands can be removed one at a time, examined for wear, and relined if necessary. As a rule if even one of the transmission bands requires relining, it pays to replace the other also. A good driver usually wears out about all three bands at the same time, and it is almost as much trouble to replace one band as it is three, so that it is usually better to replace all three bands at the same time.

Instead of relining the bands at home, one can take the old transmission bands and have

them exchanged at any Ford agency for a set of bands in which new linings have already been riveted in place. The advantage of doing this is that the cost is low and time is saved. Also, that the new bands will have been properly trued to a circle, so that they will not tend to 'drag' on the drums when installed.

If one wishes to reline the bands, then the ends of the lining should be riveted to the bands leaving a slight 'bulge' in the bands so that when the linings are finally riveted to the bands they will fit tightly, and will not rub on the drums.

In riveting linings to the bands, it is imperative that brass or copper rivets be used. If iron rivets are used, then the bits of iron filings, worn from the rivets, may collect on the magneto and cause short circuits. Also, the hard iron rivets may cut and 'score' the brake drums, thus making expensive repairs necessary.

When bracing the rivets in the linings, one should spread the ends of the rivets across the transmission linings, so as to spread the wear from the rivets across as wide a surface of the transmission drums as possible.

While the transmission cover is off, one has an excellent opportunity of installing one of the improved kinds of transmission linings which will give greater service and wear. However, it is necessary to follow the instructions of the makers, if the best results are to be secured.

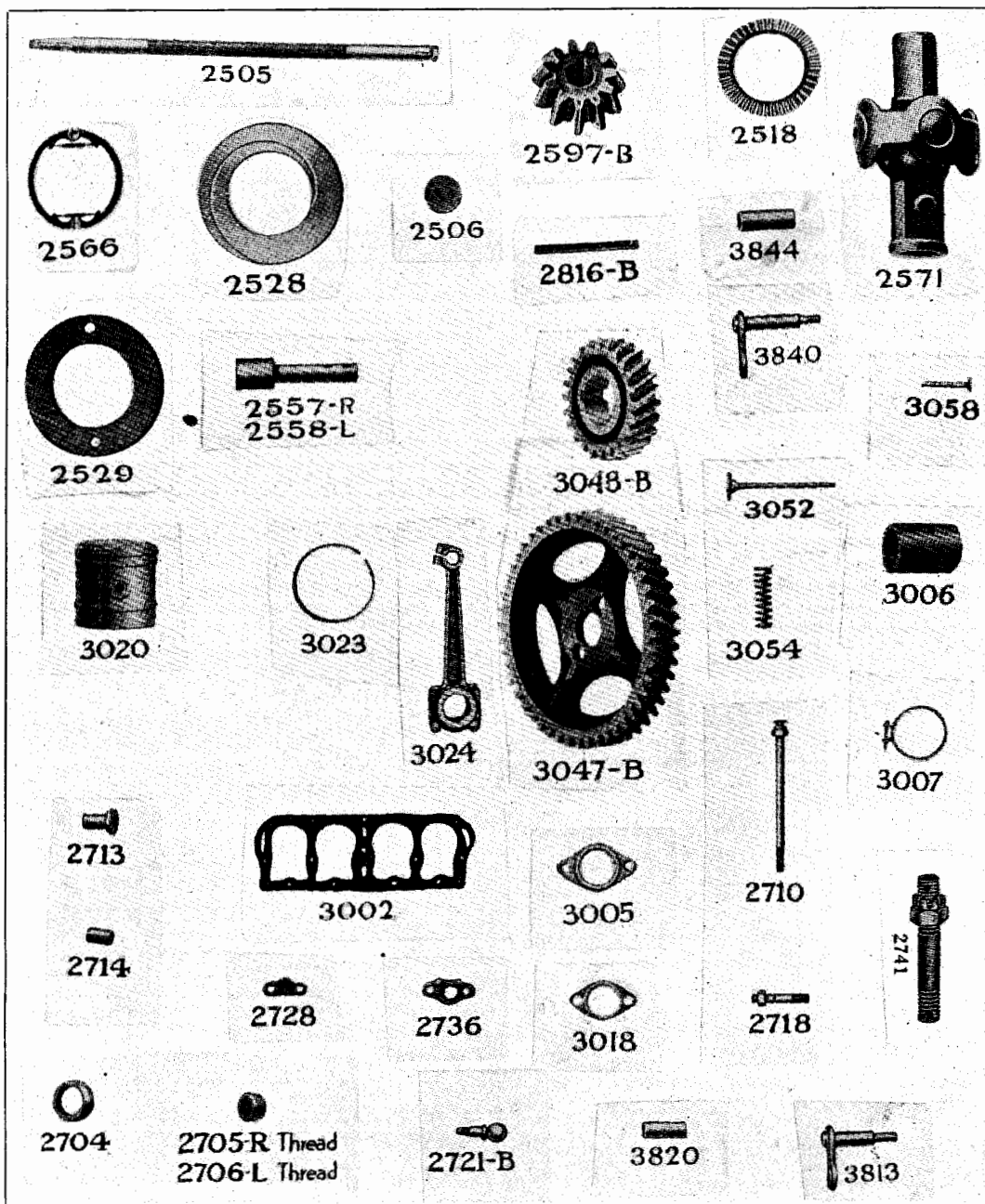
The writer has secured more than a year's service from a set of cork insert band linings. But, these linings were carefully installed, and were so loosely adjusted that they had to be tightened about three times during the first week or so of use. During the last three months of use, they have not required any adjusting at all.

After installing the new brake bands, one should tie the lugs of the three bands together, squeezing these lugs as closely together as possible, and tying them with some flexible steel wire, such as is used for hanging pictures.

We are now ready to put new gaskets on the crank case, using a thick cup grease to hold these gaskets in place. Personally, we consider the cork gaskets very good for this purpose, as they are flexible enough to compensate for any slight inequalities in the surface of the crank case. As it is so hard to remove the crank case to replace gaskets in case an oil leak develops, it is a good plan to use new and good gaskets at this point, if the old ones seem to be at all 'doubtful.'

By pouring oil into the oil feed pipe and noticing how quickly this oil disappears down the funnel, one can get a good idea of whether or not this oil feed tube is partially clogged. If the oil does not flow through freely and easily, one should take a piece of flexible steel wire, and shove this through the oil feed pipe until the pipe is well cleaned out.

The magneto contact point should be inspected, and cleaned if necessary, so that it will be sure to make good contact with the disc on the magneto when the transmission cover is replaced. The clearance or 'gap', between the magnets and the poles of the



PARTS OFTEN REQUIRING REPLACEMENT

No. 2505	Axle shaft	No. 3054	Valve spring
No. 2566	Rear hub brake shoe	No. 3006	Cyl. head outlet hose
No. 2528	Babbitt thrust washer	No. 3007	Cyl. head hose clamp
No. 2557-8	Hub brake cam shaft	No. 2713	Spindle body bushing
No. 2506	Axle shaft washer, fiber	No. 2714	Spindle arm bushing
No. 2597-B	Drive shaft pinion	No. 3002	Cylinder head gasket
No. 2518	Diff. drive or ring gear	No. 3005	Cyl. head outlet gasket
No. 2571	Universal joint assembly	No. 3018	Cyl. water inlet gasket
No. 2516--B	Rear hub key	No. 2728	Ball socket cap
No. 3844	Rear spring perch bushing	No. 2736	Front radius rod ballcap
No. 3840	Rear spring banger	No. 2710	Spindle body bolt
No. 3058	Push rod or tappet	No. 2718	Spindle con. rod bolt
No. 3048-B	Spiral crank shaft gear	No. 2722	Ball cap stud and nut
No. 3047-B	Spiral cam shaft gear	No. 2704	Stationary front wheel cone
No. 3020	Piston, complete	No. 2705-R	Adjusting front wheel cone
No. 3023	Piston ring	No. 2721-B	Spindle con. rod ball
No. 3024	Connecting rod assembly	No. 3820	Front spring perch bushing
No. 3052	Valve	No. 3813	Front spring hanger

magneto coil assembly, should be measured to see whether this is the correct distance of $1/32$ of an inch or less. If this clearance is much greater than this, then it is probable that the lights will not be as bright as they should be, and the engine may be hard to start, due to the weak current furnished by the magneto.

In measuring this clearance, one should pull back on the fly wheel so as to give the same conditions as when the fly wheel is pulled back by the high-speed clutch spring, when the transmission is in neutral. If the fly wheel can be moved back and forward much, this shows that there is 'end-play' in the crank-shaft, and this may mean that a new rear main bearing cap may soon have to be installed.

Replacing the transmission cover is a rather difficult piece of work. And before replacing the cover, one should move the nuts on the pedal shafts out as far as possible, without danger of them dropping off. Thus it will be easier to drop these pedal shafts over the lugs of the transmission bands.

After replacing the transmission cover, the bolts holding the cover to the crank case should be tightened evenly. But it is not necessary to put cotter pins in these bolts. With the transmission cover in place, one can adjust the transmission pedal control linkage. It is better to have the transmission bands a little loosely adjusted at first so that the bands will have a chance to wear in more evenly, before they again wear out.

OVERHAULING THE REAR AXLE SYSTEM

After we have worked on the front end of the car, and have overhauled the engine and transmission and other working parts, we will probably have become rather tired of the work of overhauling. But the work of overhauling the rear axle system can be conveniently done at some later date.

Before overhauling the rear axle system, it will be necessary to remove the rear axle system from the car. And this work is necessary if one expects to replace thrust washers, differential drive gears or to replace the axle shafts. However, in this particular article we do not intend to cover the work of overhauling the rear axle system in detail, because this work has been recently covered in other issues of this magazine, so that we shall only mention those repairs and adjustments which can be made **without removing** the rear axle system from the car.

The first part of the rear axle system to be inspected is the universal joint. This universal joint should be tested by jacking up one of the rear wheels and noticing how much the rear wheel can be turned without turning the engine. If the rim of the rear wheel can be turned more than 4 inches, this suggests the possibility of considerable wear in either the rear axle gears, or in the universal joint, or perhaps in both. But if there is less than this amount of play, it is probable that the rear axle system can be used a considerable time without requiring an overhauling.

If it is found that the universal joint is worn, then it may be necessary to replace

the universal joint. The universal joint and drive shaft assembly can be taken off without removing the rear axle system entirely from the car, but this will necessitate pulling the rear axle system back far enough so that the universal joint can be pulled out of the engine.

It is a good plan to repack the universal joint with clean, fresh grease. And, by filling the grease cups on the universal joint and drive shaft front end bearing with grease and turning down these cups several times, sufficient grease can be forced in, to force most of the dirt and old grease out.

Another advantage of **packing** the universal joint with heavy grease is that this heavy grease tends to form a packing in the universal joint and front end bearing of the drive shaft, so that the grease helps to keep the oil from the crank case from running down the drive shaft housing and thinning the oil in the rear axle housings, and thus causing grease leaks around the rear hub brake drums.

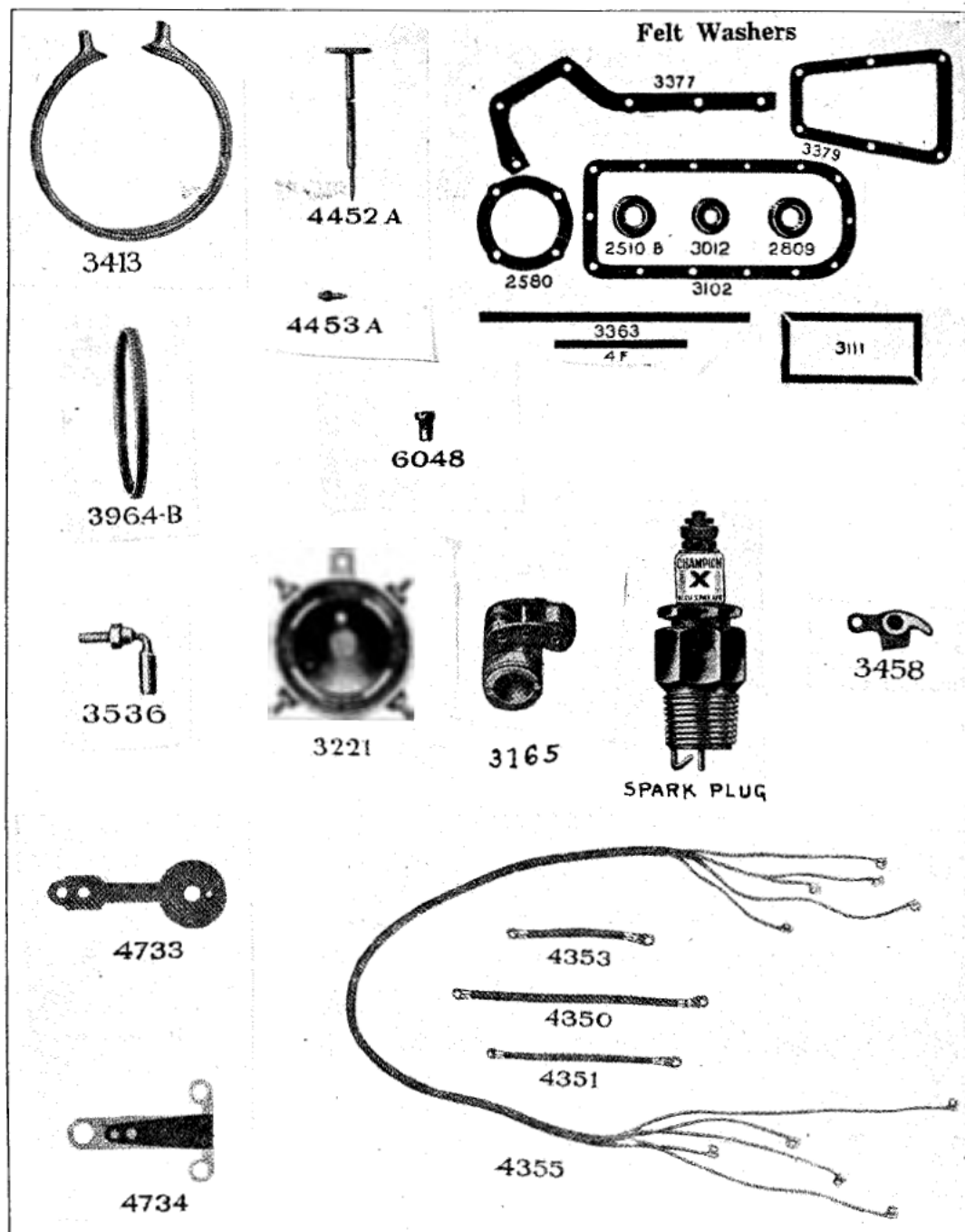
While working around the universal joint, we should tighten the nuts on the front ends of the rear radius rods, thus preventing any rattle or pounding which might occur at this point, and which usually results in the crystallization and breakage of the steel, thus necessitating the replacement of the rear radius rods.

The nuts holding the radius rod to the drive shaft housing should be tightened very securely, using a pipe wrench if necessary for this purpose. However, if one has an engineer's or S-wrench of the proper size, these nuts can be securely tightened without the necessity of using a pipe wrench. The bolts holding the rear ends of the radius rods should also be tightened, after the wheels have been removed.

We are now ready to block the front wheels and then jack up the rear wheels, and then run the engine to determine whether or not both wheels run true. If the wheels run true, then we need not worry about either wheels or axle shafts being bent. But if the wheels 'wobble', then it is possible that either the wheels or axle shafts are bent. To determine which is at fault, it will be necessary to remove the axle shaft nuts and to pull off the wheels and then take out the key from the axle shafts. Now replace the wheel on the axle shaft and, by allowing the axle shaft to revolve within the hub of the wheel, one can determine whether or not it is the wheel or axle shaft that is at fault.

If it is the axle shaft that is at fault, then the bent axle shaft will cause the wheel to wobble if the wheel is held from turning while the axle shaft revolves within the hub of the wheel. But if the wheel remains steady when held, then the axle shaft is true, and the wheel is sprung.

While the wheels are off, one can pull out the outer roller bearings and use a piece of heavy wire, or light steel rod, to jam down rags or waste into the axle housings and to clean out the axle housings as much as possible. While the wheels are off, it is sometimes more convenient to wash out the axle housings with kerosene to remove the old



PARTS OFTEN REQUIRING REPLACEMENT

No. 3413	Trans. band assembly	No. 3363	Trans. cover front gasket
No. 4452-A	Spray needle	No. 3111-B	Valve cover gasket
No. 4453-A	Gasoline inlet needle	No. 3536	Ball and socket joint
No. 6048	Float valve seat	No. 3221	Commutator shell
No. 3964-B	Fan belt	No. 3165	Comm. roller brush assembly
No. 3377	Trans. cover gasket	No. 3458	Hand brake lever pawl
No. 3379	Sloping door gasket	No. 4733	Vibrator spring
No. 2580	Ball cap gasket	No. 4734	Vibrator point
No. 3102	Lower cover door gasket	No. 4355	Comm. wire loom assembly
No. 2510-B	Axle outer washer	No. 4353	No. 3 & No. 4 spark plug wire
No. 3012	Cyl. cover felt washer	No. 4350	No. 1 spark plug wire
No. 2809	Front and rear felt washer	No. 4351	No. 2 spark plug wire

grease, dirt, and bits of metal which have probably accumulated.

By thinning the old grease with kerosene, the mixture of grease and kerosene can be drawn out of the filler opening of the axle housings by means of a grease gun. And then the rear axle housings should be repacked with about one pound of clean, fresh grease. Graphite grease is very good for this purpose, also Kaoga grease, which is especially made for the rear axles.

After repacking with grease, we are ready to inspect the rear hub brakes. If they are so badly worn that they hardly hold the car while it is being cranked, then it is advisable to install new brake shoes. Personally, we prefer the installation of lined rear hub brakes as offering a better method of holding the car from creeping forward when the engine is cranked. Also, these lined rear hub brakes are more effective in holding the car, in case an emergency should ever arise.

When replacing the hub brake shoes, the easiest method is to slip the divided ends of the brake shoe over the hub brake cam and then to swing the brake shoe around, and bolt the rear side of the brake shoe to the flangs on the axle housing.

After replacing and adjusting the rear hub brake shoes, we are ready to replace the wheels on the axle shafts. It is advisable to install new felt washers in both the hub of the wheel and at the ends of the roller bearing before replacing the wheels. Many car owners make a practice of slipping a felt washer on the axle shaft, and shoving this felt washer towards the middle of the axle housing and as close to the inner roller bearing as possible, then two more felt washers are placed on the drive shaft, and shoved in just far enough to allow the outer roller bearing to be replaced. The installation of three flat washers in this manner is a considerable help in preventing the leakage of grease out around the rear hub brake drums.

After replacing the rear wheels on the axle shafts, we are ready to tighten the nuts holding the wheels to the axle shafts. These nuts should be very securely tightened in order to prevent the wheels from moving on the axles and thus eventually either shearing the key, or cutting the key-way in the rear wheels, or mutilating the key-way in the axle shaft so as to necessitate the replacement of the axle shafts. The axle shaft nuts should be pulled up as tightly as possible, and if the slots in these nuts cannot be pulled into alignment with the cotter pin hole through the axle shafts, then the nut should never be backed off and the cotter pin installed. But rather the nut should be entirely removed and a slight amount of metal filed or ground from the surface of the nut so as to allow the nut to turn up to the next slot for the cotter pins, when securely tightened. Attention to this detail will eliminate much trouble with the rear wheels loosening.

We are now ready to tighten the four nuts on the spring clips holding the rear spring to the cross member of the chassis frame. If these nuts are securely tightened, the middle of the rear spring will be held as one **solid mass**, so that there there will be no bending

in the middle of the spring. Consequently there will be no chance for the spring to eventually break at the tie bolt which passes through the middle of the rear spring. The breakage of springs at the **middle** is a certain sign that the tightening of the nuts on the spring clips has been neglected.

If the bushings of the spring hangers are worn and loose, these bushings, and perhaps the hangers, should be replaced. Loose spring hangers and bearings are a prolific cause of rattle and noise when the car is driven over rough roads.

After this work has been done to the rear springs, we should finish up the care of the springs by making some pads of cloth or waste and soaking them with old oil, drained from the crank case of the engine, and shoving these oil-soaked pads up into the recesses between the rear spring and the cross member of the chassis frame.

TOUCHING UP THE CHASSIS.

Some time again, when the weather is fine and dandy, and we feel like working at the car; we can overhaul and touch up the miscellaneous parts of the Ford chassis. In doing this work, we should pursue a system, and begin with the front end of the car.

We should tighten the nuts on the front spring clips securely, so as to eliminate any chance of the front springs breaking in the middle, just as we did sometime ago on the rear spring. The next detail is to rebush the front springs, if necessary, and to replace the front spring hangers if they are worn.

Now we are ready to shove oil-soaked pads of waste up into the recesses between the front spring and the cross member of the chassis frame, so that when the car is driven over rough roads, the flexing of the springs will compress these oil-soaked pads and squeeze the oil down over the spring leaves. If sufficient oil is scattered over the outside of the springs, this oil will eventually work its way in between the spring leaves, where it is really needed. Springs really have a **bearing surface** where they rub upon each other, and it is as necessary to lubricate the springs of a car, as it is to lubricate other bearings, if the car is to run quietly and smoothly.

The next detail in overhauling the chassis is to rebush the spindle bodies and the steering arms, but this work has been so comprehensively described in a couple of other articles published within the last six months in this magazine that it would be telling a twice-told tale to repeat those instructions here.

We are also ready to tighten the ball caps, by removing them from the steering gear connecting rod and the spindle arm connecting rod, and filing or grinding off a small amount of metal from the ball caps. Then, when the ball caps are replaced and the bolts tightened, the ball caps will grip the balls on the steering gear without any play or looseness, and yet without undue friction. After replacing these ball caps, the nuts on the bolts should be tightened securely. Cotter pins should be used on all the bolts and nuts of the steering gear, as the steering

gear is far too important to take a chance on nuts or bolts which are not securely cotter-pinned in place.

The radius rod ball cap, which holds the ball joint of the front radius rod to the crank case, often shows sufficient wear to necessitate its replacement. However, if the ball cap is not badly worn, then this ball cap can be tightened by filing off some of the metal from the face, in the same manner as described for tightening the ball caps of the steering gear.

We are now ready to inspect and adjust the front wheel bearings. To do this we should jack up the front wheels and then notice how much 'play' or looseness there is. Probably it will be advisable to remove the wheels and inspect the bearings for broken or pitted balls, or grooved race-ways. Any ball-bearings which show any 'pits' or flaws at all should certainly be replaced. For when the hard surface of a ball-bearing has once been worn, then the ball-bearing is apt to split or break. This may cause the cutting up of the entire ball-bearing assembly and perhaps also injure the spindles, thus necessitating expensive repairs.

After replacing all damaged parts, with new ones and installing new cups and cones as necessary, the ball-bearings should be

packed with grease and then adjusted. When adjusting ball-bearings, the adjusting cone should be tightened up until the wheel binds. Then the cone should be loosened so that the wheel will turn freely, (after the lock nut has been tightened) under the weight of the tire valve. And the weight of the tire valve should cause the wheel to oscillate a couple of times.

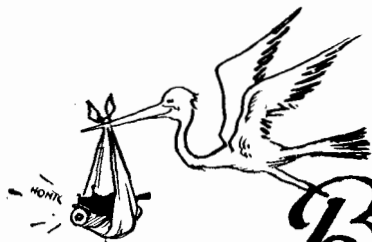
The alignment of the front wheels should be tested, to make sure that the front wheels are 3 inches farther apart at the top than at the bottom. The wheels should also be toed-in to about $\frac{1}{4}$ of an inch closer at the front than at the rear, this 'gather' being for the purpose of making the car steer more easily and for reducing tire wear.

Another detail of the chassis overhauling is to inspect the rivets at the corners of the chassis frame, and to tighten up the nuts holding the body of the car to the chassis frame.

After tightening up the different parts of the chassis, we are ready to give the fenders and running boards the 'once-over' tightening or replacing any loose or worn nuts and bolts, and perhaps putting strips of fabric or leather between the fenders and running board where they are bolted together, to eliminate squeaks and rattles.



A SUGGESTION FOR THE LARGE FORD OWNING FAMILY



The Fourth Birthday Party

Telling When Each Ford Car, Ford Truck, and Fordson Tractor Was Born, Including Canadian Fords, and Bringing These Lists Up to Date

By MURRAY FAHNESTOCK, A. S. A. E.

On page 26, of our June 1920 issue, we published a list of Ford motor numbers which was considered by other magazines good enough to copy. Since then, the Ford Motor Company has been grinding out new Fords, so that extensive additions have to be made to the list. Our first list has stood the test of time and the questions put to it by our readers, so that we feel that we have something that you can rely on.

Our biggest change this year is in our list of Fordson Tractor motor numbers. While last year's list was correct as far as it went, the list we are now publishing is much more complete and comprehensive, and tells, where as well as when, the first tractors were assembled.

This issue of the magazine should be preserved, if you ever have occasion to sell your car or tractor, this list will make it easy for you to prove your statement as to when the car or tractor was actually built. If you ever have occasion to buy a used Ford or tractor, this list will be even more valuable in making it easy for you to verify the statements of the seller as to when the car or truck was really built. Don't take the seller's word for it. Look at the list and be sure.

We are going to give the complete list, for the convenience of those who buy and sell used Fords, as well as for the use of insurance men and repairmen, who sometimes need to know the exact age of the car in order to settle questions in regard to the ordering of parts.

The present standard location for the motor numbers is on the side of the cylinder block, stamped into the casting, right over the side water inlet hose connection. On some of the very early Fords, made around 1910 or so, the motor numbers were stamped down near the 'breather', or oil filler pipe.

But as nearly all these early Fords have had their cylinder blocks replaced by this time, practically every Ford now in use carries the motor number on the left-hand side of the cylinder block, right over the side water inlet hose connection.

When the cylinder block is replaced by a new one, the same motor number should be stamped on the new cylinder block as appeared on the old cylinder block. Thus each car retains the same motor number—from the assembly line to the junk-yard—irrespective of how often the different components of the car have been replaced.

If the same motor number is not stamped on the new cylinder block, then one may have difficulty in selling the car at some future time. No intelligent buyer will take a car without a motor number, as he knows he will have difficulty in securing a state license; and that he may get into trouble with the police, who may think that the car is a stolen one.

The Ford Motor Company does not have any spare motor numbers, so that the only safe way is to use the same motor number right along, and so keep out of trouble.

While replacing the cylinder block may seem like replacing the motor, it must be remembered that the motor number is also the car number—as that is all the car number that the Ford has. On the earlier Ford cars, up to about 1915 or so, Fords had a car number, or serial number, which was stamped on a small metal plate attached to the dash. But these car numbers were of no value, and no attention is now ever paid to them.

For many years, Ford cars have been sent out from the factory without any car numbers at all. However, if one has the car number, but has lost the motor number, the correct motor number can usually be obtained by writing to the nearest Ford Branch.

While there is a date cast on the cylinder

block, this date only indicates the date on which the cylinder block was cast. As a cylinder block is improved by being allowed to season for several months, in order to allow the 'casting strains' to settle; this means that the engine will be just as good, or better, if the motor number indicates a date of several months after the date on the cylinder block.

In the case of a used Ford, it is not safe to rely on the date as cast on the cylinder block—as the cylinder block of a 1914 Ford may have been replaced by a new cylinder block in 1918. And then the date on the cylinder block will indicate 1918, while an honest motor number will prove that the car is a 1914 model.

Never make up a fictitious motor number, as this is dishonest and is stealing a motor number that belongs to some other car owner. Also, if a buyer takes a car on which the motor number has been altered, he has a chance to make it hot for anyone who has altered a motor number with fraudulent intent to deceive.

If there is a suspicion that the motor number has been altered, look up the jail record of the seller. An altered motor number makes the car an 'outcast' and its owner an object of suspicion. If people would only be a little more careful in looking up the records of cars offered for sale 'at a bargain', far fewer Fords would be stolen. In most cases, the motor number of the car can be verified by the bill of sale, which comes with the car. Or by referring to the records of the local Ford agent, through whom the car was originally bought.

Every once in a while, we used to receive letters from our readers in regard to 'B-numbers'. These numbers were used in the twelve months, between October 1, 1912 and October 1913, when there was some switching around of motor numbers. Consequently, if one has a B-numbered engine, one knows that the car was made at some time between October 1, 1912 and October 1, 1913.

The 'C-numbers' are applied to the Canadian Fords, and these are the 'overseas' Fords which are shipped to foreign countries all over the world.

The motor numbers which we have given in our list, apply to the famous Model T Fords, as built by the Ford Motor Company after October 1, 1908. Before the successful Model T was built, there were a lot of earlier Ford models tried out, from the Model A, up to the better known Models N. S. and R, some of which are still in use, and regarding which we still receive inquiries from our readers.

Even though Ford produces as many cars in a day, as were formerly produced in a year, the owners of these early Fords have not been forgotten, and it is still possible to purchase parts for these early Fords. That's real service that creates good-will, years after the early purchase price has been forgotten. The fact that there are no orphans in the Ford family now, is splendid evidence that those who buy new Ford cars now will be just as faithfully taken care of. Past performances are the best possible guarantee of future good faith.

As the Ford is the only car that is 'made in millions', it is interesting to notice that Ford motor number 1,000,000 was built on December 10, 1915. That Ford with motor number 2,000,000 was built on June 14, 1917. And that Ford with motor number 3,000,000 started on its long career in April 1919. And motor number 4,000,000 was given to a Ford built in the month of May 1920. It makes one wonder if the Ford car with motor number 10,000,000 will be built in the year 1925?

If the motor number on a used, or second-hand, Ford does not agree with this list; it is possible that the motor number may have been changed by placing a "1" in front of the true motor number, thus making the car appear to be of much more recent vintage than it really is. Or, a number is sometimes added after the true motor number, to give a larger motor number, and one that is apparently of more recent date. Also a "6" is sometimes changed to an "8", or numbers may be filled up and new numbers stamped in. So that it does not pay to place too much faith in the motor numbers, as stamped on the block. While good evidence, they are not necessarily conclusive evidence.

	Motor Number	Cars Built
1908 —October 1 to October 31.....	1 to 11	11
November 1 to November 30.....	11 to 101	90
December 1 to December 31.....	101 to 309	208
1909 —January 1 to January 31.....	309 to 646	335
February 1 to February 28.....	646 to 1052	406
March 1 to March 31.....	1052 to 2025	973
April 1 to April 30.....	2025 to 2691	666
May 1 to May 31.....	2691 to 4036	1345
June 1 to June 30.....	4036 to 5980	1944
July 1 to July 31.....	5980 to 8107	2127
August 1 to August 31.....	8107 to 9840	1733
September 1 to September 30.....	9840 to 11148	1308
October 1 to October 31.....	11148 to 12405	1257
November 1 to November 30.....	12405 to 13132	727
December 1 to December 31.....	13132 to 14161	1029
1910 —January 1 to January 31.....	14161 to 15500	1339
February 1 to February 28.....	15500 to 16600	1100
March 1 to March 31.....	16600 to 19700	3100
April 1 to April 30.....	19700 to 23100	3400
May 1 to May 31.....	23100 to 26500	3400

	Motor Number	Cars Built
June 1 to June 30.....	26500 to 29500	3000
July 1 to July 31.....	29500 to 30200	700
August 1 to August 31.....	30200 to 31000	800
September 1 to September 30.....	31000 to 31900	900
October 1 to October 31.....	31900 to 32500	600
November 1 to November 30.....	32500 to 33700	1200
December 1 to December 31.....	33700 to 34900	1200
1911 —January 1 to January 31.....	34900 to 37000	2100
February 1 to February 28.....	37000 to 40000	3000
March 1 to March 31.....	40000 to 45000	5000
April 1 to April 30.....	45000 to 50800	5800
May 1 to May 31.....	50800 to 57200	6400
June 1 to June 30.....	57200 to 60500	3300
July 1 to July 31.....	60500 to 62100	1600
August 1 to August 31.....	62100 to 66700	4100
September 1 to September 30.....	66700 to 70500	3800
October 1 to October 31.....	70500 to 83100	12600
November 1 to November 30.....	83100 to 86300	3200
December 1 to December 31.....	86300 to 88900	2600
1912 —January 1 to January 31.....	88900 to 92000	3100
February 1 to February 29.....	92000 to 95900	3900
March 1 to March 31.....	95900 to 103800	7900
April 1 to April 30.....	103800 to 112900	9100
May 1 to May 31.....	112900 to 123800	10900
June 1 to June 30.....	123800 to 132000	8200
July 1 to July 31.....	132000 to 139700	7700
August 1 to August 31.....	139700 to 144500	4800
September 1 to September 30.....	144500 to 147300	2800
October 1 to October 31.....	147300 to 156300	9000
November 1 to November 30.....	156300 to 161200	4900
December 1 to December 31.....	161200 to 171300	10100
1913 —January 1 to January 31.....	171300 to 186900	15600
February 1 to February 28.....	186900 to 203300	16400
March 1 to March 31.....	203300 to 218900	15600
April 1 to April 30.....	218900 to 242300	23400
May 1 to May 31.....	242300 to 260000	17700
June 1 to June 30.....	260000 to 282700	22700
July 1 to July 31.....	282700 to 298200	5500
August 1 to August 31.....	298200 to 306800	8600
September 1 to September 30.....	306800 to 314800	8000
October 1 to October 31.....	314800 to 324900	10100
November 1 to November 30.....	324900 to 344900	20000
December 1 to December 31.....	344900 to 370400	25500
1914 —January 1 to January 31.....	370400 to 395500	25100
February 1 to February 28.....	395500 to 419500	24000
March 1 to March 31.....	419500 to 447600	28100
April 1 to April 30.....	447600 to 473200	25600
May 1 to May 31.....	473200 to 490920	17720
June 1 to June 30.....	490920 to 507102	16182
July 1 to July 31.....	507102 to 517800	10698
August 1 to August 31.....	517800 to 538200	20400
September 1 to September 30.....	538200 to 558300	20100
October 1 to October 31.....	558300 to 583400	25100
November 1 to November 30.....	583400 to 599100	15700
December 1 to December 31.....	599100 to 611100	21000
1915 —January 1 to January 31.....	611100 to 614200	3100
February 1 to February 28.....	614200 to 630500	16300
March 1 to March 31.....	630500 to 682400	51900
April 1 to April 30.....	682400 to 723500	41100
May 1 to May 31.....	723500 to 805500	82000
June 1 to June 30.....	805500 to 839700	34200
July 1 to July 31.....	839700 to 855500	15800
August 1 to August 31.....	855500 to 913000	32000
September 1 to September 30.....	881000 to 913000	32000
October 1 to October 31.....	913000 to 949000	36000
November 1 to November 30.....	949000 to 985400	36000
December 1 to December 31.....	985400 to 1029200	43800
1916 —January 1 to January 31.....	1029200 to 1071800	42600
February 1 to February 29.....	1071800 to 1119000	47200
March 1 to March 31.....	1119000 to 1167900	48900
April 1 to April 30.....	1167900 to 1219400	51500
May 1 to May 31.....	1219400 to 1272000	52600

		Motor Number	Cars Built
	June 1 to June 30.....	1272000 to 1326900	54900
	July 1 to July 31.....	1326900 to 1362213	35313
	August 1 to August 31.....	1362213 to 1400900	38687
	September 1 to September 30.....	1400900 to 1452200	51300
	October 1 to October 31.....	1452200 to 1510500	58300
	November 1 to November 30.....	1510500 to 1570700	60200
	December 1 to December 31.....	1570700 to 1614600	43900
1917—	January 1 to January 31.....	1614600 to 1680000	65400
	February 1 to February 28.....	1680000 to 1739900	49900
	March 1 to March 31.....	1739900 to 1812000	72100
	April 1 to April 30.....	1812000 to 1888000	76000
	May 1 to May 31.....	1888000 to 1968629	80629
	June 1 to June 30.....	1968629 to 2044100	75471
	July 1 to July 31.....	2044100 to 2113500	69400
	August 1 to August 31.....	2113500 to 2162800	49300
	September 1 to September 30.....	2162800 to 2231000	68200
	October 1 to October 31.....	2231000 to 2310400	79400
	November 1 to November 30.....	2310400 to 2383900	73500
	December 1 to December 31.....	2383900 to 2449100	65200
1918—	January 1 to January 31.....	2449100 to 2503200	54100
	February 1 to February 28.....	2503200 to 2558200	55000
	March 1 to March 31.....	2558200 to 2611400	53200
	April 1 to April 30.....	2611400 to 2657500	46100
	May 1 to May 31.....	2657500 to 2700800	43300
	June 1 to June 30.....	2700800 to 2735700	34900
	July 1 to July 31.....	2735700 to 2756251	55451
	August 1 to August 31.....	2756251 to 2774600	18349
	September 1 to September 30.....	2774600 to 2787800	13200
	October 1 to October 31.....	2787800 to 2792300	4500
	November 1 to November 30.....	2792300 to 2805100	12800
	December 1 to December 31.....	2805100 to 2831400	26300
1919—	January 1 to January 31.....	2831400 to 2880170	48770
	February 1 to February 28.....	2880170 to 2933000	52830
	March 1 to March 31.....	2933000 to 2997100	64100
	April 1 to April 30.....	2997100 to 3067700	70600
	May 1 to May 31.....	3067700 to 3140000	72300
	June 1 to June 30.....	3140000 to 3210800	70800
	July 1 to July 31.....	3210800 to 3277850	67050
	August 1 to August 31.....	3277850 to 3346900	69050
	September 1 to September 30.....	3346900 to 3429400	82500
	October 1 to October 31.....	3429400 to 3515430	86030
	November 1 to November 30.....	3515430 to 3588000	72570
	December 1 to December 31.....	3588000 to 3659970	71970
1920—	January 1 to January 31.....	3659970 to 3743075	83105
	February 1 to February 29.....	3743075 to 3817430	74355
	March 1 to March 31.....	3817431 to 3910000	92569
	April 1 to April 30.....	3910001 to 3969150	59149
	May 1 to May 31.....	3969151 to 4055280	86129
	June 1 to June 30.....	4055281 to 4141450	86169
	July 1 to July 31.....	4141451 to 4233350	91900
	August 1 to August 31.....	4233351 to 4329900	96549
	September 1 to September 30.....	4329901 to 4426385	96484
	October 1 to October 31.....	4426386 to 4526540	100154
	November 1 to November 30.....	4526541 to 4617925	91384
	December 1 to December 31.....	4617926 to 4698420	80584
1921—	January 1 to January 31.....	None	None
	February 1 to February 28.....	4698420 to 4736431	38011
	March 1 to March 31.....	4736432 to 4810014	73582

CANADIAN FORD MOTOR NUMBERS.

For the convenience of our readers who live in far off lands (and it is surprising how many of them who do), we are giving the motor numbers of the Fords made in Canada.

As these Canadian Fords are built in Canada, not being merely assembled there; they are built within the far-flung limits of the British Empire and so can be shipped to all parts of the Empire without having to

pay such high import duties as are charged on Fords built in the United States.

As a result of this, the Fords used in Australia, New Zealand, India, and other parts of the British Empire, are apt to be of Canadian origin, and to have "C" motor numbers. All Fords, made by the Ford Motor Company of Canada, Ltd.; located at Ford, Ontario, Dominion of Canada, have their motor numbers prefixed by the letter "C".

CANADIAN FORD MOTOR NUMBERS.

Year		Motor Numbers
May 1, 1913 to July 31, 1913.....	C-1	to C-1500
Aug. 1, 1913 to July 31, 1914.....	C-1501	to C-16500
Aug. 1, 1914 to July 31, 1915.....	C-16501	to C-37500
Aug. 1, 1915 to July 31, 1916.....	C-37501	to C-70000
Aug. 1, 1916 to July 31, 1917.....	C-70001	to C-121000
Aug. 1, 1917 to July 31, 1918.....	C-121001	to C-170000
Aug. 1, 1918 to July 31, 1919.....	C-170001	to C-208500
Aug. 1, 1919 to July 31, 1920.....	C-208501	to C-262500
April 1, 1921.....		C-291500

While we at first intended to give a monthly list of Canadian Ford motor numbers, we found this to be impractical and thought it might be misleading. Canadian Ford motor numbers are not turned out exactly in numerical order, due to the fact that, at certain

seasons of the year, large numbers of motors are manufactured and stored. And then the motors which were manufactured and stored last, are used first. However, by taking the yearly figures, the results are practically accurate, as few motors are stored around the first of August of each year.

**Serial Numbers of Tractors Shipped Each Month From
October 1st, 1917, to October 31st, 1920**

Motors assembled at Home Plant		Motors assembled at Home Plant	
1917		1918	
October.....	1 to 75	August	15,226 to 18,637
November.....		September	18,638 to 22,247
December.....	76 to 259	October	22,248 to 26,287
1918		November	26,288 to 29,978
January.....	260 to 616	December	29,979 to 34,426
February.....	617 to 1,731	1919	
March.....	1,732 to 3,082	January	34,427 to 39,554
April.....	3,083 to 3,900	February	39,555 to 44,782
	6,901 to 7,608	March	44,783 to 50,961
May.....	7,609 to 9,580	April	50,962 to 53,079
June.....	9,581 to 11,937	May	53,080 to 53,110
July.....	11,938 to 15,225	June	53,111 to 55,304
Motors assembled at Branches		Motors assembled at Cork, Ireland	
1919		Motors assembled at Home Plant	
July.....		C1001 to C1009	55,305 to 60,864
August.....			60,865 to 63,000
September.....		C1010 to C1068	63,201 to 65,000
October.....			65,501 to 68,055
November.....		C1069 to C1080	68,056 to 74,809
December.....		63001 to 63003	
1920		63004 to 63063	74,810 to 81,363
		63064 to 63177	81,364 to 88,465
		63178 to 63200	88,466 to 92,113
January	100,001 to 100,192	105,025 to 105,049	92,114 to 96,973
February	100,193 to 102,294	65,001 to 65,240	
March	102,295 to 104,759	105,050 to 105,290	96,974 to 100,000
April	104,760 to 105,000		110,001 to 111,500
	120,001 to 121,591	105,291 to 105,704	111,501 to 117,133
May	121,592 to 124,731	105,705 to 105,893	117,134 to 120,000
June	124,732 to 125,000		125,001 to 125,036
	135,001 to 138,086	105,894 to 106,269	125,037 to 129,104
July	138,087 to 140,000	106,270 to 106,635	129,105 to 134,622
	150,001 to 151,504		134,623 to 135,000
August	151,505 to 154,890	106,636 to 106,871	140,001 to 146,097
		106,872 to 107,199	146,098 to 150,000
September	154,891 to 158,177		160,001 to 163,426
		107,200 to 107,303	163,427 to 169,258
October	158,178 to 158,322	65,321 to 65,500	169,259 to 169,583
		107,304 to 107,640	

Cork Number C-1001 to C-1080 inclusive replaced by 65,241 to 65,320 inclusive in September, 1920.

ENGINE, WHEEL, AND CAR SPEEDS

The gear ratio of the Ford rear axle system is 3.63-to-one, meaning that the Ford engine crank shaft makes 3.63 turns, for each turn of the rear wheels. Now the Ford car is regularly fitted with 30 inch diameter tires, which have a circumference of 94.25 inches.

Since there are 5280 feet in a mile, then 5280 feet multiplied by 12, and divided by 94.25, gives 672.3 turns or revolutions of the Ford rear wheels for each mile of distance covered.

One mile per hour is equivalent to 88 feet per minute, so that at a car speed of 20 miles an hour, the car travels 1760 feet per minute, or one-third of a mile.

Car Speed	Engine speed	Wheel speed
1 m. p. h.	41 r. p. m.	11 r. p. m.
5	204	56
10	407	112
15	611	168
20	814	224
25	1018	280
30	1221	336
35	1425	392
40	1628	448
45	1832	505
50	2035	560
55	2239	616
60	2442	672

FORD CAR WEIGHTS.

Year	Truck	Weights				
Aug. 1 to July 31	Chassis	Coupe	Sedan	Runabout	Touring	Chassis
1915 to 1916	....	1540	1730	1395	1510	1200
1916 to 1917	....	1540	1730	1380	1500	980
1917 to 1918	1450	1580	1745	1385	1480	980
1918 to 1919	1450	1580	1715	1390	1500	980
1919 to 1920	1395	1580	1750	1390	1500	1060
1920 to 1921	1380	1525	1725	1400	1500	1020

When cars are equipped with starter, add 90 pounds.
When equipped with demountable rims and tire carrier add 45 pounds.

OVERALL DIMENSIONS.

Model	Height	Width	Length
Touring	7'-0"	5'-7 1/2"	11'-2 1/2"
Runabout	6'-9"	5'-7 1/2"	11'-2 1/2"
Sedan	6'-9"	5'-7 1/2"	11'-2 1/2"
Coupelet	6'-9"	5'-7 1/2"	11'-2 1/2"
Chassis	.....	5'-7 1/2"	10'-8 "
Truck chassis..	.....	5'-7 1/2"	12'-9 "

CAR PRICE CHANGES.

	Aug. 1909	Aug. 1910	Aug. 1911	Aug. 1912	Aug. 1913	Aug. 1914	Aug. 1915	Aug. 1916	Aug. 1917	Aug. 1918	Aug. 1919	Mar. 1920	Aug. 1920	Sept. 1920
Touring	\$850	\$950	\$780	\$690	\$600	\$490	\$440	\$360	\$360	\$525	\$525	\$575	\$575	\$440
Runabout	825	900	680	590	525	440	390	345	345	500	500	550	550	395
Chassis	.....	.....	.....	.....	.....	.....	360	325	325	475	475	525	525	360
Sedan	.....	.....	.....	.....	.....	975	740	640	645	775	775	975	975	795
Coupelet	950	1050	1050	.....	.....	750	590	505	505	650	650	850	850	745
Truck	.....	.....	.....	.....	.....	.....	.....	600	550	550	550	600	640	545
Town Car	1000	1200	1200	900	740	690	640	595	.....	.....	.....	.....	.....	.....

FUEL TANK MEASUREMENTS.

Gallons	Square Tank	Round Tank	Oval Tank
1	3/4"	1 1/8"	1 1/8"
2	1 1/2"	2 3/8"	2 3/8"
3	2 1/4"	3 1/2"	2 13/16"
4	3 "	4 1/2"	3 5/8"
5	3 3/4"	5 1/8"	4 3/8"
6	4 1/2"	5 3/8"	5 "
7	5 1/4"	6 3/4"	5 11/16"
8	6 "	7 1/8"	6 7/8"
9	6 3/4"	8 3/8"	7 1/8"

For the round tank, the dimensions vary considerably for each gallon. These round tanks were used on Ford touring cars and roadsters on earlier than 1920 models and even on some 1920 cars.

With the square tank, each $\frac{3}{4}$ -inch represents a gallon. This was the tank used on Ford Sedans, and on some of the Ford

Coupelets, though the Coupelets as now made are using the oval tank.

The oval tank may be roughly estimated at $1\frac{1}{2}$ inches for the first gallon, and $\frac{3}{4}$ -inch for each additional gallon up to nine. The elliptical, or oval tank, is used on 1920 and later touring cars and roadsters, and also on the Coupelets as now made.



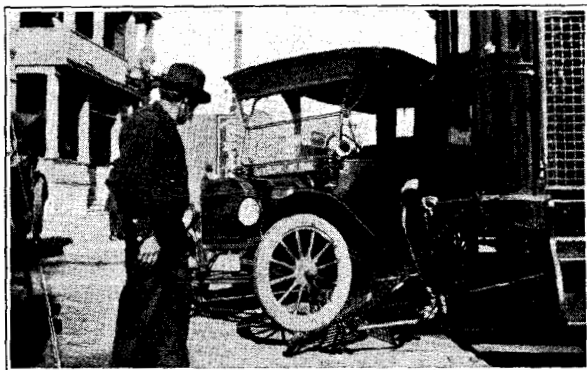
BETTER NOT TRY IT

In Milwaukee there is a Ford salesman yclept J. Harry Tobin, who makes it a point to watch over his customers and see that they treat their purchases with due consideration. Being of Celtic strain, he usually mixes in a little "kidding" with his admonishments on the care of cars and generally advises his customers thus: "Have a heart. Don't abuse your car or expect the impossible from it. Remember that it is only human."

So many Ford owners have found by experience that their cars seem to balk at nothing, it is only natural that many forget that it is 'only human.' They look with disdain upon

the muddy or sandy roads that cause other cars to give up in despair; they approach a railroad crossing and snap their fingers with disregard of the warning whistle, which after all emanates only from an insignificant locomotive. One thing must be said for the Ford: It will at least *try* to do anything that its driver wishes it to do, and many times it gets away with some real achievements. However, it has its limitations much as we are loathe to admit, and in proof of this we show two photographs of Fords which felt that they were not to be stopped by such puny things as street cars.

One picture shows A. R. Cavender of Chicago,



who discovered that his Ford was not quite equal to the task of forcing its way between two surface cars and hurling them off the track. The result of the bout was a tie, for the little Ford successfully wedged itself between the two cars and stopped the traffic. Incidentally, no one was hurt.

Another picture shows a Ford which was sure

that it had the right of way on a San Francisco street. With typical aggressiveness it argued the matter out and this bout ended with no damage done.

Of course, the invincible Ford fan will argue that no other car would have done this much. Perhaps it is true, but why ask so much of a faithful servant? The best moral to be drawn is: "Don't do it."

IN SPRING

Oh tell me, dear Elizabeth, where shall we go to-day;
For spring has touched the sleeping earth and
luring winds call low,
While lilting notes of songbirds fill the air with
music gay,
So tell me, dear Elizabeth, just where shall we
two go.

Somehow, my thoughts are straying far from
dingy city streets
And all the noise and turmoil that so often
there assail,
Until, within a shady nook, my eye with rap-
ture greets
The purple-petaled violets hard by an open
vale.

So let us haste, Elizabeth—my Ford and heart's
desire—
To haunts where crooning tree-tops over vio-
lets now sway;
For hill and dale, by woodland trail, are bright
with springs attire
And gypsy breezes beckon us—come! let us
haste away.

Ethel Hope.

Ford Repair Book FREE

See Page 129

Contrite.

She: (over telephone)
Is that you Jack—dear?
Yes, I know I said I never wanted to see you
again—but
You knew I didn't mean it,
Well, I was cross with you—
And Jack, I do—now
And I want to see you—right away—this
minute.
You'll come—oh you're a dear.
Where am I?
Well, the farmer here, Mr. Jones,
Says I am about fifty miles from home—and
—and
My car is broken down—all broken down—
And there's nobody to fix it—
But I just had to tell you
That I loved you
Before I walked ten miles to the nearest
garage—and—
What? You'll start at once?
Oh you're too good Jack—
Yes—I love you—
Oh Jack.

A FORD CANNIBAL.

A young man, Ray D.—; from Decatur,
Fell in love—it blazed like a crater!
Took Ford and his girl,
Went out for a whirl;
Alack and alas! RAY D. ATE HER!
Alack and alas! Ray D. ate her!"

A man refers to his automobile as "she" probably because it is something he can't reason with.—Syracuse Herald.

SEASONABLE SUMMER ACCESSORIES

Equipment for Fords in Service

WHEN a car has been used for a year or more, it will generally be found that some of the original equipment has been broken or lost, or has been worn out in service; so that there is ample opportunity for the installation of new accessories and parts on a car that has been in service for some time.

In considering the fitting of accessories to a car in service, the first thing will be to replace parts that show the effects of wear. For example, take the tire chains, which after a year or so of use will have quite a number of broken cross chains, and it probably will be possible to sell the car owner a set of new cross chains, as well as a tool for their application.

As experience in owning a car generally shows the advisability of securing certain tools for repairing, it is usually possible to sell the car owner quite a number of new tools for use on his car.

Since the tires are probably well worn and may need repairing, it may be advisable to sell the car owner a vulcanizer and other tire equipment for

putting the tire in good condition for another season of useful service.

In considering the overhauling of a car during the coming season, it will probably be necessary to grind the valves and to remove the carbon; so that there is an opportunity for the sale of valve grinders, and for speed wrenches for spinning out the cylinder head bolts.

Perhaps the overhauling of the motor will reveal the necessity for the installation of new light-weight pistons and piston rings, as well as other parts; so that the up-to-date accessory dealer will find out whether or not the car owner contemplates the overhauling of the motor, when advising the car owner as to the possibility of useful accessories.

When the car has been in use for some time, the owner will appreciate the installation of certain accessories for improving the performance of the car. After wear has caused **looseness** of the parts with consequent **noise**, the car will be in a receptive mood to consider the purchase of anti-rattlers to provide automatic adjustment for such parts, as usually cause noise.

MODERNIZING APPEARANCES

Special touring, or roadster bodies.
Racing bodies and equipment.
Radiator shell and hood.
Special radiator.
Crown fenders.
Anti-rusting running boards.
Running board tool box.
Glass rear light.

PAINTING

Body paint and varnish.
Fender and chassis paint.
Top dye, and top dressing.
Tire paint.
Rim paint.
Body polish, and metal polish.
Hose brush, sponges and chamois.
Cotton waste.

INCREASING COMFORT

Special springs.
Deeper seat cushions.
Enclosed top attachments.
Ventilating windshields.
Rubber pedal pads.
Horn button attachments.
Foot accelerators.
Automatic speed controller.
Running board mats.
Extension door handles.

WEARING APPAREL

Dusters.
Driving gloves.
Working gloves.
Overalls.

ENGINE STARTERS

Electric.
Mechanical.

ELECTRIC LIGHTING

Electric lighting systems.
Storage batteries.
Storage battery covers.
Headlight bulbs.
Bulb carriers or cases.
Dimming switch.
Anti-glare lenses.
Spot light.
Electric tail light.
Hydrometer.

STEERING

Irreversible steering gears.
Radius rod braces.
Steering controllers.
Support for steering column.
Tilting steering wheels.
Front wheel bearings.

AXLE PARTS

Four-speed transmission.
Lined rear hub brake shoes.
Contracting hub brakes.
Ball-bearing thrust washers.
Special-ratio bevel gears.
Special differentials.

TIRES AND FITTINGS

Tire gauge.
Tire pump, hand or engine driven.
Tire fillers.
Blow-out patches.
Vulcanizers.

ENGINE FITTINGS

Overhead valve cylinder head.
Light-weight pistons.
Light connecting rods.
Special piston rings.
Crankshaft counter balances.
Gaskets.

Transmission band linings.
Demountable transmission bands.
Muffler cut-outs.

LUBRICATION

Special rear axle grease.
Grease gun.
Oil gauge.
Rear axle grease retainer.
Spring oilers.

COOLING

Radiator thermometer.
Fan belt.
Water circulating pump.
Folding water bucket.

Anti-leak compound.
Radiator cleaning compound.

FUEL SYSTEM

Improved gasoline carburetor.
Primer.
Reserve fuel valve.
Fuel mixer.
Moist air supply.

IGNITION

Spark plugs.
Wiring harness.
Special timers.
Timer elevators.
Special ignition systems.
High-tension magneto.
Batteries.

Modernizing Appearances.

Probably the greatest improvement that can be made in the **appearance** of the Ford car is to fit a special body of either the touring or speedster type. Some of these bodies only cost about \$50 or so, for the light speedster type bodies; while others cost up to \$500, for some of the more expensive types of touring car bodies.

Often the fitting of a racing type body is an economical way of modernizing the appearance of a 1914 or earlier model which has the old style body, and for which, it would be expensive to purchase a new body of the touring car type.

Much can be done to give a snappy appearance to the car, by fitting some stylish type of radiator shell and hood; or the square type of radiator shell and hood which are now in vogue.

One of the most practical improvements, especially in warm climates, is to fit a special radiator of improved make, as such radiators not only enhance the appearance of the car, but also give increased cooling capacity.

Some car owners believe in fitting special fenders, to give an individual appearance to the car. But when this is done, the fenders should be bought from some reliable manufacturer who keeps them in stock, so that spare fenders can be purchased whenever it becomes necessary to complete the set, after an accident to one of the fenders.

As the enamel is soon worn off the steel running boards, they tend to rust very quickly. Painting the running boards gives only temporary relief, because the paint is worn off so rapidly when the car is in service. A rusty running board tends to give the car a disreputable appearance and aluminum, or linoleum covered, running boards do much to keep the car in a permanently neat condition.

Among the most practical accessories are wire wheels, or wheels with demountable rims. Most car owners consider that the wire wheels do much to give the car a light and attractive appearance, besides adding to the ease of tire changing.

Whether one should install demountable wheels, or demountable rims, is one of those open questions which may well be left to the choice of the individual car owner. The fitting of demountable wheels means that a spare wheel, as well as a spare tire, is available in case of an accident. Also, some car owners believe that a demountable wheel can be changed more quickly and easily than a demountable rim.

A running board tool box keeps the tools in an accessible location, where they can easily be reached, for repairs and adjustments. One of the most improved forms of tool box, fits just below the front edge of the seat cushion, where the tools are out of

the way, and securely protected against both the weather and sneak-thieves.

As most of us have noticed, nearly all modern cars, except the Ford, now have glass lights or panels in the rear curtain as standard factory equipment. It has been generally recognized that glass is much more transparent and practical, and also gives a much better appearance than celluloid in the rear lights.

Painting.

In order to improve the appearance of the car, the **best** grades of body paints and varnishes must be used. Not only does one expect a "piano finish" upon a car, but the finish of an automobile is exposed to all the vagaries of the wind and weather.

A cheaper grade of paint, which may be of the quick-drying type, is suitable for painting the chassis and for touching up parts where a fine finish is not so essential as protection against rust. Such a paint should be very quick drying, so that the car can be used shortly after the "touch-up" paint has been applied.

When the top fabric is of the rubberized type, special top dressings are made, which do much to preserve the waterproof qualities of this rubber coating. When the top fabric is of the mohair type, a special kind of top dye can be used.

Some car owners paint the spare tire, which gives it a neat appearance and protects it fairly well against the water. But tire paint does not protect the tire from abrasion on the tire carrier as well as does a fabric tire cover.

In order to keep the tires from sticking to the rims, some car owners paint the rims with a special quick drying paint, which contains a certain amount of graphite so that the tires will not stick to the rim.

Among the other accessories for keeping the car in a presentable condition are automobile soaps and polish for the body, a metal polish, and also a hose brush, sponges and chamois, and cotton waste.

Increasing Comfort.

If the car has been driven for a year or so, without fitting shock absorbers, the driver himself may be pretty well inured to bumps. But if he considers the comfort of his passengers, he may wish to fit a set of shock absorbers to the car. In addition to protecting the passengers, the experienced driver will realize that these shock absorbers also afford a certain amount of protection to the tires and car, as they allow the wheels to bounce away from bumps more rapidly and easily.

If the springs tend to "strike bottom," as the saying is, which means to strike the axles, this is not only apt to cause the breakage of the springs but may cause the breakage of the axle parts as

well. In such cases, the installation of auxiliary axle springs will be an effective aid.

On some of the most expensive automobiles, the seat cushions are from 12 to 15 inches deep, and there is no reason to doubt but that fitting deeper seat cushions is a practical means of securing easier riding action, without mechanical changes in the car itself.

Of course, the fitting of an enclosed top attachment, for all-weather use, is one of the most effective means of increasing the comfort of the passengers. But this subject was considered in detail, in our January, 1921 issue, as well as the fitting of ventilating windshields of improved types.

If the driver is not too long and lanky, he will often find that the fitting of rubber pedal pads on the three foot pedals, gives greater comfort and adds a factor of safety in keeping the driver's feet from slipping off the pedals.

To make it more convenient to reach the horn button in an emergency, many drivers fit an attachment to hold the button for the electric horn on top of the steering wheel.

Other drivers find it convenient to use a foot accelerator for controlling the throttle, and changing the speed of the car, without the necessity of removing their hands from the steering wheel.

If the car is not fitted with a running board mat or foot scraper, it will be found that such a mat, by keeping the dirt out of the inside of the car, makes the care of the car much easier.

Extension door lever handles are found to be a convenience by many drivers, as enabling the car doors to be more easily unlatched and opened.

Wearing Apparel

In order to protect the clothing of the driver and passengers in riding in an open car and over a dusty road, it is convenient to have a duster or slip-on raincoat. Also a set of driving gloves for the driver. And in addition to the driving gloves, one should always carry a set of working gloves, of the cheap cotton variety, in the tool box, for making tire changes and repairs to the car. Some drivers also carry slip-on overalls, to be put on while making tire changes and repairs.

Engine Starters

The installation of electric starters, as standard factory equipment on Ford cars, has called the attention to the owners of cars already in service to the desirability of having some means of more easily starting the engine than by the usual method of hand-cranking. Of course, the fitting of an electric starting and lighting system is the logical answer to the starter problem. And as special electric starting and lighting systems are made for easy attachment to Ford cars now in service, these starters can be installed for about half the cost of changing the cylinder block and transmission to install the regular Ford electric starting and lighting system.

In the case of an old Ford, it may not pay to change the cylinder block and transmission, in order to get the standard Ford equipment; so that the fitting of the electric starting and electric system of this type is often the best means of securing easier engine starting and the advantages of electric lights.

There are mechanical starters of many types, but most of these are made to spin the engine by means of a handle extending through the dash of the car, and within easy reach of the driver. Whether or not such mechanical starters will give good service depends on whether they are properly designed and well made. Some of these starters have given good service, according to reports furnished us by the readers of our magazine.

However, if the driver is careless about retarding the spark and the engine backfires, this may bend or break some of the parts of the mechanical starter, though it is possible that this may be much less costly than the breaking the arm of the driver. Other details in regard to mechanical starters are that they require oiling and cleaning, and should be so designed that they will not be clogged with mud thrown up by the front wheels. If the driver expects to install one of these starters, and never intends to oil or clean it, he might better leave it off.

Electric Lighting.

While many car owners install electric lighting, as part of the electric starting system, still it is quite feasible to install an electric lighting system, without installing the starter also. When this is done, it is not necessary to use nearly as large a storage battery, or to use as large an electric generator, for keeping the battery charged. This simplifies the installation of the system, and makes it much less costly to install.

Some of these electric lighting systems have the generator driven by the same belt which drives the fan. They are provided with special brackets to fit on the side of the cylinder block, which makes it easy to install and couple-up the generator. Owing to the small amount of power required, but little trouble should be experienced with such a method of installation, as only about 1/10 of the horse power is necessary to drive the generator. This is much less than the one or two horse power, required to drive the radiator fan.

Another method of electric lighting, which some car owners consider preferable, is to fit a storage battery of fairly large capacity to the car. Such a storage battery should be of about the 6-volt, 120-ampere hour type. With the use of such a storage battery, the battery will only require recharging about every month or so, depending of course on how much the lights are used at night.

If one has electric light service in the garage, then it is quite easy to charge this storage battery by means of an alternating current rectifier, connected to the electric lighting circuit of the garage. While such a rectifier costs from fifteen to twenty-five dollars, the cost for charging the storage battery will probably not be over ten or fifteen cents each time. And the storage battery can be charged right in the car, without the necessity of removing the battery.

If a storage battery is used in the car, then one of the storage battery covers made of pressed steel, which will fit neatly around the storage battery, is an excellent means of protecting the battery from mud and water splashed up from the road. These storage battery covers can be easily installed, without removing the battery from the car.

For use in the Ford electric lighting system, where bright head lights are desired from the Ford magneto; we recommend the installation of the type C Mazda Nitrogen-filled bulbs of the 9-volt, 27-candle power type. These bulbs will give a splendid light when connecting in series to the Ford magneto, provided that the magneto itself is up to normal.

As one never knows when the headlight bulbs will burn out, it is nice to have a set of extra headlight bulbs in the car. But as these bulbs are frail and easily broken, about the only way that they can be safely carried is by means of a small metal bulb carrier, or case, which is made for just this purpose. These steel cases are provided with sockets to hold two headlight bulbs, and a couple of smaller bulbs, for use in the dash and tail lamps.

If the car is not already provided with the headlight dimming switch, then such a "courtesy"

switch is almost essential, if one is to drive through traffic, or to give other drivers a fair chance to pass in safety on narrow roads.

In most states, the fitting of anti-glare lenses is compulsory. And in all states, the fitting of these special headlight lenses is certainly a desirable means of keeping the glare from the headlights down on the road where it belongs. By keeping the light on the road, instead of attempting to illuminate the clouds, much more light where it is needed will be secured.

Some drivers like a spot-light for reading street numbers or road signs, or annoying those who sit on park benches, and also to give a bright light at a distance on the road ahead. Such spot-lights can be easily connected with the Ford magneto, if a bulb of the 18-volt type is used. If an electric starting and lighting system is used, one can use a bulb of the 6-volt type.

For use with the Ford magneto lighting system, an electric tail lamp of the two candle power, 12-volt type can be connected in series with another bulb of the same voltage and attached to the dash. The dash light will act as an indicator, so that the driver will always be certain that the tail lamp is burning.

If one has an electric starting or lighting system, or an electric lighting system including a storage battery, then a hydrometer for measuring the density of the solution in the storage battery, is an essential part of the equipment for taking care of the expensive battery.

Steering.

For those who find that the regular Ford steering system causes more or less arm strain on long drives, there are irreversible steering gears, of the worm-and-segment type, similar to those used on cars of other-than-Ford makes.

For those who do not put too much faith in the Ford front radius rods, there are radius rod braces which tend to give extra strength to this part of the car. Special types of front radius rod braces, for both new and old styles of Ford front radius rods, were described in an article on easier steering in the April, 1921 issue of our magazine.

In order to make the car more easy to steer, and to keep the car traveling along the straight-and-narrow road; there are steering controllers of many types, including one or more springs to bring the steering gear to the "straight ahead" position, and prevent front wheel wobble.

As the Ford steering column tends to **vibrate**, when the car is driven at speed over rough roads, much of this vibration can be eliminated by steering column braces, which fasten to the cowl dash and are attached to the steering column up near the steering wheel.

For those who own enclosed Fords and find it a little difficult to get into the driver's seat of the Sedan, a **tilting** type of steering wheel is often found to be of convenience. Some of these tilting steering wheels are arranged so that they can be locked to prevent the theft of the car.

On some of the older Ford cars, which were provided with the ball-bearings on the front wheels, and for those who had trouble in keeping these ball-bearings correctly adjusted, the installation of the new types of roller bearings for the front wheels is recommended. These roller bearings have been found to give splendid service, and seldom require adjustment or cause trouble by breaking.

Axle Parts.

In order to increase the road ability of the car, a multi-speed transmission is often found desirable. Such transmissions are usually of the sliding-gear

type, as are generally used in the transmissions of the larger and expensive cars. These transmissions give the much wished for **intermediate** speed, between the Ford high speed and the regular low speed. They also provide an extra low speed, for emergency use.

One of the big advantages, of these multi-speed transmissions, is that they provide a really **free** neutral, which makes it easy to crank the Ford engine in even the coldest weather. This also allows the car to coast more freely on slight down grades, so that these multi-speed transmissions are often an effective means of securing more miles from the fuel.

For those who do not have an excess of confidence in the Ford rear hub brakes, there are special, lined rear hub brakes of the expanding type, which give much more effective braking than the plain, cast-iron brakes generally used.

Another form of effective rear hub brakes is of the contracting type, which greatly increases the braking efficiency of the rear hub brakes. Some of these **contracting** rear hub brakes are operated from the foot pedal and are used as **service** brakes. While others are connected to the brake lever, and are used for emergency only. In any case, these lined rear hub brakes tend to save wear and tear on the rear axle system by eliminating much of the chatter and jerk which occurs when hard and glazed transmission brakes are used.

Another rear axle improvement, which we have found to give good service, is the ball-bearing thrust washer for the rear axle system. Not only do these thrust washers tend to eliminate much of the wear, which allows the differential to shift back and forth and pump the grease out around the rear hub brakes—but these ball-bearing thrust washers have another important advantage in that they tend to hold the rear axle gears in **accurate** mesh; thus preventing much wear and tear on these gears and also tend to prevent noisy rear axle gears.

In order to increase the hill climbing ability of the Ford, there are special-ratio rear axle gears of either the 4-to-one, or of the 4.2-to-one types. These special-ratio rear axle gears are especially convenient for use in hilly countries or where the roads are rough and sandy, as they give the car much better pulling ability where the road conditions are severe. They are especially desirable for use in the Ford enclosed car models of the Sedan and Coupelet types.

In order to give rear wheels better traction over muddy or slippery roads, special rear axle differentials of the so-called gearless types are made which transmit the driving effort to the wheel which has traction, and so tend to prevent much skidding which would otherwise occur.

Tires and Fittings.

In addition to the regular tire equipment with which most Ford cars now in service are fitted, there are many drivers who do not have a tire gauge, which should be used to keep track of the air pressure, thus enabling more mileage to be secured from the tires.

Another useful tire saving accessory is a **good** hand tire pump. Many of the cars carry tire pumps that are hardly in condition to pump up an inner tube, not to mention putting forty pounds of air pressure into a tire casing on a hot day. There are also engine driven tire pumps made which fit on to the Ford engine and which use the power of the engine to do this hard and laborious work.

Some car owners advocate the use of tire fillers, or tires of the so-called "airless" type. Such tires

eliminate the possibility of punctures, and usually give long service before wearing out.

There are many cars now in use not carrying a blow-out patch, which should be part of the equipment of the car, in order to take care of those blow-outs which sometimes occur quite unexpectedly.

Instead of attempting to patch tires by using the so-called "cementless" patches or by using rubber cement, it is usually found preferable to carry one of the small portable vulcanizers and to use this for vulcanizing repairs on the road. By doing the work **right** the first time, it will be unnecessary to go over the work at some future time after one has returned to the garage.

Engine Fittings.

In order to increase the power and efficiency of the Ford engine, one can install an overhead valve type of cylinder head. Some of these overhead valve cylinder heads are of the eight-valve type, giving greater power and speed to the engine, due to the use of **larger** valves. Other overhead valve types of cylinder heads have sixteen valves, thus giving two inlet and two exhaust valves for each cylinder, and greatly increasing the power of the engine at high speeds. Such cylinder heads are especially desirable for speedster or racing use.

By fitting lighter pistons, the power lost in engine vibration can be reduced, thus securing a smoother running engine and one that is capable of higher speeds.

Another means of increasing the speed and smoothness of running of the engine is to fit light-weight connecting rods. But as the Ford connecting rods are already quite light and strong, it is difficult to gain as much, by fitting lighter connecting rods, as it is by the installation of lighter pistons.

In order to hold the compression better, thus giving more power and speed, and to prevent the pumping of oil up into the combustion chambers and the fouling of the spark plugs, it is often desirable to install special types of piston rings. These piston rings are made in a variety of forms, in order to prevent oil pumping, or to hold the compression, so it is difficult to specify any one make of piston rings as being preferable to the others.

Another way of increasing the engine speed and its smoothness of running, is to install a set of counter balances on the crank shaft. It is the usual experience that the fitting of these counter balances enables the engine to run about five or ten miles faster, before the "critical" speed at which vibration becomes excessive, starts in.

As these counter balances are intended to balance the crank shaft **only**, they can be used equally well with light-weight pistons or connecting rods. The exception is that, if light aluminum connecting rods are used, it will seldom be possible to fit counter balances owing to the space required by the bulky aluminum connecting rods. But the combination of light weight pistons and counter balances works very nicely.

Most cars now in service have been using the same cylinder head gasket and hose connection gaskets for some time, and so the car owner will often find it convenient to purchase additional gaskets to be installed the next time the engine is taken apart.

Transmission band linings are of many kinds. And some of these transmission band linings will greatly increase the length of time that the Ford car can be run without the necessity of relining the bands, provided that these bands are properly adjusted and that the car is driven in a reasonable manner.

In order to make it more easy to change the trans-

mission bands without removing the whole transmission cover, demountable transmission bands are made by means of which the transmission band linings can be replaced through the transmission cover door, without the necessity of taking the entire transmission cover off the crank case.

For those who live in the country, where the noise of the open muffler will not be annoying, and who like to use the muffler cut-out as an "engine testing valve" in order to ascertain whether or not all four cylinders are firing smoothly and evenly, a muffler cut-out can be recommended.

Lubrication.

On cars that have been in service for some time, there is usually more or less wear in the rear axle thrust washers. This allows the differential gears to shift back and forth, thus pumping the grease out around the rear hub brakes. And it is desirable to use a special grade of rear axle grease, which is made for use in the rear axle of Ford cars. There are several different makes of good grease for this purpose, some of the greases containing graphite which has a desirable effect in polishing the surfaces of the gear teeth and making them run more smoothly.

In order to get the grease in and out of the rear axle housing, a grease gun is a desirable accessory. But the grease guns need not be of an expensive make, as it is seldom used for any other purpose, save cleaning out the grease from the rear axle housing or filling the hubs of the front wheels.

If the car is much used, an oil gauge to indicate the level of the oil in the crank case, makes it easy for the driver to keep track of the amount of oil in the engine. There are many types of these oil gauges, some having a sight feed indicator on the dash. Other oil gauges are attached to the crank case and make it unnecessary for the driver to crawl under the car to test the oil level.

In order to keep the grease in the rear axle housings where it belongs, it is often found helpful to install rear axle grease retainers, consisting of special leather gaskets or washers to fit around the axle shafts, and to keep the grease from working out around the rear hub brakes.

In order to make the car ride more smoothly and easily, the lubrication of the springs is important. This lubrication can be more readily accomplished if special oiling pads or devices are used for oiling the leaves of the front and rear springs. If the springs are kept well lubricated, not only will the car ride more smoothly and without squeaks and noise, but the springs, this will be much less apt to break, as rust is the chief cause of broken springs.

Cooling.

The experienced driver, who takes an interest in the performance of the engine, will be much interested in the radiator thermometers which keep the driver acquainted with the conditions in the engine, and warn him in time if the oil level is getting low, or if the water supply is insufficient. Such a radiator thermometer is almost as necessary to the Ford car as a safety valve is to a steam boiler. The fact that many other than Ford cars have the radiator thermometer as a part of the standard factory equipment of the car, indicates the importance which may be attached to this accessory.

During the summer months, it is a wise precaution to carry an extra fan belt in the car. One never knows when the fan belt may break and the engine may become overheated, and if one attempts to drive the car without the fan in perfect condition.

In order to improve the cooling efficiency of the Ford car for touring, or hard driving during the warm summer weather, a water circulating pump

to increase the speed with which the water flows through the cooling system will do much to keep the engine cooler in hot summer weather.

In order to replenish the water supply when one is touring, it is very convenient to have a folding water bucket which can be carried in the car. This is a necessary summer accessory, if one attempts long drives or tours in warm weather.

Another summer accessory is anti-leak compound to repair leaks in the radiator, which would allow the cooling water to escape too easily and would tend to cause overheating by too low a water level in the radiator.

Another effective method of keeping the engine cooler, is to keep the inside of the radiator clean by using one of the radiator cleaning compounds which are made to dissolve the sediment and scale, which tend to accumulate on the inside of the radiator and in the water jacket of the cylinder blocks. Then the cooling water can reach the metal surfaces, and keep the engine much cooler.

Fuel System.

If the Ford engine is fitted with a carburetor of one of the earlier types, much smoother running and more miles per gallon can be secured by the installation of a carburetor of later make, which is designed to cope with the poor quality of fuel now available. Some of these improved carburetors also give smoother running, as well as more power and speed.

While combined inlet and exhaust manifolds, as described in our January, 1921 issue, are especially desirable for winter use, they are also helpful in securing more miles per gallon and smoother running even in warm summer weather. They do not seem to cause overheating, because the engine runs most easily and with the least amount of overheating, when the fuel in the cylinders is properly vaporized.

A primer for injecting a rich mixture into the manifold is really a winter accessory, as it is then most necessary for securing easier starting. But those who have trouble in starting their engines during the summer months may find it convenient to use the primer to give the engine a shot or two of rich mixture to make the engine start more easily.

During the summer months, when most touring is done and when one takes long drives out into the country, is the time when one is most apt to run out of gasoline. So a reserve fuel valve, which gives the driver notice while there is still a gallon or so of gasoline in the tank, is a convenient addition to the gasoline tank. In order to make the engine run more smoothly, due to the use of a better vaporized fuel mixture, different types of fuel vaporizers or mixers are placed between the inlet manifold and carburetor.

Most of us are aware that the Ford engine runs more smoothly and easily, and keeps cooler when moist air is available in the early evening or in foggy weather, so that it requires little argument to con-

vince us that a moist air injector, which supplies some moisture to the fuel, will improve the engine performance in dry, hot weather. Such moist air vaporizers are more convenient for summer than for winter use as they are more needed during hot weather and during the summer there is no danger of this reserve supply of water freezing.

Ignition.

We have met tourists who did not carry an extra supply of spark plugs in their car. But it seems foolish not to carry at least one or more spark plugs at all times, as spark plugs sometimes fail without notice, and it is more convenient to install a spark plug which one **knows** to be clean and correctly adjusted, than to bother with taking a spark plug apart and attempting to clean it on the road.

On many Ford cars which have been in service for some time, the wire loom assembly has become oil-soaked and rotted, so that the car owner will be ready to consider the installation of a special wiring harness or wiring system, which will hold the timer wires up out of the oil and dirt.

If the Ford car has been in use for about a year, or perhaps less, the timer itself will often be worn out, and so the car will be ready for the installation of a new timer, which can be of one of the various makes which have been illustrated in our magazine.

For those who wish to secure a smoother running engine and higher speeds, a special ignition system can be installed. This will give a more accurately timed spark, especially at high speeds. And this same spark will usually make it easier to start the engine and to run the engine smoothly at low speeds.

Almost all the Ford racing cars, which we have examined, have been fitted with some form of high-tension magneto or single-spark ignition system, thus proving the practical necessity of such an accurately-timed spark when the Ford engine is run at really high speeds. There is no room to doubt that the Ford engine runs more smoothly and easily when some form of high tension magneto is installed.

These high-tension magnetos are made with special brackets for attachment to either the old style Ford cylinder block, or to the present "starter" type of cylinder blocks. Or special magneto couplings can be obtained which will enable one to attach a magneto of one of the older types, to the present type of starter cylinder block.

In order to make the Ford engine start more easily, a set of dry batteries is very convenient. If about five dry cells are connected in series, and to the battery side of the coil box, this will make it much easier to start the engine. Such a set of batteries are also convenient as a **reserve** supply of current in case of accident to the regular current supply from the Ford magneto. We do not recommend the attachment of electric lights to dry batteries, as dry batteries are so expensive that this is hardly an economical method of securing electric lights.

WHEN CLUTCH STICKS

When the Ford sticks in high gear and one cannot get it out of high, as has been known to happen from some mysterious cause, one cannot get it started. You may find someone who will tell you that one of the clutch discs is broken and jammed in between the others. If this is true, it means a costly job of repairing, or rather of taking out parts, to get at the trouble, and it will cost some \$15 or more.

But this may not be the trouble at all. We had such a case and, when we got an expert to look at it, he found that the trouble was all in the three clutch fingers. That the fingers were stuck onto the plate and, by loosening these, he fixed it in about twenty minutes. So before you have the engine taken out to get at a broken disc, it may pay to have this clutch loosened up.

JOHN UPTON, LaFargeville, N. Y.

The Luring Road

BACK midst the scenes of my childhood,
Winding away o'er a hill,
Stretched a pale road, like a ribbon;
Often I've watched it until
Slowly, the deepening twilight
Cast o'er it shadows of gray;
Wondering whither it wandered
Away—far away—far away.

Who knew what treasures awaited
Him who would yield to its call
And, faring forth gypsy-fashion,
Take what'er lot might befall?
Perchance (I thought) fame or fortune,
Perchance a princess quite gay,
Lingered somewhere o'er the hilltop
Away—far away—far away.

Then came a day when, in manhood,
Driving a Ford I returned
To the old home for whose beauty
Oft in my absence I'd yearned;
Never had it seemed more lovely
Merrily rose the birds' lay
And the road still seemed to beckon
Away—far away—far away.

So, on the morrow I started
Saying I'd follow the trail
Whithersoever 'twould lead me,
Whether o'er hilltop or dale;
Blithely the Ford skimmed along;
As a child running at play,
While I kept urging it onward
Away—far away—far away.

Soon, in the distance I noticed
Someone whose form was quite bent
Carrying a load which a maiden
On helping bear seemed intent;
Gladly I stopped for a moment,
Asking them only to say,
Whither they went and I'd drive them
Away—far away—far away.

Often thereafter I journeyed
Unto their farmhouse so old,
Until one day the fair maiden
List to the love that I told;
Shyly she answered my question,
Setting, demurely, the day
When, as a bride, she'd go with me
Away—far away—far away.

Now, we oft sit as the sunset
Lights up the west with its glow
Talking, in low, happy accents,
Of days of long, long ago;
For the good Ford we are thankful
And that it once chanced to stray
Over the pale road which lured it
Away—far away—far away.

—ETHEL HOPE





By
FRANCES MATHILDA PURDY.

"How's her ladyship standing it, Dora? Look out and see. I haven't heard a sound from her for sometime, and if I take my eyes off this confounded road a minute we'll go over the grade."

I glanced behind his broad back, down the side of the car to where our small Toggenburg patiently watched the fleeting scenery over the edge of her wooden fence, which my inventive husband had erected to hold her safely on the running board.

"She's still chewing that piece of paper I tried to amuse her with the last time we stopped," I returned, noticing with joy that his color was improving in the strong, keen air of the San Bernardino mountains, through which we were slowly winding our way to Big Bear Lake and the camp of our dreams.

For my "six feet'n'over" of blonde husband had mysteriously acquired something which resulted in the loss of most of his energy, and "pep," necessitating the addition of this new member to the family, in order that he might regain his health by the widely advertised, goat's milk route; which I was determined should lead, via these steep mountain passes in the direction of Big Bear. We had always planned to camp there, anyway, and as I felt sure that one concentrated dose of outdoor life would be far more effective than many large, nauseating administrations of prescriptions from any doctor, we agreed to seize this perfectly good excuse and "do it now;" regardless of threatening clouds and keen winds from the snow-clad north slopes of the Sierras.

So, after due consultation with Lizzie, the most important member of our tiny family, and finding that she was more than ready to approve of anything in the nature of a pleasure excursion, being gratefully pleased, as ever, to return our always considerably careful treatment with perfect service, we had lost no time in getting under "weigh".

"We're coming to that awful big grade in a minute; you know, the one they call Snow-slide grade; and if it's as straight up as I've heard, we'd better lighten Lizzie's burdens by letting Toggie walk up this mountain, don't you think so?" said Tom, coming to a stop at the foot of a fearsome looking incline. "She might get excited, and try to jump, or something."

"I suppose that means I will have to transfer my gentle society to the end of her rope," I said, already on my way to liberate our prisoner, who baaed thankfully, and jumped around to ease her cramped limbs, dragging

me protestingly right in the path of a loudly panting fellow motorist.

As chief goat-herd of the expedition, I am here to state that Lizzie's ascent of that steep piece of California scenery, though, under these unusually trying conditions, slightly reluctant, was hasty, as compared with Toggie's.

She started with the firm conviction that the grade was altogether too much for any small goat, and pulled back with every ounce of her strength, unlike her polished black friend, who was already half way up. Then she as suddenly and unaccountably decided that the thing to do was to take it in a rush, of course compelling me to follow with equal suddenness at the end of her string, demonstrating her entire ability to beat anything on four legs (or wheels) ascending an altitude designed originally, in her opinion, solely for the use of her kind, zig-zagging from side to side of the road, narrowly missing annihilation at the hands of raging drivers, whose maddened honks and siren shrieks added the last touch to my confused mortification. However, just as I was beginning to lean on her strong tugs to assist me over the last steep pitch (Lizzie having long since disappeared gaily over the top, an anxious arm waving commandingly for me to catch up), Toggie, with great serenity, decided that right here was a good place to camp, darting without further notice into the bushes, where she tethered herself firmly by winding her rope among their tangled branches, and commencing to get supper on her own account; only being induced to desist from this justifiable occupation by the appearance upon the scene of distress of the head of the family, and his taking charge with that lordly and masterful certainty of successful results only possible to those who have a real, inherited right to wear "hiking trousers!"

The top of this mountain proved to contain Little Bear Lake, some distance lower in the range than Big Bear, and as purple shadows were rapidly enveloping the sloping flanks seemed to us like gratitude for the change of and deep canyons, we decided to camp for the first night at this lake, getting dinner, tired and happy, under the enormous spreading oaks filled with sleepy birds.

II.

By morning, again on the way, Lizzie seemed to enjoy it even more than we, humming along up and down grades with what

scene, rounding curves with perfect indifference to dangerous drop-offs at their edges into a thousand feet or more of nothingness, continuing like this all day; in fact, behaving much as usual during the whole trip, and keeping always in this sweetly reasonable frame of mind.

This of course could not be said for Toggie, every stop being regarded by her as an opportunity for fresh suspicion, with demonstrations to match, until my almost exhausted patience was rewarded at last, in the sunset hour, by the sight of her, peacefully chewing, tethered and milked, under a big pine tree for that night and many more to come; Big Bear Lake shimmering its cloud reflections with suggestions for future fishing delights, and Lizzie, draped in her bed clothes, ready for our happily weary forms to repose upon.

Lizzie, the cherished and adored, lends herself most readily and charmingly to just such performances: Although her front seat has been cruelly cut, in two places, and adorned with large catches that unfasten at night to let it down, so as to allow us to spread a mattress across her cushions from front to back, with all the accompaniments of the usual comfortable bed at home, she never seems to mind; and when we put up her curtains all round, leaving the "front window" open for ventilation, she behaves so quietly that our slumbers are always unbroken until the chipmunks and song birds wake us from dreamlessly perfect repose. Then my side-partner generally builds a roaring fire close by, so that I may comfortably finish dressing.

She has also rendered unnecessary the use and burden of a tent, as, aside from sleeping and partially dressing (this last feat being easily accomplished in her tonneau's generous space), all that we use are some large pieces of canvas, which serve to fence us from whatever straying public might come "snooping" round; though this rarely happens, as we usually seek camping spots remote from such undesirable contingencies. This is not interfered with by an unexpected rain storm, as this same canvas is always taken down and spread neatly over everything in the camp before retiring for the night, and we sleep as comfortably—more cozily, if anything—with rain pattering upon our roof and dripping from our eaves. In fact, many times we have started a long trip in the rain, depending upon our comfortably tried and trusted "pullman berth," at the end of the day.

After experimenting with various brands of gasoline stoves, we have at last arrived back at the old-fashioned, but reliable, camp fire built over stones, with an old stove pipe for a draught if possible, but if none is to be found, just the fire glowing on its rock-pile. Our tables and chairs were the proud accomplishment of my handy man, friend husband; as well as the big box which sits upon the right-hand running-board in state. This box is my pride. Inside, it is made like a big cupboard, containing shelves, drawers, and all sorts of compartments, which I keep filled for every possible emergency. Do they shake around and fall out, you ask? I should say not. One whole side lets down and forms a

kitchen-cabinet-table, and this side also shuts up close against them, and no amount of shock-absorbed bumping disturbs them in the least. This perfect treasure of camp equipment stands up as high as the edge of the door, and by its indispensable assistance all my repasts are prepared with that lightning speed demanded by the special brand of appetite acquired after a swift run with Lizzie. With this one exception, every other thing either folds, or rolls up and is stowed away in the roomy tonneau; and as there are "only two of us," when everything is buttoned neatly under the canvas cover, no one would suspect from our appearance that we were "going camping."

III.

"How many boxes of marshmallows did you bring?" my husband asked, impaling the last one in a gold-and-pink box upon a long, thin stick and holding it over the glowing embers for a moment. "This isn't the last, is it?"

"The very last one in the very last box," I replied, "but of course, as this is the very last night too, we won't need any more, and I'll let you have that lovely brown one all to yourself."

"Won't we miss our good old fish fries every night, when we get home," he sighed, throwing his stick at a marauding chipmunk. "And rowing around on that glittering lake every morning to get them; and——"

"And having to lug the water all the way from that lake to the camp; and the chipmunks running off with everything we leave unguarded for a moment; and those big black ants that got into the bedding when we first came," I jibed, to change the current of his thought, while I secretly hugged myself with delight at his brownness and general back to normal appearance. I was right. No physician could possibly have improved upon my combination treatment of rough outdoor life and matchless, pine laden air. He was a well man again, and we could start making plans for the future that would ——

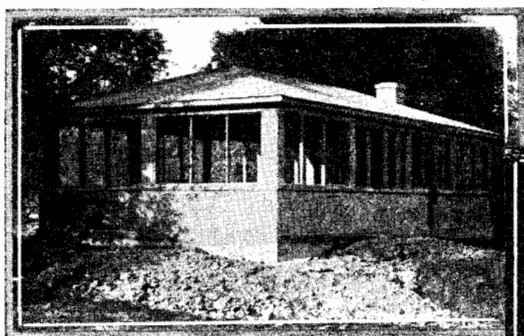
"Forget it," he interrupted my meditations. "If I could live my ideal life it would be right here on this spot, for the rest of my span. But, as we simply have to go back tomorrow, I vote for the Victorville road. You know the map showed it running along the top of that ridge overlooking the desert, and coming out into a different kind of country altogether; through Victorville, where all those movie actors make their headquarters for 'desert stuff.'"

"Sure," I agreed, with the enthusiasm that eternally froths in my cosmos for something new and different. "Let's go and consult Lizzie, and if everything's all right with her ——"

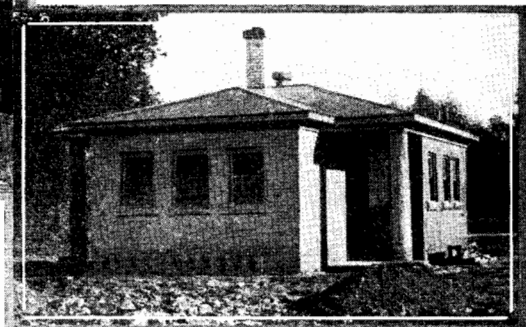
"When has Lizzie ever failed us?" He rose lazily, and, suddenly swooping down, picked his wife up bodily and deposited her upon the blankets of our soft nest. "There's just one thing in this world of change that you can absolutely depend upon not to go back on you, and that is——"

But this is one point upon which there is always a happy agreement of opinion, so I beat him to it:

"Lizzie," I shouted!



Picnic Pavilion in Free Camp.



Comfort Station in Free Camp, Mason City, Ia.

FREE CAMPS FOR THE FORD VACATIONISTS

H. N. Burhaus, president of the American Travel and Development association, in a public address delivered before the National Conference on Parks at Des Moines, Iowa, in January, made the prediction that the time would come when every town of any size would have an auto camp for the comfort and convenience of motor tourists. The railroads in the beginning of the railroad era first built their road beds, then they got the traffic, he said, and after that they built stations for the comfort and convenience of travellers. The same evolution is forecasted for the great motor touring travel of the future.

The Middle West and East are just beginning to wake up to the need of auto camps. Motor tourists from the eastern states to the West, particularly to Yellowstone Park and over the other much traveled trails to the great national playgrounds, are bringing back the gospel of the free auto camp, for they are finding these new institutions everywhere on the main trails in the West nowadays. Of the 48,000,000 who went in cars to Yellowstone Park last season 33,000 carried their own equipment and camped out instead of staying at the hotels. By far the greater number of the 33,000 were Ford owners for the Ford family knows the real vacation is not spent in hotels but out in the open by campfire and in tent.

Where to pitch camp for the next night, that was the absorbing question with them all each day, and it "blessed be the auto camp" when they found a town about supper time with a place already for them to pitch their tents, a fireplace or stove over which to cook their coffee and bacon, and a "comfort station" in which to clean up, fuel at hand and other conveniences which take the disagreeable features out of camping in the open and leave only the pleasant things behind.

Many of these Ford owners who enjoyed the hospitality of the western auto camp have returned home to talk the need of such free camps along the main traveled highways in the Middle West fully as much as in the West. The Indianian, the Illinoisan, or Iowan who with family and camp outfit aboard the Ford starts for the West on his vacation wants to camp right from the start. Where shall he find a place?

Truly it is not too early now in the Middle West and East to emulate the example of the West and build auto camps. A few towns have set the example and report comes from other places that they are talking auto camps for the coming season. Where camps have been established they have found they more than pay for themselves, and are even more a boon to the towns than to the motoring public, for the tourists leave many good dollars at overnight stops.

What is requisite for such an auto camp?

Many towns are asking the question and many more will.

The two photographs taken on a free auto camping ground established at Mason City, Iowa, will perhaps be helpful in answering the question. They have been found to meet the requirements of auto campers so well that the donors of this civic enterprise are well pleased with their efforts.

The site chosen was close to the North Iowa Pike—about three blocks from it to be exact—and in natural woody surroundings along a creek. This made the site both accessible to the Pike, the main traveled road through northern Iowa, and also gave a measure of seclusion which the camper likes. The place was in the city water and sanitary sewer district which is of course a feature to be considered in selecting a camp site. Tables and open fireplaces are provided and the two

buildings shown in the pictures. One of these is a comfort station. It is 24 by 35 feet built of hollow tile cemented over. It has a woman's rest room in front and back of that the building is divided into separate rooms for men and women. These are provided with lavatories, toilets and shower baths.

Near the comfort station is a picnic pavilion which is also built of hollow tile cemented over. The pavilion is 24 by 48 feet with cement floors and the upper half of the sides screened. At one end is a large brick fireplace. Down the center is a row of stoves for cooking. A screened-in building of this kind gives a chance to get away from the mosquitoes which are often a bugbear to camping. The big fireplace makes a rallying point for sociability in the cool evenings.

Around these buildings are about three acres for camping. Everything is free—a free

will offering to the motor touring public to park their Fords in Mason City for the night, and be guests of the town. The money for the camp was raised by popular donations with the exception of \$1,500 appropriated out of the city treasury. Cement men donated cement, tile men donated tile, plumbers donated plumbing, bricklayers and carpenters donated labor and so it went. It was not found hard to get the business men to give when it was shown them that it had been proved in towns having auto camps in the West that every car spending a night in an auto camp leaves on an average \$10 in a town.

Since the Mason City camp has been founded another town on the North Iowa Pike is taking steps to establish one, and wideawake Ford garage men in the town are the first to get interested. It is indeed a movement that dealers may well sponsor in their territory.



The "Tin Canners" En Route

With the coming of Summer the "Tin Canners" are emigrating northward. For the benefit of the uninformed let it be here stated that the "Tin Canners" are modern gypsies—auto tourists who camp as they go, traveling through the northern states, during the summer season. Some of the camps on wheels are wonderfully equipped having all the conveniences of home. Others are not so

complete but their owners seem to enjoy the free life of the open road.

Many "Tin Canners" are now reaching Washington on their northward journey. Some have established a camp on the Virginia banks of the Potomac where these photos were made. This series of photographs shows the "Tin Canners" mode of living.



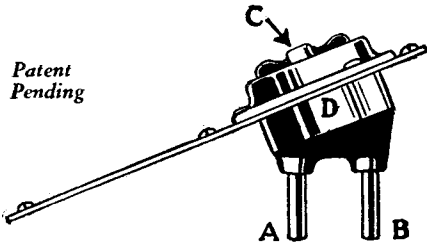
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The Red-Cup fits your Ford. You install it yourself with only a screw driver.

Simply remove the regular Ford transmission cover plate — under the foot boards — and replace it with the grease-filled Red-Cup, using the same gasket and six screws.

Then hop in, start off and leave that chat-tat-tat-chatter forever behind you.

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Re-lining is an expensive operation and new linings soon wear smooth if not fed by the Red-Cup, while your old linings, *greased* by a Red-Cup *will* do.

You can install a Red-Cup in your Ford in ten minutes, using only a screw-driver. The Red-Cup costs you less than one lining renewal; requires no mechanical knowledge to apply; has no delicate adjustments; keeps your old linings like new and makes starting, driving and stopping your Ford a greater pleasure—free of the chat-tat-tat-chatter.

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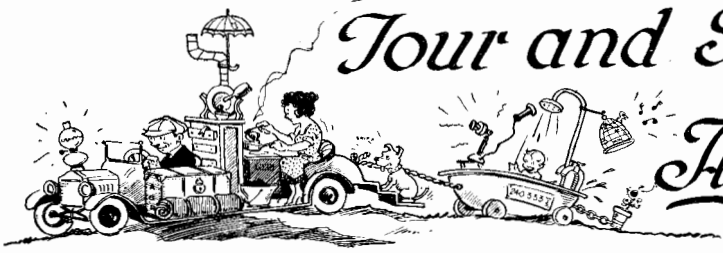
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Tour and Stay Out- All Night

By HARRY IRVING SHUMWAY.

I KNOW a bird who thinks when he has backed out of his garage, run over the wife's bed of tame petunias and then driven frantically back into the car's bassinet that he has been on a tour. Once he drove almost thirty miles and he's talked about it ever since as some trip. He reads about geography but he doesn't live it.

There is another chappie whose idea of getting the old engine warmed up is to run it from Boston to San Francisco. A little jaunt like this just gets the bus tuned up, so to speak, and then he can really go somewhere. This man bursts into tears every time he realizes that it is only the presence of a couple of oceans that prevents him from rolling around the earth ad infinitum.

Well, between these two extremes you can take your pick and be as mad a gadabout as you please. Nobody has the same notions about touring as his neighbor, comrade or brother-in-oil.

One of our most prevalent gasoline hounds is the thirster for historical relics, the lad and lassie who want to roll around the map checking up where George Washington stopped under a spreading chestnut tree or where Israel Putnam knocked the blooming snag-froid out of a few red coats on his afternoon off. If history repeats itself, believe me, gasoline is a great ditto mark. Personally, I'd just as soon change a tire under a tree where the immortal George spoke a piece as anywhere else, but after the gauge says 65, let the chariot sing.

Then there is the cuckoo who goes out for the air and figures he can soak up more of it by rushing into it, at the rate of thirty miles an hour than to imbibe it in a front porch endeavor. In this way he can see the air, smell it, taste it and otherwise enjoy it to his heart's content.

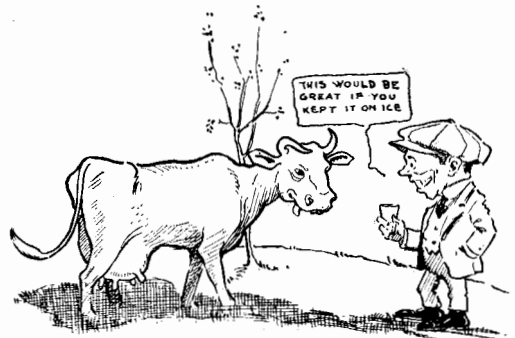
Another one of the legion is the speedometer reader who loves to go as far as possible in one day. If he does less than 200 miles on a Sunday, then he knows there is a seepage of power somewhere and on Monday he'll have Jabez, the graphite eater, crawl into the engine and take a fall out of the carbon. On the days he does 300 miles he writes the manufacturers of the car he drives a testimonial telling them the car is all they say it is and they can use his signature if it'll be of any help.

There are many more reasons for touring than these, probably hundreds of them. I have tried them all and the one best bet so far is doing it with a trailer. This does not apply for a one-day trip, of course, but to one that takes from a week to a month. If you have never toured this way then you have missed something of so elusively fascinating a character that I can't describe it. All I can say is try it once and after that you'll know what living is.

You don't need to have a regular trailer either. Almost any of the camping outfits are satisfactory. Some of 'em hang on the running boards, some

strap on the back of the car, some are merely thrown into a convenient space. But if there is a comfortable bed or cot, and you can keep dry and warm, free from insects, then that is enough. Up through the mountains where I travel I have seen all sorts of contraptions and everybody is happy, gaining weight and getting tanned.

There is a fascination about auto-camping that defies analysis. One thing that probably makes it such a joy is the absolute lack of schedules and other hindrances that apply to so many other methods of seeing the country. You are your own landlord, chef, janitor, motorman and everything else. Nobody bothers you; nobody wants to. You can pull up stakes any time and stop generally where you jolly well please.



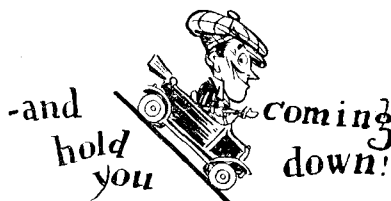
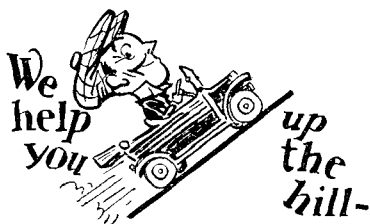
Tell the cow how much you liked it

In addition to these beauties the cost of this method of going and living is so low that it would surprise you. Foodstuffs of all kinds, even cooking tobacco, are much lower than in the cities. That about the tobacco may sound queer, but I bought tobacco in the Maine woods last summer cheaper than I can in the biggest cities.

Another joy of the epicurean side of this life is the freshness of everything. You don't have to look at a chicken brought out of the refrigerator to see if you want it. You ask to hear it cluck instead. Then if the cluck sounds good the farmer will chop its head off, dress it and it's yours.

The eggs and milk, too, are picked right off the bat. Usually you can drink a couple of quarts of milk at a stopping place and go and tell the cow herself just how much you liked it which is a pleasant thing, now we can't compliment George, the bartender, and tell him how much we like his cocktails. And eggs laid Tuesday afternoon and boiled Wednesday mornings are things to cheer about.

Then there is the fishing. I might run on until your tongue stuck out about the joys of fishing in



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pools and streams far from the busy haunts of men. Some places you can throw a line into the water without leaving your car—a darn good way to fish too, if the game warden should happen along. Seriously though, it is a good idea to buy a license to fish in the state wherein you are traveling. Good fish like good men, are getting scarce and we ought to help the cause of fish along by contributing to the support of the associations and bureaus.

Fish dinners, the result of your own catch, not only are delicious, but lower the cost of living. For once in your life you can probably get enough of fried brook trout to satisfy you. The cost is nix unless you feel you ought to buy the angle worms from a zoo.

A good many of us live in cities, mostly of the fair and deadlier species, think there are untold dangers lurking in the jungle that lies on the outskirts of civilization. Just what these dangers are supposed to be is a problem that requires some probing. First they think the wild animals won't behave themselves. Then they fear snakes. They also feel that Captain Kidd and his fierce crew are not dead as the encyclopedia says but are waiting for somebody to set up a tent and then come and kill them for their money or something.

All these bugaboos are highly exaggerated. There may be some wild animals but so long as they stay wild, why worry? The only thing to fret about would be their suddenly becoming tame and unduly sociable and the Natural Histories say it can't be done. Yeggs and pirates there may be but they are also to be found in the cities, so they tell me. Every now and then you read of some policemen in a big city getting rough with a yegg and taking his name and address.

Of course, it does seem funny not being able to lock the front door and put the cat out at night. You feel as if you were slighting some ritual or neglecting to play safety first. But God really meant people to live outdoors some of the time. And if He made such a gorgeous one, why worry about sleeping in it?

I had rather not tell you what this life will do to your appetite. All I will say is you had better have your vest buttons set over a notch or two so they won't be snapping off every now and then, hitting somebody in the eye or falling into the soup. People who say breakfast is a poor meal for them ought to try this life and realize what breakfasts are made for.

There is usually no difficulty about finding a place in which to set up your outfit and camp. Our friends in the hinterland are regular folks and hospitality means something to them except a mere word in the dictionary. Now and again you may find a grouch but if so, play the Pollyanna glad game and run over him with a cheerful smile. In all my tours, which number quite a few, I have not come upon a single specimen of the Grouchus Crabeas and I am hoping the breed has become extinct along with the Dodo bird and the bustle.

Contrast this care-free gypsy mode of travel, if you will, with the other way of frantically getting into a hotel with its barrage of porters, deck hands, bar maids, bell boys and busy clerks who fancy the pleasant smile has been buried long, these many years. I have stopped at a good many hotels and have

even paid my bill in some of them. In the sunshiny, dew-kissed morning I have driven away from them with my remaining nickel firmly clutched in one hand, wondering if I could make the next poor farm before curfew called it a day.

I have spent a night in a roadside inn and counted more sheep than the stock yards ever had at a party while outside my soft pine door a gay blade made small talk with a fair giggler far into the night and the next morning. At other times the Sandman has had a gay set-to with the jangling piano down stairs and I have heard Morpheus quarrel violently with Orpheus about the latter's offspring, Kid Jazz.



Realizing what breakfasts are made for

Then there is that other mode of travel, the resting places being marked by the abode of near or not so near relatives. Instead of using a Blue Book you use the Family Album to find out where you are going. This is all right and sometimes pleasant, but sometimes it isn't. It isn't so darned nice to come out on a morning and find a young nephew of the family has taken your engine apart in the early hours and wants you to put it together again. This takes the fun out of the visit and depletes your vocabulary of strong language to bankruptcy.

With the camping outfit these troubles do not occur. To be sure you can have troubles but not the same kind. Your sleep will not be marred by any more terrible music than that of the Katydids' Silver Cornet Band or the Bull Frogs' Saxophone Sextet. As these organizations play only lullabies their presence is not unwelcome.

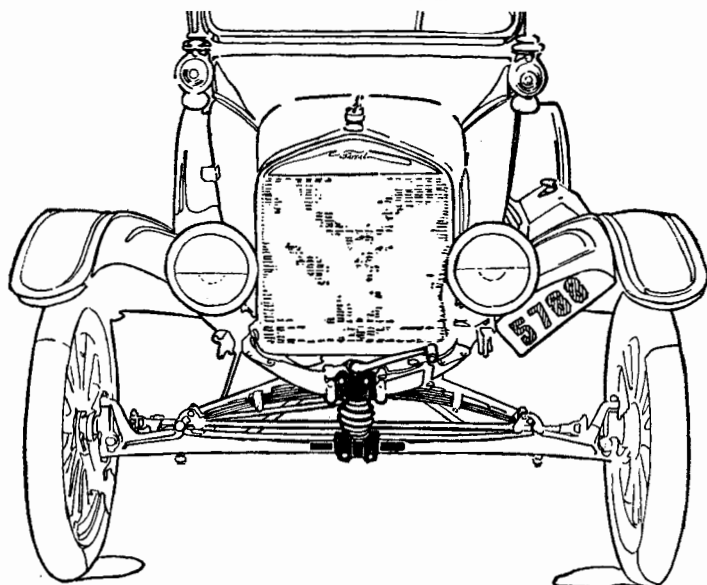
You will not have to tip anybody. The itching palm is a plant unknown in this nomadic existence. Indeed, you get your money's worth for every cent you care to spend.

Space forbids setting down in detail some of the articles, hints and so on that might interest the thirster for this kind of lore, the items of what to carry, how to carry it and where to put it when you get there and also how to know you are there when you have arrived. Maybe the editor of this magazine will write right back to me when he reads this, saying, "Well, why in blazes don't you tell all you know and be done with it? Don't keep it all to yourself." If he does, all I can do is to go into another trance and pour my passionate soul into a story of the how-to-do variety.

The old-time girl that once said, "You'll have to ask father," now chirps up and says, "Step on the gas, Bill, dad's gaining ground on us."

By the way, Jim, what size shoe do you wear?

Absent minded Ford Owner: 30 x 3 1/2 in the rear and 30 x 3 in the front.



Why the Tri-Chek?

To Ford Owners—

The main reason why your Ford should be equipped with a TRI-CHEK is because it will pay for itself many times by saving the front springs from sagging and breaking.

But that is not all—

The TRI-CHEK makes driving and riding easier by stopping the rebound and absorbing the bumps.

It forms a spring tension between the frame of the car and the front axle, and lessens the sideway that makes driving so hard on a rough road.

AND IT ONLY COSTS \$5.00.

To prove our statements we will gladly refund your money at any time if you attach a TRI-CHEK to your Ford and find it unsatisfactory in any way.

Join the many thousands of TRI-CHEK boosters. Send us a \$5.00 bill or money order today if you can't get one from your dealer.

To Ford Dealers—

Here's a guaranteed Ford Accessory that practically sells itself.

It is something you can sell consistently, for the Ford car is not damaged nor the mechanical construction changed in any way when attaching.

We are now offering to new dealers an attractive display stand 18"x 24" in three colors. This stand illustrates the front of the Ford car and is cut out so that the TRI-CHEK itself is shown in the proper position on the Ford car.

Talk to your jobbers salesman or write to us for our attractive advertising plan to help you sell the TRI-CHEK. It will mean greater profits for you.

Yours very truly,

GEMCO MANUFACTURING CO.

Gemco
MILWAUKEE
TRADE MARK

GEMCO MFG. CO.

Tri-Chek
\$5.00

Milwaukee, Wis., U. S. A.



All the
Comforts
of Home
on Wheels
and Ready
for
Vacation



The bungalow car is fitted out with all the comforts of a modern apartment, including electric lights, heat and a complete plumbing system. The one room compartment is con-

vertible so that during the day it serves as living room and at night as bed room. Additional sleeping space is provided on the drivers' seat, which can be converted into an upper and lower berth.

LOUDON ADJUSTABLE Storm & Sun Shade for Ford Cars

**An Excerpt
From a Letter
From an Expert**

LOUDON ADJUSTABLE Storm & Sun Shade for Ford Cars

**Most
Practical**



**Strong
and Rigid**

**Easy to
Attach**

"We are convinced that your shade is the most practical of any on the market, as it is strong and rigid, and easy to attach on account of your patented feature.

From the demand we have had for your shade since we have had the agency, we are led to believe that a large portion of the Ford cars will be equipped with the Loudon Shade within a very short time, and we find that Ford owners are only too glad to be able to get this shade for the advantages it has over many of the other makes, and willingly pay the retail price of \$8.00.

Some dealers are so enthusiastic over the advantages of this shade and the low price at which it is offered, that they have made the statement that they will sell one to every Ford owner in their locality."

When Chas. S. Marshall, Manager, Marshall-Racine Rubber Co., orders Loudon Adjustable Storm and Sun Shades in hundred lots—when he selects the Loudon in preference to all others—when he writes us as shown above, after he has been selling the Loudon for several months—surely no stronger proof of its practicability—accessibility—construction—price and demand—could be asked.

**Read
It**



**Big Demand
Priced Right**

**Sell Every
Ford Owner**

LOUDON ADJUSTABLE STORM AND SUN SHADE

Lasts the life time of the car.

Steel frame—Reinforced.

Does not sag or flap.

Free from rattle.

High quality material—Sun proof—rain tight.

Adjustable without leaving car. Made so water does not drip over back onto windshield.

Try it and you'll buy it.

Put a Loudon on your car.

Use it ten days and if you are not entirely satisfied return it and get your money back.

All Loudon Dealers are authorized to make this guarantee.

DEALERS: Write for our proposition. Some good territory still open. There is big money selling the Loudon and we help you get the business.



The Loudon with top down. Windshield open. Note how it attaches to car. May be attached to any Ford in five to ten minutes.

LOUDON, Incorporated
Manufacturers—Distributors Automotive Specialties
105 WESTERN AVE. MINNEAPOLIS, MINN., U. S. A.



Let's Go!

A MOTOR JAUNT IN WISCONSIN

By O. E. PARSONS.

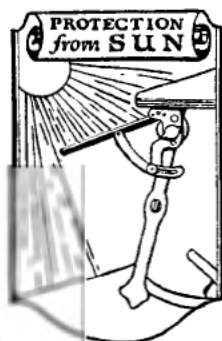
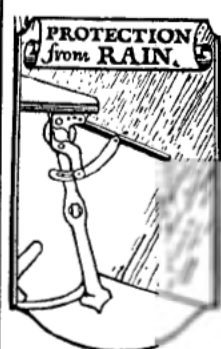
"Where in Sam Hill did I put my cap?" "Are you sure the back door is locked?" "I wonder if we've forgotten anything." "All right, let's go."

It was a bright July morning and the trip we had been looking forward to for fifty weeks, or since our trip the year before, was a reality. A twist of the starting crank, a waving of hands, and we were off. No need of a second look at the machine to tell what kind of a trip we were on. One running board piled high with poles, tent, etc.; a large box bolted to the other running board; the back of the car filled with a miscellaneous assortment of articles needed for a two weeks' stay in the wilds; a folding cot and bedding carefully wrapped in oilcloth and strapped to the rear tire holder. A person who saw the outfit before it was packed would have said that it could never be put on one Ford and leave room for three people. But much experience had taught us how to make the greatest amount go in the smallest space and everything had been planned with a view to portability. Packed somewhere was to be found tentage, bedding, clothing for hot or cold weather, food, cooking utensils, camp stove, camp stools, table, water bag, hatchets, folding cot, shovel, fishing tackle, etc. Not only was our Ford to furnish transportation by day but it must also serve as a double bed at night.

Well, we were off and a great feeling of relaxation came over us after the hurry and strain of getting ready. Out through the city and into the open country we went, some twenty miles with no blot on the landscape. Then a familiar object appeared in the road ahead, "Closed for traffic, road under construction." Down a bumpy side road we went until we reached a bumpier road going in the direction we wanted to go. So we kept on with many detours until we reached Fond du Lac, Wis. We usually made it a point when going north to make Fond du Lac the first objective. The park on the shore of Lake Winnebago always seemed an inviting spot at which to eat our first meal. This park, too, is only a short distance off the main line of travel and gives a fellow a chance to rest and stretch himself before starting on the afternoon drive.

Through the main business part of town we went and put out to the park. Unpacking the lunch basket and getting out the little gasoline camp stove we were preparing to get a good hot meal when a nickel plated star, attached to the coat of a man, appeared on the scene. Now we had been used to associating nickel plated stars in parks with "Keep off the grass" signs and other similar unpleasant things. So we waited in some trepidation as it approached. "Don't you folks want a table to eat on?" and away went our fears. We were used to eating with the ground for a table and didn't know just what kind of a deal was being handed us, so we declined with thanks. "Better have one, there's no charge for it," "Perhaps it would be a little more convenient," said the Mrs., and no sooner said than done. Off he went and returned in a few minutes with a couple of stands and some boards and we soon had a big table ready for use. "No, we don't take any tips, glad to accommodate you," and he was off to attend to the comfort of others. Say, why don't more cities do that sort of thing instead of trying to get all they can out of you? Makes a fellow willing to spend his money for anything he needs in a town like that. Besides it gives the many tourists from outside the state a fine opinion of this beautiful state of ours.

Dinner prepared and eaten, we were soon on our way. More detours greeted us but the roads were better than the ones we had been over in the morning so we did not object to the few miles extra traveling it made us. Through Oshkosh, Neenah, Menasha and Appleton we went. It was familiar scenery to us so we made no stops except to mail a post card. Out of Appleton and over fifteen miles of concrete road that made touring a pleasure. Everything was lovely and we sprawled all over the space allotted us. The tent on the running board prevented the front door being opened so it was necessary to occasionally let the junior member of the firm drive while we hung our feet over the top of the door and cooled them off. The day was perfect for driving, the road was fine, the car was behaving perfectly, we had a two weeks' vacation ahead of us, so why should we worry.



NATIONAL WINDSHIELD VISOR

Satisfies Seller and Buyer

NATIONAL WINDSHIELD VISORS are the one essential accessory for summer driving. They increase the comfort and safety of the driver and front seat passenger. They eliminate the glare of approaching headlights, summer sun, street lamps and they keep the upper part of the windshield free from rain or snow. Clear vision is always possible with it.

Dealers find our special model for Fords adaptable to all bodies of the Universal Car. They find customers easily, and make better friends of them by selling Nationals. The price (\$7.50) is low enough to attract the trade, and the profit is full compensation for any sales-effort required.

National Windshield Visors are made of steel, well stiffened on all edges. They can be attached by their nicked fittings in a few minutes. They stay put silently at any angle desired. Black baked enamel above, green satin-finish below. Send for prices.

HILLMAN MANUFACTURING CO., Inc.

2317 E. 16th St.

Los Angeles, Cal.

E. J. Edmond Co., 1976 Broadway, Dist. for New York

We had a 300 mile drive to reach our camping ground and had decided that dividing it into two days would make it just about right. So when the speedometer registered 150 miles we began to look for a place to stop for the night. And a few miles before we reached Shawano we found it; a school house with a pump and other necessary attachments in the yard. While the Mrs. prepared supper the Jr. and Sr. got the half of the tent we used when traveling, unpacked and in place. As there were three of us and the auto would only hold two when used as a bed, it was necessary to use a tent that stretched from the top of the machine to some seven feet on one side. This not only served as a sleeping room for Jr. but also as a dressing room for all of us, which was more comfortable than undressing in the car as you have to in a Pullman berth. One who has never tried it would be surprised at what a comfortable bed a Ford makes when the back of the front seat is cut and hinged and folded down to reach the rear seat, and the uneven places filled in with surplus clothing. At the back of the school yard and near where we were camped was a heavy fringe of trees and bushes that shut out any view of what was beyond. We were very much surprised when, shortly after we had made camp, there was a roar and a passenger train thundered by just beyond these trees. But we didn't mind a little thing like that. A hot supper of fried bacon and potatoes, coffee, etc., and we felt we were ready for bed.

Morning did not find us very "early birds." The alarm clock was one of the things we were leaving home and we didn't propose to hurry when we didn't have to. But we were finally packed up and on our way. Once, on one of our previous trips, we had driven through the Menominee Indian Reservation but had registered a solemn vow of "never again." At least not until the state or some other good road builder got busy in that locality. So off we hit it for Birnamwood, then north until we reached Antigo. Here we stopped to see some friends and for the only time on the sixteen days we were out, ate a meal indoors. Goodbyes said, and we were on our way again.

We were now getting into the real north country and the very air was different. Summit Lake and Pelican were passed. The weather had been perfect up to now but as we neared Crandon it began to cloud up and soon after a light rain began to fall. We had hoped the rain would hold off until we reached our destination and had the tent up, for it is no pleasure either making or breaking camp in the wet.

As we neared the place where we must leave the main highway a sharp lookout was kept for the almost invisible lane down which we must turn. "There it is," and we were bumping over tree stumps and through ruts; then leaving this lane drove through the woods for a ways and—we were there.

It was well worth the bumping we had received for we were in a beautiful birch grove running down to the waters of the lake. Driving to within a hundred feet of the water we piled out and began to make camp. The rain

had stopped for a little and we managed to get the tent up before it began again. The tent up and the bed made, we decided to let the rest go until morning and prepared for a good night's snooze. But such was not to be. Some time in the night the flapping of canvass and the howling of the wind through the trees chased away all chances of sleep. A north wind right off the lake was doing its best to make us homeless. And it pretty near succeeded in doing so. The pegs began pulling out one at a time until the sides were flapping and making a great racket as the wind had full sweep through the tent. Fortunately the main guy ropes held, but "yours truly" had to crawl hastily from between the warm blankets, pull on trousers, shoes and rain coat and sally forth in the cold, hatchet in hand, to do what he could to keep the whole outfit from blowing away. Camping isn't all sunshine by any means.

Morning dawned, beastly cold and windy, with no signs of the sun to cheer us up. The first business of the day was to cut pegs as long as could be driven and to peg down that tent so that nothing less than a cyclone could uproot it. Logs were placed around the bottom of the sides and banked with dirt to keep the wind from blowing through. This added greatly to the warmth and comfort of the tent. After that was done the rest of the day was spent in unpacking and making the camp comfortable. And believe me it was some camp when finished.

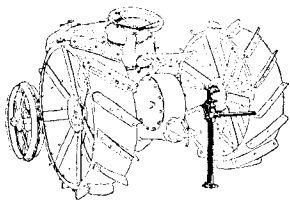
On one side was the part with the cot for the junior member and with plenty of room left for dressing. Then came the machine, made into as inviting a bed as one could ask for, and with room between it and the back wall of the tent for easy passage. Then the main room of the tent. The folding table was set up and the camp stools put around it; the trunk taken from the running board was just the right height for the camp stove to be set on; the box that had held the bedding made a table for the food and cooking utensils; a folding cabinet was hung on two forked sticks while hooks were placed on each pole for the accommodation of surplus clothing. The corners of this part of the tent are laced together and in nice weather any or all of the sides can be extended out and give us six feet more of space each way.

There was plenty to do and we managed to keep fairly warm, but as night came and the work was finished there was nothing to do but to go to bed to keep warm and hope for better weather next day. Bed certainly felt good after the previous night's experience.

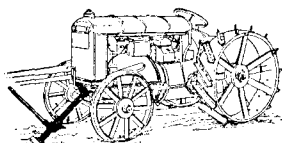
The next four days seemed to be making up for our poor reception and the weather was all that could be asked for. Fishing, swimming, picking berries or just lying in a hammock with nothing to do made a fellow feel that it was worth coming a long ways just to be there. And talk about berries; acres of big, luscious berries just waiting to be picked! That was one of the pleasures the Mrs. had been looking forward to and the space under the back seat of the machine was filled with jars. The little stove worked overtime and the jars filled up with the berries that would have cost us about 30 cents a pint

The Handi-Tool Does Many Hard Jobs Easily and Quickly

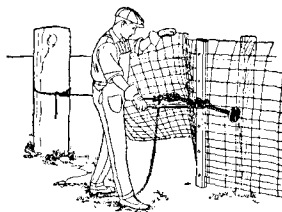
THERE is practically no limit to the heavy, hard jobs that the HANDI-TOOL will do for you. Whenever you have work that requires lifting, pulling, hoisting, pressing, clamping, stretching, moving, etc., etc., the HANDI-TOOL meets the need exactly. It saves you time, labor and money. After you once use it you won't want to be without it.



Jack up the right rear wheel in a jiffy, at just the right place, (under the axle next the wheel and not under the draw bar hitch) and slip on the pulley for stationary work and be running in less time than you can do it any other way.



The time, labor and trouble saved in this one feature alone, of keeping the tractor belt at just the proper tension, pays for this inexpensive HANDI-TOOL every day you use it.



No excuse now for not setting that new fence, or repairing the old. Sturdy, reliable, simple

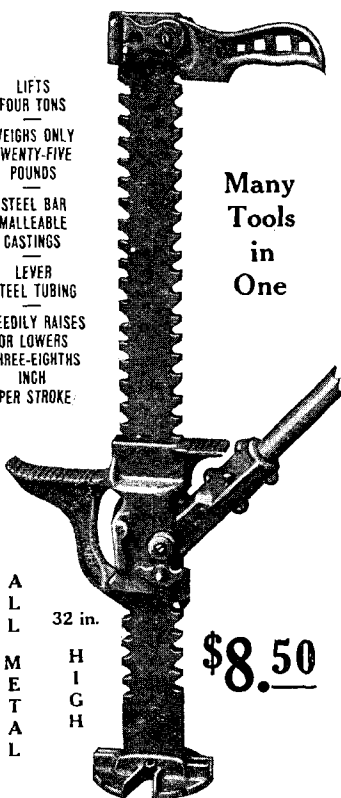


AUTOMATIC Handi-Tool

PATENTED

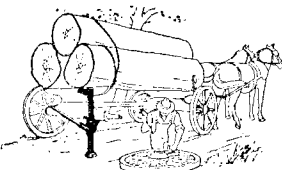
LIFTS
FOUR TONS
—
WEIGHS ONLY
TWENTY-FIVE
POUNDS
—
STEEL BAR
MALLEABLE
CASTINGS
—
LEVER
STEEL TUBING
—
SPEEDILY RAISES
OR LOWERS
THREE-EIGHTHS
INCH
PER STROKE

Many
Tools
in
One



ALL 32 in.
METAL HIGH

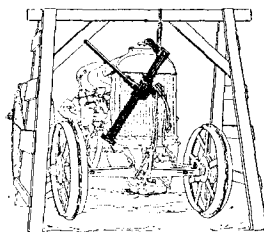
\$8.50



If your Ford dealer can't supply you, write direct.

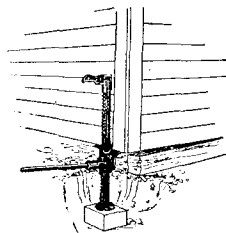
Distributors and dealers wanted in unoccupied territory.

HANDI-TOOL MANUFACTURING CO.
INDIANAPOLIS, U. S. A.

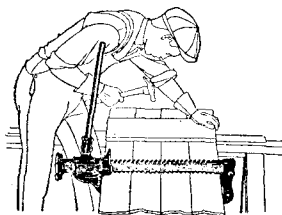


Use it as a hoist. Note the extreme simplicity of attachment, and the accessibility of motor axles, etc.

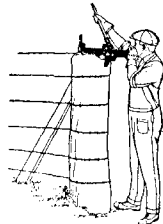
Does away with the confusion of the ropes and chains of a block and tackle or chain hoist, both of which cost considerably more than the HANDI TOOL.



The difficulties always encountered in replacing a sill or trueing up barns, garage, sheds, etc., are eliminated and this kind of heavy work done quickly and satisfactorily, when the HANDI-TOOL is used.



Making doors, gates and windows for the barns, sheds, etc., made easy with the HANDI-TOOL.





In Milwaukee but here cost nothing but the picking.

After those four days of fine weather the weatherman seemed to think he had done his duty. We had been off for the day on a trip to some of the other lakes and, being tired, had retired early. Just about the time we were peacefully sleeping a terrific crash of thunder awakened everybody. Talk about thunder storms; that one had every other I had seen beat to a frazzle. The lightning was incessant and the thunder deafening, while the rain came down in torrents. The tent had been put to the wind test the first night and now it was being put to the water test. It proved equal to the emergency and shed the water like a duck's back. The forest soil on which we were camped was of the porous kind that soaked up the water as fast as it fell. So we got up in the morning to a dry floor although everything outside was drenched. From then on it was a case of rain about every other day (or night). But for one who enjoys the great outdoors it would take more than rain to spoil a trip of this kind.

Occasionally the machine was run out and a ride through the beautiful north country taken. On one trip 35 lakes in 45 miles were passed.

The days went by only too fast and the time to pack up and pull out for home had arrived. It is a whole lot more fun packing up to go on a trip than it is to pack up to go home. But it had to be done, so one bright morning found us packed and saying goodbye to the only settler near us. Upon advice given us before leaving home we had decided to try the new route from Crandon to Pulaski instead of the long way through Antigo. Soon after leaving Crandon symptoms of overheating under "Henry's" hood began to develop. We got out to investigate. Hardly had we done so that four Indian youths appeared—in a Ford of course. They stopped to offer any assistance they could give. The trouble turned out to be a case of indigestion, due to too much oil in the crankcase. This was soon remedied and we were on our way again.

The road was excellent and the scenery all

that could be asked for. We shook hands with ourselves for having come this way. So through beautiful Forest County we went. But Forest County didn't last forever and in due time the sign "Oconto County" was passed. Soon after this the hard road began to disappear and the sand got deeper and deeper. Mile after mile we went through sand that made the water boil in the radiator. Fortunately we carried an Australian water bag slung to the side of the machine and filled with water. Every few miles it was necessary to pour some of this in the radiator.

No pleasure now in driving. As we left the hard road behind we also left the woods and pretty scenery. Stopping to cool off for a few minutes in the shade of a lone tree a "bang" was heard that we thought was due to backfire. But when we started again a bumping caused us to lean over the side of the machine to see what had happened. "Flat tire." In the hot sun on a sandy road was no place to change a tire. A short distance away was a farmhouse with a row of trees in front. At the risk of spoiling the tire the heavily loaded car was driven to the farmyard before any effort was made to change the tire. Of course the pump refused to work properly and would only put a small part of the air it should into the tire. After pumping and sweating for some time a good angel appeared in the shape of Mrs. Farmer. Seeing the trouble we were having she immediately offered us the use of a pump from their machine. With this the work was soon accomplished. Then availing ourselves of her offer to use the other kind of a pump we took a good wash and felt better.

We didn't feel like driving any farther that evening but there was no good place near to camp. About four miles more of sand and we came to a schoolhouse. Driving in back of it we prepared for the night. We ate in the dark and made the bed by the use of a flashlight. This was one of the few school houses we had seen that did not have a pump in the yard. We had used nearly all the water in the bag in filling the radiator, so although badly in need of a good scrub, were



A receipt printed and issued by a National Cash Register →

Benefits the customer:

The plainly printed figures of the amount on the receipt show that she has not been overcharged. She likes to buy in a store of this kind.

Helps the clerk:

It proves that he registered the right amount. The added and printed records inside the register give the clerk credit for the sale.

Protects the merchant:

He knows that to get the proper amount printed on the receipt, correct added and printed records must be made inside the register.

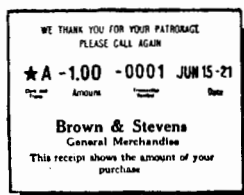
A National Cash Register is the only machine that prints and issues this kind of a receipt.

We make cash registers for every line of business. Priced \$75 and up.

NATIONAL

CASH REGISTER CO.

DAYTON, OHIO.



The register prints a record of the sale on the receipt. The star shows it was a cash sale. "A" is the clerk's initial. The amount is \$1.00. It was the first sale on June 15, 1921. The register also prints an advertisement of the merchant's store on the front and back of the receipt.

obliged to do without it. While we were eating our supper some children from a neighboring farm appeared and inspected us from around a corner of the building. Here was a chance to get some water so we called out, "We'll give you some candy if you will get us some water from your place." Needless to say the offer was promptly accepted. They were a noisy bunch and as they started to leave us for the night we had a sneaking suspicion that they were likely to show up too early in the morning for our comfort. So we called out, "Don't any of you come around here early tomorrow." "We get up at 4 o'clock, will it be too early if we come at 5," piped up a small voice. "If one of you shows up before 8 o'clock he will be shot at sight," was the answer. That proved effective and the only sight obtained of them the next morning was when we went to the farmhouse for milk and a small head was thrust in the door with the remark, "It isn't 8 o'clock yet."

Starting the next morning we hoped the sand would soon be left behind, but that wasn't to be. Not until we reached Pulaski did we strike hard roads again. You may be sure that at the first town we came to the best inner tube we could find was purchased. Fortunately it was not needed for we experienced no more trouble of any kind with the machine. At Green Bay we stopped for lunch but did not stay long as a cold wind was

blowing. Through Manitowoc and Sheboygan we went. This was Saturday and we still had Sunday between us and the office. We didn't care whether we got home that day or not. So soon after passing Sheboygan Falls decided to "make another night of it." Looking for a camp sight we saw a grove at the end of a lane so stopped at the farmhouse and asked permission to camp. We usually fight shy of asking farmers to let us camp on their land. Somehow the farmers don't seem particularly friendly to campers. This seems to be principally due to the fact that so many campers are careless with fires. But this farmer was different. "You'll find it hard to get to the grove as the end of the lane is blocked. Better drive through the field and camp by the river." That suited us, and opening the gate we drove through the field until we reached a large tree on the edge of the river. Supper eaten and everything ready for the night, we sat on the bank of the river and watched the moon rise. Talking over our trip we wished that this was the first night out instead of the last.

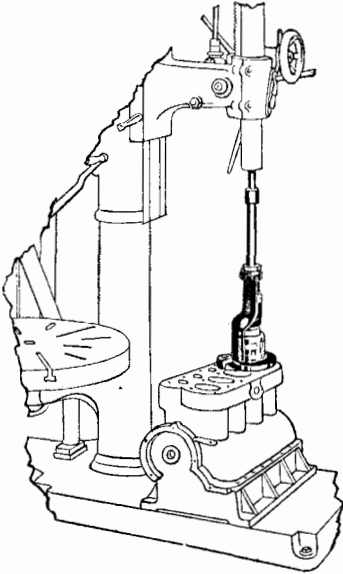
Thus ended our trip, for the next noon found us eating dinner at home, tent and equipment put away, and "Henry," dirty but still able to hit on all four, back in his own garage. We are already talking and planning for next year and the time when we can again enjoy the pleasures of the open road.



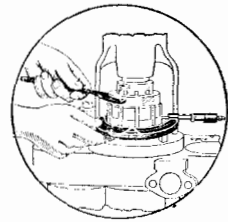
"Good Bye"

The Keystone Cylinder Reamer

Rebores and finishes at one operation, Ford, Fordson Tractor and Dodge Motors for all oversize pistons



A Complete
Tool for
Hand or Power.
RANGE
3 $\frac{3}{4}$ to 4 $\frac{1}{4}$
INCHES



Not necessary to remove
from block nor dis-
mantle the tool to ac-
curately adjust for size
bore.

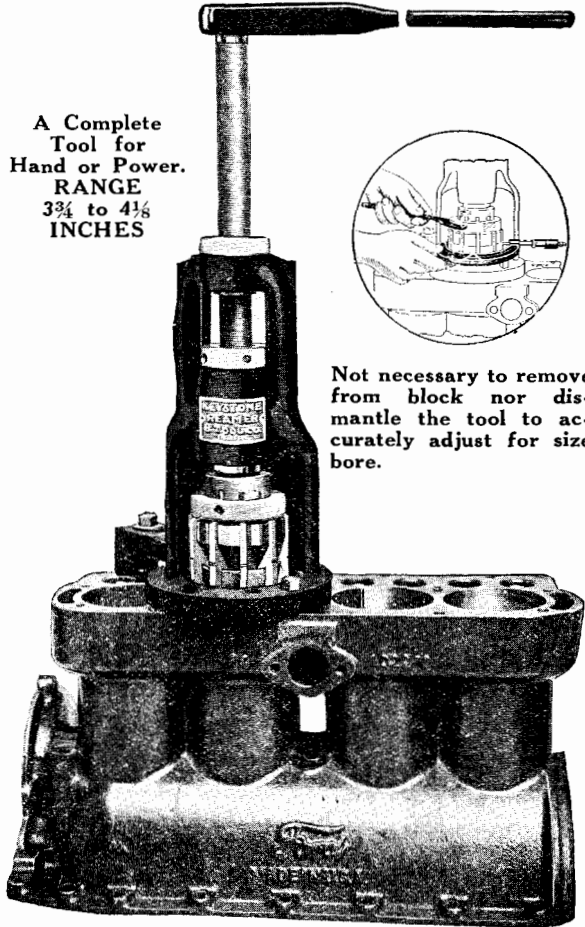
A true bore is positively cer-
tain, no matter how badly
"out" the old cylinder may be
because of wear or previous
faulty boring.

Cylinder walls are left as
smooth as when the motor
came from the factory and
require no lapping or burnish-
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on all moving parts. The tool
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Simple and strong. Can be
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Los Angeles
San Francisco
Portland

Factory: MILLERSBURG, PA.

THE CALL OF THE OVERLAND

By PAULINE BELL



Every year as the summer days draw near I hear the "Call of the Overland." I cannot lie myself down until I have had a long trip overland in my Ford car. My trip of two years ago took me to Tonopah, San Francisco, Portland and back to Ogden over mountains and deserts was published in the Fordowner magazine.

Last year I planned to make a trip to Seattle the way of Walla Walla, over the Blue mountains by the toll road, then leaving the

car at Seattle to go by boat to Skagway, Alaska, returning to Seattle continue our way home by way of Spokane and Glacier Park.

My companion was a young lady, Kitty Hanes. I am a woman past sixty. I have no trouble driving my car any where. I have "all the conveniences of home"—nearly.

We left Ogden June twenty-six, late in the afternoon and drove to Snowville a distance of eighty-one miles. The next morning we started on to Straville over a very poor road; drove to Conants and had lunch by a stream and under the shade of some trees. Pursuing our journey we next passed Albion, a beautiful little city in the hills. The road leading from here is graded and smooth and winds around the mountain; the scenery is picturesque indeed.

Burley was our next stop where we took dinner with friends. Soon we were speeding on to Twin Falls to spend the night.

One driving that way should not miss a side trip to Shoshone Falls, it is only seven miles and one of the grandest sights we saw on our trip. From there we continued to Buhl, finding a cool place to have lunch.

After lunch we started up a steep graded mountain to Bliss, from where we had to detour, as they were building the Highway. It was late in the evening when we reached Mountain Home, where we spent the night with friends. In the morning we continued on to Boise over the desert for forty miles on a splendid road. Just before reaching Boise a heavy rain-storm came up and made the road of clay almost impassable, but I put the chains on and away we went. It was raining so hard we did not stop in Boise but rode on to Eagle where a niece lived. It was late in the afternoon and she urged us to stay and spend the night with her, we were glad to do so. The next morning the sun came out bright and the roads were so much better for having had the rain.

Our road led through Huntington Canon, a very dangerous road, with many steep hills and sharp turns. In one place I was making a run for the hill and only my quick thought and

action saved us from jumping off the road, the turn was so short. I gave a sigh of relief when we were through the Canon. I have gone over that road twice before in other years.

We reached Baker just before sundown, and went to the home of a friend, where we enjoyed the luxury of a hot bath a good supper and each a bed to sleep in.

It was late in the afternoon when we started on, we drove to Union and went to tourists' park. It was a beautiful shaded place by a large stream of water. When we went to the stream to get some water we found a fish pole with a line that was jumping around so lively that we pulled it out and there was a trout on the line. We just took it off and put it into our pail putting the line back, we knew it belonged to some of the people that were fixing camp but, we took it and cooked it for supper. We knew they would get more.

The next morning we started over the terrible Blue mountain forty miles from one side to the foot of the other. It was twenty-five miles to the top where the toll gate is situated and with steep grades up and down but always rising a little higher. The road is very rough and rocky. A young man overtook us. He was driving a runabout and asked us if we were travelling alone and said he would keep along back of us and if we needed any help he could assist us, we were glad to have his company.

When we arrived at the toll gate I asked the man what we were paying toll for. He said "I don't know". Neither did any one else as the road is not kept in shape to travel over.

We passed through Walla Walla and on through to Wallula to camp for the night. It is a most desolate spot. The wind was blowing the sand in great gusts. There were about a dozen houses, but the people seemed to be happy as we could hear music and laughter from a home where there seemed to be a party. There were several miles of deep sand to cross and we wanted to cross in the cool of the morning which was our reason for spending the night in such a place. We got up early and made a light breakfast. I must confess I felt a little dread of the sand, but we went through it in high all the way.

We crossed the Snake river on a ferry to Pasco; went a few miles and had to cross the Columbia on a ferry also. We arrived in Yakima early in the afternoon.

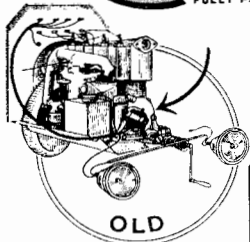
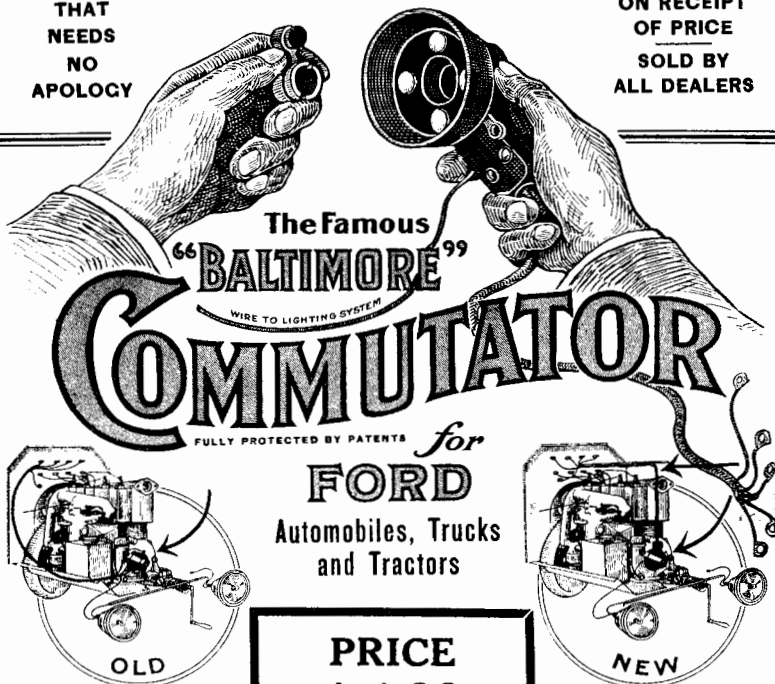
I was proud of my car the way it went over the Cascades on high most of the way. The road is smooth and graded, a wonderful piece of engineering, and the scenery is beautiful. The Snoqualmie Pass is a most enchanting place. We would have liked to spend a month there but we had to be satisfied with a look and pass on. The sun was just setting when we reached Kirkland. We camped in the park for the night getting a good supper of beef steak, boiled potatoes, boiled rice and the best coffee for which we had cream that we

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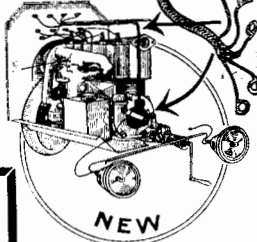
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bought at the store when we bought the eatables. We had driven one hundred and sixty miles that day.

The next morning we wanted to go over to Seattle to make final arrangements for our Alaska trip. I did not want to drive the car over but felt it was not safe to leave it. This trouble was settled when a lady who came to see us promised that no one should touch the car.

We went over to Seattle on the ferry. We knew we were ahead of time as this was Tuesday and the boat was scheduled for Saturday morning. We thought some of going to Mt. Rainier Park but we had felt so tired the evening before when we reached camp that we had decided to rest the intervening days. When we were going over on the ferry we heard several talking about there trip to Mt. Rainier, so we decided that we were not so tired as we had thought we were. We planned to start the next morning and get back by Thursday or even Friday. We attended to every thing; got films for the kodak and left inner tubes to be repaired. We found time to call on some friends and promised to go to their home to stay Friday night when we returned from the Park.

We left Kirkland at ten o'clock Wednesday morning for Mt. Rainier. The roads are mostly red brick pavement. We camped at the foot of the mountain in a place prepared for tourists. Cars are not allowed to start up after six in the evening or before eight in the morning. We were up and waiting by eight o'clock at the gate. We went to see a glacier and took a picture while waiting for the man to come to open the gate.

The cars have to keep a certain distance apart. After the last car has passed, the number is telephoned to the station at the top of the mountain while the same is done in going down, as the road is too narrow for cars to pass. The road winds round the side of the mountain creeping higher and higher until it reaches the top. We could not go the two miles to Paradise Inn as the road was blocked with snow. We started on our way back feeling well repaid for our trip. We took pictures of Mt. Rainier in the distance also the big trees and the entrance to the Park where there is a government station.

We reached Kirkland before dark. The next morning we took the car to a garage to store until we returned from Alaska. Then taking our suit cases and leaving our overland suits in the car, we again crossed the ferry on our way to the home of our friends.

The next morning at eight o'clock we were on board the Jefferson waiting for the boat to start. As the boat does not stop in British waters we were on the boat until Monday noon. The first stop was at Roe Point, a Salmon fish cannery; we decided that never again would we hesitate to eat Alaska canned salmon. Everything about the place was as clean as could be.

That evening we landed at Ketchikan. Everybody went ashore to see the town. There were several U. S. chasers in port.

The next day we stopped at Douglas, once a big mining town, as the tide was low we could see where the waters had broken into

the mine. Since that time the mine has been closed down although I was told there was a million dollars or more of ore blocked off in the mine. The few people living there still are in hopes that some day it will be opened again. Hundreds of houses are now deserted.

Our next stop was at Juneau. There is a big quartz mill there on the side of the mountain. I understand it is low grade ore. The next stop was Haines a small place. Fort W. H. Seward is only a mile or so from there. The boat stopped from one to several hours in every place to load and unload freight so the passengers had plenty of time to see the cities.

The next morning we landed at Skagway. The trip to White Pass by rail is very picturesque. When going from the boat to the town I noticed a train load of Ford cars. I was so pleased that I stopped and took a snap shot of them. I had noticed that nearly all the cars used in Alaska were Ford cars. Even where there are no roads that could rightly be called roads, just rocky trails, the Ford is there doing duty. I thought that Ford owners would be pleased to know their choice of car could be depended upon to meet these emergencies.

At seven-thirty that evening the boat started on the return trip to Seattle. It was light nearly all night. We were called at four o'clock to see the great glacier. The sun was just rising and the light on the glacier was beautiful beyond description. There were numerous icebergs floating around us. The boat whistled and we saw several pieces of ice break off into the water. The vibration set up by the whistle's blowing had splintered them off.

At ten o'clock we landed at Juneau. This is the most wide awake town of any along the coast of the inside passage as it is called. We reached Pettersburg the next morning at eight o'clock. Then on to Ketchikan. I took several pictures of the Totempoles.

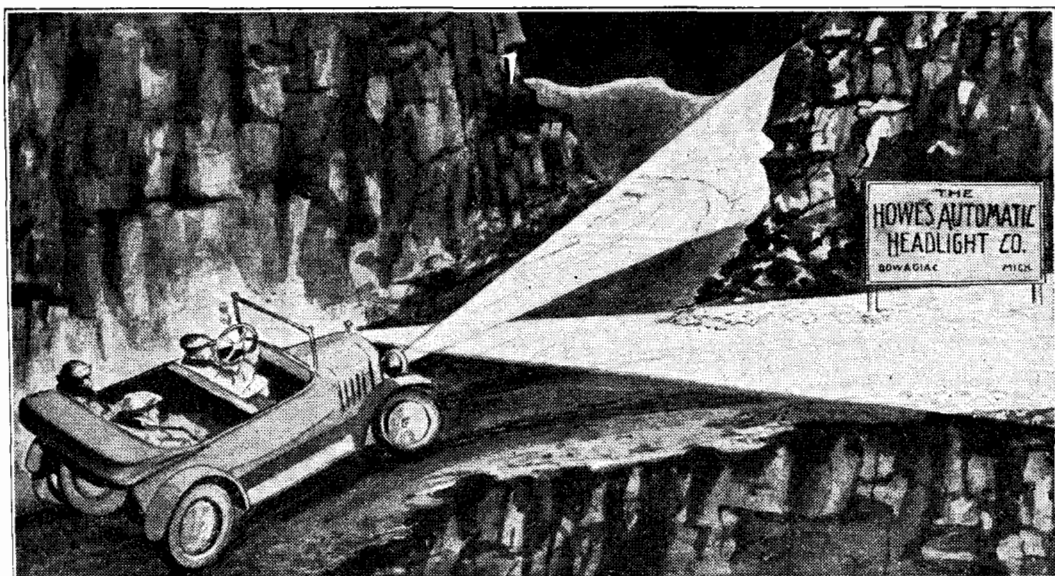
Saturday night there was a dense fog. A number of us sought refuge in our state rooms, but by morning when the fog had cleared, we were all again quite fit to enjoy to the utmost the unfolding panorama of the near-by land, the mountains in the back ground covered with pines which also grew to the very water's edge and was reflected in the placid summer sea.

Monday evening the young people had a dance. The next morning at seven-thirty we arrived in Seattle.

We went at once to our friends who had breakfast waiting for us. After breakfast we bade our friends good by and soon returned on the ferry to Kirkland to get our car and resume our journey. Going to the garage we found our car in readiness for us. It was two before we started. We drove to North Bend.

In the morning we went on to Ellensburg, enjoying the ride over the Cascades once more. We pushed on to Vantage Ferry over the worst roads we had found in the state of Washington. The state however has good roads nearly everywhere.

There was a terrible wind blowing when we reached the ferry so we decided to wait until morning. Several times in the night I was afraid the wind was going to blow us over into the Columbia river, but the amount of



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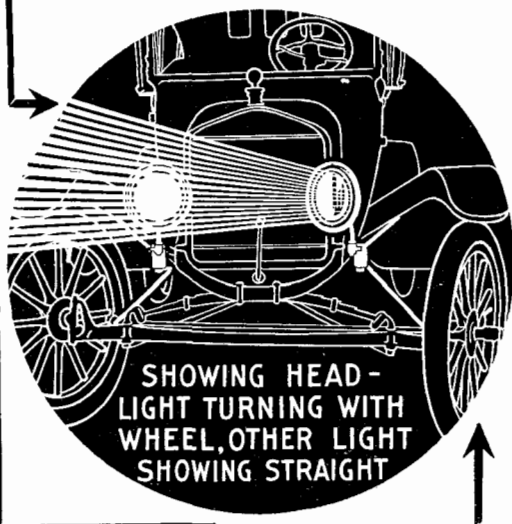
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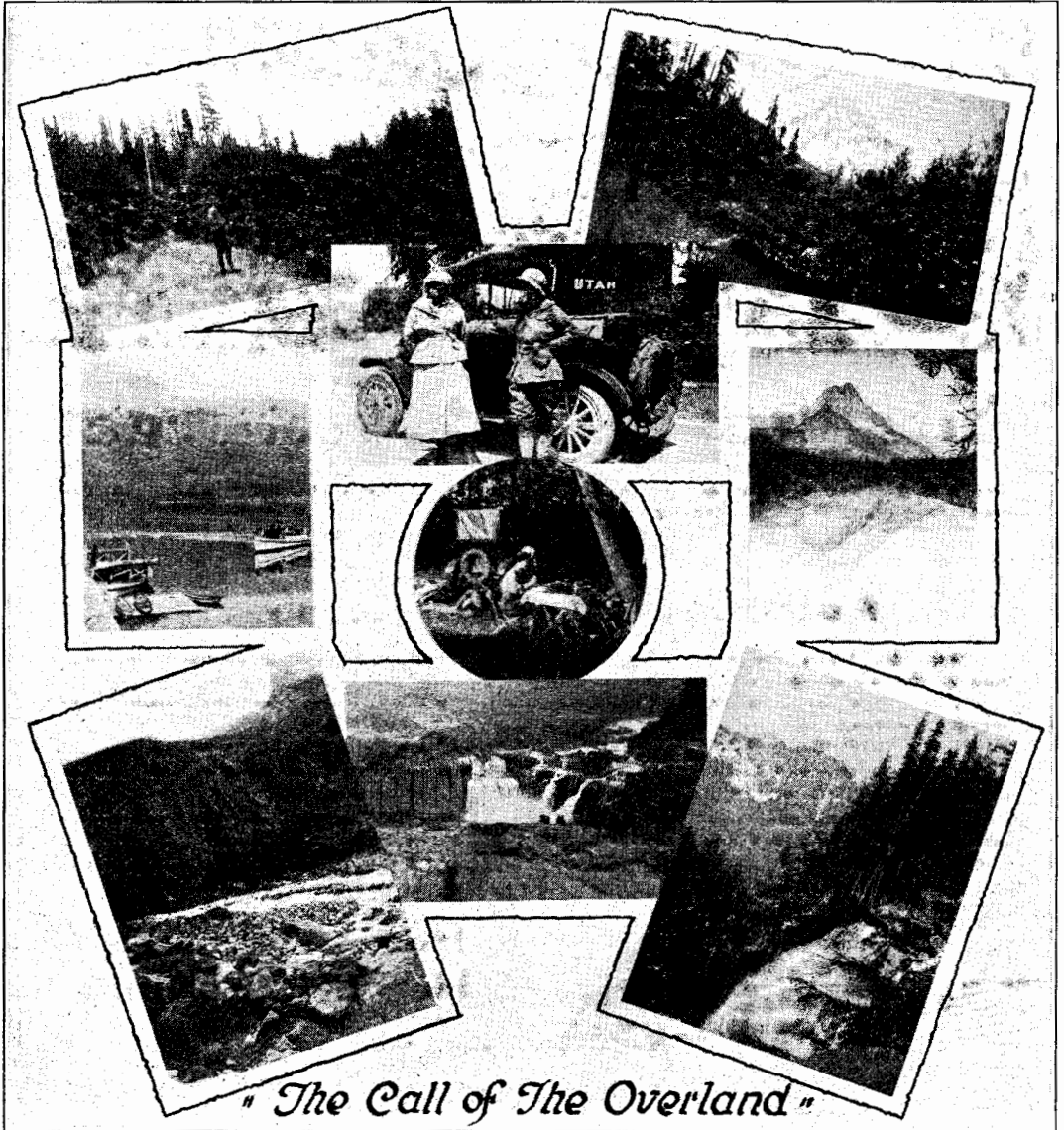
Are you a car owner?.....

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sand blown into the car I think helped to hold it down.

We did not cook breakfast the next morning but got a cup of coffee and hot cakes at the ferry. By eight o'clock the wind had gone down and we had shaken the sand out of the things and were ready to start on our way. Our road led over a mountain but so smooth

Point. We crossed a ferry the first where we did not have to pay toll. The sand road was quite deep, but we kept in the ruts so had no difficulty. We wound around through the canon, the Priest river and the rail road always in sight. There is a steep rocky mountain to cross before you reach Bonner's ferry. We continued from there on a road



and a steady grade it was not hard to climb. The view we had from the winding road of the country was beautiful.

We drove to Wilber where there is a lovely place for the tourists—stalls for the cars, gas stoves, tables, chairs and a shower bath, every thing one could wish for. It was too early to camp so we rode on to Davenport, where every convenience was found for the overland traveler.

The next morning we started on for Sand

built by the U. S. Government, a wonderful piece of engineering. It is built upon the mountain side and is just wide enough for a car. There are places at the point of the mountain for cars to turn out one can see from one point to the other. Here and there the road is constructed on brackets built out from the solid rock, the Kootenai river six thousand feet below, the mountain rising higher still on the other side. It is the most awe-inspiring place I ever saw. There are

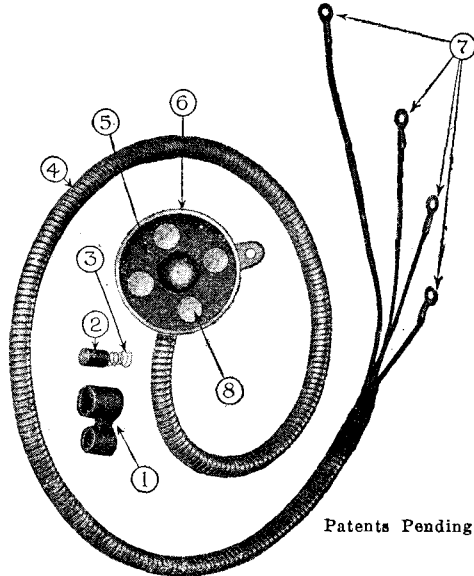
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3. Telescoping contact brush spring. This spring maintains the tension of the contact brush against the timer face the same at all times, whether the speed is three miles or fifty miles per hour.
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houses all wires. This system is GUARANTEED to be oil, water and grease proof.

5. Genuine BAKELITE insulated timing disc, the best insulation known to the electrical world today and GUARANTEED not to warp or change its shape.
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7. Note the four different lengths of best quality wire in four colors. These cannot be put on wrong.
8. Hard brass contacts of best quality used. A machined part throughout.

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six miles of this road. It almost made me light headed to drive.

When we were going down the mountain we saw a dark object sitting in the road. At first we thought it was a cub bear, and we knew the mother bear would not be far off. I told Kitty to get her thirty-two ready, but as we drew near we saw it was only a porcupine.

We arrived at Libby at seven-thirty. The city has set aside a beautiful pine covered hill commanding a view of the city and country for the tourists.

The next morning we started for Kalispell. As we were traveling along a large gray wolf crossed in front of our car, he walked slow and looked very cross at us.

We had gone only a few miles and had just one more steep hill to drive up (so the last overland car we had passed told us) when something went wrong, the car stopped and would not go. At first we thought it would soon start or that overland cars would come along and then they would help us, as the time went by we knew it was too late for cars to leave either place as it was forty miles to Libby and forty miles to Kalispell. Would we have to spend the night there in that thickly covered mountain of pine? I tried cleaning the spark plugs; looked at the timer to see that all the wires were fast; adjusted the carburetor, but the car would not start. At seven-thirty I told Kitty to try her gun and see if it was all right, she fired two shots, in a minute or so we heard what we thought was an echo, although we thought it was a long time getting back.

My heart was in my throat when I put my foot on the starter, when lo and behold! it started just as though nothing had happened.

We were afraid if we did not unload it might stall going up the hill, we took every thing out and I drove the car up; then we carried the things up the hill.

It was eight-thirty when we again got started. The sun was setting and the pines were so dense that little light could come in. I drove as fast as I dared for I wanted to get to a ranch house where some one lived. Once I saw two eyes like balls of fire. An instant later what ever it was, darted into the brush. Whether it was a mountain lion or a wolf I could not tell.

When we had driven fourteen miles, Kitty, who was on the look out for a light, saw one. I stopped the car when I reached it. Never did a light in a window look as good to me. I called and a man came to the door. We asked the privilege of camping, he told us we were welcome to stay in the house. It was a forestry station and the forester's name was Mr. Shale. We felt safe to stop in "Uncle Sam's" home. Mr. Shale was a very pleasant man. He made us a cup of tea, and gave us a lunch which we enjoyed as we could not eat our supper on the mountain, we were too nervous. But now we felt safe from wild animals and could enjoy it.

He said if we had fired two shots some forestry man would have heard us and answered back, as the stations are not many miles apart, two shots is a call for help. We told him we heard an answering shot but thought it was an echo. We left soon after.

He also told us that wolves and mountain lion were killed there often.

The next morning he prepared a breakfast of mush, ham and eggs and hot cakes. My! but it was good. We were almost glad we were stalled on the mountain. With many thanks for his kindness we bade him good by and started on for Kalispell. We arrived there at eleven-thirty. We went to the Ford garage where there was a splendid machanic, he looked the car over and found the timer worn out. He put the car in splendid shape, so we had no more trouble.

At two we started on to Belton, the western entrance to Glacier Park. It was a beautiful drive around through the canon where the waters of a dark blue river seemed to cool the air, the road was kept in good condition.

We met friends at Belton station. They advised us to go by stage through the park. We would have to ship the car by train forty miles to the eastern entrance then ship it back or go home by the eastern way a longer distance and not so good a road. It did not take us long to decide and as the train left in less than an hour, we had to find a place to leave the car, pack our suit cases, and dress. At six-thirty we were at the depot, with all signs of the overland traveler gone from our appearance. My friends said it was a great transformation.

The scenery along the Great Northern is beautiful. It took three engines to pull the train to the summit. We arrived at ten-thirty at Glacier Hotel secured a room and made reservation for the stage the next morning. We had an early breakfast and promptly at eight o'clock the stage was at the door. The road went on a steady grade up hill most all the way. The stages, I noticed, showed no consideration for any one; they monopolized everything. I met some overland travelers and they were very bitter in their expressions about it. I told them it was not that way in Yellowstone Park, and would not be that way when the government looked into it, as the parks are for the people and not for any company. The prices at the hotels are reasonable; five-fifty a day American plan, room and board. The scenes through the Park are worth going a long way to see.

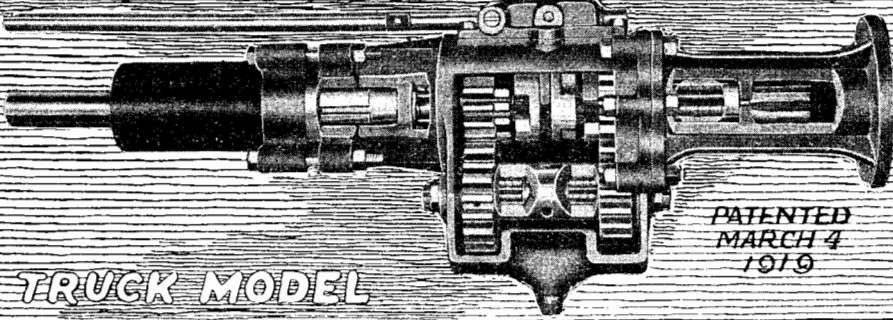
The stage drove to many Glaciers where we had lunch and some of the people went horse-back to the many sights, while others stayed and enjoyed the scenery from porches and verandas. It was very much like the scenes in Switzerland.

The next morning we started out on our return trip. We passed Kalispell. From here we traveled over a beautiful road that wound around near the Flathead Lake for forty miles or more. The cool breeze made it a delightful ride to Polson. The road from Polson to Pablo was very poor most of the way.

We camped there for the night. In the evening some of the tourists came to our camp and told their experiences on their trips. They all admired our outfit, especially our bed made in the car.

From there we went on through the Bitter Root country to Hamilton. We were told we would have to drive over the Big Hole divide and that it was seven miles to the top, it was a very steep grade all the way, but the road was smooth. I told my informers that I knew

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The UNIVERSAL is a Four Speed Auxiliary Transmission for Ford cars and worm-drive trucks. Doubles your power or speed—four speeds forward and two reverse. Made of the finest materials obtainable

GEARS—Alloy steel, one inch face, heat-treated and oil tempered. Constantly in mesh. (No chance of stripping)

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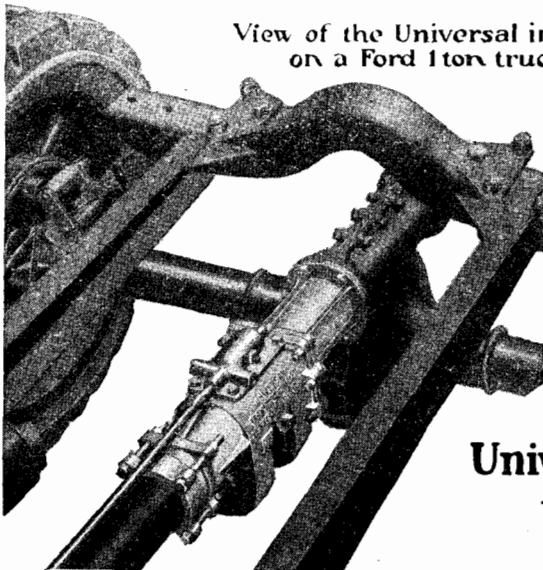
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my car would go up anything any other car could go and some that others could not. They laughed and said there was nothing like faith.

We thought we better drive on and get as near the foot of the mountain as we could to camp in order to start up while it was cool in the morning. We drove on to Dry Creek. A lady gave us permission to camp in her yard.

The next morning we reached the foot of the mountain at eight-thirty. I drove slowly and stopped often to cool the engine, I don't suppose it was really necessary to go so slow, but I treat my car a good deal as I used to treat my horse. It was a gradual grade down the mountain on the other side. We passed the road that a few miles farther on went to the "Battle Field of the Big Hole."

We went on to Wisdom over a poor road. When we stopped at the garage, we met people there from our own town. They were regular joy killers telling us of a high mountain or divide we had to cross before we reached Dillion. Well that was a long way off. We started on. The road was very bad as there had been one of the worst storms the day before that had come to that country in many years; cloudbursts every where. We crossed several steep hills and were just beginning to think we were over the worst of it, when way in the distance loomed the steepest mountain I had ever seen.

"You don't think we have to go over that do you?" I said to Kitty, but as I drew near I could see that it was our road. The cloudburst seemed to have washed the hill of all the grade it ever had, and left just the rocky steep pitch. I have never seen anything so steep, even the mountain going up from Lake Tahoe where it has a rise of two thousand feet to the two miles could not compare with it. I told Kitty to get out. I took a long breath and patted my wheel saying "Old Pal if you ever stop it is all off with you and me,

as no break will ever hold on this steep pitch." That little car seemed to understand and the way it climbed! I listened to the engine and slowly shut off the spark and gave it more gas and it just pulled right on up to the top. I was so happy I wished it was a thing of life so I could tell it how proud I was of it, as it was I patted the wheel again and said, "I'll never go back on you as long as I live." We still had some more mountains to go over but none as steep as that. When we went farther on some men were repairing a bridge that a cloudburst had taken out. They said no car had been over the mountain since the washout and that it would have to be repaired first. They were surprised that we made it, so were we.

The road near Red Rock was one mass of mud for six miles. My jack and chains were under the back seat and as it would mean for me to unpack the car, I let the little car wade on through the mud without chains.

When I reached Old Pleasant Valley I did not notice that I was exceeding the speed limit, but Kitty looked at her watch when we arrived at Spencer and said I had driven there in twenty minutes, over hills and through a canon, ten miles. That showed that after a trip of nearly three thousand miles my car was still O. K.

Tuesday morning we started for Ogden. The road to Idaho Falls was the best I have seen in several years. From Pocatello we had to detour as a cloudburst had washed away the road in some places. We camped at night at Aramo and continued on our way next morning, stopping for dinner in Logan. We arrived in Ogden at four o'clock, feeling fine after a trip of three thousand miles overland and two thousand miles over water. I wish to say that the expense of the trip when with my car was less than sixty-five dollars apiece, including gas, oil, upkeep of car and our living expenses.



The Whirl Wind Tire Pump



A Wonderful Tire Pump for Ford Cars

Drives on the fan belt. Can be connected in less than five seconds. Correct in principle and positive in action. 3 inch in diameter—think of it! A wonder! No gears or cylinders. No parts of the motor to change. No holes to bore. No more back breaking work. No more sweating and drudgery to inflate a tire. The WHIRL WIND PUMP will fill a Ford tire to the required pressure in less than five minutes.

The initial installation on any Ford car requires less than five minutes time. The bracket which stays permanently on the motor is attached by removing and replacing one nut and loosening another. The spring attached to the bracket gives the driving wheel the necessary tension on the fan belt.

The WHIRL WIND PUMP is small and compact—weighs about three pounds. Easy to use. Slip it on to the bracket, hook up the spring and your Ford motor will do the rest.

If your Local Ford Dealer cannot supply you, we will send you direct, by parcel post, prepaid, one WHIRL WIND PUMP, complete with 13 feet of hose and connections upon receipt of \$10.00.

Get your order off to us today, using coupon at bottom of page.

FORD DEALERS, here is a live quick-selling accessory for Ford cars. They sell like hot cakes. In fact, our plan sells them for you. Every Ford owner is anxious for a Power Tire Pump.

Write right now for our liberal proposition for Ford Dealers and Repair Men. Some choice territory still available to exclusive state and territorial distributors.

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Enclosed is money order or draft for \$10. Send me one Whirl Wind Pump under your Money Back guarantee.

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Write Plainly.

DRIVING DISTANCES and TOURING INFORMATION

Each year we know when the driving public is thinking in terms of mileage along highways leading most anywhere away from home, for at this time we receive many letters inquiring as to the driving distance between various geographical points and requests for data on road conditions, and the best way to get from here to there.

The touring bureau of the Chicago Motor Club recently issued a bulletin covering mention of this desired information and we take the liberty of reproducing a portion of the bulletin herewith. To answer the perennial question there is 3,305 miles from Forty-second street and Broadway, New York City, to the Golden Gate, at San Francisco. Other distances which are given in the following table are computed from Chicago, this city being perhaps a good central point to work from.

Place	Distance Between Places	Total From Chicago
Chicago.....	0.0	0.0
Davenport, Ia.....	189.6	189.6
Des Moines.....	177.2	376.8
Omaha, Neb.....	152.7	529.5
Lincoln.....	66.5	596.0
Minden.....	141.0	737.0
Holyoke, Colo.....	220.7	957.7
Ft. Morgan.....	107.8	1065.5
Denver.....	86.4	1151.9
Colorado Springs.....	73.2	1225.1
Pueblo.....	43.6	1268.7
(The half-way point is about Walzenburg)		
Trinidad.....	91.3	1360.0
Las Vegas, New Mexico.....	144.4	1504.4
Santa Fe.....	74.3	1578.7
Albuquerque.....	65.2	1643.9
Socorro.....	87.4	1731.3
Magdalena.....	24.8	1756.1
Springerville.....	134.2	1890.3
Holbrook, Ariz.....	100.3	1990.6
Winslow.....	33.7	2024.3
Flagstaff.....	64.2	2088.5
Seligman.....	82.0	2170.5
Kingman.....	94.1	2264.6
Needles, Calif.....	50.6	2315.2
Barstow.....	166.2	2481.4
San Bernardino.....	82.9	2564.3
Los Angeles.....	63.3	2627.6

When a traveler reaches Las Vegas or Albuquerque he may be told to go over the route through Gallup to reach Holbrook. True, he will save some 95 miles, but the best authorities do not recommend that way. It seems there are two mercantile corporations, one plugging for the Socorro-Springerville route and the other boosting the Gallup way, with the Becker bunch the better campaigners.

Average 125 Miles A Day.

Traveling about 125 miles a day will consume just three weeks of time and will permit easy driving, plenty of time for sight seeing and not make work of the trip. There are times when a little more or less will be required in order to make hotels and procure supplies.

The better way is to make time in Iowa, Nebraska and parts of Colorado and then slow down through New Mexico and Arizona, visiting in Colorado and the last named states.

There would be, however, no difficulty in driving from Chicago to the coast in two weeks.

If one wishes to save time and work, take to the hotel; if time is no object and it is desired to save money, then camping will be found the best method of living. There are about as many doing one as another; anyway at Socorro on October 2 there were 159 cars that passed westbound in the one day.

What to Carry on the Trip.

No car should start out without new tires; it is a safety first proposition. Old tires will not stand the mountain roads, whereas new ones will be of long service on California's roads after the trans-continental trip.

Casings, tubes, a small vulcanizing outfit, an inner and outer shoe, a tire gauge and good pump—if the engine is not fitted with one—should be one outfit for tires and this will carry a car through.

Two sets of tire chains, an extra coil, valve or two springs, a good outfit of tools, an extra set of plugs, extra fan belt, light bulbs and fuses—these are about all you will need. Some cars may require certain small parts that cause minor troubles, but do not load down the car with a single thing that can be left at home.

This applies to personal luggage; leave most of it home or ship by freight. With a Khaki driving suit of knickerbockers, leather puttees, khaki shirt and coat, street suit, underwear and a small assortment of linen, besides toilet articles, a man can go through nicely. A woman would want—and have—more. But one suit case to a person is all that should be carried unless there are only two persons when more baggage may be carried.

Brakes should be relined and adjusted before starting on such a journey; then, by using the transmission as brake in descending hills, the brakes will not be half worn out when the trip is completed.

Accommodations Are Ample.

The hotel and garage accommodations all along the route are ample; in fact, good. In every one of the towns mentioned may be found good hotels, even in the far-away-from-the-railroad towns of Socorro and Springerville, where new hotels have been established.

Furthermore, the rates are by no means exorbitant and in addition there are good eating houses everywhere except in Winslow and Kingman. Where the Santa Fe railroad is met, which is frequent, there are the Harvey Hotels and eating houses and these are known the world over.

Modern Single Coil Distributor Ignition for the Ford Car



Supplied by the NEW YORK UNI-COIL DISTRIBUTOR IS THE ONE MOST NEEDED, LARGEST SELLING and greatest value giving device yet PRODUCED—because it abolishes your timer with all its accustomed troubles, short circuits, oil soaked wires and eliminates three vibrating coils and the impossibility of keeping them all uniformly adjusted.

THIS IS THE ONLY SYSTEM that operates from the Ford Magneto or Battery, therefore the car may be driven regardless of batteries' condition, which guarantees continuous service—even when battery is removed entirely.

It requires but one-half hour to install on any Ford from 1910 to date and will positively *prove a revelation* IN SMOOTHNESS, EASY STARTING, *extraordinary pulling ability with an entire absence from all the troubles* to which you have been accustomed.

Not an experimental unproven device,—the same principles employed in this system are used on America's highest priced cars. In use by thousands of Ford owners for the past eight years.

Furnished complete to the smallest detail. Price **\$18.00**

Made and *guaranteed* by one of the oldest Ignition Manufacturers.



NEW YORK COIL COMPANY

338 PEARL STREET.

NEW YORK CITY.

Every little burg along the route boasts a surplus of garages, tire supply houses and repair shops. Practically anything can be procured and, unless a car is somewhat exclusive, parts can be secured. Popular makes like the Dodge, Ford, Buick, Overland and such cars can be supplied with parts in almost any town on the route.

There is ample gasoline and oil, water stations where needed even in the desert; still it is a good practice, and is generally followed, to carry along well filled water bottles or canteens strapped to the running board. You will need water for the radiator and to drink and when hot you need plenty of it.

Gasoline averaged 37 cents from Chicago to Los Angeles. It was 60 cents at Springerville, but that town is 98 miles from a railroad; and on either side for some distance it was 45 cents. At the pacific coast end of the trip it will be found to be 27 cents, but it is not by any means as good a grade as is served in Chicago, although made on the ground.

You can stop at hotels with comfort and no excessive cost; but there are hundreds who camp out and cook enroute, for supplies are easy to procure.

Most every town has a free public camping

ground, with water and lights. Denver, Colorado Springs, Las Vegas, Albuquerque, Socorro, Springerville all have good places, the worst was at Winslow, alongside a railroad yard.

Have some sort of shock absorbers or snubbers; they are absolutely needed. Hitting one of the washes and rocks will cause a terrific rebound and break springs.

A Word of Caution

It is not advisable, to carry a rifle; it is a nuisance and there is nothing to use it for except bowling over a prairie dog now and then—if you can.

But it is advisable to have a revolver. You won't use it but it gives a sense of safety.

Do not pick up strangers and give them lifts; it is a dangerous practice. This applies more particularly if traveling alone or where the party consists of two. North Denver there have been two cases where a motorist traveling alone helped out a hiker, only to be murdered and the car taken. Again this happened near Flagstaff and the motorists' body was found in an abandoned well.

This might happen in Iowa or Illinois, but it emphasizes the fact that at least two should occupy a car. There will then be no excuse for giving a tramp a ride, as there might be where the driver is alone.

SONNET TO THE FLIVVER

Now, Flivver, though no other ever dared
To write a sonnet to the like of you,
I take my fountain pen and saunter through
This maze of words—where I may be ensnared
But then the cause is good—and having fared
This far with little toil, I start anew
My wild attempt to do what I would do
And leave you helpless—all your beauty bared!

Still with your loveliness in open view,
Flung forth in mine immortal poetry,
Do not despair—you are the friend of man;
You are—you are—oh hang it!—You are
YOU:
The tin conveyance of democracy—
You are, sans doubt, THE GREAT
AMERICAN!

自動車修繕。アセチレン溶接機。タイヤー修繕を修得には組織的に實地教授を受けるに限定する。最も完全せる設備ある最大唯一の學は第一報次第カ

生徒募集

FORD

特別申込所

東郷 グラージ

ナシヨナル グラージ

日本人街唯一

クベカク自動車會社

沙市ジャクソン街一〇〇一

電話ベロコン五三二

五人乗 六四十九弗五八

二人乗 五百二十九弗

八四 四百七十四弗七八

荷物車 四百八十五弗二〇

シヤス 四百八十五弗二〇

雪

御待命 店に命を損せる事と信じて

KNOWN IN ANY CLIME

From time to time universal languages have been devised or originated, and it was intended that they should become a means of world-wide communication. Yet we doubt whether our old friends Volapuk or Esperanto have ever reached the point where a user of these tongues can drop in upon a foreign country and immediately be greeted by a native in the familiar language.

Yet there is one word in the English language which apparently has become universal. It is the surname of the Universal Car. If you doubt this we call your attention to the clipping shown here from a Japanese newspaper.

Perhaps you are a travelled scholar to whom the Japanese language is familiar, or you who read this may be one of our many subscribers in Japan. In either case, you can perhaps read, with pleasure, the matter contained on this clipping, which, we understand, is an advertisement for the car which is named in plain English characters, and which, as we said before, would be thus recognizable in perhaps every country in the world.

Make Your Ford a \$3,000 Car

From the Standpoint
of Motor Service



LAUREL EQUIPPED FORD carrying Type BB sixteen valve cylinder head and other parts built by Marion Walker, chief mechanic of San Juan Garage Co., Daytona, Fla., with Cassie Wingate driving, which made a world record for five miles on a two "hairpin" turn course at the Daytona, Fla., Beach Races, January 22, 1921, the time being three minutes and forty-six seconds, a wonderful tribute to the speed and power specialties manufactured by the Laurel Motors Corporation.

Roof 16 Overhead Valve Equipment

POWER DEVICE NEEDED BY EVERY FORD OWNER

One hundred per cent extra efficiency, with greater gasoline and oil economy for either touring car or truck. Hill climbing for the touring car owner beyond his wildest dreams. Sand, mud, or the steepest grades have no terrors for the Ford owner with the Roof 16 valve cylinder head.

FORD RACING CARS

SPEED—Ford cars with the Roof 16—valve cylinder head equipment have been rivals of the best racing cars on mile and half mile tracks, and have practically driven the high priced racing cars from competition, excepting on speedways. Joseph C. Hayes, L. E. Kerbs, Williams Bros., Ben Lawell, C. F. Goltry, Paul M. Boozer, James C. Hackney, Patz Willard and hundreds of other famous Ford drivers with speed records of from 75 to 97 miles per hour attest the wonderful power given to a Ford car by the use of the Roof 16 overhead valve equipment.

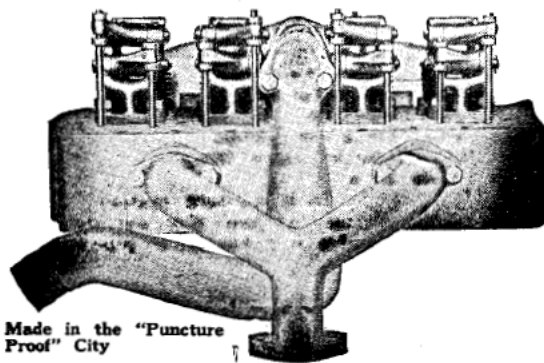
We are headquarters for everything necessary in Ford speed equipment, including polished nickel Roof 16 overhead valve equipment, Aluminite and Triple Life pistons and rings, grey iron pistons and rings complete, Aluminite and Triple Lite connecting rods, parts for underslinging chassis, nickel steel racing gears three to one ratio, racing carburetors, everything in ignition equipment, counter-balances for crank shaft, high speed cam shafts, wire wheels and steering gears.

Tell us what you want. We can supply it. Send for photographs of our beautiful racing bodies and racing radiators, which are our own special design.

Get Our Special Circular on Long Mileage Tires and Illustrated Folder Showing Our Full Line of Special Touring, Roadster and Racing Bodies for Fords.

SIXTEEN VALVE CYLINDER HEADS

For Dodge Motors Put the Dodge in the \$5,000 class from the standpoint of road and hill-climbing ability and general all around efficiency and service. Do not fail to get our special illustrated folder on the Dodge 16-valve cylinder head equipment.



Made in the "Puncture Proof" City

DEALERS—GARAGEMEN—REPAIRMEN
The ROOF-PEUGEOT TYPE CYLINDER HEAD FOR FORDS IS AN ALL-YEAR SELLER.

THEY ARE QUICKLY AND EASILY INSTALLED—SET RIGHT IN PLACE OF THE OLD CYLINDER HEAD. ROCKER ARMS OPERATE FROM THE REGULAR CAMSHAFT. Every Ford owner is a likely prospect, every Ford truck owner is a SURE SALE. If you want a steady stream of business throughout the year that pays, get our agency terms. Send for free illustrated literature of the greatest selling specialty for 1920. Place one equipment in your territory and it will bring every Ford owner to your door.

Write today for Special Agency Terms.

Laurel Motors Corporation
ANDERSON, INDIANA



THE FORDSON TROUBLE-HUNTING CHART

Motor Will Not Start or Starts Hard

(a) Defects in Motor Mechanism

Water in cylinders
Broken exhaust valve spring
Piston rings gummed to pistons
Valve stuck (rare)
Broken crankshaft (rare)
Leaky head gasket
Broken inlet valve spring
Dry pistons or seized pistons
Valve gears out of time (rare)
Hole in valve for grinding tool drilled through

(b) Fuel System Faults

Sandhole in intake manifold
Tank shut-off closed
Loose or defective inlet manifold
Cylinders flooded with gas
Dirt in float chamber
Fuel-supply pipe clogged
Leaky float (causes flooding)
Carburetor or fuel line frozen
Dirt in hole or shifter valve
No fuel in tank
No fuel in carburetor float chamber
Gas mixture too lean
Water or dirt in carburetor spray nozzle
Clogged filter screen
Fuel level too low in float chamber
Fuel level too high in float chamber
Bent or stuck float lever (rare)
No water in air washer or leaky float

(c) Ignition System Troubles

Loose terminal
Carbon deposits or oil between plug points
Primary wires broken or short circuited
Short-circuited secondary cable
Broken secondary cable
Magnet wire shorted
Timer segments dirty
Water-soaked coil unit
Dirty oil in timer case
Vibrator contact points burnt or pitted
Too much clearance between magnets and spool support
Spark plug points too near together or far apart
Broken spark plug insulation
Magnet contact plunger short circuited
Dirt between contact plunger and spool support
Poor contacts at timer
Wrong cables to plugs
Dirt or water in timer casing
Broken timer contact roller spring
Ignition timing wrong, (spark too late or too early)
Magnet defective (no spark at plugs)

Motor Stops Without Warning

No fuel in tank
Water in spray nozzle
Insufficient lubrication
Broken magnet wire
Particles of carbon between spark plug points
Flywheel wedged by foreign matter in engine base (rare)
Seized main bearings (rare)
Fuel supply pipe clogged
Magnet wire loose at either terminal
Spray nozzle stopped up
Broken commutator brush spring (rare)
Magnet short-circuited by ground in wire
Pistons seized on account of lack of oil
Fuel shut-off valve jarred closed (rare)
Bent or broken camshaft or crankshaft

Motor Stops Gradually

Fuel supply pipe partially clogged.
Float needle valve stuck
Sticking coil vibrator
Spark advance rod broken
Motor overheating due to defective oiling or not enough water in radiator
Water or dirt in spray nozzle
Loose terminal at magnet
Mixture adjusting needle jarred loose
Air vent in tank filler cap stopped up
Valves stuck open (rare)

Motor Races

Throttle not closing
Clutch slips (in high speed)
Air leak in inlet manifold
Timer case stuck in advance position
Control rods broken

Motor Will Not Speed Up

Not enough oil in engine base
Throttle stuck closed
Worn fibre ring in timer
Spark timed late.
Pistons binding in cylinder
Bent or sticking valve stem
Valves timed late
Timer casing stuck in retard position
Too much space between valve stem and push rods
Air choke valve in carburetor air pipe stuck closed

Motor Speeds Up Suddenly

Clutch slipping or released
Timer casing jarred advanced
Throttle has jarred open

New Fords for Old



HOW MUCH OIL?

Los Angeles, Cal.
"Your 'Nu-Life' Piston Ring Expanders fill the bill completely."

"The number one cylinder in our Ford roadster was an excellent oil pump, using a quart of oil every 30 miles. We had just decided to have the cylinders rebored and new pistons and rings put in, in fact, we had laid up the car for this job when the expanders arrived. We put them in at once and they surely are good. We now make 200 miles per quart of oil, besides many other betterments. These expanders are worth one dollar each. They even make a good engine better."

PISTON SLAP

St. Louis, Mo.
"I installed your 'Nu-Life' Piston Ring Expanders in a car that had a hard piston slap in two cylinders; also pumped oil. I find they killed the slap and give me better compression than I have ever had. They do everything you claim."

OLD PISTON RINGS

Camden, N. J.
"Today we tested out your 'Nu-Life' Piston Ring Expanders and I think as long as I have been in the business of repairing cars I have never seen such results for an old car. A new motor could not give better results. They are worth their weight in gold for an old motor. These expanders were installed under piston rings that were two years old."
(Names and addresses furnished on request.)

"NU-LIFE" PISTON RING EXPANDERS are placed under piston rings to restore their life. They absolutely stop oil pumping, cure piston slaps, increase compression, reduce carbon deposits, save oil and gasoline, and give life to the motor, without installing over-size rings or pistons.

For every type of motor and machine using piston rings. No fitting required.

In ordering specify the number wanted and the diameter and width of piston rings under which they are to be installed.

Price 25c Each

Jobbers and Dealers:

We are receiving inquiries and orders from your territory. Liberal discounts.

Manufactured Only by

AMERICAN AUTO PRODUCTS CO.

1319 L Street, N. W.,
WASHINGTON, D. C.

Motor Runs Irregularly or Misfires**(a) Faults in Fuel Supply System**

Poor fuel adjustment
 Water or dirt in fuel
 Carburetor float chamber getting dry
 Fibre washer under needle valve seat misplaced
 Too much fuel, carburetor flooding
 Not enough fuel in float chamber
 Adjusting-needle valve seat not properly screwed down

(b) Ignition System Faults

Loose wiring or terminals
 Wrong spark plug gap at plug points
 Gummed oil in timer
 Water in timer
 Prematurely grounded primary wires
 Worn roll and segments in timer
 Timer case loose on engine
 Pitted platinum points on vibrator
 Poor adjustment of contact; points at spark coil vibrator
 Primary wires shorted on coil-box cover or on cylinder front cover
 Spark plug points sooted or oily
 Dirt under magneto collector plunger
 Broken spark plug insulator
 Worn fibre ring in timer
 Weak roller spring (in timer)
 Leaking secondary cables
 Wire broken inside of insulation
 Weak magnets in magneto (rare)

(c) Defects in Motor Mechanism.

Carbon under valve heads
 Air leak in inlet piping
 Broken cylinder head gasket
 Worn push rod or guide
 Stuck valve stems (rare)
 Carbon deposits in combustion chamber
 Weak or broken valve springs
 Incorrect clearance between valve stem and plungers
 Air leak through inlet valve guides

Motor Noisy in Action.**(a) Mixture Troubles.**

Too much gasoline, mixture rich
 Carburetor float chamber flooding

(b) Other Causes of Knocking

Climbing steep hills on high gear with spark advanced
 Overheating due to defective cooling or lack of oil

(c) Ignition Trouble

Spark timed too early

(d) Mechanical Depreciation Producing Knocking

Carbon deposits in combustion chamber
 Worn main bearings
 Poor oil or lack of oil
 Timing gears worn
 Loose flywheel
 Piston worn, permitting side slap

Incandescent spark plug points or carbon particles
 Loose connecting-rod big-end bearings
 Loose wrist pin bearings
 Play in valve operating mechanism
 Foreign matter in engine, such as loose nut in engine base
 Piston rings tight
 Cylinder head retention bolts loose
 Cylinder worn out of round

(e) Hissing and Squeaking Sounds.

Poor lubrication (causes squeaking)
 Leaking cylinder head packing
 Broken insulation on spark
 Spark plug leaks
 Loose joint between motor and exhaust manifold
 Tight piston rings (scraping sound)
 Broken piston rings (blowing sound)

(f) Popping or Blowing Back in Carburetor.

Spark retarded too much.
 Weak spark at plugs
 Weak inlet valve spring
 Inlet valve not seating
 Wrong cables to plugs
 Not enough gasoline (open needle valve)
 Dirt under inlet valve seat
 Contact points on vibrator or timer roll and segments pitted
 Incorrectly timed inlet valves

(g) Muffler Explosions.

Exhaust valve sticking
 Wrong cables to plugs
 Mixture not exploding regularly
 Exhaust valve sticking

(h) Grinding Noises.

Worn change speed gearing
 Defective cylinder lubrication
 Worn timing gears

Motor Loses Power (See Also "Motor Runs Irregularly.")**(a) Causes of Poor Compression.**

Leaky valves (regrind)
 Head casting loose on cylinder
 Loose or leaky spark plug
 Cracked piston or cylinder wall (rare)
 Warped valve heads
 Defective cylinder head gasket (rare)
 Piston ring joints in line (rare)

(b) Other Causes of Lost Power

Carbon deposits
 Fan belt loose or broken
 Overheating due to racing motor
 Oil too light
 Inlet valve lift insufficient
 Tight bearings
 No water in radiator
 Overheating due to too rich mixture
 Overheating due to driving with retarded spark
 Exhaust valve lift insufficient

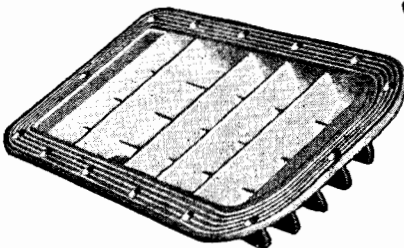
Note—All causes contributing to irregular motor action also produce lost power.

NEW

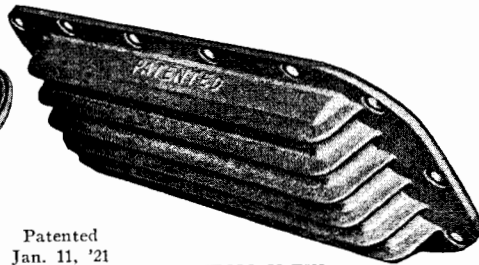
*and what every
Ford owner has
always wanted*

ADAMSON

OIL COOLER for FORDS



TOP VIEW

Patented
Jan. 11, '21

BOTTOM VIEW

MADE of a solid piece of aluminum; is readily bolted in place of the present Inspection Plate under engine crank case. Catches the hot oil as it falls from the cylinders, cools it like a radiator cools flowing water, and

- | | |
|---|---|
| <p>A. Prevents the oil from getting too hot, thin and fluid, and escaping past pistons to carbonize the cylinders, foul the spark plugs, etc.</p> <p>B. Keeps the engine running cooler and greatly increases its power.</p> <p>C. Saves from 50% to 75% in lubricating oil, as proven by actual comparative tests.</p> | <p>D. Gives better, cleaner lubrication; prevents bearings from burning out, magneto from short-circuiting, etc.</p> <p>E. The extra quart of oil retained in Cooler provides a wide margin of safety.</p> <p>F. Easily applied. Merely unbolt the present Inspection Plate and bolt the Adamson Oil Cooler in its place.</p> |
|---|---|

Price \$5 Each Adamson Oil Cooler comes packed in a stout corrugated board container all ready for the motorist to put on.

Dealers and Agents:

You want this new quick seller. Every Ford owner is a live prospect. Hot weather will multiply the demand. Write us at once.

ADAMSON MFG. CO.

STODDARD AVE., EAST PALESTINE, O.

Makers of the Famous Adamson Vulcanizers, Ford Brake Shoes, Etc.

FORDSON FURNISHES POWER AND LIGHT



The Fordson tractor is giving its cousin, the Ford car, a snappy race for honors in the matter of versatility. Already the Ford car has the name of being able to do most anything, and the tractor is striving for a similar or better record.

The latest achievement of the Fordson tractor is that of furnishing power and light to the town of Stoneville, N. C. This is called to our attention in a letter received from the Jones Motor Co., Ford dealers at Leaksville, N. C., and from which we quote herewith:

February 23, 1921.

Ford Owner & Dealer,
Milwaukee, Wis.
Gentlemen:

We are sending you under separate cover, two photos, one view taken of two Fordsons pulling a 60 K.-W. Generator. This furnishes power and light for the Town of Stoneville, North Carolina. The other picture is the Commissioners who bought the outfit.

The Town of Stoneville had been getting power to drive their generator from a Roller

Mill. They found they were paying more for the power than they could afford, according to the revenues they were getting. We found this out so we showed them the advantage of using two Fordsons. One was they could be operated much cheaper than they were paying at present, also they would have something they could dispose of any time they wished to put in a larger outfit. They finally agreed for us to give them a test. We did this and found the expenses were about half what they were paying. They now have good light and can have it any time they want it.

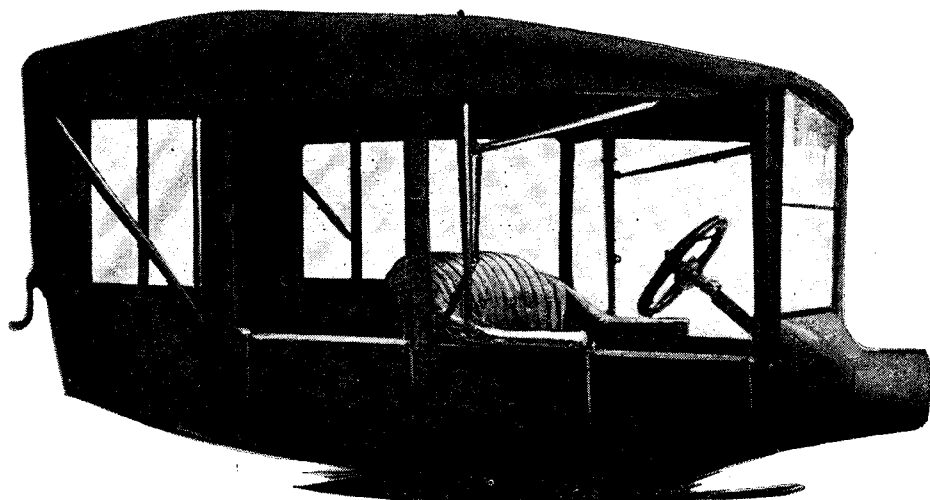
The Commissioners are all on the picture except one who was sick and not able to be out. They are, reading from left to right, as follows:

Mr. W. A. Robertson, Barber, Mr. R. B. Stone, Merchant, Mr. S. T. Hodgin, Mayor and Depot Agent, Dr. L. A. Taylor, Dentist, Mr. Dameron Joyce, Merchant.

Yours very truly,
JONES MOTOR COMPANY,
Claude H. Jones,
Proprietor.

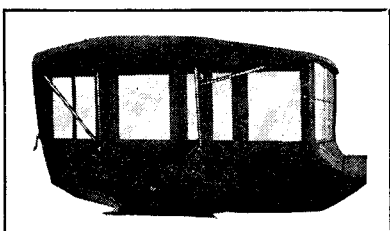
CHJ*G





STORM KING CURTAINS AS THEY APPEAR OPEN FOR FINE WEATHER USE

Storm King Curtains require only about twenty-five minutes to put on your car, and once they're on they can be opened or shut by anyone in five minutes or less.



STORM KING CURTAINS

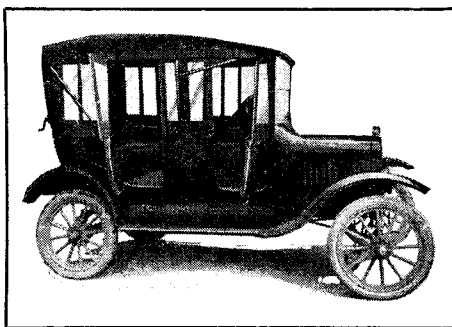
CLOSED AFFORD PERFECT PROTECTION IN ALL WEATHERS

For a curtain to protect you from the heavy unexpected drenching downpours of June—one that you can close from inside your car almost instantly without getting wet yourself, you need Storm Kings.

STORM KING CURTAINS

SWING WITH THE DOOR AND WILL NOT CRYSTALLIZE OR CRACK

You can turn your Ford into an "almost limousine" in only a few minutes with these remarkable curtains. The Storm King design makes getting in and out with the curtains closed an easy matter. They swing with the door and this same special design prevents them from cracking.



You'll wish you had Storm King Curtains on your car a dozen times before fall comes. They're the only thing for summer because they are so easy to open and close—why it only takes about thirty minutes to put the whole set on the first time—and the only tool you need is a wrench.

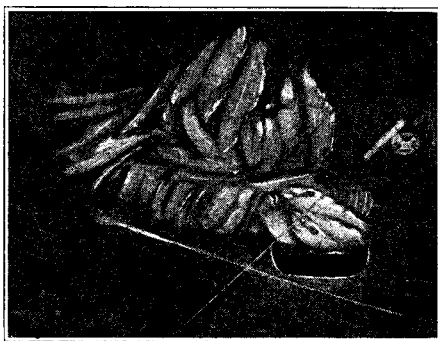
Drive down to your dealer and get a pair today. If he hasn't got his stock yet send us his name and address and we'll see that you get your set promptly. A set for the touring model will cost you \$38.00, \$22.00 for the Roadster. Write department No. 102.

STORM KING MFG. CO. Winneconne, Wis.

When writing advertisers—Just say FORD OWNER and DEALER

HEALTH and HAPPINESS via FORD ROUTE

By HELEN CHAFFEE TEMPLE.



A cheerful face peered out through the curtains of a weather-beaten Ford, when we called a greeting to a fellow Fordist at the Old Comfort Camp grounds. "What's the matter, want to borrow my pump? It's the only one on the grounds that works," he grinned.

"Nope, we were just wondering if you really came from New York State."

That was the beginning of a friendship that has proved highly satisfactory to all concerned. A few questions were all that we needed to get their story, a story that was interesting to the smallest detail. However, in order that other Fordists may really enjoy the story, I will endeavor to tell it as it was told to us. First, an introduction to the storyteller, his wife and little "Bumps," the small son of the family. The storyteller, Andrew J. Ross, was a bookkeeper in one of the large stores in New York. His wife was a struggling housekeeper in one of the crowded apartment houses that "inhabit" a great part of New York. She struggled with high prices, poor health and unhappiness. She was unhappy in her existing conditions, nothing being saved for the future, ill health dragging down all desire to continue in this mundane existence and a dreary outlook for her baby's future life. "Bumps" is a chubby boy of three, who has an enquiring mind and habits, therefore acquires bumps of various sizes at frequent intervals.

Mr. Ross' Story as He Told It to Us.

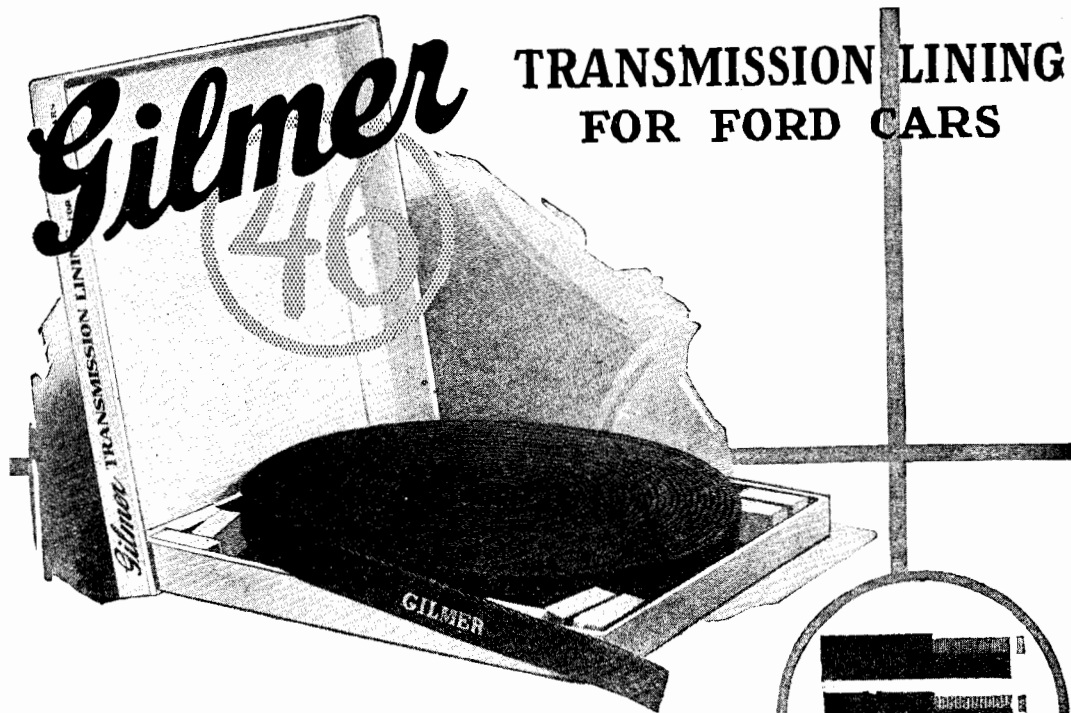
I worked at a bookkeeping job ever since I was eighteen years old. Bernice (Mrs. Ross) and I were married when I was twenty-one and she nineteen. She was working in a millinery store and kept right on for three years after we were married. In three years, between us, all we had saved was two hundred and five dollars. Then Bernice quit working about six months before the baby came. We were never able to save a cent after this, and

had to keep using what we had saved, until we only had fifty dollars left. We both had the "flu" in nineteen eighteen, and Bernice didn't "pick up" again. The baby was sick a good deal of the time, too. I had to keep at my job, or we'd have been hungry, but between the rent man, the doctor and grocer, we couldn't keep our heads above water.

One day, I heard of an extra job that I could get keeping books and cashiering at night, in a garage. That would mean extra money. Worked only three hours a night, but it was a "help". Worked three months but still we didn't put away much. Bernice and I got pretty discouraged. One night I was talking to "the boss" at the garage. He said, "I tell you Andy, you ought to get away from the city. Go around through the country for a year or two. I told him that I had a "fat chance." He sure was one white man, I'll tell the world. He had this Ford in his shop. It was an old nineteen-twelve model but he had put a lot of new parts in it, and fixed it up so "she" ran like a new car. He had a price of three hundred and fifty dollars cash, on her, but he told me to take it and pay for it when I could. I made him take the fifty dollars that Bernice and I had saved. Well, when I went home and told Bernice about it, she was so happy that she sat down and cried like a kid.

We built a cup-board that fastened on to the running board. When you opened the door, your cooking utensils and groceries were right in front of you. The door made a table to eat on. Bought a two burner oil-stove, and cut the back of the front seat to let-down and make a bed right in the car. All three of us slept in the car, but now, we have the regular camping bed and tent.

When we left New York, we had a good supply of groceries, the machine all equipped to live in and twenty-eight dollars in cash. We didn't know just where we were going, but we were going until we reached the real country, before we stopped for any length of



YOU cannot stock a more serviceable transmission lining than Gilmer "46." But neither can you stock a more convenient one. For every piece of Gilmer "46" comes to you in a "sales help" carton—compact, handy and dust-and-oil proof.

There is the big flat carton containing a 60-foot roll of Gilmer "46" with sufficient rivets. Then there are the individual cartons, each carton containing sufficient lining and rivets for one car. Ten individual cartons are packed in a large carton.

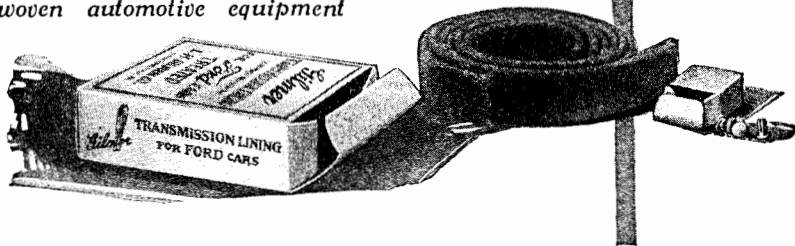
These Gilmer cartons are not only conveniences but also actual trade builders. The name "Gilmer" on each carton is a selling message to the careful buyer.

It recalls to him the persistent Gilmer advertising and the big Gilmer "Compare 46 to 26" selling story. It reminds him that Gilmer "46," with its 46 picks (or cross weaves) to the inch as against the 26 picks of the next lining, gives almost double strength and durability.

L. H. GILMER CO., Philadelphia, Pa.
*Makers of Gilmer Woven Endless Fan Belts
 and other woven automotive equipment*



*Compare 46
 to Any Other*



When writing advertisers—Just say FORD OWNER and DEALER

time. We went down into Pennsylvania. I got a good job, keeping books in the oil-fields. Kept it until we had saved seventy-dollars, almost two months. Then we decided to start to California. Bernice said that she'd always dreamed about California. It seemed like it was a million miles away then.

We travelled as far as Illinois and stopped. I worked on a farm, for the first time in my life, there. I worked for three months. We were beginning to feel like we were never going to leave Illinois, as the fellow that owned the farm needed help so bad, that I hated to quit. We saved more in the three months there than we had saved in the three years that Bernice and I had both worked in New York. Didn't have to pay for board or lodging for either of us. Bernice helped the man's wife with the cooking and made enough to buy a good outfit of clothes for winter. By the time, we left Illinois, we were "country broke." We'd never be satisfied to live in a city again, and were getting so fat that our clothes were too small.

We spent the winter in Colorado, at Colorado Springs. We could hardly wait until we could travel again, but I worked in a garage there and learned enough about Fords, to more than pay us for stopping. We also saved another hundred. Of course, we had to pay house-rent and so on, so couldn't save so much as we would have otherwise. We talked about California almost constantly.

Left Colorado in February, but didn't get far. Only got as far as Salt Lake City. The weather was too bad to travel much. Worked for a fellow in a grocery store. He only had a small store, but did a big business. I finally made a proposition with him that I'd use the Ford to help deliver. I was paid for my time,

and five cents a mile for delivering. Had a speedometer put on. He paid for half of that. We stayed there until the last of April. Saved two hundred dollars, besides having the machine overhauled and fixed up before starting out. We paid all but twenty-five dollars on the Ford, so I sent that back to New York, and told them all about our trip. Had a telegram from the former boss who said he was coming out to Los Angeles himself and start into a Ford Garage business. Would I work for him? I telegraphed and told him that I would meet him in Los Angeles, where ever he said.

We reached Los Angeles, the twenty-first of May. It was too much of a city for us to live in, so we made our first payment on an acre out near Pasadena. Have the acre all paid for. Expect to build a real house on it in the spring. Have two rooms in the garage that we live in, now. I haul three of my neighbors to and from work with the old Ford, so it pays me to run her to and from the city.

Bernice has a pen of chickens and I have a cow, so we're on the road to being real farmers. The old Ford sure has paid us big dividends. I never knew that a fellow could start out and make a go of it, on pure chance before, but there aren't any chances taken with a Ford. Here we are at our destination, all of us so healthy that we'd burst if we were any healthier, and the old Ford equal to another trip, any day. We get itching feet once in a while, so pick up a few odds and ends and spend Saturday night and Sunday in some one of the camps around in this country. And, what's more, we don't worry about things any more. When you are in good health, your mental condition is good, also.

MY TERRIBLE CONDITION

*I find I'm in a fearful state—
A state to be abhorred;
This dreadful state, (I state) is this:
I can't afford a Ford.*

*I squeeze and save and practice thrift
Economize and hoard,
My money talks, e. g. "Good-by!"
I can't afford a Ford.*

*A life of gasoline and speed
Is what I'm looking toward,
I'll look, I think, for quite a while—
I can't afford a Ford.*

*Whereas I travel anywhere
A train I have to board,
The street cars drive me nutty, for
I can't afford a Ford.*

*I think I'll shoot and hang myself,
And "fall upon my sword,"
Drink Paris Green and cut my throat—
I can't afford a Ford.*



**FOR
FORDS**

YOUR STURDY FORD NEEDS "DEFENDERS"

All experts agree that proper shock absorbers add riding comfort, steering ease, driving safety and remarkable operating economy to any car of any make—big or little.

On your own sturdy Ford, Defender Shock Absorbers will prove the best investment of a few dollars you can possibly make. They absorb shocks and bumps, jars and rebounds, side-sway and road vibrations, saving the car itself; greatly lowering operating cost and up-keep expense, and, at the same time insure a degree of riding ease, driving comfort and safety positively beyond the belief of those who have never ridden in a "Defender" equipped Ford.

SOLD TO YOU ON A TEN-DAY "MONEY-BACK" TEST TRIAL

Defender Shock Absorbers are made for all Fords—passenger and commercial, and dealers are authorized to sell them on a ten-day money-back, if-you'll-take-it, trial. Easily installed without boring holes, changing, marring or mutilating your Ford in any way.

Defender Shock Absorbers are the strongest made. The big, self-lubricating roller bearings easily take the heaviest shocks and strains. There are no small parts to break or get out of order; no coiled springs to stretch, grow weak or work loose—just rugged enduring strength and practically endless satisfactory service.

Ask Your Dealer or Write Us Direct

DEFENDER AUTO-LOCK CO.

ALLEGAN, MICHIGAN.

*Pioneers in the Ford Lock Field and Makers of the New
Defender Thief-Proof Steering Wheel Lock for Fords*

DEFENDER SHOCK ABSORBERS

**SPECIAL
OFFER
TO
DEALERS**

We want every dealer to test the truly remarkable merit of Defender Shock Absorbers on their own Ford car. Write for our SPECIAL TO DEALERS 30 day trial proposition.

FORD FERRYING ON THE MISSISSIPPI

SOME day the Ford owner and his brethren of the motor touring fraternity are going to rise in their might and demand more bridges across the Mississippi, the great river bisecting the nation which must be crossed by every motorist traveling from the east half to the west half or from the west half to the east half of the United States.

There are a fair number of bridges now. Practically every city on its banks is connected with the other shore by one, two, three or even more bridges. But there are not a great many large cities on the Father of Waters and there are stretches of a hundred miles of its two thousand mile length without a bridge other than railroad bridges.

Dakota. It is at this crossing that the "drive-away" Fords from the Detroit factories are brought over by the Ford dealers of northern Iowa and the Dakotas, sometimes strings of ten or twelve of them reaching Prairie du Chien together.

The new ferry is thus of particular interest to the Ford dealer as well as the Ford tourist. It was built last season and operated for a number of months, giving satisfaction. Some seven thousand cars were transferred by it and a second launch-barge ferry which also was in service at this crossing.

The "Wanamingo" as the auto ferry is called was planned by its owner, J. Zimmerman of Prairie du Chien and built at the Du-



All along these bridgeless reaches, there are towns, through which roads lead from inland in the bordering states to the river. Quite often there are twin towns on the two sides of the river. In these cases the Ford tourist finds his most direct route is to cross the Mississippi at these points instead of going many miles out of his way to the nearest city where there is a wagon bridge.

There is no way but to ferry it, and ferrying it they are by the thousands at accessible crossings on the great river. For the most part the auto ferries are poor, unwieldy contrivances, consisting of barges towed by a gasoline launch. The barges accommodate two to a half dozen cars, and sometimes two of them are towed, one fastened to either side of the launch.

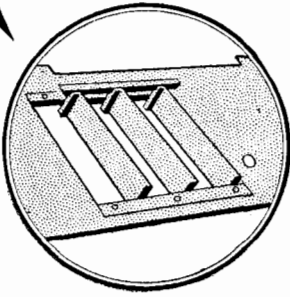
But with the enormous increase in motor touring the ferrymen at main crossings are finding these launch-barge outfits wholly inadequate, and special types of ferries adapted to car carrying are coming into use.

The photograph shows one which will be operated this season between McGregor, Iowa, and Prairie du Chien, Wisconsin, a crossing half way between bridges at La Crosse, Wisconsin and Dubuque, Iowa. The crossing is on a bee line from Milwaukee and Madison, Wisconsin, and is the favored motoring route from Chicago to northern Iowa, and South

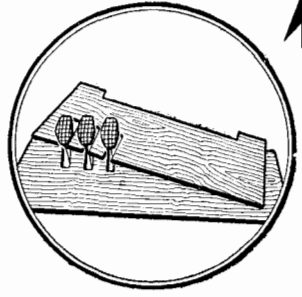
buque, Iowa, boat yards. It is in reality a self-propelled barge. Gas engine and two passenger cabins are at the rear end, and the entire remainder of the barge is a clear space for cars. Fourteen can be carried at a load. The space is divided into seven stalls by gates on either side. Two cars are admitted through each gate and park one behind the other on the boat. A little canopy observation space fitted with benches is at the front of the boat. The Ford owner and his passengers, may either enjoy the river scenery on the ride sitting in the Ford or finding seats in front. The cabins are for use, stormy or cold days.

The hull of the ferry is steel with air-tight compartments making it non-sinkable. It has a speed of nine miles an hour against the current and makes the three mile crossing in about twenty minutes. The quickness with which it loads and unloads, make it a great improvement over the ordinary ferry now in use on the Mississippi. As the most scenic part of the whole Mississippi is at the McGregor crossing, the motor ferry ride is a delightful trip for the Ford tourist.

The Wanamingo is undoubtedly the fore-runner of many specially built auto ferries which will be brought into use on the Mississippi and other large rivers until such time as bridges have been built at all main crossings.



DON'T endanger innocent lives by worrying along with a loose or broken foot board on your Ford. One slip—a locked gear at the wrong moment—may be fatal! Safeguard yourself and others by equipping your car with

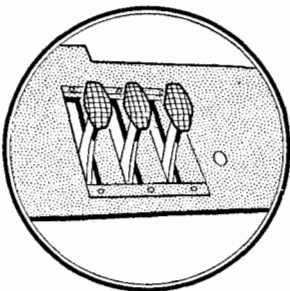


For
Ford
Cars **WILLIAMS** *For*
Ford
Cars **ONE PIECE**
STEEL FOOT BOARD

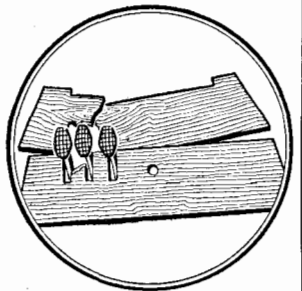
Fits any Ford roadster, coupe or touring car, since 1914 model. Can't rattle, slip, break or lock your car in gear. Easily put on or taken off in a minute. Slips over pedals and is held firmly and snugly in place by patent locking bar. Durably made of 16-gauge steel, the Williams One Piece Steel Foot Board will outwear your car and give you *real* protection against accidents.

Send No Money. If your dealer can't supply you, simply send us your name and address and a Williams One Piece Steel Foot Board will be sent to you by return parcel post. Pay the postman \$3.50 on delivery—use it 5 days—then if you are not entirely satisfied your money will be refunded to you without question or delay.

Dealers! There's big money supplying the demand for Williams Foot Boards in your territory. Our dealer proposition will interest you. Write for particulars TODAY.



Williams
Manufacturing Co.
Gloyd Building
Kansas City, Missouri



Touring Time and the Trade

Each year an increasing number of Ford car owners make touring trips in their cars varying from jaunts about their own state to trans-continental trips. This is revealed in the hundreds of letters which reach this magazine asking for information as to roads and equipment necessary for successful touring.

The live accessory dealer will make the most of this touring season. He will not be content to carry the average stock of ordinary accessories, but will realize that there is a big market to be had if he caters to the prospective tourists. There is, in fact, a big field for seasonable specializing on many practical items of equipment, such as tents, camping stoves, folding chairs and tables, beds and luggage carriers.

The enterprising dealer will not be content to carry such stock and wait for the tourist to

seek him out and buy. He will arrange clever window displays and send a salesman to call on his customers asking if they contemplate a trip and telling them that the entire matter of equipment can safely be placed in the hands of the dealer who will furnish every need for the contemplated tour. A good plan also is to use a circular letter, or other piece of advertising literature, telling Ford owners that the planning of touring equipment can best be made through consultation with the dealer who is ready to supply all needs.

It is surprising the amount of additional business which can be obtained through the application of a little enterprise, and the dealer who makes the most of seasonable opportunities will realize sales far beyond that of the one who waits for the customer to seek him out and ask that he be sold things which he needs and will buy.

The Long Trail—Advance, Mo.

IF you and your Ford should happen to be traveling through southeastern Missouri during one of their periodical cloudbursts, you might decide to stop at Advance. If your car is not a Ford you probably wouldn't even be lucky enough to get to Advance; you'd park at the nearest church or deserted schoolhouse for half-a-week or so. Advance—ironical name—is a town of a hundred families, a pine bench movie theater, and great expanses of mud. The more it pours, the muddier everything gets. There is mud enough there to have supplied the entire Republican and Democratic parties during the late campaign. The movie is only shown twice a week, so choose well your time for getting marooned. Also pick carefully the magazines you bring with you, for you'll surely have to read them through twice. You can dispense with the reading if you have non-leakable rubber boots, but if you haven't and have

ever read of the Everglade swamps, you will hesitate to step off the hotel porch.

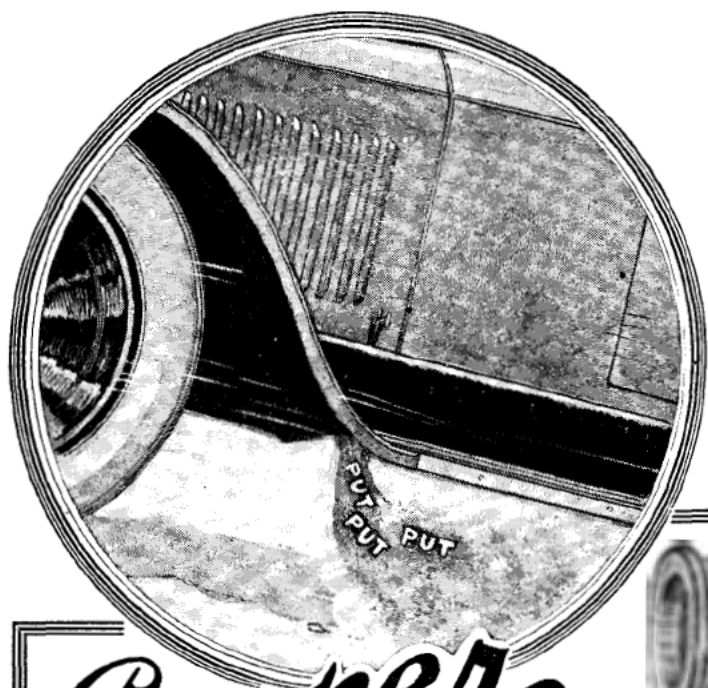
The hotel itself deserves the language of Sinclair Lewis or Irvin Cobb. Flowered carpets, wall paper designs like spiders, oil lamps, bolsters, and over all that subtle penetrating odor, sort of a cross between frying pork chops and soft soap, found only in country hotels. Unmistakable evidence that the capable landlady downstairs, who is also cook, cleaned and scrubbed every exposed inch around here last week, and then shut it all up tight to keep out the neighbors' dirt.

Meantime this same lady is getting supper. And what a supper! Shades of the things your mother used to make—huckleberry pies, and cream gravy, and beaten biscuits, and fried chickens. Fresh eggs, and fresh cream, and fresh butter. No nut-margarine fad has yet disturbed this peaceful spot. That night you wonder if they will warm up the leftovers for breakfast, but no,

at breakfast time there's a fresh load of piping hot bird and beast, plus mountains of waffles, and maple syrup.

By the next night you feel yourself putting on weight, and by the end of the third day you are pumping desperately on the wheezy parlor organ to keep from foundering, and wishing it would do you any good to crank on the Ford for a while, just for exercise. For you can't give up eating; it's your only amusement. When, after four days, you finally gird on your Ford's chains and skid out, you feel like it's a case of do it or bust.

But sometimes, in the months to come, when your funds are low and you come out of a Child's restaurant, almost broke and still hungry, you dream of that good old mud hole and its biscuit and cream gravy and pear preserves. You feel that if you and your Ford do ever have to get marooned in a mud hole again, after all you'd rather like to have it happen right there in Advance.



Cooper

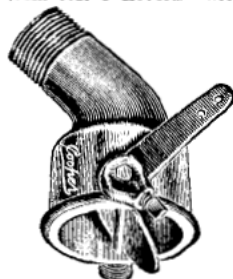
SPECIAL CUT OUT

Cooper Screw Type Cut-Out for Buick Cars

It's made of malleable iron—attaches easily. Just remove the standard plug from the exhaust pipe, screw in the COOPER "SCREW TYPE" CUTOUT and the job is done for good. It can't come loose—can't rattle or squeak, nor cause any annoyance whatever. The bell shape forms a megaphone—causes a loud tone—simplifies locating weak cylinder, etc.

PRICES:

Valve only.....\$3.00
With No. 3 Pedal.....3.50
With No. 4 Pedal.....4.00
With No. 5 Lever.....4.00



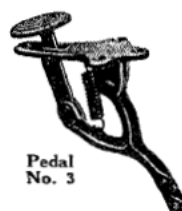
Patent Applied For

Your Car Needs It

Most remarkably simple and effective means of blasting out carbon, revealing defective spark plugs or locating various forms of engine trouble. Cooper "Special" Cut-Outs are attached very easily without cutting the exhaust pipe in two. Will not loosen or rattle or get out of fix. Cooper "Special" Cut-Outs are enthusiastically endorsed by best motorists the world over. Fall in line. Be Cooper-Equipt. You'll notice more life and pep and get there in your car immediately. There's a Cooper "Special" Cut-Out to fit YOUR car. It will save its price many times over. Ask your dealer.

Complete

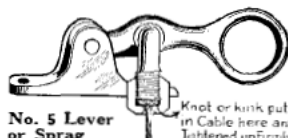
Sizes	With No. 3 pedal	with No. 4 pedal	with No. 5 lever
1 1/2 in.—Ford Size	\$3.00	\$3.50	\$3.50
1 3/8, 1 1/4, 1 1/8 in.	3.50	4.00	4.00
2, 2 1/8	4.00	4.50	4.50
2 1/4, 2 3/8, 2 1/2, 2 5/8	4.50	5.00	5.00
2 3/4, 2 7/8, 3	5.50	6.00	6.00



Pedal No. 3



Pedal No. 4



No. 5 Lever or Sprag

Knot or kink put in Cable here and tightened up firmly

Cooper Manufacturing Co.

Dept. F. Marshalltown, Iowa.

THE FULTON CO., Sales Mgr., Milwaukee, Wis.

DEALERS—Get a stock from your jobber today, or write us, giving his name

HINTS

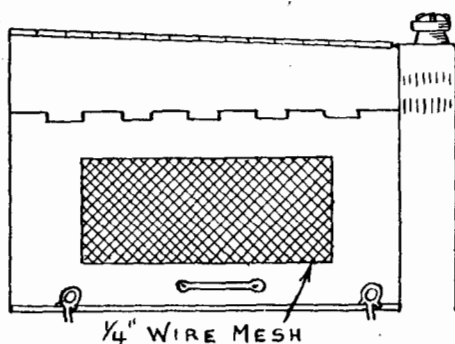


Send us rough sketch and description of any repair hint that would be of assistance to Ford owners. If acceptable, we will pay \$1 for same. Here's a chance for easy money.



VENTILATES HOOD

To improve the air circulation through the Ford radiator and around the engine, oblong openings can be cut in the sides of the hood and fitted with fine mesh wire screen. Rivet a section of strong

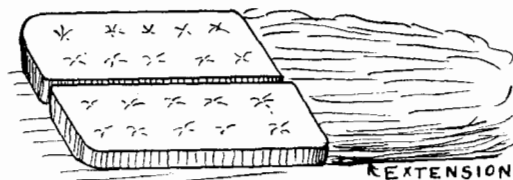


wire netting of $\frac{1}{4}$ in. mesh, such as is used to screen gravel, to the inside of the hood, in place of the usual louvres. This can be painted to improve the appearance. And the regular hood clips will prevent rattling.

RALPH DUNBAR, Albuquerque, N. M.

CAMPING OUT

My friend and I went on a four days' touring trip. We decided to take blankets along and sleep in the open. And we tried the following plan, which proved as comfortable (?) as many hotel beds!



We took the two seat cushions from the Ford touring car and placed these cushions flat on the ground, side-by-side. At one end of the cushions, we filled in with earth or sod, or any brushwood we could find, to the height of the cushions. And then covered both the cushions and brushwood with the blankets.

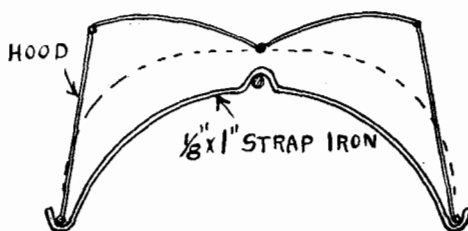
The cushions are wide enough for two (no kicking allowed), and are long enough for the head, should-

ers, and hips, which are the main points—while one's feet are just as comfortable on the extension. The only extras that one needs to carry, are the blankets and pillows.

M. M. MUDGE, Valparaiso, Ind.

HOLDS HOOD RAISED

To hold the sides of the hood raised for increased cooling efficiency in hot weather, one can take a piece of scrap iron about one inch wide and $\frac{1}{8}$ inch thick, by 3 feet, 6 inches long. By bending this strip to fit down around the radiator-to-dash rod, it will make a neat holder for the hood, and is entirely concealed within the hood when not in use.

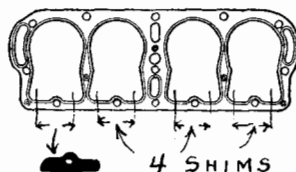


To keep the hood from bouncing up on rough roads—when this holder is used—extension hood clamps will have to be made to fit into the regular hood clamps and over the beads on the edges of the hoods. Or else a strap can be run from one hood clamp to the other, over the entire hood.

JOHN C. STEVENSON, Crafton, Pa.

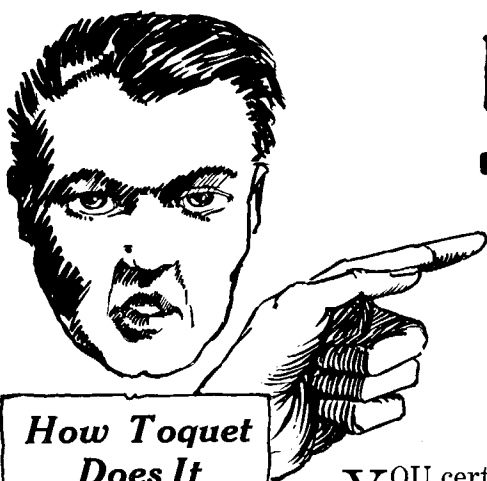
CONNECTING ROD SHIMS

For regular use, the laminated shims, which can be peeled to the correct thickness, are undoubtedly the best. But sometimes roadside or emergency



repairs make it necessary to use available materials, and then it is well to know that two different thicknesses of shims can be cut from old cylinder head gaskets, by cutting out the metal as shown, between the lines marked in the sketch.

E. C. CROSS, Underhill, Vt.



DO YOU TAKE PRIDE IN YOUR FORD

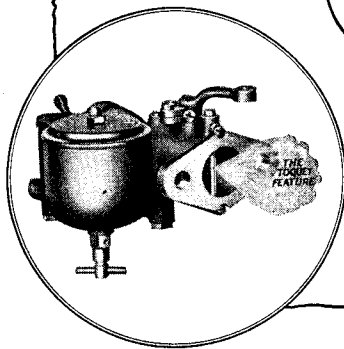
How Toquet Does It

The Toquet Carburetor works on the principle of the gas mantle — combining more air with less gas to produce greater efficiency. Two jets are used—one for starting and idling—one for higher speeds. These jets work in harmony to give perfect flexibility and a clean burning, economical mixture. (17 parts of gas to 1 of air).

The Toquet is standardized, simple, sturdy. Not a nut or screw need be changed to apply it. Needle valve adjustments are eliminated. Satisfactory operation is guaranteed or money refunded.

Send the coupon. It will pay you to learn more about the way.

**"PERFECT
ATOMIZATION
DOES IT"**



YOU certainly do if you're like most Ford owners.

But think how much more pride you would have if your Ford would **always** start easily, idle quietly, have ample power for every road and hill.

Think what it would mean to **always** have quick pick up, a smooth, snappy motor, and **never** any trouble.

Think what a **saving** you could make by doubling the mileage from gas and oil.

Think of **passing** other cars when and where you like!

Right now more than 19,000 Toquet equipped Fords are giving such performance—breaking all kinds of records—making their owners prouder than ever.

You, too, can enjoy these advantages. You, too, can beat any previous record you have made. You, too, can take more pride in your Ford's achievements.

Get all the facts about the Toquet Carburetor. The information costs you nothing. There is no obligation. The data is interesting and valuable. Fill in and mail the coupon at once.

Toquet Carburetor Corporation

1819 BROADWAY

NEW YORK CITY

Factory: Westport, Conn.

Toquet Carburetor Corp. Dept. J.
1819 Broadway, N. Y. C.

Gentlemen:

Tell me more about the Toquet
Ford Carburetor.

Name

Address

☐ Owner ☐ Dealer ☐ Jobber

WHAT- WHY- HOW-



Wherein Your Questions
Are Answered

Conducted by
Murray Fahnestock

ENGINE MISS.

About two weeks ago, I had my Ford overhauled, and new oil piston rings were installed, and the connecting rods and bearings were all tightened. For about a week it ran fine.

Then it started missing on one cylinder, then on two. Sometimes, it would start and run all right again. Trouble is in the two end cylinders. The spark plugs foul in a very short time. The two middle cylinders are all right.

The magnets are a little weak. Have new timer, new wiring, and coils test up to standard.

We suggest that you install a set of four new plugs. With these plugs, you should set the gap between the points at slightly less than 1/32 inch, or twice the thickness of an old vibrator spring from a Ford coil unit. It is important to make sure that the side wire of the spark plug clants upwards, towards the center; so that any oil, which collects on this wire, will run off to one side, and NOT collect at the gap between the spark plug points.

Keep the oil level midway between the two test cocks. And, after an overhauling, it is a good plan to drain out the old oil; and replace with clean, fresh oil, after only a few hundred miles of service.

If the magnets are weak, and the engine misses fire, this will allow the oil to collect in the cylinders and foul the plugs. It is possible, but not probable, that the piston rings were installed upside-down, as this would tend to work the oil up into the cylinders.

MOTOR KNOCK.

Have a 1918 Ford that has a light knock in one cylinder but, so far, have been unable to locate it. Noticed this first last June. I dismantled motor, installed 4 new wrist pins, and 8 new piston rings, refitted the connecting rod big ends (even the fourth) ground the valves, and removed carbon. But still the knock is there. Have gone through this operation three times this summer—and still no relief.

The engine does not knock when idling, or when pulling a hill. But on a level road, at 20 miles an hour, the knock occurs. Also installed a new timer. The knock seems to be too light for a main bearing, as it is just a light, metallic tap. The pistons have from .004 to .006 inch clearance.

As Ford pistons are supposed to be fitted TIGHT on .004 inch, and LOOSE on .003 inch thickness gauge blade; and as the pistons in your Ford have from .004 to .006 inch clearance, it is possible that this much piston clearance, together with a slightly "sprung" connecting rod, is the source of the trouble.

If the connecting rods are ABSOLUTELY STRAIGHT, then the pistons may not knock with .006 inch clearance or over. And we suggest that you have the rods straightened and tested, in a connecting rod alignment jig or fixture, with which every well-equipped Ford repair shop is supplied. "Piston slap" and a "sprung" connecting rod, often work together in causing a knock such as you describe.

WEAK COMPRESSION.

Have a 1913 Ford engine, in which the compression is weak in two of the cylinders. I put in .0025 inch oversize pistons and rings, fitting the rings as snugly as possible. But, when the engine is cranked slowly, one can hear the compression blowing past the pistons.

Would piston ring expanders have a tendency to wear the cylinder walls more rapidly than the rings?

A 1913 Ford engine is SEVEN years old and, while you COULD try lapping-in a set of .005 inch oversize pistons; it is probable that the cylinder walls have worn oval by this time, and that you will have to have the cylinder block rebored, in order to get good compression.

Whether or not the use of piston ring expanders or of special piston rings will prove helpful, depends on how badly the cylinder walls are worn. If too badly worn, then reboring will be necessary. To hold the compression, it is necessary that the pistons as well as the rings fit the walls reasonably well. And no piston rings can make a compression tight joint if the cylinder walls are worn oval or out of round.

Most of the wear of the cylinder walls is due to the friction of the pistons, rather than of the springy rings and, while the use of expanders slightly increases the pressure of the rings on the cylinder walls, we do not believe that this would noticeably increase the wear.

WHEELS FOR TRAILER.

What kind of springs, wheels and axle are best to use in building a two-wheel trailer of 1,000 to 1,500 pounds capacity? Trailer to be used on a Southern farm with a Ford touring car in hilly country, where only some of the roads are graded and raked.

You can use a couple of Ford front springs, placed in a fore-and-aft direction, and used as semi-elliptic springs, for a two-wheel trailer, of 1,000 to 1,500 pounds capacity.

For wheels, buy a couple of Ford front wheels, of the 30 by 3 inch size, which you should be able to purchase cheaply from someone who has changed the wheels of their car to the 30 by 3½ inch size all around.

For an axle, use a piece of cold-rolled steel, of good quality, and of about 1½ inches diameter, turned down at the ends, to fit the Ford front wheel ball or, better still, roller bearings.

VIBRATION—POOR LIGHT.

Have a 1919 Ford roadster, which has a great amount of vibration. If I speed up the car, and shut off the gas, when slowing down, the engine vibrates just awful. It has not run much yet, and otherwise runs excellently.

The light of the Ford is poor. Am using 9-volt, 21 candle-power bulbs. The engine starts with one or two turns, which shows that the magneto is in good condition. Have attached a special plug, in the right hand head lamp, but it does not give more light.

When pulling a car stuck in the mud, where is the best place to tie the rope to, in front of the car, when pulled out by a different car? When pulled from behind?

**QUALITY
SNAP RINGS**

*More Than
a Million a Month*

Ask your
Dealer for
Quality
Snap Rings.

THE PIERCE RING COMPANY
DUSKESON, MICH.

There are vast differences in the amount of vibration developed by new Ford cars, as they come off the assembly line. The crank shaft, fly-wheel, and transmission are not balanced together and, if all three happen to be "just a wee bit" off in their balance in the SAME direction, then the result will be a "Shimmy-Sam" Ford engine. Again, sometimes these revolving parts will HAPPEN to be assembled just right. Then the result is a remarkably quiet engine.

Sometimes, the bearings are new and stiff, or the compression may not be EQUAL in all four cylinders, or the coil units may not be properly adjusted, and any of these causes, or even worn connecting rod bearings, will cause an engine to vibrate to beat the band.

Try using 8-volt bulbs, instead of the 9-volt bulbs you are now using, and use Nitrogen Type C Mazda bulbs, or 27 candle-power. These cost slightly more, but give a much brighter light.

When towing a car out of the mud from in front, tie onto the front cross member of the chassis frame, and around the front spring. And when towing out from the rear, tie onto the rear cross member of the chassis frame, where the rear spring fits in.

BEARINGS—CRANK SHAFT PLAY.

Is it enough to put in a new rear main bearing cap, to take up end play?

Are roller and ball thrust bearings, a worthwhile improvement? Will they stand up under heavy loads and give satisfaction?

Last summer, I had the Ford garage put in light-weight, gray iron pistons. As there was quite a little end play in the crank shaft, they put a new cap on the rear main bearing. Also installed counter balances. Had the cylinders rebored at the same time. Nothing was done to the transmission or other parts, as they seemed to be in good shape.

After driving about 400 miles, I began to notice an unusual vibration, and thought the counter balances had slipped out of place. Removing bottom plate, I tested the counter balances with calipers, and found them as near perfect as could be. I took a screw driver, and pried endways on crank shaft. And found 1/32 inch end play. Otherwise all right.

When the new pistons were installed, I instructed the garage to test the crank shaft for alignment. Do you think the cause due to lack of oil, or poor bearing cap? Wouldn't connecting rods suffer first, in case of lack of oil? Had changed oil every 200 miles, up to time of noticing excessive vibration, using Zeroline light oil.

If the crank shaft itself is not too badly worn, then the replacement of the rear main bearing cap with an oversize cap will eliminate any end play which may exist.

We have used one of the anti-friction thrust bearings in the rear axle of one of our own cars for over a year, and it has shown no signs of wear, or given any trouble. By holding the rear axle gears in proper mesh, it has probably considerably reduced the wear on them.

It seems unlikely that lack of oil caused the rapid wear of the new main bearing cap that was installed in your car. Sometimes repairmen pene out the metal, to make the bearing cap fit the crank shaft. But this does not wear for a very long time. It is better to use an oversize cap, and to file off the surplus metal.

CAUSE OF VIBRATION.

My 1917 Ford has recently developed a vibration which it never had before. This shows up when pulling hard on a hill, or in deep mud when in low gear, or almost anywhere in high gear when the engine requires a little power to pick up speed, or if accelerated quickly. But on a level—after speed has been acquired—the vibration stops.

Compression is about 50 pounds in each cylinder and the engine pulls very well. For more than a year I have noticed a dull "knock" (only occasionally, when pulling hard in high on long hill and engine pretty hot). Since the vibration has started, I noticed this knock more frequently, and even a few times when pulling hard in low gear.

I did not weight the piston I lapped in, but bought two at the same time, that looked to be just the same. The one that I have not yet

installed is only one ounce heavier than the old one that I removed. Retarding the spark will sometimes stop the knock.

Wear, in one or more of the main bearings of the crank shaft, will cause a dull knock, which is most evident when the throttle is opened for accelerating, or when pulling hard on a steep hill on high gear. But it is possible for such a knock to also be noticeable when the engine is pulling hard on low gear.

If the piston weights are within two or three ounces, this will not tend to cause much vibration. We think that the vibration that you mention is due to worn main bearings, which allow the crank shaft to vibrate and pound when the pressure of the connecting rods against the crank shaft are severe.

Retarding the spark stops the knock—because it also stops much of the pressure against the crank shaft. It will be necessary to tighten up, and perhaps reft, the main bearings of the crank shaft.

HOW LONG, OH, FORD?

I have driven the same Ford touring car since 1912. And I think it will give good service for four years more. (Bully for you and your Ford. Editor.) It has been but small expense to keep in repair. Of course you will surmise that I have taken good care of it, which is true.

Three and a half years ago I installed tire filler in each tire, which is still good in three of the casings, and for one I had to get a new casing.

The same Holley carburetor is still in use—though I think there may be a better one. I am aware of your policy not to recommend any particular fitment in the magazine, but may I ask your opinion as to which is the best carburetor?

As fuel has changed so greatly since about 1915 or so, and as modern carburetors are much better adapted to handling the poor grades of fuel now available, we think that you will obtain increased fuel efficiency and better engine performance by the installation of a carburetor of recent design.

As some owners wish easier starting, as others wish fuel economy, and as others want power and speed, it is impossible for us to recommend any one particular make of carburetor in preference to the others.

FUEL SAVING.

About one year ago I wrote you regarding the use of a large stove and a heated intake manifold for 1917 Ford touring car. And you published the reply in the issue of June, 1920.

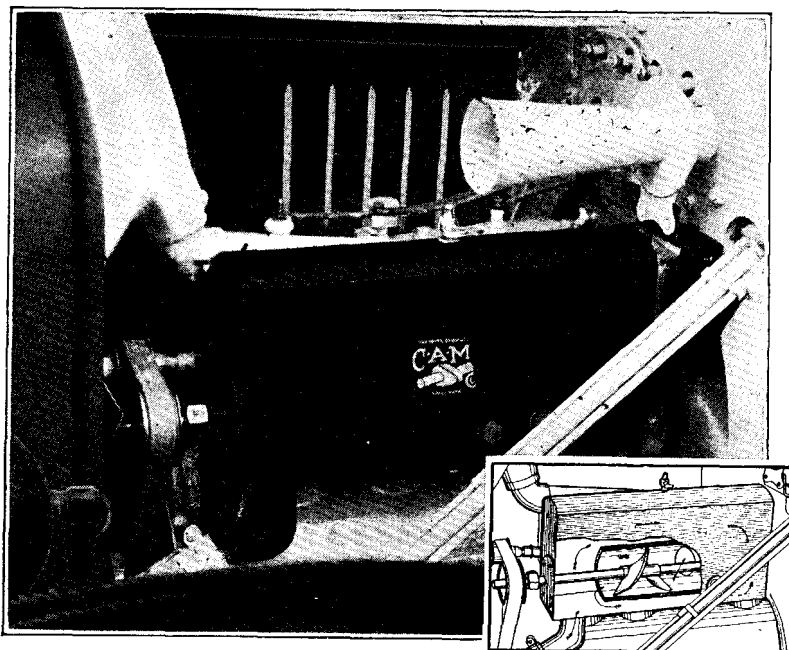
Last year I put on a new style carburetor and used the large stove in combination with the heated intake manifold. I put a valve into the stove, so as to admit cold air by turning a lever on the dash. I found I could get better results by not using this valve, but by taking the air directly through the stove and heated intake manifold.

Last year, I drove up through the Green mountains of Vermont to Montreal and returned down through the Adirondacks, by the way of Troy, New York, Jacobs' Ladder in the Berkshires and home, a distance of 840 miles. There were three persons in the Ford car, also a camping outfit, making a total weight of 2,560 pounds. On this trip I averaged 25 miles to the gallon. And the total average for the year was 24½ miles per gallon.

The year before, with the regular Ford fittings, with large stove and regular Ford manifold, the average was 20¼ miles to the gallon. I think this experiment proved very satisfactory and in favor of much heat to vaporize present day fuels. Socony gas used mostly.

We are very glad to learn of your experiences in fuel saving. As the field for Ford accessories is so large and varied, we cannot cover it all personally, and so we need all the help and suggestions from our readers that we can get.

In addition to your 20 per cent increase in fuel mileage, it must not be forgotten that, when you saved fuel, you lessened the amount of carbon deposited, and also saved lubricating oil, and wear and tear on the engine.



C-A-M-CO Cooler Combined Reservoir and Turbine Pump

Keeps Ford Motors Cool

WITH THIS NEWEST TYPE MOTOR COOLER YOU GET

- 1—2-3 more water.
- 2—Steady flow of water through engine.
- 3—Worm motor that cannot overheat.
- 4—15% more mileage on gas.
- 5—50% more mileage on oil.
- 6—75% longer life on engine.
- 7—100% satisfaction.

PUT ON IN 15 MINUTES. NO HOLES TO DRILL. NO MACHINE WORK TO DO.

Cools Boiling Ford in 1 Minute!

DEALERS WRITE for Agency Proposition

**Consolidated Accessories
Manufacturers Co.**

Factory and General Offices
FREDERICK, MARYLAND.

"C-A-M-CO" COOLER is a steel, non-rust, double seamed 2½ gallon water-tight reservoir containing an aluminum Turbine Pump, driven by flange pulley on ½ inch cold rolled steel shaft through bronze, self-lubricating bearings with brass non-leak stuffing box; so constructed that the water will continue to circulate even if pump should stop.

**If Your Dealer
Can't Supply
You Mail This
Coupon**

C-A-M-CO.,
Frederick, Md.

Gentlemen:—Please ship at once, parcel post prepaid one C-A-M-CO. COOLER for which I am enclosing \$19.50. You guarantee to refund money after ten days if it does not do all you claim for it.

Name.....

Address.....

Ford News Notes

By ROY BUELL.

Detroit, Michigan, May 11th, 1921.

All of the former employees of the Ford Motor Company have been called back to their jobs, officials at the Highland Park plant announced today.

This means that approximately 48,000 men engaged in production of Ford cars before the shut-down of last January have received notice that their jobs are open and the company can place them at work.

About 3,000 men it is understood, secured other positions during the three months' period when work was comparatively slack, so that the present force numbers approximately 45,000.

Despite this decrease in the numbers working all previous production records have been surpassed during the past two weeks, when an average of approximately 4,000 cars daily have been produced.

During the latter part of May, officials announce, it is probable that the force of men will be increased by calling in new help from outside.

More than 100 huge steam drop forge hammers, costing in excess of \$1,000,000 are being ordered this week by the Ford Motor Company, officials announced today.

This equipment, added to that at present installed at the Highland Park plant, will bring to the Ford Company the distinction of having the largest drop forge plant in the world, with the possible exception of the Krupp Works in Germany.

The expansion of this department of the great Ford industries is in keeping with the announcement in the Motor Times two weeks ago that the Ford Company had planned expansions for the next few months which would bring it to the unique condition of being industrially independent.

The new equipment is designed to produce every steel forging used in construction of Ford passenger cars, trucks and tractors. The present plant produces only one-eighth of those needed.

The present forge shop, already one of the largest plants of its kind in the United States, has an equipment of about 20 great steam drop hammers and several smaller "upsetting" machines for forging out small parts such as gear blanks.

The addition of the hundred great machines, some of more than 100 ton capacity, will make necessary the purchase of these forgings outside the plant as is now the case with the greater proportion used.

The machines are scheduled for delivery beginning in July. They will probably be installed in the present foundry buildings at the Highland Park plant, it is understood, which are to be vacated soon by the removal of the foundry equipment to the Rouge plant this summer.

The engineering department is arranging to train men for the new jobs to be created by the expansions in the forging plants.

After several months of experimentation, Ford officials announce that production of steel balls for the ball bearings used in automobile manufacture will start soon. Special machinery designed by Ford engineers is now being successfully operated on an experimental basis.

The manufacturing of the steel balls presenting difficult problems for the engineers has been reduced to the Ford efficiency system in which human labor plays the smallest possible part, the officials state.

This Is the Biggest Replacement Year in all Automotive History

THE restricted buying of recent months has caused owners to use make shifts to keep the old car going. Now comes the time when the repair business **MUST** see an increase to get these millions of cars through the summer.

Feeling the pulse of the automotive industry, we know that these vast numbers

of cars must be repaired or get off the road; that they will not be replaced by new cars, but that they will be put in the shop for adjustment and repair that has been too long neglected.

All indications point to 1921 as the start of the biggest replacement activity the industry has ever known.

GET READY FOR THE REPAIR RUSH

CANEDY-OTTO Automotive Equipment

WILL HELP YOU GET AND HOLD THE BUSINESS

Be prepared to turn out **MORE WORK** at **LARGER PROFITS**; to make **LOWER PRICES** at the **SAME PROFITS**—to simplify operations—provide **EVERY** workman with tools he can **ALWAYS** use—do these things with Canedy-Otto equipment. We were leaders when the automobile was invented and we still lead.

In the rush of repair work which is now before you, Canedy-Otto equipment will play a most important part. Get ready for the emergency. The

shop which can serve best and quickest and most efficiently will reap the harvest.

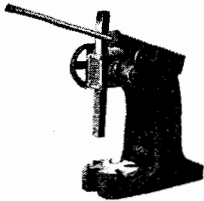
GET THE EXTRA PROFITS THAT PERFECT EQUIPMENT GIVES

Our tools and equipment are made to the highest standard known. Our prices are moderate. There is a distinct profit value to you in everything we make. Talk to your jobber **NOW** about your repair equipment needs.

Canedy-Otto Manufacturing Co.

Builders of Blacksmith, Automotive and Machine Shop Equipment

DEPT. M. A. CHICAGO HEIGHTS, ILL.



C-O ARBOR PRESS NO. 1

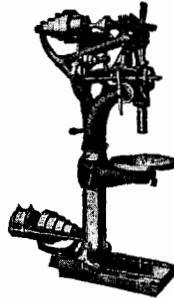
Takes $3\frac{1}{2}$ -ton pressure; finest material; handles up to 14" work; fastens to bench or lathe; angular pressure of 20 degrees; quick adjustment; cross pinion locks to lever. Leverage 48 to 1. Net weight, 125 lbs.

Handy Bulletins
Showing Items
You Need
Send for Those
You Want



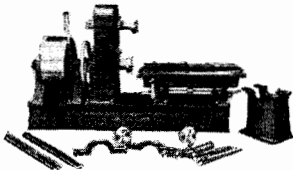
C-O JUNIOR MOTOR STAND

For Ford and Chevrolet motors. Is most modern ever designed, permitting entire power plant to be securely fastened by means of a special yoke and spindle in less than 30 seconds. Motor can be completely revolved in circle, locked at any desired position by means of friction stop, making any part of motor, including all the valves, accessible. Tool tray is regular equipment.



C-O POWER DRILL NO. 36

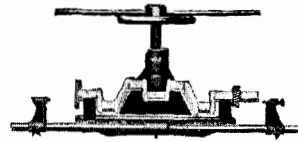
Back-geared power feed, adjustable automatic stop and instantaneous feed release, 8 speeds; height 75 in.; drills 0 to $1\frac{1}{2}$ in.; circle 21 in.; spindle travel $9\frac{1}{2}$ in.; furnished with either No. 3 or 4 Morse Taper; spindle to table 27 in.; spindle to base 39 in.



C-O UNIVERSAL

BURNING-IN MACHINE

Will positively burn-in and run in the bearings of all internal combustion motors regardless of type or make. Simple and flexible. Silent drive. A money-maker in every shop.



C-O STRAIGHTENING PRESS No. 2

For straightening work of all kinds, such as shafting, axles of any size, crank and cam shafts. Takes 6 ft. between centers and has a capacity of $2\frac{1}{2}$ in. stock.

NOTES FROM OUR CORRESPONDENT IN FRANCE

WHY MOTORING IS COSTLY IN FRANCE.

It is often declared that owners of Motor Cars are now obliged to put them up in the garage in order to avoid the running expenses. And the price of Petrol is not to be left out of reckoning. The fact is that the Automobile in France, one way or another is nearly taxed out of existence.

There are for example four different government taxes on a car:

1. A principal tax PER CAR, per year. For Paris at present it is 270 francs.

2. A tax on the horse-power, averaging 20 francs per horse-power, but increases to 45 francs per horse-power for cars of 60 horse-power and upwards.

3. The two foregoing are now totalled and an increase of 25 per cent added.

4. Then there is the "circulation" tax, (a sort of tax for the maintenance of the roads, etc.), rated on the horse-power again. A Ford (as it comes in the range 13 to 24 horse-power), pays 200 francs per year. A 30 horse-power has to pay 300 francs and a 60 horse-power, 500 francs.

On these figures you may make up the charge for a FORD at 815 francs per annum, (say \$163 normal). (In parenthesis I may mention that in England the total taxes for a FORD per year are £23—which at normal rates equals \$115. And all these taxes are not paid by just writing out a cheque for the amount and posting it off to a certain office. If your time is worth anything at all it will cost you a pretty figure for hanging around half a dozen insalubrious huts and fill-up and delivering sheafs of forms and producing all sorts of "Papers"—to prove that you are really the man who wants to run the car!

And so when the Fordist has paid his 800 francs odd he looks 'round for his Petrol. Since that fateful day at the beginning of August in 1914, when his fuel was to be had for about 40 centimes the litre,—normally less than 2 francs the gallon,—he has been taxed, and taxed, and more taxed, until he now pays about 72 francs the gallon. Some of the increase of course has gone to the gentlemen in the Youessay country who have kindly obliged by increasing their price because there has been a war over here.

A big importing firm gave me the following figures as to the way the money goes on the Petrol, per litre:

	Francs
Average price at U. S. A. Port.....	1.40
Storing, loading, shipping and general charges .....	.0405
French Importation tax, since first July, 1920 .....	.016
French Customs Tax, ordinary.....	.10
Extra Tax, since 25th June, 1920.....	.20
New Tax "chiffre d'affaires" since 31st Aug., 1920 (1.1%).....	.0223
Various expenses at port and transport to Rouen .....	.1618
PROFIT to the POOR wholesaler!.....	.02

Total per litre.....1.9606 francs

But when you get your petrol INSIDE the great City of Light,—ah! that's something extra! And you are asked to subscribe another 20 centimes per litre

2.1606

And you won't forget the poor retailers and other individuals who "occupy" themselves over the petrol, will you? THEIR little profits of about 50 centimes per litre have to come on the top of the price I have mounted up, and which put into simple American language means a total of about \$2.40 per gallon. I am told that your price at New York is 35 cents the gallon! Smells queer doesn't it?

Several of our newspapers and Trade Journals continue to print supposed credible news about Mr. Henry Ford being very short of capital. Our leading Trade Paper even pretends to have got hold of a "private" circular sent out from Detroit to the agents. From this circular they get the following information: "When the Ford Co. voluntarily reduced its prices the public thought that the Company would still be making profits on each car. But this was erroneous. On each car sold there is a loss. The following figures are details of the losses or profits, which are published for the confidential view of the agents in order that they may understand and appreciate the sacrifices which the Company have been willing to make in order to allow business to continue:

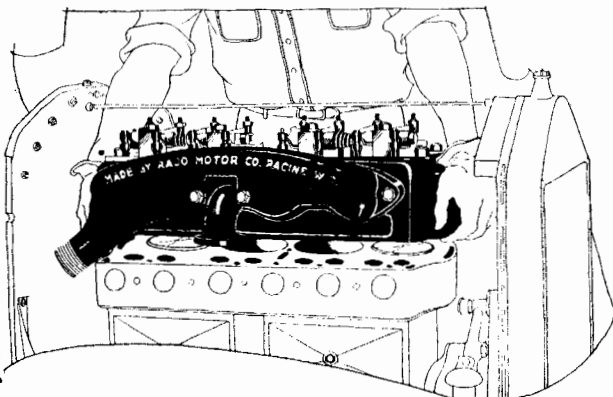
	Dollars	Loss
Runabout, 2 seats.....	30	Loss
Touring, 5 seats.....	44	Loss
Coupe	30	Profit
Chassis	1	Profit
Interior Drive.....	31	Loss
Van	30	Profit
Tractor	60	.....

It will be seen that the loss falls upon the cars for which there is the greatest sale, and it doesn't take the journalists long to multiply the loss per car by the number of cars turned out—and there you are, Mr. Ford, going down to perdition in a handcart right away.

One of the newspapers, however, extinguished the exuberance of his confrères by printing an interview with Mr. Ford in which it is stated that the "supposed loan of \$75,000,000 dollars was a blaque." Henry Ford is reported as saying:

"I was totally ignorant of the fact that I had need of \$75,000,000 until certain financial sharks came and tried to convince me of the fact. But I think I made it pretty clear to some of them that the Ford Company knows its own business best. The closing of the factory during January was purely for organization purposes. The Company are not in difficulties for orders. We got orders for 67,000 cars during January, and we don't expect to have to reduce the wages of any of

The **RAJO** Valve-in-Head Cylinder Head comes to you with full instructions. All you need do is unbolt your present Ford cylinder head and replace the **RAJO** Head attaching connections. No fitting or adjusting. The result is a powerful valve-in-head motor in a class with any on the road. **EVERY** **RAJO** Head has sold another because every user is an enthusiastic booster. You will be one too.



Can Your Ford

Go 55 Miles an hour?

Throttle down to 4 miles an hour?

Climb steep hills without laboring?

Go 25 — 40 miles per gallon of gas?

Your Ford, open or closed car, without any special gearing or a dollar's worth of accessories—equipped with **RAJO** Valve-in-Head Cylinder Head will do **ALL** of these things **ALL** of the time. The sure fire, powerful, valve-in-head principle, long used in the world's greatest racing cars is the reason for this marvelous performance, because **RAJO** makes a perfect valve-in-head motor of your Ford motor, and does it without fitting or adjusting, and in 3 hours' time.

Think of driving in heaviest traffic without having to change speeds, saving gas, saving your motor, saving bands, and saving your entire car. **RAJO** makes your Ford a real car as nothing else can.

A **RAJO** equipped Ford Truck will pull large loads and will save time and cost of operation. Owners of Ford truck fleets are proving **RAJO'S** worth every hour of the day.

If you really want to speed **RAJO** will drive your Ford race 80-100 miles an hour, specially geared. Joe Jagersberger, former famous racing driver, designer and builder of **RAJO**, will guarantee that, and Louis Disbrow, King of Dirt Track Racers, now sales Manager of **Rajo Motor Company**, will tell he's done it.

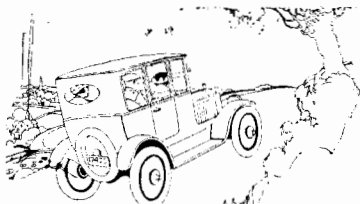
A RAJO Ford Can!
A RAJO Ford Can!
A RAJO Ford Can!
A RAJO Ford Can!

DEALERS:—Write for the **Rajo** franchise—the greatest Ford equipment proposition in the country today.

Mr. Louis Disbrow, dirt track racer of international fame, is our distributor for Illinois, Indiana, Iowa and Michigan, at 2118 Michigan Ave.

HERE'S THE BEST FORD STORY YOU EVER HEARD

A Wisconsin sheriff heard so much about the **RAJO** Head he decided to drive down to Racine (30 miles) and get one. His Ford made 35 miles an hour at best on the way down. A little over three hours later he was on the way back to Milwaukee going 58 miles an hour—**RAJO** did it, and nothing but **RAJO**. And to "top it off" he went out to a hill that a Ford never climbed before and took it without a murmur. That much for **RAJO** power and speed.

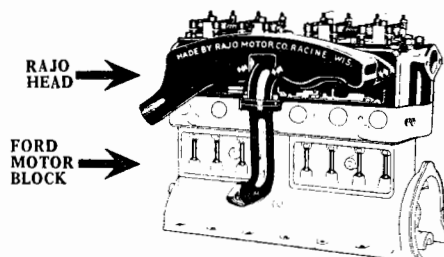


RAJO

VALVE-IN-HEAD

CYLINDER HEAD

For Ford Cars and Trucks



If you own a Ford fill out this coupon for **FREE RAJO** literature. Send it today and learn more about this remarkable device.

RAJO MOTOR CO., 1355 Racine St., Racine, Wis.

Gentlemen: Please send me free literature on **RAJO** Valve-in-Head. Check which you want: Passenger Cars—Racing Cars—Trucks—Dealer Proposition.

Name

Address

Dealers Use Letterhead.

Rajo Motor Company, 1355 Racine St., Racine, Wis.

those men still employed, although possibly we may have to employ them only a fortnight per month, taking half of them alternatively, until the automobile crisis is at an end. For the motor industry will never perish. It supplies the vehicles on which the modern world moves. The future of the busi-

ness will be assured for as long as the world turns 'round.'

Whilst the foregoing may not be in any way "news" for you, I have thought that it might interest you to hear how the story of the Ford is being told in another country many thousands of miles away from Detroit.

WHAT I LIKED ABOUT THE GARAGE WHERE I BOUGHT MY AUTO

By FRANK H. WILLIAMS.

It was neat, well lighted and attractive.

The show cases in which parts were displayed were immaculate, free from dust and the glass polished brightly.

The goods on display in the show cases looked fresh and new and up-to-date.

The entire garage had an air of alertness and enthusiasm that registered a big hit with me.

The salesman was kindly and courteous and knew what he was talking about and didn't press me to buy too strongly.

The garage was definitely mapped out. The sales room was a salesroom alone and didn't have any storage stuff in it or repair shop work scattered around and an inspection of the garage showed me that much thought had been expended in planning the building so that repair work and service could be handled most efficiently and so that the sales room would have plenty of light and air.

There was a phonograph in the sales room and an invitation was extended to me, by a sign near the machine, to select a record from the cabinet and play it if it was impossible for the salesman or some other employee to attend to my wants immediately. I did as suggested and thoroughly enjoyed the selection.

The salesroom had a number of other interesting and novel things. For instance, there were a number of framed photos on the walls showing cars purchased by various prominent people of the city. The owners of the cars had been photographed in the machines or standing by the machines and under each photo was a typed memorandum telling the names of the owner, the type of car and the other cars purchased from this same garage which the owner of the car shown in the picture had formerly owned.

I found that the garage was a firm believer in home town progress and also that its two owners and its sales people were leaders in

local doings. One of the owners belonged to the Rotary club, while the other belonged to the Kiwanis club and all of the sales people were members of the local Chamber of Commerce. This made me feel that the garage was a live wire proposition and that because it was so deeply interested in local progress it would go the limit in helping me to get what I wanted, as satisfied local customers would do more to push along the progress of the town than any number of local folks who got what they wanted through the mails or out of town.

The salesroom had an interesting window display and changed these displays frequently. Almost every time I passed the salesroom I found a new display on view in the show window and I always found this display so interesting that I stopped and looked at it. This was another indication to my mind as to the store's alertness.

There was no confusion as to prices and terms of the car I was thinking of purchasing. The garage had issued a little booklet in which all the prices and the exact terms under which the car would be sold and financed by an automobile financing corporation had been printed. I found this booklet a real aid in helping me decide how to pay for the car.

The salespeople were candid about deliveries and other matters connected with the car and I felt that I could believe everything they said. This added to my confidence in the concern and to my desire to patronize it.

The sales people seemed to regard me as a friend instead of merely as a prospect and this, too, was true of the proprietors. And, naturally, this made me have an even better feeling toward the garage.

This is the sort of a garage from which I purchased my car.

Would I have liked to purchase a car from YOU?

Think it over!

McKAY BUS EQUIPMENT.

With the coming of good roads and the demand for rapid transportation, McKay Carriage Co., Grove City, Pa., have added to their line of Bus bodies beside their regular fourteen passenger Ford one ton Bus body, a School body for the Ford one ton truck, built along the same lines, this body is built especially for the purpose of hauling school children in the Centralized School Districts. The Ford regular Bus body as well as the School

body are built with the full swell side and rear, with a wooden wheel house which gets the body down low on chassis and at the same time gives a good roomy job, all windows drop and are equipped with anti-rattlers so as to be noiseless, upholstered in a good grade of imitation leather with spring cushions, complete with dome lights, painted and ready to mount.

These bodies are shipped, painted, complete ready to mount on Ford one ton chassis.



BLINDED!

You Can Prevent This

Every Ford owner knows the trouble of being blinded by the rays of the sun or headlights of motor cars. This momentary blindness often results in accidents.

For your own peace of mind—to prevent eye strain and consequent results and also to protect the life and limb of yourself and family, equip your car with the **PRESTO VISOR**.

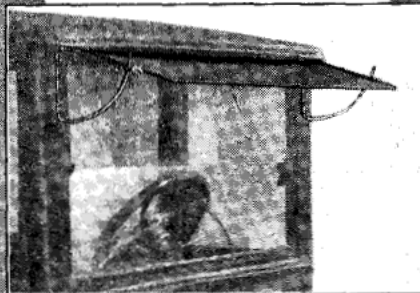
Visor of high grade, black top material; brackets nicked. Easily applied. Adjustable to any angle. Fits any width of open or closed car—does not interfere with handling of top or windshield.

MODEL A—FOR ALL CLOSED CARS
MODEL F—FOR FORD TOURING CARS

DEALERS:—Here's a new Presto product that is a big seller. A necessity for every car owner. Patent brackets and sturdy construction make the Presto superior to any other device. Your sales are limited only by the number of car owners in your vicinity.

Presto **STORM & GLARE** *Visor*

Price \$7.50



West of the Rocky Mts. \$8.50

METAL SPECIALTIES MFG. CO.
338-352 N. KEDZIE AVE., CHICAGO, ILL.

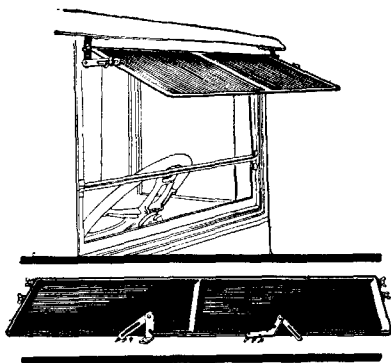
EQUIPMENT REVIEW

A monthly department in which manufacturers are given an opportunity to furnish news and views concerning accessories, equipment and ideas for the Ford car.

FOR BETTER DRIVING

The McKinnon Dash Company, 250 Amherst St., Buffalo, N. Y., is manufacturing a new practical automobile visor, which is of great convenience to drivers in shading their eyes from the sun and preventing the windshield from becoming clouded from rain or snow.

The McKinnon Visor has several important



features of construction. Its frames are one piece electrically welded steel with no joints to shake loose. They are covered with fine quality artificial leather, beautifully finished, the upper side being black, the lower side green.

This Visor is easily attached and adjustable to any angle because of the slotted screw openings in its brackets. It is also removable altogether at will. Once adjusted, it is held firmly in place and will not work loose or rattle. The average weight of the McKinnon Visor is 3 3-4 pounds. It is made in four sizes, from 38 to 42 inches, and can be used in connection with any top construction or body design. It sells at a list price of \$5.00 and is already on the market and in stock in most sections of the country.

A PRACTICAL ITEM

The Face-to-Face Gauge is a visible gasoline gauge for use on Ford cars. The advantage of this Gauge is the fact that it accurately records the amount of gasoline in the tank at all times in plain view of the driver.

The unusual feature of this gauge is, that it uses no wires, no spirals, no corks, no air pressure, or any other complicated devices that have been attempted before.

The principle of this Gauge is similar to the principal of a guage on a steam boiler. The Gauge contains a cylinder that is installed at the exact level of the gasoline tank, and as the gasoline rises or falls in the tank, it will do likewise in the gauge cylinder. And this upward and downward movement within the cylinder acts upon a specially constructed and patented steel float and steel spring, which very accurately records the amount of the gasoline on the face of the gauge.

This Gauge can be installed in a very short time with no material injury to the mechanism of the automobile, and it will outlast the car. Once installed there is nothing to get out of order.

The price of this Gauge is \$2.75.

Another feature of the Gauge is, that the indicating dial is on the dashboard in front view of the driver at all times. This is a convenience that no other car has at the present time.

The unusually careful construction and workmanship in this Gauge, plus the use of only the highest grade materials, make it an article of scientific accuracy. Although patented sev-

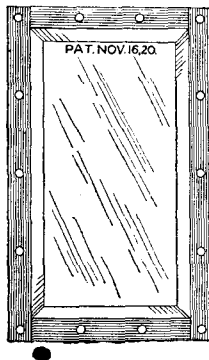


eral years ago, it has since been perfected and is being marketed broadcast at the present time. It is an accessory of convenience that should appeal to every man that owns or drives a Ford car.

Leitch-Nelson Co., 222 W. Congress, Detroit, Mich., are the manufacturers.

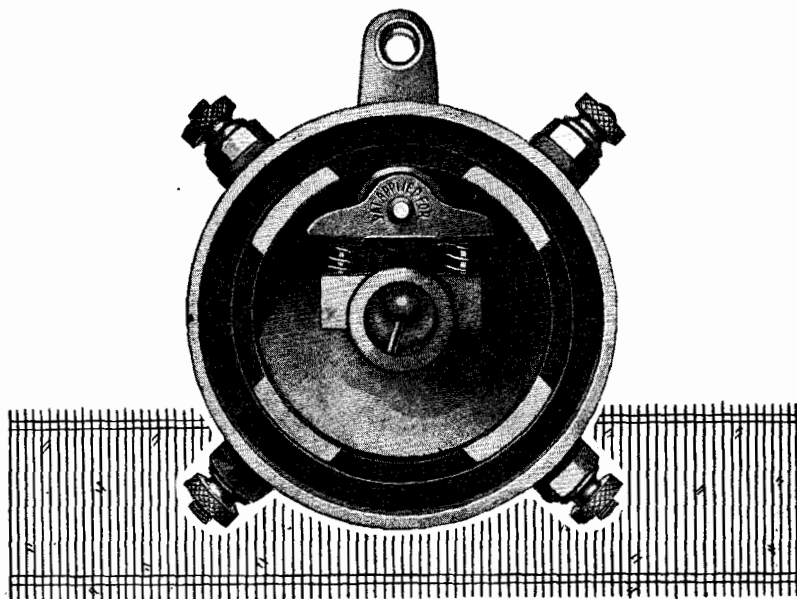
REGARDING BEVELITE.

Bevelite is the trade name of a new curtain light for all Ford Back Curtains, 1917 to 1921 inclusive. The nickel frame is $\frac{3}{8}$ " wide after it is bent over and pressed down on the outer edge of the light, the bevel of which has previously been embossed to imitate bevel glass.



It is applied to the curtain with 14 nickel fasteners. The lights are furnished in sets of three and are carefully packed in cartons suitable for either mail or freight shipments.

This is a product of Replace Light Mfg. Co., 2308 Sixth Avenue, Rock Island, Ill.



NECEDAH TIMER

THE BRUSH IS THE THING

for Ford Cars and Fordson Tractors

You Buy Tires for Mileage—Why Not Timers?

AFTER all, it's mileage that counts in timers—not novelties. You wouldn't buy a tire because it just "looks good"—the same applies to timers. When you buy a Necedah Timer, you get more than timing equipment—you get a positive assurance of unlimited mileage and trouble-proof service.

Cut Out "Chance" in Buying Timers

Study the two illustrations below and you will see why the perfected brush assembly of the Necedah gives you the greatest timing value obtainable.

The brush presses squarely and firmly against the fibre ring and it can't "jump," "arc" or pitter the contact segments. Rebound and arrested sparks are impossible and there isn't a chance for the roller to wobble and wear waves into the segments and fibre.

After unusually long and hard service, the roller on the Necedah can be replaced without the use of tools. Simply take off the shell, lift the old roller out of the hub and insert the new one. Keep the Necedah Timer properly lubricated and it will last indefinitely, giving you an exceptionally low-cost timing service.

Necedah Timer, Complete.....\$2.50
Roller Replacement......75

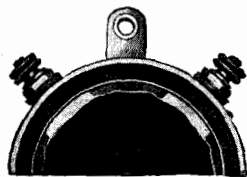
DISTRIBUTORS WANTED

We have a profitable proposition for distributors for the following states: Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, New York, Pennsylvania, New Jersey, Delaware, Virginia, West Virginia, North and South Carolina, Alabama, Florida, Georgia, Tennessee, Canada, Mexico. Write for particulars.

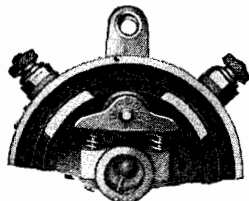
NECEDAH MANUFACTURING CO.

NECEDAH,

WISCONSIN.



Illustrating the effects of the jumping roller in ordinary timers.

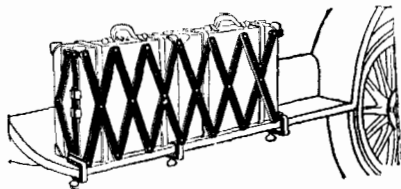


The Necedah Timer—no waves or bumps even after unusually long service.

AUTOMATIC LUGGAGE CARRIER.

It is touring time and the average car owner is thinking of touring needs which should include the Automatic Luggage Carrier, manufactured by National Carrier Co., 707 Second Ave. S., Minneapolis, Minn.

The "Automatic" is made to especially accommodate those wishing a carrier adjustable to different sized suit-cases, sample cases, packages or parcels, and at the same time giving a good STRONG, RIGID Carrier that will stand the excessive strain.



With the handy "Automatic" all the bulky luggage can be safely and conveniently carried on the running-board instead of crowding or cluttering the tonneau or in any way disturbing the comfort of passengers. Constructed of extra-heavy steel throughout, with three good strong steel clamps which lock to the running-board and hold the carrier absolutely RIGID at all points. End-gates operate automatically with opening and closing of the carrier, and are strongly and securely connected to the carrier itself. Adjustable to any size package up to 70" in length. Quickly and easily attached or detached without tools. Cannot rattle. Folds into package 7 $\frac{1}{2}$ "x19 $\frac{1}{2}$ ", weight, 12 lbs., finished in black enamel. The cost is \$6.00.

AUT-O-SEK FOR AUTO TOPS

A scientifically correct top dressing for automobiles is now on the market under the name Aut-O-Sek. It seems that top fabric begins to break down even before installed in the top of the car, through the drying out of the oils and the difference in contraction between the coating of the top and the backing layer. Aut-O-Sek penetrates and lubricates the fibre of the top material, preventing deterioration and prolonging its life indefinitely. Aut-O-Sek on old cars covers and waterproofs all cracks in addition to giving a rich, black lustre-like-new top. Aut-O-Sek will not check nor peel. It is wiped on the top with a rag and a quart is enough for a five passenger car. The price is \$2.00 a quart and it is manufactured by Sek Mfg. Company, 2750 W. Madison Street, Chicago, Ill.

ADJUSTS BRAKE BANDS

One of the most recent necessary Ford Accessories placed on the market is a brake and reverse band adjusting mechanism manufactured by the Michon Manufacturing Co., Toledo, Ohio.

By the use of this device, the manufacturers claim, it is no longer necessary for the Ford owner or driver to remove the transmission case cover to effect an adjustment of the brake and reverse bands, as the adjusting lock nuts for both bands are carried through on a shaft to the outside of the transmission case—as is done with the clutch band adjustment only, on the Ford Car as manufactured.

In this way, all three bands can be adjusted by the mere application of a wrench to the proper bolts outside the transmission case.

"We thus eliminate," states Mr. Michon, president of the company, "the dirtiest job on a Ford"—that of removing the transmission cover and plunging the hand and a small wrench into the oily recesses of the housing, and attempting to connect with the proper lock nut before the wrench slips from the fingers and disappears into the delicate mechanism of the transmission, clutch, fly wheel and Ford magnet.

"Every garage and repair man knows of scores of instances where this exceedingly aggravating accident has happened, necessitating, as it does, the tearing down of the whole Ford transmission housing in order to re-trieve the wrench before one dares to start the motor."

Through the greater ease and dispatch with which the brake adjusting job can be done on

a Michon-equipped Ford, a definitely increased factor of safety is introduced into Ford driving. By decreasing the "corneriness" of the task, the incentive is afforded the car owner to keep his brake equipment in a high state of efficiency, say the Company's officials. In this connection, the Director of Public Safety in a large, middle western city—after being shown the Michon device—predicted a definite place for it in the nation-wide "Safety First" campaign.

The Michon Manufacturing Co. is now in production on this device, which is being distributed to motorists through garage and accessory dealers the country over.

"SPEED" CHATTER ABSORBER

The chattering, or jerking, in Ford cars, when the foot brake, reverse or low-speed pedal are applied, is due to the fact that the co-efficient friction between the drum and the lining itself has been reduced to such a point, for reason that a glazed or smooth surface has been formed on the lining. In consequence, greater pressure has to be exerted in order to stop the transmission drum revolving, so that you get the action forward, back or stop.

When this greater pressure is applied, the action is not smooth—it allows the drum to slip for an instant and then holds, giving the jerking effect that is so detrimental to the car. This is overcome by the application of a new lining, or fresh oil. But unfortunately, when oil used as a lubricant in a motor is heated for any length of time, it loses its viscosity, consequently, the car starts to chatter.

"Speed" Chatter Absorber is a very interesting compound. Its application is simple and the result ideal. The method of applying is as follows:

First, remove the drain plug at the bottom of the transmission case, thereby removing the oil. Then take the cover off the transmission, squeeze the pedals down tight so as to express all the mineral oil, or as much as possible, from the band lining; loosen the transmission bands; place a screw driver between to separate them from the transmission; take an 8 oz. can of Speed Chatter Absorber and pour its contents slowly between the drum and the bands; turn the motor over several times during the operation so as to cover the lining thoroughly. After the bands have thoroughly absorbed the contents of the 8 oz. can, and there is nothing dripping from the drain plug opening, close the drain plug opening, adjusting the bands, put on the cover, use the same oil that was taken out of the car, providing it is still in good condition, place it back in the motor, and the chattering from that time on has ceased for the life of the bands.

It is a product of Automotive Laboratory, 721 Frankfort Ave., Cleveland, Ohio.

FOR RELIABLE IGNITION.

The Philbrin Corp., Kennett Square, Pa., has established an enviable reputation for the production of ignition equipment for Ford cars. We quote from information furnished by the Philbrin Corp., regarding the high frequency system which has proven so practical.

You know the trouble you have starting your Ford in extremely cold weather. And when piston rings leak, oil gushes up from the crankcase, soaking and fouling the plugs—or something goes wrong with carburetion—or some gas station fills your tank with heavy, sluggish fuel. These are conditions that test the Ford ignition far beyond its capacity—and trouble develops.

Here a turn of your Philbrin Switch throws on the High Frequency System, and immediately a veritable torrent of crackling sparks rains down into the firing chamber. Neither fouled plugs, sluggish mixture nor faulty carburetor adjustment can resist this flaming downpour. The compressed gas will ignite completely and instantaneously in spite of them.

The High Frequency System delivers a rapid succession of sharp, biting sparks at the rate of over 60,000 per minute. These are evenly distributed to the spark plugs by means of the special distributor blade. The mechanism is contained within the Switch and consists of a highly developed magnetic interrupter with its set of point sand condenser. These points need no adjusting and are of the special Philbrin type.

Ford Dealers

\$50.00 added profit
on every Ford you sell

We are offering a unique plan to Ford Dealers under which they can add \$50.00 to their profits on every Ford sold by delivering it equipped with House Wire Wheels at a special price to the purchaser.

The plan carries a two-fold advantage: first, it provides a new source of revenue that demands no extra selling expense or effort on the dealer's part; second, it provides an additional sales argument that, in view of public interest in wire wheel equipment, should actually have an influence on the actual sale of cars. You'll agree that you can't afford to forego a profit of \$50.00 on every car you sell. Then, why not write for particulars today?

WIRE WHEEL CORPORATION of AMERICA

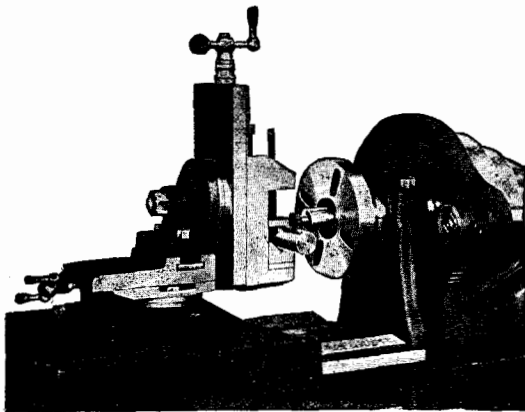
(Successor to Houk Manufacturing Company)

1700 Elmwood Avenue

Buffalo, N. Y.

AN EFFICIENT GARAGE LATHE.

Garage and service station men are constantly on the lookout for practical equipment to reduce time and increase efficiency in motor repair work. This explains the growth of sales of the 14-24-inch Sliding Extension Gap Lathe, one of the several practical items manufactured by Barnes Drill Co., 814-830 Chestnut St., Rockford, Ill.



This Lathe is a strong, well built tool and will handle a wide range of work.

It is provided with six Quick Change Geared Feeds and the spindle is exceptionally large. All gears are covered with suitable guards.

The Sliding Top Bed will be found an indispensable feature for many jobs, especially on general repair work, because it permits one to swing pieces of larger diameter through the gap and of greater length between centers than is possible on an ordinary 14-inch lathe. Lathe can be furnished with Taper Attachment, Milling Attachment and with Cylinder Boring Attachment when so ordered, at extra cost. It is especially well adapted for automobile garage and general repair work, and is being used extensively by such shops in all parts of the world. It also makes a very convenient lathe for fitting and assembling work in factory machine shops. In fact it does the work of any standard 14-inch lathe and has the advantages of the sliding extension gap feature in addition.

STUDY COURSE FOR MECHANICS

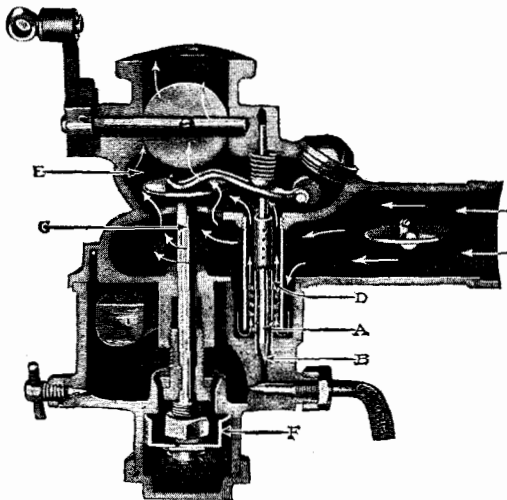
Knowing that you are at all times anxious to acquaint your readers with the latest developments in the industry, we are writing to say that Ambu Engineering Institute of Chicago, is now putting out a Home Study Course in Automotive Electricity, in addition to the residence school course in this subject.

While the residence course gives the student personal instruction, there are many ambitious men who cannot get away from their business long enough to take it, and the Ambu Home Study Course will be welcomed by those men and will prove of greatest benefit to them.

The Home Study Course has been prepared by the engineering staff of Ambu Engineering Institute and covers the same outline of study as the residence course, the main divisions of which are: Fundamental Electricity, Ignition, Starting and Lighting, Storage Batteries.

NEW FORD CARBURETOR.

The Wilcox-Bennett Carburetor Company, of Minnesota, announce their Ford model carburetor and make a claim of selling it on performance only. The principle used in the Ford model of the BENNETT carburetor has been used in BENNETT carburetors for several years in tractor carburetors for heavy duty work. With



this experience for a guide the Ford model has been designed to give the greatest economy (mileage per gallon of gasoline), maximum power for hill climbing and heavy roads, and smoothest and best acceleration without changing the adjustments. In other words, in obtaining the most economical setting for mileage, you will also have the best adjustment for all other qualities.

Note low speed needle (A) regulates the flow of gasoline at the point (B) above the high speed needle. The valve (C) is closed so that all air goes through the primary tube (D).

The action of the valve (C) is retarded by the dash-pot (F), which cannot move upward rapidly due to the slow passage of fuel around the dash-pot from above to below. However, a quick closing of the air valve (C) is obtained by the release of check valve ports in the dash-pot when the air valve starts downward, permitting the fuel to pass quickly in the opposite direction as soon as the suction, or pull, is reduced on the valve.

The action of the air valve (C) is unusual from the fact that it is not spring-controlled, which would increase the tension or resistance the more the valve opened. It is operated by its own weight only, and the resistance to the air passing it is the same at all positions. The small spring shown in the cut is used only to hold the low speed needle in place.

Due to the shape of the mixing chamber (E) the gasoline is thoroughly vaporized and mixed with the air before entering the manifold. The BENNETT patented design of manifold keeps the mixture in this same condition until it enters the motor. This insures a steady running motor, firing evenly on all cylinders.

The above cut shows the position of the air valve and low speed needle on wide open throttle. Note that the valve raises the low speed needle so that the flow of gasoline is entirely regulated by the high speed needle.

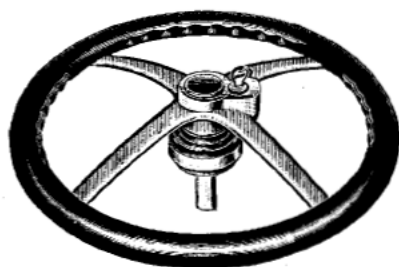
PRACTICAL CURTAIN LIGHT.

The Replace Light Mfg. Co., Rock Island, Ill., is marketing the No. 25 Curtain Light for Fords which makes a very practical replacement light. It is furnished in nickel frame, with nickel head fasteners for attaching. It is lighter than bevel glass and can be applied easily by the car owner, making a neat and satisfactory job.

A Worth-While Offer—See Page 129.

Stealing Ford Cars a Profitable Business

THE saleability of a used Ford car is recognized by everyone. That is what makes the Ford so much sought after by the automobile thief.



Perry No. 9 De Luxe for Fords
List \$15.00

You Can Fool Him

There is one sure way to do it. The minute you equip your car with a specially designed Perry Ford Lock you have made it practically thief-proof. It is absolutely impossible when the car is locked for anyone to steer it.

No matter where you leave your car you can be sure of its being there when you return. The thief who sees that Perry Lock on the wheel knows from experience that he is wasting time in an endeavor to run away with that car.



Perry No. 5, for Fords
List, \$7.00

***Perry Locks for Ford Cars
Are Made in Various Types
to Sell From \$7.00 Up***

**If Your Dealer or Garage Man Does Not Handle
The Perry Lock**

SEND US HIS NAME AND ADDRESS—WE WILL SEE THAT YOU ARE SUPPLIED. INSIST ON A PERRY, BECAUSE IT IS SUPERIOR TO ALL OTHERS.

PERRY AUTO LOCK COMPANY
2633 South Michigan Ave., Chicago, Ill.

REAR COMPARTMENT LOCK.

The rear compartment of a Ford roadster is a very handy place to carry tools, spare tubes, lunch when picnic-bound and most anything else in the way of luggage and equipment. It is also a handy place from which the light-fingered gentry may remove things when the car owner

PERFECT LOCK

for Ford Roadster
Rear Compartment Lid.



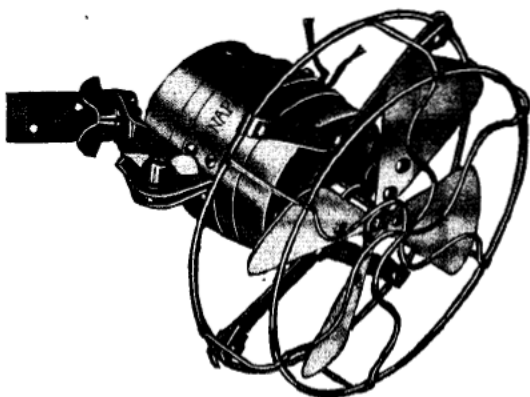
Locks Lid on both sides---
and protects it in the center.

is absent. It is therefore a wise thing to be equipped with the Perfect Rear Compartment Lid Lock manufactured by Stanard Corp., Columbus, Ohio.

This device locks the lid on both sides and protects it in the center. It is easily attached, there being no holes to drill. To unlock it, the padlock is removed, the center piece is moved to the right and the arms are swung back. It is a very practical theft insurance and costs only \$2.00.

KNAPP LIMO-SEDAN FAN.

The Knapp Electric & Novelty Co., 511 W. 51st St., New York City, has placed on the market a practical summer device in the Knapp Limo-Sedan Fan. This fan is easily fastened to the ceiling or any other part of the tonneau and is



easily attached with connecting core and control switch to the storage battery. It transforms the oppressive heat of the car to a refreshing breeze while the car is not in motion and but very little current is used in operation. This fan is well built and easily portable.

LAMINATED SHIM CO. MOVES

The Laminated Shim Co., manufacturers of laminum for shims, will remove on May 1st to their new plant and offices situated at 14th St. and Governor Place, Long Island City, N. Y. The popularity of Laminated Shims and the ever-growing demand for them, is responsible for the development of the new plant. The building is of concrete and brick construction and the manufacturing space available totals 25,000 feet. The design of the building permits the addition of two more floors of 12,000 square feet each. In placing the administration offices under the same roof with the production department, the Company believes that it will be in a still better position to serve its patrons.

AN UNUSUAL CATALOG.

There is something compelling about a well-prepared piece of selling literature or catalog. It is bound to get attention, reflect prestige and produce sales. FORD OWNER AND DEALER

has just received one of the most artistic catalogs that has appeared for some time. It is that of Paul G. Niehoff & Co. Inc., 232 E. Ohio St., Chicago, Ill. This catalog contains descriptions and illustrations of the complete line of electrical equipment manufactured by this company. It is a masterpiece of printing and a book of the sort that one would be apt to retain long after lesser productions of the press are consigned to the waste basket.

BENZER WIND DEFLECTORS.

A practical double purpose device are Benzer Rear View Wind Deflectors manufactured by the Benzer Corp., Myrtle, Cooper & Webster Aves., Brooklyn, N. Y. These deflectors are made of the highest quality one-fourth inch plate glass with

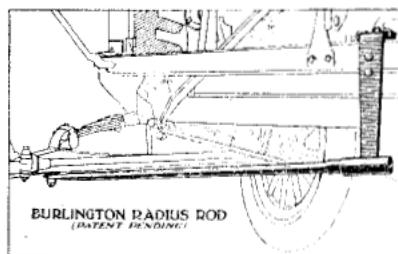


one-half inch bevel and universal fittings by which they may be attached to any car. Ground into each deflector is a rear view mirror, which enables occupants of the car to clearly view the road behind. It is claimed that big sales are meeting this practical device everywhere.

A TROUBLE SAVER AND A MONEY MAKER

The Burlington Radius Rod here illustrated is manufactured by the Burlington Motor Truck Co., Burlington, Wis.

It is described as eliminating all crank case and radius rod trouble; cannot break the crank case; cannot break an engine arm; practically impossible to bend; wheels absolutely cannot lock; improves steering; holds the road better;



insures safe and smoother driving over rough roads; no holes to drill; all parts interchangeable; no rights or lefts; saves labor and worry; can easily be installed on any Ford car or truck; requires only three bolts on a side; made of steel; every set guaranteed to do the work; and the makers add, "We guarantee this Rod will outlast the car or truck."

This Radius Rod is already in use by well known and large business concerns, Ford fleet owners, in Chicago and elsewhere, with great success and satisfaction.

STOP THE DEATH GLARE

HED-LITE GLARE DEFLECTORS

Made of Metal
Easily Installed

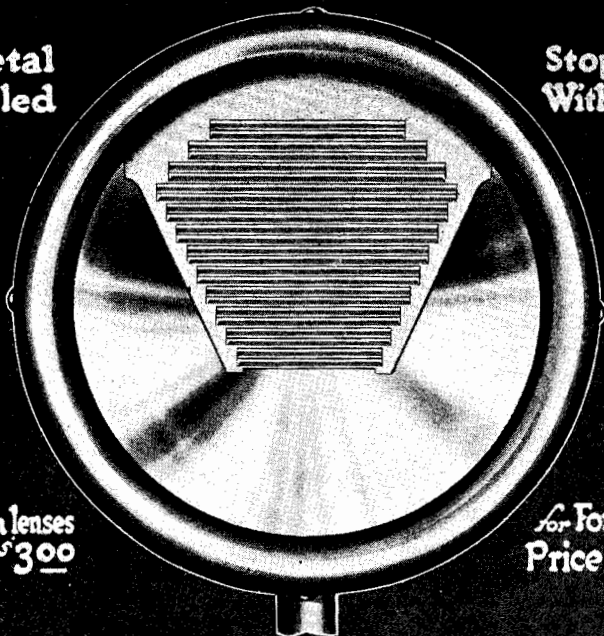
Stops the Glare
Without Dimming

LEGAL
EVERYWHERE

MONEYBACK
GUARANTEE

Three Sizes
for 8 to 10½ inch lenses
Price per pair \$3.00

Special
for Ford Lamps only
Price per pair \$2.00



THE PENNYPACKER CO.
2206 S. Michigan Ave. Chicago, U. S. A.

Car Economy

*I used to think I needed gas
To run my flivver—sill ass.
But now I take a magazine
Instead of buying gasoline.*

*An advertisement showed me that
The "Hayfield," fifteen dollars flat,
In carbureting so behaved
One-third the gas was always saved.*

*The spark plug "Zip," upon my word,
Accounted for another third.
It made a spark so fine and large
It fired all the gaseous charge.*

*Thirty-three one-third per cent
Of saving to the credit went
Of "TOM AND JERRY PISTON RINGS,
Close To The Cylinder It Clings."*

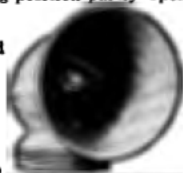
*Tydol, Gulf, and Socony,
You are nothing now to me.
Because I take a magazine
Instead of buying gasoline.*

Normal position
facing forward.



**RADIATOR
SAFETY FUNNEL CAP**
A Stationary Filler Cap. A
Radiator Cooler. A Practi-
cal Funnel. A Reliable
Overheat Meter. Good
Looking. Sure.

Cooling position partly open.



Cast Aluminum Highly Polished

\$3.75 Prepaid

Send for Circulars

**RADIATOR
FUNNEL CAP CO.**

3852 Grand Boulevard, CHICAGO

SOMETHING WORTH WHILE

Car owners have shown a great deal of interest in Glov Kit—a new accessory which was announced in the May issue of Ford Owner and Dealer.

The Glov Kit is the invention of a practical motorist and fills a long felt need. Glov Kit as the name indicates, consists of a pair of gloves, but they are real man's-size gloves, which not only protects the hands, but reach up over the sleeves and cover the whole arm. Whenever it is necessary to change a tire or make some minor adjustment to spark plug or do any one of the other incidental jobs, which every motorist is familiar with, it is only necessary to slip on these long, protecting gloves and keep not only hands, but cuffs and coat sleeves free from oil and grease.

Included with Glov Kit are four handy tools—a substantial screw driver, an adjustable end wrench, a pair of pliers and a spark plug wrench. When not in use, Glov-Kit is rolled up and slipped under the cushion or in the door pocket, ready for the next dirty job.

The price of the outfit is but \$3.00, and the Glov Kit Company, 114 North 15th Street, St. Louis, Missouri, report that motorists are ordering them in large numbers.

DEALERS-OWNERS

**A New Invention—Cooks Your
Meals While Touring**

The **AUTO COOKER** solves the food problem for tourists. Cooks meals while you ride—meats, vegetables, hot drinks. Exhaust supplies the heat. No odors—no troubles. Attached in one minute.

Price \$6

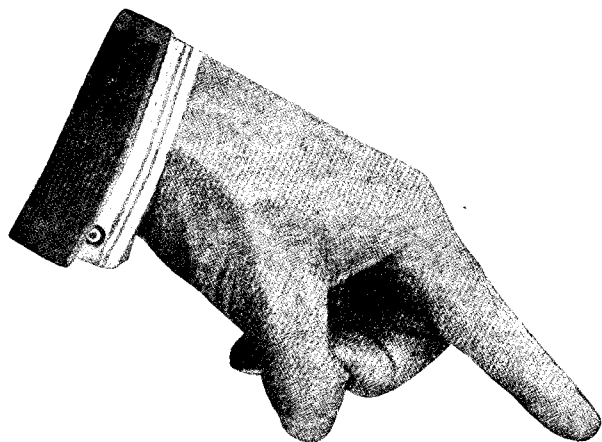
Ford models ready for delivery—other models soon.

The Auto Cooker Co.

97 Glendale Park, ROCHESTER, N. Y.

Ford Repair Book Free—See Page 129.

When writing advertisers—Just say **FORD OWNER and DEALER**



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You!**

***This Valuable
Ford Car Repair Book
With
Ford Owner and Dealer
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FORD CARE AND HOME REPAIRS is one of the most practical — valuable — interesting hand-books ever published for the owner or driver of a Ford car.

It is filled with helpful illustrated articles telling in an interesting, simple way how to adjust, repair or care for practically every part of the car.

The information contained in it is reliable and expert and it will save money, time and trouble for any Ford owner.



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For a limited time we are offering a copy of FORD CARE AND HOME REPAIRS FREE with every year's subscription to FORD OWNER AND DEALER MAGAZINE at the regular price \$2.00. If you are now a subscriber this also applies to a renewal of your subscription.

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For the enclosed \$2.00 (money order, check or currency) please enter my name for a full year's subscription to FORD OWNER AND DEALER MAGAZINE and send me a Free copy of the book FORD CARE AND HOME REPAIRS.

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I am a car owner—car dealer—garage-man—accessory dealer

NOTE—Foreign Subscription Price \$2.50

When writing advertisers—Just say FORD OWNER and DEALER

HELPS THE DEALER

A new and attractive counter display has been prepared by the Vogt Mfg. Corporation of Rochester, N. Y., for the use in connection with their VIKING Brake Lining for Fords. The display is a four color lithograph. As shown in the illustration the drawing is very attractive and shows Fords of all descriptions with both city and country background.



The package of VIKING lining fits neatly into the space provided and by reason of two stout supports on the rear of the card, the entire display will stand firmly on a show case. This display is furnished to any dealer or garage ordering VIKING Brake Lining for Ford cars. For details write the Vogt Mfg. Corporation, Rochester, N. Y.

DAYTON AIRLESS HAS NEW CONSTRUCTION

Many important changes have recently been adopted in the new construction of Dayton Airless Tires which its manufacturers say have added greatly to its wearing qualities.

The tire is built with tiers of rubber set about an inch apart and vulcanized as parts of the tire itself. These tiers take the place of an inner tube. They were formerly made of one kind of stock, but now they are made of what is known as two-stock compound.

The lower half, or base of the pier, is made of a compound that adds strength and endurance to the side walls and is of sufficient density to prevent rim cutting. The upper, or outside half of the pier is made of much more resilient, springy, shock-absorbing rubber, adding greatly to the easy-riding qualities of the tire and insuring flexibility. As a result of this new construction the new Dayton Airless Tire on a Ford car without load indicates a depression of approximately fourteen percent, whereas with the old construction the deflection was approximately six percent.

Another important change in the construction of Dayton Airless Tires which was made several months ago is the breaker strip. The new breaker strip is of very much heavier material, and tests which extend over a period of more than a year indicate that the change in this feature has entirely eliminated tread separation.

NEW HOLLEY MODEL

Because of its primary air passage so designed that cold fuel is lifted off the nozzle into the main air stream assuring ease in starting, the Holley Model "NH" Carburetor is finding a ready market as a replacement proposition.

While this model of the Detroit company has been standard equipment on Ford automobiles for some time, it is just recently that it has been produced in sufficient quantities to make it possible to offer it to the consumer desirous of using this proved carburetor on his car.

This Holley model enables the driver to accelerate his car from idle to maximum speed in a matter of seconds without change of needle valve adjustment, and this means a good deal to those who do considerable driving in traffic.

The inlet needle seat is designed as a detachable part and if damaged can be removed or replaced in a few minutes. The inlet needle is of special alloy and is impervious to the effects of acids or other impurities in present-day gasoline.

There are fewer moving parts than in any

other Ford carburetor on the market with the result that there is practically no wear and operation is extremely simple.

While it is practically impossible to give figures as to gas consumption, owing to various driving conditions, mileage figures are unusually high, thousands of satisfied owners say.

DISTEEL WHEELS FOR FORDS

The Disteel Wheel Corporation of Detroit, Michigan, has recently placed on the market a Disteel Wheel especially designed for Ford cars.

In the past, Disteel Wheels have been made almost exclusively for the larger, higher-priced cars. It is said that the reason for the extension of the company's manufacturing operations into the Ford field is the direct result of the nation-wide demand that has been created among Ford owners during the several years that Disteel Wheels have been in general use on other makes of cars.

The new product is of Disteel patented construction and is made of the same material as the Disteel Wheels used on Cadillacs, Packards, Paiges, Hudsons, Jordans, Coles and other excellent cars. A choice may be had of two different finishes—either dark blue or dark maroon.

The Disteel Wheel is best described as a spokeless, single disc of steel, tapered and dished. It is tapered on the same principle as an automobile spring, being thicker at the center of the wheel and thinner at the rim. This taper distributes and diffuses road shocks and strains, instead of localizing them, as is the tendency of all spoked constructions. This tapered section lessens the impact from the tire to the hub and then to the axle and mechanism of the car. It preserves tires and prolongs the life of the car.

The Disteel Wheel is dished "inwardly" a type of design which not only adds to the beauty of the wheel but also makes possible a lighter section with vastly greater strength. Because of this construction, the Disteel Wheel is capable of taking severe strains and side-thrusts without collapsing. Its concave disc and tapered section have eliminated the terrors of wet pavements and the inevitable curb stone. There are no spokes to break. The rim of the Disteel Wheel is offset, the result being that the steel disc changes the direction of every blow and shock, breaking it up before it reaches the axle.

The special Disteel equipment for Fords includes five demountable wheels with clincher rims attached, two front hubs, two rear hubs with brake drums, spare wheel carrier bracket and license bracket. The spare wheel is a great convenience in time of tire trouble, besides serving as a rear bumper.

KEYSTONE CYLINDER REAMER.

This Keystone Cylinder Reamer is a compact and complete tool designed to ream cylinders for all oversize pistons of Model T Ford, Dodge and Fordson Tractor. As the name indicates, it reams the cylinder to proper size and leaves it so smooth that no lapping or burnishing is necessary.

The Keystone Cylinder Reamer has but few parts and is as nearly "fool-proof" as it is possible to make a tool for this sort of work. Any ordinary mechanic can ream cylinders with a Keystone Reamer so that they will be as round and smooth as when new.

The entire construction of the Keystone Cylinder Reamer is so simple and sturdy and the workmanship so excellent that it calls forth the admiration of the best mechanics who pronounce it "a real machine tool."

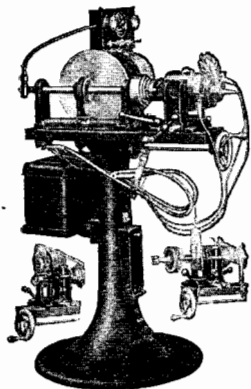
This Cylinder Reamer is adapted for either hand or power use. It can be easily operated with one hand when making a 31 thousandth cut, using the ratchet wrench furnished. Only five to eight minutes are required for reaming the average cylinder.

The Keystone Cylinder Reamer is adjustable for diameters from 3 3/4 to 4 1/4 inches. The method of adjustment is extremely simple. It is not necessary to unbolt from the engine block, nor remove any part of the tool to adjust the size.

The manufacturers are Keystone Reamer & Tool Co., Millersburg, Pa.

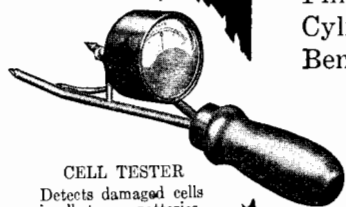
"Service Products"

What this Name Means To Your Business



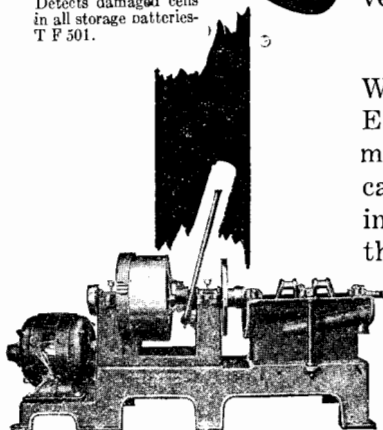
**ELECTRIC
TEST UNIT**

For testing all types of starting, lighting and ignition. T F 1.



CELL TESTER

Detects damaged cells in all storage batteries. T F 501.



**BURNING-IN
MACHINE**

Motor-driven for burning-in standard makes of bearings. F S 51.

EQUIPMENT—the kind that saves time and makes money—that raises your “shop work” to a higher standard—that keeps old customers satisfied with your service and brings new ones in—that enables you to do a \$10 job in one hour instead of five or six—this is the type of equipment that the name “SERVICE PRODUCTS” stands for.

To your business “Service Products” equipment means an opportunity for doubling its present capacity. It means speed, efficiency and an up-to-date shop—IT MEANS ADDED PROFITS.

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In the “Service Products” line you will find general and special Electrical Test Units of all kinds, Armature Lathes, Pinion Gear Pullers, Piston Aligners, Mica Undercutters, Cylinder Lapping Tools, Motor Stands, Tool Stands, Vises, Bench Legs, Clamps, Expanding Mandrels, Safety Lathe Dogs, Battery Trucks, Battery Post Builders, Battery Post Cutters, and Battery Cover Pullers—some of them absolute necessities to an up-to-date shop, other conveniences, but all time-savers and money-makers.

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Write us today for our book entitled “Service Station Equipment.” It is FREE and it will show you the big-money possibilities that “Service Products” equipment can open up for you. If you are especially interested in any one or several of the items listed above, specify them and we will send you special literature. Address

The Service Products Company

Formerly the J. O. Heinze Co.

Department C

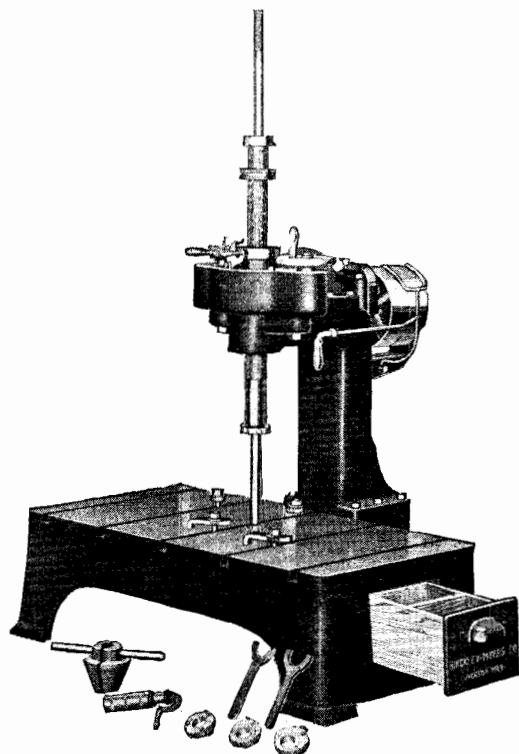
Springfield, Ohio

Pacific Coast Representatives, NORMAN COWAN CO.

451 Rialto Bldg., San Francisco, Calif.

CYLINDER REBORING MILL.

The Hinckley-Myers Power Cylinder Reboring Mill, No. HM-7, fully meets the demand for a positively accurate cylinder reboring mill embodying all the necessary features to produce a perfect wall. It has an absolute center locating device, pilot bar through cylinder and mi-



chrometer adjustment of each separate cutter blade. It is positively free from chatter, and has an automatic stop. It is a one-man machine in that the bed plate is only a few inches above the floor so that one man can readily place any ordinary cylinder block in position for reboring without the use of a chain hoist or crane. Users of this device are strong in their endorsement and it is gaining rapid favor with service stations everywhere. It is a product of Dearborn Equipment and Hinckley-Myers Co., 6 North Michigan Blvd., Chicago, Ill.

NEW PISTON RING.

The Norman Piston Ring Corp., Peoria Heights, Ill., will place a new piston ring on the market about July 1st. This is to be a one-piece, flexible, self-adjusting, hammered ring. The hammering is done with special-built machinery of our own design, with more force opposite the joint than near it, which produces a more permanent elasticity and gives it an even pressure against the cylinder wall at all points.

It is tempered in a crude oil furnace controlled by Brown's Pyrometers which seasons the ring and makes it very tough. The super joint is constructed of fillets and rounding ends, making it very flexible. The projecting end is rounded so it will slip by the opposite end without catching, also prevents oil from accumulating on the inside of the joint. When the joint is closed the ring is locked tight. The peculiar construction of this makes it always tight, whether closed entirely or partly open. The rings are all beveled on the inside edge, making them extremely easy to install. The ring is strictly a high-grade article. Time and money have not been spared in perfecting them.

THE KNOCK TECTOR.

Of very recent invention is the Knock Tector, an instrument devised principally for use in locating trouble in automobile motors or bearings, or gears or anywhere in the car and also adapted to many other uses.

The idea in using a Knock Tector is to ascertain accurately and with certainty the origin of sounds which are made by some moving defective part of mechanism or it may be an improperly adjusted or wornout part.

The Knock Tector looks very much like a doctor's stethoscope and is used in very much the same way. The binaural is placed to the head so as to permit the ear tips to enter the ears. When properly placed the operator will be able to hear only the sounds transmitted directly through the tubes from the Tector.

The Tector is fashioned so that the knock or grind of the trouble giving part is heard distinctly and the vibrations and resonance from surrounding parts do not interfere.

To determine where the defect is the Tector is pressed against the object to be tested, moving the Tector until the spot is found where the objectionable noise is most intense, this will be found to be the center of the trouble.

As a time saver and a nerve saver it is without rival for the mechanics use.

With a Knock Tector such trouble as piston slaps or knocks, loose wrist pins, loose bearings, noisy gears, noisy tappets, rattles, etc., may be located without going through the long process of tearing down and guessing.

It is made by the E. R. Benson Mfg. Co., of Portland, Maine. Price is \$5.00. Mail orders receive prompt attention and samples can be sent through the mail safely. Agents are wanted to handle Knock Tector in all parts of the country.

STOPS BRAKE CHATTERING.

The F. L. Huber Co., 219-21 North Channing Ave., St. Louis, Mo., report steady increases in sales for the popular No-Chat-Inserts. No-Chat Inserts form a cushion between the metal bands and the solid transmission drum, making it impossible for band linings to grab or stick. They promote smooth action in starting, reversing or stopping and their peculiar curvature forms three oil pockets which fill with oil while the car is in motion, thus constantly furnishing a lubrication which prevents the linings from burning out. It has been proven that the use of No-Chat Inserts prevents wearing and grinding of bands and transmissions and their effects in saving the car is felt down to the key seats in the rear axle.

THE BALTIMORE COMMUTATOR.

Growing sales success is reported for the Baltimore Commutator which sells for \$5.00, complete with wire assembly, and which is a product of The Baltimore Commutator Co., Key Highway & Webster St., Baltimore, Md.

The Baltimore Commutator is made of Condensite, a non-conducting hard substance, not affected by heat or water and especially adapted for this purpose. Its Contacts are of brass $\frac{1}{2}$ " in diameter, the Brush is of carbon, especially prepared, $\frac{1}{4}$ " in diameter; which combination is a recognized standard for efficiency and endurance.

The vital part of any ignition system lies in the protection given the terminals at the point of distribution. Any timer with exposed terminals invites trouble, uncertainty and loss of current, all of which means cost to you.

It is claimed that leaky wires, frayed terminals, short circuiting, oil and water soaked connections are impossible with the Baltimore Commutator, due to distinctive construction and overhead assembly, all of which tends to intensify the spark and give a full volume of energy.

The Baltimore Commutator employs the well-known and scientifically proven wipe system of contact, which gives accuracy and fullness of spark, which avoids mis-fire and insures more power, saving of gas and less carbon.



PHOENIX

Rebores all Cylinders

Here you see the Phoenix Cylinder Reboring machine in action. Note the simple, sturdy construction—the positive action and perfect balance. Operator removes cutter head after cutting through the cylinder thereby preventing the cylinder from becoming scratched when boring bar is brought back to starting position. The machine is self-centering and will re bore practically every make of cylinder without removing the block from the car. A quick easy change of attachments converts the Phoenix to a hand or power reboring machine giving you two complete machines in one.

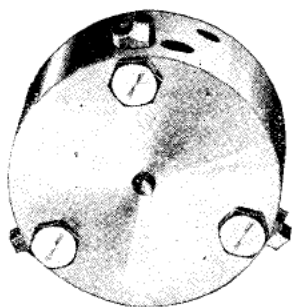
New Folders Show Tools in Action

Send immediately for new free illustrated folders showing Phoenix Garage Machine Tools in action. See for yourself how they save you most in time and money. Write us today.

Phoenix Manufacturing Co

Dept. C6 EAU CLAIRE, WISCONSIN

The Phoenix Machine is equipped with a three-tool-cutter head. Experience has proven that three cutting tools cut more accurate because they work more rigid and reduce chatter to the minimum.



FIVE years ago the average mileage guarantee was 3500 miles. 80% of all tires running were fabrics.

Today the average tire guarantee is 8,000 miles. 80% of all tires used, above 4 inch, are cords.

The reasons are obvious.

The last man to be convinced was the Ford owner.

We are in a position to quote about the same price on a 30x3½ inch cord tire as is paid for a first-class fabric tire. **GET IN THE BAND WAGON.**

Here is a leader which we will sell to **one dealer only** in a town.

Our New 1921 Type

30 x 3½ R. C. N. S. CORD

Full oversize, extra heavy shoulders. The handsomest and strongest tire of this size ever built.

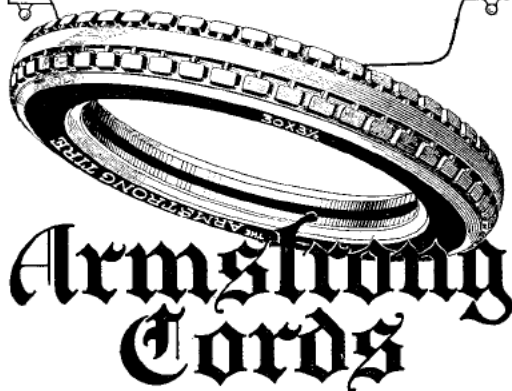
Fully guaranteed for 8000 miles, and they are good for double that.

DEALERS:—Here is a tire that is creating good will and growing sales in every section. Get started on this sure business. Write to us today.

FORD OWNERS:—It's a straight matter of tire economy. If your dealer is not supplied, write to us.

The Armstrong Rubber Co., Inc.

Sales Office: 4 W. 61st St.
New York City



HEATH NO-FLOAT CARBURETOR.

The Heath method of carburetion is embodied in a design permitting a fifteen minute installation on Ford motor. With this system the float is eliminated and it is claimed that instant starting on closed throttle is possible because a rich charge with the fuel broken is carried by the air through cold pipes, without any fuel loss. The Heath Carburetor furnishes complete carburetion without leaving the mixing to cylinder suction, which always is variable. There are no delicate parts and only one simple adjustment, making it a thoroughly practical device. It is manufactured by Heath Products Corp., Detroit, Mich.

HIRST SPRING LUBRICATOR.

A practical means of keeping car springs in good condition and making for better riding are offered in Hirst Spring Lubricators. This device forms a well around the spring bolts, carrying the oil up around the present center bolt of the spring and feeding it through the spring leaves. It is easily attached and it is claimed provides continuous and perfect spring lubrication. It sells for \$2.50 and is manufactured by F. G. Hirst, S. W. Cor. 13th and Wallace Sts., Philadelphia, Pa.

THE MARCH DISTRIBUTOR FOR FORDS

All high priced cars are equipped with electrical distributors, and with contact breakers of the make-and-break type which every electrician knows is the only correct principle, and for the Ford heretofore there has been an urgent demand for a satisfactory timing and firing system.

The purpose of the manufacturers of the March Distributor is to provide a really high grade, dependable timing and firing device that will be for the Ford what the most perfect electrical systems are for the highest priced cars. The March Distributor is installed in the place of the ordinary Ford timer and in the same manner, but its electrical and mechanical perfections are such that it is in a different class from ordinary timers.

There are no current-carrying rollers to jump or miss, no wipe contact to become foul or cause mis-timing, no race to become rough. There is very slight motion in the moving parts and electric contact is made by the direct make-and-break system—the recognized correct principle.

The entire distributor is very strongly and finely made and the manufacturers guarantee it for the life of the car. In fact, they allow the purchaser to write his own guarantee. They claim that the March Distributor will for all time eliminate timer troubles.

The March Distributor retails at \$5.00 and is manufactured by the American Metal Products Co., 72 W. Adams St., Chicago.

THE ACCURATE TIMING SYSTEM.

From the manufacturers, Safstrom Mfg. Co., 6706 S. Chicago Ave., Chicago, Ill., we learn the following facts regarding the Accurate Timing System which is meeting with strong favor among car owners and the trade.

It brings the timer away from oil and dirt up to the level of the cylinder head, and the inside workings can be inspected while motor is running by simply removing top cover.

THE TRAVELING MOVIE THEATER.

Films can now be shown any place a Ford can travel. This nomadic movie is made possible by a suitcase projection machine and an electricity generator, which is attached permanently to a Ford engine—both inventions of Herman A. DeVry, shown in the picture.

County agents use these roving theaters to display agricultural films to farmers. A turn of a switch directs the energy of the Ford engine to the electricity generator, a wire is run through the school house window, the suitcase projector blinks open its fiery eye—and the show is on! By this method the Red Cross delivers health messages to isolated localities. Rural salesmen employ the traveling theaters to demonstrate modern farm equipment. Welfare work is furthered in lonely mining and lumber camps. These roaming theaters are speeding up the rehabilitation of devastated Europe.

HALFERTY CLUTCH CONTROL.

This attachment relates to a device for controlling the clutches of tractors and more particularly tractors of that type wherein the clutch tends normally to engage and can be held in released position only by pressure constantly exerted by the operator on a suitable lever.

The gist of this attachment consists in the employment of a pivoted weighted lever which, when the tractor assumes a given angle over 30 degrees, causes the release of the clutch. Means are provided to prevent the accidental release of the clutch by the weighted lever during the ascent or descent of the grades ordinarily encountered or during travel over an irregular or uneven surface.

It has been found through experience that a great many operators are inclined to rest their foot upon clutch lever during the whole time that tractor is in operation. It has been found in practice, however, that the pressure of the foot on the pedal is very likely through inadvertence to be too heavy and to produce a constant slipping of the clutch, thus rapidly wearing away its engaging surfaces and destroying its efficiency. It is therefore an important object in our provision of means of foot rest which we provide that the operator will leave the clutch pedal free and support his foot in a position when in seat of tractor.

The provision of both hand and foot control for clutches of this nature.

The provision of means, controllable at will for holding the clutch disengaged without the attention of the operator.

This makes it possible to leave the tractor standing on any grade with the motor running, the transmission gears being in mesh preventing accidental drifting; with this improved control, however, the operator upon leaving the tractor standing simply compresses the ratchet on lever which withdraws the detent and lever will move in a forward position, thus holding the clutch released.

FORD OWNERS NEED THIS.

Ford drivers are increasingly realizing the necessity of batteries well protected from mud, slush, and water, to further their longevity.

One of the most recent innovations in the way of a perfect Ford battery box, which has many excellent features, is that recently introduced into the market by the F. B. Electric & Manufacturing Co. of Detroit.

This battery box, which is also provided with a thorough fitting cover, is made of metal, heavily enameled so that it withstands battery acids, and for convenience in shipping is uniquely arranged to be shipped in knocked down form. It is instantly assembled and to install it, it is not necessary to remove the battery or even touch the leads. Furthermore, there are no holes to drill or any machine work required.

Another excellent feature of this battery box is the fact that it lends itself to ready installation on any Ford car, old or new, with binding or loose supports.

Ford Repair Book

Free

See Page 129



for Fords and Fordsons
Sure as the Planets

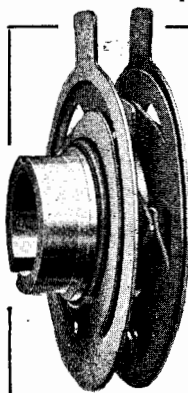
\$2.00

complete at your
 dealers or sent di-
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 paid.

**POSITIVE SPARK AT ALL
 ENGINE SPEEDS**

THE Tisch Wipe Contact Timer for Fords and Fordsons delivers a hot spark accurately timed to each spark plug without fail. It prevents the motor from skipping, jumping or bucking. This is due to the fact that the Tisch Timer has **no rollers, no rocker arms, no spiral springs, no fibre roller-race** and makes a positive break after each equally positive contact. Tisch double contact rotating brush touches each contact post from both sides every revolution and keeps these posts wiped clean continually. It requires no oil and operates even though oil, water or dust gets inside its shell. It has only one moving part and consequently is long-wearing.

The Tisch Timer is inspected, tested, guaranteed and patented for your protection.



**TWO TISCH FEATURES.
 DOUBLE CONTACT RO-
 TATING BRUSH AND
 THE 3-IN-1 TIMER CLIP**

The 3-in-1 Timer Clip illustrated below, replaces the burr, tin cap and pin formerly required to hold Ford timer rotating parts in place. It is always tight, cannot come loose and yet may be removed in a moment.

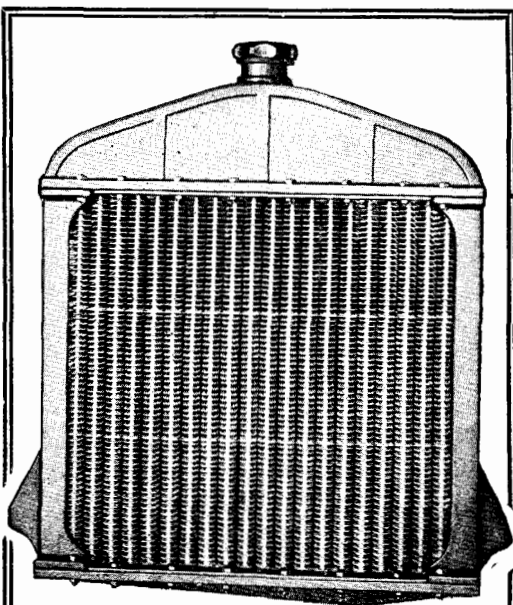


MANUFACTURED BY

TISCH AUTO SUPPLY COMPANY

215 Division Ave., South
 GRAND RAPIDS, MICH.

28-30 Juneau Ave.
 MILWAUKEE, WIS.



Cast Iron Tank Truck Radiator for Ford Cars

Genuine heavy duty tubular truck core with a minimum of solder seams. Not injured by freezing. Tanks, side columns and core bolted together. Water connections cast integrally with tanks, eliminating leaky joints. Pleasing design and maximum efficiency.

RETAIL PRICE

\$45

Including Tax

The G & O Manufacturing Co.
 NEW HAVEN, CONN.

G&O
Radiators

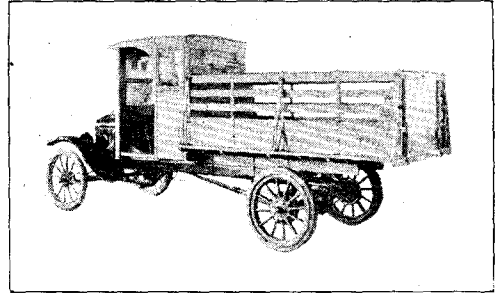
AN INTERESTING TRUCK BODY

The past several years have witnessed a great development in commercial transportation through motor vehicles. This development is manifested in improvement in motor construction, introducing refinements which make for economy, greater speed and load-carrying ability of vehicles and the construction of specially designed bodies to meet varying problems of haulage.

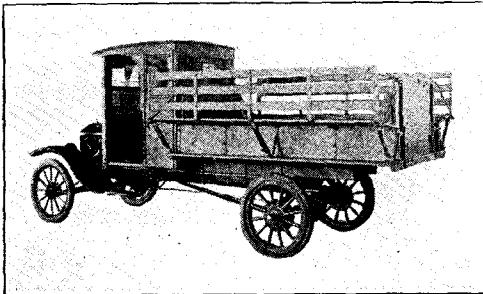
The Ford, of course, has been one of the biggest factors in the solution of traffic questions and because of its economy and dependability has been a favored vehicle in commercial work.

This has resulted in a rapid growth in the designing and building of special bodies adapted to various needs in hauling.

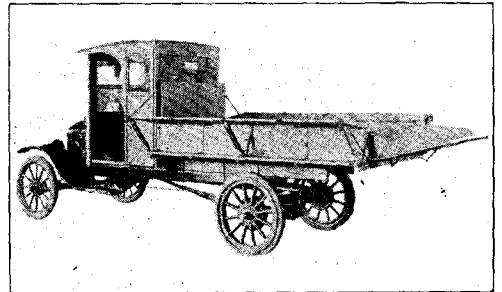
Among the most interesting examples of body-building is the 8 in 1 American Convertible Motor Truck Body, a product of the American Wagon Co., Dixon, Ill. This job combines a body suitable for a number of purposes as shown in the illustrations herewith and forms a valuable contribution to the reduction of commercial transportation problems.



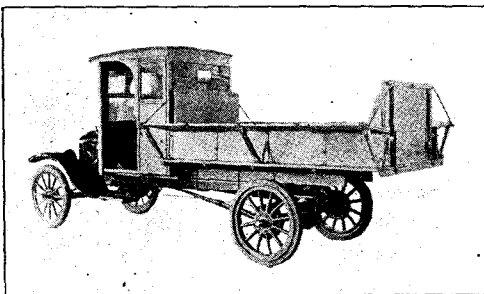
This position illustrates the Hog Rack. Height 2 feet, 5 inches. Capacity about ten 200 pound hogs. Is perfectly ventilated, therefore no danger of smothering. Cover over top to prevent jumping out. Also suitable for hauling all poultry.



This position illustrates Basket Rack Body. Width at top 6 feet 7½ inches. Height 2 feet 0 inches. This position is well adapted for the truck farmer's use, also for the hauling of fruit and vegetables in baskets, boxes or crates especially in hilly countries.



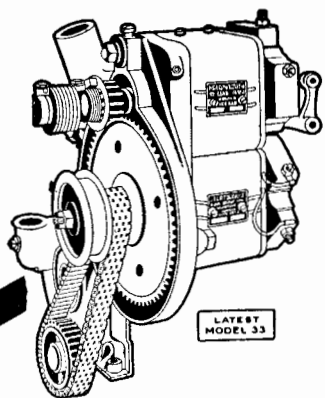
This position illustrates the Flat Rack with scoop board down. Scoop board is provided with grain door 11½ inches by 3 feet 1¼ inches for dumping grain.



This position illustrates the Flat Rack. Width at top 6 feet 7½ inches and is well adapted for hauling fruits and vegetables in crates, produce in bags, bailed hay, bailed cane, etc.



This position illustrates the Grain Body. (Inside dimensions.) Length 9 feet 9½ inches, width 3 feet 7½ inches, depth 2 feet, 5 inches. Capacity 60 bushels of wheat or other loose in proportion.



Genuine Heinze-Springfield Starters Latest—Improved

RIGHT now is the time to buy this well-known starting and lighting system for that Ford of yours. **THE ACKNOWLEDGED BEST**—yet one of the lowest priced systems ever put on the market.

Fits on Any Ford

The "Heinze-Springfield" fits any Ford no matter what model or year. A quick, sure start—bright, steady lights all the time—no cranking—these are some of the advantages and comforts the "Heinze-Springfield" gives you at a small cost.

Everything complete. Installation is very simple. Light and starter buttons are right on the dash where you want them. The "Heinze-Springfield" is the one starter to give you the best of service with the least expense.

Write us today for full details and prices.

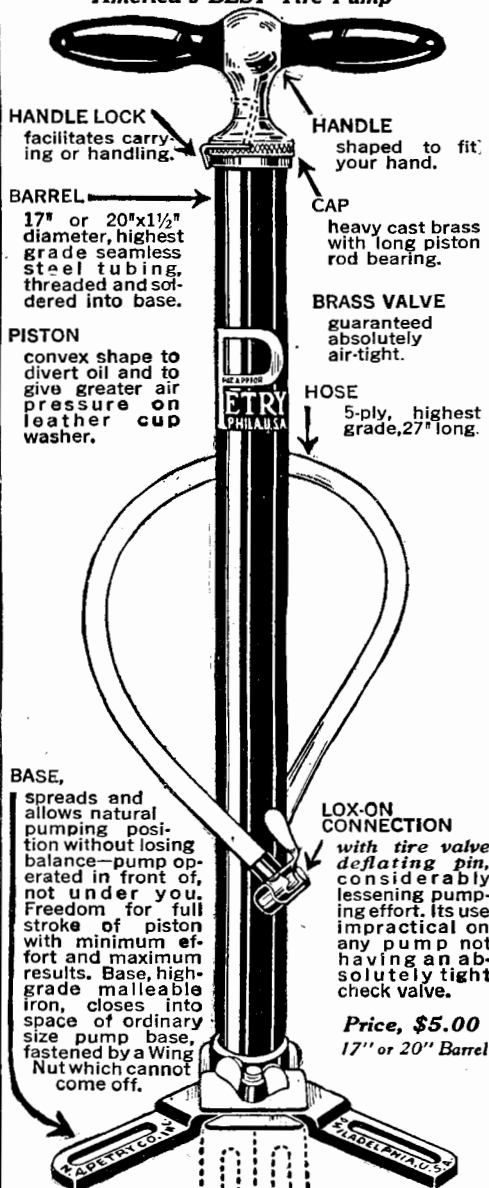
Dealers Write Us Now For Proposition
The Service Products Company

Formerly the John O. Heinze Co.
Dept. C. SPRINGFIELD, O.

Pacific Coast Representatives:
NORMAN COWAN CO., 451 Rialto Bldg.
San Francisco, Cal.

THE PETRY PUMP

America's BEST Tire Pump



HANDLE LOCK
facilitates carrying or handling.

HANDLE
shaped to fit your hand.

BARREL
17" or 20"x1½" diameter, highest grade seamless steel tubing, threaded and soldered into base.

CAP
heavy cast brass with long piston rod bearing.

PISTON
convex shape to divert oil and to give greater air pressure on leather cup washer.

BRASS VALVE
guaranteed absolutely air-tight.

HOSE
5-ply, highest grade, 27" long.

BASE,
spreads and allows natural pumping position without losing balance—pump operated in front of, not under you. Freedom for full stroke of piston with minimum effort and maximum results. Base, high-grade malleable iron, closes into space of ordinary size pump base, fastened by a Wing Nut which cannot come off.

LOX-ON CONNECTION
with tire valve deflating pin, considerably lessening pumping effort. Its use impractical on any pump not having an absolutely tight check valve.

Price, \$5.00
17" or 20" Barrel

Copyright 1921
N. A. PETRY
CO., INC.

"Stands by Itself"

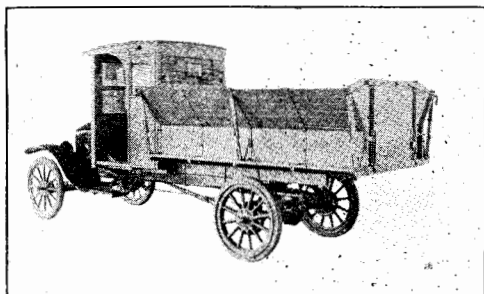
THESE SPECIAL FEATURES not found in any other pump. Finish, baked black enamel, with all brass parts polished and lacquered. PETRY design, quality and workmanship throughout. Guaranteed to make good. Patents applied for.

N. A. PETRY COMPANY, Inc.

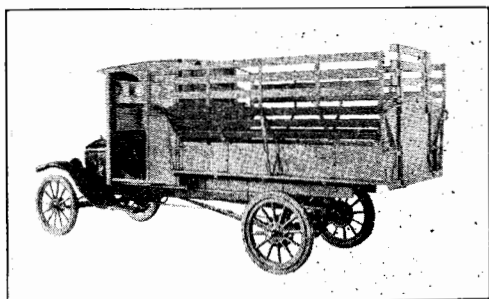
Makers of the Petry Cut-Out, Pedal, and Ventilator

338 N. Randolph St., Philadelphia

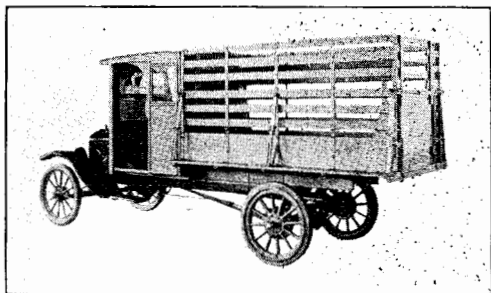
Western Distributor, Norman Cowan Co., 445-451 Rialto Bldg., San Francisco, Cal.



This position illustrates the Flared Body. Width at top 5 feet 6 inches. This is a good position for hauling grain. Capacity 80 bushels oats, 45 bushels ear corn.



This position illustrates the Rack Body. Width at top 5 feet 6 3/4 inches. Well suited for hauling fertilizer, melons, cabbage, etc. With ample capacity for bulk produce.



This position illustrates the Stock Rack Body. Height 3 feet 11 1/4 ins. For hauling cattle, sheep, and makes a splendid body for hauling cotton.

WALKER PERFECTS ROLLING JACK

After two years of experimenting, testing and developing, the Walker Mfg. Co., of Racine, Wis., has perfected Roll-A-Car, a husky garage jack, which is receiving very favorable comment from users.

Garage men are enthusiastic about Roll-A-Car because it is so easy to operate. Even to lift and roll the heaviest car there is no need of bending over. A handy finger lever on the handle controls the entire functioning of the jack, and the leverages have been worked out to give a quick lift with short strokes.

With Roll-A-Car in position under a car, a touch of the toe on a trip lever instantly raises the rack bar into contact with the axle. Then a few short, easy strokes of the handle and the load is up, ready to be rolled into a parking place or to any other part of the shop. Six strokes of the handle raises the load six inches. Only by reversing the lever and pumping down

can the load be lowered, so there is no danger of accident from bumping against the lever on the jack handle.

A feature which makes Roll-A-Car the ideal jack for use in a garage where space is generally at a premium, is the fact that when a job is left jacked up, the Roll-A-Car handle can be set and left in any desired position—even upright—so it is always out of the way. In shop, garage, and show room Roll-A-Car is proving itself a positive necessity—a time-saver, labor-saver, and money-maker.

Like other Walker Jacks, Roll-A-Car is substantially made of high-carbon, heat treated steel. Roll-A-Car weighs only 120 pounds and has a capacity of 5000 pounds. It is easily identified by its distinctive Walker blue color.

VALVE CLEARANCE.

How can Ford valves be given .025 inch clearance—and still be quiet? Some repairmen claim that .005 inch is plenty of clearance to allow for the expansion of the valve stem. But I find that this will not allow the valves to open and close at the proper time, in regard to the position of the piston if set at this distance, and that engine will not develop its rated power.

I set the valves at about .015 inch and the engine usually has plenty of snap, but the valves are a little noisy. Why didn't Ford design his engine so that the valves would open correctly, with a clearance of only .003 or .004 inch?

When placing a shim under the magneto coil support, it sometimes happens that the magnets clear the coils by only about .025 inch. Could a shim be placed between crank shaft flange and fly-wheel? Would this shim throw the fly wheel out of true?

Is there a right and wrong way of replacing a "wish-bone," or front radius rod? That is, should a certain side be up when installed? They appear to be perfectly straight, but I have often improved the steering of a Ford by removing the wish-bone and turning it over before replacing it.

Ford cars were INTENTIONALLY designed to be as nearly "fool-proof" as possible. And when the Ford car was designed, ability to "go" and to "keep on going" was the supreme requirement, and such a detail as valve tappet noise, was of minor importance.

If the Ford engine had been designed for .005 inch valve tappet clearance, then any change in this clearance of .005 inch would hold the valve off its seat, and cause the engine to run poorly. As it now is, the Ford valve tappet clearance can vary .025 inch or more—and still the engine will RUN. But not, of course as well as it will run when the clearance is correctly adjusted.

Look out on the street at Fords in general use, and as trucks in commercial service—and then guess how often these neglected Fords are apt to have the valve tappet clearance correct within a couple of thousandths of an inch. Yet the real REPUTATION of the Ford is largely based on the all-year performance of these DISREPUTABLE Fords.

Valves and tappets, of the oversize type, will help a little in eliminating tappet noise, by eliminating side play. As you truly state, it is usually necessary to sacrifice power to get silence.

Yes, a shim of EVEN thickness can be placed between the flange of the crank shaft and the fly-wheel, in order to secure the proper clearance between the magnets and the poles of the magneto coil assembly.

There is no right or wrong way of installing a STRAIGHT front radius rod—but those on Fords in service are usually BENT. Consequently, the steering can often be improved by installing the wish-bone so that the front axle is held at the correct angle.

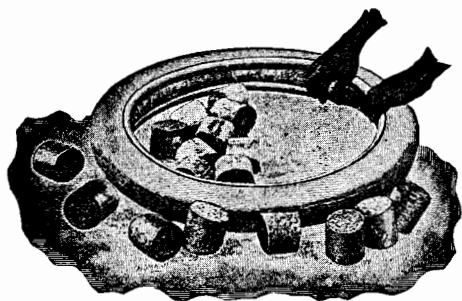
CLUTCH DISCS.

Have a 1917 Ford that seems to be short of one clutch distance place. In taking it apart, I find that there are 12 small discs and 13 large discs. I tried to get a distance plate from the Ford Agent, but he said that they did not make them any more.

The transmission distance plate, Part No. 3330, was only used on 1909-16 Ford cars. As your 1917 Ford has the trans. brake drum assembly made differently, with a shoulder inside, no distance plate is needed.

THE TIRE FILLER

that has made good



Trouble-proof tires with ample resiliency

is a combination that has long been sought by the motoring public. Some tire fillers failed to stand up under long service—most of them lacked the essential resiliency. But these two vital qualities were at last combined in

National Rubber Tire Filler

It has brought joy and satisfaction to tens of thousands of car owners. It has done away with punctures, vulcanizing, patching, and saved a many long wait on the roadside. Users get 10,000 to 20,000 miles out of every tire.

Besides, National Rubber Tire Filler has a wonderful resiliency. It takes the place of the air and inner tube, rides as easy and makes the car a real pleasure.

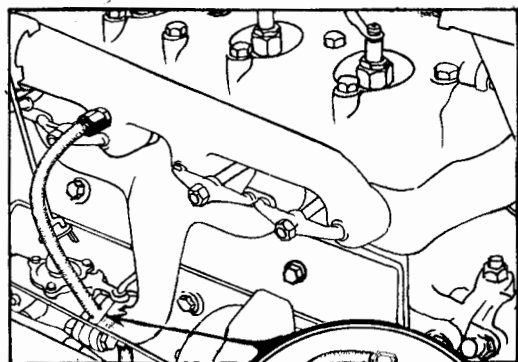
National Rubber Tire Filler is made of the best grade of rubber, cut in small pieces, treated, moulded and vulcanized by our special process. The result is a compound that is light, strong and resilient, that will stand all kinds of hard, rough service. Made in sizes to fit all standard tires. It is laid in the tire and not melted and poured in. Will not harden, freeze or melt—fully guaranteed against deterioration in any form.

DEALERS—National Rubber Tire Filler sells because it has made good. It combines comfort with economy of tire upkeep. Your customers are going to want it. We have a fine proposition for you. Write us today.

National Rubber Filler Co.

222 College St., Midlothian, Texas

The Real Way to Save Gasoline



SCOE HOT SPOT

The copper tube is asbestos covered excepting where it enters the manifold

For Ford Cars \$3.50

This is what the SCOE Hot Spot does for your Ford:—It cuts down your gasoline adjustment one-eighth turn (45 degrees) with the regular carburetor; gives 4 to 6 miles more per gallon; gives sweeter running, more power, and greater smoothness in idling and at low speeds; prevents dilution of crank case oil; prevents scored cylinders and fouled plugs.

It is a thin copper tube heated by the exhaust. It extends through the intake passage. Its great heat instantly and completely vaporizes the gasoline into pure, highly explosive gas. It can be applied in 30 minutes or less. Just drill and tap one $\frac{1}{8}$ pipe thread—that is all.

Install it on your car for 10 days. If you are not enthusiastic at the end of that time, we will willingly refund your money. Send \$3.50 check or money order—and obtain the Hot Spot for your car. Liberal discount to dealers in lots of two or more. Act now.

DEALERS:—Here is a real, permanent opportunity to make big money every month. Practically every Ford needs the Scoe Hot Spot. Write TODAY.

Briscoe Devices Corporation

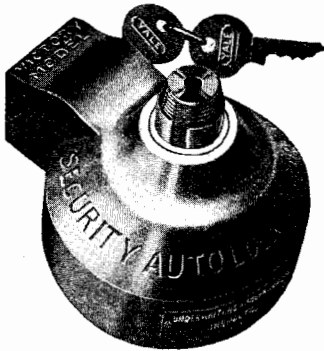
PONTIAC, MICHIGAN.

DEALERS' COUPON—

Send Scoe Hot Spots C. O. D. at dealers' price.

Name

Address



FORD DEALERS—Do you know that there is *No Trouble Chasing* when you install *Security Auto Locks*?

They don't get out of order. Are simplest to install.
Takes only 5 minutes.

**Absolutely Thief Proof — No Lost Motion nor Wobble
in Steering Wheel — The Security Can-
not Cause an Accident**

This lock has been on the market since 1916 and has given satisfaction everywhere. Let us show you this splendid lock. Send us in your orders. You will be pleased. Approved by Underwriters. Insurance reduced 15%.

Security Auto Lock Co., 410 N. Paulina St.
CHICAGO, ILL.

SELLING MORE FORDSON TRACTORS

The Hall-McCarty Motor Sales Company of Potsdam, N. Y., has solved so satisfactorily the problem of selling Fordson Tractors to farmers in their territory that the solution should be of interest to every dealer in Fordsons.

This company says that they worked day and night trying to show people that the Fordson would operate satisfactorily without a governor. They spent hundreds of dollars on such demonstrations without making a sale. They were discouraged.

Then they equipped one of their Fordsons with a Superior Governor. Thus equipped, they demonstrated the Fordson, operating a big 22-inch Climax Ensilage Cutter so evenly and so perfectly that they took orders at the demonstration for five Fordson Tractors, which were delivered to the buyers as soon as the factory could make the shipments.

This company now installs a Superior Governor on every Fordson Tractor they handle; and in reporting on this appliance for Fordsons they say: "We think that, if every dealer would install a Superior Governor on the Fordson, half of the hardships on the part of the salesmen would be ended."

The experience of this dealer is not unusual, according to reports which come from the Tractor Appliance Company, of Shelbyville, Ill., makers of the Superior Governor.

OAKES GETS TOELLE PATENT ON LOCK

An item of considerable interest to the automobile trade is the announcement last week that the Oakes Company of Indianapolis, widely known as manufacturer of radiator cooling fans and other automotive parts, has acquired the Toelle patent No. 1339075 which is a basic patent covering lock housings for screws and bolts.

Utilizing this patent, the Oakes Company has perfected a new type of tire lock which, it is claimed, gives the car owner full protection against the theft of spare tires from rear carriers. Sample locks have already been submitted to several motor car builders who have given the device strong approval. The new lock will shortly be ready for announcement to the trade and motoring public.

ESTABLISH GARAGE TOOL DEPARTMENT

The Phoenix Manufacturing Co., Eau Claire, Wis., manufacturers of Machine Tools, have announced the establishment of a Garage Machine Tool Department. This department will be responsible for the efficiency and sufficiency of Garage Machine Tools and the sale and distribution of the products through jobbers.

The Phoenix combination running-in and burning-in machine burns in and runs in all makes of motor cars, trucks and tractor bearings. It has a three to one gear reduction providing ample power to accomplish all burning-in jobs, burning-in at a speed of 200 R. P. M. and running in at 600 R. P. M. One special feature of this machine is the Solid Fibroid Cone self-adjusting clutch which is especially adapted to the severe strains existing in all burning-in operations. It is exceptionally easy and conveniently operated from either side of

the machine. The machine is very rugged in construction, weighing 2200 pounds and is suitably ribbed and reinforced so that the frame will not throw the bearings out of alignment. It takes up a floor space of 29 inches by 78 inches with a height of 34 1-2 inches. Ford and Fordson fixtures are furnished with the machine and other fixtures for different types of motors can be supplied.

The Phoenix Cylinder Reboring Machine will rebore all makes of cylinder blocks and gives a very satisfactory job for this work. This machine was tried out a year in local garages before being placed on the market so that what can be accomplished with it, is not a matter of guess work or development—it is a tried out machine and is particularly adapted for small garage work.

The price of the present burning-in machine is \$600 f. o. b. factory, Eau Claire, Wis. The Cylinder Reboring Machine is \$200, the Alignment Gauge \$30, the Angle Iron \$3.50, the "V" Blocks \$4.40 and \$3.90, respectively. In order to know of the character of the Phoenix Garage Machine Tools inquiries should be sent direct to the Phoenix Manufacturing Co., Eau Claire, Wisconsin, and descriptive matter and specifications on all tools will be sent immediately.

POWER FEED DRILL PRESS.

The up to date repair shops are finding in the Champion 22 inch Back-Geared, Upright, Power Feed Drill Press a tool which combines, at a remarkable low price, all the graduated and automatic features of the higher priced drills.

This tool may truly be called the happy medium among Power Feed Drill Presses. Larger Drills are not adaptable for economical drilling in lighter work and a lighter tool is not satisfactory for the heavier jobs. The Champion Drill Press is a practical compromise in size, a strictly one-man tool, capable of drilling anything from the smallest hole to 1 1/2 inches in diameter and all are achieved with highest speed and accuracy.

A feature of the Champion 22 inch Power Feed Drill Press is its simplicity and ease of operation. Equipped with quick return lever, the spindle moves with great rapidity and the table can be readily raised or lowered by means of its quick action screws.

Experts have built into the Champion Power Feed Drill Press strength, rigidity and accuracy in drilling. Its gears are all machine cut, bearings large and powerful. This tool can be instantly changed from plain drill to back-geared by the movement of an eccentric shaft.

The Champion 22 inch, Back-Geared, Upright, Power Feed Drill Press is offered at a remarkably low price by the Champion Manufacturing Company, 2908—10 W. Fletcher Street, Philadelphia, Pa.

Stephen A. Howell, formerly in charge of the Chicago Branch of A. Schrader's Son, Inc., has been promoted to the post of Manager of the Schrader Toronto Branch, succeeding Harold R. Cole, who is now at the Main Office of the Company at Brooklyn, N. Y.

When writing advertisers—Just say **FORD OWNER and DEALER**

PRICE REDUCED To \$1.00 Only 1 a Pair FILMOLENS

Our announcement last month of the Filmolens price reduction and Free Offer brought orders pouring in from every corner of the country. Our Free Offer will therefore remain open till June 30th so get your order in at once.

Filmolens is not made of glass and will not break even when bent double. Absolutely will not glare from any angle. Approved by state and city authorities. Sold on a Money-back Guarantee of Satisfaction. Undoubtedly the biggest headlight lens value ever offered.

FREE OFFER

Tear out this advertisement, pin a dollar bill to it and mail it with your name and address. In return we will send you a pair of Filmolens (Ford size) on a ten-day money-back trial. In addition we will send you free of charge, one Filmolens unbreakable tail-light provided your order reaches us by June 30th. For larger sizes send \$1.25 and size of headlight.

Test Filmolens on your car in any way you like. If you are not fully satisfied, return Filmolens within 10 days and we will refund your money in full.

Send your order in at once while free offer is open

Filmolens Sales Co.

1926-27 FORD BLDG., DETROIT, MICH.

EUREKA AUTO LOCK

Officially Passed and Approved by the National Board of Auto Insurance Underwriters

For Ford Cars

Absolutely
Protects Car

Locks
Wheel
Rigid

Adds
Greatly to
Appearance
of Car

Easily
Installed

\$9.85 Postpaid

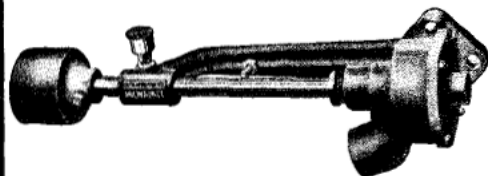
SAVE YOURSELF ALL WORRY. Know positively when you return that your car will be where you left it. The EUREKA AUTO LOCK is GUARANTEED THIEF PROOF. POSITIVELY CANNOT BE TAMPERED WITH. It's the best lock ever made. REDUCES INSURANCE 15 PER CENT. It's the ONLY LOCK YOU CAN ABSOLUTELY DEPEND ON.

The EUREKA AUTO LOCK has only two moving parts. Nothing to get out of order. Equipped with King unpleckable cylinder lock. Highest quality material and workmanship throughout. With the EUREKA AUTO LOCK you ALSO GET A NEW 17 INCH ALUMINUM WHEEL which adds greatly to the appearance of the car. Furnished complete with jig for installing, illustrated chart and full directions. Can be installed by anyone in thirty minutes or less. Guaranteed to outlast your car. Direct from factory to you. Save middleman's profit.

The EUREKA AUTO LOCK, NEW 17 INCH ALUMINUM WHEEL JIG, ILLUSTRATED CHART and COMPLETE INSTRUCTIONS, ALL sent anywhere in the U. S. or Canada for only \$9.85 POSTPAID. ORDER TODAY. NOW.

EUREKA AUTO LOCK CO.

1136 W. Lake St., Chicago Ill.



The Pump That Keeps the Ford Motor Cool in the Hottest Weather

Excessive carbon deposits, scored cylinders and bearings and thinned lubricating oil are all caused by constantly overheated engines. You can prevent these injurious results and bring your cooling system up to the highest efficiency, increasing your power and fuel economy, if you install the

**MILWAUKEE
CIRCULATING WATER PUMP**
FOR FORD CARS AND TRUCKS

"Built for Service"

The "Milwaukee" is so skillfully designed and built that after you have put it on, it virtually becomes a built-in part of your motor—operating without trouble for the life of the car.

The "Milwaukee" eliminates all guess work in selecting a water pump because it's made right—even down to three bronze bearings, a grease well, cast bronze propeller—each pump is tested under pressure and guaranteed for workmanship and materials.

Don't assume that "just any" pump will do what the "Milwaukee" does. Be sure you get a Milwaukee Circulating Water Pump. Sold by all dealers and distributed through recognized jobbers.

**JOBBER:—Write to the nearest
office of our sales representatives**

CRAMER MFG. CO.

387-9 Tenth St.,

MILWAUKEE, WIS.

SALES REPRESENTATIVES

C. N. & F. W. JONAS

525 Transportation Bldg.

CHICAGO, ILL.

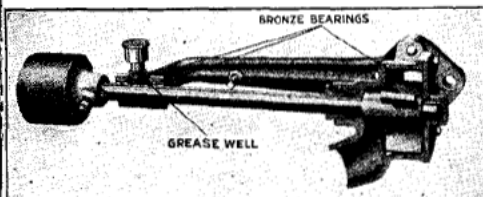
San Francisco, 111 New Montgomery St.

Los Angeles, 407 Equitable Bldg.

Seattle, 616 Pioneer Bldg.

Atlanta, 197½ Edgewood Ave.

Dallas, 1403 Grand Ave.



When writing advertisers—Just say FORD OWNER and DEALER

The Simplex Accelerator

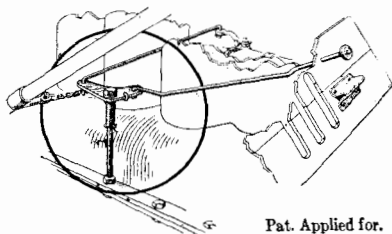
When installed your SimPlex is a necessary part of your car, not a mere accessory. Its Adjustable Tension and Spring Suspension puts the SimPlex in a class by itself.

Guaranteed to give satisfaction for the life of your car.

It costs \$2.50 and is worth it. Delivered. Ask your dealer, or write us.

Manufactured by

SIMPLEX MFG. CO., Sandpoint, Idaho



Pat. Applied for.

HY-POWER TIMER

For Ford Cars, Ford Trucks and
Fordson Tractors

OUTLASTS FOUR ORDINARY TIMERS

Is Averaging Over 16,000 Miles

Price \$1.50

Send Us Your Order NOW

Dealers and Jobbers Given Full
Credit for All Mail Orders

BENFORD AUTO PRODUCTS, INC
MT. VERNON, N. Y.

"LETTERIAN."

Leterian is the outcome of a discussion of automobile accidents by three practical men while dining one winter's evening at the Old Colony Club in New York. These men, Dr. John C. Baker, an eminent chemist; Victor B. Johnson, former assistant copy and art manager of the Street Railways Advertising Co., and Ben J. Sweetland, President of the Ben J. Sweetland, Inc. Advertising Agency—each agreed that most rainy day accidents were directly caused by blurred windshield vision. In other words the confusing vision caused by looking through myriads of rain drops requires quick braking which causes the dangerous skid—this in addition to the danger of collision or even running down pedestrians by the inability to see clearly.

This existing danger has long been recognized, which is proved by the number of attempts made to find a remedy. Numerous appliances are to be found on the market—both mechanical and chemical—but all have their shortcomings. The squeegee type cleans, but requires constant wiping by the driver. This causes him to take his hand off the wheel when his vision is not clear. The automatic wiper is better, but is annoying due to the constant pendulum like movement of the arm passing in front of the driver. Chemical treatment of the glass seemed to offer the best solution, but the attempts made were only partially successful. Some would not last long, others would leave the glass very smeary after the rain had subsided.

Doctor Baker seemed to feel that he could solve the problem. He started to work it out scientifically. First he analysed the properties of glass. He then analysed the properties of water and learned just why glass had an affinity to water and held it in drops instead of allowing it to pass off freely.

After countless experiments a chemical was discovered that acted as an insulator, destroying the existing affinity and permitting the water to flow off in thin transparent sheets instead of being held in the form of drops.

Another problem presented itself. Motorists will not be troubled carrying a liquid. In the first place there is the danger of breakage and furthermore they very seldom have a cloth in their car clean enough to use on their windshield.

Dr. Baker next discovered a non-drying chemical which could be used as a base and by combining the two could use them impregnated

in fabric so that no liquid would be required. A fabric mitten was next devised to hold these chemicals and actual tests showed that a sufficient quantity could be retained to last a year at least.

One treatment on the glass was found to last, at least, 12 hours in a heavy rain. The chemicals can be applied when the glass is either wet or dry and when applied dry, a transparent coating is deposited on the glass which will last several days. In other words the glass may be treated Monday and if it does not rain until Thursday the effect will still be there.

The product completed, a name was required—one in keeping with its merits. The happy name of "Leterian" was conceived by Ben J. Sweetland and speaks for itself.

Baker, Johnson and Sweetland then took their initials and formed the B. J. S. Specialty Co. to market their new product, LETERIAN. Up to the present time their advertising campaign has not started, but the demand has been enormous. Their factory has been constantly increasing its output and after a full fledged campaign is launched it is expected that LETERIAN will be seen on sale from the largest accessories stores in the Metropolis to the small stores in the villages.

The B. J. S. Specialty Co. has its factory located in New York City and the executive offices are at 95 Liberty Street, of the same city.

GILMER FAN BELT

The H. L. Gilmer Co. has extended its Woven Endless Fan Belt line to include every automobile using a fan belt through the introduction on April 1st of the Gilmer Round Type Endless Fan Belt.

This belt is made to fit such cars as Chevrolet, Nash, Cole, Oakland, Winton, Packard, Pierce-Arrow, Westcott, Reo, Marmon, Vellie, Oldsmobile, Scripps Booth, Jordan, Roamer, Sheridan, Hupmobile, etc.

It is made in twelve sizes, grouped similarly to the Gilmer Flat Type Endless Fan Belt and is packed in cartons of five. Each belt is individually wrapped and mounted.

GOOD BUSINESS

Proving again that known-quality goods are always in demand regardless of business conditions, the Milwaukee Engine & Supply Company, Milwaukee, Wisconsin, manufacturers of the Milwaukee Timer for Fords are working at 100% capacity, turning out 4,000 Timers per day. In fact their chief difficulty is keeping up with orders, it is said.

According to Harrie R. Williams, director of sales and advertising, April has proved to be the biggest month in their history. It should be noted here that their business for March, 1921, on timers exclusively was 15% greater than their bumpers which they have since discontinued.

During the past year the Milwaukee Company has more than doubled its number of active jobbing accounts until today more than 85% of the legitimate jobbers in auto supplies stock the Milwaukee Timer—more than 50 of the larger jobbers handling this timer exclusively.

Mr. Williams lays the striking prosperity of his company today to unslackening and intensive sales and advertising work throughout the readjustment period which has obtained during the last few months. Even through the worst of the depression, the Milwaukee company kept its product conspicuously before the eyes of the dealer and consumer.

When writing advertisers—Just say FORD OWNER and DEALER



SALES— and More Sales

That Ford owners know real mechanical value—recognize genuine worth of a product—and study practical economy—is proven by the rapid growth of sales of the

Holm Multi-Channel Radiator For Ford Cars

For cars, trucks or tractors, and under the most severe service, this radiator proves itself **BETTER**—better cooling—longer life—fewer repairs.

Here are just a few of the superior Holm points:

- Thirty-eight distinct water channels.
- A larger water area.
- Positively will NOT clog.
- All water passages reinforced.
- All brass is **ROLLED**—not stretched through stamping.
- Lock seamed at joints.
- Side braces of 10 gauge band iron, can't break from vibration.

CAR OWNERS—If your dealer cannot supply you write us direct, give dealer's name and address.

DEALERS—Others are gathering some real profits. Get in touch with your jobber today or write direct.

HOLM RADIATOR CORPORATION

340 First Avenue

MILWAUKEE, WIS.

ELECTRIFY Your FORD

DOUBLE EE CHARGER
FOR FORD CARS
CHARGES BATTERY FROM MAGNETO



AT SMALL COST

PUT this self-contained electric lighting system in your Fords and save all expense of charging batteries outside. It charges your battery from your magneto; keeps both in perfect condition; supplies starting and lighting "juice" at all times; gives full flood of light for head and tail lights; no more oil lamps or weak lights for owners of the

Double EE Charger

As simple as a transformer; can't get out of order. **INSTALL IT YOURSELF**

Fully guaranteed by the maker. Costs only half as much as any other systems. Batteries, wire, ammeter, etc., furnished at rock-bottom prices. Write today for all details and prices.

Illinois Starter & Magneto Co.
2450 Calumet Ave. Chicago, Ill.



A Free Socket Wrench Board



DEALERS—Buy the tools belonging on this Display Board. Get full discount from retail prices. We furnish the board—“No Charge.”

No. 4 Set—80 Wrenches for Fords. Retail value \$66.75.

ASK FOR COMPLETE CATALOG NO. 44

FAWSCO WRENCH CO., Makers
TOOLS TO USE AND SELL 27 Warren St.
NEW YORK

A FORDSON GOVERNOR.

The Jennings Governor for Fordsons operates by the variation of the vacuum which occurs in the intake pipe of an internal combustion engine with variation of speed. As no revolving shaft is required to actuate the device, compactness and simplicity of design and ease of installation are secured.

In this device, the intake suction operates on a spring-controlled piston, connected to the governor throttle in such a manner that for all conditions of load a slight variation in speed from the desired maximum causes the throttle to open or close as necessary.

Hand operation is not interfered with for speeds less than 1,000 revolutions per minute, at which the Fordson tractor is designed to operate.

The Jennings Governor can be installed in one-half hour. It is not necessary to drill any holes, or to alter or remove the standard Fordson throttle valve. The governor throttle flange is put in place between the intake manifold and mixing chamber, and the governor body installed on engine cylinder head by means of extra long bolts provided. Detailed directions are supplied with each governor. This practical governor is the product of The Jennings Engineering Co., Detroit, Mich.

BENZER REAR VIEW WIND DEFLECTOR

The Benzer Rear View Wind Deflector is especially designed to protect the occupants of the car from wind, rain, snow and dust, and, as will be noted from the illustration, upon each wing there is ground a rear view mirror, which enables the occupants of the car to see the rear on both sides while driving. The glass is $\frac{1}{4}$ inch thick, with $\frac{1}{2}$ inch bevel; the fittings are made of steel and aluminum that cannot rust. They will fit any car, are adjustable to any angle, and installation is very simple. They are absolutely guaranteed not to rattle, and are made in sizes for all cars. Being easily adjusted, they can be used as ventilators in the summer, to direct breezes into the car. The manufacturers will supply free to dealers, literature, sign and display equipment.

The manufacturers are THE BENZER CORPORATION, Myrtle and Cooper Avenues, Brooklyn, N. Y. List price is \$25 per pair.

FRANK R. LUECK ENTERS BUSINESS

After fifteen years' experience in the manufacturing field, the last four years of which have been devoted largely to the manufacture of circulating water pumps and oil pumps for automobiles, motor trucks and tractors, Mr. Frank R. Lueck has entered the field for himself.

Mr. Lueck heads the recently organized F. R. Lueck Manufacturing Company of Milwaukee, which firm has just put on the market the Cataract Circulating Water Pump, which can be readily attached to the motor on any Ford car or truck.

"The field we are entering is a large one," said Mr. Lueck, when asked about the new organization, "But after a very careful investigation I found there was a big demand for a well made pump for the Ford motor, a pump which would last as long as the motor

and really become an integral part of it, after once being installed.

"The Cataract Pump which we are manufacturing can be readily installed by any owner in 30 minutes.

"Most drivers of Ford cars and trucks do not realize that the motor is overheating until they see some visible evidence. When the water begins to boil over, the damage has been done.

"The Cataract Pump is designed to keep the temperature of the water low enough to prevent boiling, and to maintain the most efficient jacket temperature under all road conditions."

Mr. Lueck has the distinction of having supervised the manufacture of more circulating pumps used for automotive purposes than any other man in the world. This, alone, should insure him no end of success in his new venture.

Associated with Mr. Lueck is Mr. A. H. Petersen of the A. H. Petersen Manufacturing Co.

A PRACTICAL WHEEL

The Jefferson Forge Products Company, Detroit, Michigan, announces a Passenger car wheel of entirely new construction; a drop forged Steel Wheel of one piece of solid metal—hub, brake drum, spokes and felloe. There are no bolts, nuts, rivets, welds or joined sections.

Wood wheels were, until the advent of the Jefferson one piece wheel, the lightest wheel for automobile uses on the market. This new wheel is, however, lighter even than a wood wheel and naturally of much less than other types of wheels of standard construction.

Jefferson Drop Forged Steel Wheels are the result of co-ordinating two positively new principals of wheel making—drop forging and unit construction.

The Jefferson Drop Forged Steel Wheel is a **real wheel**—ten spoked—and of exceedingly graceful design.

Rigid tests have shown that it possesses a greater strength than any other kind of wheel for passenger car service. It is not affected by extreme climatic influences as are wood wheels; nor are there numerous parts to loosen, erode, break, cause annoyances or become dangerous as in all other passenger car wheels.

There is a distinct elasticity to drop forged steel—in the manner in which it is utilized in the construction of the Jefferson one piece wheel—that assures the maximum of safety in the event of unusual side thrusts of the severest road impacts.

It has been demonstrated that a lateral blow that will completely collapse a wood wheel or destructively separate the many parts and sections of other types of wheel, will but bend them to the limit of their normal alignment without injury.

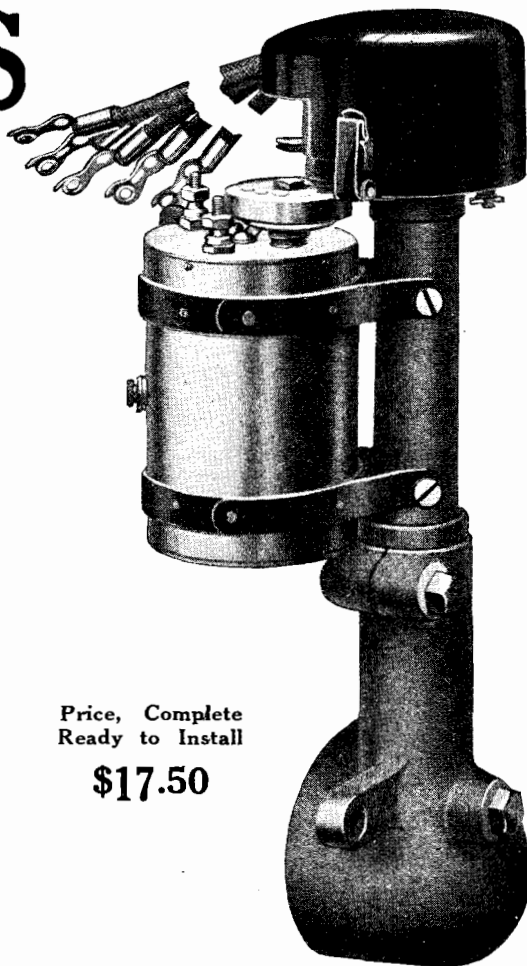
Aside from the advantages of lightness, greater strength, perpetual alignment and the possession of radiation qualities for superheated tires, they contribute to the artistic effect of an automobile by being capable of a high and enduring enamel finish, instead of merely being painted as are other wheels.

When writing advertisers—Just say FORD OWNER and DEALER

A NEW BATTERY IGNITION SYSTEM FOR FORDS

THE NEW KINGSTON Battery Ignition System for Fords has already received a warm reception and promises to attract wide attention during the season. It will prove a boon to the Ford owner. It completely wipes out all commutator trouble resultant from dirty contacts and uneven wear. It obviates trouble from loose, broken, oil-soaked wires, or wires, with raveled insulation, and it **provides the best and highest possible character of ignition**, the kind in use on high-priced cars everywhere.

It can be installed simply and easily, and it insures delivery of the spark to the power at exactly the right instant, **every time and always**. Made of the best possible materials, handsome, durable and efficient. It entirely eliminates the four units, the commutator and the magneto.



Price, Complete
Ready to Install

\$17.50

A Big Demand Is Assured

To the Dealer

THE KINGSTON BATTERY IGNITION SYSTEM is the best value in the automotive accessory field this season. The initial demand is heavy. We are prepared to make immediate shipment in any quantity, and we are backing the System with a vigorous advertising campaign. Write or wire for our special proposition.

THE KOKOMO ELECTRIC COMPANY

KOKOMO

INDIANA

U. S. A.

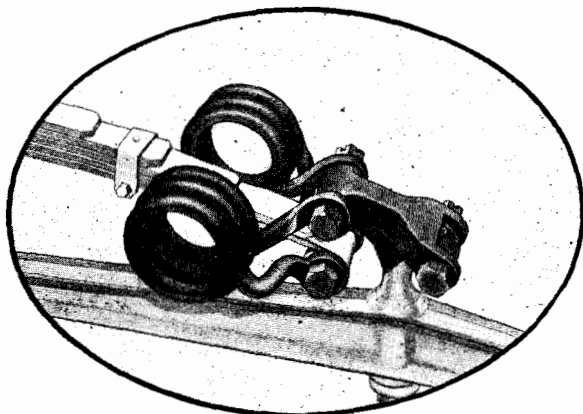
BRANCHES:

New York—245 West 55th Street Chicago—1430 Michigan Ave. Detroit—4610 Woodward Ave.
Boston—15 Jersey St. San Francisco—1235 Van Ness Ave.

We Challenge Contradiction of Our Claims GET AN EXPERT'S OPINION

We are asked every day to explain wherein our TWIN SPRING SHOCK ABSORBER differs from the SHOCK ABSORBER in general use today. The answer is easy and clear to you. The great majority of SHOCK ABSORBERS in use today are nothing more or less than a brake applied on the leaf springs, which retards their action and prevents them from doing the work for which they were intended. They REDUCE the spring capacity of your car instead of INCREASING it, as should be the case.

TWIN SPRING



SHOCK ABSORBERS

For Fords

Front and Rear Set Complete \$20.00 List

The TWIN SPRING SHOCK ABSORBER is a SUPPLEMENTARY SPRING, instantaneous in its action. The principle and result obtained therefrom is entirely foreign to the so-called SHOCK ABSORBER. TWIN SPRING SHOCK ABSORBERS are FREE TO ACT in every way in conjunction with the LEAF SPRING. They not only leave the LEAF SPRING free to perform the work for which they were designed, but they assist them to perform that work. Every road shock coming from the wheels passes through the TWIN SPRING SHOCK ABSORBER (see those coils) on its way to the body of your car. The shock is transformed and reduced, the LIFE is taken out of that shock right there, and that without in any way disturbing the action of the leaf springs. Let us prove to you, Mr. Car Owner, that our statements are correct.

TWIN SPRING SHOCK ABSORBERS add to and do not detract from the lines of the car.

Write for Agent's Proposition and Prices

TWIN SPRING SALES CO.

266 Essex St.,

SALEM, MASS.

Phone, Bayonne 2199

F. C. ALSBACH, Prop.

Motor Transportation Service

TRUCKING AND HAULING
73a WEST 27th STREET

Bayonne, N.J., D. 29th, 1920 19

Only
Express
Service
To and From
New York City
Hoboken
Union Hill
West Hoboken
Jersey City
Greenville
and
Bayonne

Steel Spring Piston Ring Co.,
Brooklyn, N.Y.

Gentlemen:

Replying to yours of yesterday
beg to state that the rings are more than good.

The rings were installed Nov. 26 in
our two ton Ford which covers the cities on the
side panel, before putting in the rings we used
between 10 and 12 gal. of gas a day and now the
car covers the same ground on from 5 to 7 gal.

These rings have paid for themselves
the first month and when ever we are in need of
rings they will be 3-A Rings.

Thanking you for your past favors,
we are,

Yours very truly,
MOTOR TRANSPORTATION SERVICE,

per. *F. C. Alsbach.*

SERVICE THE BIGGEST WORD IN THE DICTIONARY—IT TAKES SPECIALISTS TO DEVELOP THIS IN EVERY DEPARTMENT OF TRANSPORTATION



*Need we tell You
more?*

**Steel Spring Piston
Ring Co.**

147 Metropolitan Ave.,
BROOKLYN, N. Y.

When writing advertisers—Just say FORD OWNER and DEALER

Reasons Why

Viking Brake and Transmission Lining Should Be in Your Stock

1. Has density of construction which gives long wearing power.
2. Impregnated by a process which eliminates chatter.
3. Every piece uniform in quality.
4. Reasonably priced, retails at \$1.50.
5. Attractive four color counter displays furnished free.

Manufacturer
VOGT MFG. CORP.
408 St. Paul St.
Rochester, N. Y.

Sales Department
THE ZINKE CO.
1323 Michigan Blvd.
Chicago, Ill.

LAW FOR THE MOTORIST

CORNERS like facts are stubborn things. And in their negotiation they present difficulties to many motorists somewhat similar to facts strewn in the rhetorical path of the chronic arguer. And, as liken unto facts, they are always with us it would seem but good policy to accept them with equanimity as one must taxes, and other unpleasant though unavoidable visitations.

That it is possible to do this with some grace will not be doubted, though if this end is sought it may require a mental effort. This may be illustrated by the remarks of a brother Ford-owner on the subject, to-wit. That his idea of heaven was a place where the streets were wide, (not necessarily paved with gold, a good grade of concrete would do), straight, and without corners. That to his way of thinking one corner to each five miles of highway was ample, and that the careless abandon with which corners were interwoven in pikes, highways and streets was enough to sadden the heart of any true motorist.

At the time my friend delivered this opinion, he had just signed his name on the dotted line for a substantial sum for damages, caused by the way he had cut a corner in our fair city and collided with a milk wagon. Also, about three months prior to this, he had acted as co-star in a little "dramer" of rural life in which he attempted to cross a four-cornered cross roads going east, at the precise moment that another gentleman was attempting the same movement on the same space going north on the intersecting road.

It was, according to his own version of the affair, a soul inspiring mixup. No one was seriously injured but the repair bill my friend was compelled to pay was no laughing matter for anyone save the repair man. So it is possible that my friend's views on corners, may be, as it were, jaundiced, and that in all fairness they should be taken with a grain of salt.

Nevertheless, there is no depreciating the value of a fair and open mind in regard to corners. And if viewed from a purely life and limb standpoint, with appropriate regard for one's loved ones, a life policy of slowing down at these intersections will pay attractive dividends. And in following this it's a fairly safe rule to add an ounce or two of extra precaution, on the theory that the other fellow is not very strong mentally, and the Lord only knows what he may do. So much for the safety side of the question which brings us to certain legal phases which are worthy of note.

"A Tip in Time May Save a Fine"

Comments on Corners

By
LESLIE CHILDS.

In the first place, the majority of incorporated cities and towns have ordinances governing the course to be taken when corners are to be crossed or turned. If the last named movement is to be executed, it is as a general rule incumbent upon the motorist to drive to the right of the center of the street, and keep on the right hand side of the street. If then he does not obey this rule, and an accident results, he may place himself in a similar situation to the little boy who was caught with his hand in the jam jar, and therefore did not have anything to say.

This is true because the remains of such an accident may speak for themselves. For example, if you cut a corner and collide, the debris may be more eloquent than mere words in explaining who was to blame. It may show at a glance who was on the wrong side, or part, of the street, and it takes some very plausible testimony in a case of this kind, to convince a judge or jury that the one shown to have been on the wrong side of the street had a right to be there.

And, as a further complication, ordinances and laws of this kind frequently provide that one who violates their terms is prima facie guilty of negligence. It follows that upon proof of such a violation, where this is the case, the burden of excusing such violation is thrown upon the offender. Which in some cases is no light burden, and supplies within itself a good and sufficient reason for strictly observing the terms of the ordinance.

So, regardless of the angle from which it is viewed, flirting with corners is a dangerous pastime. And, as the majority of us take chances now and then, a sobering thought on the possible consequences may do no harm; and though such thoughts may not reduce us to the status of a tiddlywink player while motoring, yet they may convince us of the desirability of being at least careful if it is not possible for us to be good. Which is after all something to the good.

Gammon Dump Body

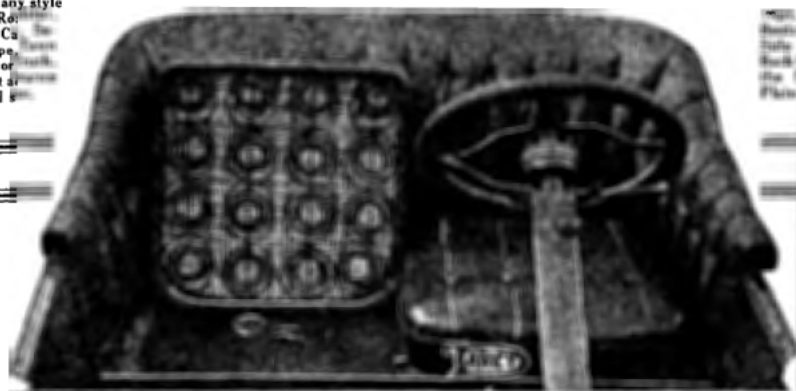
The Gammon Dump Body (not illustrated) has two steel dump boxes, each mounted on rollers, which serve to dump the load off at either side of the chassis. By having the two separate bodies on one chassis, it is possible to carry two different materials in bulk, such as sand and gravel for concrete work. The steel boxes are made of No. 10 gauge annealed sheet steel, strongly riveted and braced to angles at the corners.

BODY VIEW SHOWING CUSHIONS INSTALLED

Ten Different Styles of Springs — Ten Styles of Cushions

Covered with Genuine Leather, Imitation Leather, Bedford Cord, Whip Cord, Velour, Tapestry, to Match any car made regardless of size

Made for any style car — Roadster, Touring Car, Sedan, Coupe, Car, Taxi, etc. At a slight increase over Ford price.



Curtains, for Tops, Curtains, Curtains with New French Glass.

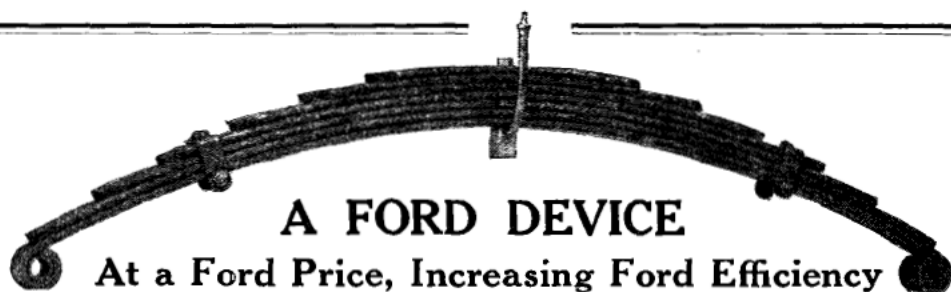
Seat View — Cushion turned up to fill gas tank. Party under steering wheel need not dismount.

Cushions for any other make of car made in America!

We Also Furnish Back Upholstering and Springs for Any Make of Car Besides Fords, Ready to Slip Right in the Job

Send In Your Order Now and Enjoy a Full Season's Pleasure, Touring.

AMERICAN CUSHION SPRING CO., KALAMAZOO, MICH.



A FORD DEVICE

At a Ford Price, Increasing Ford Efficiency

The HIRST FORD SPRING LUBRICATOR is the only 100% spring lubricator on the market. It puts the oil BETWEEN the spring leaves from the INSIDE.

FORD OWNERS RIDE (With Real) DELIGHT

and at the same time save the wear and tear on the entire car.

Get the resiliency out of your springs, not out of your tires.

Keep your tires inflated to their full capacity and get greater tire mileage.

The HIRST SPRING LUBRICATOR is a device which forms a well around the bolt, permitting the oil to flow up around the present center bolt of spring. The oil is then fed through the spring leaves.

To attach simply remove the nut on the center bolt of front and rear spring and screw on the HIRST SPRING LUBRICATOR. The one with the short tube is for the front spring and the long tube is for the rear spring.

NO FELT PADS

Anyone Can Attach This Device **\$2.50**
in Fifteen Minutes. Price.....

Ask Your Dealer
or Write Us

F. G. HIRST Manufacturer's Agent
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When writing advertisers—Just say FORD OWNER and DEALER



FORD TRAMPS

By D. C. RETSLOFF.

"Come right in, Sam. Long time since you warmed one of our chairs. Ain't seen you since 'fore we went to California."

"Some trip?"

"Bet you're life. Winter just flew—fact, we lost the winter when we crossed the Rockies. Some mountains they be with their patches of snow. Beats all how God fixed up this old world, just like a house, by gum! Part of it cold and part of it warm all at the same time. When a letter came from our son John and his new wife urging us to visit them in Los Angeles, we flurried around, got old man Dotson to stay here on the farm, look after the stock and keep Ma's oleanders from freezing. We packed our trunk with our best duds and some of our work ones, for we did not know how much farming John was doing on his three acres in Hollywood, and Ma said maybe I could help his hired man. But by gum, Sam, when I saw that place of son John's, I most swallowed my upper set. It's ahead of the park in Milwaukeee.

"The sun gets up earlier and goes to bed later out there, I figured that there's about three hundred and seventy days of sunshine in California every calendar year. With blue sky and climate enough for half a dozen other states.

"Seems to me every human out in that southern land and a considerable number of the Japs own some sort of a motor buggy. scores of big cars — all glassed in, like ma's china closet, lots of plain, sturdy ones, made for comfort and speed, and believe me, Sam, I never realized how much the Standard Oil company owes to Henry Ford until I struck Los Angeles. Seems that every man Jack, out there, could rustle a Ford and had, though I've a sneaking idea that some of them didn't own much of anything else.

"Well, Ma and I had the time of our lives and saw in them three months what will stay green until our last sun set.

"Our John drives a Marmon. Every Saturday and Sunday of our visit he and his wife took Ma and I tramping. John has a law business in Los Angeles. Nobody who is anybody out there works on Saturday, just grocery clerks and undertakers keep open shop, that's all.

"Christmas came on Monday, if you remember, so John said. 'Now, Dad, we'll take a three day trip this time. Saturday, Sunday Monday. We'll drive down the coast to a little town called San Diego and motor back inland, making a loop of something better than three hundred miles.'

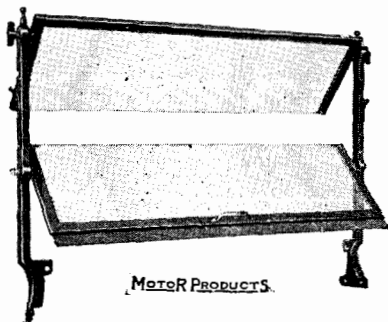
"Three hundred miles?"

"Yes, Sam, those were his very words. Sounded like pretty much of a loop for three days, compared with what I could do with my span of colts. But I knew John and the Marmon, and I was beginning to know the roads of southern California as well.

"John took the camera along with us, so that Ma and I might have some teasers to look at back in Wisconsin. The roads in that part are the finest ever, some are of decomposed granite, but sweet smelling according to Nature's sanitary rules, and then there are miles and miles of concrete highway built by the state. We passed three of the old missions, sturdy, solemn and solid, in spite of more than a century's fog and rain.

"At San Juan Capistrano we came out to the coast, for miles on the paved highway follows the curves of the ocean. We saw fully a dozen men surf fishing and John took some pictures. They catch sea bass, corbina, spotfin and yellow-fin croakers, all very fine edible fish.

"All my life I've been accustomed to tramps, but I never really knew what tramps were until I reached southern California. On that three days' trip we saw more of the tramping fraternity than I dreamed there could be in all Christendom.



MOTOR PRODUCTS

Model No. 170

KEEP COOL

Enjoy Those Long Country Drives

Ventilating

WINDSHIELD

Eliminate the necessity of driving with the doors open

Model No. Z 17—Complete with glass ready to install, has lamp brackets for side oil lamps.

Model No. 170—Same as Z 17 but without side oil lamp brackets. For Starter Equipped Cars.

Model No. 150—Everything complete except glass. For Re-Framing glass of regular Ford Shield.

Model No. 100—Same as No. 150 but without lamp brackets for Re-Framing glass of starter equipped cars.

Free Booklet Sent Upon Request

Motor Products Corporation, Detroit Mich.

"Katta-Pilla" Metal and Cork Fan Belts



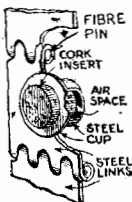
Are made of thin steel links, Fibro Pins and Corks; are noiseless—**RUN SLACK**—practically indestructible, unexpected breakage impossible; are unaffected by dirt, water, heat or oil; will not fall down, wear out, get hard, rot, break, tear, stretch or shrink.

100% EFFICIENT—100% PROTECTION
Saves Oil, Saves Gasoline, Saves Overheating,
Saves Valves, Saves Bearings,
Saves Cylinders

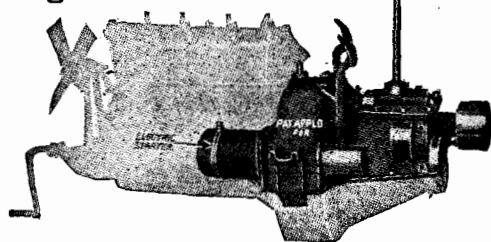
**Fit Any Car, Truck or
Tractor**

"Kork-Tred" Ford Transmission Lining is the original cork lining. There is nothing—"Just as Good." No other cork insert lining contains the **LUBRICATION OIL CUPS**. This feature is fully protected by patents and cannot be duplicated. Don't let 'em fool you with substitutes that have tapered corks which fall out. Will outwear four sets of any other kind of lining. Send for Booklet. Dealers, we have a money making proposition for you.

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Dept. 8, N. Y. City



Saving—More Power "Big Car" Control—



You get the utmost of power, flexibility and speed and give your Ford the same control used on high-powered cars when you equip with

CRANK SIMPLEX FOR SLIDING GEAR TRANSMISSION FORD CARS AND TRUCKS

This is a Three Speed Forward, One Reverse Selective Type Sliding Gear Transmission of the most practical character. The low gear ratio is lower than the Ford low, giving more power in low speed. An intermediate is provided between low and high, and the gear ratio is the same as the Ford high. Hills and rough roads, that heat and wear a planetary transmission are taken with ease with this intermediate speed. The simple "cane shaft" makes it unnecessary to hold down the clutch pedal. It provides a wide range of power with utmost simplicity of operation.

It is strongly built and easily installed without cutting or machining. It saves its cost in preventing axle and engine wear and converts the Ford into a car of more flexible power.

If there is no agent in your vicinity,
we will sell direct. Prompt delivery.

E. D. & A. F. CRONK, INC. Utica, New York

Limousine tramps, motorcycle tramps, hundreds of Ford tramps, in fact, tramps in every make of car.

"An auto road circles Cuyamaca Lake. There the sportsman finds a paradise—in season, trout fishing and duck shooting. The lake covers four sections and in

some places is forty feet deep.

"This fall Ma and I are going on our second honeymoon. We've rented the farm and will tramp from one end of California to the other in a little Ford."

"Why a Ford?"

"Because they are more popular out there than di-

vorcees in Reno and there's a Ford 'Fix-it' shop at every cross road. That suits me. Ma accuses me of not knowing enough about machinery to remove the works from a Thanksgiving turkey. So long, Sam. Better be a Ford tramp with us next time we go."



FORD PALACE TO MAKE EASTERN TRIP

The accompanying photo shows a Ford car that has been equipped with all the comforts of a Pullman palace car by Smith & Kayser, Ford dealers of San Francisco, Cal., and is to be driven across the continent by C. B. Huyett, who is planning to return to his boyhood home in Charlestown, W. Va.

Huyett, who is now 65 years of age, came to San Francisco many years ago and is now going to visit his old home via the motorway. He will drive his Ford Palace, as he calls it, from here to Los Angeles, thence to San Diego, and via the southern route to West Virginia. He is to be accompanied on his trip east by his brother, who is 70 years old.

Considerable ingenuity has been shown in

the construction of the car, which has been fitted up with a cook stove, dining space, lavatory, bureau dresser and mirror, and an upper and lower berth. It has every necessity and every luxury that the modern apartment can boast about save the ever-present rent-raising landlord. The car is equipped with a special battery that will furnish electricity for both lighting and heating purposes.

A ten-gallon extra gasoline tank is carried on the running board. The photo shows Mr. Huyett at the wheel and the builders alongside the car. There is a side door and an end door, with a special step at the rear. All windows can be lowered, and there are ventilators above each window. San Francisco is painted in large letters on the sides of the car.

Ford Miracles—What a New Ford Driver Can Do.

Say "Presto change!" and turn turtle.

Run seventeen miles on a pint of gasoline and a gallon of yarn.

Induce his best friends to perch on a running board—without life insurance.

Buck a stone wall and escape by the skin of his auto.

Take a bee line for an obstruction and gather honey—for the garage.

Steer so poorly that an innocent calf is transformed into poor-steer beef.

Keep his wife on edge.

Ford Owner's Medicine.

Do not halve the road too fine—the knife might slip.

The prudent Ford owner takes his corners slowly lest he have purse indigestion afterward.

There's a lot of satisfaction in turning over a new leaf—with an auto, now, it is different. Strange to say, a Ford owner rests better in his own bed than he does in a hospital—he also has more money left for gas.

Why should a Ford owner seek to curry favor with the judge now that equine days are only a memory?

YOU Battery Repair Man

can open and seal any type or size of starting or lighting battery with the

McNAUGHTON

TRADE MARK
DRY HEAT

Electric Battery Opener

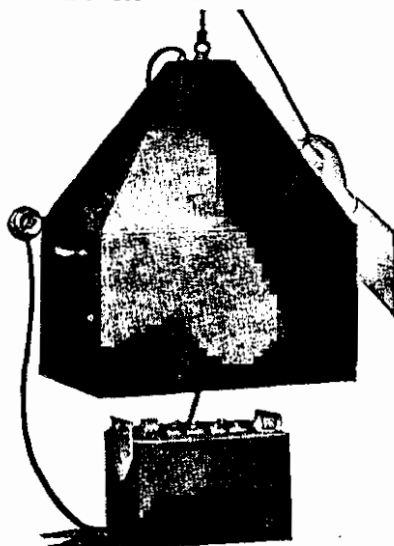
Simply turn on the switch and in five minutes the sealing compound is softened. You can immediately remove the elements or the jars in the presence of your customer showing condition of the battery and the necessity for repair expense.

No trouble waiting, work or muss. No more broken tops on jars, no more steam or water to slop around the battery bench and eat up the service man's clothes.

The McNAUGHTON enables you always to turn out a clean dry job even with a dirty water soaked box.

The only safe method of removing top from glass jars used in farm lighting plants.

Just the thing for baking armatures, drying carburetors, floats or parts, water soaked coils and coil boxes, or for any work where dry heat is desired.



The McNAUGHTON can be used on 110, 125 or 220 volt alternating or direct current.

The cost of operating varies from five to eight cents per hour, actual cost of opening a battery less than one cent. PRICE \$30. F. O. B. CHICAGO or PORTLAND, OREGON.

IF YOUR JOBBER CANNOT SUPPLY YOU
ORDER FROM US DIRECT

J. M. McNaughton Company 565 Washington Blvd., Chicago, Ill.
331 Oak Street, Portland, Ore.

How to Do Efficient, Accurate, Speedy Reboring Jobs

Efficient reboring of Ford Cylinder Blocks becomes

highly profitable when the equipment for the job permits its completion with a minimum of time and effort. That's why there's a new source of added profit for your shop from the

CHAMPION

Reboring Tool

"The Modern Shop Necessity"

The only tool reboring all four cylinders with one setting of locating plates. Rebore and refinishes in one operation.

Rebores in true alignment with Crank-shaft Bearings.

BUILT FOR HARD SERVICE

Compact, accurate, simple in construction, moderate in price. Exceptional durability makes the Champion Reboring Tool stand up under hardest usage.

No need of an expert mechanic to set up or operate.

Equip your shop for greater efficiency prestige and profit from reboring jobs.

Write for full particulars, prices, etc. on both these business-getters

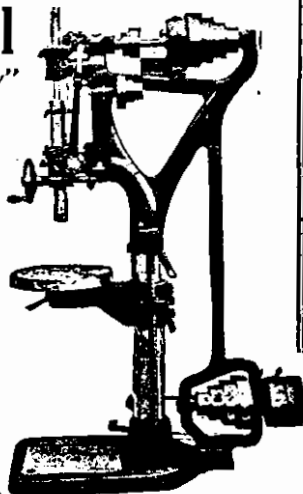
Champion Manufacturing Co.

2908-10 West Fletcher St.

Philadelphia, Pa.

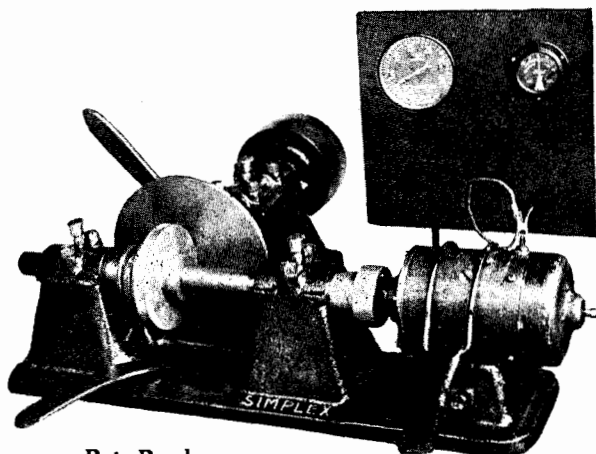
CHAMPION Power Feed 22 in. Drill Press

A modern, up-to-date Power Drill combining at a remarkably low price all the graduated and automatic features of highly priced Drills. Distance Spindle to Base 43", Spindle Travel 12", Feed .004", .012", .020". We can offer you complete outfits, Reboring Tools, and Drill Press with which you can re bore and refinish a Ford Model T Cylinder Block in 30 minutes or a Fordson Cylinder Block in 45 minutes.



SIMPLEX FORD GENERATOR TEST STAND

**Compact
and
Durable
in
Construction**



**Simple
and
Efficient
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Operation**

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SIMPLEX MACHINE WORKS

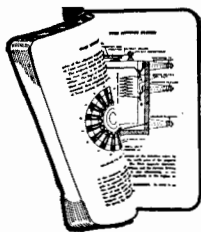
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SAN FRANCISCO, CALIFORNIA

Make Money **Ford** Starting, Lighting Repairing & Ignition Systems

BUT YOU MUST BE PREPARED

When a Ford owner has trouble with the starter, lighting or ignition, be prepared to locate the trouble in a few seconds and make the repairs in the quickest possible time. In this way, you can make money, save time and satisfy your customers.



THIS AUTHORITATIVE BOOK

"The Ford Standard Electrical Equipment"

TELLS YOU ALL ABOUT IT

Prepared by experts to help the every-day repairman quickly locate and repair trouble in the F-A Starting, Lighting and Ignition System.

The book tells of every wire—every connection and what it is for. It has 150 pages and 47 photographs and accurate diagrams. It describes the construction and tells all about the electrical connections for starting, lighting and ignition.

Keep posted—keep ahead of your competitors.

Write your name and address on the coupon below, tear it out and mail it to us with \$2.00 and we will mail you the book. Read and consult it for five days and, if you are not satisfied, we will return your money.

(Coupon) Enclosed find \$2.00 for which please send me your book—"The Ford Standard Electrical Equipment."

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The Forc-Ful Silent Salesman



Displayed on your counter will attract the attention and make a buyer of every Ford Owner who enters your store.

The

FORC-FUL
LUBRICATOR

is the one and only efficient means of proper lubrication of a Ford Car.

It enables you to Fill Full every bearing on your car adapted to hard grease lubrication, including the king and tie rod bolts, in less time than is often spent on a single grease cup.

We help your sales by advertising in the leading trade papers and our Forc-Ful display card as illustrated.

The efficiency of the Lubricator and the appreciation of the Ford Owners do the rest.

Write our sales dept. today for full details.

Made by
I. C. MFG. CO.
Chicago, Ill.

Sales Dept.
THE ZINKE CO.
1323 Michigan Av.
Chicago, Ill.

Keep Both Hands on the Wheel!



BROWNIE
FOOT

Trade Mark



The Newest Thing In Motordom

The hit of the recent auto show at Seattle. Thousands of motorists pass approval on the simplest, most practical dimmer yet invented.

The Brownie Foot Dimmer easy to install—cuts into your headlight circuit right at the switch. Operates with slight pressure of left foot (see illustration). Handsomely nickel-finished, just the size of a silver dollar, quickly attached to the floor board of any make car.

50,000 already placed with California dealers. 10,000 in Washington, 5,000 in Oregon. Some attractive territory still open.

Sells Complete, With Necessary Wire, for \$3.50

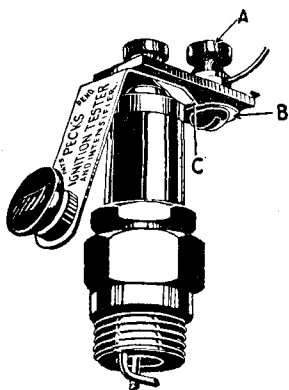
Can be installed in 10 minutes by any driver. Made in 6-9 and 12-16 volt. If dealer cannot supply you we will send direct on receipt of price. Give make and model of car.

ATTRACTIVE OFFER TO DEALERS

Backed by National Advertising

BROWNIE MANUFACTURING CO.

1414-A ALASKA BUILDING, SEATTLE, WASHINGTON



\$100.00 Prize for the Best Mileage on the Least Amount of GAS

PECK'S TESTERS AND INTENSIFIERS will give your car the flexibility of a steam car. It lessens the necessity for gear shifting as it fires the plug under all conditions, no matter how badly fouled with oil or carbon.—Even when the porcelain is cracked.

22% Saved on Gas

This fact was demonstrated at Brooklands Race Track and with each set shipped directions for obtaining this result are sent.

Price 50 cents for each cylinder. Instantly attached. Wear forever. Tests motor without screwdriver.

Convince yourself by filling your plugs full of grease. It is impossible to foul a plug fitted with my invention. It will clean itself the instant the current reaches the superheated points.

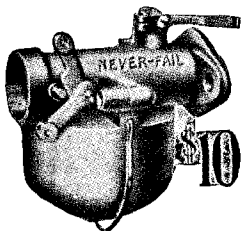
Agents and dealers can obtain \$30 worth by sending \$6. Display them in store windows and collect your money each week.

C. H. PECK

2154 N. Carlisle St.,

Philadelphia, Pa.

With each order for \$6 a cardboard working model of a Valve Timing Chart will be shipped. This chart makes this difficult subject as clear as day.



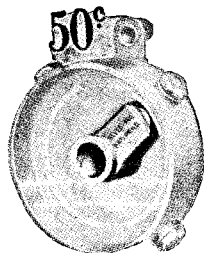
A Powerful Purring Motor

There's a big reserve of pep and power in your Ford, waiting to be freed by the Never-fail Carburetor—pep that will bring you new flexibility, and power that will take you "zooming" over hills. You'll notice the difference the moment your Never-fail is installed.

The Never-fail also brings easy starting, smooth running and **real** gas economy. Satisfaction guaranteed or your ten dollars refunded.

And when you install this little brush in an old, pitted timer shell, it's just like buying a new timer for 50 cents—you get the perfect contact of a new timer, with a fat, hot spark all the time. Satisfaction guaranteed.

Get this Never-fail combination from your dealer or from us. Try it. If you don't agree within 30 days that it's a big step in driving comfort, your money will be refunded.

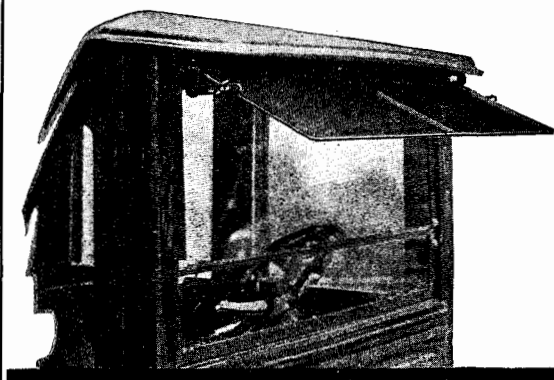


NEVER-FAIL CARBURETOR COMPANY

198 Jackson Avenue

LONG ISLAND CITY, N. Y.

Showing Never-fail Timer Unit in Ford shell.



THE McKINNON AUTO VISOR

Makes driving safer and easier. Put one on your car and protect your eyes from the glare of the summer sun.

McKinnon Visors are made of Black Art Leather—lower side green. They add to the attractive appearance of your car.

Frames are electrically welded steel—one piece—and will not warp. The visor is suitable for any car of standard top construction—open or closed body. It is easily attached, adjustable and fits perfectly without rattling.

Ask your accessory dealer for a McKinnon Visor. If he cannot supply you send us \$5.00 and we will send one direct by parcel post.

McKINNON DASH CO.—(Accessory Division)

250 AMHERST ST.

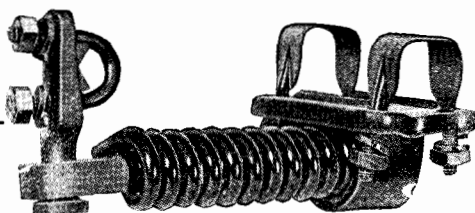
BUFFALO, N. Y.

DEALERS:—WRITE FOR INFORMATION ABOUT McKINNON ACCESSORIES.

GOING BIG! WHY?

SAVES

TIRES,
BUSHINGS, PINS,
STRAIN ON STEER-
ING GEAR,
ROAD SHOCKS,
DRIVING FATIGUE,
ACCIDENTS



BECAUSE

EASILY ATTACHED,
NO HOLES TO DRILL,
MAKES DRIVING
EASY FOR LADIES,
CHEAP INSURANCE

D. & O. SAFETY STEERING CONTROL

for FORD CARS and TRUCKS

Write for FREE TRIAL OFFER

Money Back Guarantee — Warranted for Years



Accesso Manufacturing Co.

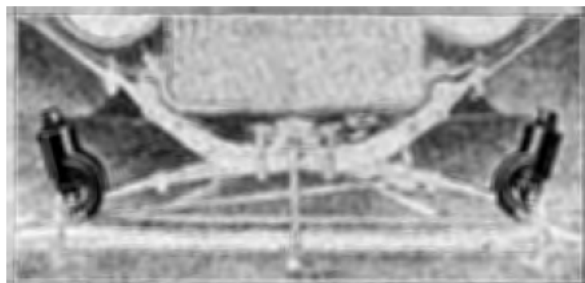
99 STATE ST., BOSTON, MASS.

\$5.00

NASH Shock Absorbers

For Ford and Dodge Cars

Ease
Every
Motion



Lengthen
Life of
Car

For Ford Cars

Absorb all shocks and rebounds.
Eliminate all side sway.
Add appearance and distinction.

Easily and quickly installed without changing any part of car.
Best Material and Workmanship.

Absolutely Guaranteed



LIST PRICES:—\$14.00 to \$22.00 PER SET

F. O. B. Indianapolis. War Tax Included.

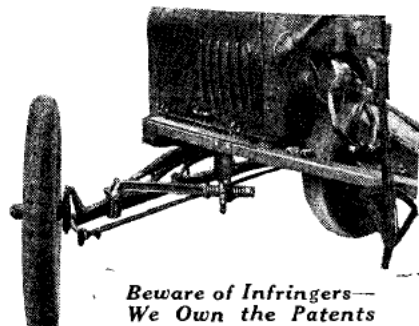
Your jobber has them or can get them for you. For detailed information write,

NASH SHOCK ABSORBER CO.
INDIANAPOLIS U. S. A.

Make Your Ford Car Strong and Safe

BY THE USE OF

Adjustable Torque Radius Rods for Ford Passenger Cars and Trucks



*Beware of Infringers—
We Own the Patents*

"Fitzall" Truck Units

Will make a real 1½ or 2-ton truck out of your Ford car. Three different length wheelbases carried in stock. Special lengths if desired.

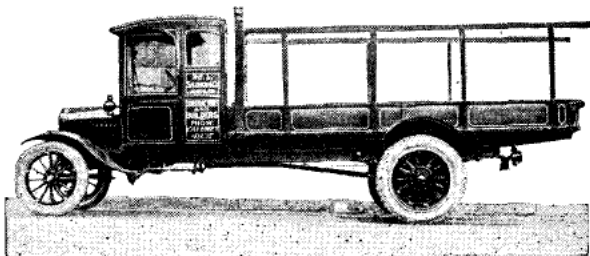
Our "EZE" Load Carrying Extension for Ford Trucks gives greater loading space and properly distributes the load.

No matter what make of passenger car you have we can convert it into a serviceable truck at a very low price with a capacity from 1½ to 4-tons by attaching our "FITZALL" internal gear driven truck unit.

Eliminates the Ford radius rod entirely and completely does away with your steering troubles. Prevents cracking and breaking of crank case and crank case arms and adds to the life of your car.

Adjustable and easy to attach.

Makes your Ford steer like any high priced car or truck. The most value ever offered in a machined product. Weight 30 lbs. Includes bolts to attach. New reduced price \$15.00 per pair.



WRITE FOR FULL INFORMATION AND PRICES.

HUDFORD COMPANY OF CHICAGO,

1416-48 South Wabash Ave.
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the white hot
spark you want
when you want
it—and every
time!

Absolutely Dependable as long as it's running

**EISEMANN
MAG**

THE EISEMANN MAGNETO CORPORATION
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Nabob Shock Remedy
A COMFORT WORTH \$12.00
HUNDREDS FOR ONLY

Complete both front and rear you can do
the job in less than one hour.

URBAN & WIES
1440 S. Michigan Ave., Chicago, U. S. A.

STORM
CONNECTING ROD TOOL

Combination testing, straightening and reaming tool. Quickly and accurately tests and straightens connecting rod bearings. Tool reamer cuts a new perfect bearing to exact size required. A big time saver, therefore a big profit payer. Write us today for the complete story.

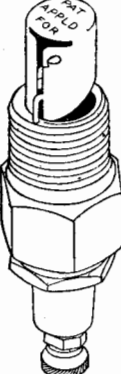
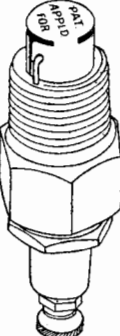
STORM MFG. CO.
Dept. M MINNEAPOLIS, MINN.




Sawco Rectifire

Is a practical device for preventing spark plugs from fouling where excessive oil is present. It is a metal cap of special alloy which fits into end of plug covering and protecting electrodes from oil and carbon. Sold under absolute guarantee.

25c Each
SAWCO CO.
Kalamazoo, Mich.

A NEW WRENCH.

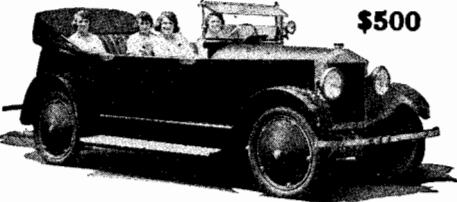
Car owners and mechanics are quickly taking to the New 101 Wrench which is spoken of as "Always the right wrench for any emergency." It takes the place of a set of socket or S wrenches, monkey wrench, pipe wrench or tire tool, and is adjustable for a three-eighths inch to one and three-eighths inch nut. It weighs one and a half pounds and is built of high carbon steel, drop forged, cyanide case hardened, smooth gun metal finish. It sells for \$2.50 and is marketed by Hutton & Hutton, 127 Spring St., Springfield, Mass.

THE F. B. ELECTRIC BATTERY TESTER.

It is not surprising that steadily increasing sales are reported for the F. B. Battery Tester for it is a practical little device that is worthy of success. With this tester the condition of the battery is learned in a jiffy. The tester is merely touched to the cell terminal and if a

**A "UNIVERSAL" BODY
for the Ford Chassis**

\$500



The Universal Body Corporation
MISHAWAKA, INDIANA

**Fan Belts
for Ford Cars**

**Immediate Deliveries.
Write for Prices.**

ACKERMAN BROS. CO., Inc.
301 West 4th St., NEW YORK CITY

green signal light shows, it indicates that the battery is in good condition. If a red light shows, the battery needs attention. It is simple, handy and accurate and a time saver and money maker for battery stations. The cost is \$15.00 with a 20 per cent discount to Ford dealers. It is a product of F. B. Electric & Mfg. Co., Detroit, Mich.

ELLIOTT LEAVES GENERAL TOP CO.
Norman Elliott has announced his resignation as Secretary, in charge of sales and advertising of the General Top Co., manufacturer of Aircraft Tops, Cleveland, Ohio.

Mr. Elliott has been prominent in the automobile top business for a number of years. He was one of the pioneers of the business and one of the originators of the present type of permanent unit automobile tops. He has not announced, as yet, his future plans but it is rumored that he is to head a company of his own which will manufacture a specially designed automobile top.

When writing advertisers—Just say FORD OWNER and DEALER

What's Your Motor Worth?



It is vibration that cuts the life of your motor and boosts your repair bills; vibration caused by unbalanced crank shaft. Expensive Automobiles are equipped with counterbalances. Their motor run smoothly at any speed. Less expensive makes use **Dunn Counterbalances** to obtain the same results.

DUNN COUNTERBALANCES

Are absolutely guaranteed as to material and workmanship. If you are not completely satisfied we will promptly refund your money. Get a set from your dealer, or if he can not supply you, order from us direct. They are easily installed. A wrench is the only tool required.

Get This Book—It's Free



Write today for a free copy of our illustrated booklet entitled "POWER, SPEED, ENDURANCE." It is the most complete and instructive book ever published on prolonging the life, increasing the power, speed, and endurance of automobile motors. Explains where aero-plane and racing motors get their amazing power, and tells how the power of the above motors may be increased tremendously. Whether you drive a passenger car, truck, or are a "speed demon" you will find this book intensely interesting. Also contains useful tables and data. **WRITE FOR YOUR FREE BOOK TODAY. A POST CARD WILL DO.**

PRICES

Ford	\$ 9.00
Overland 4	10.00
Chevrolet 490	10.00
Dodge	12.00

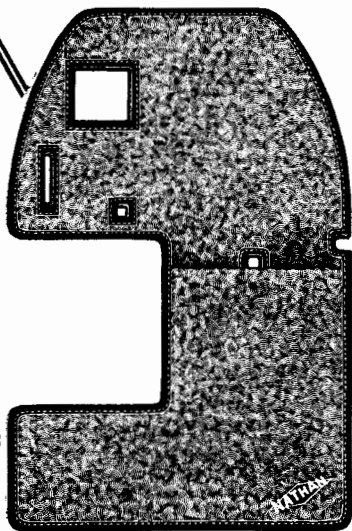
Terms, if your dealer cannot supply you, cash with order or C. O. D.

DUNN MFG. CO.

DEPT. F. D., CLARINDA, IOWA
DUNN SALES CO., 250 W. 54th St., N. Y.

CARPET FLOOR MATS

FOR FORD CARS



Made of especially constructed auto carpet about ¼ in. thick, with wool filling. Edges are substantially bound with fabric leather; all "cutouts" are reinforced. Neutral gray color. Although handsome in appearance, built for hard usage and long wear. Easily cleaned.

F. O. 1481.....\$3.35

FOR FORD TOURING FRONT
OR RUNABOUT

F. O. 1483.....\$4.00

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F. O. 1482.....\$2.80

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NATHAN NOVELTY MFG. CO.

55 FIFTH AVENUE

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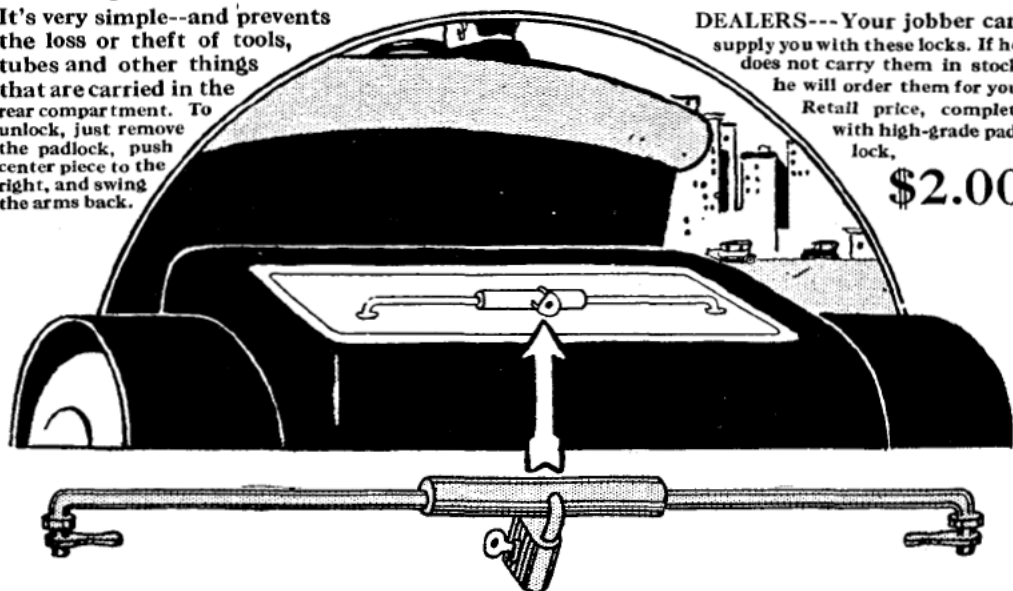
NEW YORK

Every Ford Roadster Should Have this Lock

It's very simple--and prevents the loss or theft of tools, tubes and other things that are carried in the rear compartment. To unlock, just remove the padlock, push center piece to the right, and swing the arms back.

DEALERS---Your jobber can supply you with these locks. If he does not carry them in stock, he will order them for you. Retail price, complete with high-grade padlock,

\$2.00



THE PERFECT LOCK

is the only practical lock for the rear compartment of a Ford Roadster. It locks the lid on both sides and protects it in the center. There are no holes to drill. Anyone can easily attach it.

THE STANDARD CORPORATION, COLUMBUS, OHIO

Manufacturers of Automotive and Glass Specialties



\$2 INSURES YOUR FORD

AGAINST
BURNT-OUT MOTOR BEARINGS

For that sum will bring you a

U-C-M Oil Gauge

Always in Plain Sight

On the foot-board just in front of the driver's seat where it faces you and tells you, whenever you enter your car, whether or not your motor needs oil.

Fully Guaranteed	Easily Attached
No More Stooping or Crawling	
Under Your Car	
No More Guessing	No More Worry
JUST LOOK!	THAT'S ALL!

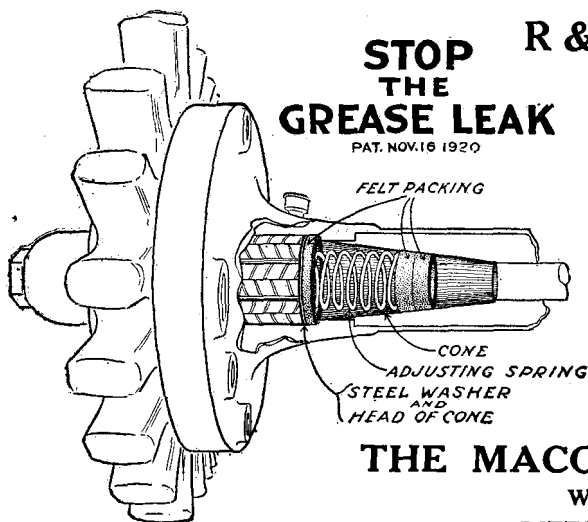
The arrow in the above cut shows the location of the indicator. This is the only part of the device that is visible when the gauge is attached to the car, the float chamber, pipes, etc., connecting the indicator with the lower pet-cock opening in the crank case, being out of sight under the floor and behind the dust shield.

Manufactured by National Novelty Co., 3124 11th St., N. W., Washington, D. C.

Stops the Grease Leak

R & R Automatic Grease Retainers for Ford Cars

Prevents loss of grease and from getting on tires, brake drums or wheels.
No special tools necessary to install. Simply remove wheel and roller bearing, insert



R & R Automatic Grease Retainer

and the job is done.

A spiral spring pressing a washer in a tapered cone keeps it in close contact with the axle making it impossible to leak grease. Sold under absolute money back guarantee if not satisfactory. If your garage man or dealer does not have it, send \$2.50 and a set of two will be sent you. Postage paid.

Write for exclusive territory

Manufactured by

THE MACORVEY COMPANY

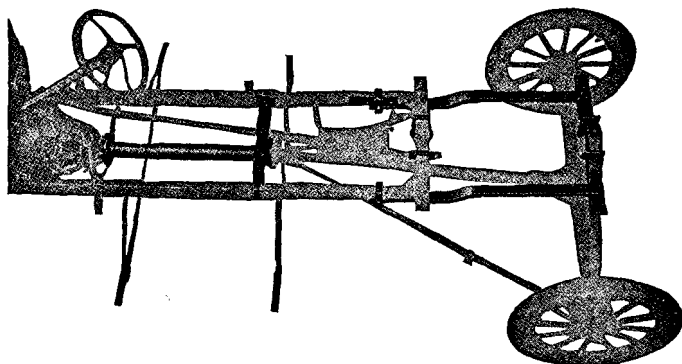
Wabash Building

PITTSBURGH, PENNA.

The Hay-Dee Extension on a FORD will solve your delivery problem

With the Hay-Dee, a hammer and wrench is all you need to convert your Ford into a practical delivery car chassis with 96 or 108 inches loading space back of the driver's seat.

The Hay-Dee Extension served the Government—let it serve you.



15 inch—\$65—Making a 115 inch wheel base

30 inch—\$70—Making a 130 inch wheel base

A. J. DIEFENDERFER CORPORATION

410 West 52nd St., New York City

More than
5000 in use

Dealers—
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"Zig Zag" Radiators

For FORD CARS

GUARANTEED FOR ONE YEAR

ZIG ZAG Radiators are being used on thousands of Fords with the very finest results. Ford owners will never have anything but a ZIG ZAG once they have had one on their car.

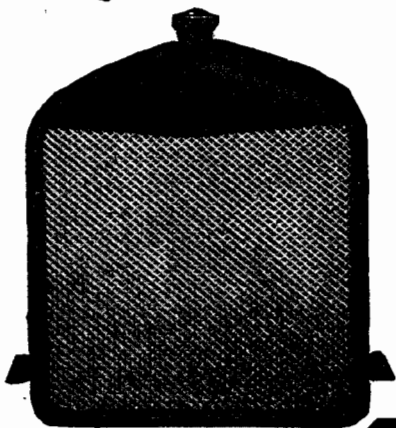
The ZIG ZAG Radiator has remarkable radiation qualities, having a greater number of water channels than any other on the market for Fords (69 against 38 to 42). Performs with equal efficiency in both summer and winter. Will stand freezing without bursting.

The ZIG ZAG is made entirely of brass, with detachable baked black enamel shell, and is built to give long service.

Jobbers and dealers are requested to write for our free radiator catalog.

Auto Radiator Mfg. Co.

1714 So. Michigan Ave., Chicago, Ill.



ATTENTION!

Ford Speedster Owners

Who Desire the Greatest

**Economy, Flexibility
and Power**

We now offer for the first time our

SPECIAL RACING MODEL

**Miller
Carburetor**

"CHAMPION OF THE WORLD"

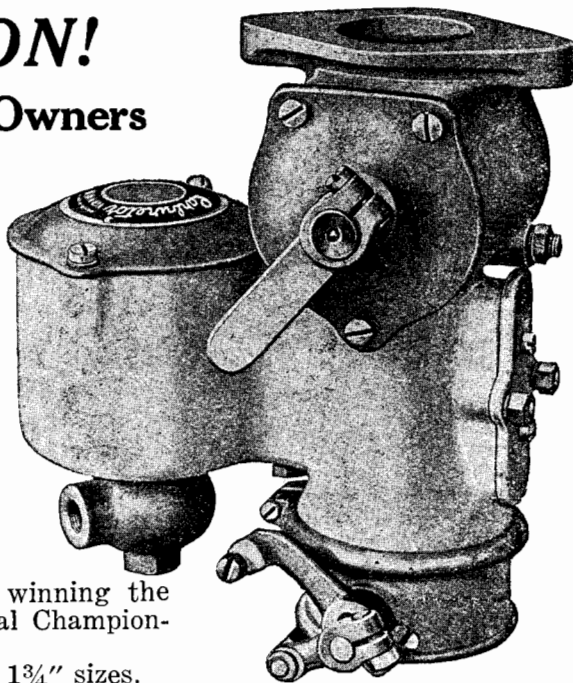
Exactly the same as used in winning the last three 500-mile International Championship races at Indianapolis.

Now available in 1 1/4," 1 1/2" and 1 3/4" sizes.

If no agent in your city, mail order direct to manufacturer.

HARRY A. MILLER MFG. CO.

2652 LONG BEACH AVE.
LOS ANGELES, CAL.



The Pledger Gas Saving Accelerator

SAVES GASOLINE

SOME OF THE EVIDENCE

Tests made in New Orleans, Galveston, Memphis, Chicago, Birmingham, Pittsburg, New York, Boston and elsewhere show that the average mileage per gallon of gas for Ford autos and trucks has been increased 50% to 100% under the use of the Pledger Gas-Saving Accelerator.

The New Orleans Item, Feb. 15, 1920, says: "A run of 17 hours and 50 minutes stretched 10 gallons of gasoline over the entire time and carried the demonstration Ford car 363.4 miles, or 36.3 miles to the gallon. The same car, without the Pledger device, traveled an average of 14 miles to the gallon."

Makes Engine Run Smoother

Price \$20

**Guaranteed to do all
all we claim**

GIVES FOOT CONTROL

In May, 1920, tests were made on the Grand Concourse in the vicinity of New York, by the Automotive Appliances Association under which a Ford car, equipped with a Pledger Accelerator, made a continuous run of 18 hours and 25 minutes, covering 354.5 miles on 10 gallons of gasoline; nearly 35.5 miles per gallon.

Accounts of this were published in the New York American and the Sun and New York Herald, Sunday, May 16, 1920.

Figure your own profit on this \$20.00 investment as it applies to your Ford, or fleet of Fords, and prove our claim of 100% to 500%.

Distributors Wanted

Big Opportunity for Ford Dealers

Write Us For Our Attractive Sales Plan

Southern Jobbers' Supply Co., Inc.

Manufacturers.

New Orleans, La.

PERFEX
THE PERFECT RADIATOR

for Ford Cars

Dependability and a continuous cooling service that gratifies, are mere incidents in the service given by the Perfex Radiator for Ford cars.

One naturally expects more from the Perfex on account of its inherent qualities which have long been writing radiator history.

For almost a decade the Perfex has helped the stalwart tractor plow the prairie. It pioneered the tractor industry. And the same unusual qualities which marked its character then, are found today in the new Perfex Radiator for Fords.

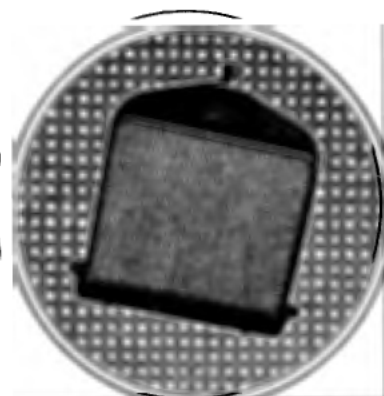
CHICAGO
Standard Motor Parts Co.
1420 South Michigan Ave.

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The Brown Supply Co.
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P. A. C. McIntyre & Company
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PERFEX RADIATOR CO., Racine, Wisconsin



Write us for the story of the Perfex Ford Radiator, giving the name of your nearest jobber, if he does not already handle it. Prices and complete information gladly sent upon request.

The Perfex Radiator is distributed by practically all jobbers of quality automotive equipment.

Don't Re-Bore Cylinders



"POWER KING" Piston Rings are guaranteed to be LEAK PROOF.

"POWER KING" Piston Rings are not an experiment. Over four years' use in a wide range of service gives them easy lead wherever introduced.

"POWER KING" Piston Rings are sold in the U. S. A. only thru our agencies, or direct to users, under our "SATISFACTION OR MONEY-BACK-IN-TEN-DAYS GUARANTEE" PLAN. You to be the judge.

Any size from $2\frac{7}{8}$ up to 5 inch, Standard Width. \$1.00 Each

GET AWAY FROM ALL YOUR PISTON RING TROUBLES

Let us send you a set of "POWER KING" Piston Rings under the above guarantee.

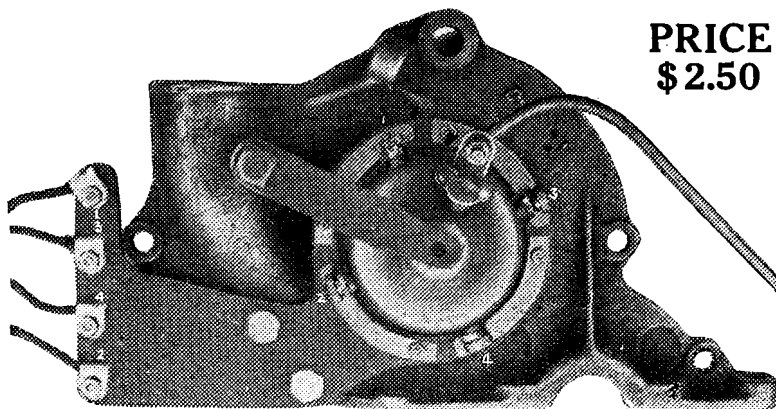
IF WE HAVE NO AGENCY IN YOUR LOCALITY ORDER DIRECT

AUTOMOTIVE PISTON RING CO.

4510 Manchester Ave., (Near Kingshighway)

ST. LOUIS, MO.

The Original Timer Extension for Fords



**PRICE
\$2.50**

Good Live Men Wanted for representatives. We deliver direct from our factory if your dealer can not supply you.

Write for one Today.

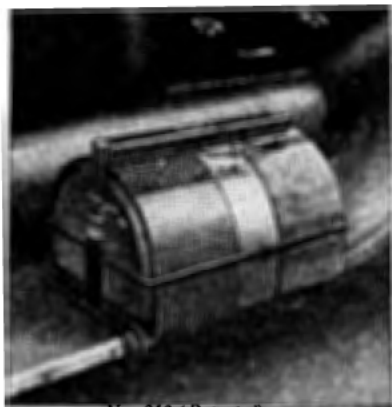
Practical, permanent and only correct way of placing the wires on stationary terminals away from grease and water without the use of gears or shafting and at a very small expense.

Constructed of three ply wood fibre body with wires securely encased and terminal plates of brass, making it impossible to short-circuit and insures a sure, sharp, positive spark.

**EASILY INSTALLED AND NEVER REQUIRES FURTHER ATTENTION
INSTALL THE ORIGINAL AND YOUR WORRIES ARE OVER**

WORTHMORE MFG. CO.

322 SOUTH FOURTH, ST., MINNEAPOLIS, MINN.



No. 212 (Patented)

Boyco Service Units and Camp Grates

Add to the comfort of those
seeking outdoor pleasures

BOYCO SERVICE UNITS for carrying a reserve supply of gasoline, oil, and water give genuine confidence to the motorist. Clamps on the running board. BOYCO CAMP GRATES are sturdy of build for use and abuse with a skilil and grid in combination. Fold into a thin compact parcel.

Ask your Dealer or Write Us

Boyle Manufacturing Company

5111 Santa Fe Ave.

LOS ANGELES, CAL.



Quick
Pickup

Low
Throttling

Bennett

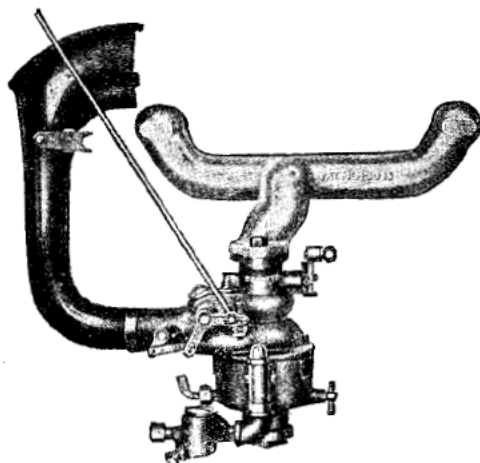
Carburetor for Fords

Economy
Power

Smooth
Running

TO THE FORD DRIVER

Motor performance
that satisfies and
makes driving a
pleasure.



TO THE FORD DEALER

An attractive sales
proposition on an article
that sells and
stays sold.

Dealers wanted in all territory.

WILCOX-BENNETT CARBURETOR CO.

1030 MARSHALL STREET, N. E.

MINNEAPOLIS, MINN.

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STOP YOUR FORD {PASSENGER CAR or TRUCK} WITH A-C BRAKES

*"Get rid of all chatter and jar
And double the life of your car."*

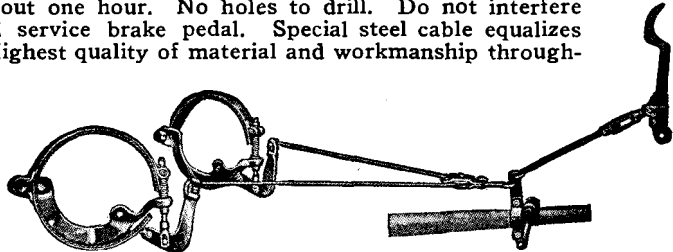
Every time you use the Ford Service Brake, the full force and weight of the car comes against the gears in the differential and transmission. Although these parts are made of very finest steel, this strain sometimes results in broken parts and always causes undue wear and depreciation as shown by rattles and chattering. Practically every car, except the Ford, brakes on the rear wheel and avoids this trouble. For a slight additional expense you can install A-C Brakes and stop your Ford like a high priced car. You prolong its life, save repair and prevent accidents so that you save many dollars for every one you spend.

A-C BRAKES are absolutely **GUARANTEED** to make all stops free from chatter and jar. They relieve your car of practically all rear axle and transmission trouble, permit 100 per cent overloading without damage to the rear axle, and prevent skidding; after installing A-C Brakes you can forget you have a transmission and rear axle on your Ford. Forty-five thousand satisfied users will testify that A-C Brakes are all that we claim and more.

You can install A-C Brakes in about one hour. No holes to drill. Do not interfere with shock absorbers. Use Ford service brake pedal. Special steel cable equalizes breaking power on both wheels. Highest quality of material and workmanship throughout. Write for full information.

*Ford Dealers Can Supply You.
Carried by All Leading Jobbers.*

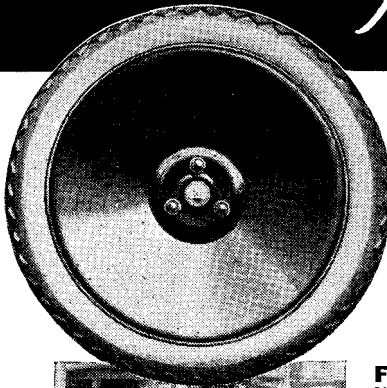
Manufactured by
A-C MFG. CO.
2251-55 W. Grand Avenue
CHICAGO, ILLINOIS



DISTEEL WHEELS

for Fords

\$75⁰⁰
FOR SET
OF FIVE



BEAUTIFY YOUR FORD

Equip your Ford car with Disteel Wheels and make it distinctive in appearance. You have seen how Disteel Wheels add to the beauty of larger cars. Here is your chance to get this beautiful equipment for your Ford at a popular Ford price—\$75 for a set of five wheels and everything necessary for a complete installation.

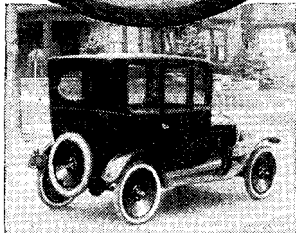
Many Advantages Disteel Wheels greatly simplify tire-changing because they are easily slipped off and on. They also make tires last longer because they never wobble or run out of true. And they are safer—no spokes to break if the car accidentally skids against the curb. The fifth wheel is handy in emergencies.

FREE BOOKLET—SEND NO MONEY

If you would like to have these wheels on your car, just mail the coupon. You will receive complete information about Disteel Wheels and how to get them. Put the coupon in the mails today and get Free Booklet. Send no money—just the coupon.

Agents can make big money selling Disteel Wheels. Ford dealers can sell them by simply placing a car equipped with Disteel Wheels in the show window. Write for liberal dealer proposition. Rich territories open.

- What the Complete Ford Set Includes**
- 5 demountable wheels with clincher rims attached
 - 2 iron hubs
 - 2 rear hubs with brake drums
 - 1 spare wheel carrier bracket
 - 1 license bracket



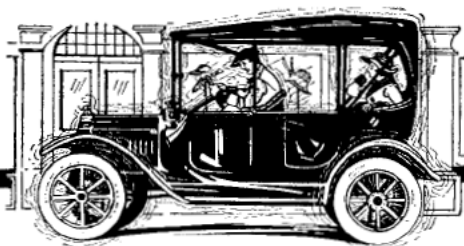
Mail
Coupon
for
Free
Booklet

Disteel Wheel Corp'n.
4818 Cabot Ave.
DETROIT, MICH.

Disteel Wheel Corporation
4818 Cabot Ave.,
Detroit, Michigan.

Please send complete information about Disteel Wheels and how I can obtain them.

Name.....
Address.....



\$1.00 STOPS ALL THAT CHATTER

Stop that awful racket—that shaking and quaking every time you start, stop and reverse.

Speed Chatter Absorber quickly soothes cranky transmission linings. It uniformly softens their hard, glossy surface—gives them an easy grip—smooth as velvet.

A half pint of *Speed* renews half-worn linings—it removes that sudden grab that jolts your nerves and racks your car. Properly applied, *Speed* gives permanent relief and requires but fifteen minutes' time.

If your dealer or jobber cannot supply you—we'll gladly send you a can by Parcel Post prepaid upon receipt of \$1.00.

FORD DEALERS

Try *Speed* for soaking linings before installing. Gallon size \$10.00. Send for sample and discounts.

JOBBERS

Write at once for details of this quick seller.

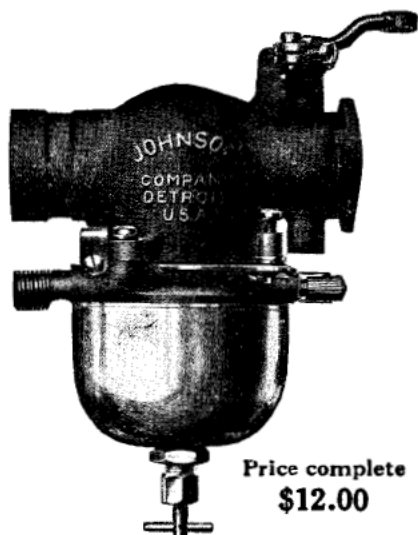
AUTOMOTIVE LABORATORY
Dept. B, 721 Frankfort Ave., Cleveland, Ohio.

SPEED

**CHATTER
ABSORBER**



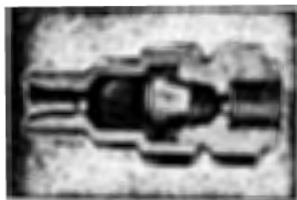
Johnson Carburetors for Ford Cars



Price complete
\$12.00

**Counts Every Drop of Gasoline.
Makes Every Drop Count.**

Strainers for Ford and Maxwell Cars.



**Traps the Dirt. Fits Any Ford.
Price \$1.25**

JOHNSON COMPANY, 1909 Forest Ave. E., Detroit, Mich.



FREE
FROM
OIL



Built
Like
a
Magneto

"LEND'S WINGS TO YOUR FORD"
ABSOLUTELY FREE FROM OIL
GUARANTEED FOR ONE YEAR!

Exclusive Territory for Distributors and Dealers

Manufactured By **Omar Tire & Rubber Co.** 42 West 39th St.
New York City



Here Is Real Driving Comfort

No other item or accessory can furnish the real summer comfort offered by the

Vento Comfort Car Seat

Cool—airy—prevents sticking to upholstery—keeps clothes from wrinkling
With Vento "YOU RIDE IN THE AIR"

Conforms to every movement of the body, flexible cane mesh above an air space an inch deep. Generous openings in the sides of the frame permit free circulation of air all around the body. Back and bottom of Vento covered with leather or velours to prevent damage to upholstery. Makes slip covers unnecessary. Can be easily cleaned with damp cloth. Splendidly made. Price complete \$12.00.

DEALERS: A sure summer seller with generous profits. Write today.

THE BROCKMAN CO.,

Dept. A, 1325 Belden Ave.
CHICAGO, ILL.

The Slipon Emergency Axle FOR FORDS

Ends the trouble, lost time and towing costs which the broken axle has meant to Ford owners. No more of the fear of being "hung up" miles from help, or losing the service of a truck at a busy time.



On Your Way
In Ten Minutes

A Slipon Emergency Axle is bolted to the brake drum. Three fluted rollers quickly lock the broken shaft and the sound axle drives the car, permitting you to proceed on your way.

A Slipon in the tool kit means that a broken axle will not cause more than a ten minute delay. It serves perfectly until you have the time and reach the place where a permanent repair can be made.

DEALERS: Stock Slipons for the service, truck and tourist trade. Write direct to

THE SLIPON COMPANY, Mfrs.
Milwaukee Dept. O Wisconsin

"SPARK-INTENSO"

The only practical
Spark Intensifier for
the Ford.

Gives the spark of a
magneto.

A real scientifically
constructed piece of
equipment, which
transforms the weak
stringy spark into in-
tense hot flame.

Removes and elimi-
nates all carbon and
deposits.

Don't cut down your
spark with an extra
gap, give your plugs
all the pep they need.

No holes in the dash, does not disturb the
present system, just add to any model Ford.

GUARANTEED

A Special Model for Fordsons

Price \$6

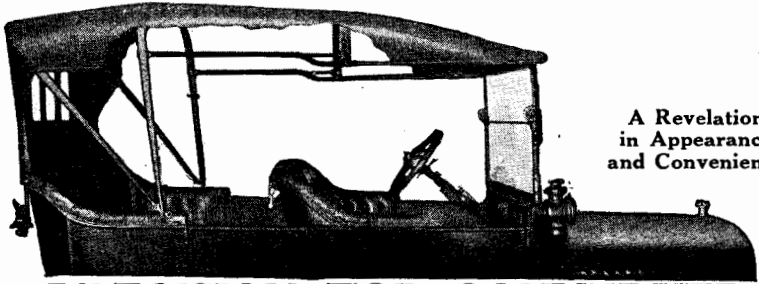
Postage Prepaid Anywhere in the U. S. A.

Western Products Co.

538 Summit St., HERMOSA BEACH, CAL.

Turn Your Old-Fashioned Ford Top Into a GRACEFUL STREAM LINE ONE-MAN TOP

Adds Snap and
Class to Your
Entire Car.



A Revelation
in Appearance
and Convenience

The PRECISION TOP CONVERTER

Why have the appearance and convenience of your entire car marred by a slouchy, ill-fitting, old-fashioned top that cramps the elbows, obstructs the vision and hinders passage thru the front door?

A Precision Top Converter installed in connection with the frame and fabric of your old top eliminates the disfiguring front bows and tension straps, closes the gap between the windshield and top and draws the fabric neatly over the frame work giving you a classy stream line one-man top that adds 100% to the appearance, convenience and comfort of your car.

ACCESSORY DEALERS:—Precision Top Converters
Move Quick and Pay Big.

SECOND HAND DEALERS AND REPAIR MEN—Precision Top Converters will aid you in selling your Second Hand Ford Cars and will pay for themselves in added selling value to your cars by many times their cost.

Precision Metal Workers

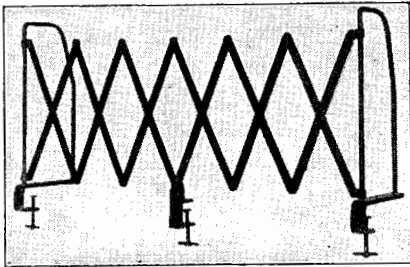
3105 Carroll Ave.
CHICAGO, ILL.



Price complete for Touring
Car or Runabout

Write us today for
full details

THE MASTER LUGGAGE CARRIER



It's a Master Product

Designed to give service and satisfaction, and will carry anything, anywhere, anytime. No tools required to make the application.

THE MASTER LUGGAGE CARRIER is stronger and will last longer than any made. Finished in good black enamel. We will send the MASTER LUGGAGE CARRIER to you, transportation charges prepaid, if you will furnish us your dealer's name with your order. Price \$6.00.

The Master Products Co.

1142-46 Belmont Ave., CHICAGO

Dealers — Write for Proposition



HANDY HANDLES FOR FORD DOORS

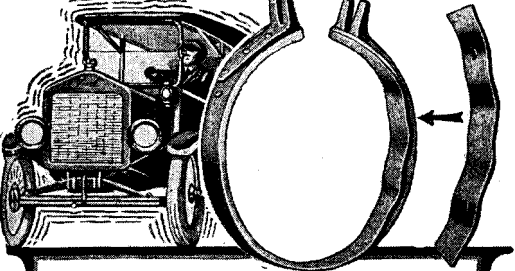
'Atta boy! Handy Handles do the trick. Don't kick your doors out of "kilter" to open them—Handy Handles open them smoothly and easily. You don't have to tug at the door or injure your fingers.

Handy Handles fit right over the regular Ford handles—a few twists of a screw driver and they're on. Solid casting, black enameled—neat in appearance.

Three for a dollar or one for 40 cents. Packed in a carton. At your dealer's or just pin a dollar bill to your name and address and send it to us.

RACINE SCREW WORKS
DEPT. F, RACINE, WISCONSIN

STOP THAT CHATTER



Take the Earthquake Out of Your Ford

Here's a wrinkle that stops the grabbing and jerking of Ford transmission linings—a wrinkle of crucible spring steel that fits between the metal band and the fabric lining to form a cushion.

It saves wear and tear on car and nerves, for it means smooth starting and sure stopping without jerks.

Prolongs the life of your fabric linings by insuring better lubrication. Even if your fabric lining is worn glassy smooth, NO-CHAT will keep it on the job.

Easily attached. Made to last as long as your car. Send \$1.50 for set of three, packed with directions.

Exclusive Territory Open For Live Representatives.

The F. L. HUBER COMPANY
221 N. Channing Ave., ST. LOUIS, MO.

NO-CHAT
TRANSMISSION INSERT FOR FORDS

STOP PISTON SLAPS STOP "OIL PUMPING"

The Apex Innering fits inside the regular piston ring and distributes an even outward pressure that assures perfect alignment of the piston ring with the cylinder wall. At the same time it presses against the piston and forces it to the center of the cylinder.

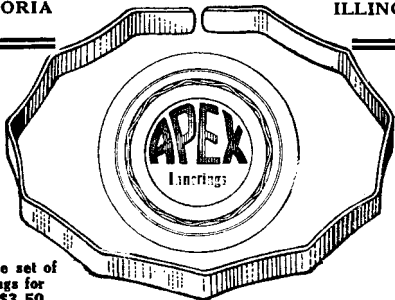
Apex Innerings

stop oil pumping, overcome tapered cylinder walls, scoring and stop piston slap. Increases compression. Keeps plugs from fouling, oil from thinning and saves oil and gasoline.

ORDER COMPLETE SET TODAY—One for each and every ring. Give size of bore, width of piston ring groove, name, model, year and make of car. Prices: sizes up to 5 in. bore, 30c each; over 5 in. bore, 50c each.

DEALERS AND AGENTS—WRITE
FOR OUR SALES PROPOSITION

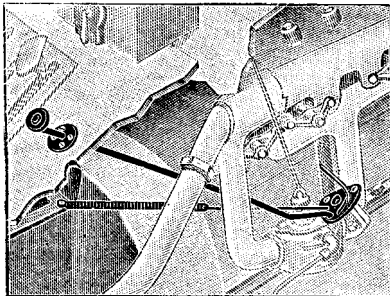
THOMSON - FRIEDLOB MFG. CO.
PEORIA ILLINOIS



Complete set of
Innerings for
Ford, \$3.50

DOUBLE

The Pleasure of Driving Your Ford Car



THE EWALD FOOT ACCELERATOR

Makes driving at least 100% easier because it allows you to control the speed of your car entirely with the foot, leaving the hands free to operate the wheel brakes and horn. It spells safety at all times and quick get-away in crowded traffic zones.

A Necessity in the City—A Convenience in the Country.

Price 75c DEALERS AND JOBBERS
Write Today for Full Details

Manufacturers
THE ROMORT MFG. CO.
Oakfield, Wis.

Sales Dept.
THE ZINKE CO.
1323 Michigan Ave.
Chicago, Ill.



Two-Way Profits to Dealers

Amesbilt Bodies for Fords offer two distinct opportunities for dealers to make **BIG PROFITS**, easily. You can work them both.

Sell Amesbilt Bodies to Ford Owners

Many Ford owners find the chassis and motor of their cars in splendid condition, but the body is worn out. You can readily sell an Amesbilt Body, giving the owner big-car comfort, convenience and appearance at very small investment.

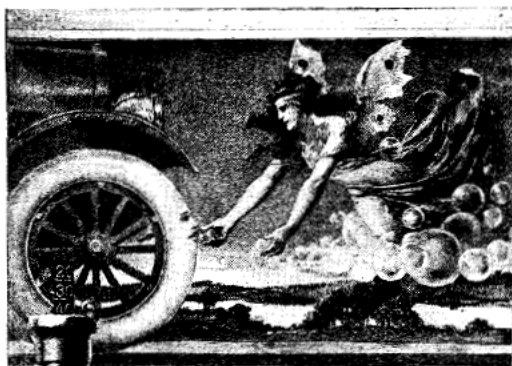
Rebuild Old Fords

Buy all the used Fords you can, put them in condition—then equip them with Amesbilt Bodies. You will have a ready market for these cars at a fine margin of profit. Amesbilt Ford Bodies have the same splendid materials and expert workmanship that we use in bodies we build for high-priced cars. Four clever, classy models meet every taste and need. Complete, ready to install. Liberal discounts to dealers. Write for our proposition.

The F. A. AMES COMPANY
Incorporated

628 Third Street
Owensboro, Ky.





"COPYRIGHTED 1921 BY THE TWITCHELL GAUGE CO."

FEED YOUR TIRES

the right amount of air and keep them fed right by using a

Twitchell Gauge

to make sure that they have the pressure that the Tire Manufacturers prescribe.

Price \$1.50 in U. S. A.
Your Dealer Has Them.

THE TWITCHELL GAUGE CO.
1516 So. Wabash Ave., CHICAGO

THIS is one of a series of ads now being run in consumer publication to stimulate the sale of Twitchell Gauges. When sending in your order for your season's supply of Twitchells take into consideration the effect of this advertising, as well as the fact that there are a million more automobiles in use this year than last.

For FORD CARS

The
Wheel
that
Won't
Come
Off



Safety—With patented reverse taper construction and hub-cap wedges, wheel positively cannot come off by accident.

Beauty—Add attractiveness to your car.

Comfort—Make your Ford ride easier.

Economy—Save tires and save gasoline.

Convenience—Quick, easy changes when necessary.

Set of 5 wheels and equipment, black, white, cream, green, blue, red or khaki color for Ford cars **\$75**
Same equipment for Chevrolet 490 and Overland 4 **\$85**

Write us for attractive dealer proposition.

STEWART WIRE WHEEL CO.

601-637 W. Barner St., Frankfort, Ind., U. S. A.

THE A. J. ALSDORF CORPORATION

Exclusive Foreign Distributors
CHICAGO, U. S. A.

The Stewart Hub Makes Safety Sure

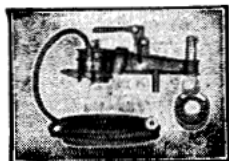


Don't Pump By Hand

Let Your Engine Do It. Don't tire yourself out with the old hand pump that never works right. Inflate your tires in one minute without work with the

G. N. T. Tire Pump

ENGINE
DRIVEN



FOR
FORDS

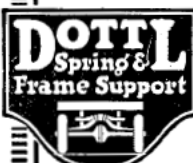
Price \$10

Wonderful new invention. Works perfectly. Will pump your tire in one minute. Easily installed under hood. No holes to drill. Money back guarantee. ORDER TODAY or write for circular.

DEALERS:
Get our attractive proposition. Write today.

HIGHFIELD
ACCESSORY CO.

317 Buhl Block
Detroit, Mich.



Haul More Tonnage at Less Cost

You can safely carry a 2,000 pound load on your Ford converted truck—make less trips per day with a saving in time and labor—if you equip it with

DOTTL Spring and Frame Supports



Dottl Supports strengthen the rear end of your truck and increase both its carrying and earning capacity. No danger of shearing the rear center bolt or of scraping tires—the load is evenly supported at three points and sideways is eliminated.

Dottl Frame and Spring Supports can be easily installed—no drilling or cutting. Made for old and new model Fords. Ten days' free trial—one year factory guarantee \$8.00 per set; Canada \$10.00. Cost quickly repaid; order your set now.

DEALERS: Write for our profitable and sales-building proposition.

DOTTL MFG. COMPANY
Dept. R. MADISON, WIS.

PORTER Safety Neutral Stop FOR FORDS



PRICE \$2.50 COMPLETE

Think What This Means

The Porter Safety Neutral Stop eliminates the danger of going past neutral into low gear when trying to make a quick stop. It makes stopping easy, positive and quick. By making the Ford car easier to handle it greatly increases the pleasure of Ford driving. Easily operated with left foot only.

We Have An Attractive Proposition For Sales Representatives

Manufactured by
PORTER PRODUCTS CORPORATION

General Offices
620 Keith Building Syracuse, N. Y.

COWLES DOOR LOCKING SET For Ford Sedans and Coupés



Handle with Lock
for right hand door

Handle without Lock
for left hand door

No. 1170FD Set

List price \$10.00 set

Liberal discount to dealers

No expense to install—a screw driver the only tool needed

Ask your dealer or write us

C. COWLES & CO.

New Haven

Connecticut

GAS SAVED

SOON PAYS FOR THIS Carburetor

Phenomenal results are obtained from the STEINBRENNER carburetor. It gives you 5 to 15 more miles per gal. because it converts every drop of gas into maximum power. In fact, for hard-hitting it is the "Babe Ruth" among carburetors and is easily



SUPERIOR TO HIGHEST PRICED CARBURETORS

The Steinbrenner makes such a wonderful improvement in the power and economy of your motor because it creates perfect combustion. It insures quick starting, reduces formation of carbon and provides a remarkable flexibility allowing motor to run smoothly under 5 miles per hour. Expert designing and construction is the answer.

Only One Adjustment, no moving parts and just 3 movable parts, insure freedom from trouble. Simple to install, will outlive the engine. Over 1000 in use in Buffalo over 5 years.

For Ford Model, send P. O. Money Order or Check for \$12.00. Carburetor shipped Parcel Post prepaid with full instructions. Models for Chevrolet, Dodge, Oakland, Overland, etc., for trucks, tractors, motorboats—prices on request.

DEALERS AND SPECIALTY MEN—Territory open. Send for liberal proposition and discounts.

David Reid Factory and Sales Office
27 Liberty Ave., BUFFALO, N. Y.
Reference—Mrs. and Traders Natl. Bank, Buffalo.



FOREIGN TYPE RACING BODIES

FIT ANY FORD

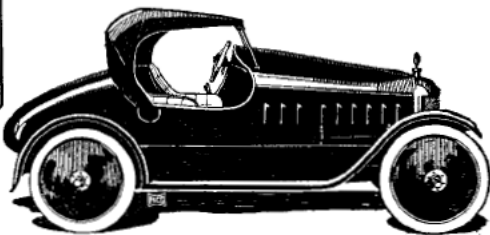
chassis. Makes them all look with envy. Gives you a feeling of genuine pride and satisfaction when you own a "Paco." Gives your Ford that snappy foreign racy look. Just like you have always wanted.

Be sure you buy a "Paco." "Paco" designs are patented. Every model taken direct from world's champion racers. Write today for all information, descriptive literature and prices of the "Paco."

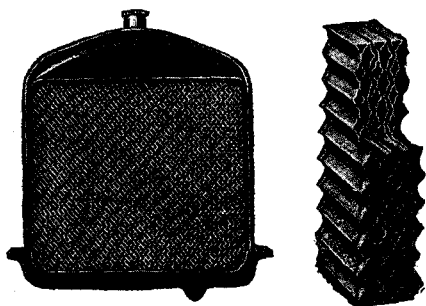
PACO MFG. CO.

Dept. 205

PEORIA, ILLINOIS.



The "SUPERFECT" NEW TYPE OF RADIATOR for FORD CARS AT NEW PRICES!



A Honey-Comb Radiator; inner unit made entirely of brass. Note improved water passage construction in cross-section. A radiator that sells on sight with a good profitable margin. Cooling efficiency guaranteed and will give service without interruption.

SALES AGENCIES GRANTED—WRITE!

SUPERIOR LAMP MFG. CO., INC.
149 W. 52nd St. 311 Halsey St.
NEW YORK CITY NEWARK, N. J.
Write for Profit-Boosting Proposition

No More Breaking Arms By Cranking a Ford Car

3 POWER MECHANICAL STARTER

Spins the engine a complete revolution fast enough to start instantly on the magneto



Any Lady Can Operate This Starter from the Seat of the Car Easily

- | | |
|------------------|----------------|
| 1 Hand Lever | Combined |
| 2 Foot Lever | In |
| 3 Spring | One |
| PRICE | Action |
| F. O. B. Chicago | \$25.00 |

For Particulars Write to the Office

3 IN 1 STARTER CO.

2297 Clybourn Ave. CHICAGO, ILL.

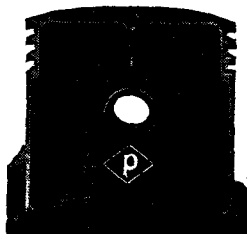
Absolutely Fool Proof. Attractive Terms to Agents.
Nothing Taken Off Your Car.

BALANCED LIGHT WEIGHT FERROLYTE PISTONS

(Trade Mark Reg.)

DESIGNED FOR EFFICIENCY FORD AND OTHER MODELS

FORD
TYPE
\$16.25
(Set of
Four)
Complete



FORD
TYPE
\$14.75
(Set of
Four)
Less Rings

Note Light Sturdy Construction of Cross Section

Higher Speed—Quicker Acceleration—No Engine Vibration—Less Wear on Motor Bearings—Lower Operation and Upkeep Cost.

SIZES:

Standard, + .0025, + .005, + .031, + .033, + .062

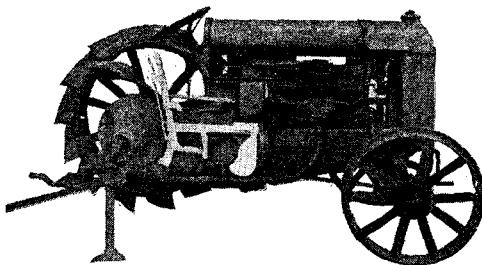
WRITE FOR LIST OF MAKES AND PRICES
Special Discount to Jobbers, Dealers, Garages, Etc.

The Perfection Auto Parts Co.
420 Lakeside Av. N. W., CLEVELAND, O.

Halferty Clutch Control

(Patent Applied For)

Automatic and Manual



Assures Safety for operator and tractor. Provides either hand or foot control. Acts as brake. Idles belt pulley. Makes cranking easy. One man control under all conditions. No more clutch troubles. We provide comfortable foot rest. Prevents other abuses which very often cause excessive wear and breakage. Simple, adjustable, and can be attached by anyone in five minutes.

DEALERS: Write today for our proposition.
OWNERS: If your dealer has not stocked this device write to us direct.

OUR GUARANTEE—"Absolute satisfaction or your money back." Write today—NOW

HALFERTY BROS.
SANTA ANA, CALIFORNIA

KOR-KER PRESERVES TIRES



What many autoists believed impossible has been accomplished

Tires can be made puncture proof and leak proof. For seven years and in forty different countries thousands of autoists have been enjoying the luxury of riding free from the worry or care of punctured tires by having them Korkerized.

Kor-Ker removes the bugbear of automobiling. Kor-Ker instantly and permanently heals punctures.

Kor-Ker stops slow leaks—makes tires non-porous.

Kor-Ker often gives 50% more mileage.

Kor-Ker keeps tires at normal inflation—no broken sidewalls, rim cuts, chafed beads, etc.

Kor-Ker reduces possibility of blowouts to a minimum.

Kor-Ker saves many dollars a season.

Kor-Ker saves you the delay and bother—of a puncture on the road.

Send for literature.

Correspondence invited with dealers.

ALCEMO MANUFACTURING CO.
115 Bridge St., Newark, N. J.



Guard Your Tire Valves

Your Tire Valve Stems need protection from accidental blows, and sand, mud, dirt and grit should be kept from the threads of the Tire Valve Stem and its Fittings.

Kwik-on-an-off Dust Caps do these things effectively and without loss of time.

Slip them over Valve Stem and then turn to the right, like screw Dust Cap, until tight. When taking off reverse until loose.

Copyright 1921, by
A. Schrader's Son, Inc.

On small diameter Tire Valves use Milled Rim Nut Bushings, on which Kwik-on-an-off Dust Caps fit perfectly.

4 to a package for 50 cents

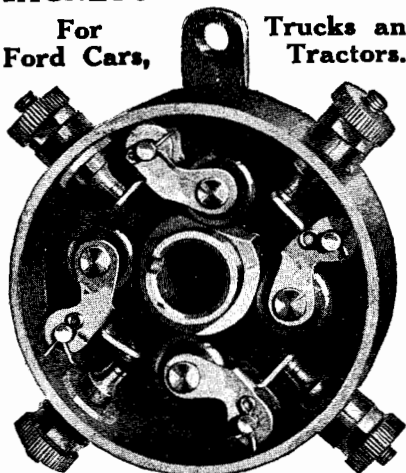
1921 MODEL IMPROVED IN DESIGN

A. Schrader's Son, Inc.
BROOKLYN, N. Y.

DEALERS: Order your stock today. You can sell as many sets as you have customers.

FANSTEEL MAGNETO BREAK TIMER

For Ford Cars, Trucks and Tractors.



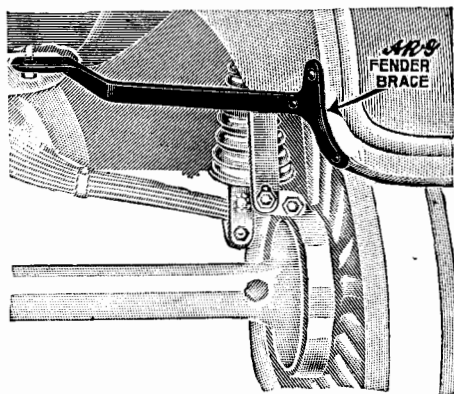
**SAVES GAS
INCREASES MILEAGE
DOES AWAY WITH EXCESSIVE
CRANKING**

**RUST PROOF CONSTRUCTION
AGENTS WANTED EVERYWHERE**

W. J. WALSH

528 MONADNOCK BLOCK

CHICAGO



Stops Rattling Fenders

Prevents vibration and keeps fenders from cracking. Easily and quickly attached. Keeps your Ford from ordinary depreciation. **Price \$3.00.**

Same high quality as the ARG Auxiliary Spring; the \$5 spring protector and shock absorber that has proved good on thousands of Ford cars. Sales Department

JESSOP & THOMPSON
1421 S. Michigan Ave. CHICAGO, ILL.

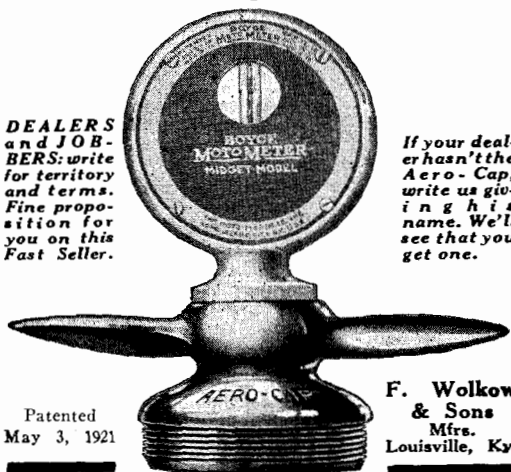
Manufactured by
ARG Auxiliary Spring Co. Inc.
BIRMINGHAM, ALA.

You'll Want This JUNIOR AERO-CAP

on your Ford Car

Niftiest and handiest Radiator Cap you ever saw. Made of one-piece bronze, heavy nickel finish. Steam tight; can't crack or break. Slight twist tightens or loosens. Price \$2.50. Furnished solid or drilled for Moto Meter Midget Model.

DEALERS and JOBBERS: write for territory and terms. Fine proposition for you on this Fast Seller.

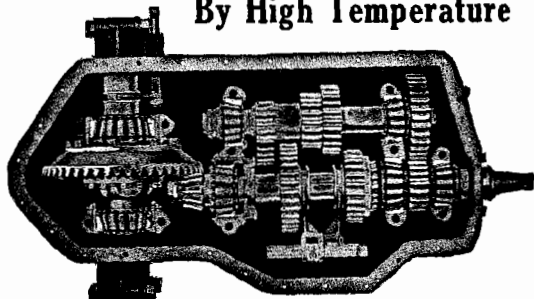


Patented
May 3, 1921

If your dealer hasn't the Aero-Cap, write us giving his name. We'll see that you get one.

**F. Wolkow
& Sons
Mfrs.
Louisville, Ky**

Cook's Lubricant Is Unaffected By High Temperature



A hot summer day, an asphalt pavement, the close proximity of the exhaust from a muffler and the heat of friction, often create enough heat to make ordinary differential grease run out through the packing and fly all over the wheels.

With Cook's Lubricant this cannot happen, because it is not liquified by high temperatures. It is the ideal lubricant for this purpose—and will not cake, clog or gum.



Put up in cans, kegs, half barrels and barrels—There is none "just as good." Write for leaflet.

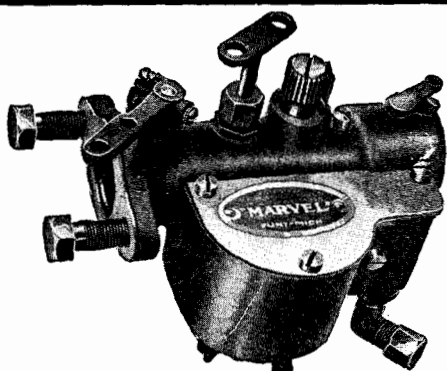
Adam Cook's Sons

708 Washington St.

NEW YORK, N. Y.

Established 1868

A MARK known and respected around the world since 1868 for fair dealing—a quality product and an unexcelled service.



THE MOST POWER AT THE LEAST COST

Real economy consists of getting the most power at the least cost. This is positively accomplished through the use of

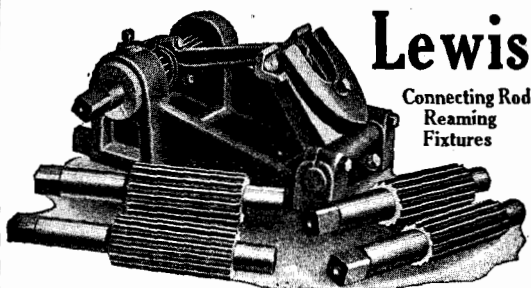
THE MARVEL CARBURETOR

The Marvel, Model N Carburetor is a horizontal type, side opening, two jet instrument, designed especially to meet the needs of Ford owners who demand a powerful and economical carburetor. Simple in design—but one moving part, the auxiliary air valve, which proportions the mixture to the demand. No excess amount of gas on the low speed needle in order to have power enough at high speeds, is necessary only sufficient gas to give proper idling and low speed performance and the high speed jet is then only called upon as the motor demand increases. Uniform carburetion at all speeds and maximum economy of fuel.

PRICED \$10.00 F.O.B. Factory. A 30 day trial—money back if not satisfactory—protects you. No extra fittings necessary.

DEALERS—Write today, seeing is believing.

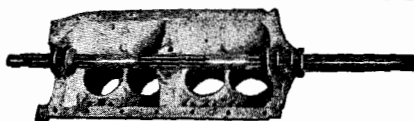
MARVEL CARBURETOR COMPANY
Flint, Michigan, U. S. A.



Lewis

Connecting Rod
Reaming
Fixtures

Perfect Alignment in reaming connecting rods. It is a jig that compels correct results and eliminates guesswork and "scraping." Any ordinary mechanic can operate it. Eleven sizes, fitting 103 different motors made in the United States.



Combination Aligning Reamer for Ford Motors

Will not dig, chatter or pull the babbitt. Eliminates end thrust. Saves time and gives a perfect job. Saves its cost on first five motors reamed, and earns bigger profits on "standard price" service work.

Write for complete detail and prices

LEWIS TOOL COMPANY
612 Fifth Avenue, South Minneapolis, Minn.

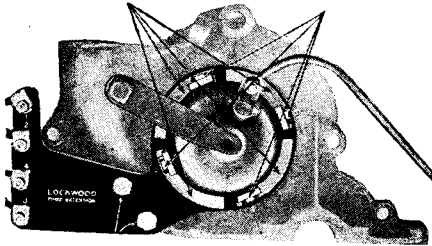
LOCKWOOD TIMER EXTENSION

FOR

Ford Cars and Trucks

Contact Plates

Contact Shoes



Bolts Holding Extension

LOOSE WIRES ELIMINATED
IGNITION TROUBLE SOLVED
SURE SPARK
EASIER STARTING
SMOOTHER RUNNING

PRICE
IN U. S. A. **\$3.50**

DEALERS AND AGENTS WANTED

Lockwood Products Co.

307-9 Met. Bank Bldg.
MINNEAPOLIS, MINN.

Will You Do This?

Look up
any car
owner in



your town or city who is
using Pressure Proof Piston
Rings in his car. Let him
tell you what these rings are
doing in eliminating carbon,
increasing compression
and cutting down fuel and
oil expense.

Then follow his advice and

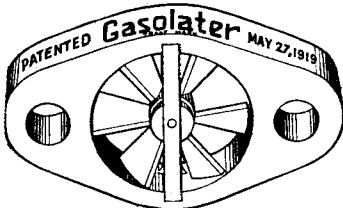
Install Pressure Proof Rings in Your Own Car



**PRESSURE PROOF
PISTON RING CO.**

107 Massachusetts Ave.
BOSTON, MASS.

Canada: Pressure Proof Rings, Ltd.
Sun Life Bldg., Sherbrooke, Quebec.



Use the Power You Pay For

There is ample power in even the lowest grade gasoline.

But the one way to get all of that power out of the gasoline—to make it work—is with the

\$7.50 GASOLATER \$7.50
Power Producer.

The Whirling blades of the Gasolater churn every drop of gasoline into a vapor as it enters the engine.

It converts every drop into efficient power—explosive gas—not part liquid that now enters the engine.

Result: You get all the power in the gasoline—you use all of the fuel and avoid the carbon which results from the gasoline which, without the Gasolater, enters the engine only partly vaporized.

Hundreds of users prove that it

Produces More Power.

Reduces Carbon.

Improves Motor Operation.

Easily attached and requires no attention.

Dealers—Jobbers: Write today.

A REAL SELLER,

AMERICAN GASOLATER CO.

1943 Railway Exchange Bldg. ST. LOUIS, MO.

DETROIT Cylinder Reboring and Burnishing Outfit —Ford Motor

All four cylinders rebored and BURNISHED in less than a half hour. Burnishing cylinders is the method used in the Ford factory.

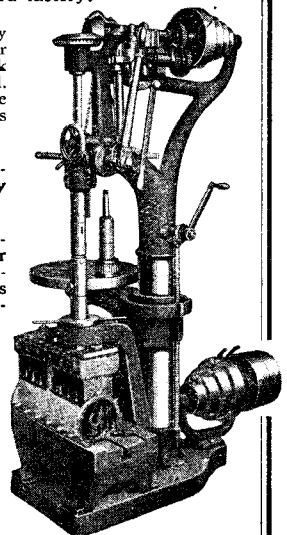
This outfit will fit any Drill Press 20-inches or larger that has Back Gears and Power Feed. Price \$225. Complete with 21-inch Drill Press illustrated, \$450.

Write for complete description, and our Money Back Proposition.

We manufacture a complete line of tools for Ford and Fordson repairing. Ask for details of equipment that interest you.

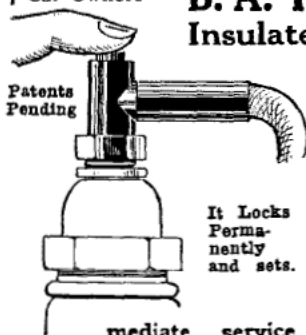
**DETROIT
GARAGE
EQUIPMENT
CO.**

44 Hendrie Av.
Detroit, Mich.



A Friend to All
Car Owners

B. A. T. Automatic Insulated Spark Plug Terminal



It Locks
Perma-
nently
and sets.

IT LOCKS permanently, cannot pull or vibrate out until the push button is pressed down when the connecting plug is released. Gives im-

mediate service, saves time, no burned fingers, no shocks, no short circuits, no loose or ragged wires, no lost nuts, no annoyances of any kind. Always a tight connection giving a rich spark to the plug. Is the only sure hold-tight electrical connection between spark plugs, timers and magnetos. Increases the life of the cables. Cables can be instantly disconnected and connected while the motor is running, enabling the user to quickly find the plug not sparking. When once used, always used.

We will mail a box containing a set of four on receipt of \$1.50 to introduce them into your neighborhood. Show them to your friends. If you are not satisfied, we will return the \$1.50 on receipt of the terminals in good condition.

When ordering state the type of Spark Plug
You Are Using

We invite dealers to write for terms.

B. A. T. TERMINAL CO., 105 Vanderveer St.,
BROOKLYN, N. Y.

**SAVES
TIRES**



**FREE
CURTIS AIR
FREE FROM OIL**

Business Building Service

Drivers of cars appreciate the superior free-air service you can render with the Curtis Air Compressor. They know Curtis Air—clean, pure and free from oil—preserves tubes and increases tire mileage.

Curtis Air—Free from Oil

The number of Curtis Compressors in use today is unquestionable evidence of their distinct superiority. The Curtis, with its exclusive, patented, controlled splash oiling system, is the only compressor so designed to prevent oil from being forced into the air line.

Ask Your Jobber

There is a style Curtis Outfit to meet your particular needs. Ask your jobber for full information, or write us, Style "V" Five Sizes

**CURTIS PNEUMATIC
MACHINERY CO.**

1639 Klenlen Ave., St. Louis, Mo.

Branch Office:

532 L. Hudson Terminal,
New York City



HARVEY STEEL DISC WHEELS



Air Valve Accessibility

Tire inflation on a Harvey disc wheel is accomplished through a hand hole cover on the outer surface of the wheel.

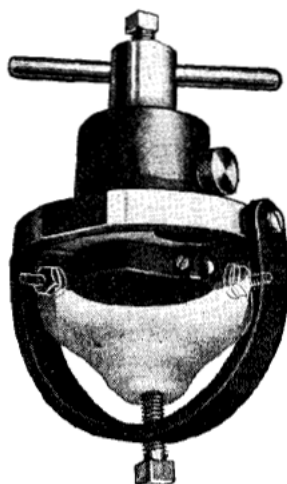
One twist of the screw driver releases the cover—the valve stem is then exposed. Being enclosed, it is always clean.

For Fords and other cars taking a 30 x 3 1/2 inch wheel Harvey discs provide easy-riding comfort and safety without additional weight.

Harvey triple disc construction withstands the "skids" and "side-swipes" of slippery pavements and sharp curves.

Write for full details.

HARVEY RIM & WHEEL CO. INC.
Buffalo, N. Y.



The "INLAND" Refacer for Ford Timer Cases

Makes the refacing of worn timer cases as practical as the grinding of valves and removal of carbon.

Only a few minutes required to make an old timer **ABSOLUTELY SMOOTH** and **CENTRAL** with the shell. As a case can be **REPEATEDLY REFACED**, this tool is an economy to the Ford owner and added source of profit to the repair man.

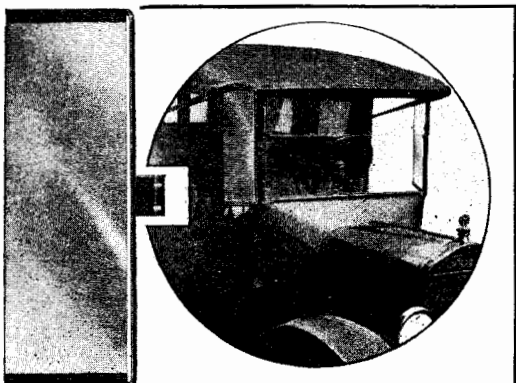
PRICE \$5.25

West of Rockies and Foreign \$5.75

Inland Metal Products Co.

COLUMBUS, IND.

DEALERS AND REPAIRMEN—Let us show YOU your profits from this tool.



DRIVE IN COMFORT

You can drive with comfort and safety in any weather, if your Ford is equipped with the

D. W. Wind and Rain Deflector FOR FORDS

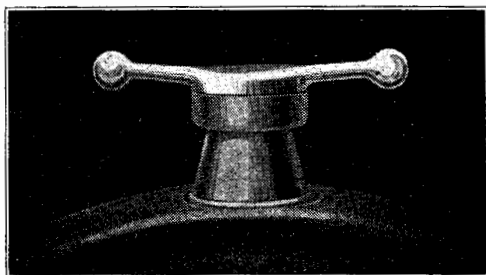
With this device, disagreeable back drafts are eliminated and the rain cannot reach you.

It is easily applied by removing two screws from the lowest part of the hinge of the windshield, placing the deflector in position and replacing screws.

PRICE
PER PAIR **\$6.00**

If your dealer cannot supply you we will send direct, by parcel post, on receipt of price. Satisfaction guaranteed. Patent applied for.

D & W Mfg. Co. Dover,
New Hampshire



FORD SPECIAL \$1.00

West of Denver \$1.10

P. C. WINGED RADIATOR CAPS

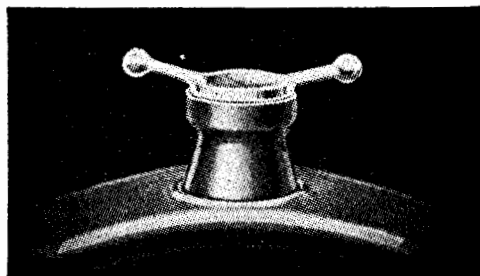
FOR FORDS AND OTHER CARS

Look classy—are classy. If your dealer or jobber can't supply you, write us.

PARTS CORP., INDIANAPOLIS

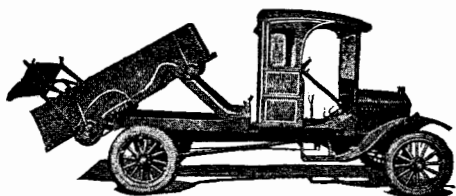
FORD REGULAR 60c

West of Denver 70c



20th Century Automatic Dump Body

Pat. 2-13-12. No. 1017016.



For 1 or 1½ Ton Trucks. Capacity approximately 33 cu. ft. No hoist required. Load is balanced so it dumps itself when released. End gate raises automatically with dumping of body, and can be dropped to facilitate loading if desired. Some good territory still open.

Auburn Wagon Co.

Martinsburg, W. Va.

Auto Owners WANTED!



To introduce the best automobile tires in the world. Made under our new and exclusive Internal Hydraulic Expansion Process that eliminates Blow-Out—Stone-Bruise—Rim Cut and enables us to sell our tires under a

**10,000 MILE
GUARANTEE**

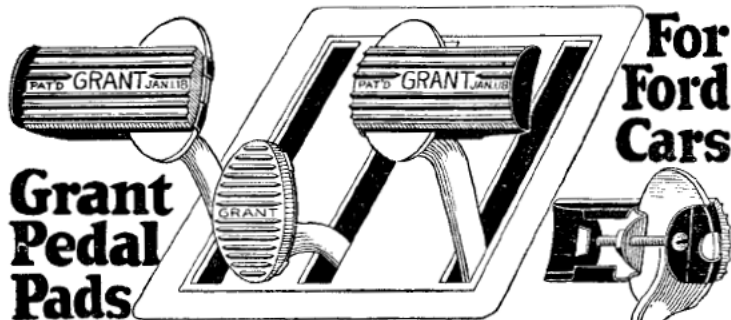
We want an agent in every community to use and introduce these wonderful tires at our astonishingly low prices to all motor car owners.

FREE TIRES for YOUR OWN CAR

to a representative in each community. Write for booklet fully describing this new process and explaining our amazing introductory offer to owner agents.

Hydro-United Tire Co.

DEPT. 191 CHICAGO OR PHILADELPHIA



**Grant
Pedal
Pads**

**For
Ford
Cars**

GRANT AUTO APPLIANCE CO.,

MANUFACTURERS OF "SURETY" EXTENSION PADS

315 S. Clinton St., Dept. A
CHICAGO, ILL.

Firm, comfortable foot-hold—perfect control. Installed in two minutes. Screw driver only tool needed. Once on, always on—stays rigid for the life of the car. **FREE TEN DAYS' TRIAL**—money back if not satisfied. Tell your dealer or order direct from us. **PRICE ONLY \$1 PER SET.** Jobbers and Dealers write for our proposition. **ACCEPT NO IMITATIONS — INSIST ON GRANT.**



FOR FORDS—America's Leading Racing Bodies

The racing body with Fiat type radiator. Exclusive and snappy, different from others.

A New CHAMPION

This Popular Torpedo Type With
Special Champion Racing Radiator
Included

REDUCED PRICES FOR 1921

Dealers:—Here is your opportunity for big profits. Write us today for distributor's proposition.

CHAMPION RACING BODY CO.
1920-24 So. Wabash Ave. CHICAGO, ILL.



1. Spark Gap or Intensifier non-adjustable, built in brass cap. Creates hotter spark at firing point, igniting a leaner mixture of gasoline.

2. One piece brass cap and terminal wire spun on porcelain. Cannot come apart.

3. Double copper asbestos gaskets turned over shoulder of porcelain. Cannot leak compression.

4. Flat firing point. Produces blaze instead of faint spark.

Buy the Best "BIG CHIEF" SPARK PLUGS

—THE PLUG THAT NEVER FAILS

"BIG CHIEF" Spark Plugs Are Made Especially for Ford Cars

We also manufacture special heavy duty plugs for Tractors and Trucks

When ordering special plugs state make of Truck or Tractor

PRICE \$1.25 EACH

If Your Dealer Cannot Supply You Write Us Direct

VULCAN SPARK PLUG CO.

1421 OLIVE STREET, ST. LOUIS, MO.



Chicago Heavy Duty Timer

A FEW SPECIAL FEATURES

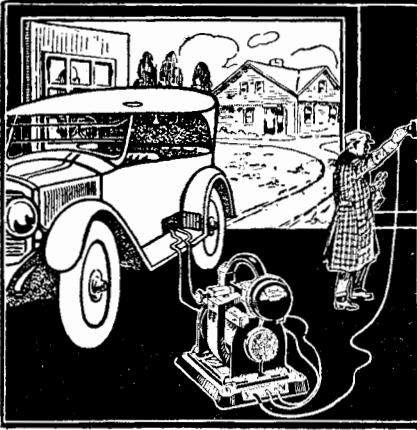
Hardened roller bearing brush—needs no oiling. Outlasts several ordinary timers by using resurfacer. Roller keeps perfect track—no side thrust. Extra heavy segments and beveled fibre ring. Real 100% value and service in each timer.

Retail Price \$2.00

BIG PROFITS TO JOBBERS AND DEALERS

DUPLEX PRODUCTS CO. 3520 Princeton Ave. CHICAGO





10c Charges Your Battery ^{At Home With An} F-F Battery Booster

Which is a Magnetic Rectifier for 105-125 Volt 60 Cycle Alternating Current

Leave battery right in the car. Snap clips of Charger on battery terminals. The Meter shows you just the amount of current flowing. No skill required to operate. Everything complete in one compact unit, ready to use. Automatic and fool-proof. Cannot overcharge. Carbon electrodes rectify the current and last for thousands of hours. Don't think your battery is dead and worn out, simply because it will not start car. Buy A Booster and Fill It With Life.

Bantam Type 6 for 6 volt battery, 6 amps. \$15 Bantam Type 12—5 amps. 12 volt battery. \$15
Type 16 charges 6 v. battery at 8 amperes. \$24 Type 112—6 amperes for 12 volt battery. \$24
Type 166 charges 6 v. battery at 12 amperes \$32 Type 1612—7 amperes for 12 volt battery. \$32
Type 1626 Combination Type charges both 6 and 12 volt batteries at 12 or 7 amperes. \$48

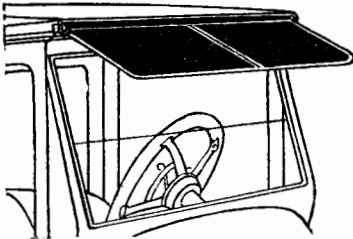
The larger types are recommended for the heavier batteries or where time is limited. Shipping weight complete with AMMETER and BATTERY CLIPS, 10 to 15 lbs. Order from your dealer or send check for prompt Express shipment; include postage and insurance charges for Parcel Post Shipment or tell us to forward C. O. D. Also other F-F charging apparatus that operate on Farm Lighting Plants and Direct Current Circuits. If not ready to order now write today for free descriptive Bulletin No. 14.

F-F Rotary Rectifier for Group Charging

Real Economy in first cost and in service. Charges up to 36 cells. Full Wave, Automatic, Dependable. Rotary Bulletin No. 14-A gives full information. Write today.

The France Manufacturing Co. General Offices and Works:
CLEVELAND, OHIO, U. S. A.
Canadian Representative: Battery Service and Sales Co., Hamilton, Ontario,

Thums Adjustable Sun Shield, Price \$5.00



Can be attached to Ford open-Sedan and Coupe and all other makes of open or closed cars.

A protection every month in the year. Neat in design—easy to attach—positive in results.

Made of strong indestructable steel frames, neatly covered both sides, with artificial leather, top side black, underside green.

Fitted with two positive locking adjustments.

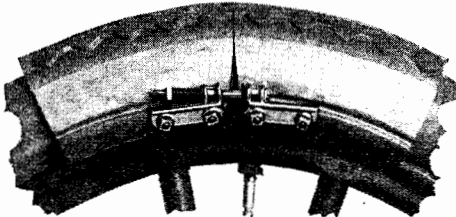
The Thums adjustable sun shield is superior to any shield on the market.

MANUFACTURED BY

THUMS VISOR CO.

107 YOUNG ST.
TONAWANDA, N. Y.

Jobbers and Dealers—Write Dept.
No. 12 for our liberal discount



MANUFACTURED BY
SECTIONAL TIRE WORKS
1608 W. Lake St., CHICAGO
EXCLUSIVE AGENTS WANTED FOR
OPEN TERRITORY

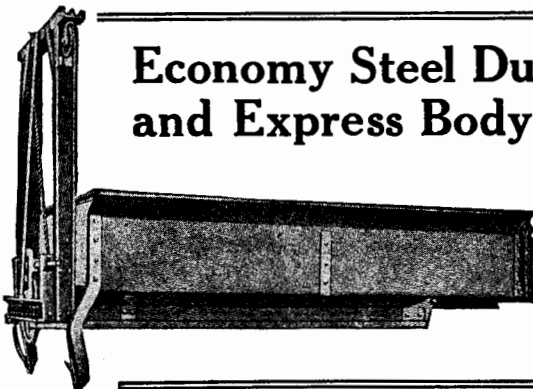
SECTIONAL TIRES

Reduce Tire Expense 75%

No Punctures or Blow-Outs.
Made in Three Sections from
Discarded Casings.

We furnish sectional tires complete or connecting parts and cutting outfit only so you can make your own tires.

Economy Steel Dump and Express Body



Two Sizes 35 and 54 Cubic Foot Capacity, Simple Worm and Gear Hoist. Body and Hoist in one unit. Will fit any light Truck Chassis. Shipped ready to attach any width of chassis.

Providence Body Co.

PROVIDENCE, R. I.

SEND FOR BULLETIN F. O.



WE TOP 'EM ALL

Auto Tops for All Makes and Models of Cars

Seat Covers—Dust Hoods—Fenders

Save one-half the cost of new Top by using our Slipover Coverings.



Write for our Catalog.

BUOB & SCHEU

104-112 Webster Street

CINCINNATI, OHIO



16-FEET LONG

GUARANTEED TOW LINE

\$2.00

MANUFACTURED BY

The Superior Manufacturing Co.

211 High Avenue

CLEVELAND, OHIO

SOLD BY MOST LEADING ACCESSORY DEALERS AND GARAGES



Patented Nov. 30th, 1920.

RAIN-SUN

(Trade-Mark)

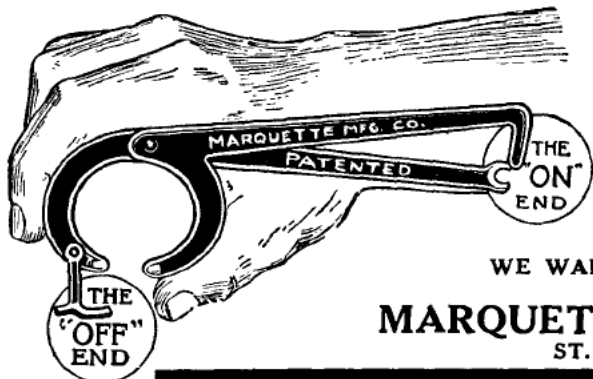
THE
QUALITY VISION SHIELD
WITH THE RAIN GROOVE
SPECIAL FOR FORD enclosed
cars, delivered any- **\$8.50**
where in U. S.

Made of auto body steel. Handsomely
finished in baked black enamel—(same
as your car)—velvet green beneath.

ASK YOUR DEALER OR WRITE
The Rain-Sun Vision Shield Co.

MFR'S.

904 West Pico St., Los Angeles, Cal.



A GRIP LIKE A GIANT HAND

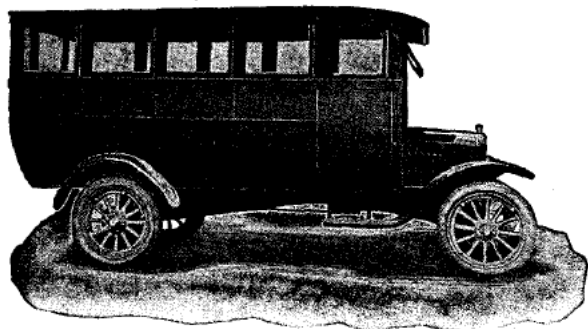
The "quick action" Marquette
Tire Tool "takes them off and
puts them on again." Removes
and puts back on all size clincher
tires. We guarantee it to do the
work. An attractive dealer prop-
osition. Write at once.

WE WANT DEALERS NOW

DEPT. F.

MARQUETTE MFG. CO., Inc.

ST. PAUL, MINN.




Manufacturers of

**Commercial Bus and
School Bodies for
Ford Chassis**

Write us for Catalog and Prices

McKay Carriage Co.

Grove City, Pa.

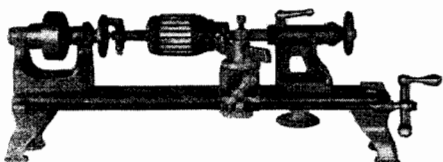


Hub Caps
with
Oil Pockets
Automatic lubricators for front wheels. Keep the grease working in around the bearings in a most efficient manner, eliminating breakage of balls, etc. **ALUMINUM ALLOY** highly polished and correctly made
Jobbers—Dealers—Owners.

\$2.50 SET OF FOUR

The Austin Motor Fittings Co.
Plymouth, Conn.

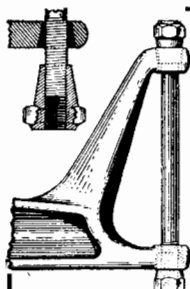
Commutator Truing Lathe



When you send out armatures to have commutators trued you are sending out profits. Do this work yourself and keep these profits.

This machine does the work as well as the most expensive lathe and at a saving of several times its first cost. Profits will pay for the machine in a short time. Price of lathe is very reasonable for a machine capable of this kind of work. It is also suitable for turning magneto contacts. Write for further information.

CENTRAL MANUFACTURING CO., Fairfield Ia.



Practical Little Giant Bolt for Ford Front Axle

This bolt can be put on any Ford axle by any workman. It is made to take up all play that is worn in a Ford axle. By tightening the nut it tightens the head of the bolt as well as the nut. This bolt is made of good steel. There is an oil hole for grease cup, nut to key with a cotter pin.

Send for complete information on this item as well as our Universal Burning-in Machine. This machine will handle any motor—only real machine on the market.

Jobbers and Dealers: Write for an Interesting Proposition

THE LITTLE GIANT MFG. COMPANY
212 N. Elm Street
Iola, Kansas

F. B. Battery Tester



Touch the F. B. Tester to the cell terminals.

Green Signal Light—Battery O. K. **Red**—Battery needs attention.

Simple, positive, handy and accurate. A true time saver and money maker for the busy battery station. Price \$15.00, 20% off to Ford dealers. Write for further particulars.

F. B. ELECTRIC & MFG. COMPANY
DETROIT, MICH.

When writing advertisers—Just say **FORD OWNER and DEALER**



\$9.50
Delivered

Send No Money FREE AIR

For Ford Owners

Send today for the great new Clark Tire Pump for Fords. Shipped on approval. Send no money. Merely sign coupon and mail. No work or sweat pumping tires on hot dusty roads. Just jack up one rear wheel—throw into gear and hold pump against the hub cap. Your engine does the work in a jiffy.



Complete outfit with gauge and 12 ft. hose postpaid only \$9.50 after examination. Pay the postman if satisfied. Weighs only 3 lbs., 10 in. long. Fits any tool box. Send coupon for the greatest convenience on your car.

Mail Coupon Today

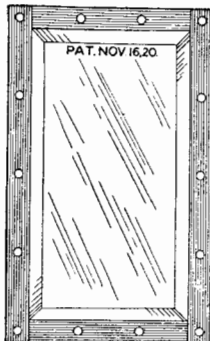
Clark Pump Co. 215 No. Michigan Ave., Chicago, Ill.

You may send postpaid 1 Complete Clark Pump Outfit on approval. If satisfied, I will pay the postman \$9.50.

Name.....

Address.....

A New and Better Light



that **Ford Owners** can apply easily and economically.

No. 25 **Bevelite** is cheaper, lighter and just as satisfactory as bevel glass. It has rust proof nickle frame with nickle fasteners to attach it to the curtain. Stays put and improves car appearance. If your jobber can't supply you, send \$1.65 for sample set of three.

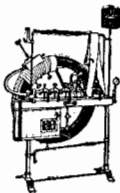
Jobbers—Dealers: A really splendid seller. Send for bottom price today.

REPLACE LIGHT MFG. CO.

Patentees and Exclusive Manufacturers
2308 Sixth Ave., Rock Island, Ill.

Big Money in Tire Repairing

It's easy to make big extra profits doing tire repairing with a **SHALER Vulcanizer**. Many garages are making \$300 to \$500 every month. Requires no experienced operators—your ordinary help can quickly learn to operate it and do perfect work.



SHALER STEAM VULCANIZER

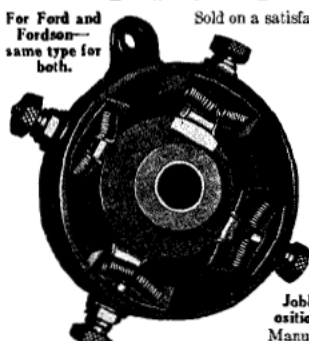
has Automatic Heat Control, and requires no regulating. Uses the **Wrapped-Tread Method** of repairing casings. Vulcanizes 12 casings and 200 tubes a day. Light, convenient and safe. Complete Outfit, with gas or gasoline burners, repair material, tools and full instructions, costs less than \$100.

Ask Your Jobber. Write us for complete catalog of the **SHALER Line of Vulcanizers** for tire repair shops and motorists' use.

C. A. SHALER CO., 2604 Fourth St., WAUPUN, WIS.

PACIFIC TIMER

For Ford and Fordson—same type for both.



Sold on a satisfaction-or-money-back guarantee!

1. Requires no oil nor cleaning.
2. Promotes easy starting.
3. Solid electrical conduction with wiping contact.
4. Cannot miss fire at high nor low speeds.
5. Produces more and smoother power thru perfect timing.
6. Saves gas and minimizes carbon thru perfect combustion.
7. Outwears other timers.

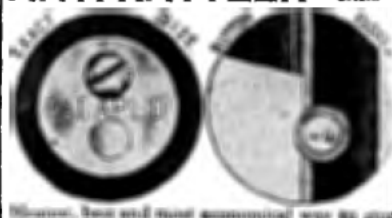
The price to the user is Five Dollars.

Jobbers and dealers, write for proposition! Freight allowance.

Manufactured by

PACIFIC AUTO SPECIALTY CO., San Francisco, Cal.

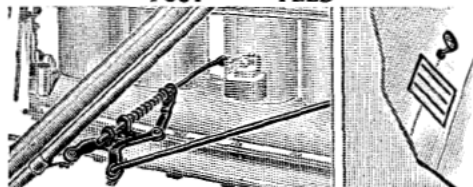
THE "BUTTON" WINDOW FOR CLOSED CARS ANTI-RATTLES!



that window rattle. Made of high-grade rubber, plates nickel finish. Will mail set of eight for Coupe, \$2; 12 for Sedan, \$3. Dealers write for attractive display-card holding 36 Buttons for trial order. They Sell. Discount to dealers and jobbers. CAMPBELL MANUFACTURING CO. 2835 SOUTHWEST BLVD. KANSAS CITY, MO.

RED-I-FIT

FOOT FEED



ACCELERATORS WORK ALL THE TIME

The extremely long life and unfailing service rendered so consistently is entirely due to their simple, but correct mechanical principle.

GIVES THAT EASY AND POSITIVE MOTION

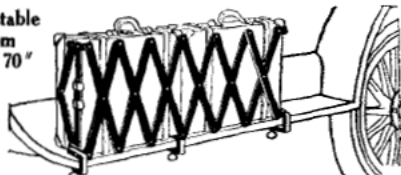
Installed by Two Cotter Pins

FITS ALL FORD CARS

HEATON-AULT, 6247 Greenwood Ave., Chicago.

"Automatic Luggage Carrier"

Adjustable from 6" to 70"



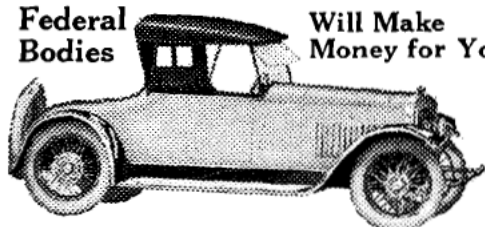
\$6.00 Each A NECESSITY TO EVERY CAR

Made to accommodate those wishing a carrier adjustable to different size suit or sample cases, packages or parcels. Strong and rigid, cannot rattle. Quickly and easily attached or detached without tools. Ask your dealer or write today.

NATIONAL CARRIER CO., Minneapolis, Minn.

Federal Bodies

Will Make Money for You



This beautiful "FRATERNITY" Roadster body built for Fords and Chevrolets is the latest and most comfortable body constructed. Choice of colors.

THE ABOVE IS ONE OF OUR TEN DISTINCTIVE DESIGNS. DEALERS:—Write us at once for our special proposition on FEDERAL Sport, Speed and Touring Bodies. Can make immediate shipments. FORD BODIES AS LOW AS \$34.75

Don't Pass Up This Opportunity

FEDERAL MOTOR SUPPLY CO., 2620 S. Michigan Ave., CHICAGO

Bruinac Battery Box

A Container and Protector for Storage Battery on Ford Cars

U shaped insulators and depressions in lid insure perfect insulation for cables.

Raised corrugations in bottom of box give level rest for bottom of battery. Four drain holes in bottom or box. Wing nuts now furnished.

Weight 8 pounds.

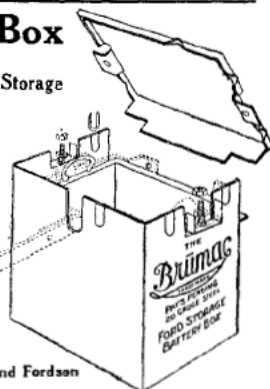
Order Today or Write for Circulars

PRICE \$3.50

F. O. B. Columbus, O.

Distributors of Equipment for Ford and Fordson

The BRUUN-McCLURE CO. Columbus, Ohio.



Side Curtains for FORDS

\$5.50
ROADSTER
(Complete)
Lot No. 3935



\$8.50
TOURING
(Complete)
Lot No. 3936

DIRECT FROM MANUFACTURER

"ROYAL" side curtains are made of strong black enameled drill, same quality and style as furnished with car originally. For all model Fords from 1912 to 1921. Specify year when ordering. 10% discount in quantities of one dozen sets or more. Terms C. O. D.—F. O. B. Aurora.

ROYAL MANUFACTURING CO., 144 Fox St., Aurora, Ill.

Representatives Wanted

Tire Agents Wanted

An auto owner in each locality to use and introduce Mellinger Extra-Ply and Cord Tires. Make big money part or full time. No capital or experience needed. Sample Sections Furnished. GUARANTEED

8,000 & 10,000 MILES

(No Seconds.) Hand made. Finest materials. Shipped prepaid on approval.

Free TIRES for YOUR CAR

to one user in each locality. Be first to write quick for special Agents' Offer and Low Wholesale Prices.

MELLINGER TIRE & RUBBER CO.
950 North Oak St., Kansas City, Mo.



WATERVLIIET SPIRAL REAMERS

For Ford Automobiles

"THEY WILL NOT CHATTER"

No. 3304

Transmission Reverse Gear Bushing Reamer \$15.00

Mr. Repairman:-

How long does it take you to scrape and fit a Reverse Gear Bushing? You can do the job perfectly in three minutes with our Reamer. A liberal discount to the trade. WATERVLIIET SPIRAL REAMERS save their cost on the first job. We make a SPECIAL SPIRAL REAMER for every bearing and bushing on a Ford. We sell them singly or in sets. Try your jobber first, and if he cannot supply you, write us direct, giving us your jobber's name and we will take care of you from here. Get our No. 47A booklet!

WATERVLIIET TOOL CO., Inc., Albany, N. Y.**AUTO SUPPLIES WHOLESALE**Dealers send for our
net price list
"The Little Salesman"Wholesale
ONLY

Fidelity Bodies for Fords & "Chevrolet"

Make Money equipping old FORDS and
"CHEVROLETS" with classy "FIDELITY
BODIES" listed in "The Little Salesman."

**FOR FORDS
\$29.85 AND
UP**

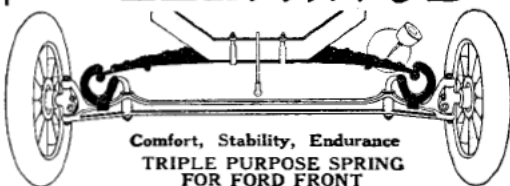
New England Mills Co., Dept. 25, 1027 W. Van Buren St., Chicago

**16,000 Miles
without a Puncture**

Wonderful invention. Insyde Tyres—Inner
Armor for automobile tires. Positively pre-
vent punctures and blowouts. Guaranteed to
give double tire mileage, any tire—old or new.

Over 100,000 Satisfied Customers
Easily applied without tools. Just slip inside casing
before replacing tube. Will not heat or pinch. Use
over and over again. Old worn-out casings will give
3 to 5,000 miles more service. Low priced. Agents
wanted in every county.

American Accessories Co., B-1937 Cincinnati, O.

STEEL WINGS

Comfort, Stability, Endurance
**TRIPLE PURPOSE SPRING
FOR FORD FRONT**

Guaranteed for the Life of Your Ford
Eliminates All Necessity for Other Shock Absorbers

STEEL WINGS CO.

Room 421—417 South Dearborn St., CHICAGO, ILL.

**NO MORE LOOSE CONNECTING
RODS IN FORD CAR**

KIL-NOCK***Stops That Knock in Your
Ford Motor***

We guarantee KIL-NOCK as repre-
sented, or Money Back. **\$10.00**
Price per set.

DISTRIBUTORS AND DEALERS—WRITE
FOR OUR PROPOSITION. THIS IS
A REAL SELLER.

KIL-NOCK COMPANY

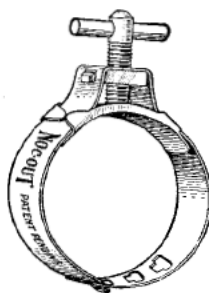
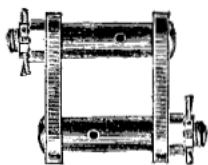
DAVENPORT, IOWA, U. S. A.

Noc-OUT**Hose Clamps**

The latest invention in de-
sign and construction of hose
clamps. Draws up evenly
and will not cut or buckle
the hose. Our No. 6 fits the
different sizes of hose used
on a Ford. Samples sub-
mitted for approval.

**R. T. Mfg.
& Sales Co.**3847 W. Madison St.
CHICAGO, ILL.

Factory, Green Bay, Wis.

**Empress No. 120
SPRING SHACKLE**

Designed for use
with either oil or
grease as the lubri-
cant. For both front
and rear spring.

Write for Catalog 2A

BOWEN PRODUCTS CORPORATION
Auburn Division AUBURN, N. Y.**A Remarkable New Spring
For Fords**

There is an almost unbelievable smooth-
ness of body motion accomplished by the
Trans-Lever Spring. They will forever
solve the vibration problem, thus saving
on tire, gas and upkeep expense.

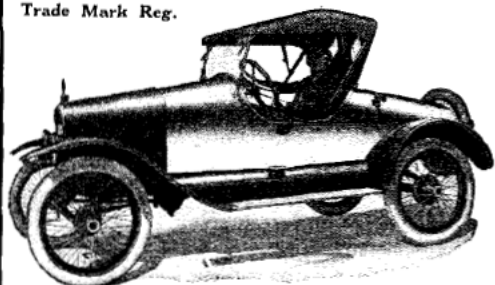
No Road Shocks, No Rebound
Makes Your Ford Comfortable

Send for descriptive booklet and dealer's terms.

Universal Trans-Lever Spring Co.
14 and Howard Streets Detroit, Michigan

LAMCO

Trade Mark Reg.



PRICES SLASHED—WRITE IMMEDIATELY
FOR THE NEW CATALOG—JUST OFF PRESS
Lehman Mfg. Co., Inc.
Cannelton, Ind.

**Shock Absorber**

Advertised Every Month in

The Saturday Evening Post

Ask Your Dealer or write

APCO MFG. CO.
Providence, R. I.SET OF
FOUR
\$20
LISTLap Score Marks Out of
Cylinders with**Clover Cylinder Lapping Tool**

and

**Clover Valve Grinding and
Lapping Compound**Free bulletins No. 75 and 80
tell you all about it.

Write for them

CLOVER MFG. COMPANY

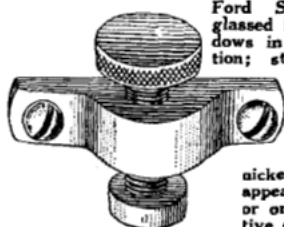
512 Main Street

Norwalk, Conn.

Branches: Chicago-San Francisco



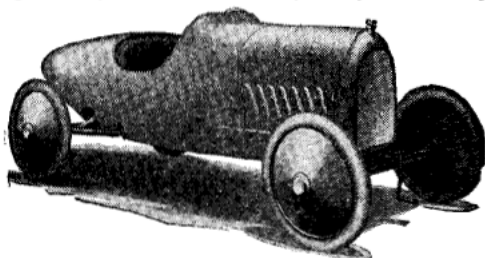
STOP RATTLING WINDOWS



Ford Sedans and other
glassed in cars; holds win-
dows in any desired posi-
tion; stops that rattling
noise; does not
put pressure on
the glass but bears
on the felt seal
preventing break-
ing glass; brass
nickel, handsome in
appearance, at dealers
or order direct. Attractive
dealers and jobbers

discounts, put up in sets of one dozen; price \$6.00
per set.**PORTLAND ANTI RATTLE MANUFACTURING CO.**
212 Railway Exchange Bldg. PORTLAND, ORE.

SPEEDWAY BODIES for FORDS



AND UNDERSLUNG PARTS.

MORTON & BRETT

INDIANAPOLIS, IND.

ABSOLUTE SATISFACTION

or your money back.

**The MULTI-LIFT
Guarantee**

20 to 50% more power,
greater flexibility, a
cooler motor and real
gas economy. Does
not interfere with regu-
lar Ford equipment.
A liberal discount to
dealers and garage men.

**GEO. RILEY
& CO.**1007 North Main St.
LOS ANGELES, CAL.

B-W COILTESTER

A Quick, Easy and
Infallible Test for the
Coils of Ford Cars.

Every garage should be provided with this
time-saver. It makes a testing job a mat-
ter of a few seconds. Pays for itself in
one day's use. Ask for folder and terms.

Ballman-Whitten Mfg. Co.
7421 Manchester Ave.

ST. LOUIS, MO.

Manufacturers Of
B-W Ammeters.

ROSE TIRE PUMPS

Rose Pumps are by far the
most popular on the market
today. If you don't sell them
you should write for our propo-
sition at once. You'll be in-
terested.

**Frank Rose Mfg. Co. Hastings Nebr.**



\$45
BUYS THIS
SNAPPY
SPEEDSTER

Just the graceful, racy sport car you want and you save big freight rates and one-half original cost through buying it knocked-down.

All parts cut to exact fit and accompanied by such complete, simple instructions that anyone can assemble it.

Complete with hood, Fiat radiator shell, instrument board, upholstering, metal and wood parts, bolts, screws, etc.

Car owners and dealers: Send today for complete details.

CENTRAL AUTO SUPPLY CO.
Eng. Dept. 123, Louisville, Ky.

FOR FULL SATISFACTION USE

Flynn Spark Plugs

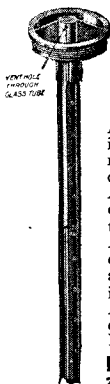
Full Particulars From

JAMES FLYNN & CO.

4551 White Plains Ave.

BRONX, N. Y.

Watch For Our Page Advertisement
July Issue.



LONGASAVAR

(Patented)

**GASOLINE GAUGE AND
GAS SAVER FOR FORD CARS**

Absolutely accurate gasoline tank gauge. Easy to inspect day or night; can be carried to light when necessary. No operative parts to stick, get out of order or collect dirt.

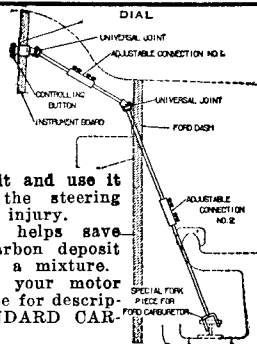
A loss by evaporation through vent hole, particularly during summer months, is prevented by venting through tube.

A convenient means for getting gasoline for priming, cleaning tube for patch when making road repair, or any other purpose where a small quantity of gasoline is required.

Always read gauge before filling tank to check amount of gasoline required. Sizes to fit all Ford tanks. Price 75c by mail or at your dealers.

BARCY-NICHOLSON COMPANY
2801 West Fort St., DETROIT, MICH.

"Standard" Carburetor Control



Attaches to your Instrument board where you can see it, reach it and use it without bending over the steering wheel or risking bodily injury.

The graduated dial helps save fuel and cuts down carbon deposit resulting from too rich a mixture.

If you would make your motor more efficient, then write for descriptive circulars of **STANDARD CARBURETOR CONTROL**.

Price Complete, \$2.25

Standard Thermometer Co., 65 Shirley St., Boston, Mass.

\$5.00

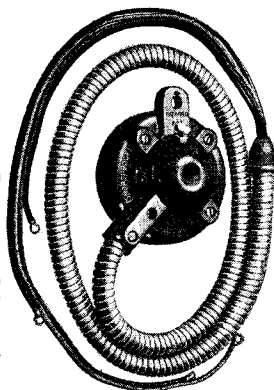
NOW BUYS THE
COMPLETE

—IXL—

SHORT PROOF
IGNITION SYSTEM

Including Timer Unit,
Protective Bakelite
Case and armored con-
duit.

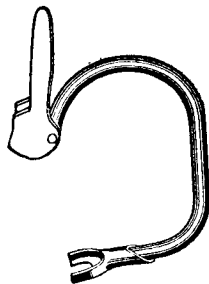
Eclipse Specialty Mfg. Co.
547 Washington Blvd,
CHICAGO



BEARDSLEY NEVER-SLIP VALVE LIFTER

Absolutely the most simple and best selling tools of this kind. Made in types for Fords, \$1.25 —Dodge cars and Fordson Tractors, \$1.75 —A Universal type to fit all cars, \$2.50. Details and dealer's proposition sent on request.

**THE LOOMIS-
BEARDSLEY MFG. CO.,**
1118 Mt. Vernon Ave.,
Columbus, Ohio.



See Page
129

Does your Ford overheat?

You can eliminate ordinary overheating, and stop waste of gas and oil if you equip your Ford with the

Ospeco Water Pump

for Ford Cars

The Ospeco sells for \$15.00, complete, ready to install. Write for full description.

Manufactured and guaranteed by
Michigan Auto Products Company
Detroit, Michigan

Sold by
Crawford-Lewis Corporation
6553 Woodward Ave. Detroit, Mich.
(4)

STANDARD SPEEDOMETER

FITS ALL STARTER EQUIPPED FORDS



Model 505 Complete \$18.00.

Designed to fit in the narrow Ford instrument board without the use of special brackets or hangers.

It is neat and compact, is accurate under all conditions, is very durably constructed and equipped with fittings built to withstand the most strenuous service.

STANDARD THERMOMETER CO.
65 SHIRLEY ST. BOSTON, MASS.



PISTON RING SATISFACTION
It does everything that a piston ring should do. It stops oil pumping—holds compression—increases power.

MID-WEST "TWO-STEP" OIL AND COMPRESSION PISTON RING assures piston ring satisfaction at last. Ford sizes—50c at dealers.

DEALERS AND JOBBERS: Write for our offer on this repeater.

MID-WEST PISTON RING CO.
St. Louis, Missouri.

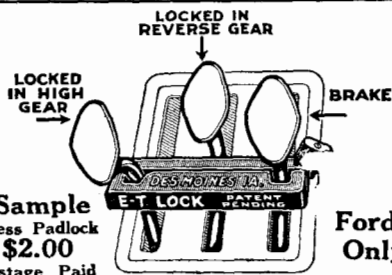
SAVE A TIRE

"DOUBLES TIRE MILEAGE"

The real answer to the
TIRE QUESTION

DISTRIBUTORS wanted everywhere.
Write for full particulars.

SAVE-A-TIRE CO., Dept. F. 12
Box 624, CINCINNATI, OHIO.



AGENTS WANTED

E-T AUTO LOCK CO.
1020 Grand Ave. DES MOINES, IOWA.

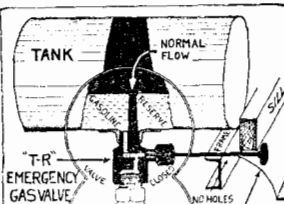
REYNOLDS SPRING CO.

RED DIAMOND CUSHIONS
FOR FORD CARS

A Perfected Product for Particular People

Made by the largest exclusive Cushion Spring Factory in America and the most comfortable and durable cushions ever built by anybody.

Sold through regular channels only
MANUFACTURERS REYNOLDS SPRING COMPANY JACKSON, MICH.
SALES DEPT. THE ZINKE CO. 1323 Michigan Ave. CHICAGO, ILL.



"T-R"
Emergency
Gas Valve

The biggest little time, worry and trouble saver you could put on your car. Practical—simple—and easy to attach. Hundreds of users say it is their best car investment and it costs only \$2.50.

DEALERS: Ask about your profit on this and the T-R Choke Rod Control. Big sellers.
TOLMAN-REEVE ENGINEERING CORP.
3104 Michigan Ave., CHICAGO, ILL.



High Grade Mailing Lists, Multi-graphing, Accurate Filling-In, Addressing, Enclosing, Mailing.
NEVADA, IOWA

Better than Solder for Radiators

Stop all leaks in the circulating system quickly—surely and economically with

LEAKURE

Composed of pure RUBBER COMPOUND in the form of small grains which easily pass through the finest Honey-Comb Radiator. These grains find all leaks, large or small—plug the leaks and are VULCANIZED by the radiator heat, forming a PERMANENT REPAIR. No more tearing down of radiator nor expensive repairs necessary.

Sold on a Money-Back Guarantee—Price..... **75c**

DEALERS:—Write for Our Real Offer
CALKINS MFG. CO., (NOT INC.)
2635 So. Michigan Ave., CHICAGO, ILL.

CLASSIFIED ADVERTISEMENTS

Advertisements inserted under this classification for 7c per word; name and address must be counted; no order for less than \$1.50. Cash must accompany order. Advertising copy due by the 10th of the month preceding date of issue. Write for Classified rates on twelve-time contracts.

\$5.00

THE DOUBLE GUARD INSURES THE SAFETY OF YOUR FORD FOR A LIFE TIME

Exclusive Features—No Key—No Combination—No Alarm—Operated From Seat
BROWN'S ANTI-THEFT DEVICE CO.
YAKIMA, WASH.

Box 708, Dept. B
BOOKLET ON REQUEST

Wanted Salesmen & Agents

calling on jobbers, accessory dealers and garages, to sell a well known line of spark plugs with a nine-year record for quality and service, on a commission basis. Exclusive contracts in territories not already covered. No applications considered unless accompanied by good references. This is a permanent and well-paying proposition for good men. For particulars write

Long Distance Spark Plug Co.

Manufacturers, Birmingham, Ala.

Systemize your stock bins; Bin label cards for Ford auto parts, sheet metal card holders, transparent celluloid card covers, bin markers and stock record cards for mill, hardware, auto and plumbing supplies. Send for samples and prices, and for booklet, "How to Systematize The Stock Room." **Haddon Bin Label Co., Haddon Heights, N. J.**

Peejay step-cut piston rings for automobile, tractor truck and marine engines. Guaranteed to do everything a piston ring can do. Two to four and one-half inch diameter, fifty cents. Special set of twelve for Ford \$4.50. **Phil. Jacobs, Distributor, Portsmouth, Ohio.**

Attention—Ford car and tractor owners—Tractor top with back cushion curtains, all round, \$49.50. Ford one man tops complete with curtains, \$42 and up. Topping outfit roof quarters and back curtain, \$7.75 and up. Back curtains, \$2.90 and up. Side curtains, \$10.50. Five piece artificial lace door coverings and panels, \$5.00. Seat covers \$7.50 and up. Twin front seat cushions, \$10.50. Single front seat cushions, \$8.00; Rear seat cushions, \$8.50. Back upholstery ready to tack in—Front seat back, \$10.00; rear seat back, \$11.00. Our entire line includes all makes of cars. Motor boats and motorcycles. We also re-cover tops sent to factory. Samples material and prices upon request. **Atlantic Auto & Body Works, 136 Jamaica Ave., Brooklyn, N. Y.**

AN OUNCE OF PREVENTION.

Put a **BURGLAR ALARM** on the door of your car and **FEEL SAFE** when leaving it at the curb without locking an expensive lock and annoyance.

We furnish you with Bell, Wire, Door Spring and Switch, also diagram. Do the work yourself. Price \$3.50.

Chas. T. Ross,
222 West 114th St.,
New York.

WANTED!

EXCLUSIVE AGENTS in every Ford District
To Handle

WOODWARD

Four Forward Speed Auxiliary Transmissions for

FORD Cars and Trucks

Price \$80.

WOODWARD & ROWE,
2125 Michigan Ave., Chicago, Ill.

AUTO ACCIDENTS PREVENTED

NEW INVENTION

Costs agent \$2.50 postpaid, sells for \$7; brand new self selling sales plan.

CARL BROWN, Manager
Dept. 16. Columbus, Ohio.

Avoid "turning turtle," leaving the road locking over center. You can steer safely and easily out of ruts, through mud, sand, snow and on center-crowned roads, with our **Worm Steering Gear.** Same type as used on all larger cars. Prevents bumps or other obstacles turning the front wheel aside and throwing car from the road; gives you control of the steering. Also absorbs vibration, shock and strain on arms and shoulders. Makes a far safer and better car. Easily, quickly installed; no holes to bore; outlasts car. Guaranteed to satisfy you. Write for particulars. **Union Sales Co., Dept. 4, Omaha, Neb.**

Salesmen wanted—Men who are calling on Ford dealers to demonstrate Apco Shock Absorbers. Straight commission—orders shipped through jobbers. A real money-maker for hustlers. Write for particulars. **Apco Mfg. Company, Owen Street, Providence, R. I.**

PATENTS—Send for free book. Contains valuable information for inventors. Send sketch of your invention for Free Opinion of its patentable nature. Prompt Service. (Twenty years experience). **Talbert & Talbert, 447 Talbert Bldg., Washington, D. C.**

Learn to Vulcanize—We teach you this interesting and profitable trade in few weeks by mail. Our students are all successful. Easy to learn by our system. Write today. Diploma when competent. **Michigan Vulcanizing School, 668 Grandville Ave., Grand Rapids, Mich.**

STOP—If you want to see the keenest thing that was ever invented for a Ford car, send 25c for a sample Spring Goose. Put one on your car and you can sell them by the hundred. **W. E. Clayton & Co., Altoona, Kans.**

\$20 DAILY—New invention, increase Ford's mileage 50 per cent. Positively guaranteed. Ten minute demonstration convinces. Sales ability unnecessary. Sample free. **Hahn Sales Co., Cullom, Ill.**

Classified Advertisements—Continued

Wanted—Salemen who call on Ford Dealers, Service Stations, Garages, Jobbers and Accessory Stores. Can earn a neat sum each month without interfering with their regular work. Write for particulars.—**Ford Owner and Dealer Magazine, Dept. C., Montgomery Bldg., Milwaukee, Wis.**

"Ford Timers" made better than new by grinding, smooth and true for 35 cents, four for \$1. Send us your rough timers and see the difference. **E. A. Chamberlin, Spencer, Mass.**

EVERYTHING FOR THE MOTOR CAR

IF ITS MADE, WE CAN FURNISH IT

Ford electric lighted head to tail \$1.50 to \$35.00. Speedster Bodies, Business Bodies. Our special. Streamline Hoods, Radiators, Shells, Crown Fenders and Electric Lights bring old-style Fords up to the minute. Carefully selected line Accessories for the Ford. Write today. Victor Auto Supply Co., 2004 Locust St., St. Louis, Mo.

SALESMEN—If you call on Ford Dealers, Service Stations, Garage, Jobbers or Accessory Dealers, we have a proposition that should net you not less than \$300.00 per month extra. Write us at once. **Gardner Auto Products, 23-25 W. Hancock Ave., Detroit, Mich.**

WANTED—Men with Ford cars to sell STOKES CARBURETORS. Exclusive territory given. Write for particulars. **Stokes Carburetor Co., Inc., 384-6 East 133 St., N. Y. City.**

PATENTS—Write for Illustrated Guide Book and Evidence of Conception Blank. Send model or sketch and description for our free opinion of its patentable nature. Highest references. Prompt service. Reasonable terms. **Victor J. Evans & Co., 627 Ninth, Washington, D. C.**

Send \$1.00 for Socket Wrench Set; fits any nut. Worth \$10.00 to any car owner. Money back if not satisfied. **S. & C. Co., Meriden, Conn.**

Make Extra Money—Every car owner and garage a prospect. Large profits. Vest pocket sample 50c. **The M-R Mfg. Co., Lincoln, Neb.**

Miller Ford Starter has made good for five years. Installed in one hour with ordinary tools. \$5.50 postpaid. **H. A. Miller, Memphis, Missouri.**

Wanted—Position as foreman for Ford Service Station by a first-class Ford service man with twelve years' experience in all branches of Ford service. At present employed. Good reasons for wishing a change. Steady and reliable. Best of references. Will go anywhere. **Ford Owner & Dealer, Dept. G., Milwaukee, Wis.**

Wanted—Men everywhere with Ford or Chevrolet 490 cars to work at home or travel. You don't need to be a salesman to sell the Stanley Gasoline Filler With Gauge (combined). Absolutely does away with removing the cushion to fill the gasoline tank and measuring with a stick. A different gasoline gauge, always visible, and pronounced by automotive experts "mechanically correct." Write for particulars. **Stanley Gauge Company, Inc., Manufacturers, Indianapolis, Ind.**

Factory closing out stock shovels, spades and forks. Eight assortments; no two alike; your selection, 25c each without handles; with handles \$1 each. Free literature showing pictures of tools. **Process Tool PO Co., Salina, Kans.**

REBORE THE CYLINDER—Insert piston. No grinding, no lapping. Our \$20 Ford Cylinder Re-boring Tool leaves the cylinder absolutely smooth all ready for the piston. Simple, easy, rapid, accurate. Request circular. **Goruse Company, Elmira, N. Y.**

SUNLIGHT FOR FORDS. Handy light switch that fits on steering post. 100% more light and dimmer to comply with all laws. Price, \$3.50. Agents wanted everywhere. Big profits. Canadian patent for sale. Sunlight System Co., P. O. Box 394, Chicago, Ill.

CALIFORNIA ROLLER BEARING SHOCK ABSORBERS—A substantial achievement. State and County agents wanted. Atlas Trading & Navigation Co., 940 So. Grand Ave., Los Angeles.

Automobile Necessities—Make your own—Formulas 15 different necessities 25 cents. **Eureka Supply Co., Box 152, Wheeling, W. Va.**

"INVENTORS—Don't lose your rights to patent protection. Send for blank form 'Evidence of Conception' to be signed and witnessed and information bulletin 'How to Establish Your Rights'." Both are free and very desirable to proper patent procedure. Lancaster and Allwine, 238 Ouray Building, Washington, D. C.

Genuine Wilmo Hot Spot Manifold for Fords, \$2.50 F.O.B. Houston, via express; cash with order. **The Way Company, Houston, Texas.**

Late model genuine "Hot Spot" Wilmo manifold for Ford cars. Check for \$2.75 gets immediate shipment. **United Supply Company, Dallas, Texas.**

Wanted—Men with Ford cars to travel over your State establishing Agencies for the Gardner Carburetor. Write us at once. **Gardner Auto Products, 49-51 Hancock Ave., W. Detroit, Mich.**

Salesmen Wanted—Men calling on the accessory and garage trade, preferably men covering territory in their own car, to handle Genett products—real money for real men. **Genett & Longyear, Inc., 3464 N. Clark St., Chicago, Ill.**

INSTANT MEND A TUBE—Agents wanted in every town. Send \$4.80 for sample dozen—make \$7.20. **Instant Mend A Tube Co., 940 So. Grand Ave., Los Angeles, Calif.**

Install the "Security" electric burglar alarm in your garage, store or home and end all your worries. We furnish complete outfits including bell, batteries, wire staples, screws, springs for doors, windows, etc., wall cabinet containing constant ringing instrument, and switches. Also wiring diagram and instructions. Write for descriptive circular. **The Electric Protective Service Co., 1806 LaFayette Ave., St. Louis, Mo.**

Patents—Prompt and efficient service personally rendered. Twenty years' experience. Reasonable charges. **Leech & Co., 307 National Savings and Trust Bldg., Washington, D. C.**

Salesmen calling on Authorized Ford Dealers to handle on side, full line of Commercial Bodies on straight commission basis. Advise territory, and how often covered by you. Address reply to Ford Owner, Dept. B., Milwaukee, Wis.

Ford Owners—Install New Front Cross Member Support. Patented. Reinforces Cross Members \$1.50. Proposition to salesmen. **Davis Mfg. Co., Iowa Park, Tex.**

Men Wanted for Detective Work. Experience unnecessary. Write J. Ganor, former U. S. Gov't. Detective, 134, St. Louis.

Salesmen—To sell our Carbon Remover, Radiator Cement, Polish and other products to automobile owners and accessory dealers. Big commissions and a wonderful opportunity for hustlers. **Bush Chemical Company, St. Louis, Mo.**

FORD OWNERS—Make use of your spare time selling Apco Shock Absorbers for Ford cars. The kind advertised in Saturday Evening Post. Cost less money and are more efficient. Special price on sample set. Write today for particulars. **Apco Mfg. Co., Owen St., Providence, Rhode Island.**

"Safety First Oil Signal and dash light warns you if oil is low. A real necessity. \$5.00 less 50% to you direct." **The Way Company, Houston, Texas.**

Accessory Dealer. 100 Per Cent Profit on Cost. Send name and address. We'll send you proposition, which gives you 100 per cent profit on cost, and our 50c size free, postage prepaid. No obligation to buy. **NoXal Co., 1238 Belmont Ave., Philadelphia, Pa. Mention Ford Owner.**

Old worn out Casings will give 3 to 5 thousand miles more service with Insyde Tyres. Just slip inside casing before replacing tube. No tools needed. Will not heat or pinch. Positively prevent punctures and blowouts. Guaranteed double tire mileage. Any tire. Low priced. Agents wanted in every county. **American Accessories Co., B-831, Cincinnati, Ohio.**

One Rockway Starter good as new; also tools to apply. Price \$30.00. **P. H. Landfred, 45 Elm St., Greenville, Pa.**

Classified Advertisements—Continued

Distributors wanted to sell Liberty Shock Absorbers for Ford cars. Simplest Shock Absorber on the market. Can be installed in twenty minutes. Will give entire satisfaction. Good territory open. Write us for particulars. **Liberty Manufacturing Company, 7454 East Jefferson**

Its the Universal Rebound Eliminator that is making Dealers, Jobbers and Agents a good income. The great Ford easy riding accessory that sells for only \$3.50. Send for one postpaid, with money back guarantee. **D. and S. Sales Co., Pontiac, Mich.**

Attention Ford Owners! Wash your auto without water! Use New Life auto polish. Will not injure the finish of any car. Money refunded if not satisfactory. Used by 80% of automobile manufacturers. Send money order for \$1.00 and a full quart will be sent you, all charges prepaid. **New Life Sales Co., 114 Green St., Michigan City, Ind.**

Salesmen calling on Ford accessory trade—We have a real proposition for you. A quality product at a cheap price. Write us. **Duplex 3520 Princeton Ave., Chicago.**

Genuine Burgess Shock Absorbers; latest model. Special cash price \$15.00 per set of four. Regular price \$20.00. Make big money selling to your friends. Be the first in your vicinity to get this special agents' price. Shipment made same day your check is received. **Burgess Shock Absorber Co., Box 306, St. Joseph, Mich.**

Agents—Every automobile owner wants gold initials on his car; transfer them yourself or sell complete sets; profits \$1.40 on \$1.50 job. Write for samples and agency. Great spare time money maker. **Transfer Monogram Co., Long Branch, N. J. 101to108***

Fords run 34 miles per gallon on cheapest gasoline or half kerosene, using our 1921 carburetor. Increased power; styles for all motors; attach yourself. Money back guarantee; 30 days' trial. Big profits to agents. **Air Friction Carburetor Co., 1510 Madison St., Dayton, Ohio.**

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Send no money. Order subject to examination. **West Side Tire Works, Dept. 50, 4447 W. Madison St., Chicago, Ill.**

AUTO SUPPLIES

4-Cyl. engines work smooth with my aluminum pistons. For autos, tractors, all sizes. Write **Edge, 1326 S. Main, Los Angeles, Calif.**

Ford owners attention!—Re-line your own Ford—buy your transmission lining direct from the factory. Finest quality cork transmission lining, set complete, \$1.50. Double pick twill weave transmission lining at 85c per set. Unterted lining at 75c per set. Send remittance with order to **George Brahs Mfg. Co., 12 McBride Ave., West Paterson, New Jersey.**

These has never been a satisfactory Ford timer. Our Ford Distributor insures perfect timing, easy starting, steady firing. Will outlast a Ford. Sells quick to Ford drivers. Liberal discount to agents. Write quick. **M. O. Smith, 1354 Peoples Gas Bldg., Chicago.**

For Sale—Rajo Valve-in-head \$45.00. **C. R. Bradley, 90 Birdsall, Winsted, Conn.**

Ford Owners—We have for immediate shipment Ford one man top, 3 side curtains on each side with large celluloid lights, 2 oval nickel frame plate glass lights in rear and windshield attachments; built with 32 oz. Ford rubber, \$26.50, or drab back long grain auto leather, \$27.50, or best grade double texture, \$31.50, ready to set right on car; no work to be done by mechanic. Recovers made up for your old top—Ford rubber \$6.75, drab back auto leather \$7.00, double texture \$8.00; with 2 plate glass in back curtain. Complete set side curtains \$9.50, back curtain of rubber \$2.75, of auto leather and 2 plate glass \$3.75, double texture and 2 plate glass \$4.50. All goods shipped C. O. D. with distinct understanding that we guarantee a perfect fit and all goods to be first class. We use no second grade material and we will be glad to refund the price of any article you are not perfectly satisfied with. Seat covers for Fords, \$7.50 to \$18.00. Write for samples. **Atlantic Auto Top Co., 3310 Atlantic Ave., Atlantic City, N. J.**

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AUTO SUPPLIES

Oil cooler for Fords—saves 50% to 75% oil by actual test; keeps engine cool and clean; increases power. Bolts under crank case in place of present inspection plate. Every Ford owner appreciates it. Quick seller, \$5.00; big agent's profit. **Adamson Mfg. Co., East Palestine, O.**

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The owner of a motor car does not want any accessory that requires the changing of any part of the construction in any way. This fact has been definitely established by the Hassler Shock Absorber selling organization during their seven years' experience all over the country.

"We always find appreciation on the part of the car owner when we tell him that Hassler Shock Absorbers do not require changing his car in any way," said Mr. George T. Bryant, director of sales of Robert H. Hassler incorporated.

"This is because the owner believes his car is good as it stands, and does not want to change it basically. He believes in the car more thoroughly than he can believe in any added feature and he wants to be able to remove the accessory at any time and have his original car as he purchased it.

"The fact that Hassler Shock Absorbers may be removed and leave the car exactly as it was before, no part having been changed, makes it possible for us to offer our ten day trial plan upon which we have built our business.

"Every owner wants added comfort and economy. He wants these things, yet we often realize that our statements are not fully believed. Yet just as soon as the owner realizes he can have Hasslers on his car and then remove them if he wishes at the end of the trial period he does not often hesitate.

"One of the biggest reasons for the success of the Hassler Shock Absorbers, which is the most successful motor car accessory in the world, is this simple application, permitting the car to remain unchanged so that at any time the owner may have his original car should he desire it. Of course, we never find an owner who wishes such a thing, at least we have found only about as many as you can count on your fingers, in a million sets sold."

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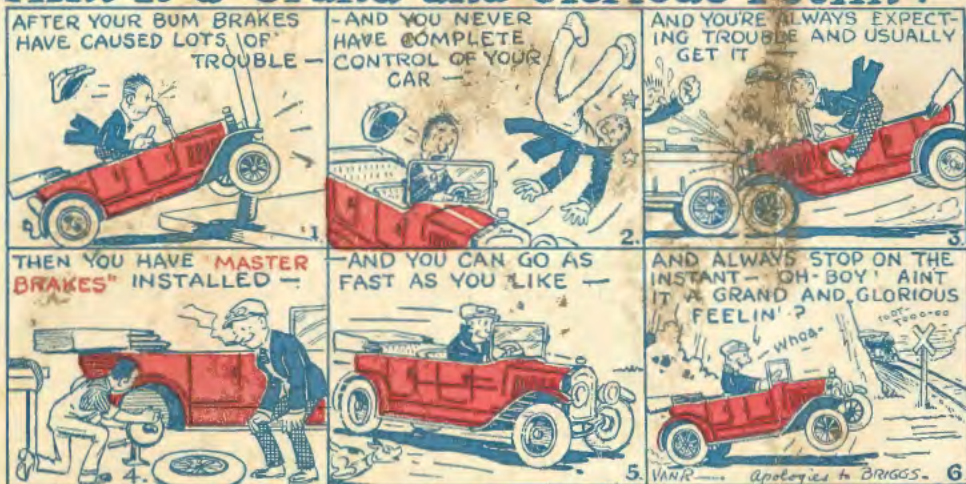
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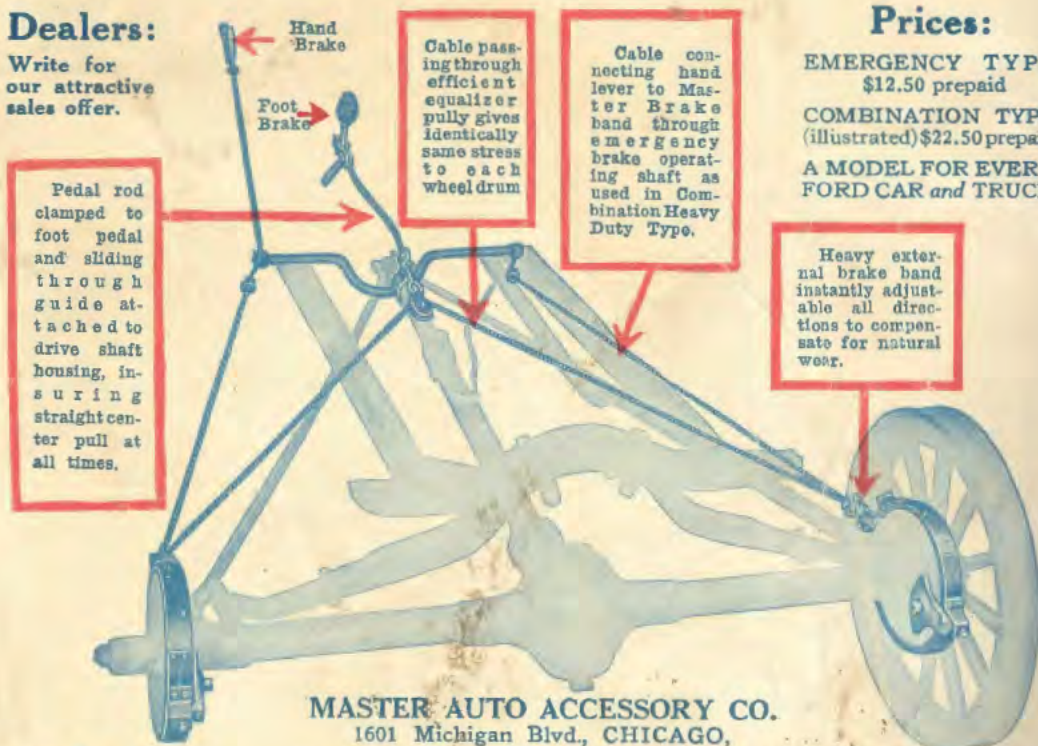
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