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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.

HASSLER
TRADE MARK REGISTERED
Shock Absorbers
PATENTED

The Ford in Arabia
"All Right, Ma'am—
I'll Be Right Out"

"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

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PUBLISHERS OF "LET'S GO."

DEALERS: Order from your jobber or write us direct.

$3.50 Per Set of Three

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Easy to Operate

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.

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ORDER NOW.

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HASTINGS

FORD NECESSITIES

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25 Mill Street, Hastings, Michigan

FORD OWNER and DEALER
June, 1921

Entered as second-class matter, January 29, 1916, 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 "how 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

H. A. Apple, Publisher and Editor
Frederick L. Goulston, Advertising Manager
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When writing advertisers—Just say FORD OWNER and DEALER
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The four jacks illustrated are right all the way. They are built to the rigid Walker standard—factory tested and guaranteed.

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**PRICE, 50 CENTS UP**
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**STAR-K SHURNUFF Junior Spark Plug.** A well made, standard type plug at a popular price. 90 cents.

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Give New Life and Speed to Ford Cars
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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 bearings, wrist pin and piston rings, including special pressure retaining ring on each piston. There are no extras to buy—the pistons are complete and ready to fit your particular car.

Say your dealer or garage man has 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 according to micrometer or at least standard cylinder gauge measurement, or else make a gauge of about 1/16" 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 $3.00 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

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When writing advertisers—Just say FORD OWNER and DEALER
TWATER
ENT
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) $16.00

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.

Automatic Advance (Type CA) $24.00

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

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Constant vibration, terrific road shocks are the 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.

A head lamp equipped with the Flexo Lens and Protector will withstand a heavy hammer blow without breaking the lens.

**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 reflector.

**FLEXO LENSES: Licensed—Registered**
The Flexo Lenses furnished with Flexo Lens Protectors give perfect satisfaction. The upper ball 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)

**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.

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

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U. S. A.

For Every Make of Car and Truck

When writing advertisers—Just say FORD OWNER and DEALER
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 evaporation 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 your 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.
I am interested in the Cataract Pump. Send me details of your selling proposition by return mail.

Name...........................................
Address...........................................
Town...........................................
State...........................................

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

Name...........................................
Address...........................................
Town...........................................
State...........................................
GONE!

Don't 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.
AHotter, Fatter Spark
For Fords and Fordsons

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 to 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.

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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
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VESTA
COSTS LESS PER MONTH OF SERVICE

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THE KINGSTON CARBURETOR is known everywhere. More than a million are in daily use on Ford cars—inures 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

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

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.

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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

"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.

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Every Ford motor has a definite rated horsepower, but this power is not delivered if there is leakage of compression and gas and constant formation of carbon through oil pumping due to "out of round" or worn piston rings. The easy way to secure full power and to save the money loss of fuel leaks and carbon trouble, is through the use of the two-piece ring that is entered into the piston groove as a one-piece ring for Ford and all other cars.

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Gaps sealed and locked at three points, against leakage, by the permanent locking lip cast in ring. Rotary hammered radial tensioning that insures long life of ring and perfect expansion under heat.

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For Ford Cars! The only scientifically correct and accurate gauge on the market. Registers in plain view of driver on dashboard. One of the most remarkable conveniences ever devised for Ford cars. Sold with unconditional money back guarantee.

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Write today for wholesale prices and exclusive territories. Nationally advertised. — Booklets and Circulars furnished.

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Don't take a chance with your oil supply! Equip your Ford with the Akuret Oil Gauge for Ford cars.

Too much oil means carbonized cylinders. Too little means burnt bearings. Both are costly.

Stop taking a chance! Know how much oil you have! The "Akuret" Oil Gauge will tell you instantly—whether your supply is O. K.—Low—Excess.

Install an "Akuret" Oil Gauge on your Ford now. It will save you money.

If your dealer cannot supply you, mail the coupon order at once.

Easily, quickly attached by anyone. One end screws into lower petcock hole, the other comes out through splash above right hand running board. No more crawling under the car to look at your oil with the "Akuret!"

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FloatAforD
SHOCK ABSORBERS
WORK WITH THE FORD SPRINGS
FOR YOUR COMFORT

FloatAforDs will make your car ride easy under all road conditions. They are built on the complete suspension principle and do not clamp the springs in any way.

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.

*The “Third Spring” Is the Snubber as Well*

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.

FloatAforDs work both “going and coming” with the Ford springs.
FloatAforDs cut your car expense—in tires, fuel, repair bills and depreciation.


See your dealer today and get a demonstration ride.

**DEALERS:**

There is a big market in your territory for FloatAforDs. Easy to sell. Good profits. Write for sales plan and territory contract. Big advertising campaign to back up your sales efforts. Write today.

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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 Fahnnestock, 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 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 overhaul” from a new stand-
point this year. Instead of tearing all the
parts out of the Ford, and scattering them from
the roof to the cellar; it is the idea to consider
the overhaul on the “bit-by-bit” or “install-
ment plan”—rather than as one all-in-a-lump
operation.

When a woman does the spring house-clean-
ing, she generally manages to maintain some
sort of a “going concern” during the process.
So that we have some where to eat, and some-
where to sleep; while the last little speck of
dust is being carried from the nook little co-
ner in which it has lain so comfortably all
winter. There is no place like home—during
house-cleaning time, with the possible excep-
tion 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 flaws,
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 overhaul and are
ready to put it together again, we often feel
the same—or worse.

When it comes to a complete overhaul,
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
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 haphazard 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 ele-
ments in skillful overhauling. And many of us
will be able 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 dis-
ssemble, such parts as are already performing
in a satisfactory manner.

Before starting the actual work of overhaul-
ing, 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 dis-
sembling 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 trans-
mition, 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 be done at the same time.

In this particular article, we do not intend to
cover "show" repairs, such as overhauling the
transmission, re-habitting of main bearings,
or re boring the cylinder block. Such repairs
require more skill and equipment than is usu-
al among the reach of the average car owner.

If you wish for more comprehensive instruc-
tions on the testing and straightening of con-
necting rods and crankshafts, or of such re-
pairs as the babbitting and re boring 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 10 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 over-
hauling 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 a-
ffords 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 cooling system.

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 in-
clude 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 con-
nections between the cylinder block and the
radiators, and cleaning the radiator fan.

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 radi-
tator tubes. If the radiator needs to be replaced,
this affords a convenient opportunity for re-
placing the rubber hose connections, or obtain-
ing more easy access to the engine, for re-
moving carbon, grinding valves or making
other repairs.

Ordinarily, however, it will only be necessary
to drain out the radiator and wash it out thor-
oughly 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 begin-
nings on page 171 of the April 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 oppor-
tunity to remove 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 effectively cleaned.

The top radiator hose connection between
the cylinder head and the radiator, most fre-
cently 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 do not require such frequent replacement.
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 fingers, 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 re-
velope 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 wire
threaded end of this rod is rusty or dirty, wash
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 overhaul-
ing 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 radi-
ator has been detached, it has been removed, in-
volves 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 re-
moved 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 bores 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 much looseness, between the pistons and the cylinder walls; it may be necessary to fit over-
sized 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” con-
necting 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 mani-

folds can be easily removed. But before remo-
ving 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 mani-

folds, 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 shot out.

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 neces-
sary 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 in-
coming 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 gen-
eral 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 joint 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. The valve must be taken apart, 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 the valve will require much more force 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 valve face 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 from .029 to .032 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 securely 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 zigzagging back-and-forth, first to the forward end and then towards the back of the car, down the middle row of cylinder bolts, 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 inserting the spark plugs in the cylinder head, they should be taken apart and cleaned. After cleaning the porcelain 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 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 testing machine, each coil unit should be adjusted to take from 1.4 to 1.6 of an amper. Before making the adjustments for proper insulation, 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 backfire, due to the sparking that occurred near the spark plug.

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 have been given 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 going 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 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 case and allow the oil to drain out, 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 rod bearings 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 reached.

**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 determine if there is any dirt or water still remaining in the tank.

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-
between 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 disaster 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 tape where it is subjected to rubbing against the side members of the chassis frame, and by 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 jet 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 adjust an overhauled 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 accurately. 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. After that 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 changing 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. 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 the 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 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 dices and remove, it is advisable to facilitate the work in every possible manner, especially for the inexperienced owner who is overhauling his car for the first time.

When removing these 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 tried to a circle, so that they will not tend to 'drag' on the drums when installed.

If one wishes to relieve 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 an 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 turn 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 in poor condition.

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 partly clogged. If the oil does not flow through freely and easily, one should take a piece of flexible steel wire, and snake 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

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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 push 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 out of the transmission housing.

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 there is any doubt as to the wholesale, 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 is 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 overhaul.

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 bearings, 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 joint, 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. 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. 4452-A  Spray needle
No. 4453-A  Gasoline inlet needle
No. 6044  Float valve seat
No. 3964-B  Fan belt
No. 3377  Trans. cover gasket
No. 3379  Sloping door gasket
No. 3536  Ball cap gasket
No. 3162  Lower cover door gasket
No. 2516-B  Axle outer washer
No. 3453  Cyl. cover felt washer
No. 2800  Front and rear felt washer

No. 3363  Trans. cover front gasket
No. 3111-B  Valve cover gasket
No. 3536  Ball and socket joint
No. 3221  Commutator shell
No. 3165  Comm. roller brush assembly
No. 3458  Hand brake lever pawl
No. 4733  Vibrator spring
No. 4734  Vibrator point
No. 4355  Comm. wire loom assembly
No. 4353  No. 3 & No. 4 spark plug wire
No. 4358  No. 1 spark plug wire
No. 4351  No. 2 spark plug wire
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 springs. 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 any of the 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 pads 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 rebrush the front springs, if necessary, and to replace the front brake drums. We will 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 rebrush 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 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.
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 for, 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 car 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 man who sold it to the customer and 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 very easily checked at the time of sale, simply by 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 4, 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 the 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.

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<tr>
<td>May 1 to May 31</td>
<td>1219400</td>
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</tr>
<tr>
<td>Month to Month</td>
<td>Motor Number</td>
<td>Cars Built</td>
</tr>
<tr>
<td>--------------------------------------</td>
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<tr>
<td>June 1 to June 30</td>
<td>1272000</td>
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<td>1326900</td>
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<td>1362213</td>
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<td>1400900</td>
<td>51300</td>
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<td>1452200</td>
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<td>1516500</td>
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<td>1570700</td>
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<td>1614600</td>
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<td>1739900</td>
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<td>2565800</td>
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<td>April 1 to April 30</td>
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</tr>
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<td>2792300</td>
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<td>2805100</td>
<td>28300</td>
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<td>2831400</td>
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<td>January 1 to January 31</td>
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<td>83105</td>
</tr>
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<td>February 1 to February 29</td>
<td>3743075</td>
<td>74355</td>
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<td>March 1 to March 31</td>
<td>3817431</td>
<td>92559</td>
</tr>
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<td>3891000</td>
<td>59149</td>
</tr>
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<td>May 1 to May 31</td>
<td>3969151</td>
<td>86129</td>
</tr>
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<td>4055231</td>
<td>86169</td>
</tr>
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<td>4114450</td>
<td>91900</td>
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<td>August 1 to August 31</td>
<td>4233651</td>
<td>96549</td>
</tr>
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<td>4329901</td>
<td>96485</td>
</tr>
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<td>October 1 to October 31</td>
<td>4426386</td>
<td>100154</td>
</tr>
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<td>November 1 to November 30</td>
<td>4528541</td>
<td>91334</td>
</tr>
<tr>
<td>December 1 to December 31</td>
<td>4617926</td>
<td>80554</td>
</tr>
</tbody>
</table>

**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 Ford, as sold 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".
FORD OWNER and DEALER

June, 1921

CANADIAN FORD MOTOR NUMBERS.

<table>
<thead>
<tr>
<th>Year</th>
<th>Motor Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 1, 1913 to July 31, 1913</td>
<td>C-1 to C-1500</td>
</tr>
<tr>
<td>Aug. 1, 1913 to July 31, 1914</td>
<td>C-1501 to C-15750</td>
</tr>
<tr>
<td>Aug. 1, 1914 to July 31, 1915</td>
<td>C-16501 to C-16500</td>
</tr>
<tr>
<td>Aug. 1, 1915 to July 31, 1916</td>
<td>C-15751 to C-15800</td>
</tr>
<tr>
<td>Aug. 1, 1916 to July 31, 1917</td>
<td>C-15801 to C-161000</td>
</tr>
<tr>
<td>Aug. 1, 1917 to July 31, 1918</td>
<td>C-121001 to C-121000</td>
</tr>
<tr>
<td>Aug. 1, 1918 to July 31, 1919</td>
<td>C-170001 to C-208500</td>
</tr>
<tr>
<td>Aug. 1, 1919 to July 31, 1920</td>
<td>C-208501 to C-208500</td>
</tr>
<tr>
<td>April 1, 1921</td>
<td>C-291500</td>
</tr>
</tbody>
</table>

While we at first intended to give a month-by-month 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

<table>
<thead>
<tr>
<th>1917</th>
<th>Motors assembled at Home Plant</th>
<th>1918</th>
<th>Motors assembled at Home Plant</th>
</tr>
</thead>
<tbody>
<tr>
<td>October</td>
<td>1 to 75</td>
<td>August</td>
<td>15,226 to 18,627</td>
</tr>
<tr>
<td>November</td>
<td>76 to 259</td>
<td>September</td>
<td>18,638 to 22,247</td>
</tr>
<tr>
<td>December</td>
<td>2,746 to 616</td>
<td>October</td>
<td>18,248 to 22,287</td>
</tr>
<tr>
<td>January</td>
<td>617 to 1,731</td>
<td>November</td>
<td>2,638 to 29,978</td>
</tr>
<tr>
<td>February</td>
<td>2,732 to 3,082</td>
<td>December</td>
<td>2,979 to 34,126</td>
</tr>
<tr>
<td>March</td>
<td>3,083 to 3,900</td>
<td>1918</td>
<td>4,427 to 9,554</td>
</tr>
<tr>
<td>April</td>
<td>6,901 to 7,508</td>
<td>January</td>
<td>3,495 to 47,823</td>
</tr>
<tr>
<td>May</td>
<td>7,508 to 9,580</td>
<td>February</td>
<td>4,783 to 50,961</td>
</tr>
<tr>
<td>June</td>
<td>9,581 to 11,987</td>
<td>March</td>
<td>50,062 to 53,110</td>
</tr>
<tr>
<td>July</td>
<td>11,987 to 15,225</td>
<td>May</td>
<td>53,111 to 55,304</td>
</tr>
<tr>
<td>1919</td>
<td>Motors assembled at Branches</td>
<td></td>
<td></td>
</tr>
<tr>
<td>July</td>
<td></td>
<td>Motors assembled at Home Plant</td>
<td></td>
</tr>
<tr>
<td>August</td>
<td>C1001 to C1009</td>
<td>Motors assembled at</td>
<td></td>
</tr>
<tr>
<td>September</td>
<td>C1010 to C1068</td>
<td>Cork, Ireland</td>
<td></td>
</tr>
<tr>
<td>October</td>
<td>C1069 to C1080</td>
<td>C1001 to C1009</td>
<td></td>
</tr>
<tr>
<td>November</td>
<td>63001 to 63003</td>
<td>C1010 to C1068</td>
<td></td>
</tr>
<tr>
<td>December</td>
<td>63041 to 63063</td>
<td>63001 to 63003</td>
<td></td>
</tr>
<tr>
<td>1920</td>
<td></td>
<td>63004 to 63177</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>63178 to 63200</td>
<td></td>
</tr>
<tr>
<td>January</td>
<td>100,001 to 100,192</td>
<td></td>
<td>100,001 to 100,499</td>
</tr>
<tr>
<td>February</td>
<td>100,192 to 102,294</td>
<td></td>
<td>105,049 to 105,094</td>
</tr>
<tr>
<td>March</td>
<td>121,119 to 121,591</td>
<td></td>
<td>105,050 to 105,290</td>
</tr>
<tr>
<td>April</td>
<td>121,192 to 124,790</td>
<td></td>
<td>105,291 to 105,704</td>
</tr>
<tr>
<td>May</td>
<td>121,592 to 124,731</td>
<td></td>
<td>105,705 to 105,893</td>
</tr>
<tr>
<td>June</td>
<td>124,760 to 126,000</td>
<td></td>
<td>105,894 to 106,249</td>
</tr>
<tr>
<td>July</td>
<td>126,270 to 126,635</td>
<td></td>
<td>106,250 to 106,635</td>
</tr>
<tr>
<td>August</td>
<td>129,105 to 134,622</td>
<td></td>
<td>106,636 to 106,635</td>
</tr>
<tr>
<td>September</td>
<td>134,623 to 135,200</td>
<td></td>
<td>106,672 to 106,672</td>
</tr>
<tr>
<td>October</td>
<td>135,200 to 137,000</td>
<td></td>
<td>106,719 to 106,719</td>
</tr>
<tr>
<td>November</td>
<td>137,000 to 139,000</td>
<td></td>
<td>106,720 to 107,000</td>
</tr>
<tr>
<td>December</td>
<td>139,000 to 140,000</td>
<td></td>
<td>107,001 to 107,001</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Car Speed</th>
<th>Engine speed</th>
<th>Wheel speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 1 m. p. h.</td>
<td>204 r. p. m.</td>
<td>112 r. p. m.</td>
</tr>
<tr>
<td>10</td>
<td>407</td>
<td>168</td>
</tr>
<tr>
<td>15</td>
<td>611</td>
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<td>20</td>
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<td>336</td>
</tr>
<tr>
<td>30</td>
<td>1221</td>
<td>392</td>
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<tr>
<td>35</td>
<td>1425</td>
<td>448</td>
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<tr>
<td>40</td>
<td>1628</td>
<td>505</td>
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<tr>
<td>45</td>
<td>1832</td>
<td>560</td>
</tr>
<tr>
<td>50</td>
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<td>616</td>
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<td>2239</td>
<td>672</td>
</tr>
<tr>
<td>60</td>
<td>2442</td>
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FORD CAR WEIGHTS.

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<th>Year</th>
<th>Truck Chassis</th>
<th>Coupe</th>
<th>Sedan</th>
<th>Runabout</th>
<th>Touring</th>
<th>Chassis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug. 1 to July 31</td>
<td>1915 to 1916</td>
<td>1540</td>
<td>1730</td>
<td>1395</td>
<td>1510</td>
<td>1200</td>
</tr>
<tr>
<td></td>
<td>1916 to 1917</td>
<td>1540</td>
<td>1730</td>
<td>1380</td>
<td>1500</td>
<td>980</td>
</tr>
<tr>
<td></td>
<td>1917 to 1918</td>
<td>1540</td>
<td>1745</td>
<td>1385</td>
<td>1480</td>
<td>980</td>
</tr>
<tr>
<td></td>
<td>1918 to 1919</td>
<td>1540</td>
<td>1715</td>
<td>1390</td>
<td>1500</td>
<td>880</td>
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<tr>
<td></td>
<td>1919 to 1920</td>
<td>1680</td>
<td>1750</td>
<td>1390</td>
<td>1500</td>
<td>1060</td>
</tr>
<tr>
<td></td>
<td>1920 to 1921</td>
<td>1680</td>
<td>1725</td>
<td>1400</td>
<td>1500</td>
<td>1020</td>
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</table>

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

OVERALL DIMENSIONS.

<table>
<thead>
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<th>Model</th>
<th>Height</th>
<th>Width</th>
<th>Length</th>
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<tr>
<td>Touring</td>
<td>7'-0&quot;</td>
<td>5'-7 1/2&quot;</td>
<td>11'-2 1/2&quot;</td>
</tr>
<tr>
<td>Runabout</td>
<td>6'-9&quot;</td>
<td>5'-7 1/2&quot;</td>
<td>11'-2 1/2&quot;</td>
</tr>
<tr>
<td>Sedan</td>
<td>6'-9&quot;</td>
<td>5'-7 1/2&quot;</td>
<td>11'-2 1/2&quot;</td>
</tr>
<tr>
<td>Coupelet</td>
<td>6'-9&quot;</td>
<td>5'-7 1/2&quot;</td>
<td>11'-2 1/2&quot;</td>
</tr>
<tr>
<td>Chassis</td>
<td>6'-9&quot;</td>
<td>10'-8&quot;</td>
<td></td>
</tr>
<tr>
<td>Truck chassis</td>
<td>6'-7 1/2&quot;</td>
<td>12'-9&quot;</td>
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</table>

CAR PRICE CHANGES.

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<th></th>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Touring</td>
<td></td>
<td>950</td>
<td>900</td>
<td>850</td>
<td>800</td>
<td>750</td>
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<td>450</td>
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<td>350</td>
<td>300</td>
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</tr>
<tr>
<td>Runabout</td>
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<td>225</td>
<td>200</td>
<td>185</td>
<td>170</td>
<td>155</td>
<td>140</td>
<td>125</td>
<td>110</td>
<td>95</td>
<td>80</td>
<td>65</td>
<td>50</td>
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<td>25</td>
<td>15</td>
</tr>
<tr>
<td>Sedan</td>
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<td>975</td>
<td>900</td>
<td>825</td>
<td>775</td>
<td>700</td>
<td>625</td>
<td>550</td>
<td>475</td>
<td>400</td>
<td>325</td>
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<td>500</td>
<td>450</td>
<td>400</td>
<td>350</td>
<td>300</td>
<td>250</td>
</tr>
<tr>
<td>Town Car</td>
<td>1000</td>
<td>1200</td>
<td>1200</td>
<td>900</td>
<td>740</td>
<td>680</td>
<td>640</td>
<td>595</td>
<td>550</td>
<td>500</td>
<td>450</td>
<td>400</td>
<td>350</td>
<td>300</td>
<td>250</td>
<td>150</td>
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</table>

FUEL TANK MEASUREMENTS.

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<th>Round</th>
<th>Oval</th>
</tr>
</thead>
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<tr>
<td>Gallons</td>
<td>Tank</td>
<td>Tank</td>
</tr>
<tr>
<td>1</td>
<td>1 3/4&quot;</td>
<td>1 1/2&quot;</td>
</tr>
<tr>
<td>2</td>
<td>1 3/2&quot;</td>
<td>2 1/2&quot;</td>
</tr>
<tr>
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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 \( \frac{3}{4} \) inches for the first gallon, and \( \frac{3}{8} \)-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.

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**BETTER NOT TRY IT**

In Milwaukee there is a Ford salesman named 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 "kid-ding" 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 loath 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."

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**IN SPRING**

Ox tell me, dear Elizabeth, where shall we go to-day;
For spring has touched the sleeping earth and luring winds call low,
While liltting 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 rapture 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 violets now sway;
For hill and dale, by woodland trail, are bright with springs attire
And gypsy breezes beckon us—come! let us haste away.

Ethei Hope.

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**Contrite.**

She: (over telephone)
Is that you Jack—dear?
Yes, I know I said I never wanted to see you again—but
You know 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
—
—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.

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**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!"

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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

COOLING

MODERNIZING APPEARANCES.
Probable 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, such as 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 the 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.

FUEL SYSTEM

IGNITION

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 cheap 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 that fitting deeper seat cushions is the most practical means of securing ease of 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. Other drivers, equipped with a long board mat or foot scraper, it will be found that such a mat, by keeping dirt off the sides of the car, makes the care of the car much easier.

Extension door lever handles are found to be a convenience, in getting in or out, and 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 of many auto owners 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 largely upon the design and construction 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 are inclined to oil and deteriorate 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 it 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 to the motor and 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 125 ampere hour type. With the use of such a storage battery, the battery 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 the 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 more than ten or fifteen cents during the year. 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 have the installation of the twin 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 safely on narrow roads.

In most states, the fitting of anti-glare lenses is compulsory. In all states, the fitting of those special headlight lenses is certainly a desirable means of keeping the glare from the headlamps 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 12-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 to give 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 turning.

If one has an electric starting or lighting system, or an electric 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-sector 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 models 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 dampers 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 in good order, 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 operated from the steering column 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 counties 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 is 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 the tire, running on a hot day. There is also a simple tire pump made which fits on to the Ford engine and which uses 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 quietly and unexpectedly.

Instead of attempting to patch tires by using the so-called "sew-gether" 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 through the work 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 in 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.

But the pistons, the crankshaft, and the connecting rods are the most obvious sources of engine vibration. By proper design, the pistons can be made so that 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 lightweight connecting rods. But 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 that they can be fitted to 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 crankshaft. It is the usual experience that the higher the balancing engine is run, the better is 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 refinishing 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 transmission 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 engine cover off the cranks, or expensive labor.

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 them containing molybdenum, 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 pistons that fit these pistons, the oil fillers, and the oil sight glasses can be made, 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 suspension 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 squeaking 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 belt in good 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 convince 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 magneto's 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.

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**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.
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 skidded 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
"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 considerately 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 its 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 protesting right in the path of a loudy 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 hocks and sirenic 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, the sun drops to its 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 all cut out, in some 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 accommodations 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 slumberers 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 feed us from whatever store by we might come "snoping" 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 preservation 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 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 all we could do was 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 Lizzie."

But this is one point upon which there is always a happy agreement of opinion, so I beat him to it: "Lizzie," I shouted!
FREE CAMPS FOR THE FORD VACATIONISTS

H. N. Barhans, 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 such 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, 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 Illinoisian, or Jewan 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. Many 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 motorists. 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.

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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.
Red-Cup Will Stop that Chatter

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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 therist for historical relics, the ladi 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-froot out of a few red coats on his afternoon off. If history repeats itself, believe me, gasoline is a great ditty 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 inhale 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 to 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 to 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 elusive a fascinating 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. Food-stuffs 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 cup 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 and 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 fresh 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. The Natural History says it can’t be done. Yeggs and pirates may be but they are also to be found in the cities, so they tell me. Every now and then you read of some policeman in a big city getting rough with a yegg and taking his life and all.

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 Grouches’ Crables 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 port, check hands, barmaids, bell boys and busy clerks who fancy the pleasant smile has been buried in, these many years. I have stopped at a good many hotels and have even paid my bill in some of them. In the sunny, 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 ½ 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 sidesway 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.

Tri-Chek
$5.00

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Milwaukee, Wis., U. S. A.

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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 convertible 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.
An Excerpt From a Letter From an Expert

"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.

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.
"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 bumpy 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 nickedel 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.


When writing advertisers—Just say FORD OWNER and DEALER
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 after 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 place 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 Menocinee 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 Holmenwood, 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 lake. And a few hundred feet from the tent we pilled 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 driving wind 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 and the tent was dragging and making a great racket as the wind had full sweep through the tent. Fortunately the male guy ropes held, but “your 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 sign 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. More places were placed here and there on 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 we 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 stouts 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 and the weary backs were thankful 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 feeling the sun on one’s face, one could how 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 a basket. Driving over time 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.

AUTOMATIC Handi-Tool

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

Many Tools in One

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

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

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.

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

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

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.

When writing advertisers—Just say Ford Owner and Dealer
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 peaceably 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.

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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.

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NATIONAL CASH REGISTER CO.
DAYTON, OHIO.
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.
The Keystone Cylinder Reamer
Rebores and finishes at one operation, Ford, Fordson Tractor and Dodge Motors for all oversize pistons

A true bore is positively certain, 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 burnishing.
Provision for taking up wear on all moving parts. The tool will retain its accuracy for a life time.
Simple and strong. Can be operated by any ordinary workman.
Send for descriptive circular 4-D.

A Complete Tool for Hand or Power. RANGE 3½ to 4½ INCHES

Not necessary to remove from block nor dismantle the tool to accurately adjust for size bore.

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When writing advertisers—Just say FORD OWNER and DEALER
THE CALL OF THE OVERLAND

By PAULINE BELL

Y year as the sum-

mer drew near I

the "Call of the

erland," I cannot

myself down until

had a long trip

land in my Ford car.

trip of two years ago

Tonopah, San Fran-

cisco, Portland and back

over mountains

deserts was pub-

in the Fordw

archine.

ast year I planned

a trip to Seattle

the way of Walla

over the Blue

mountains by the toll

road, then leaving

car at Seattle to go by boat to Skagway, Alaska,

turn to Spokane and Glacier Park.

My companion was a young lady, Kitty

Hansen. I am a woman past sixty, I have no

touble driving my car any where. I have

"all the conveniences of home"—nearly.

We left Ogden June twenty-six, late in

afternoon and drove to Snowville a distance

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 together 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 Buhi,

finding a cool place to have lunch.

After lunch we started up a steep graded

mountain to Bliss, from where we had to
deur, 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 splen-
did 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, but

her were glad to do so. The next morning

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 sunset, and

to the home of a friend, where we en-

joyed 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 kept it in it and let

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

to the other of the thirty miles.

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 if we

were travelling alone and said he would keep

along back of us and if we wanted 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 drove through Walla Walla and on

through to Wapala to camp. It is a most desolate

spot. The wind was blowing

sand in great gusts. There were about a
dozens 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

Paseo; 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 Snakes river bridge is a most exciting

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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IT IS ECONOMICAL, PRACTICALLY INDESTRUCTIBLE AND MOST EFFICIENT, RUNS DRY, NEEDS NO OILING. IS WATER, OIL AND DUST PROOF. CAN BE ADJUSTED IN A FEW MINUTES AND IS

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bought at the store when we bought the eat-ables. 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 but everyone was not as 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 the Park on 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 name is dis- ingoing 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 for a short distance. We were in good shape to go 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 over-land 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 was more 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 quarrz mill there on the side of the mountain. I understand it is low grade ore. The next stop was Haines a small place. Port W. Haines 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. In front of our hotel are two 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 six o'clock the morning that 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 large icebergs floating around us. The boat whistled and we saw several humps 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 hotel. In the morning when the fog that 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 hours 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 over till 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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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 canyon, 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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**Complete. Retail Price $4.50.**

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If your dealer cannot supply you with the TURNER 2 in 1 TIMER, write us direct.

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Write us today for our proposition, which you will find highly attractive.

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1. Brush container is of cast steel and will last as long as the motor.
2. Contact brush of specially treated phosphor bronze, a long hard brush that will run 10 to 12 thousand miles. This brush is grooved to slide in a pin with a stop, this makes any variation in timing impossible and makes it impossible for brush to get out of socket when installing, a protected feature of this timer.
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.
4. Flexible metal conduit cord packed, which 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.
6. Timer shell of aluminum, machined to size with polished finish. This metal resists rust, is water tight, never has to be thrown away. Any part within it is quickly, cheaply and easily replaced.
7. Note the four different lengths of best quality wire in four colors. These cannot be put on wrong.

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**A TRIAL WILL CONVINCE YOU THERE IS NOTHING LIKE IT**

**TURNER MANUFACTURING CO.**
**KOKOMO, IND.**

When writing advertisers—Just say Ford Owner and Dealer
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, as ours.

The next morning we started for Kalispell. As we were traveling along a large grey 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 pines? 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 still 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 and 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 for a rest of car driving, 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. While we enjoyed it 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. He told us we should be there in an hour. He 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 he made 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 Mackanick, he looked the car over and found the timer was out. He put the car in splendid shape, so we could go on more trustily.

At two we started on to Belton, the western entrance to Glacier Park. It was a beautiful drive around through the cabin 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 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; fifty-five 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 horseback 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 Poison. The road from Poison 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 of 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 over the Bitter Root Mountain to the top, it was a very steep grade all the way, but the road was smooth, I told my informers that I knew
Bad Roads Made Easy!
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)

BEARINGS—Hyatt roller thrust

CASE—Manganese bronze, same materials as used in all propellers on battleships—practically unbreakable

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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 big mountain or divide we had to cross before we reached Dillon. 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.

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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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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 this at 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 3,306 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.

<table>
<thead>
<tr>
<th>Place</th>
<th>Distance Between Places</th>
<th>Total From Chicago</th>
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<tbody>
<tr>
<td>Chicago</td>
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<tr>
<td>Daveport, Ia</td>
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<td>Des Moines</td>
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<td>Pueblo</td>
<td>43.6</td>
<td>1288.7</td>
</tr>
</tbody>
</table>

(The half-way point is about Walzenburg)

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 150 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 transcontinental trip.

Cassettes, 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 belts, 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 khaki cloth, weather 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—one. 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 UNICOIL 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 are 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 Springfield, 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 was found to be 37 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, Springville all have good places, the worst was at Winslow, alongside a railroad yard.

Have some sort of shock absorbers or snuffers; 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 motorist's 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 ensured
But then the cause is good—and having jured
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 loneliness in open view,
Fling 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!

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 track. 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., Don Lowell, C. F. Coltray, Paul M. Hooper, James C. Hackney, Futz 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, gray iron pistons and rings complete, Aluminite and Triple Life connecting rods, parts for under-valve 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.

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. BOOKER ARMS OPERATE FROM THE REGULAR CAMSHAFT. Every Ford owner is a likely prospect, every Ford truck owner is a NURE 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

When writing advertisers—Just say FORD OWNER and DEALER
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 intake 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
Magneto 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
Magneto 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)
Magneto defective (no spark at plugs)

Motor Stops Without Warning

No fuel in tank
Water in spray nozzle
Insufficient lubrication
Broken magneto 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
Magneto wire loose at either terminal
Spray nozzle stopped up
Broken commutator brush spring (rare)
Magneto 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 cooling or not enough water in radiator
Water or dirt in spray nozzle
Loose terminal at magneto
Mixure adjusting needle jarred loose
Air vent in tank filler cap stopped up
Valves stuck open (rare)

Motor Races

Throttle not closing
Clutch slips (at high speed)
Air leak in intake 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

"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 25¢ 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 plug
- Spark plug leaks
- Loose joint between motor and exhaust manifold
- Tight piston rings (scrapping 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

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

A. Prevents the oil from getting too hot, thin and fluid, and escaping past pistons to carbonize the cylinders, foul the spark plugs, etc.

B. Keeps the engine running cooler and greatly increases its power.

C. Saves from 50% to 75% in lubricating oil, as proven by actual comparative tests.

D. Gives better, cleaner lubrication; prevents bearings from burning out, magneto from short-circuiting, etc.

E. The extra quart of oil retained in Cooler provides a wide margin of safety.

F. Easily applied. Merely un-bolt the present Inspection Plate and bolt the Adamson Oil Cooler in its place.

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:

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 Leakesville, 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.
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
CLOSER 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
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 story-teller, 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.


*Make of Gilmer Woven Endless Fan Belts and other woven automotive equipment*

When writing advertisers—just say Ford Owner and Dealer
Mme. 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 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 to 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 hauled 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-bye!"
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.
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.

DEndefender
SHOCK
ABSORBERS

When writing advertisers—Just say Ford Owner and Dealer.
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.

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 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-

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 filled 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
ONE PIECE
STEEL FOOT BOARD

For Ford Cars

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

When writing advertisers—Just say FORD OWNER and DEALER
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 transcontinental 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—an 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 pack 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-margarinefad 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 frowning, 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 grid on your Ford's chains and skid out, you feel like it's a case of do 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 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:

<table>
<thead>
<tr>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valve only</td>
<td>$3.00</td>
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<tr>
<td>With No. 3 Pedal</td>
<td>$3.50</td>
</tr>
<tr>
<td>With No. 4 Pedal</td>
<td>$4.00</td>
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<tr>
<td>With No. 5 Lever</td>
<td>$4.50</td>
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</tbody>
</table>

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-Equipped. 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.

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.

When writing advertisers—Just say FORD OWNER and DEALER
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 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, shoulders, 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 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.

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

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

When writing advertisers—Just say FORD OWNER and DEALER
ENGINE MISS.

About two weeks ago, I had my Ford overhauled. The timing was installed with metalite 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. The one in the two end cylinders. The spark plugs foul in a very short time. The two middle cylinders are all right.

I have a new timer, new wiring, and coils test out to standard.

We suggest that you install a set of four new plugs. With these plugs, you should set the gap to 0.030 inch, and the thickness of an old vibrator spring from a Ford coil unit. It is important to note that the spark plugs points 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 overheating, 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 1919 Ford that has a light knock in one cylinder but, so far, have been unable to locate it. Noted this first last June. I dismantled motor, installed 4 new wrist pins, and 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 metal break on pistons just plain, flat, light, metal-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, this much piston clearance, together with a slightly "springing" 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. "Sisters" are the new name for connecting rod, often work together in causing a knock such as you describe.

WEAK COMPRESSION.

Have a 1919 Ford engine, in which the compression is weak in two of its cylinders. I put in .005 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 will try installing a set of .005 inch oversize pistons; it is probable that the cylinder block will have worn out the cylinder wall, and that you will have to have the cylinder block re-bored, in order to get good compression.

Whether the rings are worn or not, it 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 hub 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 2-colt 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, intest the use of piston ring expanders.

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?
When writing advertisers—Just say Ford Owner and Dealer
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 noticeable 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 continue even if the engine is pulling hard on low gear.

If the crankshaft weights are within the tolerances, this will not tend to cause much vibration. We think that the vibration that you mentioned is caused by the weight of the crank shaft to vibrate and pound when the pressure of the connecting rods against the crank webs is 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, and perhaps redo, 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 go good service for four years more. (Bully for you and your Ford. Editor.) It has been but small expense to keep it in good repair. I can assure you that I have taken good care of it, which is true.

Three and a half years ago I installed the Holley carburetor, and I am pleased with it. I have studied a lot of the casings, and for one I had to get a new casing, and installed the Holley carburetor.

The same Holley carburetor is still in use—though I think there may be a better one. I am aware of your policy ad a good to recommend any particular fitment in the market, 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 more better in 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 the side valve and ford fold for 1917 Ford touring car. And you published the reply in the issue of June, 1920.

Last year I put on a carburetor and used the large stove in combination with the heated intake manifold. I put a valve in the tubing from the stove, making a sealer 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 155 pounds. On the trip I averaged 36 miles to the gallon. And the total average for the year was 24 1/2 miles per gallon.

The year before, with the regular Ford fittings, with large stove and regular Ford manifold, the average was 20 1/2 miles to the gallon. I think this experiment proved very satisfactory and in favor of much heat to vaporize present day fuels. Sockeye gas used mostly.

We are very good to learn of your experiences in fuel saving. As the field for Ford accessories is so wide, and so many are interested in saving money personally, and so we need all the help and suggestions that you can give us, so we can get.

In addition to your 20 per cent increase in fuel mileage, it must not be forgotten that, when you saved 20 per cent, the weight and 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

CANEY-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.

Caneedy-Otto Manufacturing Co.

Builders of Blacksmith, Automotive and Machine Shop Equipment

DEPT. M. A. CHICAGO HEIGHTS, ILL.

C-O ARBOR PRESS NO. 1

Takes 3½-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.

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. 34

Back-gearred power feed, adjustable automatic stop and instantaneous feed release, 8 speeds; height 75 in.; drills 0 to 1½" circular 21 in.; spindle travel 9½ in.; furnished with either No. 3 or 4 Morse Taper; spindle to table 27 in.; slide to base 39 in.

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 3½ in. stock.

Handy Bulletins
Showing Items
You Need
Send for Those
You Want

When writing advertisers—Just say Ford Owner and Dealer
WHY MOTORING IS COSTLY IN FRANCE.

There are 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. 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 12 to 24 horse-power), pays 200 francs per year. A 30 horse-power has to pay 360 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 235p—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 times 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 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 1 franc the litre—normally less than 2 francs the gallon—he has been taxed, and taxed, and more taxed, until now pays about 2 francs the gallon. Some of the increase of course has gone to the gentlemen in the Yessay 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:

<table>
<thead>
<tr>
<th>Description</th>
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<tr>
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<tr>
<td>Storing, loading, shipping and tax</td>
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<td>French Importation tax, since first July, 1920</td>
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<tr>
<td>French Customs tax, ordinary</td>
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<tr>
<td>Extra Tax, since 25th June, 1920</td>
<td>.20</td>
</tr>
<tr>
<td>New Tax &quot;chiffre d'affaires&quot; since 31st Aug., 1929 (11.12%)</td>
<td>.023</td>
</tr>
<tr>
<td>Various expenses at port and transport to Rosen</td>
<td>.1638</td>
</tr>
<tr>
<td>PROFIT to the FORD wholesale:</td>
<td>.02</td>
</tr>
<tr>
<td>Total per litre</td>
<td>1.8606</td>
</tr>
</tbody>
</table>

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 5 francs 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:

<table>
<thead>
<tr>
<th>Description</th>
<th>Dollars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Runabout, 2 seats</td>
<td>Loss</td>
</tr>
<tr>
<td>Touring, 5 seats</td>
<td>Loss</td>
</tr>
<tr>
<td>Coupe</td>
<td>Profit</td>
</tr>
<tr>
<td>Chassis</td>
<td>Loss</td>
</tr>
<tr>
<td>Interior Drive</td>
<td>Profit</td>
</tr>
<tr>
<td>Van</td>
<td>Profit</td>
</tr>
<tr>
<td>Tractor</td>
<td>Loss</td>
</tr>
</tbody>
</table>

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 confères by printing an interview with Mr. Ford in which it is stated that the "supposed loan of $75,000,000 dollars was a blague." Henry Ford is reported as saying:

"I was totally ignorant of the fact that I had need of $15,000,000 until certain financial sharks came and tried to convince me of the fact. But I think they do not see 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 get 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 unbol you 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, new 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 2111 Michigan Ave.

HERE’S THE BEST FORD STORY YOU EVER HEARD

A Wisconsin aborigine 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 36 miles an hour—RAJO did it, and nothing but RAJO. And to “too it off” he went out to a hill that a Ford has 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 alternately, 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 business 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.

\[ \text{WHAT I LIKED ABOUT THE GARAGE} \]

\[ \text{WHERE I BOUGHT MY AUTO} \]

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 it as wanted immediately. I did as suggested and thoroughly enjoyed the selection.

The garage 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!

\[ \text{MCKAY BUS EQUIPMENT} \]

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 passengers 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

METAL SPECIALTIES MFG. CO.
338-352 N. KEDZIE AVE., CHICAGO, ILL.
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.

The price of this Gauge is $3.75.

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 sever-

oral 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., 223 W. Congress, Detroit, Mich., are the manufacturers.

REGARDING BEVELITE.

Bevelite in the trade name of a new curtain light for all Ford Back Curtains, 1917 to 1921 inclusive. The nickel frame is 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.

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 gauge 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.

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., 2988 Sixth Avenue, Rock Island, III.
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 pitt 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.
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., 797 Second Ave., S., Minneapolis, Minn.

This is made to especially accommodate those wishing a carrier adjustable to different sized suit-cases, sample cases, packages, or anything that might be driving around.

With the handy "Automatic" all the bulky luggage can be safely and conveniently carried on a running board instead of crowding the cluttering the tonneau or in any way disturbing the comfort of passengers. Constructed of extra-heavy wrought iron, with long steel clamps which lock to the running-board and hold the carrier absolutely RIGID at all points, it can be easily fastened with opening and closing of the carrier, and are strongly and securely attached to the frame. It is adjustable to any size package up to 70" in length. Quickly and easily attached or detached without tools. Cannot rattle. Folds into package 7½"x3½"x2½", weight, 12 lbs., finished in black enamel. The cost is $6.00.

AUT-O-SEK FOR AUTO TOPS

A scientifically correct top dressing for automobile tops now on all 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 is put on old cars covers and waterproofs all cracks in addition to giving it a rich, lustre-like new top. AUT-O-Sek will not check or peel off. It is wiped on with a rag and a quart is enough for a five passenger car. The product is manufactured by Sek Mfg. Company, 2759 W. Madison Street, Chicago, Ill.

ADJUSTS BRAKE BANDS

One of the most recent necessary Ford Accessories placed on the market is a brake and relay 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 and adjustment only, on the Ford Car as manufactured.

In this way, all three bands can be adjusted by the master adjustment wrench to the proper bolts outside the transmission case.

"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-tighten the wrench before one darts 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 "otherness" of the task, the incentive is accorded the car owner to keep his brake equipment in a high state of efficiency, say the officials of the company. The Director of Public Safety in a large, middle western city, after being shown the Michon accessories, expects a definite case for fit on the nation-wide "Safety First" campaign.

The Michon Manufacturing Co. is now in production on a new 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 clutch is applied, is due to the fact that the co-efficient friction between the drum and the lining itself is not great enough when the oil applied, is due to the fact that the co-efficient friction between the drum and the lining itself is not great enough. This is overcome by the application of a new fluid, called fresh oil. Unfortunately, while oil used as a lubricant in a motor is heated for any length of time, it loses its viscosity, consequently the oil deteriorates.

"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 pedal down tight so as to express all the motor oil, or as much as it comes from the band lining; loosen the transmission bands; place a screw driver between to separate them, when the inner plate turns toward you. 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 oil can, and there is nothing dripping from the drain plug opening, close the drain plug opening, adjusting the bands, put on the cover and turn the oil that was taken out of the car, providing it is still in good condition. Once it has been demonstrated emitting a chatter from that time on has ceased for the life of the bands.

It is a product of Automotive Laboratory, 787 Frankfort Ave, Cleveland, Ohio.

FOR RELIABLE IGNITION

The Philbin Spark Co., Scranton, Pa., has established an enviable reputation for the production of ignition equipment for Ford cars. We quote from information furnished by the Philbin 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 crank-case, soaking and fouling the plug—something goes wrong with carburation—or some gas station fills your tank with heavy, sluggish gas. This archaic trouble is solved by the Philbin system, which combines the entirely new principle of ignition far beyond its capacity—and trouble disappears."

Here a turn of your Philbin Spark Switch throws on the High Frequency System, and immediately discards any and all ordinary gas leakage and other trouble. 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 completely weatherproofed and consists of a highly developed magnetic interrupter with a bank of point and condenser. These points need no adjusting and are of the special Philbin 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., 514-920 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 Re 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 Automobile 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 a valve 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 type 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.

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 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 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 hole to drill. To unlock it, the padlock, which is connected to the lid, is turned to the right and the arms are swung back. It is a very practical theft insurance and costs only $2.90.

KNAPP LIMO-SEDAN FAN.

The Knapp Electric & Novelty Co., 611 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 yet a 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 move 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 35,900 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. Nishoff & Co. Inc., 332 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 the 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 interreplaceable; 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.

When writing advertisers—Just say FORD OWNER and DEALER
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 "Haysfield," 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."

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 16th Street, St. Louis, Missouri, report that motorists are ordering them in large numbers.

Ford Repair Book Free—See Page 129.

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.

When writing advertisers—Just say FORD OWNER and DEALER.
Free
To
You!

This Valuable
Ford Car Repair Book
With
Ford Owner and Dealer
Magazine

FORD CARE AND HOME REPAIRS is one of the most practical—valuable—interesting handbooks 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.

How to Get This Book Free

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.

You will need FORD OWNER AND DEALER during the coming year. It will be bigger and better than ever. Subscribe now and get your copy of FORD CARE AND HOME REPAIRS FREE!

SEND THIS COUPON TODAY

Ford Owner and Dealer Magazine,
Montgomery Bldg.,
Milwaukee, Wis.

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.

Name ..........................................................................................................................

Address .....................................................................................................................

City .............................................. State .........................................................

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
HELP 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 the new VIKING Brake Lining offered for Ford cars.

The display is a four color lithograph. As shown in the illustration the drawing is very attractive and consists of a strip 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 stand firmly on the counter.

This display is furnished to any dealer or garage ordering VIKING Brake Lining for Ford. Details written to 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 piers of rubber set about an inch apart and encapsulated as parts of the tire itself. These piers 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, spryngy, shock-absorbing rubber, adding greatly to the easy-riding qualities of the tire and insuring flexibility. As a result of this new construction the Dayton Airless Tire on any given load induces a depreciation of approximately fourteen percent, whereas with the old construction the deflection was approximately twenty 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 air is lifted into the bowl into the main air stream assuring ease in starting, the Holley Model "NF" Carburetor is finding a ready place in our 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 replacing his old carburetor.

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 the man who considers driving is 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.

DISTEL WHEELS FOR FORDS

The Distel Wheel Corporation of Detroit, Michigan, recently introduced a Distel Wheel especially designed for Ford cars.

In the past, Distel 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 manufacture 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 Distel Wheels have been in general use on other makes of cars.

The new product is of Distel patented construction and is made of the same material as the Distel Wheels used on Cordeliers, Packards, Pierce-Arrows, Jourdan, Coles and other excelleent cars. A choice may be had of two different finishes—either dark blue or dark maroon.

The Distel Wheel is best described as a spokeless, single-tube assembly. It is insulated. It is tapered on the same principle as an automobile spring, being thicker at the center and gradually tapering down to the tire. The taper distributes and diffuses road shocks and strains, instead of localizing them, as is the tendency of all-spring-type suspensions. The taper section lessens the impact from the tire to the hub and then to the axle and mechanism of the car. A clean-cut, noiseless suspension life is the result. The Distel Wheel is insulated "inside" a type of design in which not only adds to the beauty of the wheel but also makes possible a tighter section with vastly greater strength. Because of the Distel wheel construction, the Distel wheel is capable of taking severe strains and side-thrusts without warping. 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 Distel 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 Distel equipment for Ford includes opening the blocks, the brake drums, the wheel rim attached, two front hubs, two rear hubs with brake drums, space wheel carrier bracket and hub and all other parts which makes it 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 Ford and Fordson Tractor. As the name indicates, it reams the cylinder to proper size and leaves it so smooth that no jarring or burning is necessary.

The Keystone Cylinder Reamer has but few parts and is as nearly "tool-proof" as it is possible to make a tool for this sort of work. Any ordinary mechanic can learn to use a Keystone Cylinder Reamer so that they will be as round and smooth as when new.

The use of the Keystone Cylinder Reamer is so simple and sturdy and the workmanship so excellent that it calls forth the admiration of the most mechanics who pronounce it "a real machine tool."

This Cylinder Reamer is adapted for either hand or foot operation and can be operated with one hand when making a 31 thousandth cut, using the ratchet wrench furnished. Only five to eight minutes is required to ream a cylinder. It cuts to standard size or can be used to oversize the average cylinder.

The size of Cylinder Reamer is adjustable for diameters from 2 3/8 to 4 inches. The method of adjustment is extremely simple. It is not necessary to remove the cylinder for adjustment or to remove any part of the tool to adjust the size.

The manufacturers are Keystone Reamer & Tool Co., Milburners, Pa.
"Service Products"

What this Name Means To Your Business

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.

Everything for Service Stations

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.

Write Today for Catalogue and Details

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-5, fully meets the demands 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 micrometer adjustment of each separate catter 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 for 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, hardened 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 season the ring and makes it very tough. The upper joint is constructed of filets 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 specifically designed primarily for locating trouble in automobile motors or bearings, or gears or anywhere in the car and also adapted to nearly every other automobile mechanism, may be an improperly adjusted or worn out part.

The idea in using a Knock Tector is to ascertain accurately and with certainty the origin of sounds which are made by moving defective parts, and if the mechanism may be an improperly adjusted or worn out 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, properly placed so that the driver may be able to hear only the sounds transmitted directly through the tubes from the Tector.

The device is fashioned in such a way that the fashioning 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 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 who use it. 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. B. 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.

STOP BRAKE CHATTERING.

The F. L. Huber Co., 219-21 North Channing Ave., St. Louis, Mo., report steady increases in sales of their popular Novo-Chat Insulators. Novo-Chat Inserts form a cushion between the metal bands and the solid transmission drums, 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 Insulators prevents wearing and grinding back of the transmission linings while 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 or especially adapted for this purpose. Its Contacts are of brass 1/2" in diameter, the Brush is of carbon, especially prepared, and the combination is a recognized standard for efficiency and endurance.

The normal 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 protect the spark and give a full volume of energy.

The Baltimore Commutator employs the well-known Timexina Spark, which provides two contact points as the ultimate in accuracy and fullness of spark, which avoids misfire 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 rebore 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

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 30 x 3 1/2 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 3 1/2 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. With the Heath, the flood is eliminated and it is claimed that instant starting is possible because a rush of 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 clips or needles and only one set of adjusting wheels 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 is so simple that every mechanic knows is the only correct principle, and for the Ford heretofore there has been an unavailed-for method for a satisfactory timing and firing system.

The purpose of the manufacturers of the Hirst Distributor to provide finally high grade, dependable timing and firing device that will be for the Ford what the most perfect electric lamp is for the incandescent lamps of 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 misfiring, 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 strong and the manufacturer guarantees it for the life of the car. In fact, they allow the purchaser to write his own guarantee. They claim the March Distributor eliminates timer troubles for all time.

The March Distributor retails at $5.90 and is manufactured by the American Metal Products Co., 72 W. Adams St., Chicago.

THE ACCURATE TIMING SYSTEM.

From the manufacturers, Sasstrom 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 anywhere 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. These pioneer movie theaters may be used by Ford owners to display agricultural films to farmers. A turn of a switch directs the energy of the Ford engine to the generator, and there is a machine running through the school house window, the suitcase projector blinks open its fiery eyes—and the show is on! Further improvements of this type of film delivery will bring health messages to isolated localities. Rural saloons, traveler's aid stations and horseless theaters 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 of the 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 inadvertance 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.

This makes it possible to leave the tractor standing on any grade with the motor running, the transmission gears being in mesh preventing accidental shifting; with this improved control, however, the operator upon leaving the tractor standing simply compresses the ratchet on lever lever and 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 galvanized, withstands battery acids, and for convenience in shipping is uniquely designed to be knocked down in form. It is instantly assembled and to install it, it is not necessary to remove the battery or to disturb 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.
for Fords and Fordsons
Sure as the Planets

$2.00 complete at your dealers or sent direct to you prepaid.

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 point from both sides every revolution and keeps these points 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 ROTATING 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.

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

When writing advertisers—Just say Ford Owner and Dealer
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 here-with 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 210 pound bags. 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 7 3/4 inches. Height 2 feet 9 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 11 7/8 inches by 3 feet 1 3/4 inches for dumping grain.

This position illustrates the Grain Body. (Inside dimensions) Length 9 feet 9 1/2 inches, width 3 feet 7 3/4 inches, depth 2 feet, 5 inches. Capacity 99 bushels of wheat or other loose in proportion.

This position illustrates the Flat Rack. Width at top 6 feet 7 3/4 inches and is well adapted for hauling fruits and vegetables in crates, bailed hay, bailed cane, etc.
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., 41 Rialto Bldg.
San Francisco, Calif.

THE PETRY PUMP

America's BEST Tire Pump

HANDLE LOCK
facilitates carrying or handling.

BARREL
17" or 20" x 1 1/4" diameter, highest grade seamless steel tubing, threaded and soldered into base.

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.

HANDLE
shaped to fit your hand.

CAP
heavy cast brass with long piston rod bearing.

Lox-on Connection

with tire valve de-flating 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

"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 Vacuum

338 N. Randolph St., Philadelphia

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 holds a capacity of 5,000 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 .025 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 operation of the piston if set at this distance, and that engine will not develop its maximum 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 .093 or .094 inch?

When placing a shim under the magneto coil support, it sometimes happens that the magnets were installed only a hair off. Could a shim be placed between crank or fly-wheel part of the shaft flange or fly-wheel? Would this shim throw fly wheel out of true on engine? In there a right and wrong way of replacing a "wish-bone," or front radius rod? That is, should a certain side be up when installing the wish-bone, or in some way appearance 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 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 no importance.

If the Ford engine had been designed for .005 inch valve tappet clearance, then any change in this clearance of .005 inch would be the very 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 the engine will runs. 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 there is a great deal of trouble, to many of these neglected Fords are apt to have the valve tappet clearance correct within a couple of thousandths of an inch. Yet the reliable DISTRIBUTION of Fords 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 dip in the oiler to get silence.

Yes, a shim of EVEN thickness can be placed between the flange of the crank shaft and the fly-wheel and wear sufficient clearance between the magnets and the poles of the magneto coil assembly.

There is a right or wrong way of installing a STRAIGHT front radius rod—but those on Fords in service are usually BENT. Consequently, the steering may 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 oil clutch. The clutch plays. In talking to a car friend I find that there are 12 small discs and 13 large discs. I tried to get a distance plate from the Ford Agency and was told that they did not make them any more.

The transmission distance plate, Part No. 3339, was only used on 1909-16 Ford cars. As your 1917 Ford has a different assembly, made differently, with a shoulder inside, no distance plate is needed.

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 jack 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

This position illustrates the Stock Rack Body. Height 3 feet 11½ ins. For hauling cattle, sheep, and makes a splendid body for hauling cotton.

This position illustrates the Flared Body. Width at top 5 feet 6½ inches. This is a good position for hauling grain. Capacity 80 bushels oats, 45 bushels ear corn.
The Tire Filler that has made good

Trouble-proof tires with ample resiliency

In 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, molded 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

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 ½ 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.

Briscoc Devices Corporation
PONTIAC, MICHIGAN.

DEALERS' COUPON
Send 50c (50-cents) SCOE Hot Spots C. D. D. at dealers' price.
Name
Address

When writing advertisers—Just say FORD OWNER and DEALER
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’t 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 your orders. You will be pleased. Approved by Underwriters. Insurance endorsed. 4/$.

Security Auto Lock Co. 408 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 Fords. This company says that they worked day and night trying to show people that the Fordson would operate satisfactorily without government interference. 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 tractor, operating a big 25-inch Climax Ensilage Cutter so evenly and so perfectly that they took orders at the demonstration. Fords for every Fordson, 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, the Fords, 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 salesman 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 TOEILLE 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 the leading manufacturer of lighter fans and other automotive parts, has acquired the Toeille patent No. 1,236,075 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 parts, cylinders, pistons, and tractor bearings. It has a three to one gear reduction providing ample power to accomplish all burning-in and burning-out operations, including the use of one or more. The Phoenix has been designed specially for direct driving, and conveniently operated from either side of the machine. The machine is very rugged in construction, weighing 2200 pounds and is suitable for any kind of duty. It will not throw the bearings out of alignment. It takes up a floor space of 29 inches by 66 inches wide and 24 inches high. Other Fordson and Fordson fixtures are furnished with the machine and other fixtures for different types of automotive work. The Phoenix Cylinder Reboring Machine will rebore all makes of cylinder blocks and gives very good work when they job it. The Champion was tried out a year in local garages before being placed on the market so that what is now to be sold will be a tested, known product 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 $500 f. o. b. factory, Eau Claire, Wis. The Cylinder Reboring Machine $390, the Alignment Gauge $30, the Angle Iron $3.50, the “V” Blocks $4.40 and $5.50 respectively. In order to control 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 PRESSES

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 marked saving in price, all the graduated and automatic features of the higher priced drills.

This tool may truly be called the happy medium for the small garage. Champion Power Feed 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 1½ 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-gedared 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 Co., 2906-10 W. Fletcher Street, Philadelphia, Pa.

Stephen A. Howell, formerly in charge of the Chicago office of A. Schrader’s Son, Inc., has been promoted to the post of Manager of the Schrader Toronto Branch, succeeding Harold R. Cole, who has become 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 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, 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 umbrella caddy which will provide 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.
1925-27 FORD BLDG., DETROIT, MICH.

EUREKA AUTO LOCK
Officially Passed and Approved by the National Board of Auto Insurance Underwriters

Absolutely Protects Car
Locks Wheel Rigid

Add: Greatly to Appearance of Car

$9.85 Postpaid

SAVE YOURSELF ALL WORRY. Know positively when you enter that your car will be where you left it. THIS 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 ring and disc cylinder lock. Highest quality material and workmanship throughout. The EUREKA AUTO LOCK will not hurt or harm a NEW 14 INCH ALUMINUM WHEEL, which adds greatly to the appearance of the car. Purchased complete with two headlights and two round bumpers. Can be installed by anyone in thirty minutes or less. Guaranteed to outfit your car. Direct from factory to you. Save middleman's profits.

The EUREKA AUTO LOCK, NOW IT ING ALUMINUM WHEEL JIG, ILLUSTRATED INSTRUCTIONS, ALL, sent anywhere in the U. S. or Canada for only $9.85 POSTPAID. ORDERS 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

"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.

JOBBERS:—Write to the nearest office of our sales representatives

CRAMER MFG. CO.
357-9 Tenth St., MILWAUKEE, WIS.

SALES REPRESENTATIVES
C. N. & F. W. JONAS
252 Transportation Bldg., CHICAGO, ILL.
San Francisco, 111 New Montgomery St.
Los Angeles, 407 Equitable Bldg.
Seattle, 516 Pioneer Bldg.
Atlanta, 1971½ 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 more necessary. To Adjustable Tension and Spring Suspension gives 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

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.

"LETIERIAN."

Letierian 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 fire engineer in charge of the Street Railways Advertising Co., and Ben J. Sweetland, President of the Ben J. Sweetland, Inc. Advertising Agency—all agreed that most rainy day accidents were directly caused by blurring 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, but is rarely solved. The numerous attempts made to find a remedy. Numerous appliances are to be found on the market—but mechanical and chemical—will all have their shortcomings. The aquatee type cleaners, 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 smoky after the rain had subsided.

Doctor Baker seemed to feel that he could solve the problem. He started to work it out scientifically. In first he analysed the properties of glass. He then analysed the properties of water and learned just why glass had an affinity to hold it in drops instead of allowing it to pass off freely.

After countless experiments a chemical was discovered which 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. Applied dry, a transparent coating is deposited on the glass which will last several days. In other words the glass may be treated any day and if it does not rain until Thursday the effect will still be there.

The Letierian is complete, a name was required—one in keeping with its merits. The happy name of "Letierian" was conceived by Ben J. Sweetland and speaking for itself.

Baker, Johnson and Sweetland then took their initials and formed the B. J. S. Specialty Co. to market their invention. 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 LETIERIAN will be seen on sale from the largest accessory 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 85 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, Oldsmobile, Scripps Booth, Jordan, Roamer, Sheridan, Hupmobile, etc.

It is made in all popular sizes, grouped similarly to the Gilmer Flat Type Endless Fan Belt and is packed in cartons of 25. Each belt is individually wrapped and cartoned.

GOOD BUSINESS

Proving again that known-quantity goods are always in demand regardless of business conditions, the Milwaukee Auto 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 busters which they have since discontinued.

During the past year the Milwaukee Company has more than doubled its number of active Jobbing accounts in New England by 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 unsinkable advertising, continuous sales and advertising work throughout the renewal period which has obtained during the past few months. Even through the worst of the depression, the Milwaukee company kept its product conspicuous 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.

HOLM RADIATOR CORPORATION
340 First Avenue
MILWAUKEE, WIS.

ELECTRIFY
Your FORD

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.

When writing advertisers—JUST SAY FORD OWNER and DEALER
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."

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 Fords operates by the variation of the vacuum which occurs in the intake pipe of an internal combustion engine with varying speed. As no moving 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 1,200 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 fit adapters for rear 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.

BEZERER REAR VIEW WIND DEFLECTOR

The Bezerer Rear View Wind Deflector is especially designed to protect the occupants of the car from wind, rain, snow and dust, and as well be noted from the illustration, upon which wing there is ground a rear view mirror, which enables the occupants of the car to see the rear on Wrecks while driving. The glass is 4/ inch thick, with 4/ inch bevel; the fittings are made of steel and aluminum that cannot rust. The rear view mirror is adjustable for 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 BEZERER 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 manufacture of the last four years 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 does a great business on the market for the Cataraunt Circulating Water Pump, which can be readily attached to the motor on any Ford owner or truck.

"The field we are entering is a large one," said Mr. Lueck, when asked about the new operation. "After a 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 Cataraunt 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 evidences when the water begins to boil over, the damage has been done."

"The Cataraunt Pump is designed to keep the temperature of the water in the coolant between the limits of business and 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 assure him no end of success in his new venture.

Associated with Mr. Lueck is Mr. A. H. Peterson of the A. H. Peterson 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 joints.

Wood wheels were, until the advent of the Jefferson one piece wheel, the lightest wheel for automobile use on the market. This new wheel is, however, lighter even than a wood wheel and of a new type and in a new type of wheels of standard construction.

Jefferson Drop Forged Steel Wheels are the result of experiments in two entirely 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, brake, cause annoyances or become dangerous 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 the ordinary passenger car wheel will 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.

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:
Boston—15 Jersey St. San Francisco—1255 Van Ness Ave.

When writing advertisers—Just say FORD OWNER and DEALER
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.
260 Essex St., SALEM, MASS.

Motor Transportation Service
TRUCKING AND HAULING
74 WEST 31ST STREET
Bayonne, N. J.

Dear Sirs,

We have just returned from a trip to the West and are pleased to state that the rings are more than satisfactory. The rings were tested yesterday and we are pleased to report that they have performed well. We have been very satisfied with the results and look forward to future business.

Yours truly,

Motor Transportation Service

Steel Spring Piston Ring Co.,
Brooklyn, N. Y.

Gentlemen:

We are writing you today to inform you that the rings we installed on your engine have been performing well. We have been very pleased with the results and look forward to future business.

Yours truly,

Motor Transportation Service

Steel Spring Piston Ring Co.,
Brooklyn, N. Y.

Piston Rings

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 the fifth mile 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 load standpoint, a life 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 life side of the question which brings us to certain legal phases which are worthy of note.

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 law is not followed, 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 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.
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Ten Different Styles of Springs — Ten Styles of Cushions

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We Also Furnish Back Upholstering and Springs for Any Make of Car Besides Fords, Ready to Slip Right in the Job

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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.

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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.

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NO FELT PADS

Anyone Can Attach This Device in Fifteen Minutes. Price $2.50

Ask Your Dealer or Write Us F. G. HIRST Manufacturer’s Agent

PHILADELPHIA

When writing advertisers—Just say Ford Owner and Dealer
"Come right in, Sam. Long time since you warned 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 hurried 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 Milwaukee.

"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 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, spot-fish 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.
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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.
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When writing advertisers—Just say Ford Owner and Dealer
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 & Kyeser, 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 Charleston, 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 luxury and every necessity 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.

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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.
Rock 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 have 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?
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can open and seal any type or size of starting or lighting battery with the

McNAUGHTON 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 mess. No more broken tops on jars, no more steam or water to stop around the battery bench and eat up the service man's clothes.

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(Writ)

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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.

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BY THE USE OF
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Will make a real 1½ or 2-ton truck out of your Ford car. Three different lengths wheelbases carried in stock.
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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 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.

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Norman Elliott has announced his resignation as Secretary, in charge of sales and advertising of the General Top Co., manufacturer of Aricraft 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 top. 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.
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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.

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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.

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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.

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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.

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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 pad-lock, $2.00

THE PERFECT LOCK

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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.

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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

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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.

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THE MACORVEY COMPANY

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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.

15 inch—$65—Making a 115 inch wheel base
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More than 8000 in use

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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.

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Jobbers and dealers are requested to write for our free radiator catalog.

Auto Radiator Mfg. Co.
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Ford Speedster Owners
Who Desire the Greatest
Economy, Flexibility and Power
We now offer for the first time our

SPECIAL RACING MODEL

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Exactly the same as used in winning the last three 500-mile International Championship races at Indianapolis.
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SAVES GASOLINE
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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.

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Makes Engine Run Smoother
Price $20
Guaranteed to do all all we claim

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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.

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Big Opportunity for Ford Dealers
Write Us For Our Attractive Sales Plan

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Dependability and a continuous cooling service that gratifies, are mere incidents in the service given by the Perfex Radiator for Ford cars.

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DIREC FACTORY REPRESENTATIVES
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.

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"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.

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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.
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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.

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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.

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Quick Pickup

Low Throttling

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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.

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"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.

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Ford Dealers Can Supply You. Cared for by All Leading Jobbers.
Manufactured by

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DISTEEL WHEELS

for Fords

$75.00 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.

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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 mail 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.

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Mail Coupon for Free Booklet

Name ____________________________
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$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 soothing linings before installing. Gallon size $10.00. Send for sample and discounts.

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Write at once for details of this quick seller.

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Johnson Carburetors for Ford Cars

Counts Every Drop of Gasoline.
Makes Every Drop Count.

Strainers for Ford and Maxwell Cars.

Price complete $12.00


Traps the Dirt. Fits Any Ford.
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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 velour to prevent damage to upholstery. Makes slip covers unnecessary. Can be easily cleaned with damp cloth. Splendidly made. Price complete $12.00.

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The Slipon Emergency Axle FOR FORDS
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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.

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"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 intense hot flame.
Removes and eliminates 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 Fords
Price $6
Postage Prepaid Anywhere in the U. S. A.

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Turn Your Old-Fashioned Ford Top Into a GRACEFUL STREAM LINE ONE-MAN TOP

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.

$7.50 IN US.

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 $2.00.

The Master Products Co.
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'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.

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RACINE SCREW WORKS
DEPT. F.
RACINE, WISCONSIN

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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, 5c each.

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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 WRITE TODAY FOR FULL DETAILS

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Racing and Touring Bodies

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.

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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.

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the right amount of air and keep them
fed right by using a

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to make sure that they have the pressure
that the Tire Manufacturers prescribe.
Price $1.50 in U. S. A.
Your Dealer Has Them.

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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.

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.
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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,
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Same equipment for Chevrolet 490 and
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Writ us for attractive dealer proposition.

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Exclusive Foreign Distributors
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The Stewart Hub Makes Safety Sure

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
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and increase both
its carrying and earning
capacity. No danger of
shaving the rear center
bolt or of scraping tires
—the load is evenly sup-
ported at three points
and sideways is elimi-

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Dottl Frame and Spring Supports can be easily in-
stalled—no drilling or cutting. Made for old and new
model Fords. Ten days' free trial—write your factory
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quickly repaired; 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
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COWLES
DOOR LOCKING SET
For Ford Sedans and Coupés

Inside Latch for locking left hand door (from inside)
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 3 to 15 more miles per gallon because it converts every drop of gas into maximum power. Its a netter for fueling it or the "false flaps" among carburetors and is easily

SUPERIOR TO HIGHEST PRICED CARBURETORS

The Steimbrenner makes such a wonderful improvement in the power and economy of your motor because it creates perfect combustion. It insures quiet starting, reduced 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 2 moveable 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 10.00 Money Order or Check for $15.00. 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.

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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 racer 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 265
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.

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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

For Ford Cars

Any Lady Can Operate This Starter from the Seat of the Car Easily

1 Hand Lever Combined
2 Foot Lever In
3 Spring Action
PRICE
F. O. B. Chicago $25.00

For Particulars Write to the Office

3 IN 1 STARTER CO.
2287 Clybourn Ave. CHICAGO, ILL.
Absolutely Fool Proof. Attractive Terms to Agents. Nothing Taken Off Your Car.

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

When writing advertisers—Just say FORD OWNER and DEALER
KOR-KER PRESERVES TIRES

What many autolists believed impossible has been accomplished.

Tires can be made puncture proof and leak proof. For seven years and in forty different countries thousands of autolists have been enjoying the luxury of riding free from the worry or care of punctured tires by having them Korkerized.

Kork-Kor removes the bugbear of automobilists.
Kork-Kor instantly and permanently heals punctures.
Kork-Kor stops slow leaks — makes tires non-porous.
Kork-Kor often gives 50% more mileage.
Kork-Kor keeps tires at normal inflation — no broken sidewalls, rim cuts, chafed beads, etc.
Kork-Kor reduces possibility of blowouts to a minimum.
Kork-Kor saves many dollars a season.
Kork-Kor ends the delay and bother — of a puncture on the road.

Send for literature.
Correspondence invited with dealers.

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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-and-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.

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
525 MONADNOCK BLOCK CHICAGO

Stops Rattling Fenders


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
brass, heavy nickel finish. Steam
tight; can't crack or break. Slight
twist tightens or looses. Price
$2.50. Furnished solid or drilled for
Moto Meter Midget Model.

If your dealer hasn't the
AERO-CAP, write us giving his name. We'll
see that you get one.

Patented
May 3, 1921

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 espe-
cially 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
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upon as the motor demand increases. Uniform carbu-
retion at all speeds and maximum economy of fuel.

Prior $10.00 F.O.R. 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.

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
liquefied by high temperatures. It is the ideal lubricant for this
purpose—and will not cake, plug or gum.

Put up in cans, jars, half barrels and barrels—There is none "just as good." Write for leaflet.

Adam Cook's Sons
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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," Hiddon Bin Label Co., Hid-
don Heights, N. J.

Peevy step-cut piston rings for automobile,
tractor truck and marine engines. Guaranteed
to do everything a 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, $7.50 and up. Back
curtains, $2.90 and up. Side curtains, $10.50.
Give piece artificial lace door coverings and
panels, $2.00. Send covers $7.50 and up. Twin
front seat cushions, $10.00. Single front seat
and cushions, $8.00. Rear seat cushions $8.00.
Back upholstery ready to tack in—Front seat back,
$18.00; rear seat back, $11.00. Our entire line
includes all makes of cars. Most boats and
motorcycles. We also re-cover tops sent to fac-
tory. Samples material and prices upon request.
Atlantic Awning Co., 156 Jamaica Ave., Brooklyn, N. Y.

AN OENCE OF PREVENTION.
Put a RUGULAR ALARM on the door of your
car and FEEL SAFE when leaving it at the curb
without locking an expensive lock and annoy-
ance.
We furnish you with Bell, Wire, Door Spring and
Switch, also diagram. Do the work your-self.
Price $2.00.
Chas. T. Ross,
222 West 114th St.,
New York.
FORD OWNER and DEALER

June, 1921

Classified Advertisements—Continued

Wanted—Salemans who call on Ford Dealers, Service Stations, Garages, Jobbers and Accessory Store men. All in large cities. Send letter giving a short resume. Full pay for 10 days. Write to W. W., Box 125, Greenfield, Mass.

"Ford Timers" made better than new by grinding, smooth and true for $35.00. Priced in four sizes and available at any time and the difference. E. A. Chamberlin, Spencer, Mass.

EVERYTHING FOR THE MOTORCARS

IF ITS MADE, WE CAN FURNISH IT—Ford electric lighting head body $125 to $30.00. Speedster Bodies, Business bodies. Our special. Streamline Hoods, Radiators, Shells, Crown, Penders and Electric Lights bring old style Fords up to the minute. Carefully selected line Accessories for the Ford. Write today. Victor Auto Supply Co., 2048 Locust St., St. Louis, Mo.

SALESMEN—If you call on Ford Dealers, Service Stations, Garages, Jobbers or Accessory Dealers, we have a proposition that should net you not less than $300.00 per month extra. Write as shown below. Send $3.00 for catalogues, 22-25 W. Hancock Ave., Detroit, Mich.

WANTED—Men with Ford cars to sell STOKES CARBURETORS. Exclusive territory given, $3.00 - $30.00 per month. Stokes Co., 1034 East 133 St., N. Y. City.


Send $1.00 for Socket Wrench Set; fits any nut. Worth $10.00 to any car owner. Money back if not satisfied. H. A. Miller, Memphis, Mo.


Miller Ford Starter has made good for five years. Installed in one hour with ordinary tools. $5.00 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 repair and present employment. Good reasons for wishing a change. Steady and reliable. Best offer. Send application to Mr. J. O. Ford, Owner & Denier, Dep. G., Milwaukee, Wis.

Wanted—Men everywhere with Ford or Chevrolet 490 cars to work at home or travel. You don't need a salesmen to sell the Standard Gasoline Filter 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.

Factories closing out stock shovels, spades and forks. Eight assortments; no two alike; your selection, $25 each without handles; with handles $1 extra. Everything showing pictures of tools. Process Tool Co., Saltlake, Utah.

REBORE THE CYLINDER—Insert piston. No grinding, no lapping. Our $20 Ford Cylinder Reboring Tool leaves the cylinder absolutely smooth all ready for the piston. Simple, easy, rapid, accurate. Request circular. Gorse Company, 1106 Cumberland, N. Y.

SUNLIGHT FOR HANDS. Handy light switch that fits on steering post. 150% more light and dimmer to comply with all laws. Price, $10.00. Agents wanted everywhere. Big profits. Canadian patent for sale. Solight System Co., P. O. Box 143, St. Louis, Mo.


Automobile Necessities—Make your own—Formulas 15 different necessities. 2 cents. Eureka Soap Co., Box 125, W. Y., P. Y.

*INVENTORS—Don't lose your rights to patient protection. Send for blank form "Evidence of Concept Blank" to be filled out and returned in order to get United States Patent. Available, 238 Ouart Building, Washington, D. C.


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 $4.00 for catalogues, 22-25 W. Hancock Ave., Detroit, Mich.

Install the "Security" electric burglar alarm in your home, store or office and end all your worries. We furnish complete outfits including batteries, wire staples, screws, springs for doors, windows, etc. wall cabinet containing constant ring instrument, and switches. Also wiring diagram and instructions and descriptive circular. The Electric Protective Service Co., 1805 La Fayette Ave., St. Louis, Mo.


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.


Salesmen—To sell our Carbon Remover, Radiator Cement, Polish and other products to automobile owners and accessory distributors. A wonderful opportunity for hustlers. Bush Chemical Company, St. Louis, Mo.


"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 opportunity to do a good job, soil our name, and make good. No obligation to buy. Noxal Co., 1238 Belmont Ave., Philadelphia, Pa. Mention The Way Company.


One Keckway Starter as good as new; also tools to apply. Write for price. P. H. Landredt, 45 Elm St., Greenville, Pa.
Classified Advertisements—Continued


The Universal Rebound Eliminator that is Making Dealers, Jobbers and Agents a Good Income. The great Ford easy riding accessory that sells for only $5.00. Send for free postpaid, with money back guarantee. D. and S. Sales Co., Fortune Mfg. Co., 42 Green St., Michigan City, Ind.

Ford owners! Wash your auto without water! Use New Life auto polish. Will not injure the finish of any car. Money refunded if not satisfied. Used by 98% 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 prices are $15.00 per set of four. Regular price $20.00. Make big money selling to Ford owners. Send the first money order to get this special agent's price. Shipment made same day your check is received. Burgess Shock Absorbers, Box 208, St. Joseph, Mich.

Agents—Every automobile owner wants gold initials on his car; transfer them yourself or self-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. 30,0149

Fords run 34 miles per gallon on cheapest gasoline or half kerosene, using air friction carburetor. Increased power; styles for all motors; send the first money order, write the first check. Air Friction Carburetor Co., 1510 Madison St., Dayton, Ohio.

New tires—Ford owners can save money by using our tires and tubes. They are new and made of fresh stock. Tires guaranteed on a 7,000 mile basis.

Size: Tire Tube
20x3 9/10s. $0.77 $1.55
20x3 3/4s. 2.00 2.15
Send this money. Order subject to examination. West Side Tire Works, Dept. 50, 4447 W. Madison St., Chicago, Ill.

AUTO SUPPLIES
4-Cyl. engine deck smooth with my aluminum pistons. For autos, tractors, all sizes. Write Pease, 1232 S. Main, Los Angeles, Calif.

Ford owners attention—Refine your own Ford—buy your transmission lining direct from the factory. Find all the details for only $5.00. Send for free postpaid, with money back guarantee. D. and S. Sales Co., Fortune Mfg. Co., 42 Green St., Michigan City, Ind.

There has never been a satisfactory Ford timing accessory. Our Distributor guarantees perfect timing, easy starting, steady firing. Will outlaw timing for Ford. Send for free shipment. Liberal discount to agents. Write quick. M. O. Smith, 1354 Peoples Gas Bldg., Chicago.


Ford Owners—We have for immediate shipment Ford one man top, 2 side curtains on each side with large celluloid lights, 2 oval nickel plate glass plate lights in rear and windshield attachments; built with 32 oz. Ford rubber, $2.50, or drab back long grain auto leather, $2.50, or best grade double texture, $3.50, ready to set right on car; no work to be done by mechanic. Receivers made up for your old top—Ford rubber $6.75, drab back auto leather $7.50, double texture $8.00; with 2 plate glass in back $14.50, back plate glass $4.50, back curtain of rubber $7.75, 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 guarantee that we understand a perfect fit and all goods to be first class. We use 2nd grade material. We will refund the price of any article you are not perfectly satisfied with. Seat covers for Fords, $17.50 to $18.00. Write to sample. Juice Auto Top Co., 3310 Atlantic Ave, Atlantic City, N. J.

Agents Wanted—The long expected scientific carburetor appliance for modern fuels is now ready for the Ford. Models for other cars ready soon. The Multipower Friction Gas Distributor makes carburetor 100% more efficient. No manifold heating necessary. Easy starting, no priming, sure firing, more power and speed. Greatly increased mileage. Installed with wrench in few minutes. Quick seller. Positive-ly guaranteed. Sample $1.00 postpaid or C. O. D. Agents write, Dept. 46, Multipower Co., 810-1016 No. Marshaileve., Chicago.

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 ingesting plate. Free delivery. Big client appreciates it. Quick seller, $5.00; big agent's profit. Adamson Mfg. Co., East Palestine, O.

"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 period 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, the owner is often hesitant.

"One of the biggest reasons for the success of the Hassler Shock Absorbers, which is the most successful motor carburetor accessory in the world, is this simple application, permitting the car to remain unchanged so that at any time the owner can have it if he should 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."
When I needed both hands on the wheel.

A narrow mountain road at night ** Rio a car just ahead of me *** barely enough room to pass *** both hands needed to steer ** ** and more power required to make the grade. Thanks to my reliable WILLIAMS ACCELERATOR, I did it.

The WILLIAMS ACCELERATOR gives safety, comfort, and convenience in driving a Ford under all conditions. It is a complete unit, adjusted at the factory, and can be installed or removed in a few minutes' time.

Only three connections: The hand throttle, carburetor lever, and floor of the car—with direct action on the carburetor. Designed and built by automotive and aeronautical engineers to last a life time.

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**ONLY** when your Ford is equipped with **MASTER BRAKES** will you know the satisfaction and peace of mind that comes from having complete and instant control over your car in any emergency.

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Cable passing through efficient equalizer pulley gives identical stress to each wheel drum

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**Pedal rod clamped to foot pedal and sliding through guide attached to drive shaft housing, insuring straight center pull at all times.**

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