

# Keeping The Radiator From FREEZING

## "Overcoating" the Cooling System

In order to maintain the Ford engine at summer efficiency, during the winter months, it is desirable to use some form of protective covering, to prevent the too-rapid radiation of the heat.

These radiator coverings serve a two-fold purpose; first, they enable the engine to warm up to its normal working temperature much more quickly and effectively, and give the engine a chance to develop its full power and efficiency.

Second, after the engine has once been running, they tend to hold the heat, so that subsequent starts are much more easy, and less fuel is wasted.

In moderate climates, it may be possible to "get-along" without using any anti-freeze solution at all, if the radiator is effectively covered with a radiator and hood cover, when the car is left standing on the street. And, if the water is drained when the car is left over-night in a cold garage.

But it is even better, in this uncertain American climate of ours, to use both methods, and to combine the protection-against-freezing, as provided by the anti-freeze solution, with the protection-against hard-starting and bum running, which these radiator and hood covers afford.

### Why Freezing Wrecks Ford Radiator.

As a rule, the effect of cold is to make metals, and other substances contract and occupy less space. Unfortunately, however, it happens that, when water freezes, it expands. As a result of this expansion, at the time of freezing, water tends to burst pipes.

When water freezes in a round pipe, like those used in the Ford radiator, it naturally splits the pipe open at the seams, as that is the only way the freezing water can obtain more room.

However, if the pipe or tube is of flattened cross-section, then the pipe can swell out to a more nearly circular form, and so affords the necessary volume for the free expansion of the ice.

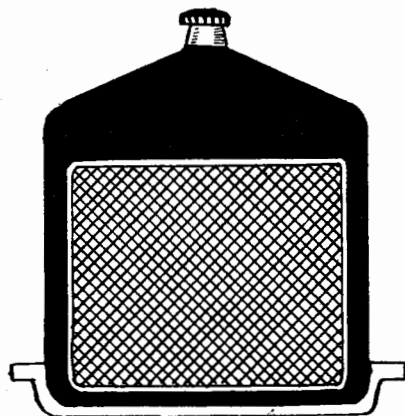
To try this for yourself, make a tube of paper, and seal one end. Now flatten the tube, and then blow into the open end. The flattened tube will swell up, as the air pressure increases, to a more nearly round cross-section.

Now, this flattened tube may be bent and twisted in zig-zag form, or the water tube may be flattened out, until the water chambers are of very broad and flat, holding the water in thin, flat sheets—but still the principle remains the same.

### Special-Type Radiators.

And so the claim of the makers of the various types of zig-zig, and other flattened tube, and honey-comb radiators, that these radiators will withstand freezing, becomes easily true; especially if the cooling section of the radiator is made of good, elastic metal, and is properly put together.

Thus, we see that the installation of a special type of radiator, may give proof against damage



Special Type Radiator.

by freezing, though it may not prevent the water in the radiator from freezing. Also, the freezing of the water may crack the water jacket of the cylinder block, if the engine is allowed to become very cold.

These special, proof-against-freezing radiators have another advantage for cold weather use. As they have much more heat radiating surface than the usual Ford radiator, they tend to keep the cooling solution cooler and prevent boiling. If an anti-freezing solution contains alcohol, this alcohol will evaporate very quickly indeed, if the solution is allowed to boil. And then the expensive alcohol must be replaced.

### SPECIAL FANS AFFORD BETTER COOLING

When the little Ford is "snow-bucking," the engine develops lots of heat, and the anti-freeze solution will soon boil, if all possible means is not used to keep it cool.

In addition, to the use of a special radiator, a special, "more-wind" type of fan is helpful in cooling the engine "when the engine needs it." When the engine is stopped, the fan stops also, and so the engine does not cool off too rapidly.

Some owners of Ford cars, loosen the fan bracket adjusting screw, and allow the fan belt to slip on the pulleys, so that the fan does not run during the winter months. But, this causes some wear of the belt, and it is better to remove the fan belt entirely, if the fan is not to be used.

However, in our opinion, it is "better to use the fan" as this tends to prevent the overheating and boiling away of the cooling solution, when the engine is running; and tends to equalize the temperature of the engine, at all times.

It is better to use the fan, when the engine is pulling hard; and to cover up both hood and

alcohol into the radiator each night, after the water has been drained out—but this method is too bothersome for every-night use, and is only advised when putting the Ford into cold storage for the winter. Also, the alcohol may fail to reach some of the tubes.

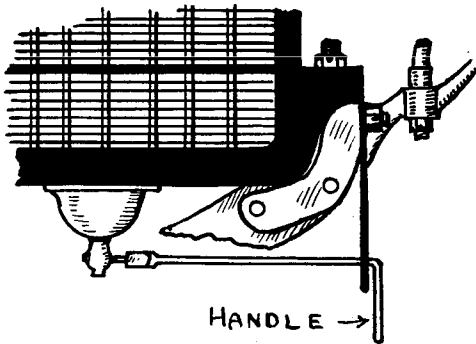
Sometimes, when the radiator is left to drain, the radiator pet cock becomes clogged with sediment, and the water stops running out, even though there may be still some water in the radiator. The only safe way is to clean out the radiator drain cock again, after the water has stopped running.

To make it easier to drain the radiator, one manufacturer makes an extension handle and bracket, for the radiator drain cock. This makes it easier to drain the radiator, without getting all messed up and dirty by reaching through the front spring.

For cold weather use, one important requisite is cooling the radiator *while the engine is running*. The other, vital consideration, is to *retain the heat, when the motor is stopped*. For this purpose, such heat retaining devices as radiator shutters, and radiator and hood covers are very useful indeed.

#### RADIATOR SHUTTERS.

Most of us have had the usual experience of apologizing, for a poorly running engine, by saying "The engine is too cold, but it will soon warm up." After a mile or so, it does—and then runs all right for a while. Then we strike some snow-drifts and hills, and we open a new line of apology that "The motor is too hot," forgetting



Draining Radiator.

radiator, when the engine is stopped—then there is less danger of damaging the engine, through overheating, on a long, hard pull.

By pulling the air through the radiator more rapidly, when the engine is running; these fans remove the heat from the radiator "at the right time;" and, by preventing boiling, save the cooling solution.

Some of these cooling solutions do not circulate as easily and as rapidly as pure water, and few of them conduct the heat away from the engine quite as well, so it is necessary to use every possible means to increase the cooling efficiency, in winter, as well as in hot, summer weather.

#### Fan Belts.

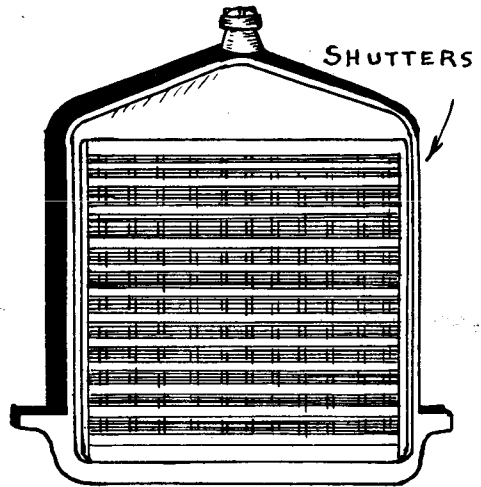
A good, non-slipping fan belt is another simple and effective method of increasing the efficiency of the cooling system, and saving anti-freeze solution.

#### DRAINING THE RADIATOR.

Some owners go to the trouble of draining out the radiator every night, before allowing the car to stand in the cold garage. As a rule, they do this "every night, but one," and that night the radiator freezes and busts, and then they have a large bill for repairs.

Aside from the unpleasantness of handling icy water in icy weather, there is always the danger that one or more of the tubes may be clogged with a bit of sediment or solder. If it is, then the water in that tube will fail to drain, and will freeze and burst the tube. The next morning, when one fills up the radiator from the top, this tube will show a joyous leak, and the car owner will "wonder how it happened."

Other, more careful owners, always pour some



Radiator Shutters.

that a clock, that is too fast, or too slow, is equally out of time.

But, radiator shutters are effective heat retaining and heat controlling devices that enable us to maintain a more nearly "just-rite" temperature of the engine at all times.

When the car is stopped, the shutters are closed, and the heat is retained—making for easier starting and the quick attaining of a normal temperature and smooth running condition.

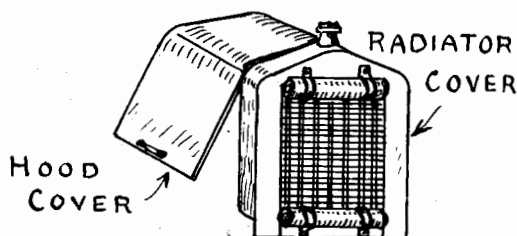
When the car is running over easy roads, these

radiator shutters can be partially closed, thus protecting the radiator against overcooling and freezing, when the car is driven against a strong head-wind. And, it is remarkable, how quickly a strong head-wind can freeze a radiator, on a cold day—even though there may be considerable anti-freeze, in the cooling solution.

This ability, to control the amount of covering of the radiator, is almost as great a help, in the efficient running of the car, as is the carburetor dash adjustment; which is not generally used nearly as much as it should be—except by clever and skillful drivers.

These radiator shutters do not require the driver to wade out in snow or slush to adjust them.

Just before stopping the car, these radiator shutters should be completely closed, thus bring-



**Padded Hood Cover.**

ing the radiator and engine to a high temperature. Then they will retain some of this heat for a long time, thus ensuring an easier start, even many hours later; especially if the hood and radiator are well covered over.

These radiator shutters are made of sheet metal, and are of the type used on The Hudson, Columbia, and other expensive cars.

#### **Other Adjustable Covers.**

Other types, of adjustable-from-the-seat radiator covers are made on the principle of window blinds, and have a cover rolled up on a shade roller. This cover can be pulled to cover as much of the radiator as desired, by means of a cord extending to the dash, and within reach of the driver.

Some of these shade covers drop down, in much the same manner that the curtain drops down in front of the stage of a theater. Others, pull up from the bottom. Just which type is better is a matter of individual preference.

#### **Padded Hood and Radiator Covers.**

One, much-used type of hood and radiator cover, consists of a patent-leather outside covering, with a felt, or quilted inside lining, or heat insulator. The outside covering gives neat appearance, and protection against snow and water; while the inside felting provides the essential heat insulating qualities.

Some of these covers are made for the radiator only, and have adjustable flaps, to be rolled either up or down, to expose enough of the radiator tubes to afford adequate cooling.

#### **CHOOSING A RADIATOR COVER.**

In selecting a radiator cover, one having a large opening should be selected. If the opening is too small, then the radiator will boil and the motor will over-heat, on those "middling" days, which occur now and then, in every winter. Also, when plowing through heavy snow, the engine has to work so hard that the full radiator surface is required, even on a fairly cold day.

Of course, one can remove the entire radiator cover but, if the flap opening is of adequate size, this will not be necessary. The securing of adequate cooling capacity is particularly necessary with the heavier, closed-car models, such as the Ford Sedan and Coupelet.

Some of these padded radiator covers are fitted with flaps which roll up, towards the top. Others, are fitted with flaps which roll down, towards the bottom.

When the Ford is not fitted with an electric starter; then it is better to select a radiator cover that rolls up, towards the top. For, if the flap rolls down, towards the bottom of the radiator, the rolled-up flap will interfere with the use of the starting crank.

However, if the Ford is fitted with an electric starting and lighting system, then it is preferable to have a cover with a flap rolling down, towards the bottom.

The reason for this is that the bottom of the radiator is always the coldest part, and most apt to freeze. So, in cold weather, when the radiator is only partially covered up, it is the bottom of the radiator which, preferably, should be protected against freezing.

If the Ford radiator freezes across the bottom, this shuts off the flow of water. Then the entire radiator soon freezes.

Steam, issuing from around the filler cap, or from the overflow pipe of the radiator, is usually one of the first indications of a frozen radiator. As soon as the water supply stops, the water, over the cylinder heads, begins to boil, and steaming results.

#### **Hood Covers.**

As the Ford hood has a number of slots, or louvres, to let the air circulate more rapidly and cool the motor; a hood cover, which closes these air-circulating slots, is of considerable advantage in retaining the heat for a longer period, and thus securing easier starting.

By retarding the radiation of heat from the inlet manifold, this also tends to make the engine start more readily.

Another advantage, of these radiator covers, is that then they tend to muffle the sound of the engine and so make it run more quietly.

These hood covers are usually made to fasten under the handles of the hood. They are fastened to the radiator cover by means of snap buttons, so that the hood can be easily detached from the radiator cover, and the hood lifted up, to permit access to the engine and adjustment of the carburetor.

#### **Inside Hood Covers.**

Another form of hood cover, which does not detract from the normal appearance of the car, is an inside hood cover, closing up the slots and so fastened on the inside of the hood that it does not interfere with access to the motor.