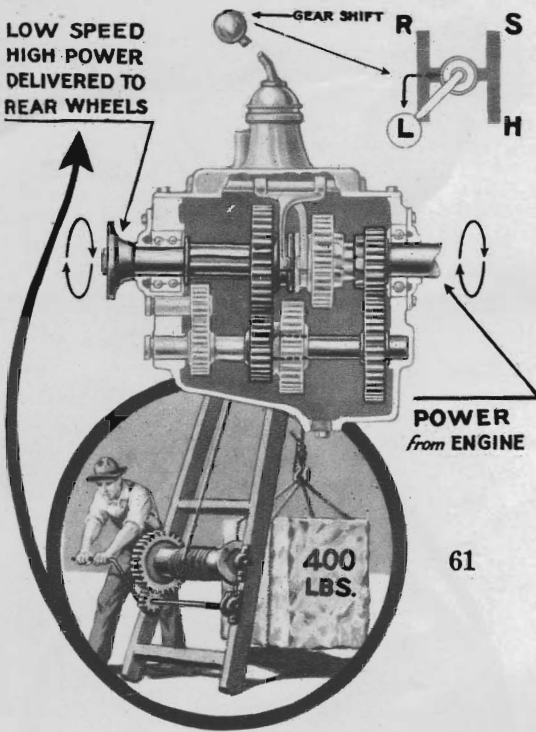


LOW SPEED
HIGH POWER
DELIVERED TO
REAR WHEELS



For Starting, Climbing Steep Hills and Reversing We Need a Transmission

61. Low Gear

Our transmission is called a selective transmission because we may "select" the gears to "transmit" the power to our rear wheels. In almost all American made automobiles, we are usually provided with a selection of three forward gears and one reverse.

When we shift into "low," we engage a set of gears whereby through fast engine speeds we transmit a world of power to our rear wheels, but with a crawling forward car-speed.

Our transmission reminds us of a man operating a derrick. When he lifts a heavy load he turns a little gear against a larger one, but he must turn his little gear many times to lift the weight a distance corresponding to once around the lifting drum.

Low gear usually operates on a 3 to 1 ratio. In other words, our engine crankshaft revolves three turns to one of our driveshaft. Low gear is a powerful but a slow gear. It comes in handy when starting or when climbing steep hills.

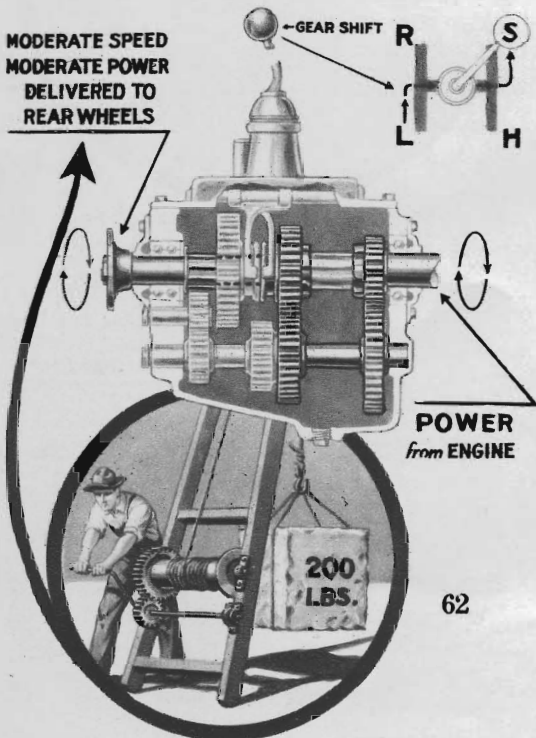
62. Second Gear

When we shift from low to second gear we mesh other gears in our transmission assembly. Through second gear we increase our car speed, but decrease the power transmitted to our rear wheels.

Second gear again reminds us of a man operating a derrick. By increasing the size of the little gear and maintaining the same size larger gear the man now turns his handle fewer times to lift the weight the same distance as explained above. But with the same effort he cannot lift the same number of pounds that he formerly lifted with the smaller gear.

In second gear, power is sacrificed for increased speed. Second gear generally operates on a $1\frac{3}{4}$ to 1 ratio— $1\frac{3}{4}$ turns of our engine make one turn of our rear driving wheels.

MODERATE SPEED
MODERATE POWER
DELIVERED TO
REAR WHEELS

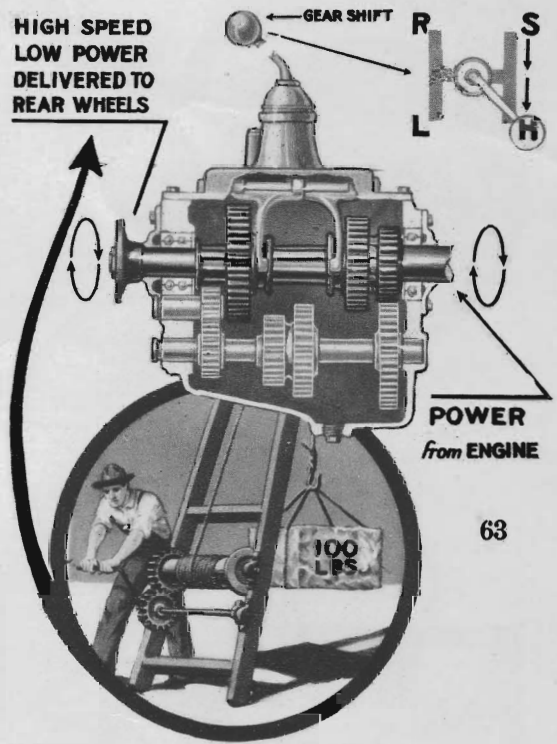


63. High Gear

When we shift from second into high gear we connect directly the crankshaft with the driveshaft, which once more increases our car speed, but still further decreases the power transmitted to our wheels.

Going back to the derrick, this time our man uses two gears of the same size to lift the weight. This time one turn of the handle lifts the weight a distance equal to once around the lifting drum. But with the same number of pounds as he lifted formerly. Once more power is sacrificed for speed.

High gear operates "direct," 1 to 1 ratio, which is one revolution of the crankshaft to one revolution of the driveshaft. High gear is our fastest, but the least powerful of all the gears in our car. High gear, sometimes called "third gear," comes in handy for speed over level country.



64. Reverse Gear

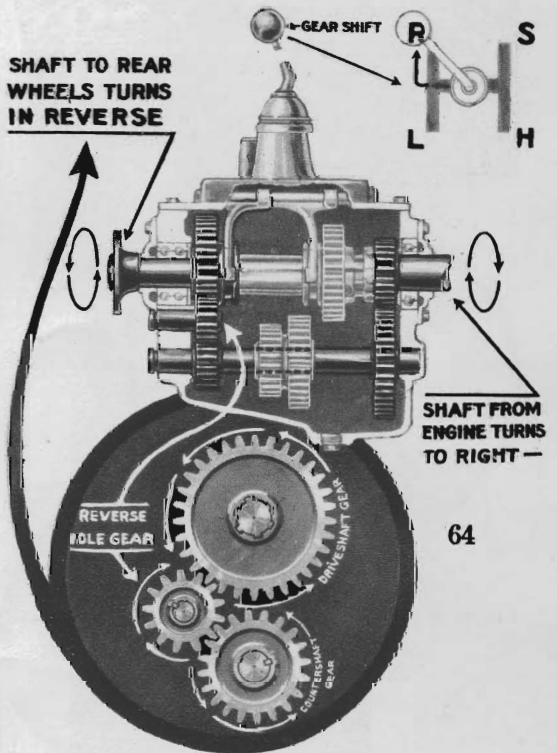
When we shift into reverse gear we engage a fourth set of gears which reverses, through an idler gear, the rotation of our driveshaft.

Reverse gear does not in any way make our engine turn backward. If we look at the illustration at the bottom of the page we will see how the idler gear reverses the direction of our propeller shaft.

Our reverse gear is the slowest, but most powerful of all gears. The reverse gear usually transmits our engine power to our driveshaft on a $3\frac{3}{4}$ to 1 ratio— $3\frac{3}{4}$ turns of our crankshaft make 1 reverse turn of our driveshaft.

In the Model T Ford car there are but three speeds in all. There are but two forward gears instead of three. And as in other cars there is only one reverse speed. Contrary to the operation of other cars, the gears in the Model T Ford car are shifted with the feet.

It is a good thing to remember that quite frequently the power made possible through our reverse gear will pull us out of a hole when even the power of our low gear fails to do so.



65



Socony Gear Oil Insures Smooth Shifting

65.

For the four shifts of our car there is a total of eight gears. These gears are composed of a number of "teeth," the same as the gears on a watch. The teeth of each gear mesh with the teeth of another gear.

For efficiency and quietness in operation they must fit snugly in their meshing spaces with just enough room for a layer of lubricant between their teeth.

The driving or power gears in our transmission turn the driven gears with a prying action. The teeth of a driving gear pry the teeth of its engaged driven gears around and around, a tooth at a time.

The prying action of gear teeth against gear teeth is similar to a lumberman rolling a heavy log by prying under it with his logging pole. Under load, the transmission gears pry one another with a pressure as high as 2,900 pounds.

In our transmission we cushion the terrific prying pressure between our small gear teeth by means of oil. Our transmission case holds about two quarts of oil. It is not the type of oil used in our engine but a heavier oil, known as Socony Gear Oil.

The purpose of the transmission lubricant is not only to cushion the shock between our little gear teeth, much the same as a rubber heel relieves the shock of walking, and not only to reduce friction by lubricating the bearings in our transmission, but to make it easy for our gear teeth to mesh and unmesh as they whirl around and around.

Socony Gear Oil is a splendid high-grade lubricant. It is light enough to overcome friction and heavy enough to insure easy shifting, even in winter.

Our transmission case should be flushed out thoroughly with Socony Flushing Oil two or three times a year, or every 3,000 miles. Particles of road dust and sand work into it; steel from our gears and bearings gather and cause undue wear unless the above precaution is taken.

Your nearest Socony dealer will service your transmission for you.

In the Ford the Clutch and Transmission Are Combined

66.

In the Ford Model T car, the engine, the clutch, the transmission and the foot brake are combined into one assembly.

In the Ford Model T automobile, one oil must lubricate and protect the important wearing surfaces of all these important units. In other cars each unit may use a different lubricant.

The Ford engine, Model T, with its planetary transmission, is lubricated by the "splash circulating" system. Connecting-rod, wrist-pin and camshaft bearings and the cylinder walls are lubricated by oil splashed from the crankcase. The main or crankshaft bearings are lubricated by oil thrown into overhead cups and fed by gravity to these surfaces.

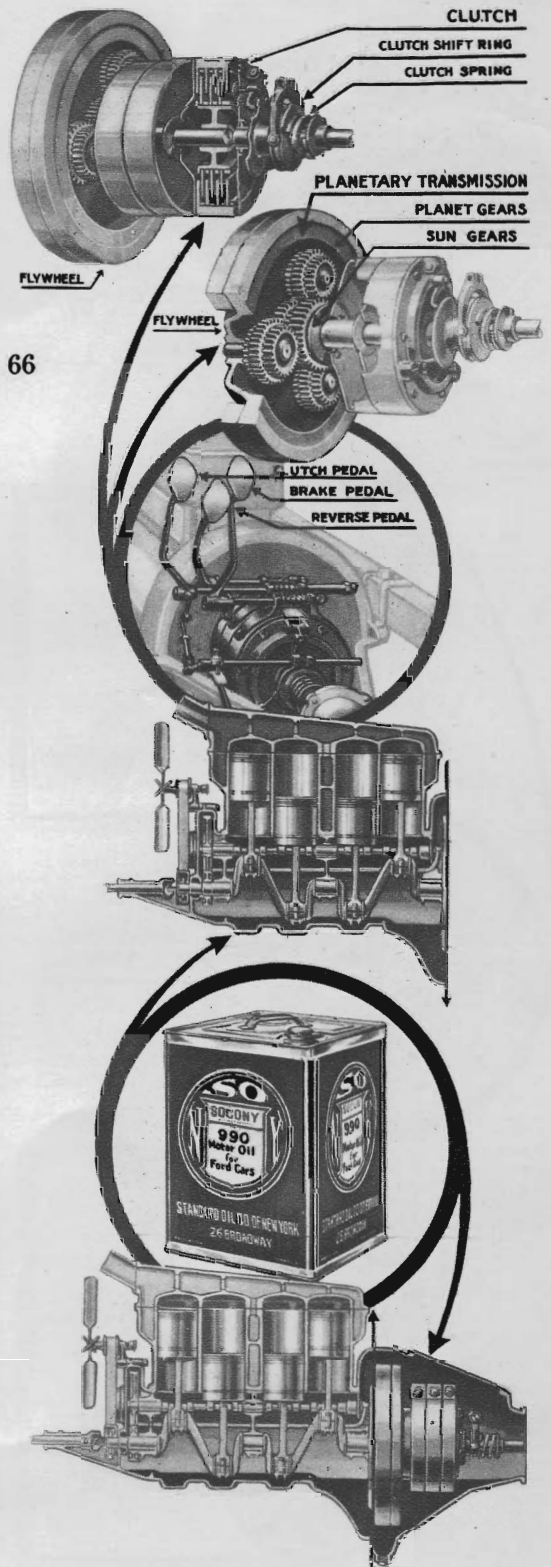
Due to its unique system of water cooling, the Ford engine is a comparatively hot running engine. Its water temperature is about 200 degrees—just a few degrees below boiling. In other cars the water temperature averages 175 degrees—25 degrees cooler than the Ford engine.

It is a two-fisted job for any motor oil to properly lubricate the Model T Ford. Think for a minute—one oil is called upon to do the work which two different oils do in other makes of cars.

It is false economy to pour inferior oil into the Ford crankcase. The risk is too great. There is Socony 990 Motor Oil made especially to lubricate the Ford Model T motor and allied units. It has taken years of research and experimenting to perfect this Socony Oil. You will find Socony 990 Motor Oil on the list of lubricants approved by The Ford Motor Company for use in the Model T car.

If you drive a Model T Ford car drain the oil from your crankcase. Flush and refill it to its proper level with Socony 990 Motor Oil refined and sold exclusively for Fords.

You may secure Socony 990 Motor Oil from any Socony dealer. Carry a can of this oil in your car. Socony 990 Motor Oil may be purchased in various sized containers, and in bulk.



Springs and Shackles Support the Weight of Our Car

70.

Car springs consist of a number of layers of steel leaves held together with clips. When our wheels hit a bump the springs flex like an archer's bow. The spring leaves absorb the shock by sliding upon each other.

An automobile spring is similar to a shoe sole. A shoe sole consists of a number of leather layers which flex back and forth as we walk. At times these leather layers chafe against each other, and our shoe squeaks.

If we take our squeaking shoe to a shoemaker who knows the tricks of the trade, he will punch a hole half-way through the sole and insert a few drops of oil. From then on the squeak will disappear. Automobile springs squeak for the same reason that shoes squeak—the spring leaves chafe against each other. A few squirts of oil will not only overcome the squeak, but will put our springs in better condition to carry out their function as shock-absorbers.

Socony Spring Oil will stop squeaks and go far toward protecting your springs against breakage.

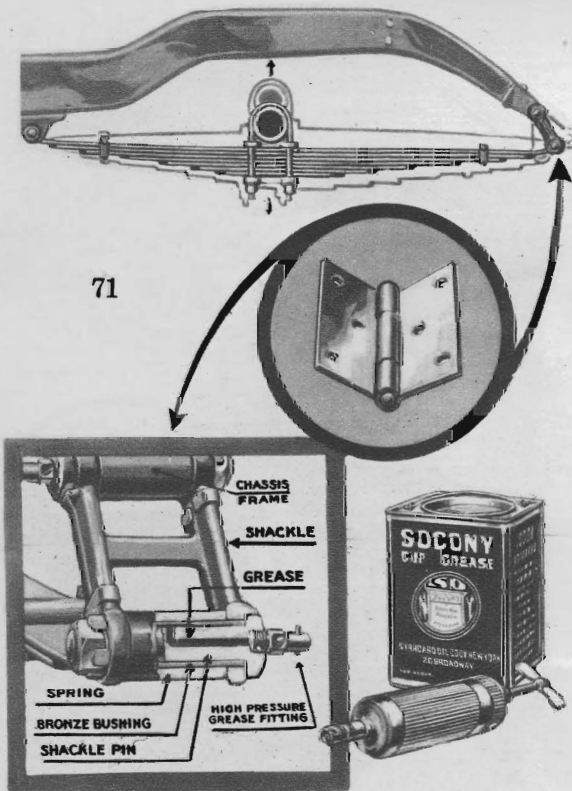
We have seen that our springs are bow-shaped. When our car hits a bump the springs momentarily straighten out and become longer. Therefore, we attach them to our chassis with spring shackles—which are like door hinges. These shackles permit our springs to extend and contract in length.

71. Spring Shackles

Our springs are anchored in their shackles or hinges with shackle bolts or hinge pins. Since our springs lengthen and shorten with the unevenness of the road, our spring hinges and hinge pins must be lubricated to insure freedom of spring motion.

Socony Cup Grease is an excellent lubricant to use for spring shackles because it is non-fluid and remains in the shackles. Socony Cup Grease owes its lubricating qualities and great lasting powers to the fact that it is solidified Socony Motor Oil.

Lubricate spring shackles every 500 miles. Your Socony dealer will do this job. If you prefer to service your own springs you may purchase either of these lubricants in various sized containers.



We Control the Direction of Our Car Through the Steering Gear

72.

In the old days when we made a turn in the horse-drawn carriage, our front axles and wheels were turned by the horse. It was an unsteady turn at best, for the entire front axle assembly, wheels and all, revolved on one central pivot called a "fifth wheel."

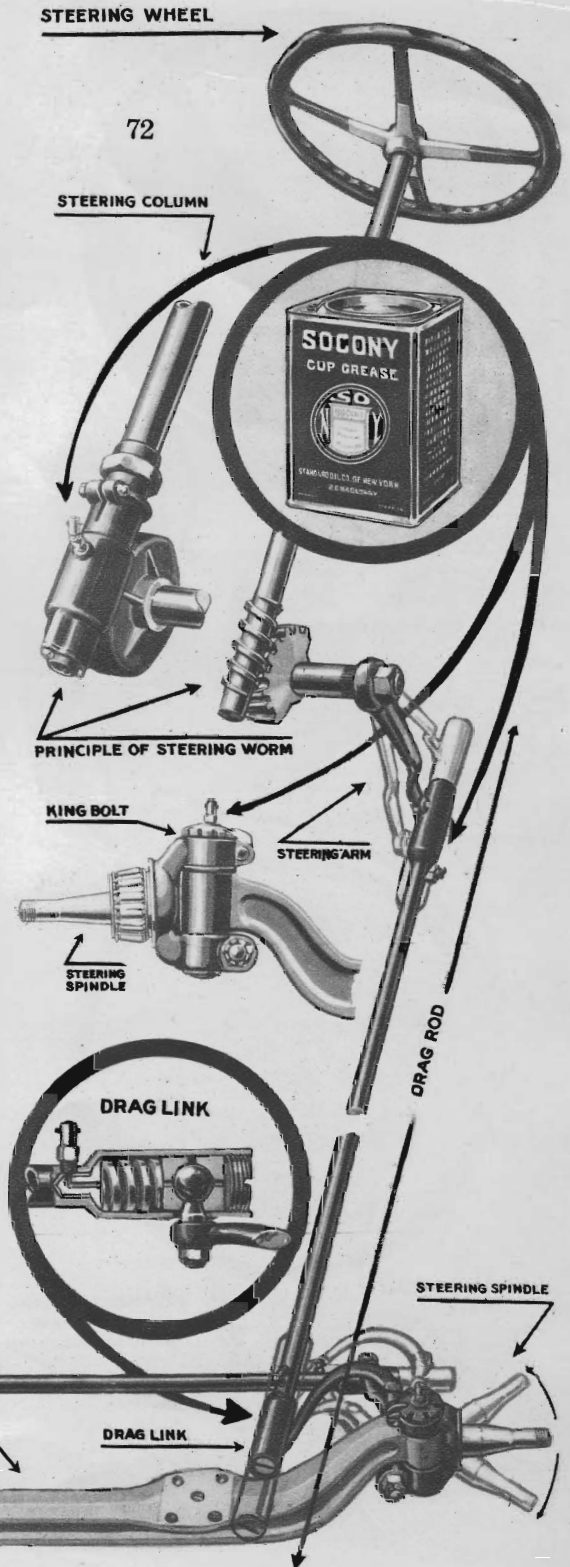
Since "horseless carriages" are self-propelled vehicles, they cannot be steered the same as horse-drawn carriages. The front axles cannot turn. Our front axle is equipped with two pivoted ends upon which the wheels revolve and swing in unison when the steering wheel is turned.

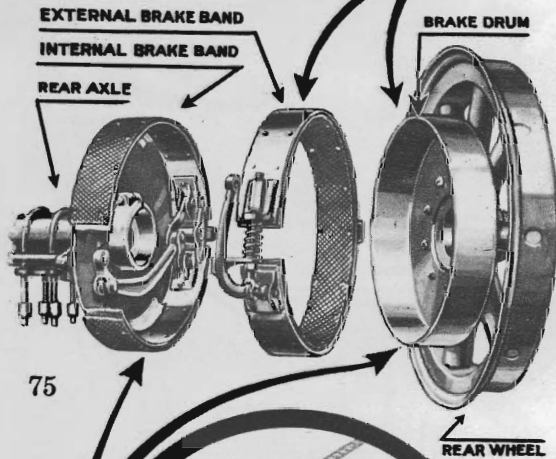
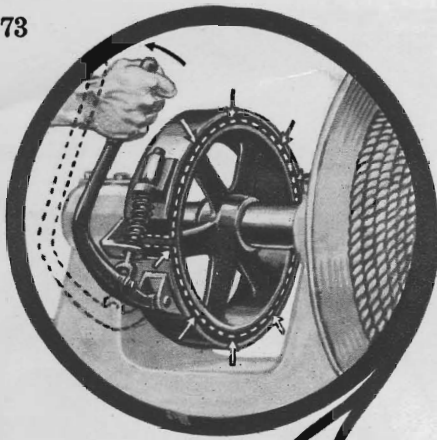
To better understand our steering gear, look at the illustrations. Can't you just see the steering arm push the drag link backward and forward through the action of the steering gear? Can't you picture our pivots or steering spindles swinging our wheels in unison as we turn our steering wheel?

The breaking of any part of our steering gear is more likely to cause serious personal injury than the breaking of any other part of our car. The gears which move our steering arm are encased in a metal housing, which must be filled with Socony Grease or Gear Oil to insure freedom of steering.

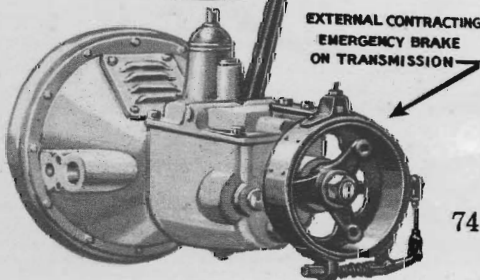
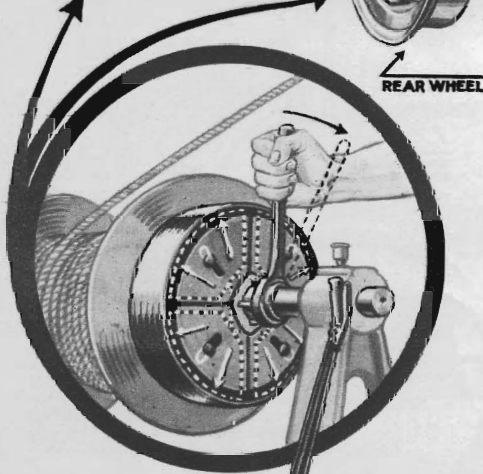
Since our drag link is another moving unit in our steering assembly, it must be filled with Socony Cup Grease once every 500 miles. Our drag link is the connection which links the steering knuckle with our steering arm. It absorbs the shock relayed to it by the wheels.

King bolts hold our pivoted axle ends in our front axle. They aid in supporting 20% to 40% of the car's weight. Both king bolts require Socony Cup Grease because they, too, must work freely under weight.





75



74

Brakes Are Added for Safety in Driving

73. Service Brakes

Now that our car can move we must be able to stop it. Brakes make a car safe to drive. The first step is to mount brake drums on the wheels. Brake drums are steel pans resembling round hat box covers.

For the foot, or service brake, there are pliable metal bands, lined with asbestos fabric, which encircle the drums. When we apply our foot brake, we contract the pliable brake linings against their revolving brake drums. Brake bands grip their drums and the retarding action of friction holds back the speed of our car.

The brakes and clutch are the only parts of our car where friction works to the advantage of the owner.

74. Transmission Brakes

Some cars are equipped with a brake operated against a drum attached to the drive-shaft. These brakes work upon the same principle as the drums described above. This brake is usually the emergency or parking brake.

75. Emergency Brakes

Our emergency brake operates differently from our service brake. It derives its friction by expanding against the inside of our brake drums instead of contracting against the outer surfaces.

The emergency brake expands shoes or bands against the brake drums by means of cams connected to our hand brake lever. Brake cams are similar to the cams on our engine camshaft. Shoes or bands are usually lined with an asbestos material.

Four-wheel brakes are simply brakes on all four wheels of our car. They differ only inasmuch as their units are operated mechanically, hydraulically, or by air. Let your service station make all necessary adjustments on your two or four-wheel brakes.

Many brake fittings periodically require Socony Grease and Oil. Faulty brakes are directly responsible for accidents. Let your Socony dealer lubricate your brake mechanism. It may prevent an accident.

Socony Liquid Gloss for High Polish and Durability

76.

"Save the surface and you save all" applies to the paint on our car even more than it applies to most things. If we protect the paint on our car it will last longer. It won't chip off, and hence your mudguards and the like will not deteriorate through rust.

It isn't as much work as you would think to put a mirror-like finish on a car. It simply requires a little time and effort—very little effort at that—with Socony Liquid Gloss, to polish a car almost like new. You will be surprised to see how long the high luster remains.

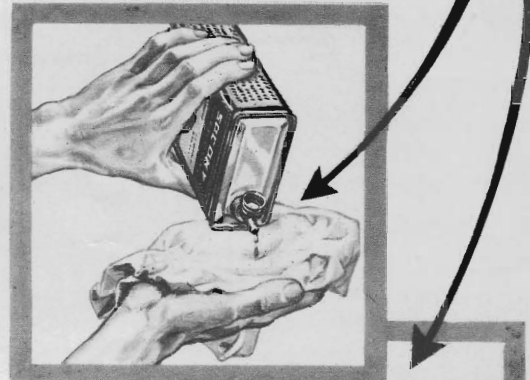
The next time you wash your car try a mixture of Socony Liquid Gloss and water on its painted surface. The correct mixture is two parts of Socony Liquid Gloss to one part of water. Start with the hood and rub in straight lines back and forth until you are satisfied with the effect.

Socony Liquid Gloss is an economical polish for automobile use. A quart can will last for months, because it is a liquid polish and because, when mixed with water in the proper proportions, a small amount of Socony Liquid Gloss will go a long way in maintaining a high and lasting luster on your car.

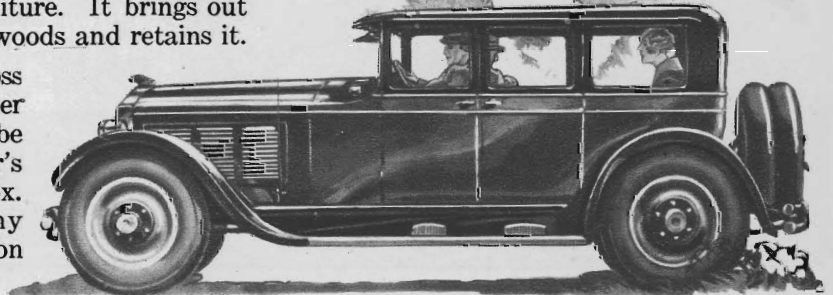
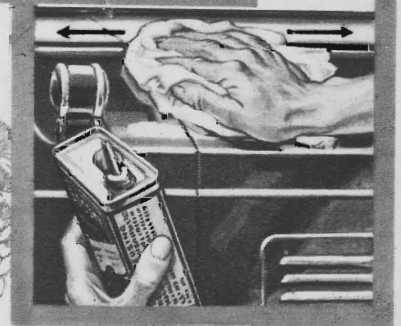
After you have once polished your car, you will discover, as thousands of motorists in Soconyland have discovered, that it does not quickly pick up dust because it does not leave a "flypaper" surface. Socony Liquid Gloss is the ideal cleanser and preservative for cars with Duco finish.

Purchase a can for your home. It is also unexcelled for bringing back the luster to your piano and furniture. It brings out the natural grain of woods and retains it.

Socony Liquid Gloss comes in quart and smaller cans small enough to be tucked under the driver's seat or in your tool box. Almost every Socony dealer and Service Station carries it in stock.



76



Let Us Take the Mystery Out of Gasoline and Motor Oil

YOU are a busy man or woman who drives a car. Technical talk tires you. You want to do the best thing for your engine with the least trouble and cost.

These Are Plain Facts

1. The Standard Oil Company of New York has been making lubricating oil for fifty-two years. We know how.
2. We produce our own crude. We refine it in our own refineries.
3. We have a tremendous incentive for making the best oil, for the safety of our investment depends on your good will.
4. We test the oil thirteen times between the time when it emerges from the ground and the time when you put it in your car.
5. It is immensely important for you to standardize on one kind of gasoline and motor oil. Buying here and there and everywhere is like eating here and there and everywhere. You can wear out an engine as easily as you can wear out a stomach.
6. It is easy for you to standardize on Socony because we have 30,000 distribution points. You are rarely out of sight of a Socony station.
7. The service at those stations is courteous, quick and appreciative.
8. We give you our word, backed by our whole experience and investment, that Socony Gasoline and Lubricants are the best that we know how to make. And whenever there is a possibility of improvement we believe that our scientists and engineers are likely to discover it first.

Standardize on Socony Gasoline and Motor Oil

YOU WILL PROFIT BY ADDING TO THE LIFE OF YOUR CAR



Socony Service Stations

THE highways and city streets of New York State and New England are dotted with service stations like the one above.

Supplying you with gasoline and motor oil is their main function—but not their only function.

These stations are designed for your convenience. They are equipped with clean rest rooms. Their attendants are courteous. They have road maps to make your travel easier. They are live, intelligent men who want to do everything possible for your motoring pleasure.

Use these stations regularly. The men in charge of them know that their success depends upon your patronage. They have pledged themselves to earn and keep your confidence.

Copyright, 1927, by
Standard Oil Company of New York