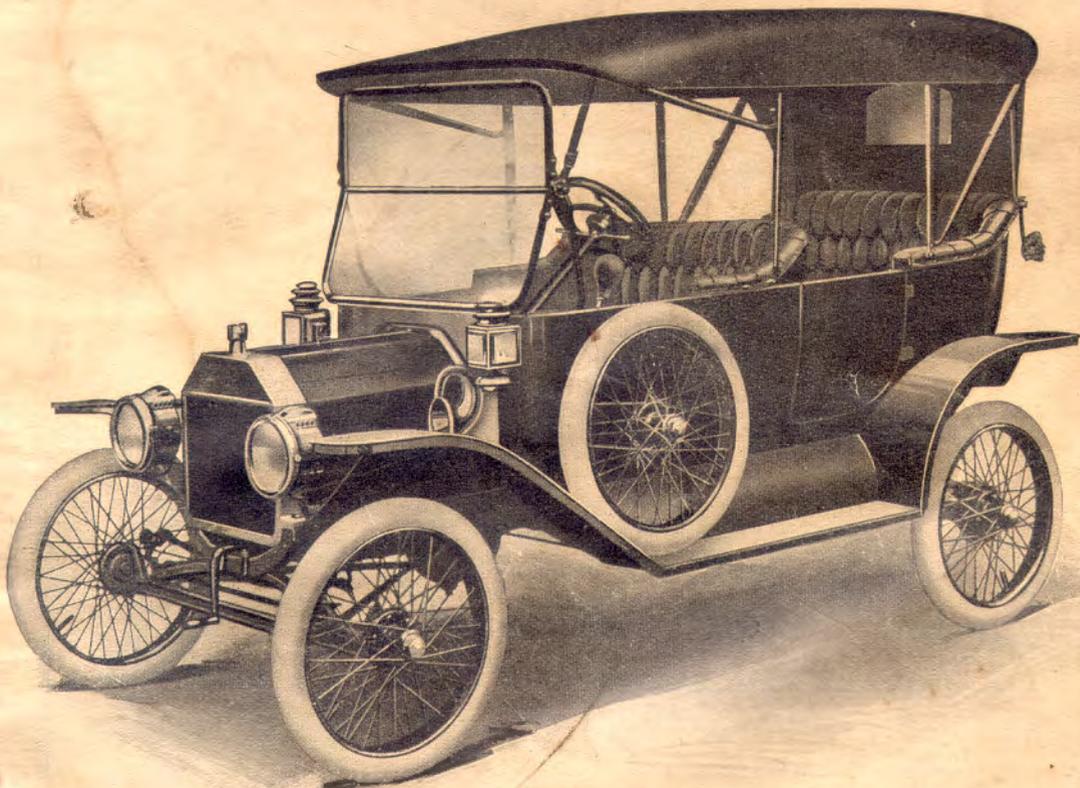


The Fordowner

"AN INDEPENDENT MONTHLY PUBLICATION
FOR OWNERS OF FORD CARS"

Cleveland, Ohio, May, 1914



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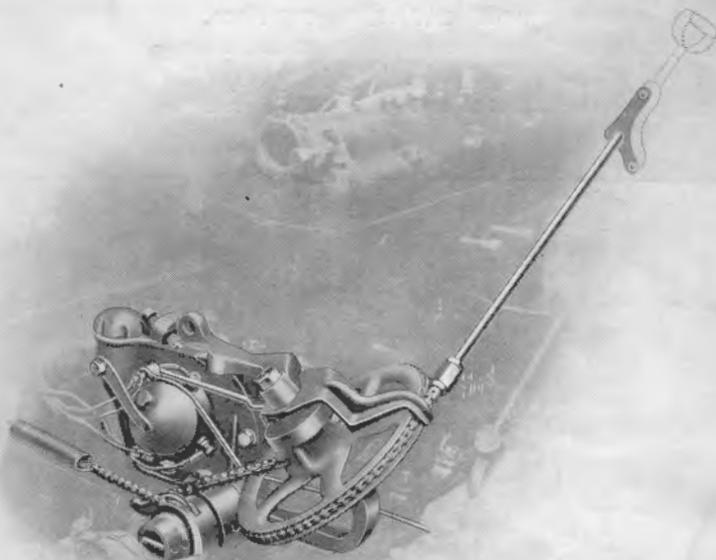
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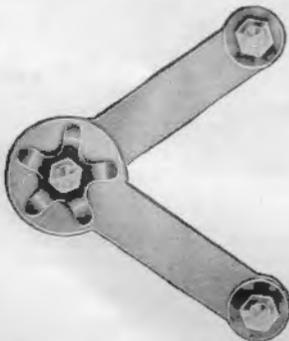
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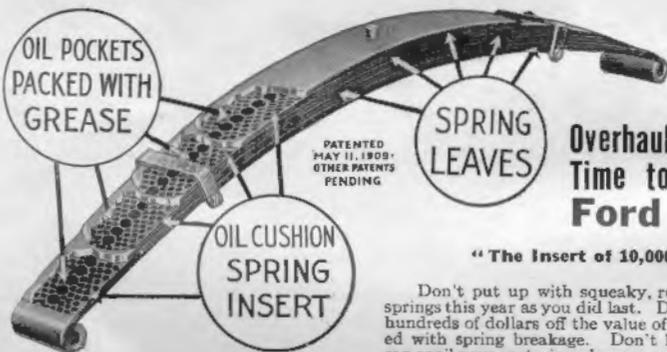
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Don't put up with squeaky, rusty, improperly lubricated springs this year as you did last. Don't let "dry" springs shake hundreds of dollars off the value of your car. Don't be annoyed with spring breakage. Don't let a hard-riding, "bumpy" car spoil your motoring pleasure.

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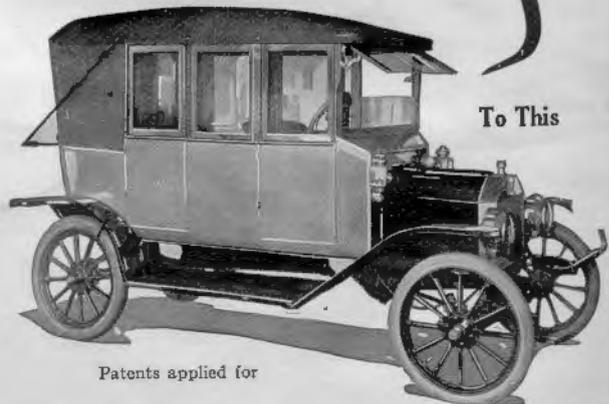
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The Fordowner

AN INDEPENDENT MONTHLY PUBLICATION FOR OWNERS OF FORD CARS"

THE HALLOCK PUBLISHING COMPANY

PROSPECT-HIPPODROME BLDG.
CLEVELAND, OHIO

Vol. 1
No. 2

May, 1914

50 CENTS
THE YEAR

On The Highway to Success

The reception of the initial number presages well for the ultimate success of your magazine. Ford owners are beginning to co-operate in the production of the publication which meets their demands, realizes their needs, and solves their problems.

STRAIGHT before us—you, the Ford owners, and this, your magazine—stretches the road to the desired goal of a successful publication—the confidence and support of the readers. Our car has been carefully oiled, the gasoline tank supplied, you are getting seated in your places, the motor is cranked, and the car moves on. And many there are who stand at the curb as we go by and note the appearance and make-up of our vehicle, and comment thereon favorably.

The first number of THE FORDOWNER has gone its way, bearing its message of introduction to the owners of the Universal Car. Everywhere its reception has been cordial, hearty, and many have been the helpful responses assisting in forwarding the work of publication. Subscribers from Maine vied with those in Oregon in sending in their filled blanks, northern Minnesota names and those from Texas came in in every mail, and soon the Universal Car will be accompanied by a Universal Magazine on every trip.

No other publication has the editorial staff opportunities which this one possesses. Each individual who owns a Ford is eligible to a position on the roster, and is urged to take frequent advantage of his privilege. Half a million cars have been made by the main factory and its branches, and the army of Ford owners is growing at the rate of over a thousand recruits a day. From these accessions, as well as from the older members of the force, there will be many who can help make the columns of the magazine teem with items of value and interest.

Now, to-day, is the time when your help will be most appreciated. Your car demands more power at starting than gliding smoothly down the road; so does your magazine.

Combined effort, whether moving a house or building a road, is much more effective than a series of individual efforts totaling the same amount of energy expenditure in the end. Ford owners constitute a large majority of the automobile owners of the United States, and represent an immense potentiality for influencing favorable automobile legislation and bettering motoring conditions generally.

Throughout our country enthusiastic, strong-minded, far-seeing men and women are doing their share toward raising the limitations under which motoring now exists. They are fighting hard and stubbornly for good roads, national highways, reasonable laws for motor car operation and against the other unfair discriminations which a motorist must face.

You are concerned in this work, because these people are striving for advantages for you and your interests. You should take your part in the forwarding of all rational measures removing unfair restrictions on automobiling, or giving added impetus to the raising of the standard of road conditions in your community. To these ends THE FORDOWNER is pledged, and in its columns you will be able to follow the trend of affairs most nearly concerning the man who has one of the vast fleet of Universal Cars.

Permit us to direct the attention of every reader to that section wherein new Ford appliances are explained—our Equipment Review. Here is a feature which in itself is well worth the full subscription price of THE FORDOWNER, for no one likes to feel that he has come into the possession of something that really does not accomplish all that he expected it would. In this department it will be our pleasure to review such Ford accessories as may seem to us to merit consideration. We are experienced Ford men—we have engineering ability at our command. Whatever is wrong or weak in design or materials falls short of the Ford quality standard and will not be brought to your attention through the reading or advertising pages

of this journal. Your genuine satisfaction is our sole aim. In the exploitation of Ford owners we shall have no part. We want to know when you are not treated with fair and warranted consideration by any concern—whether an advertiser in our pages or not. Help us make THE FORDOWNER the thoroughly practical, interesting and instructive publication we propose it shall be.

If you are of a mechanical turn of mind you may have worked out some very practical improvement. Perhaps you can sketch this in a way that will better illustrate your written description. Do it. Spend a few moments on this as soon as you can and be assured that your contribution will be well received and that for your time and good intentions you will earn a reward.

Do you want to tour this summer? Give your fellow Ford owners a chance to know your plans. May be they can give you some information concerning the best route to take through their home country. In return you may be able to help them get to your home place. Write in to us, and we will try to put you in touch with some one in the locality you wish to visit.

Do you ever take pictures? Views of Ford cars are wanted—especially those which point out some improvement in appearance, some original use to which the car is put, or some helpful or interesting suggestion to other Ford owners.

If you have nothing in your own field of Ford experience to write about, or have no photographs or drawings to submit, perhaps you can suggest some subject which you would like to see thoroughly reviewed in the columns of THE FORDOWNER. This co-operation will be of as great value as any other. We are producing this magazine for your benefit and the more we know of your requirements the better equipped we will be to reach your ideals.

Breaking in the New Car

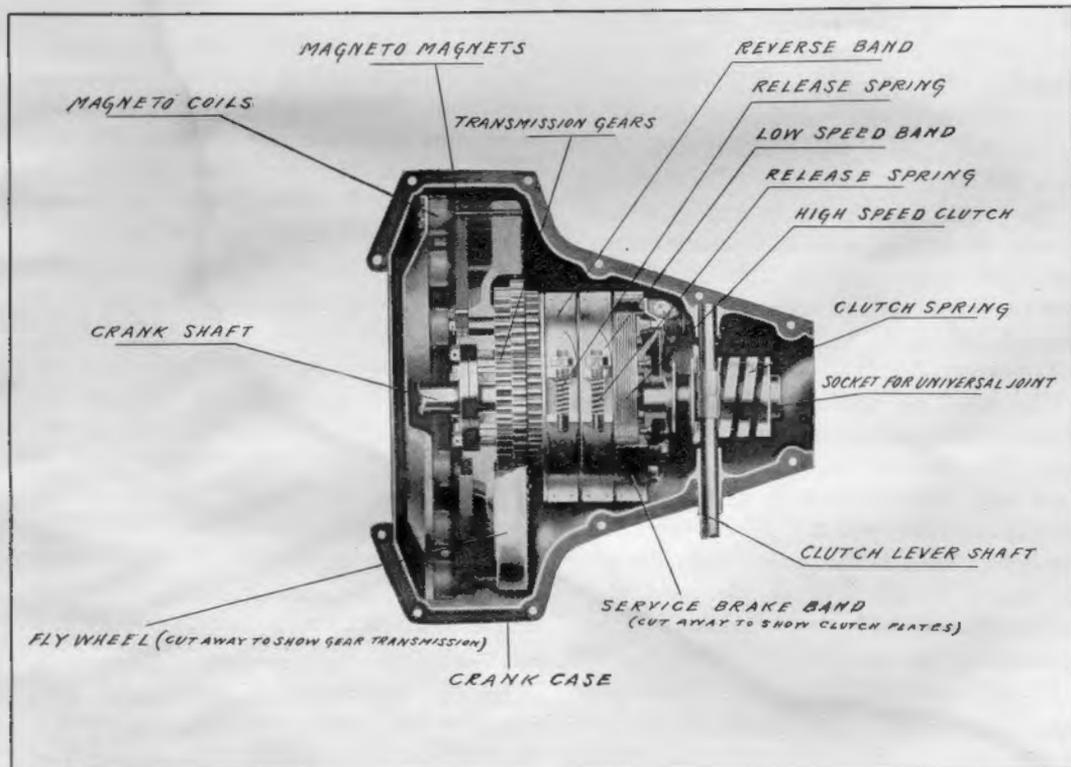
There's a way to do all things right—even to driving an automobile. Skill in motor car operation comes with confidence and a thorough understanding of the component parts of the car itself.

FOUR THINGS are essential to the operation of a motor car. Gasoline, oil, water and brains. The gasoline or fuel goes into the tank, provided for its storage, the oil or lubricating agent goes into the crank case and in various other places throughout the car; the water, or cooling agent goes into the radiator and the brains should be well at the command of the man at the wheel every moment while he occupies that position.

Comparing the importance of the three material essentials, it would seem at the first glance that a supply of gasoline would be the most important; such is not the case, however. The one absolute necessity is *oil*—without gasoline, the car would simply not run and, of course,

could do no damage to itself, while with plenty of gasoline and no oil, the engine would run hot, melt out the babbitt in the main engine bearings and connecting rods, cut the pistons and cylinder walls and do almost irreparable damage before the lack of oil was discovered. A shortage of water would soon make itself evident by excessive heating of the engine, misfiring, backfiring in the carburetor, and knocking in the engine caused by pre-ignition, and finally the engine would stop of its own accord because its overheated condition would fire the gas in the intake manifold before it had a chance to charge the cylinders, a condition which generally occurs before any great damage has been done.

In breaking in the new car, always



Transmission with cover removed as it appears from driver's seat

look carefully to the oil supply, as the engine gives no warning of a lack of oil until after the damage is done.

In dealing with this subject, we will assume that when your new car was delivered to you, your agent or salesman gave to you sufficient instructions so that you are able to perform the various operations necessary to start, back up, and stop the car, and it only remains for you to acquire skill in the manipulation of the machine, which will come only with practice and a thorough understanding of the component parts of the car itself.

To supplement those instructions and to try to explain why you should do "thus and so" and what takes place down in the "inwards" of the machine after you have made those various moves will be the endeavor of this article.

To start the motor, you set the spark and throttle lever as you have been shown, put the lever in neutral, turn on the switch and crank the motor.

Why do you do these things and *whence comes the power?* In the specifications of the Ford Model T the motor is termed four-cylinder, four-cycle—four cylinders being, of course, the number of cylinders and four-cycle the type.

The term four-cycle is really a misnomer, as—cycle pertains to circle or orb and signifies complete, as a series of numbers or events which, beginning at one, go through the series and return to the first and repeat.

The term as applied to a gas engine refers to the movement of the piston, there being four distinct movements, two downward and two upward, in producing one complete power event. First downward movement with intake valve open the piston draws the air through the carburetor, where, passing the spray nozzle, it takes up a charge of gasoline.

Second, upward, movement with valves closed, the piston compresses the mixture of air and gasoline just taken in and as the piston nears the top of the stroke the

timing device of the engine sends an electric spark to the cylinder and fires the mixture, which, expanding during combustion, drives the piston forcibly downward on its *third*, or power stroke.

Fourth, the upward stroke, with exhaust valve open, drives out the burned gases and prepares the cylinder to begin the cycle once again by taking in a new charge.

The four pistons of the engine are connected to the same crankshaft in pairs; that is, two pistons are always doing directly the opposite of the other two, *i. e.*, when 1 and 4 are going down, 2 and 3 are coming up.

In the four piston strokes of each cycle there are down-stroke intake, up-stroke compression, down-stroke explosion, or power, up-stroke exhaust—or one explosion or power stroke from each cylinder for each two revolutions of the crankshaft. Or in other words, two power strokes for each revolution of the crankshaft.

It will be seen then that the power of a gasoline engine is a series of rapid combustions of gasoline vapor and air—so rapid, in fact, that it almost amounts to explosions—and as each explosion does not take place until the one preceding it has entirely spent its force, there will be two intervals in each revolution of the crankshaft when there is little power generated.

The function of the flywheel is to store up power during the explosion period and deliver it back to the crankshaft during the time between explosions, giving a comparatively smooth and even delivery of power available for the propulsion of the car.

The degree of intensity of the power generated depends upon the rapidity of the explosions, the amount of fuel furnished for each and the time in the compression stroke when the spark is delivered to fire the mixture.

All the operations of the engine just described are purely automatic, except for the regulation of the amount of fuel and a slight variation of the time of the elec-

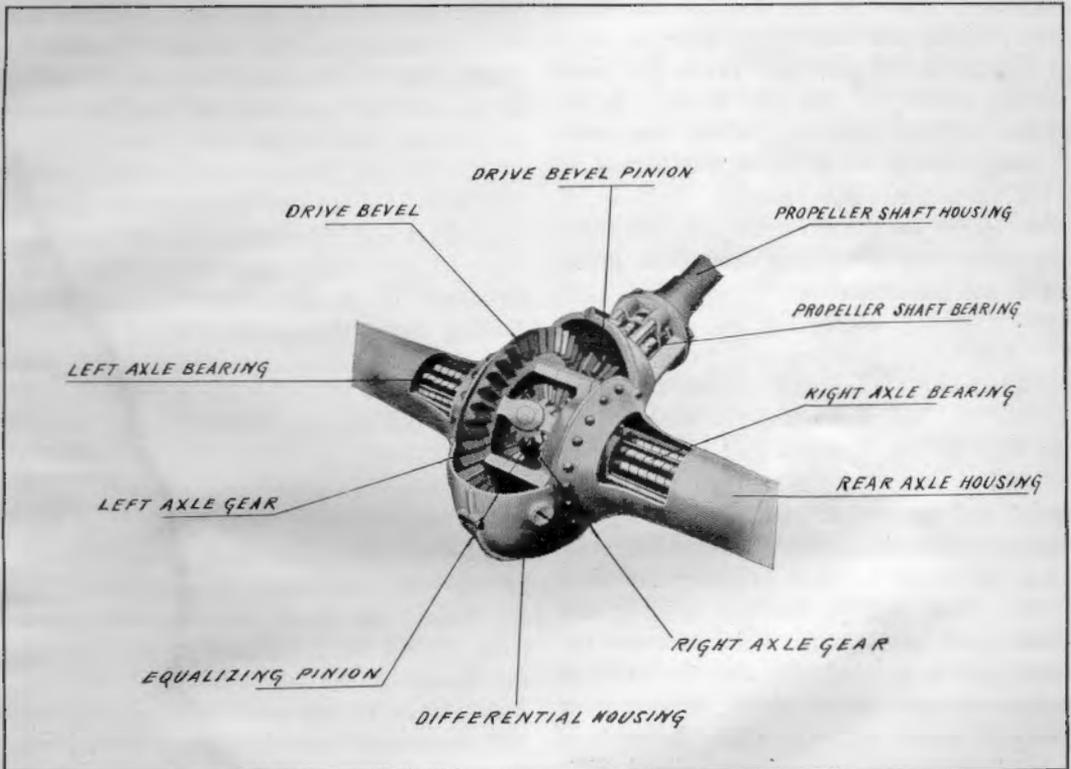
tric spark which are under the control of the driver.

The lever convenient at the right hand just under the steering wheel regulates the fuel supply and the one at the left hand gives the variations of the sparking time. Moving the right hand lever downward or toward the driver gives an increase of fuel and moving the left hand lever in the same direction quickens the time at which the fuel is fired, the first operation is termed opening the throttle; the second,

radiator. If advanced too much, there will be a dull knock or thump in the engine, caused by the explosion taking place while the piston is on the upward movement. The proper place for the spark lever is as far advanced as it will go without causing the engine to knock.

The position of the throttle lever, of course, depends upon the speed at which you wish to run.

The oiling of the engine is accomplished in the simplest manner imaginable. The



Differential and rear axle assembly showing parts

advancing the spark. The reverse would be closing the throttle and retarding the spark.

The spark lever should be in the retarded position in cranking the engine and advanced when engine is running. The exact position must be determined by experimenting until you find the point at which the engine works the best. If retarded too much, the engine runs slow and has a tendency to boil the water in the

flywheel revolves in a reservoir of oil carrying the oil upwards and into a tube with a funnel-like opening which carries the oil to the front of the engine into the timing gears, from there it flows back to the reservoir through a series of pockets in the engine bed, one pocket being directly under each connecting rod, so that with each revolution of the engine each connecting rod bearing is in turn splashed into the oil and the force of the revolu-

tion throws the oil against the camshaft and up into the cylinder walls and reaches all the moving parts of the engine. The oiling is entirely automatic. All that the operator has to do is to be sure at *all times* that there is a *sufficient quantity of good oil* in the reservoir.

Remembering now your instructions in starting the car, you take your position at the wheel, gradually open the throttle until the engine has reached the proper speed and slightly depress the pedal marked *C* with the left foot, at the same time pushing the hand brake lever forward as far as it will go; then press the pedal farther down and the car starts. When under sufficient headway, allow the pedal to drop slowly back; then the car is in what is termed high speed. This is all very simple on the driver's part, yet there are some very interesting operations going on in the transmission.

Referring to the accompanying cut, you will see that part of the transmission gears are mounted on the face of the flywheel and revolve with it, and others are fastened to the slow speed and reverse drums. Depressing the left pedal causes the band around the slow speed drum to contract gripping the slow speed drum tightly, thereby holding the slow speed gear still, which causes the triple gears carried by the flywheel to rotate on their axes and the driving gear being in mesh with the triple gears it is caused to rotate at a slower speed than the flywheel and give to the car what is termed slow speed. In turn, depressing the middle pedal causes the reverse band to contract, holding the reverse gear still, and rotating the driving gear backwards at a reduced speed.

Allowing the left pedal to come clear back brings the clutch spring into action compressing the clutch plates, one set of which are fastened directly to the engine shaft and the other to the propeller shaft, so that when the plates are compressed the drive shaft turns at the same speed

with the engine. The car is then in high speed.

The function of the transmission is to provide means of reversing the car (as a gasoline engine of this type cannot be run backwards there must be some other means provided to enable the car to run backwards). Also to afford a reduction of speed with an increase of power, to be available in getting the car in motion and to pull through rough or muddy places, where speed is not desirable and more power is needed.

The transmission also furnishes a convenient housing for the clutch. The clutch is that part of the mechanism which makes it possible to disconnect the engine from the driving shaft of the car.

The next important piece of machinery of the car is the differential or equalizing gear. As the rear axles are set at right angles to the main driving shaft, there must be some means provided to change the direction of the rotary motion generated by the engine and sent to the driving shaft by the transmission.

Also a means must be provided to allow one wheel to travel at a greater or less speed than the other, as in going around curves—the outside track, of course, being longer, the wheel on the outside must turn around more times than the one on the inside of the curve.

A glance at the accompanying drawing will show that the main driving shaft from the transmission terminates in the differential housing in a bevel pinion gear which is in mesh with the large bevel or ring gear.

The rear axle of the car is not a steel rod running straight through from one wheel to the other, but is composed of separate axles, each independent of the other, terminating at the differential in a bevel gear and connected together by the equalizing pinion gears shown in the center of the cut. These equalizing gears (three in number) are fastened by a cage to the face of the large bevel gear, which

is driven by the small bevel pinion on the end of the main driving shaft.

So you see, Mr. Ford owner, when you sit up there, behind the steering wheel, enjoying a quiet spin, there is much more going on down in the inside of the car than would be apparent at the first glance; and while it may seem strange that so many parts are needed to accomplish such a simple result, yet every bolt, nut or gear has its own little part to perform, and a great deal of care and attention should be given all these parts that they may be in condition to properly perform their various functions.

Just a word now about
 STARTING starting the engine. There
 THE ENGINE is a right way to do this,
 and it is just as easy to do
 it right as to do it wrong. It is not necessary to open the throttle way up to start the motor easily and then have it race three or four thousand revolutions per minute while you run around to the steering wheel to shut it off. If the carburetor and vibrators are adjusted properly, the engine will start just as readily with the throttle set for moderate speed and the first thing for you to do is to learn how nearly you can keep the throttle closed and keep the motor running.

After you have practiced starting the motor until you are able to do so without tearing it to pieces, it is time to try starting the car. Remember now that when your engine is running about one thousand revolutions per minute you are generating approximately twenty-two horsepower and you must not slap it all on by jamming down hard on the pedal. If you were going to hitch a horse to a buggy, you would not start the horse out of the barn on the run and then try to hook on the buggy as the horse shot by. No, you would hook him up first and then start up slowly. The same principal will apply in starting the car. Press on the slow speed pedal gently, but firmly, until you notice the engine beginning to slacken in speed; then gradually advance the throttle lever and increase the pressure on the pedal at

the same time and you will find the car will start off smoothly and gently. Practice this a while and you will not be annoyed by having the car try to jump out from under you and at the same time stall the motor.

The gears and working parts of the Ford Model T are amply strong to pull the car under most any road conditions that you may encounter, but no automobile machinery will stand the racking strain of jumping on the level with the engine going full speed and the car standing still.

Also in stopping the car just
 STOPPING as much care and judgment is
 THE CAR required as in starting. Never
 jam on the brakes hard (except
 in a case of emergency). Don't run full speed until within a few feet of where you want to stop and then throw off the power and slap on the brakes and come up short. Throw off the power while some little distance away and let the car finish the distance under its power of momentum and simply regulate it gently with the brake. With a little intelligent practice you will soon be able to handle the car properly with little use of the brake.

The shock of sudden starts and stops does more damage to the working parts of the car than many miles of straight travel.

The question of lubrication
 LUBRICATION is really the most important
 thing about the care of the
 car and too much stress cannot be laid upon this subject. The small boy's definition of "lubricant" as the stuff that wears out machinery when you don't use any, applies very nicely to the working parts of a motor car. The first place to watch, of course, is the engine itself, as it is the most expensive part of the car and will suffer more damage in the shortest length of time when the oil gives out than any other part of the car. Always be careful that the oil does not get below the lower drain cock on the underside of the transmission case and use *good oil*.

The differential is the next of im-

portance and should be frequently inspected to see that the oil or semi-fluid grease is of sufficient depth to run out of the plug hole on the side of the differential housing.

Most of the other parts of the car needing lubrication are indicated by an oil or grease cup and should be attended to every two or three hundred miles, also the yoke ends of rod and any moving parts not provided with oil cups will last much longer and run quieter if given a regular supply of oil.

You will notice after your new car has been run two or three hundred miles, that it is much easier to start than when you first began using it. The reason for this

is that when the car leaves the factory it has only been run enough to assure the inspector that it has been properly assembled, and all the bearings and working parts are tight and comparatively rough, especially the crankshaft, bearings and cylinder walls. For this reason the first few trips of the new car should be short and easy and frequent stops should be made for inspection to ascertain if there is any undue heating or any other indications of trouble.

Treat your new car gently while you are getting acquainted and you will find that the extra care and attention invested will bring a dividend of many extra miles of travel.

Golden Rules of Traffic

THE equal rights of pedestrians, horse-drawn vehicles, motor cars, and street cars are beginning to obtain recognition in localities where one class was formerly favored over others. The following from the *Chicago News* shows a set of safety rules whose use is being urged there:

"Look at it from the other fellow's viewpoint.

"Co-operate with him to use the streets, sidewalks, cars and buildings on the equal rights basis of traffic.

"Pedestrians on the streets, give an equal right to that automobile, street car or other pedestrians.

"Owners and operators of automobiles, respect the rights of others; the pedestrians on the streets have as much right to the use of that street as you have, and your forcing them to submit to your domination will call for drastic legislation on car users.

"Mr. Business Man, you may be the brightest man in town in other ways, yet if you get in front of an automobile or street car, which are not respecters of persons, you will be hurt more than the man in the so-called lower walk of life.

"Owners and operators of auto trucks,

see that your trucks are operated more carefully, especially in the congested districts and in the vicinity of schools, as the daily toll of injuries to children will force severe penalty if the remedy of carefulness is not applied at once.

"Every one stop, look and think 'safety' before you cross a congested street or pass behind a car, automobile or wagon. Always see what is on the other side of the object you are passing. Cross the street on a cross-walk.

"All users of the street, do not crowd pedestrians into a place of danger with your automobile, wagon or street car, or dash into a crowd on a cross-walk in the absence of a crossing policeman, and even if the policeman is at that crossing, and gives you the signal to proceed, go safely and carefully.

"All users of the street, remember the child and the aged. You were a child once and know how much you looked up to your elders and followed their example and depended upon them. Help that child by your example of safety and assist the aged, as you will probably reach that advanced state in the future.

"Get the safety habit; practice it and help others to acquire the same habit."

Repainting the Car

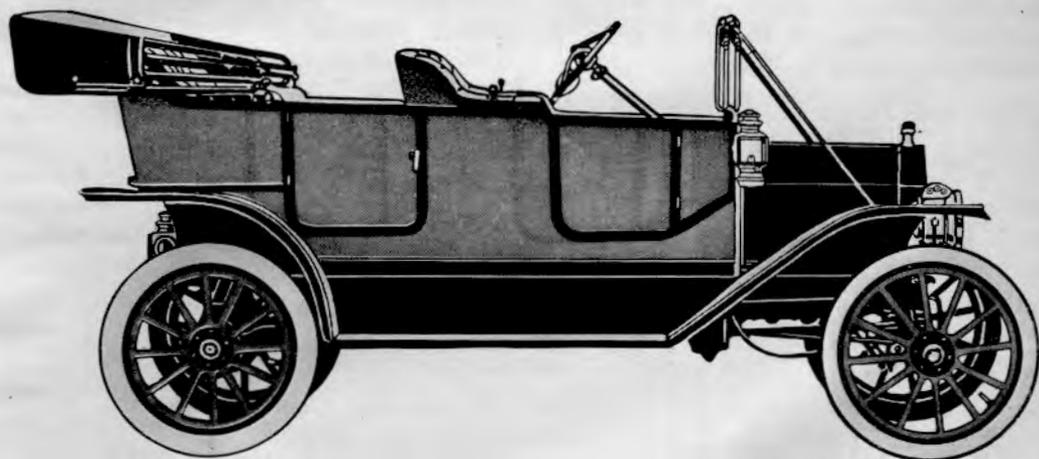
Suggestions for guidance in restoring car to its original appearance through painting it—at home, with little labor and time expenditure, adding thereby to the life of the car as well as improving its looks.

NO OTHER car owners, as a class, take the painstaking interest in the appearance of their cars, which the Ford owners do. And probably no other type of automobile is so widely groomed and cared for by the owner and driver as is the Universal Car. In the smaller towns and on the farm the owner is nearly always his own garage man, and takes a personal pride in the appearance of his property. Often, too, the younger members of the family are pressed into service, and the son is told that he can go riding with the family in the afternoon, if he

the machine, and also aids materially in obtaining a good second-hand price when the old car is disposed of in trade for a new one.

A year's service, over all kinds of roads, through mud and rain, under hot suns and along dusty highways, will affect the luster of even the best kept car. As the finish becomes dulled, and the enamel or paint on the various parts of the car becomes chipped or broken off, the careful owner begins to wonder about having his car re-painted.

With this object in view, he will first



Repainted car. Note apparent lengthening of hood due to painting radiator the same color
From booklet "The Car Beautiful," Arsenal Varnish Co., Rock Island, Ill.

has the brass all polished before dinner time, while his sister industriously shines the windshield and wipes every trace of dust from the tufts in the cushions—for the same reward.

The same interest which is taken in the external appearance of the car usually extends to the motor and working parts, and the cleanliness which was apparent when the new car arrived from the factory often endures throughout a whole year of service. This same care of the car's appearance adds appreciably to the life of

go to some carriage painter in his neighborhood, and ask two questions of him: "How long will it take to paint the car?" and "How much will it cost?" The answers to both these questions will, in most cases, effectually dispel any thoughts of refurbishing the car at the price of relinquishing the family necessity for a period of from eight to twelve days, and paying a matter of some fifty dollars for having the painting done—these being the common time and expense estimates given by job painters.

On account of the time and money involved in having the car re-finished, many old cars are run in a condition which far from expresses the owner's ideals of car appearance, but which must be tolerated, on account of the drawbacks to the professional refinishing.

This need of car owners has led several of the most progressive paint and varnish makers to bring out properly filled painting outfits, whereby the car owner may re-paint his machine at a very low cost, and with the loss of only a day or two's use of it. These packages of paint, varnish and accessories are very complete, and if instructions are closely followed, it is a simple matter to remove the worn-out appearance of the car and make it again look like new. Neither is any particular skill or experience needful to make a very creditable job. Several precautions must be taken, to simplify the work as much as possible, but the work itself is neither fatiguing or unpleasant.

First and foremost, the car must be thoroughly washed—not merely sprayed with a hose and allowed to dry in the sun—and carefully dried; especial emphasis must be placed upon removing every trace of grease, as neither the paint or the varnish will stick and cover over it.

A good test for the removal of grease is to try wetting the surface. If the water forms a continuous film, there is no grease present, while if there is, it will appear dry, or spattered with small globular drops of moisture.

When the car is spotlessly clean and every vestige of dust brushed or wiped from the top and cushions and motor parts properly cleaned with gasoline, it is ready to be put into some kind of a paint room.

An ounce of prevention in this paint room will save many strokes of the varnish brush, and assure a smooth, dustless finish. This room should be located in some quiet place, away from the dust and dirt. Most of the large automobile manufacturers have their paint departments at

the tops of the buildings, as far away from the dust of the roads as possible, and all kinds of precautions are taken to avoid raising even the slightest dust cloud. While these ideal conditions cannot be realized around every owner's garage or home place, the nearer they are approached the better the completed job is likely to look. Warmth is necessary to insure an even flow of the varnish, and so it is well to see that the room is heated if the work is done in chilly weather. Sprinkling the floor is a good dust preventative, though care should be taken to keep from overdoing the matter and rendering the room too wet.

After making sure that the room is in the best possible condition, and every precaution taken to insure exclusion of dust, it is well to turn the attention to preparing the car for the painting. The amount of work which this will entail will depend entirely upon the condition the old finish is in. If the car has been run long periods without being washed, and dust and mud have been allowed to mar the surface, considerable sandpapering may be necessary before the proper smooth finish for the new coat has been obtained. Of this the car owner himself must judge. The rough paint must be smoothed down, and any loose particles removed, before the fresh paint can be applied, and any rust on exposed spots of the car carefully rubbed off. For the rubbing operation it is economical to use two grades of sandpaper; one coarse, for removing the loose paint and larger particles, and the other fine, to give a perfect surface upon which to apply the next coat of paint.

When the surface has been fully sandpapered, it should be carefully brushed off and rubbed with a dry, clean cloth. After this has been done, be particularly careful to keep the hands off the car body, as the slight amount of grease present on the hand may render the surface unsuitable for painting—and blisters and ragged spots may develop after the car has been used a short while, which will be blamed on

(Continued on page 46)

Conserving the Resale Value

Proper treatment to be given car to retain original worth, and to make it an attractive bargain if a sale should be desired. Lubrication, thorough and regular, is the best form of insurance for car life.

THE owner of a Ford automobile may comfort himself with the reflection that in case he should desire to dispose of his car again, he will be able to get a greater proportion of the original price than if he were offering any other car. Experience has shown that the Ford depreciates less, not only intrinsically, but from a market standpoint, than others, and this is one of the best reasons which could be named for purchasing a Ford.

The jeweler who points out that one may invest in a diamond with the assur-

they have an elephant on their hands and sacrifice the car at a small percentage of its original price; that being, of course, one of the reasons why the second-hand market is "shot to pieces" with offerings of many high-grade cars, which may be had at a fraction of their original value. Conversely, the strength of the Ford second-hand market is due chiefly to the car's small maintenance cost, which enables the man with modest purse to enjoy ownership of an automobile of this type when it would be not only unwise, but absolutely



The new car — guard against its depreciation

ance that at any time he can get most of his money back, because diamond values are rising, has no stronger argument than is offered in the Ford, which, judged as a second-hand proposition, is the strongest automobile on the market.

Few people who buy automobiles do so with the expectation of selling them again. Many who buy heavy, high-priced cars, which devour fuel and wear out tires like some voracious monster, soon decide that

out of the question to attempt to drive one of another make.

But while it is a readily admissible fact that the Ford owner expects to keep his car, and not sell it again, it is well to consider this as a possibility, just as the man who buys a house for a home considers it with the cold eye of a real estate appraiser. Its value to him as a home may be great; yet at the same time he desires to buy a property which will ap-

preciate, rather than depreciate, in value, and which, in case it should be desired to sell, will bring close to its original price, if not more than that, on the open market.

With this sort of feeling, the Ford owner should look at his car, remembering that he may some day want to sell it, and that for that reason, as well as his own present enjoyment of it, he should conserve it to the greatest possible extent. The same plan, be it noted, that will result in the greatest satisfaction to the owner in the actual use of the car will also make its resale value 100 per cent of what it ought to be.

In the first place, the owner should know his instruction book from cover to cover. He cannot know his car thoroughly until he knows the instruction book thoroughly; and knowledge in this case is surely power. There are a lot of things explained in the instruction book which cannot be picked up on the outside, and the car cannot be driven with the greatest success unless the owner knows it thoroughly. It should be his pride to understand every feature of the mechanism, and to be able to explain to his friends just how the gasoline is drawn into the cylinders and fired, just how the ignition is provided, just how the engine is cooled. All of these things and many more are explained in the instruction book. The owner, who in the flush of enthusiasm which comes with ownership, has merely learned enough to be able to drive the car, should realize that he is not really its master until he understands it; and that understanding will not come of itself, but must, for the most part, be acquired. Study the instruction book, and learn the details which make all the difference between being an automobilist in the full sense of the word and merely an "owner"

The biggest abuse which automobiles of all makes are subjected to is lack of proper lubrication. Everybody knows that cylinder oil must be provided, otherwise the engine will not run. Unfortunately, from one standpoint, the car will run even if all of its parts are not oiled, but it must

pay the penalty by rapidly wearing out. Friction is the greatest enemy of mechanical efficiency, and the automobile which is not sufficiently lubricated to eliminate friction is an automobile which will not last as long or serve as well as one whose owner is careful to see that the grease-cups are always filled and whose hand oiler is always at hand.

Some interesting remarks on this important subject are made in the Ford instruction book, and they are well worth repeating here:

"The first rule in motoring is to see that every part has at all times plenty of oil. Permitting any part to run for even a brief period without proper lubrication will certainly result in serious injury to the machine and undue expense to the owner."

This is a fair statement of the situation. The time and trouble taken to keep the machine well oiled are repaid many times by the increased efficiency of the car, the greater smoothness with which it runs, the absence of noise, and the better condition it will be in after having been driven many thousand miles. And that brings us back to the point from which we started, namely, that the resale value of a car depends chiefly on how it is taken care of, and how it has been lubricated.

"If Ford owners would oil their cars constantly and carefully," declared the head of one of the branches of the company recently, "their troubles would be greatly reduced and the value of their cars would be considerably increased. It is not usually mileage that cuts down the value and usefulness of a car; it is abuse."

The writer knows of one owner who has had his car for five years. He has driven it close to 60,000 miles. It is still running well, and, as he expresses it, he wouldn't sell it for a thousand dollars if he couldn't get another. He believes in taking care of his car, and especially in giving it ample oil and grease. The result is that he could go out and sell his car today without very much loss compared with its original cost to him.

Many Ford owners take care of their

own cars, which in the long run is the best plan to follow. Frequently where this work is delegated to someone else, especially if that someone is a servant, the car is merely wiped off and cleaned, and oiling is but improperly attended to. This is an operation that takes a little time, if properly done, and for that reason is often neglected if the eye of the owner is not watching the operation. It is much more satisfactory all around for the man who owns and drives the car to attend to its maintenance. The man at the wheel is in a better position than anybody else to tell what the car needs; and if he is supplying its requirements, there is little danger of anything important being overlooked.

Another feature which has a big bearing on the resale value of a car is the speed at which it is driven. The condition of the roads makes a big difference in the proper rate, of course; but there are some motorists who appear to believe that their cars cannot possibly be driven too fast. They get every bit of speed that the machines are capable of delivering, all of the time. The result of such a practice is to wear out the car very rapidly, the excessive vibration to which it is subjected loosening the bolts, increasing friction and making for weakness throughout.

Fast driving is in itself dangerous, but looked at from the point of view under discussion the result on the car is equally harmful. When the machine is driven at a normal pace, inequalities in the road are taken up by the springs, and neither the mechanism nor the passengers feel the jar or vibration. On the other hand, fast driving magnifies the inequalities, and a slight rut, depression or projection, against which a wheel may strike, causes vibration which the springs cannot absorb. The result is that the engine and transmission equipment are badly jarred and jolted, and that the capacity of the car for giving service is cut down rapidly, and its value, as a marketable proposition, materially reduced.

The Ford owner, according to the opinion of factory men, is generally a safe,

sane and conservative driver, and seldom drives faster than good judgment from all standpoints suggests. In their opinion, 25 miles an hour is as fast as the car should reasonably be driven. This is fast enough to suit anybody but a confirmed joy-rider. Twenty-five miles an hour takes one over the road at a snappy pace, yet is not so fast that the car cannot be slowed down either to take care of a bad spot in the road or to avoid a pedestrian or another vehicle. Incidentally, that speed is usually considerably greater than the maximum allowed by law, and though no automobilist expects to drive as slowly as local ordinances usually prescribe, when he has a clear road and a good car, this fact at least suggests that the speed mentioned is fast enough for most purposes.

Many Ford cars have been sold for 80 per cent of their original cost after having been driven 5,000 miles or more. This would mean, roughly, that the owner got 5,000 miles of pleasure and profit for \$100—certainly a modest expenditure, judged from any standpoint. If you want to make your car easily salable, as well as to keep it in perfect condition for your own use, follow the suggestions contained herein, study the book of instructions—and use common sense all the time.

BLAME IT ON THE TIRE

He didn't pump it full enough
Though all the air is free;
He left it soft and spongy-like,
And scooted on with glee.

He whizzed along and sizzed along,
He picked up nails and wire,
And when they banged, his fist he
whanged,
And blamed it on the tire.

He skidded, then he glided, and
He whooped through dust and mire;
And when it burst, he cursed and
cussed,
And blamed it on the tire.

—*Courtesy Miller Rubber Co., Akron.*

Problems of Ignition

Under this heading might very well be cataloged the greater percentage of all motor difficulties. Two elements enter into the combination from whence comes power—the one is fuel, the other ignition.—Possibly you have met with problems similar to some of these.

DISTRUST of the ignition system has robbed many an inexperienced motorist of half the pleasure which he would otherwise derive from his car. Like many other worries, most of this one is based on what he has heard from others concerning failures and eccentricities of the sparking equipment. In common with other mechanical details of the car, the magneto may sometimes break down, even as a wheel may become worn out or damaged through an accident; but, on the other hand, it is often blamed with defects which are really not traceable to the ignition, but which are blamed to it on account of its unfamiliarity.

Instead of beginning with the magneto, timing, and wiring, to search for trouble when the engine balks, it is well to save this until the last, looking to the fuel supply first. No adjustments should be attempted until the working of the apparatus is understood, as it is easy to spoil the set of the vibrator points and cause a much higher current consumption than necessary, through striving to quickly remedy some obscure stoppage of the motor.

This department of **THE FORDOWNER** will be devoted to answering questions and solving problems having to do with the ignition of the Universal Car. Ford owners who are meeting with strange experiences in this line are asked to send in their puzzles, that our expert may pass judgment on them—remembering when so doing that the information sent must be full enough to give an idea of the car conditions. If any equipment other than that furnished by the manufacturer is used on the car, be sure and state its name and model.

MAGNETO MAGNETS WEAK.

I think the magneto on my 1912 Ford is getting weak; can it be recharged?

A. A. Q.

Yes, the magnets may be remagnetized in the same way they were charged in the first place, but it is more satisfactory and as cheap to install a complete set of new magnets. They are sent from the branch houses, mounted on a board in the way they should be installed in the magneto, and thus you are protected against making an error by reversing one or more of the units.

* * *

STARTING WITHOUT CRANKING.

How often can one start his car by switching on the current without having to resort to the crank? Of course, I know a good deal depends on the weather, the valves, etc., in the last question.

E. H.

This depends upon the position in which your motor stops and whether or not the last intake into the cylinders was of a mixture suitable for ignition. If this is the case, and one piston has stopped at the firing point, then the motor may be started by simply putting the switch on the battery side. The length of time after a stop at which a motor will start like this depends, as you suggest, on the tightness of the valves, the fit of the pistons, the effectiveness of the piston rings and the condition of the compression of the motor. It should be possible to make a start without cranking any time within a half hour after stopping, if the motor is in good condition and thoroughly warmed—otherwise the crank will have to be resorted to for any but a momentary halt.

* * *

ONE PLUG SOOTS.

My Ford Model T runabout, 1913 model, will run perfectly for a few miles and then the spark plug on the third cylinder will soot up quickly and cause missing. The oil level is right and the other three cylinders fire regularly. I have tried shifting the plugs around, but the third one from the front always soots up first.

T. P. W.

If this is ignition trouble, instead of being due to leaky rings, which would permit of excess oil being drawn up on the suction

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Carburetor Conundrums

One motorist calls the carburetor the heart of his car, another its lungs, and it may well be said that there is no more important part of the car and none more subject to vital ailments which only the experienced driver can remedy.

MOST car owners who drive their own cars complain that the carburetors furnished as a part of the equipment are too complicated. In general this is true, in their strivings for a little better fuel economy many manufacturers have made additional adjustments and added more valves and regulations for fuel and air. With all the added "fixings" a trifle better fuel mileage was obtained—if the carburetor was thoroughly tested and adjusted by the maker of the car. This condition of accurate tuning could not be attained by the owner, however, save through accident, and many complaints are heard on this score.

The reverse of this is true with the Ford. The carburetor adjustment is so easy, and so conveniently to hand that the inexperienced driver is constantly twiddling with the knurled knob, without giving his car a chance to show what it is capable of producing under any one setting of the valve. If the engine manifests any symptoms of the motor maladies which occasionally affect even the best running power plants, the first thing the driver does is to shift the carburetor adjustment—with the result that the engine performance is changed, and the symptoms temporarily lost through the new conditions.

When the car owner has determined just what a carburetor should do, and begins to become seasoned in road driving so that he can tell what a car ought to take on high and where he should use low speed, then he is beginning to get in shape to try to lower his fuel bill slightly; and not until then should he try to master the art of carburetor setting.

The Ford Manual answers many of the puzzling conditions which sometimes appear, and furnishes a good guide for the

inexperienced motorist to follow until he has mastered the individualities of his car.

MOTOR CHOKES AT SLOW SPEED.

I have a Ford Model T, 1913, and I want to ask you something. Now, for instance, when I start from home, and I stop to shut the gate and leave the motor running at a slow speed, and then speed up again, a good many times the motor stops. And then again, when I go along slow, and speed up again, she sort of pulls back for about six to ten yards before she picks up again. I have a Holley carburetor.

A Subscriber.

Your carburetor adjustment is such that when you suddenly open the throttle to speed the gasoline chamber floods, and you get too rich a mixture, which will not develop the power for the suddenly applied load. If you are not thoroughly familiar with the Holley carburetor and its adjustments, you can save time and lower your fuel bill by going to a good mechanic and having him make the necessary adjustments for you.

MOTOR WEAKENS AT HIGH SPEEDS.

My Ford Model T, 1912, is not developing as much power as it should, and will not take the hills on high now that it used to climb last year. The valves are properly adjusted, and have been recently ground in. The pistons and rings seem to be in good shape, and are not scored or badly worn. What can I do to bring my power up to normal? The equipment is that furnished with the car.

S. N. E.

A similar case was illustrated in a near-by garage not long ago, and the repairman was much puzzled to discover the cause of the low power output. The piston rings were worn somewhat, but seemed to give sufficient packing effect to give good compression on cranking. On testing the cylinder's walls with a straight-edge it was found that they had worn in wavy rings, and that the piston rings had worn to such an extent that their spring was insufficient to force them out into the slight depressions at high speeds. The cylinders were trued up and new pistons and rings used, after which the engine gave its proper horsepower.

More Miles for Tire Dollars

Tire trouble is the motorist's bugaboo. When everything else is working fine—watch out for tire trouble. But there are ways to forestall tire difficulties—some suggestions are here given.

MOTOR CAR TIRES are designed to perform two important functions: to afford some yielding, but firm grip upon the roadway for driving and steering purposes; and to cushion the car and passengers from the road shocks and jars.

The first is accomplished through the use of the tire casing, which is so constructed as to give the necessary holding surface on the road, and to serve as a protective covering to the cushion. The care of casings, and means for adding miles to their active life, were taken up in the previous issue of this magazine, and many of the casing troubles diagnosed and cures prescribed.

The cushion is obtained through the use of compressed air in the tire, which gives sufficiently to take up the small inequalities in the road surface, and so eliminates most of the jar before it has a chance to get to the passenger, or to the more delicate parts of the car's power plant. This compressed air is stored in the inner tube of the tire, which is especially built up of the best and purest rubber gum, to make it as nearly air-tight as possible. The composition of the tube renders it imperative that it be thoroughly reinforced by the outer casing, and protected by it from damage from rough roads, or from puncture by sharp objects, such as nails, tacks, broken bottle-necks, and loose pieces of tin.

An inner tube, being of purer rubber than the casing, and not subjected to as thorough a toughening treatment, will not stand exposure to sunlight or air for any length of time without deteriorating seriously. The practice of hanging tubes on the wall of the garage for storage should not be indulged in, as the tube is exposed, and will soon dry out and become too stiff to work well. Another reason why tubes should not be hung up this way is that

the nail, commonly used for a support, puts a crease in the tube at the point of contact, and is likely to rust and damage the tube in that way.

Neither should inner tubes be allowed to lie around on the work bench, or on the garage floor, for the same lack of protection from the light prevails there as where the tube might be hung, with the added disadvantage that the tube may come in contact with some oil or grease, and thus quickly be rotted through. If



Tubes ruined through abuse

left lying around, the tube is also likely to be moved from place to place, and dragged over rough flooring, across nails and otherwise exposed to accidental injury.

Spare tubes should be well coated with talc, and then either folded carefully, or rolled into a bundle, and stored in light-proof bags or boxes, where they will be protected from injury until needed. And even then it is well to remember that rubber deteriorates, even while not in use, though not very extensively, if properly protected from light, air, grease, oil, and accidental damage. If bundled, the tube should not be tied too tightly, as the string will tend to cut the rubber, and to make it set in the shape in which it is formed. Bands cut from old tubes make good containers and are easily slipped in place.

Only a small percentage of inner tubes

live to become damaged through waiting to be used in service, though many miles of tube wear is often lost through lack of protection in tool box or under the seat, and the most of the injury is incurred through improper handling during replacement, or in road service.

Care should be exercised when making a replacement, that the tube is not caught under the tire tool, and pinched. Even though this damaged spot does not give way at once, it is so weakened that it forms a source of danger, and may blow out at any moment. Tubes may also be pinched under the casing as it is being put on, in which case they may be blown out as the tire is being inflated, or they may hold air until the tire has been run a short distance. The guard around the valve stem also offers a point where the inexperienced motorist may pinch his tube. This can be avoided by partially pumping the tube before placing it in the casing, so that the air will straighten out all wrinkles and folds and cause the tube to lie smoothly in the case.

Running a car with a flat tire will totally destroy a tube quicker than any other method, and only a few feet of travel after the tube is flat will cause it to become pinched between the casing folds at the rim; if the abuse be kept up, the tube will be rubbed to shreds and rendered absolutely useless.

Rusty rims, with which the tube must come in contact in the narrow strip between the beveled edges of the beads, offer a point for rapid tube deterioration. The particles of rust work loose from the rim, and gradually become imbedded in the rubber of the tube, eventually puncturing it, and giving those slow leaks which are so baffling to the motorist, and which lead to the oft-repeated accusation that the tube is no good. Flaps in the tire offer protection against rust from the rim, but introduce an added danger from pinching, as it is a difficult matter to get the tube in correctly, with the additional obstacle in the way. A simpler way to prevent this type of tube damage is to

paint the rims with a good graphite paint. This aids in removing the tire, as well as preventing rusting of the rim.

Two types of tubes are marketed: Those made from pure gum, and those in which the gum is mixed with other ingredients, which are designated as compounded. The compounded tubes are heavier than the gum ones, but are much more susceptible to damage from heating, on account of their being composed of materials which are good heat conductors. The compounded tube is hard to vulcanize properly, as the pure gum patches will not combine properly with the mixed substances of the tube—with the result that the patch soon comes loose, or, if the vulcanizing has been carried far enough to insure a firm joint, the tube around the patch has been partially disintegrated by the heat. The gum tubes are thinner, and, therefore, more liable to pinching accidents, but if properly handled and kept fully inflated, will give better and longer service than will the compounded tubes.

In the case of inner tubes, as with casings, the proper inflation, and protection against overloading, will add much to the life of the accessory, and do a great deal toward removing the hugaroo of "tire trouble" from the woes which beset the motorist. In tire buying, and tire using, as well as in the other operations of running and keeping a car, brains can do much toward keeping down unnecessary expenditures for supplies, and render pleasant many rides which would otherwise be spoiled by the dread of accident.

The best way to drive a car over a short stretch of broken stone is to take a short run at it—not too fast—and let the car coast over the stone with the clutch out. Thus the rear tires are relieved of driving strains and of the resulting tearing action of sharp stones on the rubber. Of course, it is not always practicable to do this, but when it can be done it adds just a little more to the life of the tires.

The Universal Club

An informal gathering place for Ford owners, where they may come to talk over matters of mutual interest. Read here of your fellow Ford owner's achievements. Contribute freely of your own Ford experiences.

THAT great American family—the Ford owner—has a healthy and prospering relative on the other side of the world—on every side, to be more exact. While the membership of the Universal Club here at home is pressing on fast to the million mark, this masterpiece of American manufacturing ingenuity is not without honor in foreign parts.

Best available statistics put the number of foreign-owned Fords at 125,000, and there are nearly 1,000 Ford dealers in other lands, who are alert to opportunities for adding to the Ford owner family. As evidence of the growing appreciation of this popular car, the fact is cited that it now takes the combined output of the five largest motor car manufacturers in England to equal Ford sales in that country.

The ability to successfully resist the Ford invasion seems to have proven a problem no civilized land could overcome.

Helpful hints to car owners.—No. 1. Before taking your car out of the garage in the morning, be very careful to see that it still has all four wheels.

Not long ago a thief entered the garage of a Norfolk, Va., Ford owner, jacked up the front axle, and removed the right front wheel with its speedometer attachment and Diamond non-skid tire—and departed the place with his booty.

Local sleuths have finally concluded that the wheel was taken by some joy-rider, who had chanced to smash the right front wheel of his car, and then had adopted the method outlined above as a quick repair scheme.

Reward offers from the local dealer and the car owner have failed to bring out any information concerning the missing part, and police officials are subjecting all

Fords to a searching scrutiny on the right front wheel.

One and one-half cents per mile for motor travel is what it is costing three hundred seventeen Ford owners in Cleveland, Ohio, according to statistics carefully collected and compiled by the Cleveland branch of the Ford Motor Co.

Three hundred seventeen Ford owners in Cleveland have kept careful records of the cost of Ford up-keep. They had owned their cars at the time this data was secured an average of nine and one-half months.

Each Ford has been driven an average distance of 5,273 miles. Each had carried an average of 444 pounds the entire distance.

The average expenditure for gasoline during the period the car had been owned was \$55.02.

The cost of lubricating oil for the same period averaged \$6.28.

The repair work necessary from whatever cause averaged \$18.19 per car.

The average life of one set of tires was 5,253 miles.

That great American family—the Ford owner—has a healthy and prospering relative on the other side of the world—on every side, to be more exact. While the membership of the Universal Club here at home is pressing on fast to the million mark, this masterpiece of American manufacturing ingenuity is not without honor in foreign parts.

Best available statistics put the number of foreign-owned Fords at 125,000, and there are nearly 1,000 Ford dealers in other lands, who are alert to opportunities for

(Continued on page 60)

Ford Starting Systems

Being a brief enumeration of the advantages to be gained by modernizing your car and eliminating hand work through the addition of an apparatus for cranking—with the portrayal of a few of the annoyances of the old method of turning over the motor.

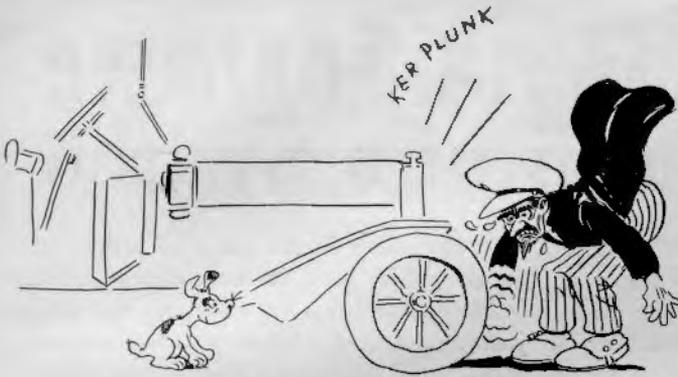
BACK in the early days of automobile-dom, when single-cylinder cars were the rule, and the possessor of an automobile was regarded as a "crank" or a visionary fool, many things were tolerated which now-a-days are not given a thought—save when some old relic turns up to remind us of the glories of the pioneer days of the industry of motor car building. Among these antiques might be listed the rear entrance tonneau, the canopy top, the single tube tire, and the fifth wheel steering gear. To this roster should be added the starting crank; for the mechanical starter, whether air, spring, electric, or manually actuated, has so thoroughly demonstrated its applicability to motor car conditions that it should be considered an integral part of the necessary equipment of every modern automobile.

What is more annoying than to have to get out of the car, run around to the front and crank the motor, after you have accidentally stalled the engine at the busy street crossing? Or on a rainy day, when

your car sticks in the midst of a mud hole on the worst road in the country? What is more dangerous than to stall the engine just as the car tops a railroad embankment, and the front wheels are directly in the path of an oncoming train? Or what will chagrin you more than to be passing your neighbor on some steep hill, and have your motor go dead? How can you compensate yourself for the close connection you missed as you were making that hurry-up run to the depot, and inadvertently killed your motor in a traffic jam and had to take a turn at the starting crank while you were out of reach of your spark and fuel control levers? Is it worth your while to take the chance of one of these or any other annoyances and risks, when your car is otherwise dependable and reliable in every way? Can you afford to use an inconvenient starting crank when time, comfort, or even the lives of you and your party may depend on your being able to get your car in motion quickly?



While traffic waits—operating the "strong arm" starter

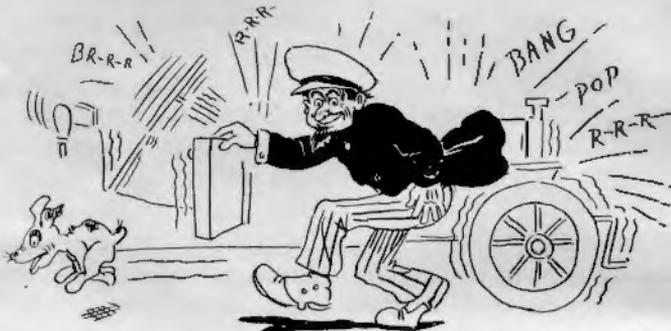


Can you win your race

It is not intended, in this article, to "boost" any particular kind of starter, or to unduly laud any one manufacturer's product to the detriment of another's specialty. Many of the starters now on the market have seen considerable service, have withstood the test of actual wear under the handling of inexperienced operators — and are still producing the goods when called upon to start the motor. Each type of starter has its talking points, some of which may be indiscriminately applied to all. Low cost is one of the alluring features of the mechanical starter, operated by the driver of the car while seated in his normal driving position. The possession of an adequate means for pumping up your tires is one of the advantages gained with the use of an air starter. The spring starter has the advantage of being light in weight, and requiring no effort on the part of the driver, other than a slight touch on the release pedal— as the engine itself winds the

current.

Simplicity, accuracy of design, and efficient service characterize most of the recognized starters. The respective types are constructed of the minimum number of

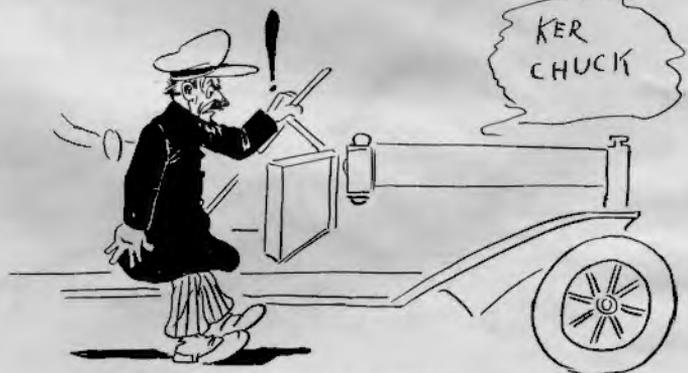


from starting crank

parts to perform their requisite functions, with as little wear as possible, and as much service. Protection of the apparatus from dirt and accidental injury is

as thoroughly worked out as it is on the Ford car itself, and the purchaser of any one of these systems may be certain that his new equipment will last as long as his car, if he gives it the proper treatment in the way of lubrication and attention. With

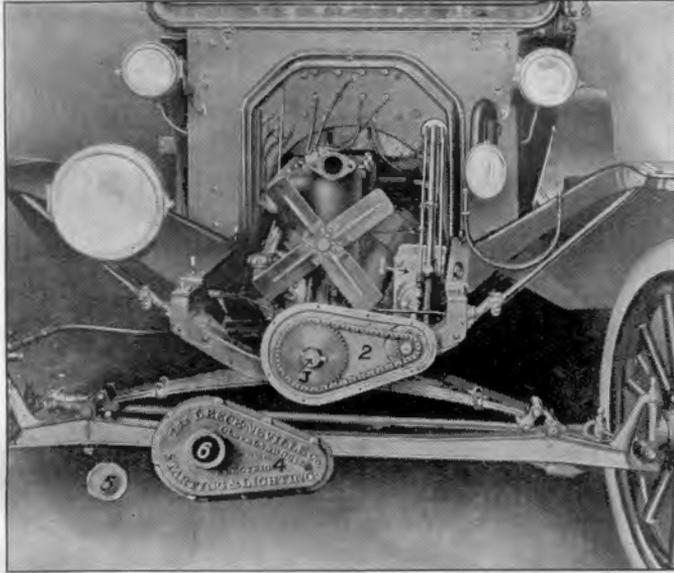
as the engine itself winds the



to spark lever?

spring, once the regular cycle Advocates of the electric of operations is taken up. starter point out that the generator and battery equipment provides a modern and highly satisfactory lighting system, in addition to giving starting service, and at the same time leaves the magneto free and unincumbered to perform its original function of providing ignition

Start and Light Your FORD CAR With the Turn of a Switch



No more cranking
No more dim lights.
No more experiment-
ing with unsatis-
factory starters.

The Leece-Neville

Electric Starting and Light-
ing System can be easily
mounted on your FORD
and will START ALWAYS,
LIGHT ALWAYS, light
from battery while car
stands, light from generator
while car runs.

A system that is fully guar-
anteed, offered to you after
five years of constant ex-
perimenting.

The Leece-Neville Starting and Lighting System consists of a compact motor-generator driven by a silent chain from the crankshaft; battery, wiring, reflectors and bulbs for hood lamps, adapters and bulbs for side and tail lights, dash lamp and hydrometer. Everything is furnished complete, ready for immediate installation. No alterations are necessary to your car.

The action of the starter is simplicity itself. When you desire to start your engine, the motor generator, driven by current from the storage battery, cranks the engine at the rate of 150 revolutions per minute. When the engine fires the motor generator automatically begins to supply current to the battery.

Your car is lighted from the battery when the car stands, from the generator when the car is running. Your lights are always ready—your starter always works.

Here is a starting system so simple—so sturdy, that it will outlast the car. Its construction throughout is the finest possible. Imported ball bearings are used. The silent chain is one inch wide, runs in a bath of oil and will wear indefinitely. Write at once for full particulars.

FORD DEALERS AND GARAGE MEN—

*Don't delay in getting our proposition on this thoroughly reliable, rea-
sonably priced FORD Starting and Lighting System. Make your first
installation now—every sale brings you a new order.*

THE LEECE-NEVILLE CO.

1051 Power Avenue

CLEVELAND, OHIO

the development of the self-starter, and the consequent demand of the prospective purchaser for facts and figures on the performance of his starter, no buyer need fear that he is being used to try out some innovation—or to act vicariously as a testing department for some fly-by-night concern which is marketing a "one-year" article, and which will take refuge behind the bankruptcy law at the first sign of a

such that only the highest grade of materials can be used to give the wear and life demanded by the purchaser, and the outfits on the market to-day represent the highest type of engineering development, followed by careful construction from the materials most completely adapted to the need. Lubrication of moving parts is necessary, the same as it is on all other mechanism, and is provided for by the



The old, old story—"It never rains, but it pours!"

falling off in sales or the first return of a defective starter.

The use of the term "fool-proof" to describe the construction of many automobile parts and accessories carries with it a double interpretation. No machine is entirely beyond destruction at the hands of one who is absolutely ignorant of its application and care, and it is possible for a bungling mechanic to disarrange a starter system, just as thoroughly and effectively as he can an ignition system or a carburetor adjustment. On the other hand, the systems are, almost without exception, constructed so as to be proof against accidental injury or misadjustment through work connected with some other part of the car.

The service demanded of a starter is

proper grease and oil openings wherever attention is needed.

This article is not intended as a discussion of the mechanical details of the various starter systems, nor as a condensation of the instructions for attaching and using—as these would be incomplete without wiring diagrams and attaching blue-prints—but the review will strive to give some of the points to be considered in deciding upon the desirability of that particular type of starter from the demands of the individual owner and his needs. Some cars, for instance, must be started often, as when used for collection and other business purposes, while those owned in the country are run fairly long distances without stopping the motor. Different kinds of starters might solve the cranking

THE EASIEST WAY TO START THE FORD



is the way thousands are now starting their cars. It's also the safest and most convenient. You, your wife, or even your children can start your Ford, every time, from the front seat by simply pushing a pedal with the



MODERN AUTOSTARTER A MECHANICAL CRANKER

This is the simplest, most positive, mechanical starter that has been adopted and is sold at a price well within the means of every Ford owner. No gas, air, springs, electricity, and in fact there is nothing about the Modern Auto Starter to get out of order or make trouble.

It has but one purpose—to start Ford cars surely and with the least possible exertion and expense. That it is successful is attested by the volume of flattering testimonials received from thousands of satisfied users. One customer who has used his original starter on three cars says:

“It's the Greatest Convenience That Can Be Attached to a Ford”

The *Modern Auto Starter* gives the same ease, convenience and safety of operation as an expensive automatic starting system—but without the high cost, added weight and costly upkeep. It can be quickly and easily installed on any Ford, with practically no alteration; and once installed, it keeps itself in order.

Get this starter—and get the utmost out of your car. Avoid the chances of a sudden back-fire and a broken wrist or other painful injury. Start your Ford the modern way.

As the “Modern” is the oldest mechanical starter now being sold, it will pay you to write for our circular telling about the actual experiences of some of its users.

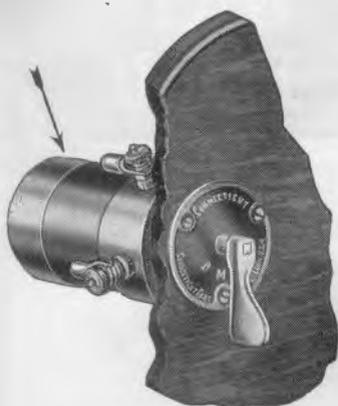
Order from any first-class dealer or

MODERN AUTO STARTER CO.

1507 MICHIGAN AVE.
CHICAGO, ILL.

DEALERS: We still have some good territory open for reliable aggressive agents





CONNECTICUT

Master Vibrator

Absolutely dependable at all times. Requires adjustment but two or three times a year. Small, neat, compact—fits flush with dash.

Makes Your Ford Like a Six Cylinder

A "Connecticut" Master Vibrator on your Ford will give you increased power—insures easy starting—a smooth running engine—freedom

from frequent adjustment of coils. It will give you real magneto service at lowest cost—give you more current for your lights.

Convincing Proof From Satisfied Owners

"The Ford master vibrators which I bought from you last season" writes Don C. Pratt, of Bainbridge, N.Y., "are all working good. Last season I put four of your master vibrators on Ford cars, and if the parties that own same could not get another, you would have to buy car and all in order to get them back."

"Please send me another master vibrator by express," writes Walter C. White, of Loch Arbour, Asbury Park, N. J. "I would not be without the one I am using on the Ford car for twice the price. I am very much pleased with it. It does all you claim it will."

Reasonable Price—Definite Guarantee

The Connecticut Master Vibrator is thoroughly made and dependable, yet the price is only \$9.00—which places it within reach of every Ford owner.

We will refund the amount paid us on any Master Vibrator which may prove unsat-

isfactory if returned to us within thirty days from date of purchase.

We will, at any time, repair or replace without charge, any Master Vibrator returned to us on account of defects in material or manufacture.

Write for full details. Ask for Bulletin No. 101M

CONNECTICUT TEL. AND ELECTRIC COMPANY, Inc.

MERIDEN, CONNECTICUT



Ever since
mother nature made the
first Grasshopper,
she used the
principle of

CONNECTICUT

Shock Absorbers For Ford Cars

Two arms working at an angle with each other, and checked by a power similar to springs such as muscles and tendons. Your elbows and knees work on that principle. Give your car the same advantage.

Equip it with real shock absorbers—the same type as used as regular equipment on such cars as Pierce Arrow, Haynes, Kissel, etc.

Easy to apply. Finished in black enamel to match Ford Cars.

Complete Set (3)—With All Fittings, \$15.00

Write for Bulletin No. 100S

CONNECTICUT SHOCK ABSORBER CO., Inc.
MERIDEN, CONNECTICUT

problem for cars in as widely differing circumstances as these, or one type might serve both.

Of the requirements of any individual owner, the local Ford dealer is probably the best situated to make the most applicable recommendations, as he is posted on road conditions in his district, and can forecast the kind of service which each starter is most likely to meet at the hands of the various owners in his district. In most cases the dealer is also the man who would have to install and look after the

starter, and his facilities for this service ought to enter into the consideration of the starter to buy—though this is merely for the convenience of any possible repair, as many self-starters are owned and successfully operated in districts where the owner is the only one who is available for either attaching or repairing. Whatever the starter selected, it ought not to be expected to see that the fuel tank is filled, the battery kept in order, or any of the other things which naturally fall within the duties of the car owner.

Some Popular Starting Systems

THE LEECE-NEVILLE SYSTEM.

This starting and lighting system for Ford cars is, in the most elementary consideration, made up of an electric motor-generator and a storage battery, together with a starting switch and one for controlling the lighting current. With the mechanical part is also furnished a set of lighting fixtures, consisting of insulated wire for the leads, reflectors with bulbs for the head lights, adapters and bulbs for the side and tail lamps, and a new meter or dash lamp. All necessary bolts, brackets and attachments for mounting come with the outfit, as do covers for the drive and a hydrometer with which to test the specific gravity of the acid in the battery.

All parts are constructed in the most sturdy manner, and are designed to stand continual use for years. Imported ball bearings are used in the motor-generator and in the first bearing in the chain case.

A cradle under the steering post carries the motor generator, between the engine crank case and the body frame. This cradle is bolted to the case and to the frame, without necessitating the boring of any new holes. It is merely necessary to remove the old bolts, and substitute newer and longer ones. The chain case is mounted on the front of the car by removing the bearing that holds the front end of the motor. The chain case replaces this bearing, being retained by the old clip bolts of the former bearing, which are used to fasten the case to the front cross frame.

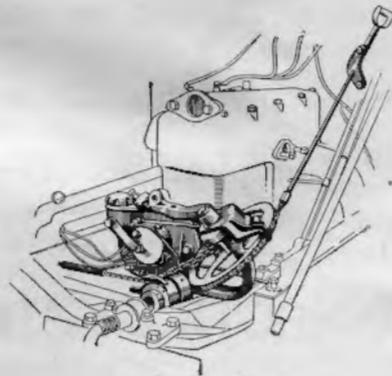
To replace the starting crank a short piece of shafting is connected to the engine shaft and on this is mounted a large sprocket, acting as the driver when the generator is being used to charge the battery, and as the driven gear when the motor is being turned over for starting. A second sprocket is

fitted onto the end of the motor-generator shaft, and, with the first sprocket, completes the connection between the starter and the engine. The battery is located on the running board of the car, where it is always accessible for testing during charging and at the same time protected from damage from road shocks.

This starter has been thoroughly tried out, and the arrangements now being consummated by The Leece-Neville Co., Cleveland, Ohio, the manufacturer, assure the Ford owner that it will be an easy matter for him to get this new equipment if he so desires and to have at his command expert advice and efficient aid when he installs it, and when he desires to learn more concerning its working.

THE BOSTON STARTER.

Many owners are satisfied with the physical method of starting the engine, but do not like to have to leave their seat to do so. Neither do they feel the necessity of spending the amount of money involved in the purchase of an electric outfit to escape the



The Boston Starter

crank task. To meet such a demand, the Boston Starter, made by the Automatic Appliance Co., Boston, Mass., is designed to

HALLADAY SHOCK ABSORBERS FOR FORD CARS

The "Goat"

Greatest Little Trouble-Taker on the Road

Mr. Car Owner—there are a hundred devilish jolts waiting to play havoc with your backbone the next time you take a long ride. Every jolt means a mashing of cartilage and a yanking of delicate nerves. It is a smash-up in miniature. That is why you get a lame back after a long run.

You don't need to stand for the jolts. Let the Halladay Shock Absorber be the "goat" instead of your backbone. The Halladay is made especially to take and **kill instantly** every shock, before it can be transmitted to the body springs.

Save your eyes, your nerves, your backbone, by installing a Halladay Shock Absorber. Put your car in the Packard class of easy riders.

Install the Halladay and forget that there are poor roads.



The Halladay Shock absorber combines features that no other form of absorber contains. It works directly over the axle, thus absorbing the shock instantaneously. The action on the springs is **direct**—no cramping nor binding. Springs are packed in grease and will lubricate automatically. Dustless, leakless, handsome. Strictly high quality. Guaranteed.

Saves car, reduces tire expense one-fourth to one-third. Applied in 20 to 30 minutes without machining.

Sold you at our risk; returnable and money refunded if not satisfactory.

**\$7.00
Per Pair**

front or rear.
\$12.50 for set of four. Send today under our absolute guarantee.

Dealers' Terms.

Excellent dealers' terms. Write for particulars.



L. P. HALLADAY CO.

Dept. 102 STREATOR, ILL.

transmit the cranking work from the front of the car to some point within the front body section, so that the engine can be started by the driver, while he is still seated before the wheel.

This end is attained through a special attachment which is placed within the space



Boston Starter Mounted

between the motor and the radiator, and which does not interfere with the regular starting crank. The mechanical arrangement of the starter is laid out to take the work of starting from the crank, and, through a suitable reduction—by means of a stepped pulley—put it where the driver is able to exert a greater force with less muscular effort. The pull-up handle projects through the dash near the steering column, so that it is possible for the driver to brace his feet against the foot boards and exert many times the force necessary to turn over the motor—at a much more advantageous purchase than can be obtained standing on the road in front of the car.

A light spring provides for the return of the starter to the "ready" position after the engine has been set in motion, so that it will clear the space in the body. The starter is provided with a safety device which absolutely prevents injury through a back-fire, and insures the driver against one of the commonest forms of accident—a fractured bone or sprained wrist from a car which was started with the spark advanced. The Boston Starter is also provided with an automatic spark retarder, so that, unless adjustments have been maliciously tampered with, it is impossible to turn

the motor over with the hand lever when the spark is in any other than the proper position.

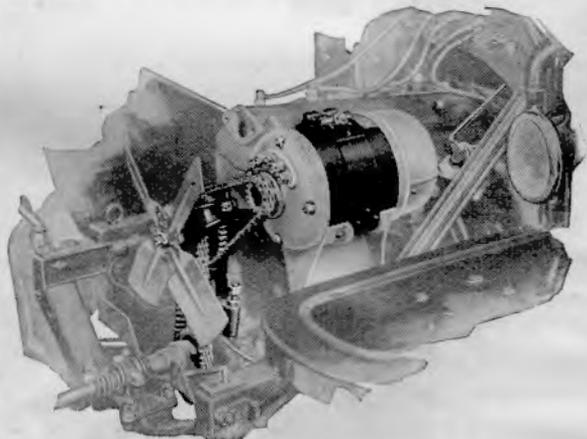
The starter can be installed by anyone, and adds to its convenience the additional advantages of being light and of requiring but little space under the hood for its placing.

THE NORTH-EAST SYSTEM.

The starter outfit consists of only a few simple parts; one motor-generator which takes care of starting, lighting and charging the battery; a starting switch; a three-button lighting switch; necessary brackets for mounting on the engine; chains and sprockets; and the necessary cable and electric bulbs and reflectors for electric lighting.

It is what is known as the one-unit type—that is, one motor-generator takes care of both starting and lighting. When the starting button is depressed the current from the storage battery operates the machine as a motor to crank the engine and after the engine picks up the machine automatically operates as a generator and charges the battery. The drive is direct from the armature of the motor-generator to the crank shaft of the engine at a reduction of 3 to 1. There are no gears whatever used in connection with the system.

The system will spin the Ford engine in all kinds of weather between 200 and 300 revolutions per minute by merely pressing the foot pedal, which is located on the dash. The battery is charged and discharged at its normal rate—the motor-generator taking such a small amount of current in starting



North-East Unit

that it takes but a very short time to bring the battery up to a fully charged condition again, and by means of automatic regula-



PAINT YOUR OWN CAR

We furnish a complete outfit with full directions for doing a fine job at the following prices:

Outfit for painting both Body and Chassis in black, \$5.00
Outfit with Chassis in black and choice of six colors for Body, \$5.75

NORWESCO

Ford and Small Car Painting Outfit

Contains one can each of the following:

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| Body Color Paint | Body Color Varnish |
| Black Chassis Varnish | Mahogany Dash Stain |
| Top and Hphol. Dressing | Engine Enamel |
| Brass Enamel | |

And Three Brushes and Four Sheets Sandpaper

Ask your dealer or write direct

The Northwestern Chemical Company
 Marietta, Ohio

tion which is located within the motor generator the battery is never charged at an abnormal rate.

The equipment is so complete and simple that with an ordinary set of automobile tools any Ford owner can install the same. There are no holes to drill, no cutting or carving of any kind to be done.

THE MODERN AUTO STARTER.

This device, made by the Modern Auto Starter Co., Chicago, Ill., is a mechanical cranker, arranged for foot power, and is the oldest one in point of continuous manufacture being marketed today. The motor is turned over by means of a foot pedal placed conveniently in front of the driver's seat. By means of a steel cable attached to a ratchet arrangement, which is in turn attached to an extension of the crank shaft through the radiator, pressure on the pedal will turn over the motor past one compression point. This starter is made only for Ford cars, and during the last five years some users have shifted the starter to as many as three different cars, and are still getting service from the device.

This starter is very simple to install, and its parts, all constructed from materials of the highest quality, are such that they can be replaced by anyone, in case of accidental damage or breakage. The extremely light weight of the outfit, coupled with the leverage gained through the foot pedal, make this a favorite with Ford owners who desire to escape the unpleasant operation of cranking. The method of starting finds special favor among women drivers of the Universal car, as it leaves them with their hands free for steering at all times. The illustration shows the small amount of space taken up by the "Modern", and also emphasizes the point that it is not necessary to dismantle the car to install it.

THE CHRISTENSEN AIR STARTER.

One of the starter systems embodying some other advantage besides that of eliminating cranking is the air-operated type. The Christensen Automatic Self-Starter Sys-

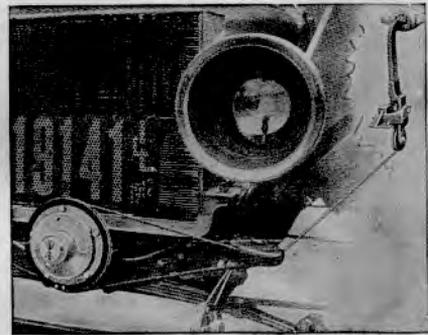
tem is of this design. As the accompanying illustration shows, the installation consists of an air cylinder of seamless pressed steel and a piston with a chrome vanadium rack, working over a pinion connected to an automatic clutch. This latter, through a sprocket and chain, turns the engine over through four compression strokes with one stroke of the starter piston. The same sprocket and chain serve to drive the compressor when necessary. This is thrown into service by means of the automatic clutch when the air pressure drops below a certain limit, and is disengaged in the same manner when the pressure rises to the predetermined maximum. All compressions are controlled through the selec-

tor valve, which is located on the dash, within the scope of observation of the driver.

This system also embodies a means for inflating tires, in which the compressed air, instead of being taken from the pump directly, is drawn from the storage tank, giving a quicker inflation than could be obtained with the engine, and without requiring that the motor be run for that purpose



North-East Installed



Modern Mechanical Starter

alone. The storage tank is located under the body of the car, and takes up but little room. The entire apparatus weighs only thirty-five pounds, and is so simple that it can be mounted and placed in a very short time by any experienced mechanic.

Mr. Ford Owner:



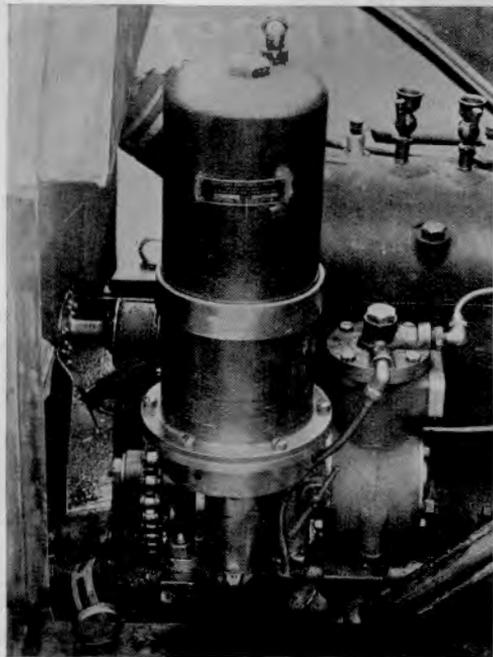
If quality and workmanship counts in securing continued satisfactory results buy **MOSLER SUPERIOR** manufactured strictly to Ford Motor Company orders and their Blue Print T 1386 endorsed by their leading engineers and our experts.

THIS COUPON IS VALUABLE
We will furnish three plugs for \$1.00
—only on receipt of this coupon,
and, any additional at 75
cents each. See
equipment Review
Section.

A. R. MOSLER & CO.
NEW YORK

THE FISHER SYSTEM.

This lighting and starting system has been designed especially with the object of in-



Christensen Air System

stalling it on Ford cars. The entire apparatus was first thoroughly tested on cars belonging to the manufacturer, and then placed in the hands of other Ford owners for further observation and testing before being offered for sale.

The principal unit of this system consists of a motor and a generator, mounted one above the other in a compact casing, the motor serving to start the engine and the generator to store current in the battery while the engine is running. The motor is therefore designed to give its highest power output under the heavy starting condition, and may be fitted for this without having to contain provision for other functions after the engine is started.

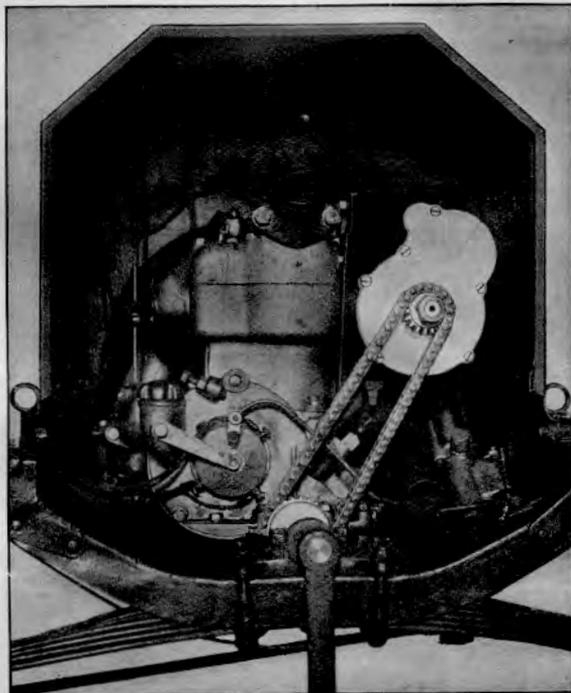
An automatic release on a positive locking clutch provides for the disengagement of the motor the instant firing begins in the engine cylinders, and thus relieves the apparatus as soon as possible, making for long life and economical usage. The armature of the generator is permanently connected to the shaft of the engine, so that it is turning and ready for generating current all the time the motor is in use. Ball bearings are used on

both armatures and closest attention given the design of the electrical parts.

To attach, it is necessary to remove the hood, radiator, water tubes, fan, starting crank, fan pulley on the end of the crank shaft and one of the bolts clamping the oil pan to the base of the engine. The driving sprockets are placed in position and firmly attached, one on the engine shaft and the other on the generator shaft. The bracket is firmly fastened in place with three bolts and the tension set-screw in the arm adjusted so that it will take the force of the starting pull and so relieve the chain from unnecessary loading.

After placing the lighting and starting unit in place, the chain is put around the sprockets and the connecting link properly cottered. The adjusting screw under the unit is then shifted to bring the proper tension on the chain, and the motor used to start the engine a few times. The chain is again tested for tightness, and everything inspected to see that lock nuts and cotter pins are in place and properly fastened.

A pint of grease put into the chain case at the time of installation will serve for lubrication purposes for a long time, and the only other care required is seeing that a few drops of oil are put into the upper and lower bearings on the commutator ends of the lighting and starting unit.



Installation of Fisher System

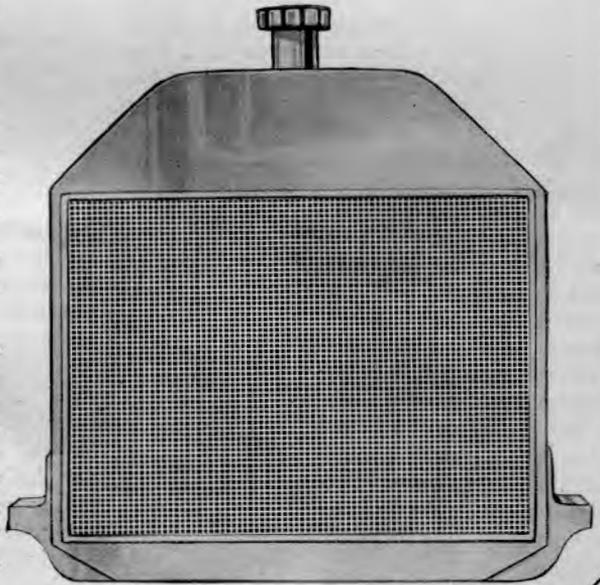
A Genuine FEDDERS for Ford Cars

Thirty Leading Car Builders Confirm Your Judgment

THE new Fedders Radiator is the finest radiator offered for Ford Cars. This means you can now buy as efficient a radiator for your Ford as that used on "some of the finest cars in the country for which we furnish radiators."

Thirty leading car manufacturers use the Fedders for regular equipment and many others have put their stamp of approval on Fedders construction. You can get the benefit of their experience, the critical examinations and tests by their engineers, simply by getting a radiator bearing the name Fedders.

The Fedders costs more because it is better. The difference in price is well spent because it insures you permanently against all overheating troubles. It guarantees that your motor will never be damaged by poor cooling. It will save its cost many times over in gasoline, oil, repair expense and increased life for your motor.



We use a pure copper core—more expensive but worth all it costs. The cooling capacity is so great that you can forget your fan and fan belt.

Fedders honeycomb construction is a standard of quality by which others are judged. It is a REAL honeycomb, with the efficiency, strength and durability which only a REAL honeycomb can give.

Price . . \$35.00

*Write today for full particulars.
Special proposition for dealers.*

Fedders Mfg. Co.

Buffalo

New York

FEDDERS MFG. CO., 55 TONAWANDA ST., BUFFALO, N. Y.
Gentlemen—Please send me full information and prices on the Fedders Ford Radiator. (If you are a dealer, please enclose letterhead or billhead.)

Name
Address
City

Equipment Review

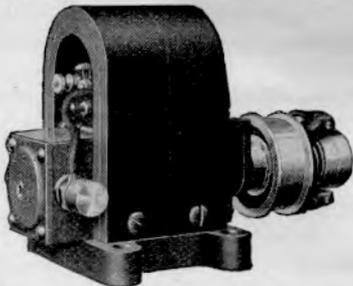
What is new and good in Ford equipment? What are the advantages claimed by the manufacturer and with what degree of approval is the new accessory likely to meet the owner's crucible test.

ELECTRIC LIGHTING SET.

With the object in view of providing a simple and thoroughly reliable lighting outfit for Ford cars that would in no wise affect the car operation through danger of short circuits or the use of an undue amount of current from the Ford magneto, which the manufacturers say never was designed for lighting purposes, the Henricks Novelty Co., Indianapolis, Ind., manufacturers of electrical equipment for many years, have produced an improved Ford lighting outfit which they guarantee in liberal terms.

The generator recommended for Ford cars is the small one known as the B. C. 2 when used with a storage battery. This machine charges a storage battery at 5½ amperes, giving current for 30 to 35 C. P., which is sufficient for head lights and tail lights. The cut out is actuated by the centrifugal governor and is therefore, not in any way interfered with by excessive vibration or otherwise. This same governor also controls the speed so that the maximum speed of the generator is constant. That is, it never charges the battery over 5½ amperes, no matter how fast the car is driven.

The cut-out is very simple. It is made in the form of a switch. The centrifugal force acting upon the governor balls closes the switch when the generator is producing the proper voltage to overcome the battery volt-



age. Of course this switch is opened when the motor stops. There is absolutely no danger of draining the battery by back-flow. Neither is there any danger of over-charging the battery.

Special lamp outfits to suit the car owner's tastes may be obtained with the generator and battery, giving an electric lighting set that will at all times insure a light when

desired, whether the engine is running or not, and that will make night driving over strange roads as safe as a trip over the well-known highways in daytime.

REAR VIEW MIRRORS.

Driving on a crowded road, with the top up, it is often desired to look to see what is coming up from behind. The same thing is necessary at a congested street crossing,



when it is desired to back slightly for some traffic disturbance. To do this, it is necessary to lean from the car and try to get sufficient outlook to the rear to enable the driver to move his car. As a means of simplifying this, the Kales-Haskel Co., Detroit, Mich., is offering a "Hind-View" Auto Reflector, which may be attached to the windshield frame or mounted on the front fender as desired. By means of a special ball joint, it is possible to adjust this attachment at any desired angle, without the use of any tools. This same company is marketing the "Ka-Ha-Co" horn, furnished complete with cable and push button, for locating on steering wheel or wherever convenient; thus offering a very effective and complete battery horn of a style to appeal particularly to Ford users.

This equipment is furnished in several finishes and combinations to match the car trimming, and makes an attractive addition to any car.

BATTERY ELECTRIC HORN.

To provide Ford owners with an electric horn which will be durable, reliable, and economical of current, the Axwell Equipment Co., Pittsburgh, Pa., is marketing the Axwell horn. This may be attached at the owner's wish on the body of the car, or under the

FOUR LIVE ONES

COMFORT, SERVICE and ECONOMY



Fordezer

A shock absorber for Ford cars, in which is combined the best of material and workmanship, regardless of price.

The only Ford shock absorber with all moving parts heavily bushed to prevent wear.

The only Ford shock absorber made of drop forgings throughout except the springs, which are the finest quality vanadium steel.

The only Ford shock absorber that is absolutely dust-proof.

Not only the best but also the cheapest.
Price per set of four.....\$15.00



Briggs & Stratton Master Vibrator

The most perfectly balanced and best constructed vibrator on the market.

Points of the highest quality Platino-Iridium, 60% larger than those in common use. So perfectly balanced and sensitive in operation that your motor will run on the least possible volume of current and work perfectly under conditions in which other vibrators would fail absolutely.

Covered by an unlimited guarantee of perfect service and backed by one of the most powerful companies in the accessories business.

Price each, with switch and all connections ready to install.....\$10.00



Dean Regulite

A bulb saver for Ford cars. Controls the current delivered to the lamps and prevents burning out the bulbs, by maintaining a constant voltage, regardless of motor speed.

Enables you to use your Ford magneto for lighting without interference with the ignition.

All the benefits of a lighting dynamo, at the cost of the Regulite.

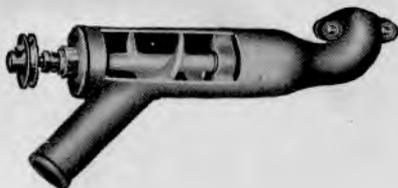
Price, complete with switch.....\$3.50

Dean Speedolite

The Speedolite consists of a Regulite equipped with a lamp for illuminating a speedometer and may also be used as a pilot to indicate whether or not the head and rear lights are working properly.

Price, complete with Regulite, switch, lamp fixture, bulb and cable.....\$5.00

Ford Water Circulator



Not merely a convenience, but an absolute necessity to insure proper cooling of a Ford motor.

Prevents boiling the water and over-heating the motor, by forced circulation of the water in proportion to the motor speed.

Can be installed by anyone in less than an hour with no tools but a wrench.

Price complete.....\$10.00

The above accessories are all covered by absolute guarantees of perfect satisfaction, and backed by companies of the highest financial standing.

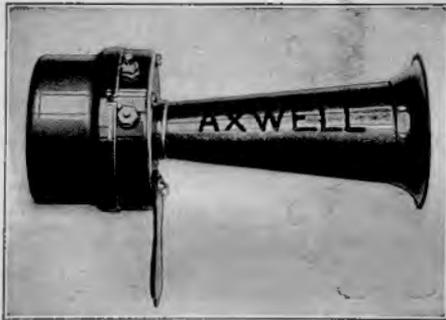
FULTON - McCUTCHAN CO.

1514 MICHIGAN AVE.

CHICAGO

When writing advertisers—Just say FORDOWNER

hood, as is most convenient. Believing that the magneto should not be taxed for any work other than producing current for ignition purposes, this horn is operated from a dry-cell current source, the sound being controlled by a push button, which may be placed on the steering wheel, steering post, on the body at the driver's left, or wherever it is found to be most convenient. The elec-



tric signal is much more effective than the bulb warning, carries better, and demands instant attention of the pedestrian or teamster. At the same time its tone may be modified to giving a low warning note for city driving. The company manufacturing the horn also puts out a special brake lining for Fords, which has proven of the quality

which results in repeat orders and satisfied users.

LIGHTNING AUTO REPAIR KIT

The man who really enjoys driving an automobile is the one who understands it thoroughly, and who instantly detects any irregular action, whether it be in the motor, gears, brakes or any one of the number of parts making up a perfect machine. Half the comfort in driving, as in doing anything else, is being master of your job. We have all noted the timid, shrinking man, whose touring consists of trips around the block in which is located a thoroughly efficient repair shop—too fearful of meeting the unexpected to venture far from home.

Again, we have observed the strong, confident master of the car who seemed to be actually a part of the machine, so promptly did he perform the necessary functions of a controlling power. This is the man who actually drives his car and who is able to cope with emergencies. For this man is designed the Federal Lightning Auto Repair Kit, consisting of 16 taps, 16 dies, two stocks and two tap wrenches. Arrangement is made with special reference to screw threads found on the Model T Ford, and provides for promptly straightening out jammed, mashed or stripped threads. The illustration shows open case which, when closed, reduces to a size $9\frac{3}{4} \times 6\frac{1}{2} \times 1\frac{1}{4}$ inches, weight $2\frac{1}{2}$ pounds.



Extending the car's usefulness through employment of Sherwood Trailer

Avoid Wheel Troubles Eliminate Tire Terrors

Put on your car a set of SCHWARZ WHEELS with DEMOUNTABLE Rims. Made specially for FORDS.

SCHWARZ WHEELS are universally known to be the best, strongest and safest. All the high-grade, higher priced cars are equipped with them. Because of their special construction, with dovetailed, interlocking spokes, they will withstand strains which will collapse the ordinary wheel. "SAFETY FIRST" is a call for Schwarz Wheels.

Every Ford owner can have a set of Schwarz Wheels equipped with Stanweld Demountable rims for 30 x 3½ tires, and one extra tire rim, at an insignificant cost.

The wheels and demountable rims can be applied to the car, simply by taking the hubs off the old wheels and putting them in the new ones. Anyone can make the change in an hour's time. No wheelwright is needed. No special tools required. No tying up of the car.



Each set consists of four wheels, complete with Stanweld Quick Detachable Demountable rims for 30 x 3½ tires, one extra tire rim, one brace wrench, and 24 hub flange bolts. The wheels are bored to exact size for hub, and with flange bolt holes drilled so that they are ready for immediate application to the car.

The wheels are made of the best carefully selected hickory throughout, and the wheels and rims are fully guaranteed.

Beautifully painted, striped and
varnished—

\$30.00 per set, complete

FORD OWNERS: Place your car on a parity with others by putting on a high-grade wheel and demountable rim equipment. The gain in safety will be fully worth the investment. The saving in tire convenience, and the increase in tire life will be all profit.

FORD DEALERS: Get your share of this business. This is a Ford specialty for which there is great demand. Every Ford owner will be interested. Write to-day for our special proposition.

The Schwarz Wheel Company
Frankford Philadelphia Pennsylvania

SPARE DEMOUNTABLE WHEEL.

The annoyance of road tire changes is eliminated to a considerable degree through the invention of a man who has made Ford conveniences a long study. By the provision of a spare demountable wheel on which is carried a tire all blown up, and which is interchangeable with all the wheels now in use, a rapid change can be made by anyone at any time. The Angier spare demountable wheel, offered by Angier's, Streator, Ill., comprises an outfit of all the necessary parts to make the present wheels interchangeable and demountable, and an extra wheel.

The Ford uses two size tires for good scientific reasons, but when inflated both front and rear wheels are the same diameter from the floor to the top—30 inches. It is through a utilization of this fact that Angier's spare demountable wheel is made practical, and that the idea is much appreciated

is demonstrated by the fact that this extra wheel is carried on Ford cars used by the police and fire departments of Detroit, and by many commercial houses where the light and satisfactory Ford is employed. One foreign Ford dealer, located in far off South Africa, has purchased more than 200 of these spare wheel outfits since they were first put on the market, and continued orders would seem to prove they are giving great satisfaction.

The illustrations show an eight-year-old girl making a "quick tire shift" with this equipment, and in the small diagram is made clear the means provided for slipping the wheel over the hub without disturbing the bearings or even removing the hub cap.

The whole principle of the Angier spare demountable wheel, as adapted to the Ford, is made very clear in an attractive booklet offered by the manufacturer and sent upon request to any Ford owner.

REPAINTING THE CAR.

(Continued from page 18)

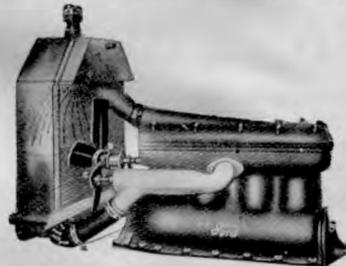
the paint, when in reality they are traceable to carelessness on the part of the painter.

A few minutes spent in retouching the spots where the old paint has been entirely removed will help inestimably in the appearance of the completed job, as the touched-up spots then will have a backing similar to that on the remainder of the car. The actual painting will depend upon the directions furnished

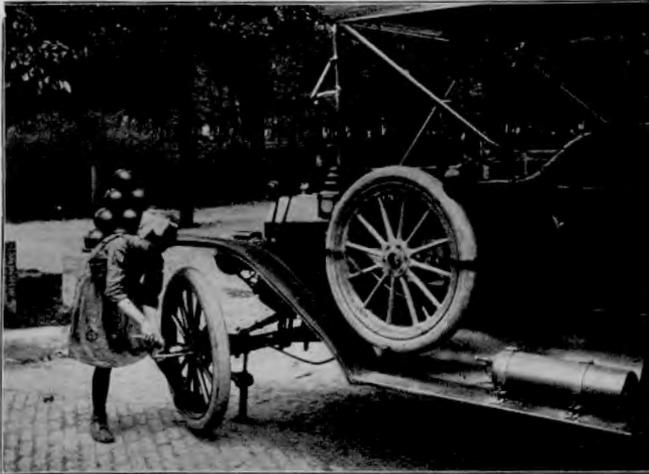
by the paint manufacturers—and the closer these are followed the better will be the job when completed. Care, close attention to directions and a little common sense, combined, will give any car owner all the technical painting knowledge necessary to produce a highly creditable piece of workmanship, and enable him to again ride forth serene in the knowledge that the appearance of his car reflects credit upon him and his skill.

AUTOMOBILE EQUIPMENT.

Featuring an extensive line of parts and accessories, the Fulton-McCutchan Co., Chicago, Ill., factory sales agents, are including several meritorious Ford specialties. A master vibrator, an auxiliary water circulator, shown in the accompanying cut, a regulator



for headlights when operated on the magneto circuit, a speedometer lamp, shock absorbers and auxiliary springs for rebound deadeners, ignition systems, accelerator pedals, license brackets, spring repair blocks, tires, tubes, and headlight sets are among the parts listed. The sales are made only to manufacturers and jobbers.



FORD OWNERS

Prevent Accidents by Using

"HindView" Auto Reflectors

and

"Ka-Ha-Co" Electric Horns

Style A Reflector with Bushings for Ford Cars—All brass, all black or black arm and brass finish and plain mirror, \$2.75; same, and lens mirror, \$4.00; same, all nickel finish and plain mirror, \$3.25; same and lens mirror, \$4.50; same, black arm and nickel finish and plain mirror, \$3.00; same and lens mirror, \$4.25.



Style A With Bushings

Horn—All black, black and brass or black and nickel—\$5.00



Either or both—Reflector and Horn—shipped via parcel post on receipt of money order or draft. Address Dept. F.

The Kales-Haskel Company

443-459 Lafayette Blvd. Detroit, Mich., U. S. A.

DEALERS!! Attention!!!

AXWELL BRAKE LINING

USED ON
FORD CARS

THIS PACKAGE
Increases Your Profit On
BRAKE LINING
50%



NO EXTRA CHARGE
For Printing Your Name
on Carton
Lots of 1000 or Over

This carton contains 2'-1 1/8" x 1/2" Axwell Brake Lining, 8 Bevel Pointed Copper Rivets—Outside Dimensions of carton 4" x 3" x 1"

Samples on request—Free



Axwell Equipment Co.

New York
Chicago

421 Wood Street
Pittsburgh, Pa.

Cleveland
Detroit



When writing advertisers—Just say FORDOWNER

COOLING WATER CIRCULATOR.

Long hills, where the road conditions are such as to preclude the use of high gear, will try out the cooling systems of your car to the utmost. Nothing is more annoying than to find the circulation inadequate to the demand. Dirty water, or water forming scale, will soon tend to decrease the natural thermo-siphon flow of the water, and the car soon gets to boiling over on hard pulls, and necessitating stops while the engine is cooled.

To increase the speed of circulation in the cooling system, the Pittsburgh Manufacturing



Co., Pittsburgh, Pa., has developed its Kern water circulator. It is a simple two-bladed propeller mounted in the water intake manifold and driven from the fan pulley. The device is built of a section of seamless steel tubing the same size and length as the lower water pipe of a Ford car. The propeller shaft is mounted on hollow self-oiling bronze bearings with a body of grease between. The water cannot leak out and there is no packing to wear out. Propeller case, which runs from body of circulator, is filled with grease between bearings, from grease cup, and this grease acts as a packing in these hollow bearings. The centrifugal motion from propeller shaft keeps the grease packed solid in shell of propeller case.

"JUMBO" MASTER VIBRATOR.

Master vibrators as a means for providing a uniform or synchronized spark have come into wide use on Ford cars. The speed at which engines of the Ford type run under normal conditions, and the hard wear to which all parts of the Ford are subjected thru constant driving, are reasons which make it very desirable to thus equip The Universal Car. Having gained considerable experience in the manufacture of Ford specialties, E. Edelmann & Co., 223 W. Illinois street, Chicago, have

developed a master vibrator of substantial size and design to which they have given the name "Jumbo." The manufacturers claim that it is only through their unusual facilities for quantity production that they are enabled to sell the Jumbo Master Vibrator at \$7.50 and the value does, indeed, seem remarkable after close inspection of the instrument itself. This same company is offering, with other Ford specialties, neatly designed and efficient grease cups in Ford sizes. The threads being cut to fit every grease cup hole on any model and to take the place of the spring closing oil cups on the spring bolts and elsewhere with which the car is factory equipped. The advantage gained through the installation of grease cups is that a daily turn of the compression screw will force just enough good grease into the oil hole to keep the car constantly lubricated, and we all know that there's not much pleasure in handling the trusty oil can, and the car frequently suffers neglect for this very reason.

Edelmann Ford grease cups of the size here shown are furnished in polished brass or nickel plated at 15 and 20 cents each, respectively—other sizes at proportionate rates.

SPECIAL FORD OIL SUPPLY.

Cars kept in home garages in isolated places, often several miles from the source of supplies, are sometimes subjected to unnecessary wear through a sudden shortage in lubricant. In a case like this it is common practice to run to the nearest repairman or dealer, and there replenish the supply. To obviate this, and to give the Ford owner a stock of good oil at all times, the Marshall Oil Co., Marshalltown, Ia., is marketing a special Ford outfit of drum oil, and faucet, which makes an ideal oil storage and protection for the man who lives in the country. Often, too, the man in town can get this drum of oil and save money over what he now pays in smaller lots,—without the assurance that he is getting a suitable lubricant, as he would be were he to order the special Ford grade.

DASH OIL GAUGE

Have you had your car a year? In that time, how often have you tested the height of oil in the engine crank case? Or have you trusted to luck, and poured in a lot every month or two, let the car smoke for a few days, and then slowly use up all the oil you have put in? True, it is a nuisance





Ford Owners

Big Car Luxury is now a reality with E. Z. Rider Shock Absorbers. They save the jars and bumps of rough roads and wear and tear on the car and engine.

Save upkeep expense and tires. Do not interfere with the control of car

TRY E. Z. RIDER ^{SHOCK} ABSORBERS 10 DAYS

We want to send every Ford Car Owner a set of E. Z. Rider on 10 days' trial. If not pleased, return E. Z. and receive your money back. Once you know E. Z. you'll never drive without them.

Dust proof, trouble proof, long wearing, fully guaranteed. Set weighs only 18 pounds. Easily and quickly installed — you can do it, we send all instructions.

\$15 set of four (front and rear) f. o. b. Cleveland

ORDER A SET TO-DAY FOR YOUR FORD

Specify Runabout, Touring
or Town Car

**DEALERS WANTED
EVERYWHERE**

The Forest City Electric Co.

5009 Windsor Avenue

Cleveland, O.

References: Bradstreets
or R. G. Dun & Co.

Please mention
The Fordowner

When writing advertisers—Just say FORDOWNER

to have to crawl half under the fender and test the try-cock, especially when you happen to remember the need for inspecting your oil supply when you are starting out somewhere.

By unscrewing the lower drain cock in the back of the case, and attaching in its stead the Cochran Dash Oil Gauge, you can always tell just the amount of lubricant you have in your motor—and thus relieve your mind of the worry of burned out crank bearings and scored cylinders and pistons. Two dollars, the price of the gauge, is a small insurance premium to pay for engine security, when it will, in addition, remove one of the worst causes of carbon and add many miles to the life of your engine. The Federal Auto Supply Co., Leader Bldg., Cleveland, O., is marketing the contrivance, and will gladly send it for the amount of its price.

GAUGE FOR GAS TANK.

The-Tel-Tale gauge rids you of the trouble of measuring with a stick or branch from the roadside, the amount of gasoline in your tank. The-Tel-Tale goes in the gas tank filler hole, and is never removed. You fill the tank through the gauge. It tells you always just how much you have, and how much you need. With The-Tel-Tale you never need be stuck for gas. Neither will you put dirt in your gasoline, to clog up the needle valve in the carburetor, by measuring with a dirty stick. Write to the Schaefer Sales Corporation, 605 Woodward avenue, Detroit, Mich., for their interesting illustrations and literature describing these devices.



MAGNETO OPERATED HORN.

Ford owners have awakened to the fact that the antiquated bulb-horn and mechanically-operated warning signals are utterly inadequate and a positive menace to safety, and many are modernizing their signaling device by equipping their car with some down-to-date electric horn. Car owners, therefore, now are demanding a warning signal that may be readily operated from a push-button

mounted on the steering wheel or other convenient place.

In the "Hilo," made by the Premier Electric Co., 4041 Ravenswood Ave., Chicago, Ill., it is said the greatest tone efficiency with the minimum current consumption is produced,



because the diaphragm is squarely hit. This perfectly balanced construction of the diaphragm striker makes it possible to have the magnet so designed that it is sufficiently energized to effectively operate the horn by a very small part of the Ford magneto's surplus energy, therefore, it is claimed the "Hilo" does not interfere with ignition; nor can it injure the magneto.

The "Hi-lo" being operated by the magneto, also indicates by its tone whether the coil-vibrators are uniformly adjusted. This makes it possible for the most inexperienced Ford owner to more accurately adjust the coil-vibrators with its use, than can the most expert mechanic without it. Thus it is a great aid in obtaining a smoothly running motor, as well as a good modernized electric warning signal which costs nothing to operate and maintain. The horn, operating only when the engine is inaction, prevents the common nuisance of children or mischievous persons sounding it when the car is unattended.

The cord terminals are enclosed in a metal cap, which makes the horn weather-proof, and properly protects the armature shield and prevents damage from rough handling. Finished in polished brass or black enamel it is said to be one of the handsomest moderate-priced warning signals ever produced, and harmonizes perfectly with the latest model Ford cars.

MOTOR EXHAUST OPERATES HORN.

Warning signals of almost every kind have been devised for the motorist's use and the kind desired or price to pay is left entirely to the car owner's fancy. One type of horn that has always been popular, but up to this

"PRO-TEC-SHUN" SEAT COVERS FOR FORD CARS

Covers the Cushions, Backs, Doors and Top

Protect the Upholstering and make the Car Cool and Clean. Protect your Clothing. Adds wonderfully to the appearance of your car.

READY-TO-FIT IN THREE QUALITIES

Waterproof Drab Jeans give the best service and holds color.

Ford Touring Car 1910, 12, 13, 14	\$17.50 Per Set
Ford Roadster 1910, 11, 12, 13, 14	\$12.00

Brown Mohair the best material used for Seat Covers.

Ford Touring Car 1910, 12, 13, 14	\$22.50
Ford Roadster 1910, 11, 12, 13, 14	\$15.00

Clean-Ezy the latest and dressiest material for Seat Covers, and they can be cleaned.

Ford Touring Car 1910, 12, 13, 14	\$25.00
Ford Roadster 1910, 11, 12, 13, 14	\$17.00

Front Seat and Arm Rests are faced with leather. The neatest covers on the market at right prices. All covers are made from the "Sure-Fit" patterns so we guarantee the fit.

All go on with "Snap On" Fasteners and are easily removed. Black buttons.

Pockets on the doors.
Front Seat Liner, if desired, at a small extra cost.

CAN BE SHIPPED PARCELS POST QUICK SHIPMENTS
THEY ARE OURS IF YOU ARE NOT PLEASED

DETROIT SLIP COVER CO.

10 Hendrie Ave.

[DETROIT, MICH.]



The AERMORE Exhaust Horn

\$5.50 buys our **FORD SPECIAL**

Complete with all equipment for attaching to your car. No batteries, no wires, no rachets, and no movable parts to wear and get out of order. The valve slips over the end of the exhaust pipe behind the muffler, and the horn is turned back beneath the car.

Consider the low price of this horn, and remember that the first cost is the only cost, as there is no expense for upkeep. Economy combined with efficiency, makes it the best accessory that can be put on a car.

The tone is musical, and can be heard a block, or a mile, according to the way it is operated. Horn can be put on by any one in a few minutes. We make horns for all cars. If your dealer does not handle the AEROMORE, order direct from us. Literature furnished upon request.

THE FULTON COMPANY

SOLE MANUFACTURERS

729 NATIONAL AVENUE

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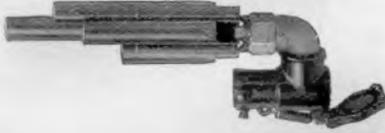
:

MILWAUKEE, WIS.



time well beyond the average Ford owner's reach in point of price, is the signal operated by exhaust from the engine, known as an exhaust horn.

A Ford special exhaust horn is now being put out by the Fulton Co., of Milwaukee,



Wis., under their well known trade name—Aermore exhaust horns. This Ford size horn is of the same construction as their regular auto horns, but is only 10 inches in length. Special fittings are furnished to fasten the horn on the exhaust pipe just behind the muffler and the horn is turned back beneath the car—out of the way and out of sight.

At the driver's will a clear-cut, musical note of warning is sounded and there's nothing to get out of order or wear out. The Aermore Ford special exhaust horn is sold at \$5.50 complete.

LAMP, LICENSE, TIRE HOLDER.

A solution of the problem of spare tire carrying on Ford touring cars or roadsters has been worked out in a very satisfactory way by a leading manufacturer. This is accomplished through a cleverly designed rear tire holder which bolts to the frame and provides a neat non-chafing and locked carrier for one tire of each size or for a single tire, as desired.

This tire holder is of pressed steel construction, black enameled, and provides a snug cradle from which the tires cannot be removed without the owner's knowledge. In addition, the number plate holder and lamp

bracket are made a part of the tire holder itself—thus simplifying the equipment on the rear of the car.

One other feature of this carrier, which is shown in the accompanying illustration, is that a protecting shield is affixed to the lower half on the muffler side of the car—thus preventing harm from the constant spraying of oil and soot from the exhaust over the spare tires.

The Sly perfect holder is marketed through Smalley Daniels, Detroit, Mich., and is now on sale in all leading accessory establish-



ments and Ford dealers. The price for the double holder, ready to attach, is \$5.50.

FORD GASKET ASSORTMENTS.

Specialization in the manufacture of certain parts that enter into motor car construction, has placed many manufacturers in a dominating position in their particular line of endeavor and enabled them to turn out a highly perfected article in great quantities. Many years ago the Victor Mfg. & Gasket Co., Chicago, offered their gaskets to automobile builders and gained recognition as reliable producers in this field. One car builder

STYLE D



Open



Closed

TUCKER'S OILERS

For Ford Cars, open with Spout of Oil Can

SELF CLOSING

Set of thirteen oilers:—Four for the Steering Gear; Eight for Spring Shackles; One for the Commutator. Mailed postage prepaid on receipt of money order, cash or check.

STYLE D—Full Set - - \$0.50
 STYLE G—Full Set - - 1.00

Ford Agents send for discount.

W. N. & C. F. TUCKER
HARTFORD CONN.

PAT. PEND.



Closed

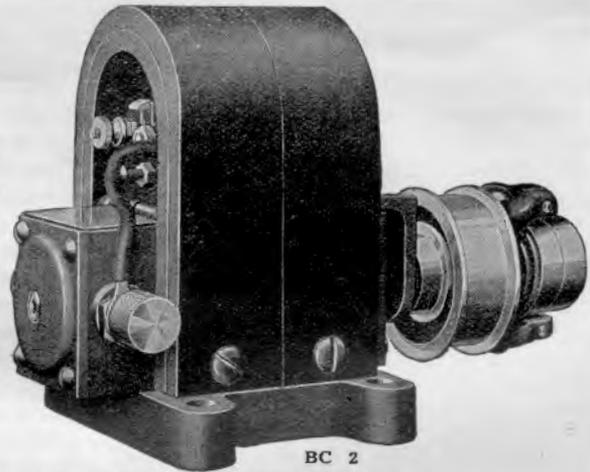
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Open

When writing advertisers—Just say FORDOWNER

The Light That's Right Eureka Lite



The fact is with our Eureka,
You can light almost any old
car as light as day, but you
can't afford to light a Ford in
any other way.

LOW COST---HIGH EFFICIENCY

Used with or without storage battery

- ☞ Special attachments for Ford, Maxwell and other cars.
- ☞ Prices \$20.00 and up, according to capacity required.
- ☞ Large profit to dealers. ☞ *Write for particulars today.*

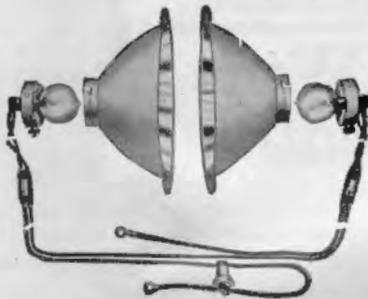
HENRICKS NOVELTY COMPANY

1294 St. Paul Street

INDIANAPOLIS, INDIANA

BETTER FORD HEADLIGHTS

AT A PRICE YOU WILL GLADLY PAY



Here's a brand new idea in the construction of reflectors for FORD Headlights, where electric lights with current from magneto are used to replace unsatisfactory tank system.

**Silver Plated Reflectors
of Genuine Brass**
with removable lamp sockets

Reflectors need never be disturbed once

they are in place, and lamp changes can be made in a moment without inconvenience, risk of breaking bulbs or lamp lens, or damaging reflector itself.

This Patented Reflector will give 100 per cent more light than ordinary "silvered" steel reflectors. **We guarantee our reflectors to be highest quality brass and heavily plated with genuine silver.**

Complete set as shown—two patented reflectors, Ediswan base Tungsten bulbs, with make and break flush switch, with all wiring of best quality

\$6.00

Without bulbs, \$5.00

Also Ford Lighting outfits of every kind, and 168 other Ford necessities.

SEND FOR OUR CATALOG
Largest line in America
DEALERS—GET OUR PROPOSITION

THE A. H. KLING CO.,

844 Woodward Avenue
DETROIT, MICH.

When writing advertisers—Just say FORDOWNER

became a patron almost from the first—Henry Ford, manufacturer of The Universal Car.

Continuing the production of gaskets and gaskets exclusively year after year, the Victor company has become the world's largest gasket manufacturer and contributes some 95 per cent of all gaskets used in the building



of motor cars in this country and Canada. The great Ford plants at Detroit and Walkerville are still served and no higher testimonial of quality than this could be given.

Having received numerous calls from jobbers and dealers in auto accessories, and from car owners themselves for Victor gaskets for replacement purposes, this manufacturer has now arranged to supply the call and place within reach complete assortments of gaskets for leading makes of cars. The first as-

sortment offered, and one which will naturally be in greater demand, is the Victor Ford assortment—consisting of 12 complete sets of copper asbestos gaskets for this popular car. These assortments are neatly boxed in a substantial wood box with steel hinge cover, and are intended for display in garages or supply houses where other Ford specialties and parts are sold. The fact that every gasket contained in the assortment is an exact duplicate of the corresponding gasket with which car is originally fitted, and carries the maker's Victor trade mark—the sign of highest quality in gasket-making—insures the car owner against annoyances and damage which an inferior gasket would certainly cause.

Boxed assortments of Victor Ford gaskets to fit all models from 1909 to 1914, inclusive, are priced at \$6.00 with discounts to legitimate dealers.

POPULAR EQUIPMENT LINE.

The extensive market opened for accessory manufacturers by the constantly increasing spread of the Ford car brings many new devices into the field, and sees a further demand for some of the older specialties. Among the producers who have been in the



\$1.00 COMPLETE, Postpaid

YOU NEED THIS

SECURITY

Ford Wind Shield Ventilator

CAUSES a downward draft of cool air around your feet in the front compartment of your Ford. Security Ventilators can be attached in fifteen minutes time without drilling. Adjustable from a closed position to an opening nearly two inches wide. Operates from the seat and securely locks at any desired opening. They are made of pressed steel finished in a baked black enamel. Supplied with felt filler strip for the top of the dash. Weighing, complete, 8 ounces, which doesn't add much weight to the car.

YOU NEED THIS—ORDER ONE TODAY. Upon receipt of \$1.00 we will send postpaid one complete Ventilator, with the understanding that if you should not be satisfied after five days' trial return to us and we will gladly return your \$1.00.

One customer writes: "It is a blessing to keep your feet cool."

Another says: "It keeps his feet as well as his head cool while motoring."

THE SECURITY CO., 8-10 Shingiss St. **PITTSBURGH, PA.**



Follow the Road With the Turning Headlights

Know what is around the curve in the inky darkness of the country night-time—don't drive blindly and trust to luck. Your family, yourself, and your car should be protected. The Turning Headlights act automatically with the slightest movement of the steering wheels and throw their light where you need it most—on the center of the curving road you are trying to follow safely.

The Turning Headlight outfit which you can install in half an hour costs \$10.00 prepaid—a very small sum for such protection. It won't rattle or give you a second thought and is sold with a rigid "Money Back" guarantee if you are not thoroughly satisfied after thirty days' trial. Why not write us to-day—enclose your check or money order—and try out this real necessity on your Ford car!

It is the "SAFETY FIRST" principle brought right home to you.

HEADLIGHT SUPPORT COMPANY

Manufacturers Auto Devices

1218 DIME BANK BLDG.

"Reliable agents wanted in every community"

DETROIT, MICH.

Your FORD Will Run Much Smoother

with a

BROWN-MASTER-VIBRATOR

It evenly distributes the current to your motor, giving the same spark to each cylinder, thereby making the motor uniform in action. One adjustment instead of four. Contact points cannot burn, pit or stick. Very easy to install.

If you cannot find THE BROWN at your dealer, write us. . . . Price \$10.00

The Brown Jr. TIRE PUMP—

Merely remove one spark plug, insert the pump and start the motor running slowly. Before you know it, your tire is filled with pure, cool air and your disposition and back is as good as ever. Proven mechanically right in every respect.

Write us, or at your dealer. Price \$7.00

The Brown Co., 201 Chester St., Syracuse, N. Y.



business for some time, and whose products are meeting with unqualified approval, is the L. P. Halladay Co., Streator, Ill. Shock absorbers bearing this name are in use on thousands of cars, as are the bumpers of the



same make. Provision is made on the shock absorbers for a continuation of the use of the spring shackle, thereby easing the strain on the absorber, and permitting of the extra adjustment to road conditions through the addition of another joint. The shackle ab-

sorbs all side-sway and rocking of the car, and prevents the transmission of excessive strain to the absorber bolt.

An attractive set of rear tire irons is another of the company's popular products. The brackets are very simple, of light weight, and may be quickly attached without marring the appearance of the car. When in place, the holders will rigidly hold two tires. The equipment is furnished in a black Japan finish.

GASOLINE RESERVER

Dependability is one of the greatest assets of the Universal Car. The Ford owner has confidence in his car's ability to take him and to bring him back, through all kinds of weather and over all sorts of roads. One factor of this dependability is the memory of the owner himself, however. If he remembers at all times to keep his supply of oil, water and fuel replenished, all will be well. If, on some hurry-up occasion, the gasoline supply is forgotten in the rush of departure, the car may use up the amount in the tank, and the car left stranded by the roadside, fuel-less. The gas-reserver, shown in the illustration,



provides for a running supply of fuel, and then, when the supply has reached a certain point, gives the driver positive warning of his fuel shortage by a stopping of the motor. To proceed, all that is necessary is to turn the valve handle to provide for the using of the reserve supply, and to crank the motor.

SATURATED FLOAT.

My 1912 Ford has never given me any trouble until this spring. The car was left in the garage for the last two months of the winter weather, and now that I have overhauled it and am running it again, I find that the carburetor floods and leaks. I have tried everything, but can't help it. The valve seems to seat perfectly, but the leak continues so much that it is necessary to screw down the adjustment when leaving the car for any length of time.

A. D. DeM.

If your valve seats properly, the cork float in your carburetor is probably fuel-soaked, and so allows the gasoline chamber to overflow. Take the float out, dry it thoroughly, and give it one or two carefully applied coatings of shellac before replacing.

A Ford Whistle That Won't Clog



Purdy Exhaust Chimes

A high grade chime alarm—producing a loud mellow warning at any speed.

Guaranteed not to clog or choke.

Easily attached—operated by foot pedal control.

Price Complete \$7.50
Ask your Dealer to-day.

DEALERS! ASK FOR PRICES

Manufactured by

Purdy Bros. Co.

47 E. 55th Boulevard, Chicago

A Kern Water Circulator on Your Car

Will Keep Your Motor Cool.

It increases the capacity of the radiator as needed.

8 gallons per minute at 500 R.P.M.
18 gallons at 1100 R.P.M. motor speed.

Cannot interfere with thermo-siphon circulation any way.

INSTALLED BY ANYONE in a few minutes.

Water will not leak out or boil out.

NO PACKING TO WEAR OUT.

The grease in the shaft case makes ours hold where others leak.

Has Been Thoroughly Tried Out.

It saves oil and reduces carbonization.

It increases power and saves gasol. inc. Keeps motor running smoothly and freely.

Avoids frequent filling of the radiator.

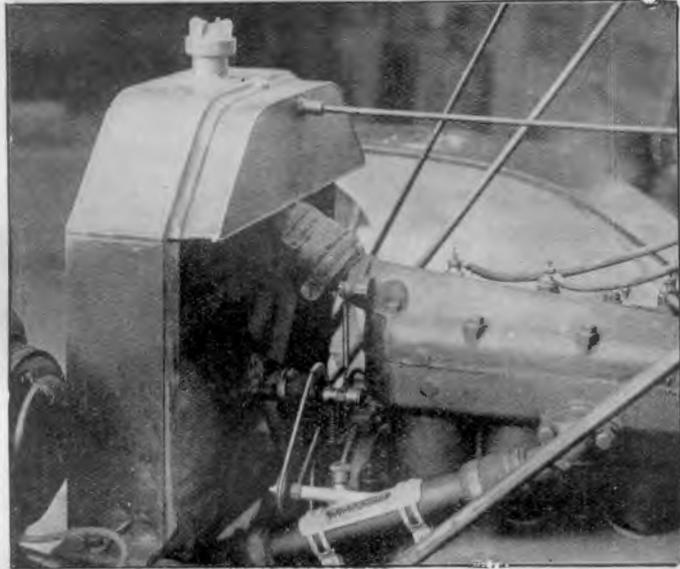
A Necessity, Not a Luxury

Price \$7.50, postpaid

See Your Dealer: Have Your Dealer See Us: See Us Yourself: Make Somebody Show You.

THE PITTSBURGH MFG. CO., LTD., East End Trust Bldg., Pittsburgh, Pa.

Agents Wanted



A Wrench for Tight Places

saves time—a trip to the garage—
and skinned knuckles—

The Eureka Ford Special Socket Wrench Set

is what you need as a safeguard



Consists of: Eureka Ratchet Wrench, with Short Extension, One Long Extension, Nine Pressed Steel Sockets, specially heat treated, Special Box.

It is the only Wrench Set selling at, or near this price, which contains a **HARDENED DROP-FORGED WRENCH.**

Sent anywhere prepaid for \$3.50

Interesting Offer to Dealers

Federal Auto Supply Company
Leader Bldg. Cleveland, Ohio

FORD REAR

**Combination Tire Holder, Lamp
Bracket, License Holder & Lock**



A snug cradle for half the tires—30x3 and 30x3½.

Avoids chafing in spots. No straps to bother. Fills up the rear. Bolts to frame. Looks swell.

Complete, \$5.50

On running board, \$5.00. Singles, \$3.50 to \$3.75
Order thro Jobbers, Ford Distributors or us.
Write for circular.

SMALLEY DANIELS, 803 Woodward Ave., Detroit

"HI-LO" MAGNETO HORN for FORD Car

Operates off magneto. No batteries needed. It utilizes only a part of the magneto's SURPLUS energy—therefore it can not injure the magneto, nor interfere with ignition.



Fully patented

Anyone can attach it in a few minutes
REPLACE your "Squaker" Horn with a "HI-LO"
No Batteries to Deteriorate No Stuffing of Reed
No Oiling Required No Clogging of Whistle
No Rubber Bulb to Rot No Delicate Springs or Pivots

JUST NO HORN TROUBLE

"HI-LO" No. 2—Nickeled or highly polished and lacquered brass sound-projector on luxurious black enameled body—concealed cord terminals.

Price, complete.....\$6.00

"HI-LO" No. 1—Plain black finish, exposed terminals. Price.....\$4.00

Ask your dealer for a "HI-LO" Horn or remit directly to

PREMIER ELECTRIC CO.

4041 Ravenswood Ave.

CHICAGO, ILL.

Angier Spare**Demountable Wheel**

FOR THE FORD CAR

Bring your Ford up to the efficiency as utilized by foreign users

A LOGICAL design and accessory for Ford owners, consists of an extra wheel and all the necessary equipment to change your hubs and wheels, making them all interchangeable. The wood wheel has proven its superiority by years of use. It is not only as light, but is more resilient than any other type of a wheel. Mud in the spoke intersections do not cause the spokes to rust and snap when you "hit that bump" in the road. One of the strong features of the Ford car is using the small tire in front which makes it more efficient when pulling through mud and sand, while with the 30 x 3 1/2 all around the car steers heavy and cumbersome. Our Demountable wheel excels the demountable rim because our bolts and nuts are up from thirteen to fourteen inches out of the mud and when making the change you do not have to take a screw-driver and dig off the mud to find the nuts; also does not add from twenty to forty pounds more weight. Write for our booklet describing how to install, and complete particulars.

ASK FOR BOOKLET E

We desire agencies in territory not already taken

ANGIER'S STREATOR, ILL.
U. S. A.

Export business handled by

Charles F. Schmitt

18 Broadway, N. Y.

PROBLEMS OF IGNITION.

(Continued from page 22)

stroke, you may find that the threads in the spark plug tapped hole are short, or that the threads have become damaged in some way so that the plug does not screw in far enough, leaving a pocket in which the oil gathers and burns to a carbon, sooting the plug. Try running a half-inch pipe tap in the hole to the same depth which it will run in the holes on the other cylinders, and see if this does not remedy the defect.

MOTOR MISSES AT HIGH SPEEDS.

Going slow, or even fairly fast on high, my engine runs like a top. When I try to pull up the hill into my place on low and run the engine fast it misses. I have tried shifting my carburetor adjustment, but can't help any that way.

J. E. DUROC.

Unless you have a loose wire, which makes sufficient contact at medium speeds to give the appearance of a perfect ignition system for that cylinder, you will probably find that the trouble is due to wear in the commutator. If the fibre ring is badly worn—if we had the model and year of your car it would be easier to tell concerning this point—the roller is apt to miss contact on some of the contact points, causing missing in the corresponding cylinders. A new commutator assembly will probably remedy your trouble.

QUICK SPRING OPENER

Spring lubrication is most desirable on all cars that have seen service for a very long period, but, like many other desirable things, its proper attainment is difficult. An application of lubricant along the edges of the leaves will do good, yet without proper appliances that represents the limit of endeavor for the ordinary motorist. The spring

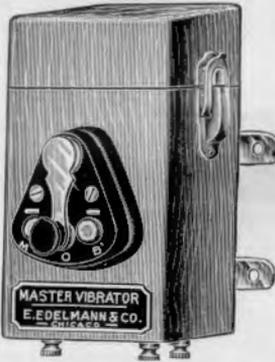


opener illustrated in the accompanying cut supplies this lack, and makes it possible for the car owner to see that the springs are properly cared for. The tool is marketed by the Federal Auto Supply Co., Leader Bldg., Cleveland, O., from whom prices and appliances may be obtained.

When writing advertisers—Just say FORDOWNER

The Jumbo Master Vibrator for Ford Cars

Manufactured by E. Edelmann & Co. Makers of
high-grade Edelmann Specialties for Automobiles



Size 6½ x 3½ x 2¼"
Highly polished
Mahogany Box.
Genuine 15%
Iridium Platinum
Points.
Full instructions
for attaching with
each instrument.

Price \$7.50 any-
where in U. S. by
Prepaid Insured
Mail or
Prepaid Express.

Improve your car by putting on one of these
Guaranteed Master Vibrators. Anyone
can attach it in a few minutes.

E. Edelmann & Co.

223 W. Illinois St. Chicago, Ill.

Make Your Old Auto Look New for \$6.50



Paint it Today—Use it Tomorrow

Repaint and re-finish your Ford Touring Car, or any other similar-size auto, with **THE ORIGINAL IDEAL PACKAGE**. It contains 15 articles—all that's required to restore that "fresh from the factory" appearance and greatly increase the value of the car.

Save 75% of the usual cost.

Your dealer has it. If not, drop us a line and we'll tell you who has. Write for illustrated folder.

HANLINE BROS.
Paint Makers BALTIMORE, MD.

THE UNIVERSAL CLUB.

(Continued from page 26)

adding to the Ford owner family. As evidence of the growing appreciation of this popular car, the fact is cited that it now takes the combined output of the five largest motor car manufacturers in England to equal Ford sales in that country.

The ability to successfully resist the Ford invasion seems to have proven a problem no civilized land could overcome.

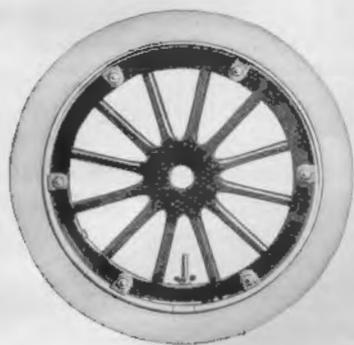
Last year the total value of cars stolen in the city of Chicago was in round figures, \$1,000,000; the number of cars stolen being 558. The cars recovered were 519, leaving only 39 reported cars which were not recovered by the department through the assistance of the bureau. Of these 39 25 were Fords which are more than usually difficult to trace on account of their lack of individual identity.

Twelve thousand nine hundred eighty-three miles on one set of Ajax tires was the record made last year with the Ford owned by a New England motorist.

Ford service and service for Ford owners exclusively is the boast of Angier's, Streator, Ill. This establishment, of which F. L. Angier is the proprietor, has specialized in Ford work for the past four years, and in this thickly populated section of the Prairie State Angier's Ford Shop has an extensive and enviable reputation. For forty miles or more in every direction come owners with their Ford problems and the faithful keeper of the shop is always alert to give helpful service to members of the clan.

There's naught of the idea of advertising this gentleman, who is so well known in his home community, in our mention on this occasion. It's just a bit of interest to the Ford booster to know that there is such a place, kept by such a man, and that at the door of this establishment the Ford owner will always find an enthusiastic welcome—a greeting which the owner of no other car is privileged to enjoy.

FEDERAL-DETROIT DEMOUNTABLE RIMS FOR YOUR FORD



Use same size tires on all four wheels.

Makes tires interchangeable—thus greatly lengthening their life.

Facilitates tire changes on the road and entirely eliminates blowouts from pinched tubes.

Original Installation Simple

Remove hub from old wheel and bolt same in new wheel.

The Most Readily Demountable Rim

Easily detached from deflated tire with no tool other than an ordinary screw driver—made possible only because of the "cut-out section construction" which permits such liberal contraction of the rim at base of the tire as to make it impossible for a rusted-on tire to cling to rim.



For the convenience, however, of FEDERAL-DETROIT users, a simple expanding tool is furnished, by means of which, when the cut-out section is removed from the rim, even though the new tire may be slightly undersized, expands the rim on the inside of the tire, sufficient so that the cut-out section can be readily inserted.

These and many other advantages are brought within the Ford owner's reach at a reasonable cost through our Special Thirty-Day Cash Offer.



A SET

consists of Four Wood Wheels, size 30 x 3½, Painted and Equipped with Felloe Bands, Bolts, Nuts and Wedges and FEDERAL-DETROIT Demountable Rims, with One Extra Rim for Spare Tire and Non-chafing Carrier for Extra Tire and Rim.

\$25.00

FEDERAL AUTO SUPPLY CO. Leader Building
Cleveland, Ohio

CLASSIFIED ADVERTISEMENTS

Advertisements inserted under any heading on this page for twenty cents a line of seven words; name and address must be counted in; no order for less than one dollar. Cash must accompany order. Nothing received later than the 20th for following month's issue.

USE AN AIR-FRICTION 1914 MODEL "C."

Increases power and economy of motor one-half. Absolutely impossible to choke or load. Uses distillate, gasoline or half kerosene with finest results. Starts easy in coldest weather. We fit all motors guaranteeing definite results, or refund money. Exclusive county rights. Liberal exchange on other carburetors.

THE AIR-FRICTION CARBURETOR CO., Dayton, Ohio.

ATTENTION—Ford Dealers and Owners.

I have what you long have been looking for—THE TANDEM FRONT RADIUS ROD BRACE AND AXLE ALIGNER—no more bent or broken Radius rods. Lines up your axle with a turn of a Wrench and keeps it there. Gives you perfect safety through sand or mud. Order One now. Your Money back if not satisfied. Price \$3.50. Special Proposition to Dealers. A. S. HALLS, Ortonville, Minn.

ANNOUNCEMENT FORD OWNERS.

We sell every Ford Accessory Advertised in THE FORDOWNER. Get Our Price.

- Hilo Magneto Horn.....\$ 3.00
- Seat Cover (Touring Car)..... 10.00
- Seat Covers (Roadster)..... 6.00
- Kellogg Ford Air Starter..... 52.50

WRITE FOR FREE 1914 Catalog.

CONSUMERS AUTO SUPPLY CO., Dept. L., 123 W. Madison St., Chicago.

A MIGHTY HELPFUL ARTICLE for the Ford car owner who makes his own repairs. A complete tool set, sixteen taps, sixteen dies, two stocks and two tap wrenches. This will save its cost on the first jammed or stripped thread. Write for information today. FEDERAL AUTO SUPPLY CO., Leader building, Cleveland, O.

SEAT COVERS.—You will greatly enhance the beauty of your Ford car with our Seat Covers. Our direct to car owner plan will save you more than half. More than ten thousand satisfied customers last year. Write now for samples and prices. **GLOBE SEAT COVER CO.**, Dept. F., Racine, Wis.

FORD OWNERS, FORD DEALERS, FORD REPAIRMEN.—The long looked for has arrived to stay. McVean's Electric Light Regulating Device. Used in connection with Electric systems on Ford cars. Brilliant light from Magneto at five miles per hour on high gear. May be installed by anyone in thirty minutes. Device will outlast your car. Every Ford owner a buyer. This device will absolutely do the work claimed for it. Don't fail to order **RIGHT NOW** and be relieved of the awful strain of driving without sufficient light. Every Ford in use will be equipped with one of these devices within a year. Owners sell to your neighbors. Dealers sell in connection with new lighting outfits installed. Repairmen make a little extra money in idle hours installing them on cars already equipped with electric lights. Everyone make a few extra dollars by ordering a sample device. Price with complete instruction for installing, \$1.50. Send Express or Post Office Money Orders to, D. W. McVEAN, Noblesville, Ind.

PREST-O-LITE GAS TANKS.

You SAVE MONEY when you buy your tank from us—

- Style "D" 40 Hour Tanks ONLY.....\$13.00
- Motocycle 40 Hour Tanks ONLY..... \$7.70

ALL tanks FILLED and COMPLETE.

Patent Burner Cleaner and Nickel Plated Key FREE. CUT PRICE GAS TANK SALES CO., Milwaukee, Wisconsin.

FORD SEAT COVERS made of double texture waterproof cloth, edges leather bound. Cover all upholstery and doors. Price, including top hood, Roadster \$9.25; Touring car \$14.75 **POSTPAID.** TRUSCOTT SUPPLY CO., Box 29, St. Joseph, Mich.

FORD WHEELS.—Have several sets Ford wheels which I have replaced with new wheels and demountable rims. Offer standard size wheels—practically new—paint good condition—\$10. Set—Not including hub assemblies for front or rear. R. E. KIMMELL, Medina, O.

PLAYER PIANO FOR EXCHANGE.—Ford dealer, also in piano business, offers brand new \$650 player piano—choice several standard makes—shipped direct from factory—exchange for new 1914 Model T touring car. Address M. D. K., FORDOWNER, Cleveland, O.

FORD HONEYCOMB RADIATORS.—This radiator will properly cool any Ford motor and make your Ford a better car. Get our dealers' proposition. Price \$25.00 f. o. b. Detroit. **DETROIT RADIATOR & SPECIALTY CO.**, 961 Woodward Ave., Detroit.

SET FORD VALVES \$2.—Highest grade Carbon steel valves—several million same quality have been sold direct Ford Co. \$2 per set postpaid. Genuine Tungsten valves—eliminate grinding in, give better compression and save fuel, \$5 set. **FEDERAL AUTO SUPPLY CO.**, Cleveland, O.

FORD OWNERS—Improve your ignition with the Atlantic Elevated Timer Bracket. Send for special combination offer on Timer Bracket and improved master vibrator. **ATLANTIC MACHINE CO.**, 255 East 15th St., Brooklyn, N. Y.

HERE'S ONE FOR YOU, MR FORDOWNER. A never failing dash gasoline gauge for \$4.00. Get one, and don't depend upon meeting some one with sufficient gas to help you out. Send today to the **FEDERAL AUTO SUPPLY CO.**, Leader building, Cleveland, O.

FORD OWNERS AND DEALERS.—The Townsan valve adjuster and silencer will silence your valves. You can adjust them quickly. Most all jobsbers, or address **TOWNSAN AUTO SPEC. CO.**, Mitchell, S. D.

PATENTS

Inventors have your patents obtained and your ideas developed by a Patent Attorney who is an engineer.

Patents to Pay, Must Protect

All cases intrusted to me receive my personal attention, backed by over twenty-five years of experience, am qualified to obtain the broadest possible protection.

I Specialize Automobile Inventions. Valuable information given for the asking.

LOUIS F. GRISWOLD

Patent Expert and Consulting Engineer
413-14 Prospect Hippodrome
Cleveland, Ohio

Washington Office—National Union Building

A Quality Tire for Ford Cars



THE tires and tubes made by The Republic Rubber Company are known for their quality the country over. The Staggard Tread for the larger cars is recognized as a world leader. The W M is a recent addition to the Republic family, being built for Fords or cars of a similar type. It is quality through and through, being made by the same skilled workmen and containing the same high grade materials found in other Republic tires. Why not have service insurance for your tires? You can get it in the W M.

Here are the Sizes and Prices :

30 x 3	\$13.50
30 x 3½	18.00
32 x 3½	19.50

The Republic Rubber Company
 Youngstown, Ohio

Branches and Agencies in All the Principal Cities

When writing advertisers—Just say FORDOWNER

ELY SHOCK ABSORBERS FOR FORD CARS



Save Your Tires
Eliminate Vibration

Give More Speed
Make All Roads Smooth



Pivot Point Suspension Takes
Care of Side Play
of Springs

\$12.50 Per Set
of Four

\$7.00 Per Set
of Two

GUARANTEED FOR ONE YEAR

Send for Catalog A

Dealers write for special proposition

Donnelly Motor Equipment Co., Mfrs. 1787 Broadway
New York

Bigger, Better, with every issue grows this Magazine for Ford Owners Exclusively

You will regret if you miss a single number

Here is a magazine built for you—edited by Ford owners and drivers of long experience, who are ably assisted by Ford dealers and Ford owners everywhere.

Not a magazine filled with pretty pictures and nothing else. Not a catalog of next year's makes of cars—A FORD MAGAZINE—A FORUM FOR FORD OWNERS—FORD FEATURES, FORD FACTS, ORIGINAL, PRACTICAL FORD INFORMATION THAT EVERY FORD OWNER AND DRIVER WANTS.

The Only Automobile Journal The Ford Owner Needs

One enthusiast who subscribed says, "Don't see how we Ford owners ever got along without it"—another, "It's great—don't fail to send me every issue".—But to you we say, this sample number now before you is only a suggestion of our facilities to give service—**Each and every issue will be better, broader, of greater and more practical interest to all who own and drive The Universal Car—and your cooperation, the cooperation of other Ford owners everywhere will help us make them so.**

There's just this one thing to do—MAKE SURE THAT YOU WILL RECEIVE YOUR COPIES REGULARLY! PLEDGE YOUR INTEREST! BECOME A SUBSCRIBER TO THE FORDOWNER TODAY! Take advantage of the original low rate of 50c for a full year which still holds—but you must act at once.

We Are Glad to Grant You This Final Offer Before the Rate is Advanced

This sample copy of THE FORDOWNER is sent you at your local dealer's request just to give you an idea of its genuine value—of its numerous features—its helpful hints on car operation—the many good things it contains for your benefit.

Ford dealers say every owner of a Ford car should read this practical, interesting and instructive journal. Ford owners say it's the greatest help in car operation that has ever come into their hands.

Coming issues will be better still. Why miss a single number?

Twelve full months for 50 cts.

USE THIS SUBSCRIPTION FORM RIGHT NOW!

SUBSCRIPTION ORDER

The Fordowner,

Prospect-Hippodrome Bldg.
Cleveland, Ohio

Gentlemen:-

Enclosed please find fifty cents (or \$1.00 if you pay for three years), for which please enter my subscription to THE FORDOWNER, beginning with the _____ number.

Name _____

Street Address _____

Date _____ City and State _____

SIGN, WRAP SILVER, STAMPS OR A DOLLAR BILL IN THIS BLANK AND MAIL TODAY.

Write names of Ford owner friends on the other side if you want them to know about THE FORDOWNER too.