

AVERAGE AMERICAN CAR OWNER MIGHT HELP REDUCE PRODIGIOUS FUEL WASTE BY WATCHING DIFFERENT POWER LEAKS

Habitual Use of Over-rich Mixture Common Extravagance—Carbon in Cylinder and Poor Ignition Also to Blame.

Every car owner likes to keep his expenses as low as he reasonably can and it is really surprising to what a small figure the costs can be cut by consistent saving.

Let us begin by saying that the bills for gasoline and tires are the two big items in the outlay for keeping the car running. There are then the obvious first points of attack in any attempt to cut down expenses. Further, it is the duty of all car owners to make their fuel go as far as possible, because our supply of petroleum is barely enough for our demands now, with still heavier consumption in prospect.

The first place to begin the campaign to cut down fuel consumption is at the carburetor. Here occur most of the leaks that increase fuel consumption. The average American car owner drives with a mixture nearly twice as rich as necessary.

LEAN MIXTURE BEST

The modern engine will run on a mixture ranging from about fourteen parts air to one of gasoline to one containing only eight parts of air to one of gas. But the engine will do its best work when the mixture is made as lean as possible. While it burns the heavier mixture it does not operate with the snap and vim that is displayed on the leaner fuel.

Practically all modern carburetors have an attachment for increasing and decreasing the amount of air injected into the mixture. It is a very simple matter to experiment with this adjustment, first making the mixture as lean as possible and gradually turning back until exactly the right proportions of gas to air have been found for satisfactory operation. In addition to the benefits of greater economy with the leaner mixture, this condition also cuts down carbon deposits.

MIGHT SAVE MILLIONS

It may seem to the individual car owner that it is a very small matter whether or not he uses too rich a mixture, but it is the aggregate of this wastage that counts. The individual's waste may be multiplied by nearly 5,000,000 to get the total amount of motor fuel that is practically thrown away. If all this potentially useful fuel were turned into actual service, instead of having our fuel supply an alarmingly tight fit for our needs we would have a handsome surplus to take care of our rapidly growing numbers of motor vehicles.

After the carburetor has been properly adjusted to supply the leanest mixture consistent with good operation the whole fuel system ought to be gone over, from engine to tank. Foreign matter partially obstructing the pipes, or lodged in the strainers, or in the

fuel tank, helps to cut down the efficiency of the whole system.

A rigid search for leaks in pipes and manifolds should be instituted. An actual physical leakage of the fuel is only a little worse than power leaks of various sorts. Wasted power invariably means additional fuel to make good the deficiency. Carbon deposits in the cylinders are a prolific source of wasted power.

OTHER BIG WASTES

And here is a place where the original waste breeds further wastage. When the fuel mixture is too rich, heavy carbon deposits are formed in the cylinders and these cut down the good cause by getting proper compression. Therefore, keep the engine free from carbon by having it cleaned out periodically and help along burner adjustment in the first place, retort adjustment in the first place.

The ignition must also be good or there will be prodigious wastage of power. The battery must be kept fully charged, the connections at the plugs, the ignition unit and the coil must be kept clean and tight to insure a good hot spark in the combustion chamber.

Many cars will run with entire efficiency on a mixture of one gallon of kerosene to four gallons of gasoline. If the engine is fitted with an attachment permitting it to take heated air from around the manifold to mix with the fuel vapor it will readily assimilate this mixture of kerosene and gasoline, thus saving one-fifth of the consumption of the lighter fuel. If all car owners adopted this idea it would add half a billion gallons of motor fuel to our annual supply.

GASOLINE IN WORLD LAST ONLY 10 YEARS

Director of Mines Says Serious Problem Confronts Motorists—No Known Substitutes for Fuel.

"There are no known commercial substitutes for gasoline or lubricating oils. The domestic output of these does not meet the present consumption. Of the original available petroleum supplies underground, we have consumed 40 per cent."

These statements by Van H. Manning, director of the bureau of mines, department of interior, have been made public to emphasize the great need in the petroleum industry for extensive research.

ENOUGH FOR 10 YEARS. "It is true," says Mr. Manning, "that there are vast oil resources in foreign countries which can probably meet de-

KEROSENE SPRAY IS WAY TO SAVE WEAR AND ENGINE TROUBLE

Every owner ought to keep the engine clean by an occasional kerosene bath. Spray kerosene all over the engine and wipe off every bit of dirt you can. This goes for the crankcase, as well as the parts that you can see when you lift the hood. Dirty oil, oil with sediment, old oil not changed for some time, are all causes of rapid engine wear.

Around the engine and other parts of the car there are supposedly tight joints in addition to actual openings. Take the front and cover, commonly called the timing gear case cover. Vibration may loosen a few of the holding nuts, allowing the cover to move away from the crankcase a small fraction of an inch. With an accumulation of dirt over the cover, some of the dirt is bound to get to the gear teeth. Dirt and lack of lubrication of front end gears are responsible for rapid wear and noisy operation.

The easiest way to get at the commutator for cleaning is to take the cover of a cigar box or some thin wood stock and make a small paddle about 4 or 6 inches long and about half the width of the brush holder. To use this simple arrangement for cleaning generator commutators, first remove the most accessible generator brush and then wrap a strip of No. 00 sandpaper over the end of the paddle and use it through the brush holder when the engine is running as one would use a hand lathe tool. This will thoroughly clean the commutator and do it evenly. Under no circumstances use emery cloth or electrical cloth, as emery is a conductor and will short the commutator.

Forecasts for the next 10 years. Predictions beyond that period are not safe. "Our efforts must be turned toward obtaining perfection in processes and mechanical equipment."

"In 1918 the value of the output of crude oil and refined products in the United States was \$2,500,000,000, and certainly the petroleum industry can afford to spend more than has been spent heretofore in research to discover new methods and perfect those now in use to make the recovery of oil and its utilization more efficient."

TO TIGHTEN TERMINAL

Much battery trouble is caused by the terminals not fitting into the battery bus bar snugly. This causes the sulphate deposits to collect in the battery terminal bearing area and make a very poor connection, offering considerable resistance to charging. In fact, a corroded battery terminal will cut down the charging rate about a third.

Usually this trouble is brought about by the terminal lock screw bottoming in its thread socket, making it impossible to pull the terminal up into the bus bar tight.

COLOR IN JUDGING OIL

Many truck owners judge lubricating oil entirely by the color, assuming that a dark oil is heavy in carbon, while a light oil is the better product. A light colored oil is usually bleached with sulphuric acid, and a trace of the acid frequently remains, which is injurious, as it attacks metal surfaces. The dark color is the lesser evil. The only safe rule is to use branded oils put out by reliable refiners.

DEALER WITH 104-YEAR-OLD CUSTOMER EVIDENTLY QUALIFIES AS PRESS AGENT

The Gordon Motor Company, Boise distributors of Briscoe cars, say they have a colleague down in California who is some press agent, and the evidence is a story about a customer of the latter who is an enthusiastic Briscoe driver at the tough old age of 104.

Here is the story in full as the California dealer eased it into print in a San Francisco paper:

In the opinion of Daniel McClane, 104-year-old youth of Burlingame, the automobile has been of more benefit to many than any other single agency. McClane attributes his longevity to the fact that he has always kept out in the open air. Leaving Scotland in his early youth, he sailed the seven seas for more than twenty years in a windjammer, visiting every quarter of the globe. The almost perfect climate of the peninsula induced McClane to make California his home. The air is so mild that it is possible for him to stay out in the open air all the year round. During a part of the year McClane still works in his gold mine in Lassen county. For the rest of the year he takes his ease in Burlingame, and relies on his Briscoe to keep him out in the fresh air.

McClane typifies progress; he keeps abreast of the times. When past 85 years of age, he married a comparatively young woman, and was the father of eleven children. His one hundredth birthday was the occasion of a plunge in the cold waters of San Francisco bay. He celebrated his one hundredth and fourth birthday by learning to drive an automobile. A Briscoe touring car was used for the occasion because of its ease of handling, and McClane experienced no difficulty in mastering the engineering principles involved. Although an enthusiastic motorist, McClane has never attempted to drive a car himself. He is enthusiastic over the performance of the car and says that it is the most comfortable light car he has ever ridden in.

The airplane was mentioned to him as a possible means of transporting him back to Scotland for a visit. McClane admits that while the automobile fills his present day needs, he is anxious to keep abreast of the times and says that within the next thirty or forty years he will be able to make the trip to Scotland by air. In his dry way, he stated that it is about eighty years since he last visited his native home.

LAWS TO PROMOTE INSTEAD OF HINDER TRUCK TRANSPORTS

New York Commissioner Writes War Department Urging Uniform Legislation for Highway Express Development.

Fear that ill-considered motor truck legislation of the different states will interfere with the development of economical highway transportation and of motor truck express service in interstate commerce has led the New York State Commissioner of Highways, Frederick S. Greene, to write to ways, Frederick S. Greene, to write to the War Department, calling attention to the necessity of having the states of the union enact uniform traffic legislation.

PREPARES FOR NEW ERA.

The commissioner points out that New York state is preparing for the motor express era and is building concrete roads as part of its program in promoting motor truck lines. The state division of roads and markets is much interested in the developments of such truck operation as an important factor in promoting agricultural production and reducing prices of farm products in the cities. "It will be the duty of the next legislature," says Greene, to enact laws that will promote transportation development."

In his letter to the war department, the commissioner says: "I have noticed that a great many states are now beginning to enact motor truck legislation, and, as usual, the laws are not uniform. This, of course, is going to hamper not only the manufacture of trucks, but will tend to ward confusion generally in motor truck traffic. I believe the law should limit motor trucks in three directions, width, height and maximum load per



Our Registration Plan

entitles you to the benefit of Willard Service and Adjustment Policies. Insist on a Willard Battery with threaded rubber insulation when you buy a new battery. Your dealer will be glad to get a Willard for you.

Free inspection of any Battery any time.

BERTRAM BATTERY STATION
 10th and Grove. Phone 905

inch of bearing surface of tire. In my opinion, no truck should be allowed on our highways which is more than eight feet in width and 13 feet in height."

LIMIT GROSS LOAD.

He also advocates a maximum gross weight of vehicle and load not exceeding 300 pounds per inch of tire, as the crushing strength of concrete pavements averages 2600 pounds per square inch. That gives a factor of safety of nearly four, which is enough to take care of stresses due to impact of heavy moving vehicles. He does not anticipate any trouble with regard to length of trains composed of tractors and trailers, as he believes that grades of more than five per cent limit them at present to one or two trailers hauled by a single tractor.

The recommendations as to weight per inch of tire and over-all width made by the New York state commissioner are the same as those in force in Massachusetts and several other states. They have been agreed upon by the motor truck industry as reasonable and sufficient for protection of

properly constructed highways, and are embodied in a uniform traffic bill that has been prepared for introduction in the various state legislatures next winter.

IS IT NECESSARY?

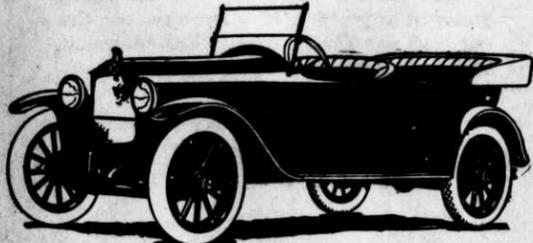
It is always wise to remember that the car should not be washed in the direct sunlight, as this causes heating of the water, and dulls the car's finish. The same thing happens to the hood when it is washed while hot from the engine. It is necessary to advise against washing the car in the open air these frosty days?

EASY PLUG CLEANING.

Very often in cleaning the spark plugs by hand the joint of the plug is broken. A good way to avoid this is to stick the plug in the ground upside down, fill it with gasoline and touch a match to it. After the gasoline has burned out the plug will be found entirely clean of soot.

A CAR WELL SPOKEN OF EVERYWHERE

Hupmobile



Here, as everywhere else all over America, the Hupmobile has the reputation of being a remarkably good car.

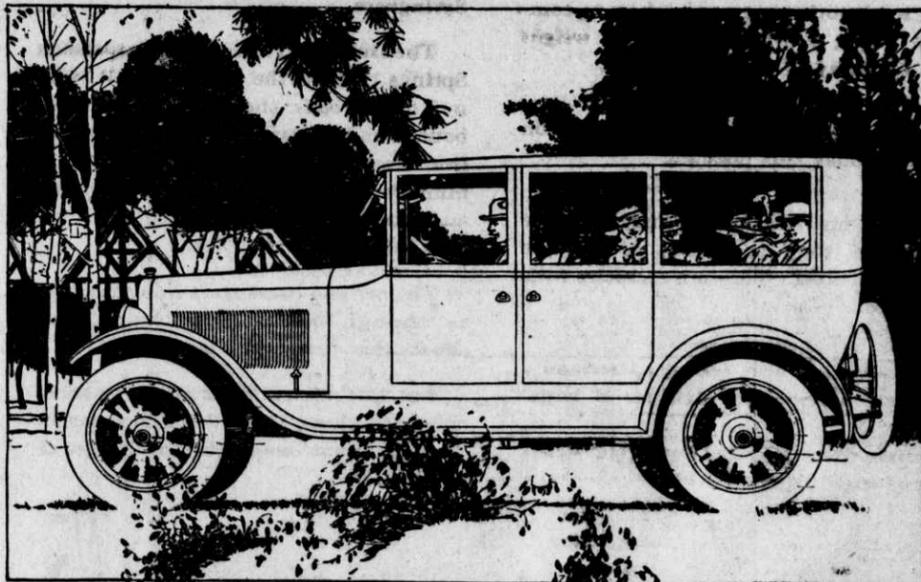
This has been so ever since it first appeared here.

It immediately began to make a name for itself as a value decidedly better than ordinary, and that good name has never stopped spreading.

So far as we know, no Hupmobile buyer in this neighborhood has ever been disappointed in the way his car lived up to its high character.

He usually finds the car a better performer, more economical, more of a glutton for hard service, than he had been led to expect.

CHANDLER SIX Famous For Its Marvelous Motor



The Most Popular Car for All Seasons

THE family chauffeur, very generally, is going into other fields nowadays. For the family type of closed car has come to stay. It has come to stay and multiply, because it has so well established its place in life.

Expressive of the very best development of the modern closed car is the new series Chandler Sedan—handsome, dignified, beautifully finished and furnished, and most comfortable in all seasons.

This new body reflects the master coach-builder's art and skill in every detail of its design and workmanship. The window posts are a permanent part of the body, adding to its strength and quietness, though the windows may be open or closed or adjusted just as the weather or the wish may dictate. A solid front seat increases the strength of the body. The interior is upholstered in silk plush, and the handsome fittings are of dull silver finish. Seven persons are seated in perfect comfort, or five when the auxiliary chairs are not in use.

The Chandler Car is the most closely priced fine car in America, and a good many people know it. Your early order would serve you against disappointment.

SIX SPLENDID BODY TYPES

- Seven-Passenger Touring Car, \$1795
 - Four-Passenger Roadster, \$1795
 - Four-Passenger Dispatch Car, \$1875
 - Seven-Passenger Sedan, \$2195
 - Four-Passenger Coupe, \$2695
 - Limousine, \$3295
- (All Prices f. o. b. Cleveland)

ARTHUR BROTHERS & BECKSTEAD
1016 Bannock

CHANDLER MOTOR CAR COMPANY, CLEVELAND, OHIO

COFFIN & BEGLAN

1012 Bannock—Phone 185