

Hints for the Motorist

By Albert L. Clough
Editor Motor Service Bureau, Review of Reviews

TYPE OF ENGINE VALVES

C. C. B. asks: Please inform me what different forms of gasoline engine valves have been invented, other than the poppet and sleeve types, with which I am familiar. Also advise me, if possible, when these various forms were patented.

Answer: The piston valve is one such form. In this construction, the valve takes the form of a piston, located in a pocket at the side of the cylinder and arranged to be slid back and forth in a direction parallel with the cylinder axis by suitable mechanism driven from the crank-shaft. The piston valve carries a port which registers with a corresponding port in the cylinder wall and, when this occurs, admission or exhaust can take place, a separate valve being provided for the intake and exhaust sides of the engine. Another form is the rotary valve. In one such construction, the valve is in the form of a drum, which is rotated upon its axis by crank-shaft driven mechanism, this drum being guided in a gas-tight cylindrical case in a valve chamber and its axis of rotation being at right angles to the engine cylinder axis. A diametral port is cut through the drum and, at the proper period this port registers with corresponding ports in the cylinder wall and valve pocket wall, permitting the entrance or escape of gases. A separate valve is used for intake and for exhaust. You will have to refer to files of the Official Gazette, of the Patent Office to obtain patent dates.

FABRIC BREAK IN CASING PINCH-TUBES

W. S. S. writes: Please explain the cause of this trouble. One of my tires went flat the other day and upon examining the tube I found a slit in it. I put in a new tube and ran the car a week, when it deflated from a crack in this tube. Using still another tube, I had the same result. What is the matter with these tubes? The casing is almost a new one and seems perfect.

Answer: The casing may appear perfect from the outside but, if you examine it from the inside bending it quite abruptly at intervals along its circumference, it is quite likely that you will find a break in the fabric of the wall, which may have been the result of a bribe sustained by running over some hard, sharp object, at speed. If such a fabric break exists, your tubes presumably have been cut by the pinching action of the sharp sides of the crack, between which the tube enters when the tire is in service. An inside blow-out patch can be fitted over the break as a temporary measure to protect the tube, but a permanent repair should be made or a blowout will probably occur at this weak spot.

RUBBER PRESERVATIVE PAINT

T. W. F. asks: Do the commercially advertised tire paint cause any injury to tires?

Answer: No, quite the reverse. A good preservative compound of this kind acts to fill small cuts and cracks in the tread rubber and to delay their becoming larger and finally of sufficient size to admit water and dirt, that will tend to loosen the tread and cause sand blisters. At least, these claims are made for these preparations and they appear reasonable.

TOO RICH, OR TOO LEAN, WHICH?

It's Generally The Former, But Sometimes The Latter In Weak Engines

The motorist does not keep in mind the fact that the carburetor is the key to the engine's performance. The carburetor is the device which regulates the mixture of fuel and air entering the engine. If the mixture is too rich, the engine will run poorly, and if it is too lean, it will also run poorly. The motorist should frequently ask of himself or others, "Is the mixture probably too rich or too lean?" It is then the problem to find out whether the fuel mixture furnished is too rich or too lean in gasoline and to correct the proportion of air and fuel.

The following suggestions should enable one to decide whether the mixture is too rich or too lean. Among signs of over-richness are fouling of the insulation of some or all the spark-plugs with black, dry soot; the rapid carbonization of the engine; low fuel economy as compared with that of similar cars; irregular missing at times and explosions in the muffler; unusual heating of the radiator; slow acceleration and inability to attain normal speed or pulling power; black smoke in the exhaust and a yellow or yellow-edged flame to the exhaust, when viewed as it leaves the muffler cut-out.

It is only when the mixture is very greatly over-rich that many of these signs are apparent. Indeed an unnecessary rich mixture may be used without causing sooted and short-circuited plugs, or diminution of power, and the most reliable sign of moderate over-richness is low gasoline economy and the ability of the engine to run powerfully before it is hot, even though the carburetor is not choked.

A lean mixture is indicated by, hard starting unless fully choked; liability to stall; slowness to get into full action after a cold start; explosions in

the intake and carburetor; inferior acceleration and pulling power, with no great lack of speed on level roads; some tendency to overheat; a tendency to "labor," when heavily loaded at low speed; perfect freedom of plugs from gasoline soot and a short greenish-blue exhaust flame from the cut-out. Even a moderate degree of under richness so reduce engine power as to make the use of a car so affected almost out of the question, which over richness may be quite extreme without producing so pronounced an effect performance; for which reason, over-richness is more common than under-richness and longer tolerated.

BREAKING WITH THE ENGINE

C. M. asks: Does it do any harm to make the engine hold back while the car is going down hills, instead of using the brakes?

Answer: No. It is considered the best practice. In coasting hills, the throttle should be closed as much as possible, the clutch kept engaged and the brakes applied only sufficiently to assist the braking effect of the engine and hold car speed to a safe value. This procedure greatly reduces the rate of wear of the brake linings. Some people also, cut off the spark and, with engine that tend to overheat, this assists the cooling process. On very steep down grades, some operators engage a lower gear, throttle the engine and switch off the spark. This gives the engine a powerful retarding effect that calls for very little help from the brakes.

SHUNT AND COMPOUND GENERATORS

V. F. W. asks: What is the difference between a shunt wound and a compound wound generator? What is meant by a series winding?

Answer: The difference is in the method of applying the current which excites the field magnets. In the former, there is a circuit the only purpose of which is field magnetization, which consists of rather fine wire, wound in many turns around the field magnets. This circuit commences at one brush and ends at the other main brush—or at the "third brush"—and carries a relatively small current but nearly the full voltage generated. The latter type is a combination of a shunt wound and a series wound generator. Its magnets carry not only the shunt winding, but also a series winding, which is a coil of a rather small number of turns of quite coarse wire that carries the whole useful current produced by the generator. The series circuit starts at one main brush, includes the series field winding and the load (battery for instance), and ends at the other main brush. In a

compound generator the shunt and series coils may both act to increase the field magnetism or the latter coil may act to reduce the magnetism produced by the shunt coil. The latter is usually the case with motor car generators.

WHY CARBURETORS SOME-TIMES NEED ADJUSTMENT

Don't Hesitate To Reset a Carburetor If You Know How

The advice is frequently given: "Do not tamper with the carburetor, as it has been correctly adjusted at the factory," and doubtless this admonition is intended in the very best spirit, for it is a fact that, when once properly set, a carburetor will go on performing satisfactorily as long as conditions do not change, so that altering its adjustment unintelligently or needlessly will do more harm than good. The reason why this advice should be literally followed is that carburetor and carburation conditions are subject to change and it is foolish to assert that a factory adjustment can be either infallibly perfect or prove permanently right. Among the factors that make carburetor adjustment occasionally necessary are the following: Changes of gasoline quality, involving differences in its viscosity or "body," that alter the rate of fuel flow through the fuel spraying nozzle. The "heavier" the gasoline used, the less will pass through a certain aperture, under a certain pressure. Changes in atmospheric density, as between low and high altitudes, less oxygen below contains in the cubic foot of air at high elevation than, for instance, at sea level. The same adjustment that is correct at Denver will not necessarily be so at New York. Change in the action of carburetor parts with time, due to the weakening of springs controlling the air supply and the alteration through wear, of links that interconnect different portions of the mechanism. Changes in the operative temperature of the intake system and cylinder walls, as between the extremes of summer and of winter weather. When no means are taken to overtake the effects of such atmospheric differences, a more liberal gasoline adjustment must be maintained in cold weather, because so much of the fuel supplied fails to vaporize and burn properly. Differences in the carburation requirements sought. Some operators wish a mixture rich enough to produce maximum acceleration and power, even at some sacrifice in economy while others, in order to save gasoline, are willing to use a slightly leaner mixture. A motorist should avoid changing his carburetor setting, unless it is known to require it but not hesitate to do so when it is advisable. Instructions, minutely explaining the correct method of adjustment, are obtainable from the manufacturer of every make of carburetor and every motorist should familiarize himself with the directions applicable to his particular instrument.

FRONT CYLINDER OIL SPARK-PLUG

P. J. S. writes: The spark-plug, in number one cylinder of my Ford, carbonizes so rapidly that I have to clean it every other day, in order to stop the engine's "skipping." The plugs in the other cylinders do not carbonize. Do you think I need a new ring at the top of this piston or what is the cause of this trouble?

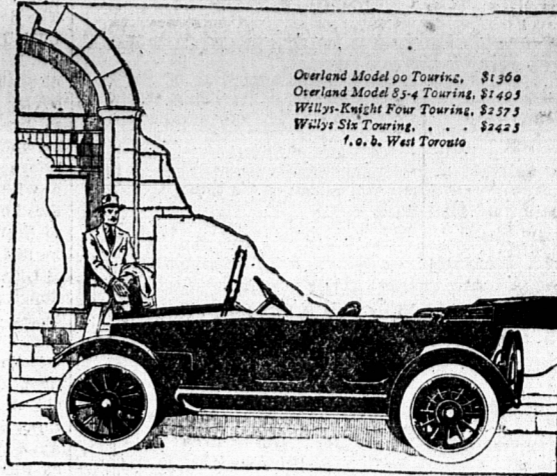
Answer: The chances are that you will have to have not only a new top ring, but a full set of rings for this cylinder, before long. If you find by cranking the engine over the compression stroke of this cylinder, that there is considerable hissing of gas past its piston and that the resistance to motion of the crank soon ceases, new rings are probably needed. However, before changing piston rings, you might try the experiment of drilling a one-eighth inch hole through the oil supply pipe so that a part of the oil is discharged into the splash basin of number two cylinder and not all of it into the front compartment. This is sometimes found to prevent excessive oiling of number one cylinder—a falling which is quite common with these engines.

INSPECTING A USED CAR

A. N. writes: Please inform me what parts should be specially inspected in buying a second hand automobile?

Answer: In a general way the working parts which have bearing surfaces that are subjected to wear. You should make sure that the pistons are a proper fit in their cylinders, so that good compression may be insured, that the bearings of the engine shafts are not loose and likely to cause pounding noises; that the road wheels are not wobbly on the axle ends; that there is no undue looseness in the steering-gear; that

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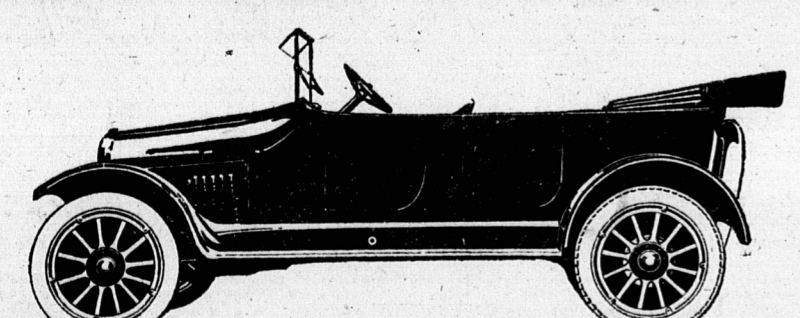
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the spring ends have not worn out their eyes and pins; that the universal joints have not developed excessive lost motion, that the transmission gears still have their teeth in

fact and their bearings in adjustment and that the clutch is in good operative condition, and that the brake linings and operative devices have not worn to a dangerous extent.

Questions of general interest to motorists will be answered in this column, space permitting. Address Albert L. Clough, care of this office.

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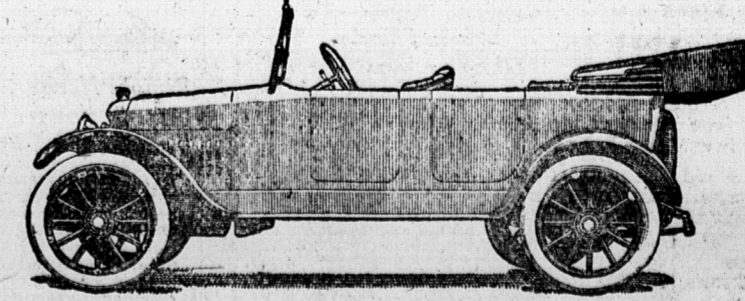
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