

VALVE-IN-HEAD NOW RECOGNIZED LEADER

Latest Motor Development Declared Triumph.

MANY ADVANTAGES NOTED

Superiority Over Old Type Motors in All Respects Declared Clearly Demonstrable.

The story of the valve-in-head motor is brimful of interest to motorists everywhere. Today in the world of gasoline motors the only motor that is on the increase is the valve-in-head. Only two prominent manufacturers in 1914 used the valve-in-head motor. One was the Buick Motor company, pioneer builders of valve-in-head motors. The majority of people, including the owners of the mobile owners, are bewildered when the subject of internal combustion engines comes up for discussion.

For a comparison of valve-in-head motors with the "T" and "L" types, perhaps the simplest illustration is the hotel hallway. Take this hallway for example. All the doors leading to the various rooms are on the right side of the hall. At the end of the hall are two windows, also closed. Open the door of the last room on the left. Two windows are on the far side of the room. Here we have a typical "L" head motor. The hallway itself is the cylinder and the room on the far side of the room is the valve chamber, or pocket, as it is called. The two windows on the far side of the room are the valves, one an inlet valve and the other an outlet valve.

T-Head Motor Explained.
Air in order to reach the half has to enter the window of the room, pass through the room out the door into the hall. In the L-head motor the gas enters the valve chamber or pocket, and then into the cylinder proper. To get a concrete idea of the operation of the T-head motor is to open the door on the opposite side of the hall.

A T-head motor has two valve chambers or pockets, the intake valve being on one side of the cylinder and the outlet valve on the other side just as in the hallway. Now close the doors on both the rooms, leaving no inlet or outlet to the room. Now open the two windows at the head of the hall. Here we have the valve-in-head motor. These windows play the part of the valves. The windows in the room means the valves are in the head of the motor, just as the two windows are at the head of the hallway. To see how much easier it is to let the air in and out of that hall through these two windows than it would be through the windows at the far sides of the adjacent rooms. Now to apply these principles. Why does the valve-in-head motor give more power for the same amount of fuel?

Step No. 1 in the production of power in an automobile engine is the introduction of vaporized gas into the upper end of the cylinder. This gas enters through the intake valve. Meanwhile the piston head returning under momentum from its previous downward stroke has compressed the gas. At the highest point of compression the electric spark explodes. When the electric spark jumps from one of the terminal wires in the spark plug to the other terminal an eighth of an inch away the vaporized gas is set on fire and explodes.

Explosion Drives Piston.
This explosion equals violent expansion. The vaporized gas expands in direction to get out of the cylinder. From every point save one it is hurled back. The piston head is forced up on the surface that yields under the strain. Unable to withstand the attack it is forced downward. The drive shaft revolves, the rear axle turns, the wheels spin and the automobile is off.

Getting the dead gas out of the cylinder after the explosion is another important matter. After each explosion in the cylinder there is a residue of dead gases. The inside of the cylinder walls must be constantly lubricated so that the piston rings can work and down with the least possible friction. Some of the lubricating oil is burned with each explosion and this leaves a residue of carbon in the cylinder. It is the duty of the piston head in the up and down stroke following the explosion to push all of these dead gases, including the carbon, out of the cylinder. If they are not pushed out they mix with the next charge of gasoline vapor and weaken it, diminishing the power of the next explosion.

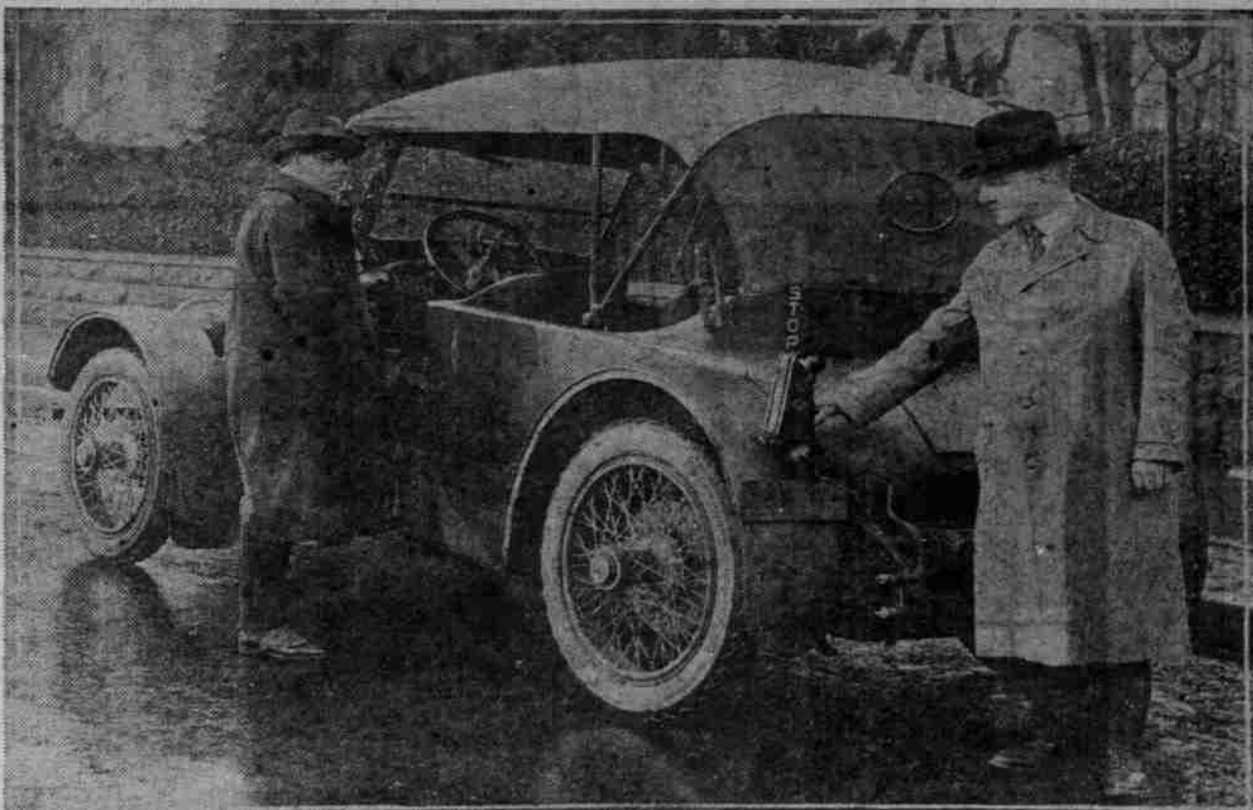
In the L and T-head motor these gases have to turn corners, as it were, in order to escape. First they must go to the valve chambers and thence to the outlet, the exhaust valve. Invariably in these types of motors a portion of these gases fail to get out. The valve opens for only the smallest fraction of a second. You cannot begin to see it with the naked eye.

Only One Place to Go.

Naturally some of the gas gets "left" some of the time. But in the valve-in-head motor the gases do not get left owing to the fact that the exhaust valve is directly in the top of the cylinder like the window at the head of the hallway. Consequently when the piston starts upward these gases take a straight shoot for the opening with no corners to turn and no projections to stop them or crannies or pockets to retard their flight. This means that in the valve-in-head motor the cylinders are always clean. In the L and T types it is impossible to make the inside of the valve chambers or pockets smooth. There are little projections and roughnesses and these catch and hold the carbon deposits. These deposits become heated. When they are red hot they ignite the incoming charges of gasoline vapor before the proper time. The gas is exploded before it is compressed, burned, but without any resultant power. This is why the best results it is necessary to have quick and complete expansion. To get this it is necessary to have the spark plug as near the gas as possible. In an L and T type of motor the flame has to travel a great deal farther than in the valve-in-head for the simple reason that the diameter of the combustion chamber is greater. In the valve-in-head motor this diameter is simply the diameter of the cylinder itself, while in the other two types the flame has to travel to the far corners of the valve chambers or pockets.

An automobile motor is a heat engine. A theoretically perfect motor would be one in which an extremely high temperature could be maintained in the metal cylinders. It is not practical, however, to operate an automobile motor with its cylinders so overheated. Consequently a cooling device is provided.

The cylinder walls are surrounded by a hollow jacket, which is kept full of water. In this cooling operation a number of heat units are necessarily wasted and destroyed. But the smaller the surface of the cylinder walls to



THIS SIGNAL LETS MOTORIST BEHIND KNOW WHAT MAN AHEAD IS GOING TO DO. Dr. E. D. Birkholz (left) and E. D. Birkholz (right), general agent in Oregon and southwestern Washington for the Kobay semaphore signal, demonstrating one of the signals Mr. Birkholz has just installed on Dr. Connell's car. The semaphore with "stop" is up in the picture. The signal also has semaphores for "right" and "left" which are thrown into position by touching a lever on the steering wheel. Mayor Baker, Chief of Police Jenkins and Public Safety Commissioner Coffin are using these semaphores.

MANY TRUCKS OPERATING

TOTAL FOR 24 STATES SHOWN TO BE \$14,029.

These Figures Are Only From States Requiring Separate Registration of Trucks.

There are 314,024 motor trucks in the 24 states which make a separate tabulation of commercial vehicles, according to statistics gathered by the B. F. Goodrich Rubber company. The other states make no distinction between passenger cars and trucks in their registration records, making a national total impossible to compile. However, it is estimated that the grand total will reach more than 700,000.

DUAL VALVES WIN PRAISE

LONDON TIMES SPEAKS HIGHLY OF PIERCE-ARROW.

Writer in Famous English Paper Declares Performance of Car Justifies Reputation.

Honest approval of the famous dual valve six models produced by the Pierce-Arrow Motor Car company of Buffalo, N. Y., is given by a critic writing in the November 4 issue of the London Times under the heading of "New American Motor Cars." Because of the pride taken by the British in their own quality automobiles, the opinion is of unusual interest. The critic says:

"The Pierce-Arrow is familiar by name to most people at home as one of America's best-known productions. It is essentially a car in which all considerations of price, within reasonable limits, have been submerged in favor of luxury of appointments and perfection of running."

"The six-cylinder engine has a double valve system, two inlet and two exhaust valves being set on opposite sides. A conservative and unusual feature is the three-pair casting. Two separate systems of battery ignition are fitted, the magneto having been abandoned. The gearbox provides four forward speeds, instead of the usual three."

"The car is exceptionally well sprung and well balanced. Several sharp corners were purposely taken at high speeds and at each the stability was very noticeable. Weight distribution has been carefully studied. Acceleration, high climbing and flexibility were alike excellent in the Pierce-Arrow. The Pierce-Arrow shows high quality in its class and its performance is commensurate."

"The performance of the dual-valve engine, with its increased power and flexibility, recently has been refined by the introduction of a dual-ignition system. Another improvement is in the transmission, which permits of easier gear-shifting."

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PAIGE KEPT ON RUNNING

COAL STRIKE DIDN'T STOP OUTPUT AT DETROIT.

Battery of Automobile Motors Kept Machinery in Operation All the Time.

Operation of its entire plant by means of passenger automobile motors was an emergency method adopted by the Paige-Detroit Motor Car company during the recent coal crisis which made it possible to obviate a complete shutdown.

The Paige was the first of a comparatively few big Detroit plants that continued to turn out cars and keep a large force of men at work throughout this period.

When it became known that the Paige plant could operate only to the extent of two-fifths of its normal current consumption, plans were hastily made to equip a number of "six" motors and transmissions with the necessary attachments to connect with the various machinery units.

Within 24 hours the battery of motors was fitted with pulleys, placed in position, belted to the overhead shafting and ready to go. On the day that government restriction on soft coal went into effect, the emergency power plant was put into operation and for the entire period kept the Paige factory in operation.

In spite of pulling a capacity load at a speed of 800 revolutions, day after day, the "six" motors performed 100 per cent efficiently, making it possible for the company to keep at work.

TRUCKS FAST OUSTING HORSE

Stables in New York City Reduced From 10,547 to 7920.

Investigations carried out by the sanitary bureau of the New York department of health show that the motor truck is rapidly emptying the stables of the nation. These statistics are part of a survey being made by the sales department of the Clydesdale Motor Truck company of Clyde, Ohio, preparatory to an intensive sales campaign.

In 1917 the bureau found that there were 10,547 stables in New York city. In 1919 there has been reduced to 7920. In the same time the number of horses had been reduced from 108,036 to 75,170. A decade ago the passenger car

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Speckled Varnish.

The varnish of a new car is likely to become speckled after its first experience with rain. These tiny spots are not easy to get off, but it is always possible to render them less noticeable by applying a mixture of raw linseed oil and malt vinegar, supplemented by a considerable application of "elbow grease."

Dashboard Clock Reflects Car Owner's Character.

If It Is Not Kept Wound, Look Out for Forgetfulness in Other Things.

The clock which adorns the dashboard of the modern motor car seems, at times, to be on the point of joining the Dodo and the nickel in oblivion.

Why? It's usually like a homely girl at a dance—it doesn't get any attention. No one seems to remember to wind it.

Of course a number of automobiles do not come equipped with clocks, and then others seem to be considered incomplete without one.

As a means of ascertaining the time they are about as useful as a weather vane atop a lightning rod on a calm day.

The reason is obvious—too many people are in the habit of pulling the old timepiece out of their pockets, or looking for the hour with a graceful flip of the wrist—and they don't tune up the stock clock.

Then why worry?

Because it's an indication, or what? It shows about how much attention an owner pays to his car.

Of course, one can't take a fleeting glance at all the clocks in the automobile of the world and class all owners as careless because their clocks happen to be stopped.

But generally the man who forgets to wind his clock forgets to take a look at some of the more vital things. He may start out on a trip without water in his radiator.

And then again he may lose a license tag and not know it.

Or he may have a weak tire; or a leaky radiator; or something else. Doesn't it figure out? Doesn't it come out the same way in the way of motor cars as in other things? And it is one way of finding out whether there is carbon in the cylinders of the man's car, for—

The chap who forgets little things, as a rule overlooks more important things, too.

Ford

THE UNIVERSAL CAR

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Under the most adverse conditions—through the worst storms and snows in thirty years—the Ford Car has again proved its power and efficiency throughout the state of Oregon.

You watched them every day—doing their utmost at a time when practically all other means of transportation were tied up or crippled by the storms. You saw Ford Cars everywhere, always doing, always helping. They compelled your admiration of their power, their sturdy strength and their indomitable energy. You realized, as never before, that the Ford Car more than earns its way wherever it goes.

The Ford Car is the most efficient and economical transportation the world has ever known.

That is why there are over three and one-half million Ford Cars now in use. That is why more than a million more will be bought this year. The demand is greater than ever, because of what it has done and is doing in the world's great work.

Get this wonderful Car working for you. It will increase your earning power, double your time, add to your efficiency and improve your health.

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Runabout \$500	Self-Starter \$75 Extra	Coupelet \$750
Touring Car \$525	Truck Chassis \$600	Sedan \$875

These prices f. o. b. Detroit

For Sale by the Following Authorized City Dealers:

Francis Motor Car Co. East 18th and Hawthorne	Rushlight & Penney East Third and Broadway	Robinson-Smith Co. Sixth and Madison
Talbot & Casey East Ankeny and Grand	Wm. L. Hughson Co. Broadway and Davis	Palace Garage Co. Twelfth and Stark

A \$25.00 Deposit Places Your Order on File

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Cohn Bros., Heppner, Or. "Also Buy a Master"

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Two Drives { INTERNAL GEAR
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Oregon Motor Car Co.

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MORE EVIDENCE

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WATCHING the lid on the teakettle bob up and down resulted eventually in the application of steam for power purposes.

Watching the operation of the Mack truck chassis in our showroom will result in your learning why we can truthfully say the Mack is the most thoroughly engineered truck.

The possibility of deriving power from steam was scoffed at. Harnessing Niagara to generate electric energy was ridiculed.

There may be some who say we cannot prove the merits of Mack trucks are all we claim for them.

These are the ones we are looking for. The more "expert" they may be the more welcome will be their reception.

We can show you so many reasons why Mack trucks are the best trucks that you will acknowledge it.

All we ask is a chance, so come in and see the Mack truck chassis on its side, electrically operated and all working parts exposed.

INTERNATIONAL MACK CORP.

Tenth and Davis Streets.
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This sturdy, speedy car "has everything"—comfort, power, beauty, ECONOMY. Just let us show you with a trial spin. Use the phone NOW for an appointment.

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Time Flies—

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