April 30, 1929. A. E. HUTT 1,711,267

VALVE STEM OIL GUARD

Filed Sept. 30, 1926

Fig. 3

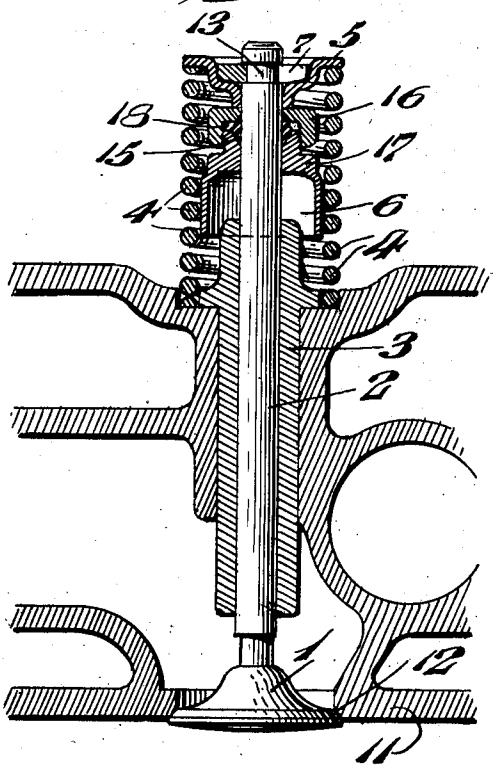


Fig. 1.

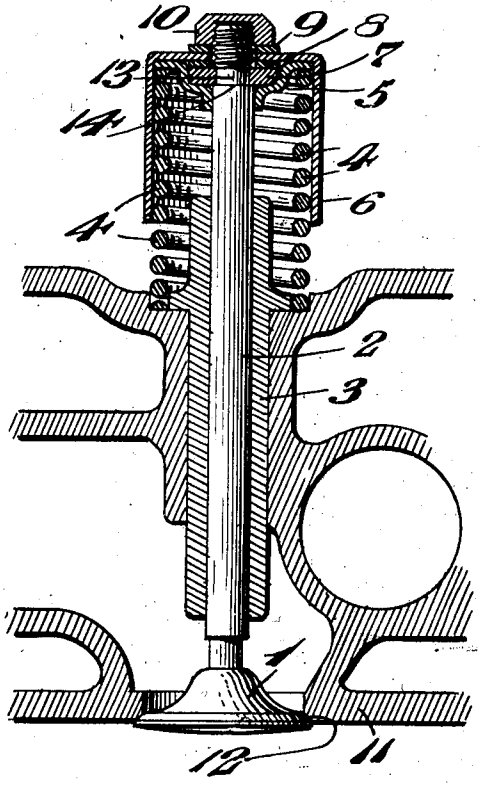


Fig. 4.

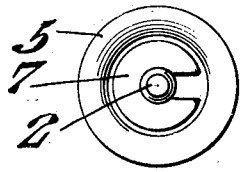
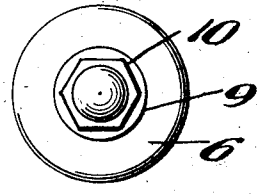


Fig. 2.



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UNITED STATES PATENT OFFICE.

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VALVE-STEM OIL GUARD.

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The valve in head type of engine is admitted by engineers to be superior in many ways to either the T or L head type of engine, because of the more desirable shape of combustion chamber that results from this form of construction. Its more general use however, has been retarded chiefly because of the tendency of the exhaust valves to stick in the guides. This sticking of the exhaust valves is due to oil working down between the valve stems and their guides and being carbonized by the heat of the exhaust gases. Another disadvantage is due to oil working down between the inlet valve stems and their guides, which is facilitated by the partial vacuum formed in the cylinders during the inlet stroke and which, while it does not cause these valves to stick, (due to the lack of heat and the presence of gasoline which acts as a solvent for the oil) still results in high oil consumption, smoky exhaust and the formation of heavy carbon deposits on the valve heads. In valve in head engines there is necessarily considerable mechanism located above the cylinder head to operate the valves and it is essential that this mechanism is adequately lubricated and it is from this lubrication that comes the oil that reaches the valve stems and starts all the trouble. The object of this invention is therefore to protect the valve stems from any oil that might reach them from the lubricating of the valve operating mechanism.

To the above ends my invention consists of a novel construction of an oil guard for the valve stems of internal combustion, or other engines, of the valve in head type, consisting of parts so made and assembled that the valve stems, are guarded from contact with any oil, the presence of which oil on said valve stems is the cause of excessive oil consumption, sticking exhaust valves and other troubles.

My invention further consists of the combination of a valve with a stem, a cup shaped member attached to said valve stem in an inverted position, said cup shaped member being so attached to said valve stem that it will move with it as a unit and that the joint between them shall be oil tight.

It further consists of a cup shaped member so positioned on the valve stem that it will surround at all times that portion of said valve stem that protrudes above the valve stem guide when the valve is seated or in a closed position, and which enters the valve stem guide when the valve is opened.

It further consists of other novel features of advantage and construction, all as will be hereinafter fully pointed out in the specification and claim.

For the purpose of illustrating my invention I have shown in the accompanying drawings several forms thereof which are at present preferred by me, since the same have been found in practice to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which my invention consists can be variously arranged and organized, and that my invention is not limited to the precise arrangement and organization of these instrumentalities as herein shown and described.

Figure 1, represents a sectional view of a cylinder head, valve guide and its adjuncts fitted with my novel valve stem oil guard, the valve and its stem being in elevation.

Figure 2, represents a top plan view of Fig. 1.

Figure 3, represents a view similar to Fig. 1 of another embodiment of my invention.

Figure 4, represents a top plan view of Fig. 3.

Similar numerals of reference indicate corresponding parts.

In carrying out my invention which is applicable to any conventional type of poppet valve internal combustion engine of the valve in head type, I employ a valve 1 provided with a stem 2 which is located in the guide 3. 4 designates a coil spring which is used to close the valve 1 and keep it on its seat 12 in the cylinder head 11. 5 designates the spring retaining cup which abuts against the upper end of the spring 4. 6 designates the valve stem oil guard to which my invention is particularly directed. 7 designates the conventional U shaped washer which fits around the recessed portion 13 of the valve stem 2 and which, in conjunction with the upward pressure of the spring 4 locks the spring retaining cup 5 in position. 8 and 9 (see Fig. 1) designate two annular washers between which the bottom of the inverted cup shaped member 6 is held by the pressure exerted when the nut 10 is screwed down or tightened.

It will be seen from the foregoing that when the various parts are assembled as shown in Figs. 1 and 2, that the pressure exerted by the nut 10 will force the two annular

washers, 8 and 9, the oil guard 6 and the U shaped washer 7 downwardly until stopped by the ledge 14 of the recess 13 and that as the pressure of the nut 10 is increased, the oil guard 6 will be compressed between the annular washers 8 and 9 in such manner that any oil falling or being thrown on the nut 10, the washer 9 or the oil guard 6 will not be able to reach the exposed upper part of the valve stem 2.

It will be apparent that while I have shown in Fig. 1, the cup shaped member 6 located outside of the valve spring 4, it could also be located inside of it with just as good results as shown in Fig. 3, in which the oil guard 6 is shown as fitted at its upper end with a conventional compression coupling as used on gasoline lines which comprises the following elements:—15 represents the tapered sleeve which is forced into intimate contact with the valve stem 2 when the nut 16 is tightened on the screw 18, thus fastening the cup shaped member 6 to the valve stem 2, and preventing the passage of oil down the valve stem 2. 17 designates a hexagon shaped lug on the cup shaped member 6 to afford a means of holding it from turning while the nut 16 is being tightened.

While I have shown in Figs. 1 and 3 the inverted cup shaped member 6 as coming below the top of the valve guide 3, it is not essential that this be so, although the further it comes down the greater protection it will afford to the valve stem, providing that it does not come down so far that when the valve is opened its lower end comes in contact with the cylinder head or other parts of the engine, which would interfere with the proper functioning of the valve.

It will thus be seen from the foregoing that my novel cup shaped member is so positioned on the valve stem in both embodiments of my invention, that it will surround at all times that portion of said valve stem that protrudes above the valve stem guide when the valve is seated or in closed position, and which enters the valve stem guide when the valve is open, whereby oil is effectively prevented under all conditions and in all positions of the valve and its stem from having access to the latter.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:—

In a valve in head internal combustion engine, a valve, a valve stem, a guide therefor, a spring retaining annulus mounted on said stem, a spring for seating said valve co-operating with said annulus, an inverted cup-shaped member having its upper end fixedly mounted on the upper end of said valve stem independently of said spring and in an oil tight manner, said cup-shaped member being so positioned on said valve stem that its pendant portion extends below the upper end of said guide when said valve is seated; the inner diameter of said cup-shaped member being greater than the outside diameter of said guide to prevent a pumping action therewith when said valve is operated.

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