March 31, 1925. 1,531,267

W. F. AWE

VALVE GUIDE

Filed Sept. 21, 1922

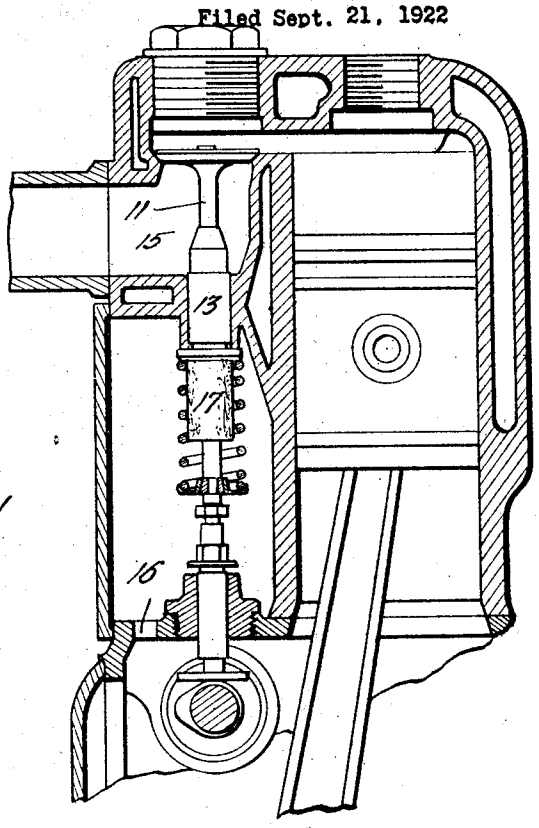


Fig. 1

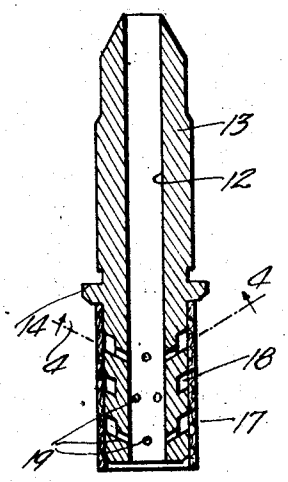


Fig. 3

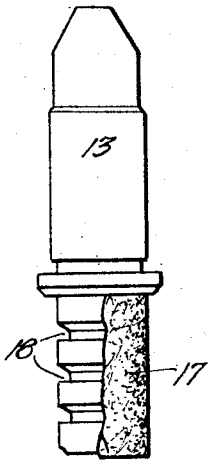


Fig. 2

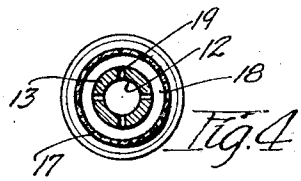


Fig. 4

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UNITED STATES PATENT OFFICE.

WILLIAM F. AWE, OF CHICAGO, ILLINOIS.

VALVE GUIDE.

Application filed September 21, 1922. Serial No. 589,580.

To all whom it may concern:

Be it known that I, WILLIAM F. AWE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Valve Guides, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

My invention relates to valve guides, and more specifically to poppet valve guides which are lubricated by the splash of oil from the crank case of an internal combustion engine by means of reservoirs or pockets on the periphery of the valve, and ducts leading from the reservoirs to the inner bearing surfaces.

The chief object of my invention is to improve the lubrication of such a valve guide by insuring a more even flow of lubricant into these pockets by means of a layer of felt-like material lying around the pockets and serving, by capillary attraction and otherwise, to feed such oil as comes in contact with it to the pockets.

A still further object of my invention is, by a similar arrangement of felt-like material, to strain the oil of such particles of foreign matter as may have accumulated in it in its previous use.

Other advantages of my invention will appear from the description which follows, in which I shall refer to the accompanying drawing wherein—

Figure 1 is a transverse vertical section of a portion of an internal combustion engine showing the guide of my invention adapted to a downwardly seating poppet valve;

Figure 2 is an elevational view of the valve guide;

Figure 3 is a longitudinal section of the guide, and

Figure 4 is a transverse vertical section taken upon the line 4—4 of Figure 3.

Similar characters of reference refer to similar parts throughout the several views.

I have indicated in the drawing a downwardly seating poppet valve 11 which reciprocates within the bore 12 of a valve guide 13, which is supported in a suitable aperture in the cylinder casting. That portion of the valve guide which lies below the limiting shoulder 14, it will be seen, lies in that portion of the cylinder casting outside of the gas port 15, access being had between this portion of the valve stem and the crank case by an aperture 16 through which the lubricant in the crank case is splashed by the rapid rotation of the crank shaft, with the result that lubricant will fall upon the lower end of the valve guide and upon the adjoining surfaces of the cylinder casting, whence it gravitates downwardly to a sleeve 17 consisting of a layer of felt-like material which surrounds the lower exposed portion of the guide. This portion of the guide, it will be observed, is provided with a plurality of vertically spaced annular reservoirs or pockets 18 having inwardly inclined or conically conformed lower surfaces, from which a plurality of small ducts 19 leads through the remaining thickness of the shell of the guide to the bore 12 which forms the bearing surface for the reciprocating valve stem.

Were the felt sleeve 17 omitted, the lubricant would run down the sides of the valve stem and enter the reservoirs 18, from which the lubricant would be fed rather rapidly into the bearing surface because it is impossible to provide the guide with ducts 19 which are sufficiently small in area, for to do so would cause frequent clogging of the ducts by small particles in the relatively thick oil. It is apparent that the lubrication of the valve stem when used in connection with the so-called splash system of lubrication in the crank case would be much more efficient and plentiful at high engine speeds than at low engine speeds when there would not be sufficient force to carry a large amount of oil through the aperture 16. As the supply of lubricant in the reservoirs 18 would be quickly spent through the relatively large ducts 19, the valve guide would be left without the most efficient lubrication during long periods of idling of the engine.

The provision of the felt sleeve 17 overcomes both of these objects in that the oil which enters the reservoir 18 is strained through the fine pores of the felt with the result that the use of ducts 19 of smaller area becomes practicable, and in that the felt tends to hold in its pores a considerable amount of lubricant which it releases gradually into the reservoirs 18. In this way, the feed from the reservoirs into the bearing surfaces is made gradual and constant, and the supply of lubricant to the reservoirs is

maintained at a relatively constant amount. An occasional speeding of the engine, it will be seen, will quickly resaturate the felt sleeve 17 with lubricant. It is also to be noted that the felt sleeve 17 gathers oil from a larger area on the guide than would be gathered by the reservoirs 18 without the use of the sleeve.

I have found in practice that as the lower end of the valve guide, as shown in Fig. 1, is insulated from the heat of the exhaust port 15 by the water jacket, there is no tendency for the felt sleeve 17 to burn, although it is not made of non-combustible material.

Having thus described my invention, what I claim is:

1. A valve guide comprising a bearing surface for a valve stem, a peripheral pocket for the reception of lubricant, a duct leading from adjacent the bottom of said pocket to said bearing, and a layer of felt secured to said guide and overlying said pocket for bringing to said pocket such lubricant as is splashed onto said guide.

2. A valve guide comprising an inner bearing surface for a valve stem, vertically spaced pockets on the periphery of said guide for the collection of lubricant, ducts feeding lubricant from said pockets to said bearing surface, and a layer of felt-like material lying around a portion of said guide and covering said pockets for the purpose of supplying lubricant which finds its way to the surfaces of said material to said pockets, said material also straining said lubricant.

3. A valve guide comprising a bearing for the stem of a reciprocating valve, said guide being provided with a plurality of longitudinally spaced annular peripheral recesses for the reception of lubricant, the bottoms of which recesses are inwardly inclined, annular portions of said guide separating said recesses from said bearing surface, ducts leading through said annular portion from said recesses to said bearing surface, and a sleeve of felt-like material lying around said guide and covering said recesses for bringing oil to said recesses.

4. A valve guide comprising a bearing surface for a valve stem, a peripheral pocket for the collection of lubricant, a duct leading from said pocket to said bearing surface, and a layer of felt-like material overlying said pocket for supplying lubricant to said pocket.

5. A valve guide for motors comprising a cylindrical bearing member having an internal bearing surface, a duct through the wall of said member for carrying oil to said surface, and a felt-like absorbent member surrounding a portion of said cylindrical bearing member and adapted to receive oil in the form of mist or splash and to retain a portion of said oil at the entrance to said duct, whence it may pass gradually to the internal bearing surface, the fibrous character of said felt-like material serving to strain out the coarser particles of carbon and grit from said oil.

In witness whereof, I hereunto subscribe my name this 15th day of September, 1922.

WILLIAM F. AWE.

Witnesses:
DAGMAR PETERSON,
J. DAVID DICKINSON.