

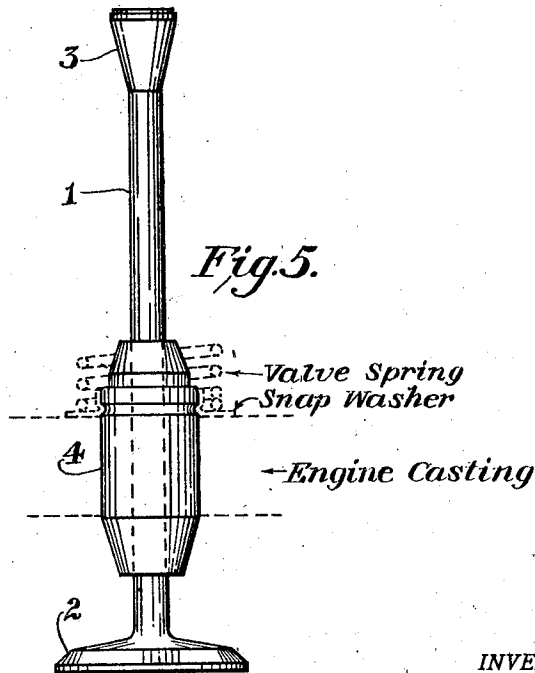
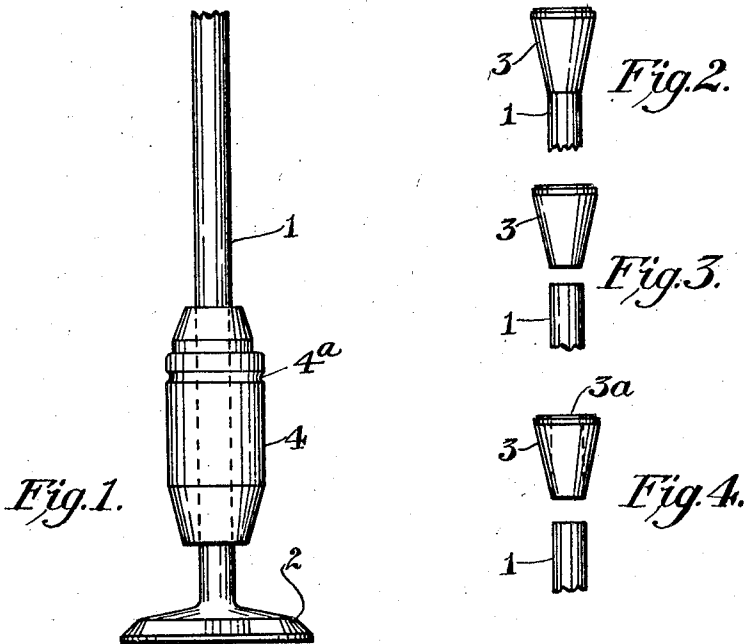
April 14, 1931.

R. H. DAISLEY

1,800,340

GUIDE AND STEM ASSEMBLY FOR POPPET VALVES

Filed July 31, 1929



INVENTOR
ROBERT H. DAISLEY
BY *George B. Willcof*
ATTORNEY

UNITED STATES PATENT OFFICE

ROBERT H. DAISLEY, OF HIGHLAND PARK, MICHIGAN, ASSIGNOR TO WILCOX-RICH CORPORATION, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN

GUIDE AND STEM ASSEMBLY FOR POPPET VALVES

Application filed July 31, 1929. Serial No. 382,514.

This invention relates to poppet valves for internal combustion engines and pertains more particularly to a new and useful assembly of a poppet valve and a guide therefor.

5 The objects of the invention are to improve the accuracy of the sliding fit between the valve stem and the bore of the guide in which it is mounted, to reduce the cost of manufacture of the assembled valve and guide, to
10 protect the rubbing surfaces of the highly polished stem when the valve and guide are shipped and while they are being assembled in the engine, and to provide a novel and inexpensive construction of the guide where-
15 by the guide can be easily and quickly inserted in the bore of the engine casting and locked in position therein.

My improved valve and guide assembly eliminates the split guide heretofore commonly
20 used in conjunction with valve stems that are upset at the ends remote from the valve head. By eliminating the split guide I reduce the expense of manufacture and insure more accurate fit of the guide and the
25 stem and reduce the cost of handling, because a one-piece guide is less expensive to manufacture than a split guide, and the bore that receives the stem can be made to a more accurate running fit, and the liability of
30 nicking or marring the surface of the bore in the guide is avoided.

I attain the foregoing objects by providing in conjunction with the usual poppet
35 valve consisting of the polished stem and head, a guide of bronze or anti-friction metal the guide being made of a single piece of metal very accurately bored to slidably receive the valve stem and made in cylindrical
40 form so as to be received by a straight pressed fit in the bore of the engine casting. An end of the guide when so received in the casting projects above the casting and there presents a peripheral groove adapted to receive a snap washer that releasably locks the
45 guide and the engine casting together and also provides a seat for the valve spring.

After the guide has been put in place on the valve stem and before it has been applied to the engine casting, as above described, the
50 valve stem is provided with an enlarged head

forming a spring retainer seat. These enlarged heads have heretofore been commonly used in connection with the valve stems, but so far as I am aware, have not been applied to the valve stem after a one-
55 piece accurately fitted bushing has been slipped over the stem, thus completing a unitary assembly of the valve and its guide. These assemblies, each consisting of a guide, a valve having the usual head and an enlarged end remote from the head, can be conveniently manufactured at a valve factory and can be shipped to the engine plant and assembled in the general way with the assurance that the accurate factory fit will be
60 preserved during shipment and after the valve and guide have been put in place in the engine.

With the foregoing and certain other objects in view, which will appear later in the specification, my invention comprises the devices described and claimed and the equivalents thereof.

In the drawings Fig. 1 is a side view partly broken away, showing the manner of assembling the valve and guide.

Figs. 2, 3 and 4 are details showing various ways of applying the enlarged end of the stem to provide the spring retainer seat.

Fig. 5 is a side view of the completed assembly, showing in dotted lines the application thereto of a snap washer for holding the assembly in place in the engine casting, the snap washer serving also as a seat for the valve spring.

As is clearly shown in the drawings, numerals 1 and 2 respectively indicate the polished valve stem and the valve head, the usual enlarged or upset end 3 forming the spring retainer seat. Numeral 4 indicates the one-piece valve stem guide accurately bored to slidably receive the stem 1 and accurately turned, and ground outside to form a press fit in the bore of the engine casting, as indicated in Fig. 5. The upper end of the guide
85 4 where it projects through the engine casting is formed with a peripheral groove 4a and into this groove is secured a snap washer which securely holds the guide in position.

The head 3, as shown in Fig. 2, may be

formed by a cold or a hot upset, or it may be made, as indicated in Fig. 3, by forming the stem and head separately and then welding them together, or, as shown in Fig. 4, the stem may be slipped into a bore 3a of the head and fastened therein by welding in the usual way.

In practicing my invention the stem 1 and head 2 are fabricated as is customary, the one-piece bushing 4 is bored, ground and grooved and is then slipped over the stem 1, after which the head 3 is formed by any of the usual methods, such as those just mentioned. Under these conditions of working the stem and guide can be highly polished and made to a very accurate sliding fit and this relationship can not be disturbed by subsequent handling as in shipping or in assembling the engine. The bore of guide 4 is always protected against accidental mar-
ring and also helps to protect the highly polished stem 1 against injury. No starting, experimental fitting or other handling is required at the assembly plant, in order to secure an accurate assembly, as has heretofore been the case when split bushings have been used, and there is no liability of the bushing working out of place when held by the snap washer in the manner indicated by dotted lines in Fig. 5.

Disassembling in service is also rendered easier because a two-piece bushing heretofore used is very difficult to get out after being put into the engine, whereas the one-piece bushing of the present assembly can be removed very easily by detaching the snap washer, forcing the bushing out.

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

1. A valve and guide assembly comprising in combination a valve having a head and a stem having an enlarged end remote from said head and forming an integral part of said stem, a longitudinally bored valve stem guide comprising a single piece of metal bored longitudinally and slidably received on said stem, the external diameter of said guide being greater than the diameter of said enlarged end, said named parts constituting an assembly adapted for installation in an engine as a unitary piece, for the purposes set forth.

2. A valve and bushing assembly as specified in claim 1 wherein the guide is formed with an exterior peripheral groove near an end thereof, said groove adapted to receive a snap washer, for the purposes set forth.

In testimony whereof, I affix my signature.
ROBERT H. DAISLEY.