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VALVE FOR INTERNAL COMBUSTION ENGINES

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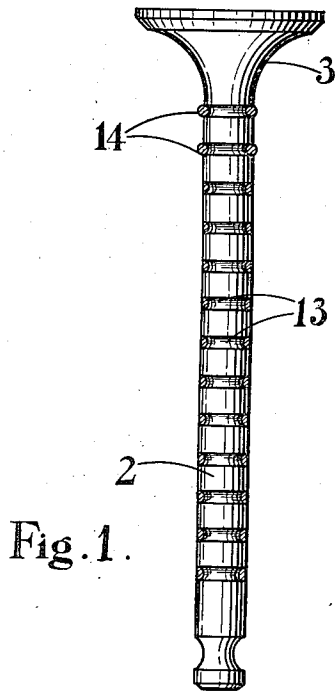


Fig. 1.

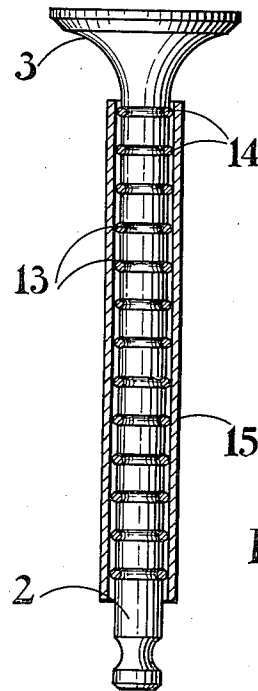


Fig. 2

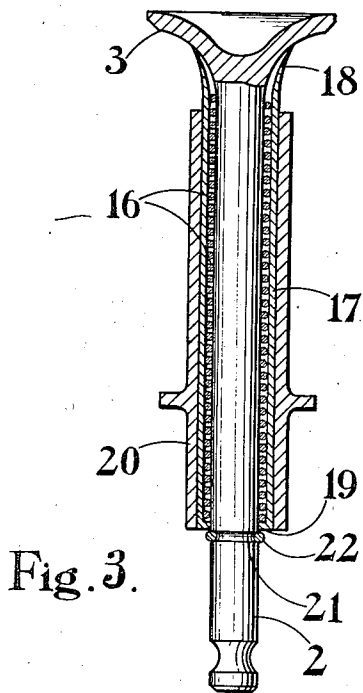


Fig. 3.

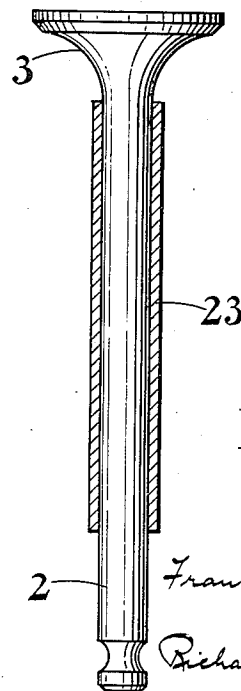


Fig. 4

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UNITED STATES PATENT OFFICE

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VALVE FOR INTERNAL COMBUSTION
ENGINES

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3 Claims. (Cl. 123—188)

This invention relates to valves of the poppet type as used in internal combustion engines.

At the present time the high working temperatures which obtain in internal combustion engines are a prevalent cause of valve fracture and it is the object of the present invention to provide means for preventing the valves from becoming overheated.

For this purpose, metal having a high degree of heat conductivity, such as copper, is applied to the exterior of the valve, i. e. between the valve and the valve guide.

In the accompanying drawing:—

Figure 1 represents a poppet valve and one way of applying the heat conducting metal thereto.

Figure 2 illustrates a poppet valve in which the heat conducting metal is enclosed in a sleeve.

Figure 3 illustrates a poppet valve to which the heat conducting metal is applied in the form of a wire coil enclosed within a bush.

Figure 4 shows a poppet valve in which the heat conducting metal is applied thereto in the form of a solid sleeve.

Referring to the drawing, the valve is in every case of the orthodox type having a cylindrical stem 2 and a head 3 at one end thereof.

The heat conducting metal is applied to the exterior of the valve, and according to the arrangement shown in Figure 1, the valve stem 2 is grooved externally as at 13 to receive copper or like metal wire 14 which is wrapped round the grooves and subsequently machined flush with the surface of the stem. In the modification of this arrangement illustrated in Figure 2, the wire 14, instead of being machined flush with the surface of the stem, is encased in a metal sleeve 15 which is forced over the turns. The advantage of this latter arrangement is that both the sleeve 15 and the valve guide in which it reciprocates may be made of cast iron.

In the arrangement illustrated in Figure 3, the heat conducting metal is applied to the exterior of the valve in the form of a sleeve 16 made of closely coiled copper or other suitable wire or strip. The internal diameter of said sleeve is a push fit on the valve stem 2 and, as will be seen, the sleeve itself is encased in a bush 17 one end 18 of which is flared to make a close

joint with the neck of the valve whilst the other end is formed with an inwardly directed flange 19 which fits closely around the valve stem and retains the coiled wire sleeve 16 in position. In this figure the valve guide is indicated at 20. For the purpose of preventing relative axial movement of the sleeve 16 and bush 17 on the valve stem 2 the latter, as shown, is formed adjacent the flange 19 of the bush with an annular groove 21 in which is located a circular spring locking ring 22. Relative axial movement may also be prevented by spot welding either end of the bush 17 to the valve or in any other suitable manner.

In a further form, represented in Figure 4, the heat conducting metal is applied to the valve in the form of a tubular sleeve or bush 23 of solid copper or other suitable good conductor of heat, the sleeve or bush being introduced onto the valve stem 2 with a driving fit.

In another method included in the present invention a heavy coating of copper or other heat conducting metal is applied to the exterior of the valve either by a process of electro-deposition or in the molten state by a spraying process.

I claim:—

1. A valve for internal combustion engines comprising a head, a cylindrical stem, a coiled wire sleeve introduced onto said stem, and made of a metal having a higher degree of heat conductivity than that of the metal of the valve, and a bush adapted to enclose said sleeve.

2. A valve for internal combustion engines comprising a head, a cylindrical stem, a sleeve on said stem made of a metal having a higher degree of heat conductivity than that of the metal of the valve, a bush adapted to encase said sleeve, an inwardly projecting flange at one end of said bush which fits closely around the stem, and a locking ring located in a groove in said stem to prevent axial movement of said sleeve and bush.

3. The combination with the stem of a poppet valve, of a sleeve introduced about the exterior of said stem and made of a metal having a higher degree of heat conductivity than that of the metal of the valve, and a bush adapted to enclose and protect said sleeve.

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