April 28, 1925. 1,535,786

J. J. MORSCH

VALVE ACTUATING MECHANISM

Original Filed June 27, 1923

Fig. 1.

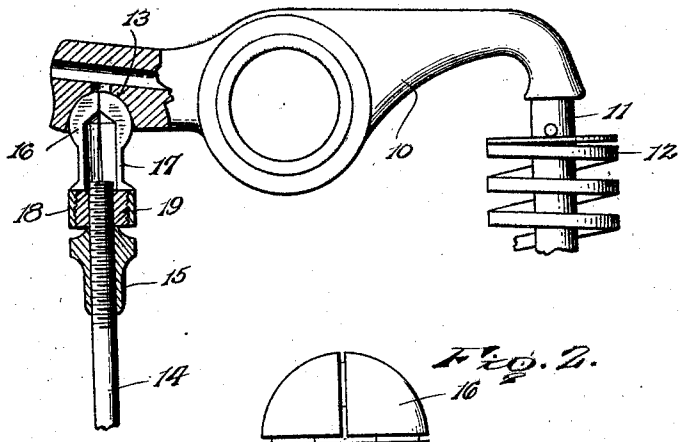


Fig. 2.

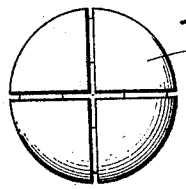


Fig. 4.

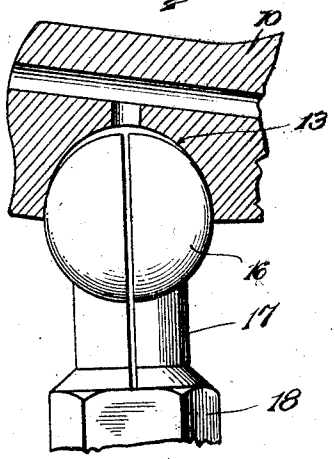
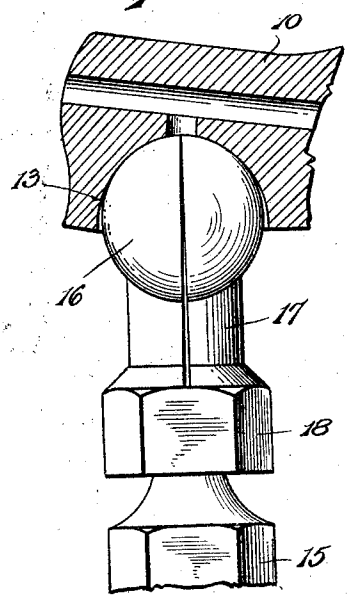


Fig. 3.



Inventor

J. J. Morsch.

By

Lacey Lacey, Attorneys

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UNITED STATES PATENT OFFICE.

JESSE JULIUS MORSCH, OF DOUGLAS, WYOMING.

VALVE-ACTUATING MECHANISM.

Application filed June 27, 1923, Serial No. 648,134. Renewed March 19, 1925.

To all whom it may concern:

Be it known that I, JESSE JULIUS MORSCH, citizen of the United States, residing at Douglas, in the county of Converse and State of Wyoming, have invented certain new and useful Improvements in Valve-Actuating Mechanism, of which the following is a specification.

This invention relates to an improved valve actuating mechanism for internal combustion engines, being more especially designed for use in connection with overhead valves, and seeks, among other objects, to provide a mechanism wherein the usual noise occasioned by the clearance between the valve rocker and valve stem will be eliminated.

The invention seeks, as a further object, to provide a mechanism wherein the usual clearance between the valve rocker and stem will be taken up so that the rocker will be held constantly in contact with the valve stem while, at the same time, necessary independent movement between the parts to avoid binding, will be permitted.

And the invention seeks, as a still further object, to provide a mechanism embodying a novel ball end for the valve push rod.

Other and incidental objects will appear hereinafter.

In the drawings:

Figure 1 is a fragmentary side elevation of the present mechanism, parts being broken away and illustrated in section,

Figure 2 is an enlarged top plan view of the ball end employed,

Figure 3 is an enlarged detail elevation showing the ball end under thrust of the push rod, and

Figure 4 is a view similar to Figure 3, showing the ball end at rest.

Referring now more particularly to the drawings, a valve rocker is shown at 10. The valve rocker is formed to cooperate at its forward end with a valve stem 11. The valve stem is conventionally shown, and associated with the valve is the customary spring 12 normally holding the valve closed. Formed in the rocker at its rear end is a substantially hemi-spherical socket 13. A push rod is shown at 14, and threaded upon the upper end portion of the rod is a lock nut 15. Mounted upon the push rod above the nut is a thrusting member or ball end having a spherically shaped head 16 from which extends a tubular shank 17 and formed on said shank is an annular skirt 18 having flat faces to accommodate a wrench. The head 16 is accommodated in the socket 13 of the rocker 10, and threaded into the skirt 18 is an annular bushing 19 internally threaded to receive the upper end of the push rod 14. Thus, the ball end may be adjusted longitudinally upon the push rod and the nut 15 may be set for locking the ball end in adjusted position.

Attention is now directed to the fact that said ball end is provided with a pair of longitudinally extending slots lying at right angles to each other and extending downwardly through the head 16 and shank 17 to the upper end of the skirt 18 to define a plurality of mating spring fingers spaced apart the width of said slots. These slots are preferably each approximately ten one-thousandths of an inch in width or the usual clearance required between the forward end of the rocker 10 and the valve stem 11. However, this clearance varies slightly for different engines and the width of the slots is varied accordingly. In the manufacture of the ball end, said ball end is first formed with the slots, as indicated, to define the spring fingers. Said fingers are then, as suggested in Figure 3, compressed into abutting relation when the head 16 is accurately turned to spherical shape. The skirt 18 is then bored out for reducing the skirt to the desired thickness for the particular tension required on the spring fingers, it being noted, in this connection, that the tension of the spring fingers will be directly influenced by the thickness of the skirt. For this reason, I employ the bushing 19 in order that the skirt may be cut away as may be found necessary to obtain the desired tension on the spring fingers, the skirt being, of course, tapped to receive the bushing after having been bored out.

As best brought out in Figures 3 and 4, the socket 13 of the rocker 10 is flared at its lower margin to fit the expanded head 16 of the ball end, it being noted in this connection that when the spring fingers of the ball end are moved into abutting relation, the head of the ball end will be contracted while when the spring fingers assume their normal position extending in parallel relation, the head will be expanded. However, when the push rod 14 is raised, for opening the valve, the spring fingers of the ball head will, under the resistance offered by the spring

12, be flexed toward each other at their upper ends so that the head 16 of the ball end will advance into the socket 13 until the spring fingers are moved into abutting relation when the head will be contracted to its true spherical shape and will thus flatly contact the upper portion of the wall of the socket to rigidly receive the thrust of the push rod for actuating the rocker. When the push rod then subsequently travels to the bottom of its throw and the tension of the spring 12 upon the rocker 10 is relieved, the spring fingers of the ball head will return to their normal position for expanding the head 16 so that the head will be caused to coact with the wall of the socket 13 for elevating the rear end of the rocker and accordingly creating a clearance, as shown in Figure 4, between the head of the ball end and the upper portion of the wall of the socket. This lifting of the rear end of the rocker by the spring action of the fingers of the ball end, will, of course, serve to move the forward end of the rocker into engagement with the upper end of the valve stem and hold the rocker in contact with the stem while the clearance between the head of the ball end and the upper portion of the wall of said socket will allow all necessary independent movement between the parts to prevent binding. At the same time, noise will be overcome by reason of the constant contact between the rocker and the valve stem.

Having thus described the invention, what is claimed as new is:

1. In valve-actuating mechanism, a ball end including a hollow thrusting member slotted longitudinally on radial lines to define spring fingers connected by a relatively thin skirt and a bushing fitting within the skirt for engagement with a push rod.

2. In valve-actuating mechanism, a ball end including a hollow thrusting member having a spherically shaped head formed with longitudinal slots arranged at substantially right angles to each other and defining spring fingers connected by a relatively thin skirt, and a bushing fitting within the skirt and threaded interiorly for engagement with a push rod, said bushing serving to reinforce the skirt.

3. In valve-actuating mechanism, a ball end including a hollow thrusting member having a spherically shaped head slotted longitudinally on radial lines to define spring fingers connected by an internally threaded skirt, and a bushing threaded in said skirt for engagement with a push rod, the exterior of the skirt being provided with an angular tool-engaging surface.

4. A valve-operating mechanism comprising a rocker having one end thereof in engagement with the stem of the valve to be operated and provided with a hemispherical socket in its under side near its opposite end, a push rod disposed below the rocker and alined with the socket therein, a hollow thrusting member having a spherical head engaging in said socket and longitudinally split on radial lines to form depending spring fingers connected at their lower ends by a relatively thin internally threaded skirt, a bushing threaded into the skirt and threaded onto the upper end of the push rod, and a lock nut threaded onto the push rod below the bushing and bearing thereagainst.

In testimony whereof I affix my signature.

JESSE JULIUS MORSCH. [L. S.]