

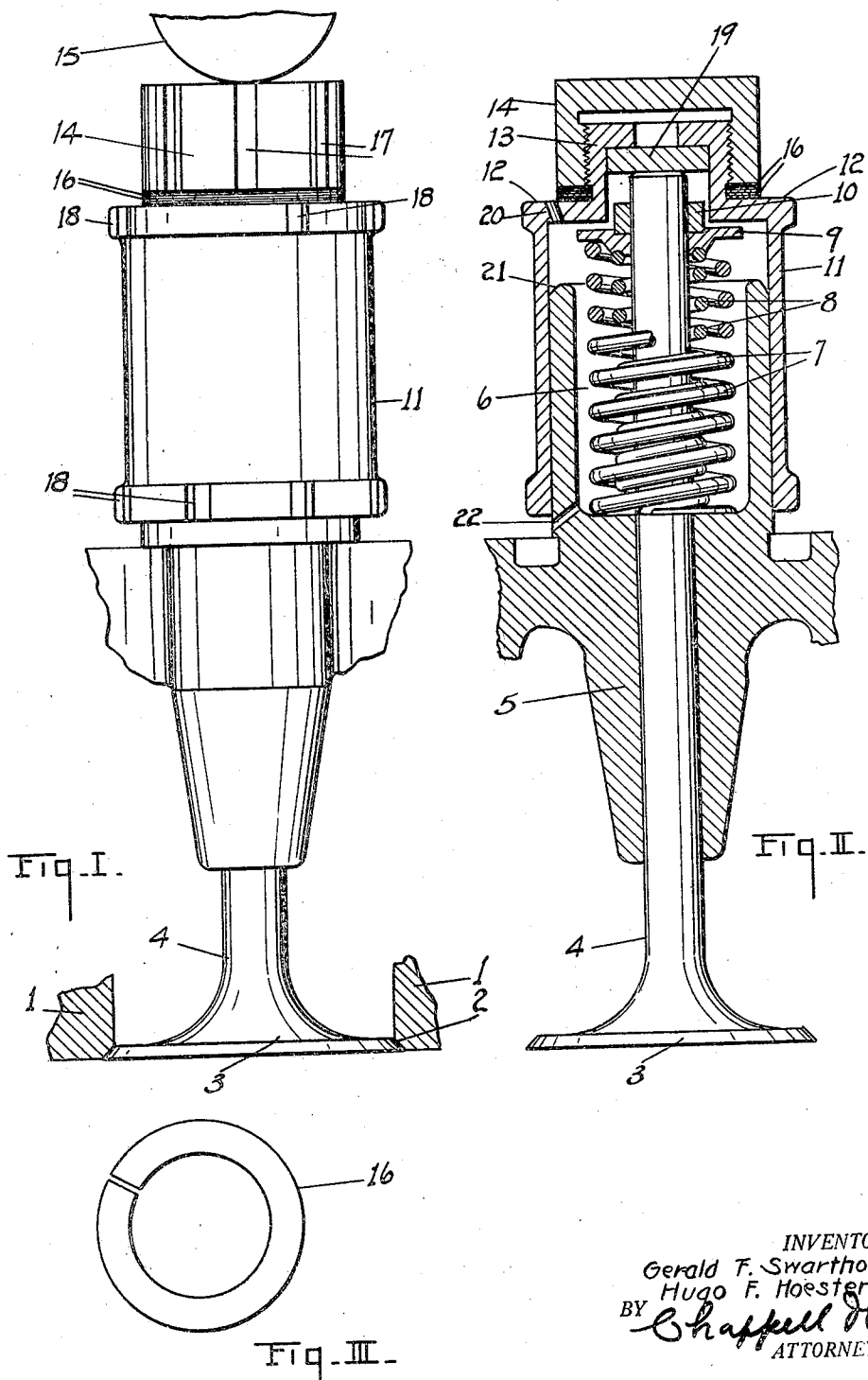
June 3, 1924.

1,496,497

G. F. SWARTHOUT ET AL

VALVE MECHANISM

Filed Feb. 23, 1921



INVENTOR.
Gerald F. Swarthout
Hugo F. Hoesterman
BY *Chappell & Clark*
ATTORNEYS.

UNITED STATES PATENT OFFICE.

GERALD F. SWARTHOUT AND HUGO F. HOESTERMAN, OF LUDINGTON, MICHIGAN, AS-
SIGNORS TO STEARNS MOTOR MANUFACTURING CO., OF LUDINGTON, MICHIGAN.

VALVE MECHANISM.

Application filed February 23, 1921. Serial No. 447,348.

To all whom it may concern:

Be it known that we, GERALD F. SWARTHOUT and HUGO F. HOESTERMAN, citizens of the United States, residing at Ludington, county of Mason, State of Michigan, have invented certain new and useful Improvements in Valve Mechanisms, of which the following is a specification.

This invention relates to improvements in valve mechanisms.

The main objects of this invention are:

First, to provide an improved valve mechanism for internal combustion engines of the type having overhead cam shafts.

Second, to provide an improved valve mechanism in which the rocker lever and its shaft, bearings, etc., quite commonly employed are eliminated.

Third, to provide an improved valve mechanism in which the parts are so arranged that side thrust and strains are substantially eliminated.

Further objects, and objects relating to structural details, will definitely appear from the detailed description to follow.

We accomplish the objects of our invention by the devices and means described in the following specification. The invention is clearly defined and pointed out in the claims.

A structure which is a preferred embodiment of our invention is clearly illustrated in the accompanying drawing, forming a part of this specification, in which:

Fig. I is a side elevation of a valve mechanism embodying our improvements, fragments of an engine and of one of the valve actuating cams being shown.

Fig. II is a detail view partially in vertical central section.

Fig. III is a plan view of one of the spacing shims for the impact member.

In the drawing similar reference characters refer to similar parts throughout the several views.

Referring to the drawing, 1 represents the wall of an internal combustion engine having a valve seat 2 for the valve 3. The valve 3 is provided with a stem 4 supported in the guide 5. The guide 5 has a recess 6 at its outer end constituting a housing for the seating springs 7 and 8. These springs rest on the bottom of the recess and their

upper ends engage the collar 9 retained by the pin 10.

We provide a cap-like tappet member 11 which is sleeved upon and supported by the guide. This tappet member is shouldered at 12 providing a reduced extension 13 at its outer end. Threaded upon this reduced end is a cap-like impact member 14. This impact member is of case hardened steel and the cam 15 engages the same directly. Between the end of the impact member and the shoulder are a plurality of shims 16, the shims being split to facilitate their ready removal and insertion, thereby permitting adjustment without removing the impact member and permitting it to be clamped tight so that it does not work loose on its threads.

The impact member has spaced grooves 17 therein to receive a wrench. The tappet member also has notches 18 with which the wrench may be engaged when adjusting the impact member of the tappet.

Within the tappet member is a hardened wear plate or block 19 disposed to engage the end of the stem 4 which is preferably case hardened so that the wearing parts are all hardened and should they become worn so as to impair their effectiveness they may be readily replaced.

The impact member is provided with a lubricant hole 20.

The upper end of the guide is preferably chamfered or beveled at 21 to facilitate the distribution of the lubricant around the bearing surfaces. A discharge hole 22 is provided at the bottom of the recess 6 permitting escape of any excess lubricant.

With this arrangement of parts the conventional rocker levers and the necessary shaft bearings and other parts are eliminated. The cam operates directly over the valve and wear and side thrust on the guide is substantially eliminated. The tappet may be adjusted to the cam so that proper opening of the valve is secured and noise is minimized. Further, the parts are economical to produce and assemble and, as stated, are very durable.

We have illustrated only one embodiment or adaptation of our improvements as we believe the disclosure made will enable those skilled in the art to which our inven-

tion relates to embody or adapt the same as may be desired.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent, is:

1. The combination of a valve provided with a stem, a guide for said stem recessed at its outer end, a seating spring arranged in said recess, said stem being provided with a thrust collar for said spring, a cap-like tappet member sleeved upon said guide, the outer end of said tappet member being shouldered, there being a lubricant hole through said shoulder, the end of the guide being beveled to facilitate the distribution of the lubricant, there being a hole at the bottom of the recess for the escape of surplus lubricant, and an impact member threaded for adjustment upon the end of said tappet member, there being a plurality of shims disposed between the end of said impact member and said tappet member shoulder, the shims being split to facilitate insertion and removal.

2. The combination of a valve provided with a stem, a guide for said stem recessed at its outer end, a seating spring arranged in said recess, said stem being provided with a thrust collar for said spring, a cap-like tappet member sleeved upon and guided by said guide, and an impact member threaded for adjustment upon the end of said tappet member.

3. The combination of a valve provided with a stem, a guide for said stem recessed at its outer end, a seating spring arranged in said recess, said stem being provided with a thrust collar for said spring, a cap-like tappet member sleeved upon said guide, an impact member threaded for adjustment upon the end of said tappet member, and a wear plate disposed within said tappet member to coact with the end of said stem.

4. The combination of a valve provided with a stem, a guide for said stem recessed at its outer end, a seating spring arranged in said recess, a tappet member sleeved upon said guide and having a reduced outer end,

an impact member threaded for adjustment upon the end of said tappet member, and a wear plate disposed within said impact member to coact with the end of said stem.

5. The combination of a valve provided with a stem, a guide for said stem recessed at its outer end, a seating spring arranged in said recess, a tappet member sleeved upon said guide and having a reduced outer end, said tappet member having a lubricant hole, the end of the guide being beveled to facilitate the distribution of the lubricant, there being a hole at the bottom of the recess for the escape of surplus lubricant, and an impact member threaded for adjustment upon the end of said tappet member.

6. The combination of a valve provided with a stem, a guide for said stem recessed at its outer end, a seating spring arranged in said recess, a tappet member sleeved upon said guide and having a reduced outer end, and an impact member threaded for adjustment upon the end of said tappet member and provided with a plurality of adjusting shims disposed between the end of said impact member and said tappet member shoulder, the shims being split to facilitate insertion and removal.

7. The combination of a valve provided with a stem, a guide for said stem recessed at its outer end, a seating spring arranged in said recess, a tappet member sleeved upon said guide and having a reduced outer end, and an impact member threaded for adjustment upon the end of said tappet member and provided with a plurality of adjusting shims disposed between the end of said impact member and said tappet member shoulder.

In witness whereof, we have hereunto set our hands and seals in the presence of two witnesses.

GERALD F. SWARTHOUT. [L. S.]
HUGO F. HOESTERMAN. [L. S.]

Witnesses:

E. M. MILLGARD,
BERTHA HOG Lund.