Sept. 17, 1929. J. MARTORELL 1,728,500

VALVE

Filed April 30, 1928

Fig. 1.

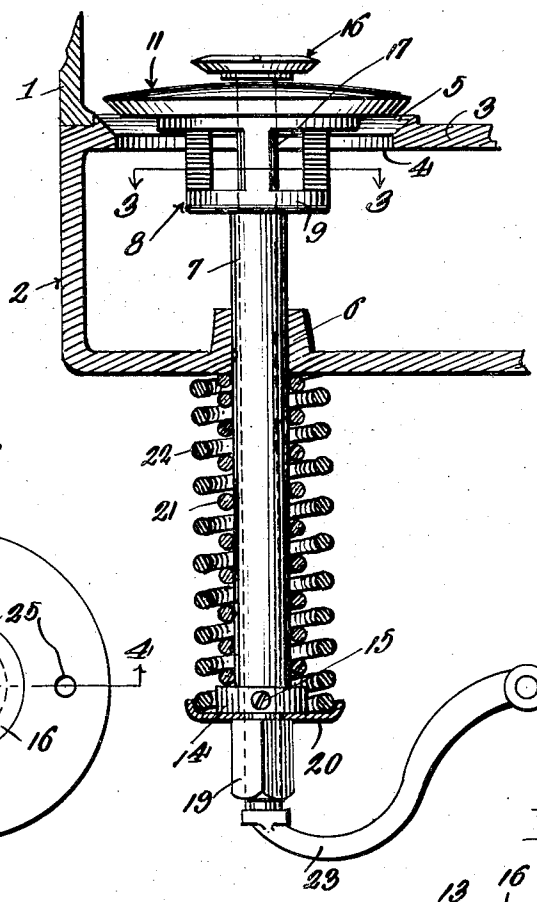


Fig. 2.

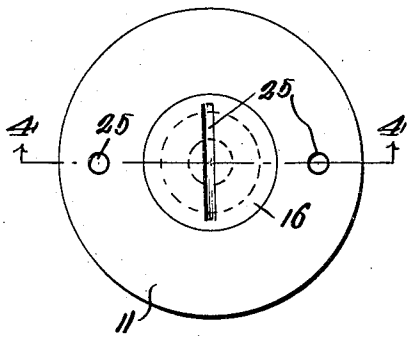


Fig. 3.

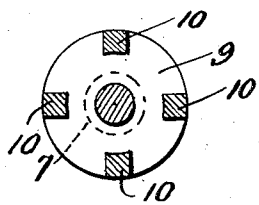
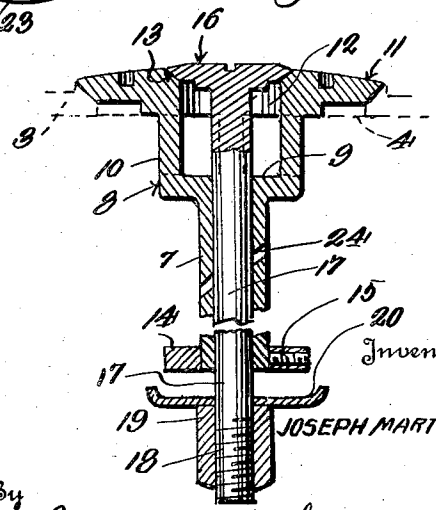


Fig. 4.



WITNESSES

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UNITED STATES PATENT OFFICE

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VALVE

Application filed April 30, 1928. Serial No. 274,116.

This invention has for its primary object the provision of a new and improved type of tappet valve designed especially for use as a control valve for the outlet port of internal combustion engines where it is desirable to have the combustion chamber opened quickly after an explosion and the power stroke of the piston has been completed.

Another object of the invention is to provide a tappet valve having an auxiliary valve of the same character in the head thereof which is designed to open before the main valve thus releasing some of the pressure to permit the easier opening of the main valve head. This also relieves strain upon some of the parts of the mechanism as for example the cam and rocker arm.

Other objects and advantages of the present invention will become apparent as the description of the same proceeds and the invention will be best understood from the following detailed description taken in connection with the accompanying drawings forming a part of this specification, with the understanding, however, that the invention is not confined to any strict conformity with the showing of the drawings but may be changed or modified so long as such changes and modifications mark no material departure from the salient features of the invention as expressed in the appended claim.

In the drawings:

Figure 1 shows the valve structure embodying the present invention, in side elevation and in operative position.

Figure 2 is a top plan view of the valve structure.

Figure 3 is a section taken substantially upon the line 3—3 of Figure 1.

Figure 4 is a longitudinal section through the valve section taken substantially upon the line 4—4 of Figure 2.

Referring now to the drawings in detail wherein like numerals of reference indicate corresponding parts throughout the several views, the numeral 1 indicates generally a portion of an internal combustion engine head. The numeral 2 indicates a casing which, for the purpose of the description of this invention will be termed the exhaust chamber. The top wall 3 of the exhaust chamber forms a partition between the same and the combustion chamber of the engine and has formed therein an exhaust port 4 the upper portion of which is beveled to provide the valve seat 5.

Directly beneath the exhaust port opening 4 and concentric therewith is a valve stem bearing 6 through which the stem of the improved valve forming the present invention extends and reciprocates.

The foregoing structure is conventionally shown and described for the purpose of more clearly showing and describing the application of the valve structure embodying this invention and forms no part of the present invention.

The present improved valve structure comprises an elongated hollow stem 7 which is positioned in the bearing 6 in the manner shown, which stem carries upon its upper end an open basket structure indicated as a whole by the numeral 8 and comprising a plate 9 having a central opening concentric with the bore of the stem 7, which plate carries the upstanding arms 10 equi-distantly spaced about the edge thereof.

The arms 10 support and preferably have formed integral therewith a main valve head 11. The central portion of this head 11, which as shown in Figure 1, is designed to rest upon the seat 5, is provided with the opening 12 the upper edge of which is formed to provide a valve seat 13.

The lower end of the hollow stem valve 7 has secured thereto the collar 14, a suitable set screw or other securing device 15 being employed to maintain the collar in position.

Upon the seat 13 formed in the center of the main valve head 7 there rests an auxiliary valve head 16 this head being carried upon an elongated stem 17 which passes downwardly through the basket 8 and through the hollow valve stem 7 to a substantial distance beyond the lower end thereof, carrying upon the lower end, which is threaded as indicated at 18, an adjusting nut 19 which supports a spring cup 20. When the main valve 11 and auxiliary valve

16 are open the collar 14 carried upon the hollow valve stem 7 rests upon the spring cup 20 as shown in Figure 1.

Surrounding the hollow valve stem 7 is a pair of coiled springs indicated by the numerals 21 and 22, the spring 21 fitting closely about the stem 7 and resting upon the collar the upper end bearing against the under face of the exhaust chamber casing 2 as shown. The spring 22 rests in the spring cup 20 and encases the spring 21 as shown. This spring at its upper end also presses against the under side of the bottom wall of the exhaust chamber casing 2. As will be readily seen the adjusting of the nut 19 increases or decreases the tension of the spring 22 while the spring 21 can be tensioned by adjusting the collar 14 upon the valve stem 7.

It will be seen from the foregoing description that when a rocker arm such as that indicated by the numeral 23 forces upwardly upon the auxiliary valve stem 17 the auxiliary valve 16 will open or leave its seat before the main valve 7 is moved. After the spring cup 20, stem 17 and nut 19 have been raised a predetermined distance the cup 20 will engage the collar 14 or the lower end of the hollow stem 7 and the main valve head 11 will be raised thus opening the large port 4. From this it will be seen that when the small valve or auxiliary valve 16 opens the high pressure within the cylinder will be relieved and less resistance will be offered to the opening of the main valve head 11.

In order to properly lubricate the auxiliary valve 17 and the engagement of the hollow valve stem 7 with the bearing 6, the stem 7 is provided with the oil passages 24 each of which extends at an oblique angle to the length of the stems. The upper one of these passages open from the exhaust chamber downwardly to the interior of the stem 7 and also leads from the interior of the stem to the exterior thereof within the bearing 6. The other oil passage is outside of the exhaust chamber 2 as shown in Figure 1.

The valve heads 11 and 16 may be provided with the usual slots or apertures 25 for connection therewith of grinding tools.

Having thus described my invention, what I claim:

In a valve construction, a valve seat, an abutment spaced from the valve seat, a main valve head provided with a central opening and associated with the valve seat, a hollow stem connected to the valve head and passing through and beyond the abutment, a collar secured to said hollow stem at a point beyond the abutment, a spring surrounding said hollow stem and bearing against the abutment and collar to normally hold the main valve head seated, an auxiliary valve head for controlling the opening of the main valve head, a stem connected to the auxiliary valve head and passing through and beyond said first hollow stem, a member carried by said second stem and spaced beyond said first hollow stem when the auxiliary valve head is closed and adapted to contact with said first hollow stem to limit the opening movement of the auxiliary valve head, a spring surrounding the stems and bearing against the abutment and member to normally hold the auxiliary valve head closed, and means cooperating with said second stem to open the auxiliary valve head and the main valve head in the order stated, said member establishing a rigid connection between said first hollow stem and said means after the opening of the auxiliary valve head so as to permit the positive opening of the main valve head by said means.

In testimony whereof I affix my signature.

JOSEPH MARTORELL.