J. W. BLACKSTONE.

OPERATING MECHANISM FOR VALVES.

APPLICATION FILED DEC. 28, 1916.

1,224,835.

Patented May 1, 1917.

Fig. 1.

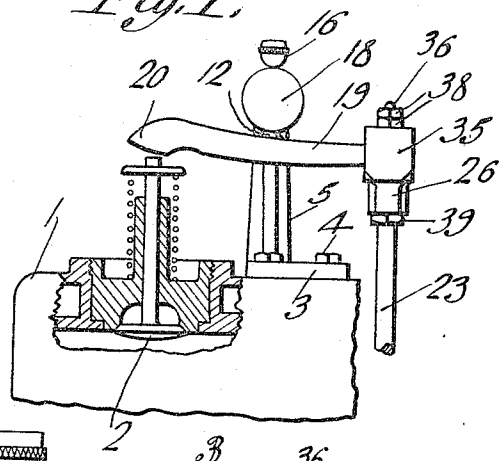


Fig. 2.

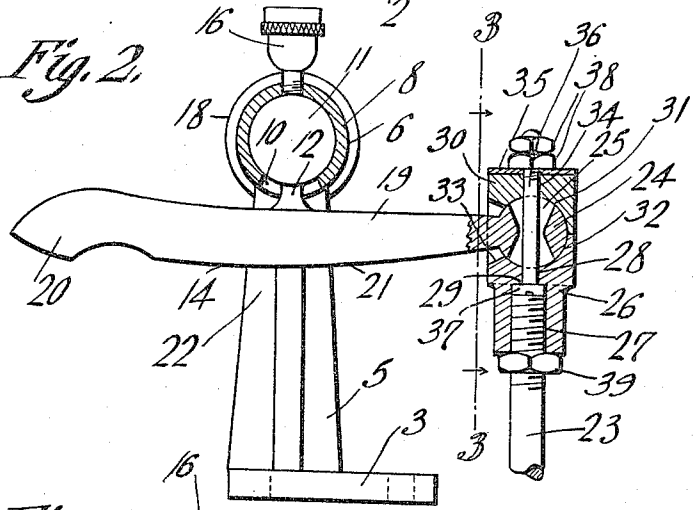


Fig. 3.

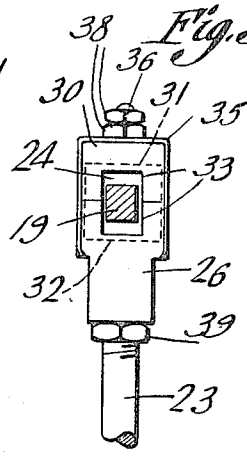


Fig. 4.

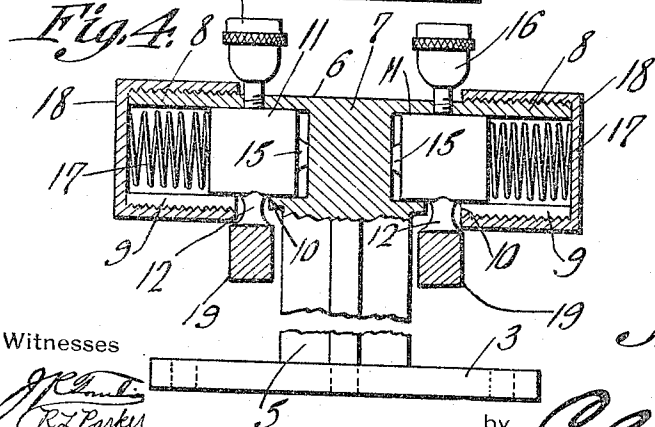
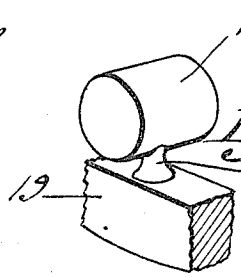


Fig. 5.



Witnesses

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OPERATING MECHANISM FOR VALVES.

1,224,835. Specification of Letters Patent. Patented May 1, 1917.

Application filed December 28, 1916. Serial No. 139,432.

To all whom it may concern:

Be it known that I, JOHN WILFRED BLACKSTONE, a citizen of the United States, residing at Shullsburg, in the county of Lafayette and State of Wisconsin, have invented a new and useful Operating Mechanism for Valves, of which the following is a specification.

The device forming the subject matter of this application is adapted to be employed for opening the valves of internal combustion engines, and for like purposes, and one object of the invention is to provide a dust-protected or inclosed bearing whereby the valve actuating lever is mounted for rocking movement.

Another object of the invention is to improve the connection between the valve operating lever and the rod whereby movement is imparted to the lever, to the end that wear can be taken up and dust and dirt kept out.

It is within the province of the disclosure to improve generally and to enhance the utility of devices of that type to which the present invention appertains.

With the above and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed, can be made within the scope of what is claimed, without departing from the spirit of the invention.

In the accompanying drawings:—

Figure 1 shows in side elevation, a portion of an engine to which the device forming the subject matter of this application has been applied, parts being broken away;

Fig. 2 is a side elevation of the valve operating mechanism forming the subject matter of this application, parts appearing in section;

Fig. 3 is a section on the line 3—3 of Fig. 2;

Fig. 4 is a longitudinal section of the valve operating mechanism, wherein parts appear in elevation; and

Fig. 5 is a perspective showing the means whereby the levers are mounted to swing on the supporting structure.

In the drawings, the numeral 1 indicates the head of an internal combustion engine, in which operates a valve 2. Mounted on the head 1 is a supporting structure including a base plate 3 held on the head 1 by securing elements 4, and a standard 5 carried by the base plate 3 and preferably formed integral therewith. The standard 5 carries a cross arm denoted generally by the numeral 6, the cross arm including tubular ends 8 and an intermediate abutment 7. In the bottom portions of the tubular ends 8, longitudinal slots 9 are formed. The slots 9 communicate with transverse slots 10 formed in the ends 8 at the bottom portions thereof.

Rollers 11 are mounted to rock in the tubular ends 8 of the cross arm 6. The rollers 11 have necks 12 which move in the transverse slots 10, the necks 12 formed integrally with the levers 19. The rollers 11 may be equipped with reduced tips 15 which, engaging the abutment 7, serve to lessen the friction. The rollers 11 are lubricated by oil cups 16 carried by the tubular ends 8 of the cross arm 6. Located in the tubular ends 8 are compression springs 17 which bear against the outer ends of the rollers 11. Caps 18 are threaded onto the ends 8 and engage the outer ends of the springs 17 to press the same against the ends of the rollers 11. When the caps 18 are in place, they close the longitudinal slots 9.

At this point it may be noted that when the rollers 11 are slid endwise into the tubular ends 8 of the cross arm 6, the necks 12 of the rollers traverse the slots 9 and ultimately arrive in the transverse slots 10. The rollers 11 then can rock in the tubular ends 8, as will be evident when Fig. 2 is compared with Fig. 4. The springs 17 are inserted into the tubular ends 8, and finally the caps 18 are mounted in place, to put the springs 17 under compression, and close the slots 9.

The ends 20 of the levers 19 are adapted to coöperate with the valves 2. Each lever 19 is provided at one end with a cylindrical head 24. The head 24 has an opening 25 therethrough, the opening 25 flaring toward its ends in a plane parallel to the plane in which the lever 19 tilts. The numeral 26 denotes a connecting block having a recess 27 in its lower end. Above the recess 27, the block 26 is provided with a bore 28 which is of smaller diameter than the recess 27, so as to form a shoulder 29. Superposed on the block 26 is a bearing 30 having a recess 31 complemental to a recess 32 formed in the upper end of the block 27. The recesses

31 and 32 define an opening in which the head 24 of the lever 19 is mounted to rock. The parts 30 and 27 are provided in one side with openings 33 through which the lever 19 passes. The bearing 30 has a bore 34 alined with the bore 28 of the block 26, and of the same diameter as the bore 28. A U-shaped cover 35 is straddled over the bearing 30 and over a portion of the block 26 and houses the ends of the head 24. A securing element 36 passes upwardly through the bore 28, through the opening 25 in the head 24 and through the bore 34 of the bearing 30, the securing element 36 passing through the upper portion of the cover 35. Nuts 38 are threaded onto the exposed end of the securing element 36 and engage the cover 35. The securing element 36 has a head 37 which abuts against the shoulder 29. The numeral 23 denotes an actuating member, ordinarily a rod, whereby tilting movement is imparted to the lever 19. The rod 23 is threaded into the recess 27 of the block 26 and abuts against the head 37 of the securing element 36, to aid in holding the securing element in place. A lock nut 39 is threaded onto the rod 23 and abuts against the lower end of the block 26.

The general construction of the device is such that it may be taken down and set up readily when occasion demands.

When the rod 23 is moved endwise, the block 26 and parts carried thereby participate in the motion of the rod 23. The head 24 on the lever 19 rocks in the opening defined by the recesses 31 and 32, this rocking movement being possible, because the opening 25 in the head 24 flares toward its ends. When a tilting movement is imparted to the lever 19 by the rod 23 in the manner hereinbefore described, the roller 11 rocks in the tubular end 8, the part 12 of the roller moving in the transverse slot 10. The springs 17 serve to hold the rollers 11 in place in the tubular ends 8, and prevent lost motion.

Having thus described the invention, what is claimed is:—

1. In a device of the class described, a supporting structure having a tubular end provided with a longitudinal slot and with a cross slot communicating with the longitudinal slot; a roller mounted to rock in the tubular end and having a neck movable in the cross slot, the neck being insertible into the cross slot through the longitudinal slot; a spring within the tubular end and coöperating with one end of the roller; means carried by the tubular end for engaging the spring; and a lever connected with the neck.

2. In a device of the class described, a supporting structure having a tubular end; a roller mounted to rock in said tubular end and provided with a neck extended through the tubular end, the tubular end having a transverse opening in which the neck is movable; and a lever assembled with the neck, exteriorly of said tubular end.

3. In a device of the class described, a supporting structure; a lever mounted to rock on the supporting structure and including a head having an opening; a connecting block and a bearing having complemental recesses in which the head is mounted to rock, the bearing and the block having coöperating openings through which the lever passes; a U-shaped guard mounted on the bearing and on the block and housing the end of the head; and a securing element passing through the block and through the bearing and through the opening in the head and engaging the guard to hold the same on the bearing.

4. In a device of the class described, a supporting structure; a lever mounted to rock on the supporting structure and provided with a head having an opening; a connecting block and a bearing having complemental recesses in which the head is mounted to rock, the bearing and the block having coöperating openings through which the lever passes, the bearing and the block being provided with bores, and the block having an opening which is of larger diameter than the bore of the block, to define a shoulder; a securing element passing through the bores and through the opening in the head and including an enlarged end bearing against the shoulder; and a rod threaded into the enlarged opening of the block and bearing against the enlarged portion of the securing element.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature.

JOHN WILFRED BLACKSTONE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."