Dec. 24, 1929. A. J. ADAM 1,741,090

VALVE MECHANISM

Original Filed Feb. 21, 1927

Fig. 1.

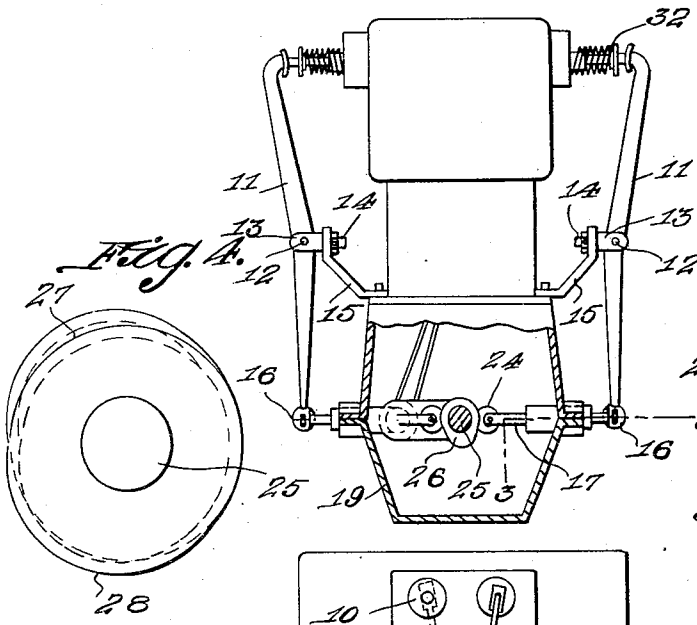


Fig. 4.

Fig. 5.

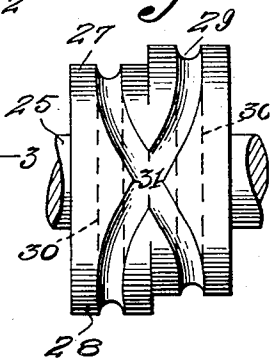


Fig. 2.

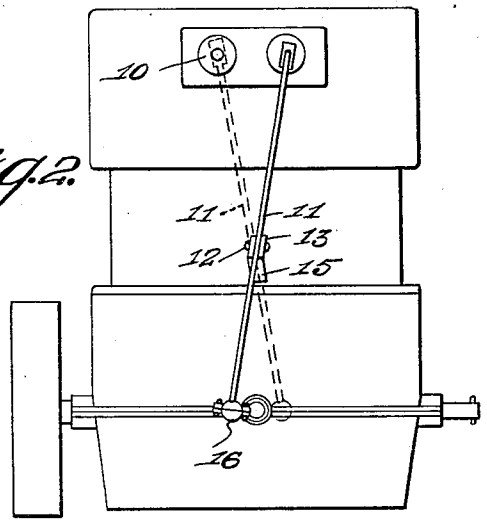
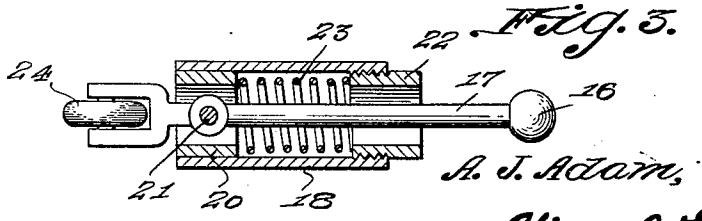


Fig. 3.



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UNITED STATES PATENT OFFICE

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VALVE MECHANISM

Original application filed February 21, 1927, Serial No. 170,018. Divided and this application filed September 26, 1928. Serial No. 308,561.

This invention relates to valve mechanisms for internal combustion engines and is a division of an application filed by me February 21, 1927, Serial No. 170,018.

An object of the present invention is to provide means for simplifying the construction and operation, and for reducing the number of working parts of a mechanism of the above character.

To this end, the invention provides means for actuating a plurality of valves through the operation of a single cam or eccentric, novel means being provided for alternately acting upon the intake and exhaust valves of one or more cylinders.

With the above and other objects in view, the invention further includes the following novel features and details of construction, to be hereinafter more fully described, illustrated in the accompanying drawing and pointed out in the appended claim.

In the drawing:—

Figure 1 is an elevation partly in section illustrated in internal combustion engine equipped with a valve operating mechanism in accordance with the invention.

Figure 2 is an elevation at right angles to Figure 1.

Figure 3 is an enlarged fragmentary sectional view on the line 3—3 of Figure 1.

Figures 4 and 5 are side and edge views respectively of the operating cam.

In the drawing, wherein like characters of reference denote corresponding parts, the invention is shown applied to a two cylinder engine, each cylinder having upon opposite sides an intake valve and an exhaust valve. These valves are indicated at 10. Mounted upon each side of the cylinder block is a rocker arm 11. This arm is mounted for pivotal rocking movement as shown at 12 upon an arm 13, and the latter is in turn pivotally mounted as shown at 14 in a bracket 15. The rocker arm 11 is thus capable of pivotal rocking movement to actuate the valves and of lateral pivotal movement for the purpose of bringing its upper end into alternate engagement with the valves 10 upon one side of the block.

In order to accomplish the purpose just stated, the lower end of each rocker arm 11 has a universal connection 16 with a lifter rod 17 which is capable of longitudinal and pivotal movement. For this punrpose, the lifter rod 17 is arranged within a sleeve 18, the latter extending through the crank case 19 of the engine. Slidable within the sleeve 18 is a bearing collar 20 and the rod 17 is pivotally mounted as shown at 21 in this collar. A stationary collar 22 is threadedly mounted in the opposite end of the sleeve 18 and a spring 23 bears against this collar and the collar 20 so as to yieldingly resist sliding movement of the latter. The inner end of each of the lifter rods 17 carries a roller 24, the rods 17 extending diametrically upon opposite sides of the crank shaft 25 of the engine.

Mounted upon the crank shaft 25 is a cam 26 and this cam may be constructed as shown in Figures 4 and 5 of the drawings, or it may be constructed after the manner of the other cams illustrated in my application above referred to.

The cam shown in Figures 3 and 4 includes oppositely located low portions 27 and similarly arranged high portions 28, while a double cam groove 29 extends around the cam. Upon one side of the cam the double groove provides parallel grooves 30, and these double grooves cross one another upon the opposite side of the cam as shown at 31.

As the cam is revolved by the rotation of the crank shaft, the rollers 24 will travel in the double cam groove and the arms 11 will be alternately rocked upon their pivots 12. When the rollers 24 pass from one portion of the groove to the opposite portion, the rocker arms will be moved upon the pivots 14. The lifter rods 17 will thus be alternately moved longitudinally and pivotally and these movements will cause the rocker arms 11 to be rocked upon the pivots 12 and 14 as previously explained so that their outer ends will alternately engage and actuate the valves upon opposite sides of the cylinder block, one of the arms 11 actuating the two valves upon one side while the other arm 11 actuates the two valves upon the other side. The valves are held normally seated by springs

32, which also act to hold the rollers 24 against the cam 26.

The invention is susceptible of various changes in its form, proportions and minor details of construction and the right is herein reserved to make such changes as properly fall within the scope of the appended claim.

Having described the invention what is claimed is:

In a valve mechanism for internal combustion engines, normally seated intake and exhaust valves, a rocker arm mounted for universal pivotal movement upon opposite sides of the engine cylinder, each of said arms being adapted to have one of their ends alternately engaging an intake and an exhaust valve, lifter rods disposed radially of the engine crank shaft and having their outer ends operatively connected with the rocker arms, guide sleeves extending through the engine crank case to receive the rods, a collar slidable within each of the sleeves, means pivotally connecting the rods and collar to provide a sliding pivotal mounting for the rods, means to yieldingly resist sliding movement in one direction, and means acting upon the inner ends of the lifter rods to operate the same and actuate the rocker arms.

In testimony whereof I affix my signature.

ALEX J. ADAM.