Oct. 29, 1929. C. DE MEESTER, JR 1,733,946

ROTARY VALVE

Filed May 13, 1927 2 Sheets-Sheet 1

Fig. 1.

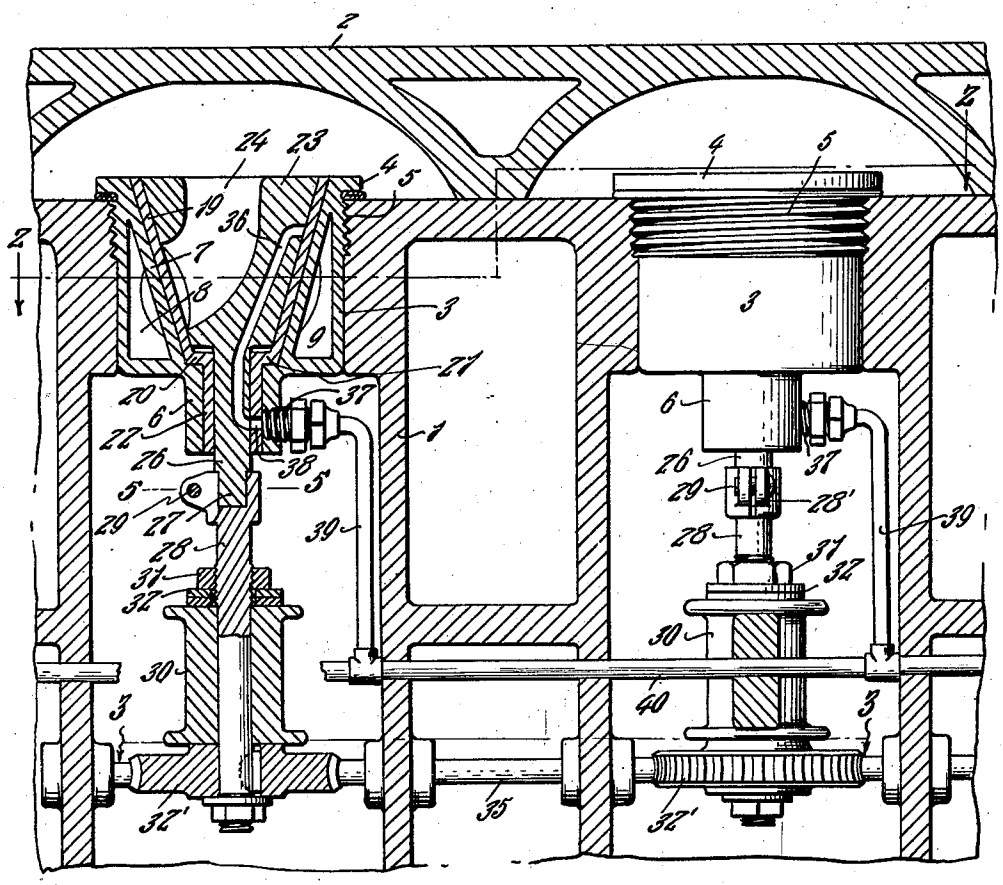


Fig. 4.

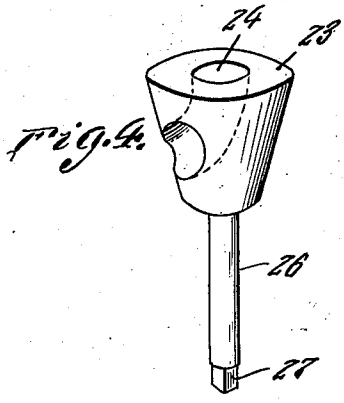
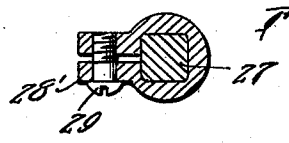


Fig. 5.



Casimir De Meester, Jr.
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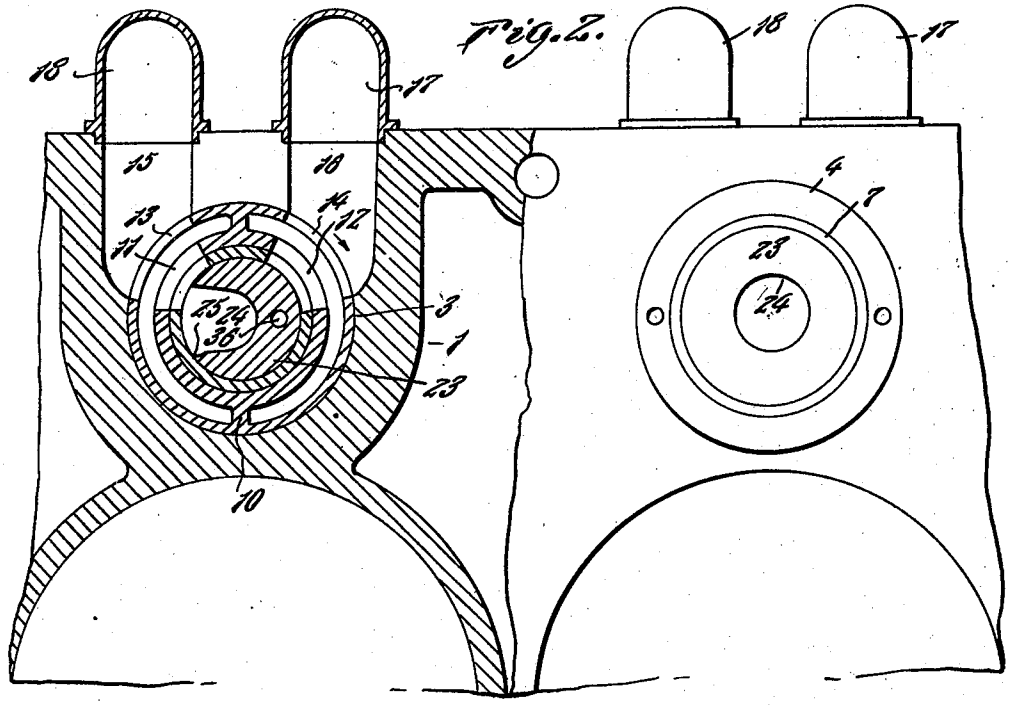
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ROTARY VALVE

Filed May 13, 1927 2 Sheets-Sheet 2

Fig. 2.



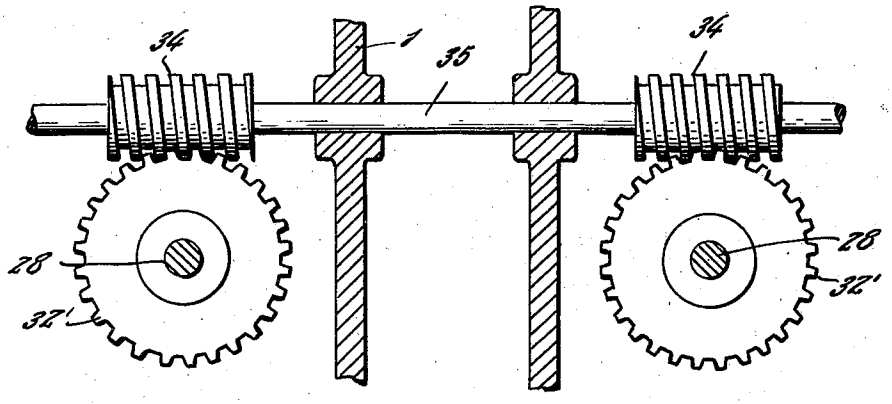


Fig. 3.

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1,733,946

UNITED STATES PATENT OFFICE

CASIMIR DE MEESTER, JR., OF HUMBOLDT, IOWA

ROTARY VALVE

Application filed May 13, 1927. Serial No. 191,175.

The primary object of this invention is the provision of a rotary valve for internal combustion engines.

A further object is the provision of a rotary valve for this purpose that is constantly lubricated, which may be arranged in or clear of the combustion chamber, requires less space than the ordinary tappet valve and which provides for both the intake and the exhaust of the explosive fuel.

A still further object is the provision of a rotary valve for this purpose which will at all times be properly adjusted and lubricated, properly seated and effectively turned in timed relation to the turning of the crank shaft, and constantly with respect to the reciprocation of the pistons.

A still further object is the provision of a valve for this purpose which is practically self-adjusting and which may be easily positioned and as readily removed for replacement when worn or injured.

To the attainment of the above broadly stated objects and many others which will present themselves are the nature of the invention is better understood, the improvement also resides in certain other novel features of construction, combination and operative association of parts, one satisfactory embodiment of which is disclosed by the accompanying drawings.

In the drawings:

Figure 1 is a longitudinal sectional view through an engine block and head embodying the improvement, parts of the latter being in section.

Figure 2 is a top plan view of the combination disclosed in Figure 1 with parts broken away and parts in section.

Figure 3 is a sectional view approximately on the line 3—3 of Figure 1.

Figure 4 is a perspective view of the valve.

Figure 5 is a sectional view on the line 5—5 of Figure 1.

The block for an internal combustion engine is indicated in the drawings by the numeral 1 and the head therefor by the numeral 2. In close proximity to the several cylinders in the engine block I arrange my improved rotary valves. The cage or body portion of the valve may if desired be placed within the block, may be pressed in suitable openings in the block or may, as disclosed by the drawings be screwed in such openings. The valve cages each include a substantially cylindrical body portion 3, having an outer head or flange 4 and being threaded, as at 5, inward of the flange 4 and these threads engage with female threads in the opening in which the body or cage is received. Each body or cage has its closed bottom provided with a depending boss or hollow sleeve 6, and inward of the sleeve with a flared wall or partition 7, leaving spaces providing chambers 8 and 9 between the said body and the flared wall 7. These chambers are divided from each other by vertical partitions 10 and the inwardly flared walls 7 have ports 11 and 12 that communicate with the interior of the flared wall or partition, which in reality provides the valve seat and will hereinafter be thus referred to. The body 3 is also provided with ports 13 and 14 disposed opposite the ports 11 and 12, and the engine block has passages 15 and 16 which communicate with the said ports 13 and 14. The passage 16 is connected to the branches 17 of the intake manifold for the engine, and the passages 15 are connected with the branches 18 of the exhaust manifold for the engine. Of course, the arrangement of the manifolds can be reversed.

In the flared valve seat 7 there is seated a hollow frusto conical bearing lining 19 which is preferably of bronze or may be of any other desired metal. The inner and widened end of each sleeve or lining rests on a shoulder 20 in the bottom wall of the cage or body, and this portion of the sleeve or lining is contacted by the beveled outer periphery of the flanged end 21 of a bushing 22 that passes through the hollow hub 6.

Received in the valve seats of the cages or bodies and resting directly on the sleeves or linings 19 there are the valve cores 23. Each valve core 23 is of frusto conical formation, and is provided with an angle port or passage 24 that establishes a communication between the top and one of the sides of the core. The inner wall of the port or passage

is rounded so that the outer periphery of the core at its juncture of the side walls provided by the said port or passage are sharpened, as indicated by the numerals 25 and as clearly disclosed by Figure 2 of the drawings. The sharpened walls are in the nature of scraper elements and have such effect upon the sleeve of lining 19 so that the valve is thus self-scraping. Each valve core has a depending stem 26 that passes through the bushing 22 and the outer ends of each stem is reduced and of rectangular formation, as indicated by the numeral 27. The ends 27 are received in squared sockets provided on the upper ends of drive rods 28. The socket ends of the drive rods are centrally slotted and provided at the opposite sides of the slots with outstanding parallel ears 28, and passing through these ears there are adjustable elements 29 whereby to compress the ears together to cause a frictional binding of the ends 27 of the valve stems with the walls of the socket. Each drive rod 28 passes through a bearing bushing 30 that is preferably integrally formed in the head 2. Each rod 28 has a threaded portion engaged by a binding nut 31 that compresses against the top of the bushings 30 any desired number of washers 32. By adding to or removing the washers the drive rods may be longitudinally adjusted, and consequently the valve cores may be likewise adjusted with respect to their seats.

Keyed or otherwise secured on the lower end of each drive rod 28 there is a worm wheel 33 and each of these worm wheels is engaged by a worm 34 on a shaft 35 that is driven by the cam shaft of the engine. While not deemed necessary to illustrate in the drawings, the drive connection between the crank shaft and the worm shaft 35 is timed so that the valve cores 23 will turn at comparatively slower speeds, whereby the valve will complete one revolution when the crank shaft has twice revolved.

Each valve, and the stem 26 therefor, has an angle port or passage 36 therein establishing a communication between the side of the valve core and the side of its stem. The hub 6, in a line with the last mentioned end of the passage 36 has screwed therein a nipple 37, the bushing 22 having a port 38 arranged opposite the nipple and communicating with the lower end of the passage 36 when the valve is in one position. The nipple is connected by a short pipe 39 to an oil feed pipe 40. Suitable means, not shown, may force a lubricant through the pipes 40 and 39, or this may be accomplished by gravity feed. By this arrangement it will be seen that on each revolution a desired quantity of a lubricant will be fed between the valve core and the line 19, thereby insuring the free turning of the valve. This lubricant is scraped by the sharpened edges 25 between the port or passage 24 and the side of the valve core on each revolution of the valve. Of course, the port or passage 24 establishes a directing means for the fuel to be delivered into the head before being compressed by the pistons and fired by the spark plugs as well as a passage for the dead or exhaust gases. The valve is of a simple construction, is noiseless in operation, requires very little energy to operate, does not require grinding or frequent replacement, takes up less room in the combustion chamber than the ordinary intake and exhaust tappet valves and is positively rotated in proper timed relation with respect to the reciprocation of the pistons. If desired, a light spring may be employed for urging the valve on its seat, but from practice I have found that the accurate machining of parts will render this unnecessary. The ports, of course, can be of various designs, and either one or two valves may be used in connection with each engine cylinder, or one valve to two or more cylinders by the addition of ports and partitions in the cage 3. The improvement is not, of course, to be restricted to the precise details of construction herein set forth, as such changes may be made therefrom which will not depart from the spirit or sacrifice any of the advantages of the invention.

Having described the invention, I claim:

In an internal combustion engine, a cage having an inner flared wall seat and having partitions dividing the cage into a fuel intake and a fuel outlet chamber and passages communicating with said chambers, said inner flared wall seat having ports communicating with the chambers, a hub extension on the lower end of the seat, a flared liner in the seat having ports communicating with the ports of said seat, a flanged bushing contacting with the lower portion of the liner and received through the hub, a frusto conical valve in the liner having an angle passage between the top and one of the sides thereof and communicating with the ports in the liner, and the said passage providing sharpened edges which contact with the liner, a stem for the valve passing through the bushing, a rod having a socket end in which the stem is connected, a bearing for the rod, adjustable and removable means between the rod and bearing for permitting the longitudinal adjustment of the rod, means actuated by the turning of the crank shaft of the engine, for imparting a like turning but at a less rate of speed to the rod and to the valve, said valve and the stem thereof having an oil passage communicating with the side of the valve and with the side of the stem, and means for delivering a lubricating oil into said passage on each revolution of the valve.

In testimony whereof I affix my signature.

CASIMIR DE MEESTER, JR.