Jan. 22, 1946. J. A. KRAMER 2,393,542

TWO CYCLE GAS ENGINE CYLINDER PISTON AND VALVE MECHANISM

Filed March 10, 1944

Fig. 1.

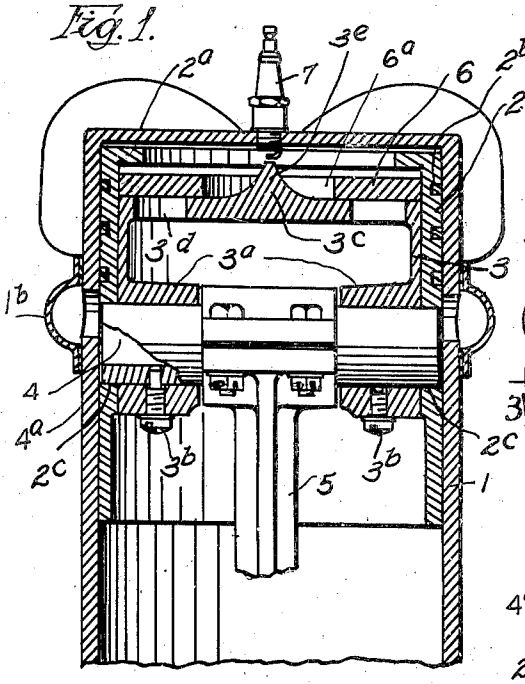


Fig. 2.

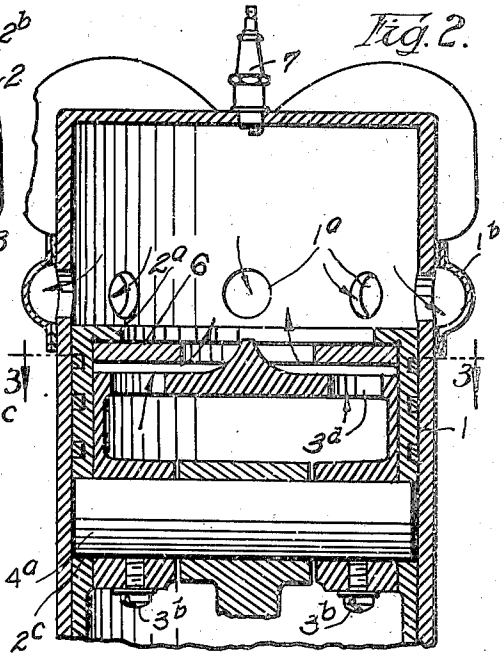


Fig. 4.

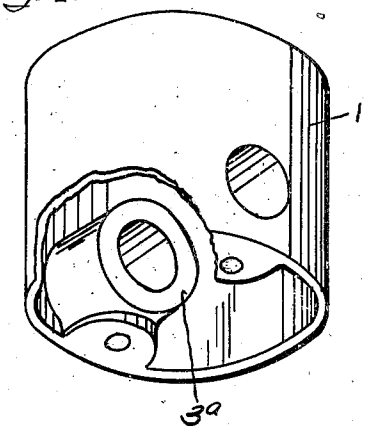
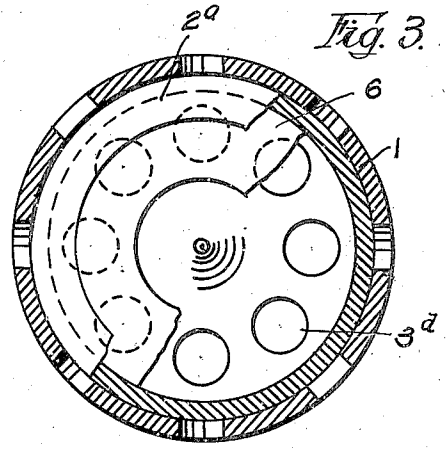


Fig. 3.



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TWO-CYCLE GAS ENGINE CYLINDER PISTON AND VALVE MECHANISM

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4 Claims. (Cl. 123—47)

My invention relates to a two-cycle engine piston and valve mechanism and the objects of my invention are:

First, to provide a piston and valve mechanism for two cycle engines which provides a maximum efficiency of distribution of the fuel to the combustion chamber of the engine;

Second, to provide an engine, piston and valve mechanism of this class which provides high efficiency operation;

Third, to provide a mechanism of this class which provides high efficiency scavenging of the engine cylinder;

Fourth, to provide a novel intake valve means for two cycle engines wherein the fuel passes through the pistons;

Fifth, to provide a mechanism of this class in which the piston and intake valve mechanism are so constructed and arranged to direct the fuel toward the spark plug of the engine to facilitate the ignition of the gases;

Sixth, to provide a two cycle engine cylinder piston and valve mechanism of this class which is very simple and economical of construction, highly efficient in its action, durable and which will not readily deteriorate or get out of order.

With these and other objects in view as will appear hereinafter, my invention consists of certain novel features of construction, combination and arrangement of parts and portions as will be hereinafter described in detail and be particularly set forth in the appended claims, reference being had to the accompanying drawing and to the characters of reference thereon which form a part of this application in which:

Figure 1 is a longitudinal sectional view of the cylinder, piston and valve mechanism of my engine showing some of the parts and portions in elevation to facilitate the illustration and showing the piston at the inner end of its stroke in the cylinder; Fig. 2 is a similar view but showing more of the parts in section and showing the piston at the outer end of its stroke in the cylinder in position for exhausting the gases therefrom; Fig. 3 is a transverse sectional view taken from the lines 3—3 of Fig. 2 and showing some parts broken away and in section to facilitate the illustration and Fig. 4 is a perspective view of the piston member 3 showing portions broken away to facilitate the illustration.

Similar characters of reference refer to similar parts and portions throughout the several views of the drawing:

The cylinder 1, piston members 2 and 3, wrist pin 4, connecting rods 5, valve 6 and spark plugs 7 constitute the principal parts and portions of my two cycle engine cylinder, piston and valve mechanism.

The cylinder 1 is substantially of conventional type. It is, however, provided with a series of exhaust outlet openings 1*a* extending around the cylinder to provide a large exhaust area for scavenging purposes. They are positioned to be uncovered by the piston at the outer end of its stroke and shown best in Fig. 2 of the drawing. These openings 1*a* are covered with an exhaust manifold 1*b* and positioned centrally in the head of the cylinder is a spark plug 7, as shown best in Figs. 1 and 2 of the drawing.

Reciprocably mounted in this cylinder 1 is the piston member 2 which is a hollow cylindrical sleeve-like member and at its inner end is provided an inwardly extending annular flange 2*a* which serves as a stop for the valve 6 when open and is provided with conventional sealing rings 2*b*. It is provided with holes 2*c* at opposite sides adapted to receive the ends of the wrist pin sleeve 4*a* and wrist pin 4.

Mounted snugly in the inner side of the piston member 2 is another piston member 3 which is provided near its outer end with inwardly extending hollow bosses 3*a* which are adapted to receive the wrist pin sleeve 4*a* and wrist pin 4. Said wrist pin sleeve and pin are secured in position relatively to these hollow bosses 3*a* by means of set screws 3*b*.

Mounted on the wrist pin sleeve 4*a* between the bosses 3*a* is the connecting rod 5 which may be of any conventional type. This member 3 is provided with a head 3*c* which is provided with a series of relatively large inlet openings 3*d* extending around said head near the periphery of the member 3. Positioned over these inlet openings 3*d* is the valve 6 which is a washer-like member provided with a central opening 6*a* and its perimeter rests substantially against the inner wall of the cylinder member 2. This valve 6 is adapted to shift from against the upper surface of the head 1*c* over the opening 3*d* to against the flange 2*a* of the piston member 2 when the engine is in operation for controlling the fuel inlet to the cylinder.

Extending centrally from the head 3*c* of the piston member 3 is a central boss 3*e* provided with curved sides so that the fuel when entering the combustion chamber through the pistons passes through the openings 3*d* against the lower side of the valve member 6 and outwardly between the inner side of the valve member 6 and the boss 3*e* upwardly into the combustion cham-

ber on the inner side of the flange 2*a* of the piston member 2 with the outward stroke of the piston in the cylinder.

Though I have shown and described a particular construction, combination and arrangement of parts and portions I do not wish to be limited to this particular construction, combination and arrangement but desire to include in the scope of my invention the construction, combination and arrangement substantially as set forth in the appended claims.

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

1. In a two cycle gas engine cylinder, piston and valve mechanism, the combination with a cylinder, of a piston provided with an inwardly extending flange at its inner end, a piston head separate from said piston but movable therewith positioned backwardly in spaced relation from said flange provided with a row of inlet openings around said head near its periphery and a washer-like valve member interposed between said piston head and said flange and arranged to reciprocate therebetween and cover said openings when the piston moves inwardly, said piston head provided with a central boss portion extending centrally into and through said valve.

2. In a two cycle gas engine cylinder, piston and valve mechanism, the combination with a cylinder, of a piston provided with an inwardly extending flange at its inner end, a piston head separate from said piston but movable therewith positioned backwardly in spaced relation from said flange provided with a row of inlet openings around said head near its periphery, a washer-like valve member interposed between said piston head and said flange and arranged to reciprocate therebetween, said piston head provided with a central boss portion extending centrally into and through said valve and a spark plug positioned in said cylinder directly in front of said boss on said piston head.

3. In a mechanism of the class described, the combination of a piston provided with a plurality of openings in a row near the periphery thereof in the head, a disc-like valve member arranged to rest over said opening against the outer side of said head provided with a large central opening, and means in connection with said piston for limiting the movement of said valve away from said head, said head provided centrally with a boss-like fuel distributing member arranged to extend into and through the hole in said disc-like valve member.

4. In a mechanism of the class described, the combination of a piston provided with a plurality of openings in a row near the periphery thereof in the head, a disc-like valve member arranged to rest over said opening against the outer side of said head provided with a large central opening, and means in connection with said piston for limiting the movement of said valve away from said head, said head provided centrally with a boss-like fuel distributing member arranged to extend into and through the hole in said disc-like valve member, said piston made of two members, the one positioned within the other and connected by the wrist pin and sleeve of the piston.

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