Oct. 24, 1944. J. L. HARRAH 2,361,095

PISTON FOR INTERNAL-COMBUSTION ENGINES

Filed Jan. 14, 1943

Fig. 1.

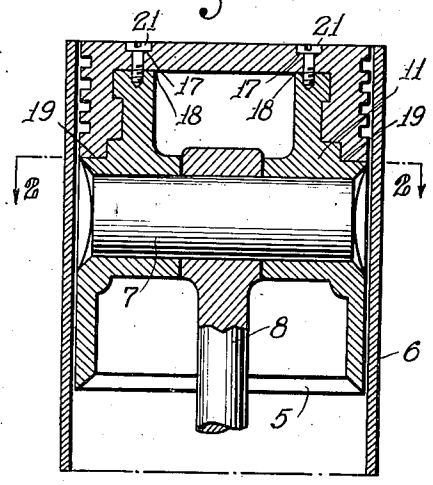


Fig. 3.

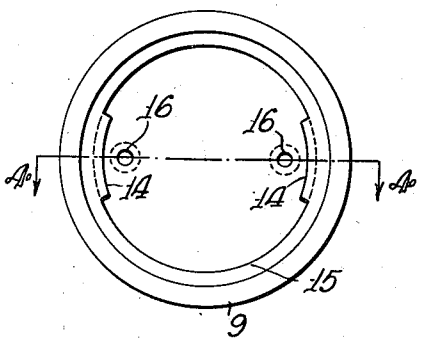
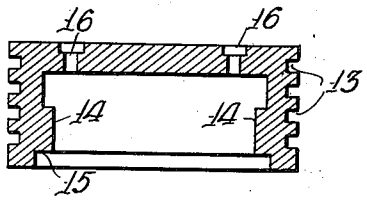


Fig. 4.



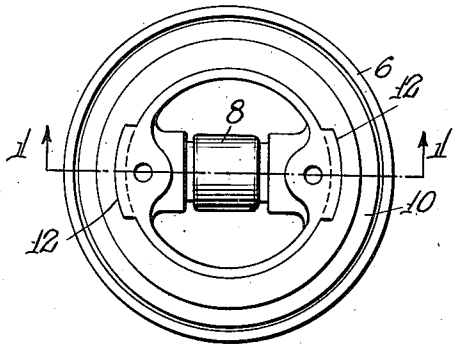


Fig. 2.

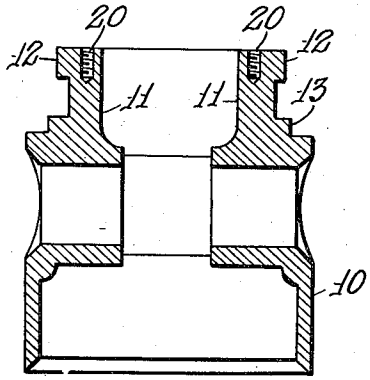


Fig. 5.

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PISTON FOR INTERNAL-COMBUSTION ENGINES

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Application January 14, 1943, Serial No. 472,301

5 Claims. (Cl. 309—14)

The principal object of the present invention is to provide a sectional piston construction, wherein the ring section is separable from the skirt section. The piston is, of course, of cylindrical construction and is made up of two independent parts, namely, the ring section and the skirt section.

From the top of the motor the ring section can be easily removed from the skirt section without disturbing the other precision finished moving parts of the motor for the purpose of replacement of piston rings and associated details.

Another object of the invention is to provide a piston construction wherein the ring sections are inter-changeable.

Other objects and advantages of the invention will become apparent to the reader of the following specification.

In the drawing forming part of the specification,

Figure 1 is a sectional view through a piston made according to my invention, indicating its arrangement in a cylinder with the wrist pin and connecting rod in position.

Figure 2 is a top plan view of the skirt section in a cylinder with the ring section removed, through the line 2—2 in Figure 1.

Figure 3 is a bottom plan view of the ring section which is removed from the skirt section.

Figure 4 is a sectional view through the piston showing the ring section removed from the skirt section, through the line 4—4 in Figure 3.

Figure 5 is a sectional view through the piston showing the skirt section.

In the accompanying drawing in Figure 1, I have shown for the purpose of illustrating one method of employing my invention, a trunk type piston 5 arranged in a cylinder 6 with the wrist pin 7 and connecting rod 8 in position.

The skirt section 10 is formed with an inward substantially thick hollow neck 11 with two rectangular lugs 12—12 centrally spaced directly above the wrist pin boss sides having an annular recessed shoulder 13 somewhat smaller in diameter than the interior of the ring section while the exterior diameter of the two sections are alike.

The ring section 9, a hollow cylindrical portion, having an upper wall, said ring section being open at the lower end with a corresponding annular recessed shoulder 15 and a plurality of circumferentially extending spaced ribs forming intermediate thereof piston ring receiving grooves 13. Centrally spaced inside the ring section are two corresponding rectangular lugs 14—14.

The ring section 9 is lowered over the skirt section 10 with the rectangular lugs 14—14 in the ring section out of alignment with the corresponding rectangular lugs 12—12 in the skirt section. By rotating the ring section 9 a partial turn to bring the lugs 14—14 beneath the corresponding lugs 12—12 so they are positioned in direct center with the wrist pin boss center the ring section becomes inter-locked with the skirt section.

For insuring a tight fit, the bearing surfaces 18—18 and 19—19 in the piston are precision machined to form a metal to metal finish.

To prevent the ring section from rotating while the piston is in motion the two lock-thread cap screws 21—21 are inserted and screwed firmly downward into the two tapped screw holes 20—20 in the piston skirt.

To insure a gas tight fit around the cap screws in the piston top, the counterbore holes 16—16 are each sealed with a gasket 17—17.

While the foregoing specification sets forth the invention in specific terms, it is to be understood that numerous changes in shape, size and materials, may be resorted to without departing from the spirit and scope of the invention as claimed hereinafter.

Having thus described my invention, what I claim as new is:

1. In a piston, a hollow cylindrical body, open at both axial ends, the lower portion of said body forming a skirt; wrist pin bearings in said body positioned immediately above said skirt; the upper portion of said body off-set smaller to form an upwardly presented, stepped shoulder and a co-axially arranged reduced portion; and a cylindrical piston head provided with ring mounting grooves; said head having a top wall and a side wall enclosing a downwardly presented cavity, the lower edge of said wall being stepped to fit on said shoulder; said reduced portion provided with outwardly projecting, circumferentially directed ribs; said head provided with complemental ribs which project inwardly from the side wall thereof for interlocking connection with the ribs on said reduced portion by a rotary movement of said head; and screws positioned through suitable bores in said top wall and threaded in alined bores in said reduced portion to additionally secure the head thereto with the cavity of the head communicating with the cavity of said body and hold the head from a rotary unlocking movement thereon.

2. In a piston, a hollow cylindrical body open at both axial ends, the lower portion of said body

forming a skirt; wrist pin bearings in said body positioned immediately above said skirt; the upper portion of said body off-set smaller to form an upwardly presented, stepped shoulder and a co-axially arranged reduced portion; and a cylindrical piston head provided with a plurality of spaced circumferentially extending ring mounting grooves; said head having a top wall and a side wall enclosing a downwardly presented cavity, the lower edge of said side wall being stepped to fit on said shoulder; said reduced portion provided with outwardly projecting, circumferentially directed ribs; said head provided with complemental ribs which project inwardly from the side wall thereof for interlocking connection with the ribs on said reduced portion by a rotary movement of said head; and screws positioned through suitable bores in said top wall and threaded in aligned bores in said reduced portion to additionally secure the head thereto with the cavity of the head communicating with the cavity of said body; said head provided with a circumferentially extending series of bores which extend through the wall thereof from the inner wall of the lower groove and coincide with like bores extending through the wall of said reduced portion.

3. In a piston, a hollow cylindrical body open at both axial ends, wrist pin bearings in said body, the upper portion of said body stepped inwardly to form a co-axially arranged reduced portion; and a cylindrical head having a top wall and a cylindrical side wall forming a downwardly presented cavity in which the reduced portion of said body is received; said reduced portion and head provided with circumferentially spaced, complemental ribs engageable by a turning movement of the head to detachably hold the head on said body; and additional means positively securing the head to said body and preventing a turning movement of said head thereon.

4. In a piston, a hollow cylindrical body, open at both axial ends, the lower portion of said body forming a skirt; wrist pin bearings in said body positioned immediately above said skirt; the upper portion of said body off-set smaller to form an upwardly presented, stepped shoulder and a coaxially arranged tubular reduced portion; and a cylindrical piston head provided with spaced circumferentially extending ring mounting grooves; said head having a top wall and a side wall enclosing a downwardly presented cavity, the lower edge of said side wall being stepped to fit on said shoulder, with the tubular reduced portion bearing against said upper wall, said reduced portion provided with outwardly projecting, circumferentially directed ribs, said head provided with complemental ribs which project inwardly from the side wall thereof for interlocking connection with the ribs on said reduced portion by a rotary movement of said head; and screws positioned through suitable bores in said top wall and threaded in alined bores in the wall of said reduced portion to additionally secured the head thereto with the cavity of said body and hold the head from a rotary unlocking movement thereon.

5. In a piston, a hollow cylindrical body open at both axial ends, means to secure a crank arm thereto; the upper portion of said body reduced to form a co-axially arranged extension; and a cylindrical head having a top wall and a cylindrical side wall forming a downwardly presented cavity in which the reduced said extension is received; said extension and head provided with circumferentially spaced, complemental ribs engageable by a relative turning movement to detachably hold the head on said body and lock-thread screws securing the head to said extension and holding the head against turning movement thereon.

JOHN L. HARRAH.