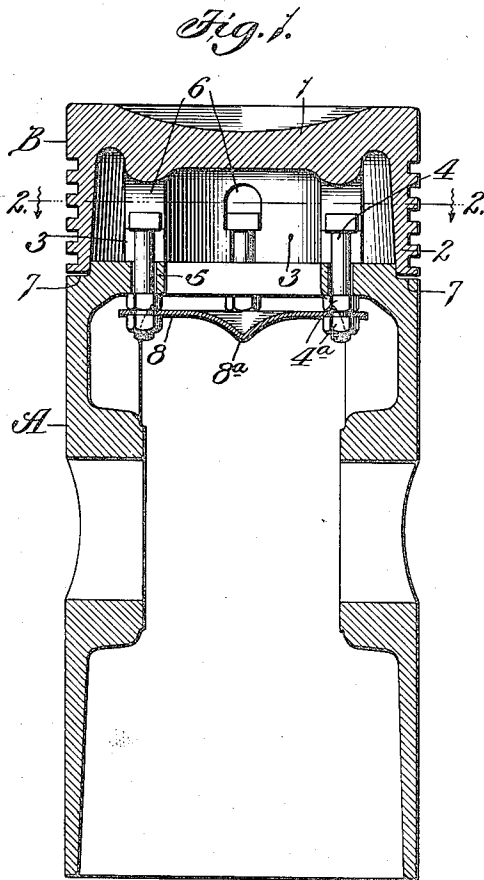
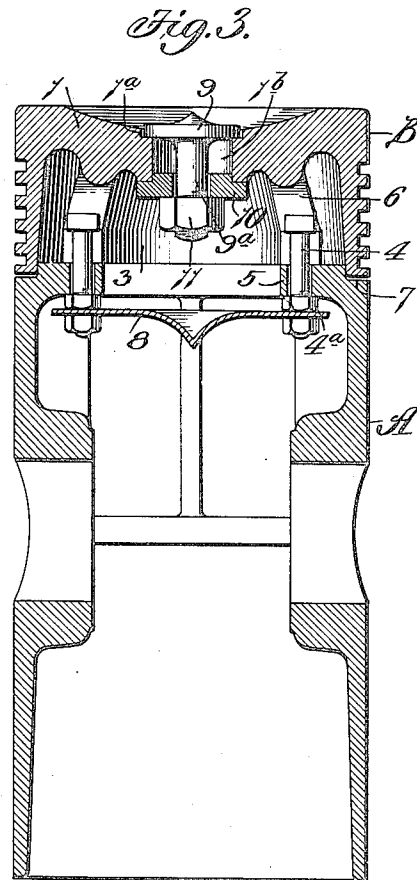
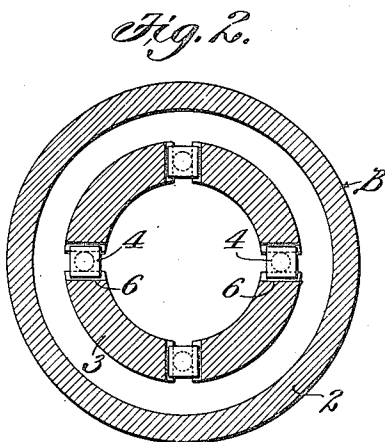


H. R. SEIZ.
 PISTON FOR OIL ENGINES.
 APPLICATION FILED MAR. 16, 1916.

1,222,147.

Patented Apr. 10, 1917.



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UNITED STATES PATENT OFFICE.

HANS R. SETZ, OF ST. LOUIS, MISSOURI.

PISTON FOR OIL-ENGINES.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, HANS R. SETZ, a citizen of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Improvement in Pistons for Oil-Engines, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to pistons for oil engines, and particularly to two-part pistons, namely, pistons of the type in which the top or upper portion of the piston is formed by a member that is detachably connected to the lower part or body portion of the piston.

One object of my invention is to provide a two-part piston which is so designed that the liability of the upper portion cracking or breaking, due to excessive heat and stresses, is reduced to a minimum.

Another object is to provide a piston which is so designed that the downward stresses exerted on the center portion of the top face of the piston are neutralized by the downward stresses exerted on the peripheral portion of said top face.

Another object is to provide a two-part piston which is so designed that it is practicable to equip the crown with a steel center piece or member that constitutes the center portion of the crown.

And still another object is to provide a trunk type piston that comprises means for preventing the lubricating oil from being thrown upwardly onto the underside of the crown when the piston is in operation. Other objects and desirable features of my invention will be hereinafter pointed out.

Figure 1 of the drawings is a vertical, longitudinal sectional view of a piston constructed in accordance with my invention.

Fig. 2 is a horizontal sectional view, taken on the line 2—2 of Fig. 1; and

Fig. 3 is a vertical, longitudinal sectional view, illustrating another form of my invention.

I have herein illustrated my invention embodied in a two-part, trunk type piston provided with a dished top, but I wish it to be understood that the particular shape or form of the crown of the piston is immaterial, so far as my present invention is concerned.

Referring to Figs. 1 and 2 of the drawings, which illustrate the preferred form of my invention, A designates the lower part

or body portion of the piston and B designates the top part or upper portion which is detachably connected to said body portion in any suitable manner. The top part B comprises a crown 1 that is integrally connected to an annular-shaped flange 2 that forms the side wall of the top part of the piston, and said top part is supported in such a manner that there is little liability of its being cracked or broken by the excessive heat and downward stresses to which the top portions of pistons of oil engines are always subjected.

Broadly stated, the top wall or crown of my improved piston is supported intermediate the center and the periphery of same, and the lower edge of the annular side wall of the top part is spaced slightly away from the body portion of the piston so that the center portion and the peripheral portion of the top part are free to move longitudinally sufficiently to prevent the top part from breaking when the metal in same expands and contracts. In the form of my invention herein shown the top part B is provided with an annular rib or bearing member 3 integrally connected to the crown 1 and arranged on the underside of the crown intermediate the center of same and the annular side wall 2 of the top part B. Said rib or bearing member 3 rests upon the upper edge of the body portion A of the piston, and the top part B is connected to said body portion by means of bolts 4 that are carried by the rib 3 and which project downwardly through openings in a horizontally-disposed flange 5 on the body portion A. One convenient way of constructing the top part B of the piston is to form vertically-disposed slots in the annular rib 3 to receive the shanks of the bolts 4 and provide said slots with enlarged upper end portions 6 whose edges bear against the heads of the bolts 4 and prevent them from turning when the nuts 4^a on the lower ends of the bolts are tightened. The annular side wall 2 of the top part B projects downwardly into an annular recess formed in the upper end of the body portion A, but the lower edge of said side wall 2 is spaced slightly away from the bottom or horizontal surface of the recess 7 so that the lower edge of the side wall 2 of the top part B will not bear upon the body portion A of the piston. By constructing the piston in this manner I make it possible for the center portion and the

peripheral portion of the top part B to move slightly in a direction longitudinally of the piston when the metal from which said top part is formed expands and contracts. In other words, in a piston of the construction herein illustrated the downward stresses that are exerted on the center portion of the crown are neutralized by the downward stresses that are exerted on the peripheral portion of the crown. Consequently, there is little liability of the top part B of the piston being cracked or broken by the excessive heat and stresses to which the crown of an oil engine piston is subjected when the engine is in operation. In assembling the piston the bolts 4 are first arranged in operative position in the bearing rib 3 and the top part B is then centered on the body portion A and securely connected to same by tightening the nuts 4^a on the bolts which bear against the underside of the horizontally-disposed flange 5 on the body portion, and thus cause the bolts to draw the bearing rib 3 downwardly into snug engagement with the upper side of the horizontal flange 5.

In order to prevent the lubricating oil from being thrown upwardly onto the underside of the crown 1 when the piston is in operation, I have provided the piston with an imperforate shield 8 that is arranged in the body portion A below the horizontal flange 5 on said body portion and above the point where the connecting rod is joined to the piston, said shield 8 being preferably deflected downwardly at the center of same, as indicated by the reference character 8^a in Fig. 1, so that the oil that strikes against the underside of the shield will drain back to the crank case. One convenient way of holding the shield in position is to mount it on the bolts 4 that secure the removable top part B to the body portion A of the piston.

Various attempts have heretofore been made to equip the crown of a piston for oil engines with a steel center piece, so as to prolong the life of the piston and prevent the crown from breaking, but such pistons have not proven entirely satisfactory, owing to the tendency of the crown to break when the metal at the center of same is removed to form an opening for the steel center piece. With a piston of the construction herein shown, however, it is entirely practicable to equip the crown with a steel center piece or separate member formed of any other suitable material, owing to the fact that the downward stresses exerted on the peripheral portion of the crown equalize or tend to resist the downward stresses exerted on the center portion of the crown. Therefore, in Fig. 3 of the drawings I have illustrated a piston constructed in accordance with my invention in which a member 9, constructed of steel or other suitable material, is used

to form the center portion of the crown 1 of the piston, said member having a head that is seated in a recess 1^a formed in the crown and having a shank 9^a that projects downwardly through an opening 1^b in the crown, the lower end of the opening 1^b being closed by a cap 10 that is retained in position by means of a nut 11 on the shank of the center piece 9. If desired, the piston may be provided with an oil shield 8 similar to that illustrated in Fig. 1. It is of course immaterial, so far as my broad idea is concerned, what particular means is used for connecting the top part B of the piston to the body portion A, and while I prefer to provide the top part B with an integral, annular rib 3 that bears on the upper end of the body portion A, this is not essential, as various other means could be employed for supporting the top part A, so long as the crown of the piston is supported at a point intermediate its center and periphery, and the annular side wall of said top part is constructed in such a manner that the lower end of same does not bear downwardly on the body portion of the piston.

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

1. A piston provided with a removable upper part supported in such a manner that the downward stresses exerted on the center of the top wall of same are neutralized by the downward stresses exerted on said top wall adjacent the periphery of same.

2. A piston provided with a body portion and a removable upper part rigidly mounted on said body portion, said upper part having a side wall portion that is free to expand and contract longitudinally of the piston.

3. A piston, comprising a body portion and a removable upper part rigidly connected to said body portion and supported in such a manner that the center and peripheral portions of same are free to expand and contract longitudinally of the piston.

4. A piston provided with a removable upper part having an annular side wall whose lower edge is spaced slightly away from the body portion of the piston, and a bearing for said upper part located intermediate said side wall and the center of said upper part.

5. A piston provided with a removable upper portion that has an annular side wall and a top wall that forms the crown of the piston; the lower edge of said annular side wall being spaced slightly away from the body portion of the piston, and an integral bearing member on the underside of said top wall that engages the body portion of the piston some distance inwardly from the annular side wall of said upper portion.

6. A piston, comprising a body portion,

an upper portion provided with an annular side wall that can move vertically with relation to said body portion, and means for rigidly connecting said upper portion and body portion together.

7. A piston, comprising a body portion provided at its upper end with an annular recess, a removable top part provided with an annular side wall whose lower edge is spaced slightly away from the bottom of said recess, and an integral bearing rib on the underside of the top wall of said removable top part that bears upon said body portion intermediate the longitudinal axis of the piston and the annular recess of said body portion.

8. A piston, comprising a body portion and a removable top part, said body portion having holes, an integral bearing member on said top part that bears upon said body portion, and fastening devices carried by said bearing member and projecting downwardly through the holes in said body portion.

9. A piston, comprising a body portion and a removable top part, a flange on said body portion, an integral bearing member on said top part that bears upon said body portion, said bearing member having slots and bolts arranged in the slots in said bearing member and projecting downwardly through the flange on said body portion, said slots being enlarged to receive the heads on said bolts and prevent the bolts from turning.

10. A trunk type piston provided with an imperforate shield arranged above the connection between the piston and its connecting rod for preventing lubricating oil from being thrown onto the underside of the crown of the piston.

11. A trunk type piston, comprising a body portion, a removable top part mounted on the upper end of said body portion, and a shield arranged inside of said body portion beneath said top part for preventing lubricating oil from being thrown onto the underside of the crown of the piston.

12. A trunk type piston, comprising a

body portion provided at its upper end with a horizontal flange, a removable top part that rests upon said flange, a shield arranged inside of said body portion beneath said flange for preventing lubricating oil from being thrown upwardly onto the underside of the crown of the piston, and fastening devices that retain said shield in position and secure said top part to said body portion.

13. A trunk type piston, comprising a body portion provided at its upper end with a flange, a removable top part provided with an annular side wall whose lower edge is spaced away from the upper end of said body portion, an annular rib on the underside of said top part that bears upon the flange on said body portion, means for clamping said rib tightly against said flange, and a shield arranged inside of said body portion beneath said flange.

14. A piston, comprising a body portion, a removable top part provided with a center opening, a member that closes said center opening and forms the center of the crown of the piston, and means on the underside of said top part arranged between said center opening and the periphery of said top part that coöperates with said body portion to sustain said top part.

15. A piston, comprising a body portion, a removable top part provided with a center opening, a member that closes said center opening and forms the center of the crown of the piston, and means on the underside of said top part arranged between said center opening and the periphery of said top part that coöperates with said body portion to sustain said top part, said top part having an annular side wall whose lower edge is spaced away from the upper end of said body portion.

In testimony whereof I hereunto affix my signature in the presence of two witnesses, this fourteenth day of March, 1916.

HANS R. SETZ.

Witnesses:

WELLS L. CHURCH,
GEORGE BAKEWELL.