June 24, 1924. 1,499,290

J. H. CASEY

FLEXIBLE RINGLESS PISTON

Filed Sept. 1, 1923

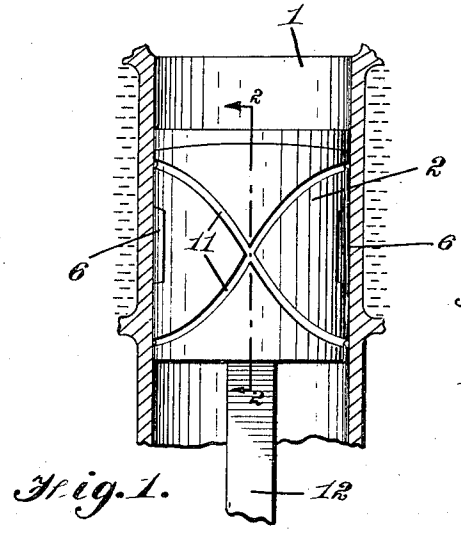


Fig. 1.

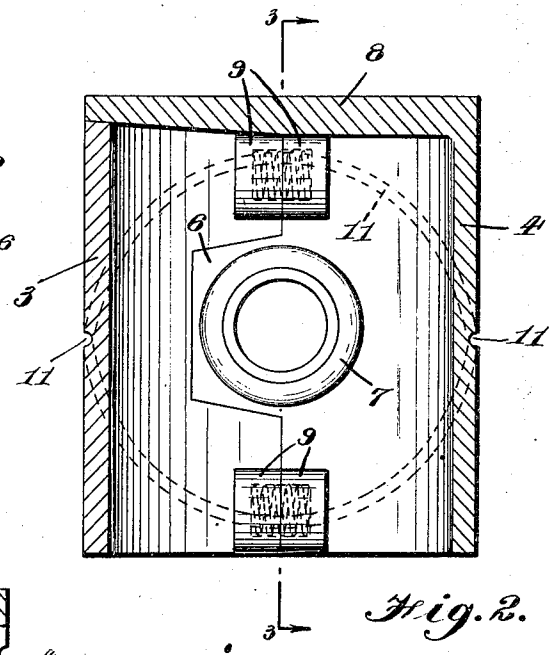


Fig. 2.

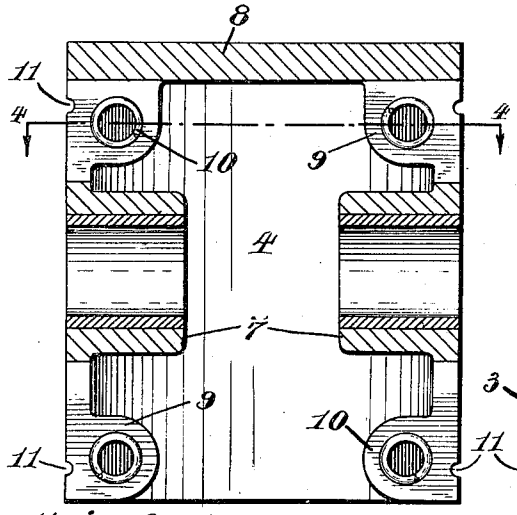


Fig. 3.

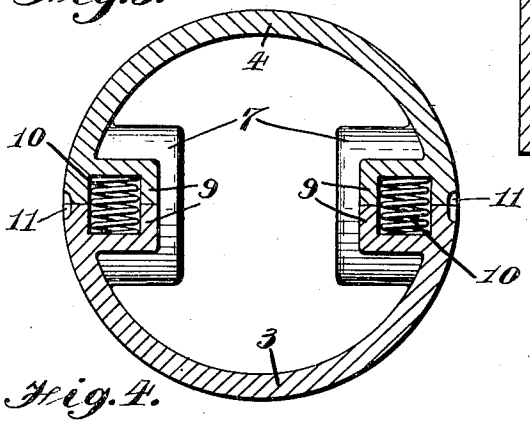


Fig. 4.

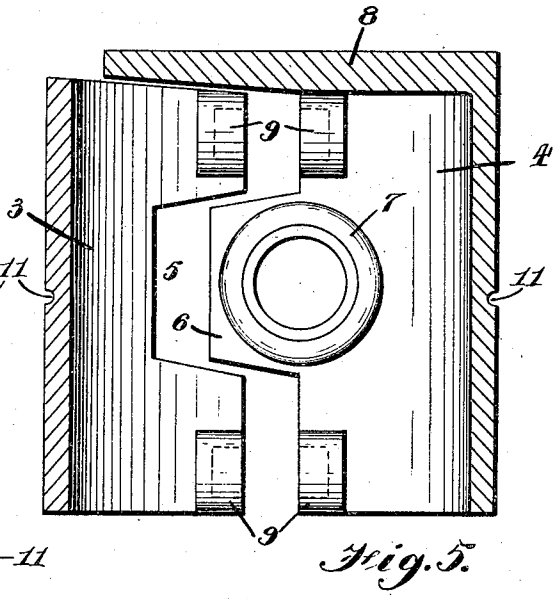


Fig. 5.

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UNITED STATES PATENT OFFICE.

JAMES H. CASEY, OF MONTREAL, QUEBEC, CANADA.

FLEXIBLE RINGLESS PISTON.

Application filed September 1, 1923. Serial No. 660,648.

To all whom it may concern:

Be it known that I, JAMES H. CASEY, a subject of the King of Great Britain, residing at Montreal, Province of Quebec, Canada, have invented certain new and useful Improvements in Flexible Ringless Pistons; and I do hereby declare that the following is a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention pertains to a novel piston, the principal object being to dispense with the necessity of piston rings.

In view of accomplishing this object, the piston is separated along an axial plane into a pair of substantial semi-cylindrical sections. In order to secure the desired expansive tendency of the piston, expansion springs are inserted between the two sections.

More specifically, these sections carry bosses at the contacting edges thereof. The bosses on one section are adapted to engage with the bosses of the remaining section, forming receptacles for containing expansion springs which are preferably constructed of coiled steel wire.

The necessary lubrication at the exterior walls of the piston is provided by means of a pair of spiral intersecting grooves cut in the outer wall. These grooves terminate short of the ends of the piston in order to prevent communication between the volumes adjacent these ends.

The invention is fully disclosed in the following description and in the accompanying drawings in which:—

Figure 1 is a side elevation of the piston disposed in a cylinder shown in cross section;

Figure 2 is a section on the line 2—2 of Figure 1;

Figure 3 is a section on the line 3—3 of Figure 2;

Figure 4 is a section on the line 4—4 of Figure 3; and,

Figure 5 is a section corresponding to Figure 2, showing the piston parts separated.

Reference will now be had to these views by means of like characters which are employed to designate corresponding parts throughout. In Figure 1 is illustrated in cross section a cylinder 1 of ordinary construction in which is disposed a piston 2 constructed in accordance with the invention. This piston, as usual, comprises a hollow cylindrical member, but in contrast to ordinary pistons is divided into two parts 3 and 4. The parts are separated along a plane passed through the longitudinal axis of the piston; the part 3, however, is formed with a notch 5 in each of its edges adapted to receive similarly shaped lugs 6 on the edges of the part 4. By reason of this construction, the bushings 7 for the wrist pin may be provided entirely on one of the parts, there being thus no need of separating these bushings which normally would lie in the plane of separation. The part 4 carries in addition a top 8 which rests on the upper edge of the section 3 as illustrated in Figures 2 and 5.

At the four corners of the cylindrical surfaces of each of the parts 3 and 4 are provided bosses 9 consisting of cup shaped members as illustrated in Figures 4 and 5. It will be seen from these figures that the bosses on the part 3 engage the bosses on the part 4 whereby there are formed four receptacles. These receptacles are designed to receive steel wire expansion springs 10. By means of these springs, the two parts are normally pressed away from each other towards the walls of the cylinder 1, whereby a gas tight fit is assured.

The outer surface of the piston has cut therein a pair of spiral intersecting grooves 11 for containing the lubricant. It will be seen from Figure 1 that these grooves terminate short of the upper and lower ends of the piston in order to prevent communication therefrom between the volumes above and beneath these ends respectively.

In accordance with the usual practice, the bearings 7 receive a wrist pin (not shown), which in turn is joined to a connecting rod 12. The latter member is suitably fastened to the crank shaft in any manner known in the art.

Having thus fully described the invention, what I claim as new and desire to protect by Letters Patent is:-

1. A piston comprising a pair of substantially semicylindrical sections, one of said sections having a pair of notches formed in the edges of its cylindrical surface, lugs formed at the edges of the cylindrical surface of the remaining section and adapted to be received in said notches, bushings

carried by said last named section and lugs, and expansion springs inserted between the two sections.

2. A piston comprising a pair of substantially semicylindrical sections, one of said sections having a pair of notches formed in the edges of its cylindrical surface, lugs formed at the edges of the cylindrical surface of the remaining section and adapted to be received in said notches, bushings carried by said last named section and lugs, bosses formed at the contacting edge of said sections, the bosses on one section engaging those on the other, and expansion springs inserted in said bosses.

3. A piston comprising a pair of substantially semicylindrical sections, one of said sections having a pair of notches formed in the edges of its cylindrical surface, lugs formed at the edges of the cylindrical surface of the remaining section and adapted to be received in said notches, bushings carried by said last named section and lugs, bosses formed at the contacting edges of said sections, the bosses on one section engaging those on the other, expansion springs inserted in said bosses, and a top carried by the upper end of one of said sections and overlying the upper end of the remaining section.

In witness whereof I have hereunto set my hand.

JAMES H. CASEY.