

No. 627,707.

Patented June 27, 1899.

J. PRICE.
PISTON.

(Application filed June 18, 1898.)

(No Model.)

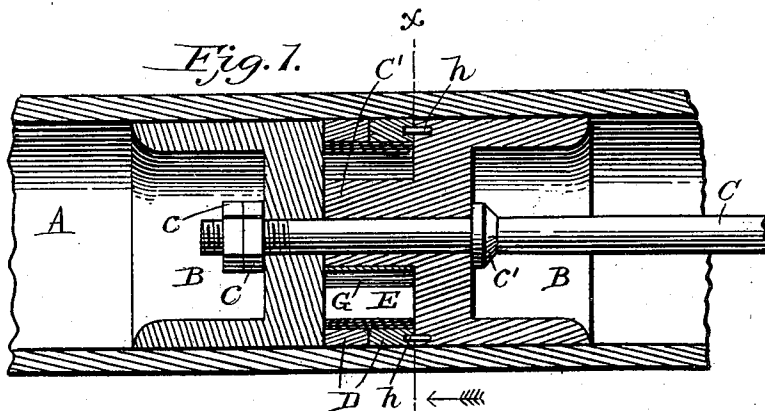
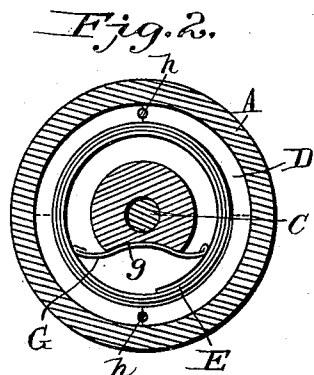
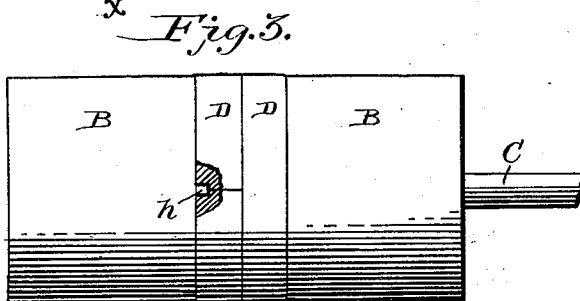
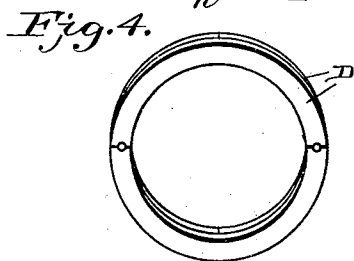
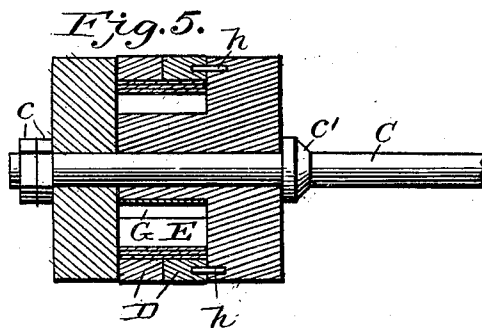
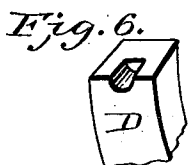


Fig. 7.



Witnesses.

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UNITED STATES PATENT OFFICE.

JOHN PRICE, OF WILMINGTON, DELAWARE.

PISTON.

SPECIFICATION forming part of Letters Patent No. 627,707, dated June 27, 1899.

Application filed June 13, 1898. Serial No. 683,336. (No model.)

To all whom it may concern:

Be it known that I, JOHN PRICE, a subject of the Queen of Great Britain, and a resident of Wilmington, in the county of New Castle and State of Delaware, have invented certain new and useful Improvements in Pistons; and I do declare the following to be 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, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification, and in which—

Figure 1 is a longitudinal vertical section of my improved piston. Fig. 2 is a section on the line *xx*, Fig. 1. Fig. 3 is a side elevation of the piston with a portion broken away. Fig. 4 is a perspective view of the packing-rings detached. Fig. 5 is a longitudinal vertical section showing a modified construction of piston. Fig. 6 is a detail perspective view of a portion of one of the packing-rings. Fig. 7 is a detail perspective view of the cross-spring.

This invention has relation to certain new and useful improvements in pistons for pumps and other purposes, and more especially to an improved packing therefor and to means for causing the weight of the piston to be carried on the packing to thereby relieve the body of the piston and prevent it from dragging on the bottom portion of the sleeve or cylinder in which it works.

The invention is designed to provide a packing which will automatically adjust itself to compensate for wear and in which such adjustment is provided for freely in all directions, so that all portions of the piston maintain a close joint with the walls of the sleeve or cylinder; also, to provide a packing which can be readily removed and replaced when worn out.

The invention is further designed to provide a central or intermediate spring-support and centering device for the piston within the packing and acting in conjunction therewith for the purpose of causing the weight of the piston to be carried by the packing and to thereby relieve the body of the piston from dragging upon the bottom of the cylinder or sleeve.

With these objects in view the invention consists in the novel construction and combination of parts, all as hereinafter described, and pointed out in the appended claims.

Referring to the accompanying drawings, the letter A designates a cylinder or sleeve—such, for instance, as are employed in the water end of a Worthington or duplex pump.

B designates the piston, which is formed in two hollow sections secured together on a rod C by jam-nuts *c* in one direction and by a shoulder or collar *c'* of the rod in the opposite direction. One of said sections is formed with a boss *C'*, which serves to separate the body portions of the sections and around which are seated the packing-rings D upon a volute expanding-spring E. In the drawings two of these rings are shown, each being composed of two half-sections, the joints formed by the meeting ends of such sections being crossed or at ninety degrees from each other, and to maintain such position of the joints by preventing the rings from turning small studs *h* are tapped into the piston-sections and engage the ends of the sections, as shown.

The material which I prefer to employ for the ring is a mixture composed of two-thirds Babbitt metal and one-third pure lead, which forms a soft and yieldable, but durable, packing. Any suitable material may, however, be employed.

The boss *C'* of the piston is hollowed out or cut away on the under side, as shown at *g*, to seat a cross-spring G, consisting of a plate of spring material bent upwardly at its central portion and whose end portions bear upon the volute spring E, as shown. This cross-spring is forced to its seat under considerable tension, so that after the volute spring E has expanded to a considerable extent the cross-spring will still sustain the weight of the piston. The cross-spring also by its pressure on the volute spring acts to aid the latter in expanding the packing, and as the expansion of the volute spring is equal in all directions the weight of the piston is thus distributed and utilized to secure an equal expansion of the packing throughout the circumference of the packing-rings.

Although I have described the invention in connection with a particular form of pump-piston, it is obviously adapted to other forms

of pistons, and in Fig. 5 I have shown it applied to a steam-piston.

In a pump-piston the springs are preferably formed of tempered brass, while in a steam-piston a steel spring may be employed.

It will be seen that the pressure of the volute spring upon the packing is equal in all directions and that the rings, being formed in sections, freely adjust themselves to compensate for wear and maintain a close joint.

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

1. In a piston, the combination with a packing ring or rings, seated around the central portion of said piston, a volute spring coiled within the said ring or rings and acting to expand the same, and a cross-spring upon which the central portion of the piston rests and whose end portions bear upon the inner portion of the volute spring, substantially as specified.

2. In a piston, the combination with a packing ring or rings, of a volute spring coiled within said ring or rings, and a cross-spring having a central bearing upon the piston and end bearings against the inner portion of the volute spring, substantially as specified.

3. The combination with a piston having an annular reduced intermediate portion, and an expansible packing ring or rings seated around such reduced portion, of a volute spring coiled within said ring or rings, and a cross-spring having a central bearing upon

said reduced portion and end bearings upon the volute spring, said cross-spring being seated under tension, substantially as specified.

4. The combination with a piston having a reduced central portion, of two or more packing-rings seated around the said portion, said rings being formed in sections with their joints crossed with respect to each other, means for preventing rotary movement of the said rings, a volute expanding-spring coiled within the said rings, and a cross-spring upon which the central portion of the piston rests, and whose end portions are seated and bear upon the inner portion of said volute spring, substantially as specified.

5. The combination with a piston having a reduced central portion formed with a bearing on its under side, an expansible packing ring or rings seated around said reduced portion, a volute spring coiled within said ring or rings, and a cross-spring having an upwardly-bent central portion which engages the bearing on the reduced portion of the piston, and end portions which bear upon the inner portion of the volute spring, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN PRICE.

Witnesses:

THOS. MANION,
HENRY R. SMITH.