No. 633,042. Patented Sept. 12, 1899.

W. ROADMAN.

PACKING FOR PISTONS.

(Application filed May 2, 1899.)

(No Model.)

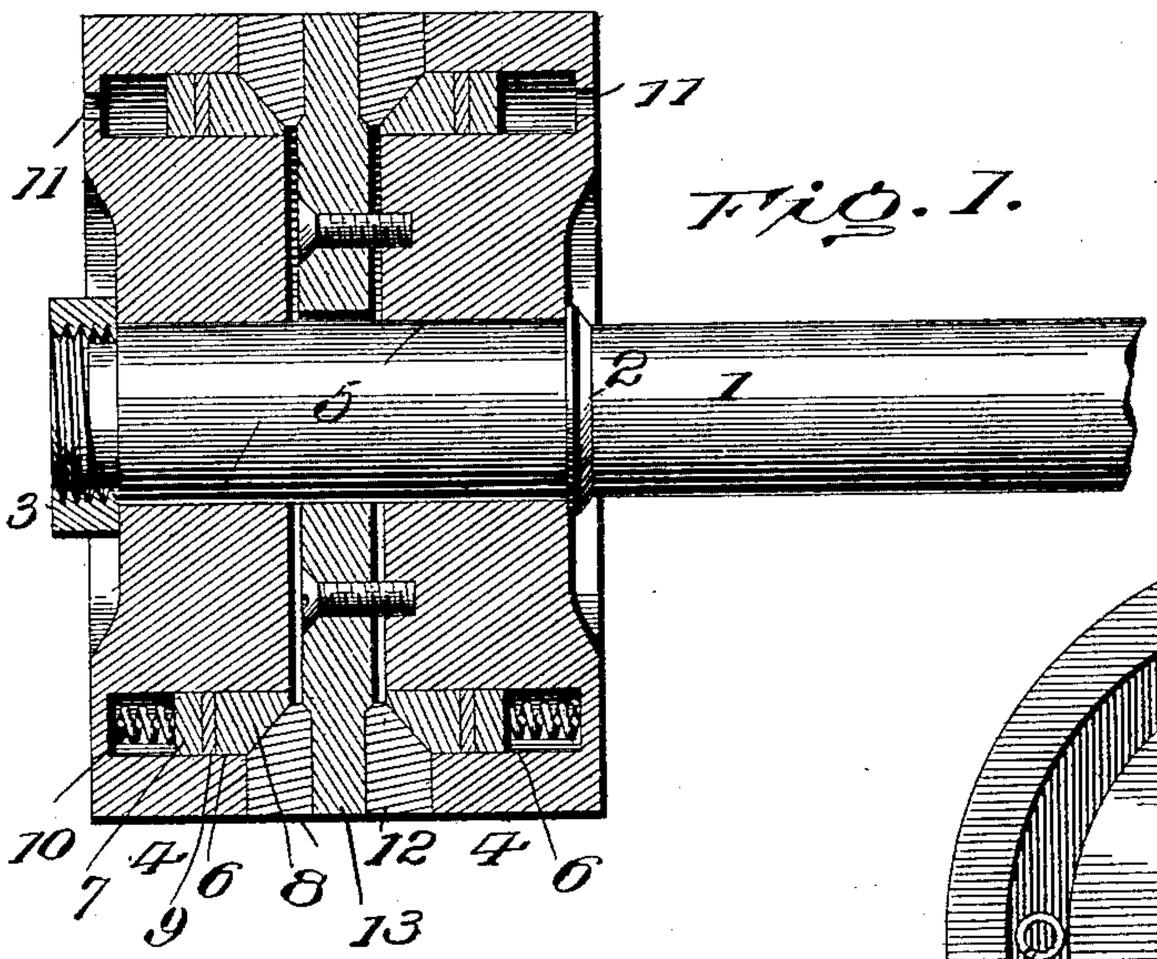


FIG. 1.

FIG. 2.

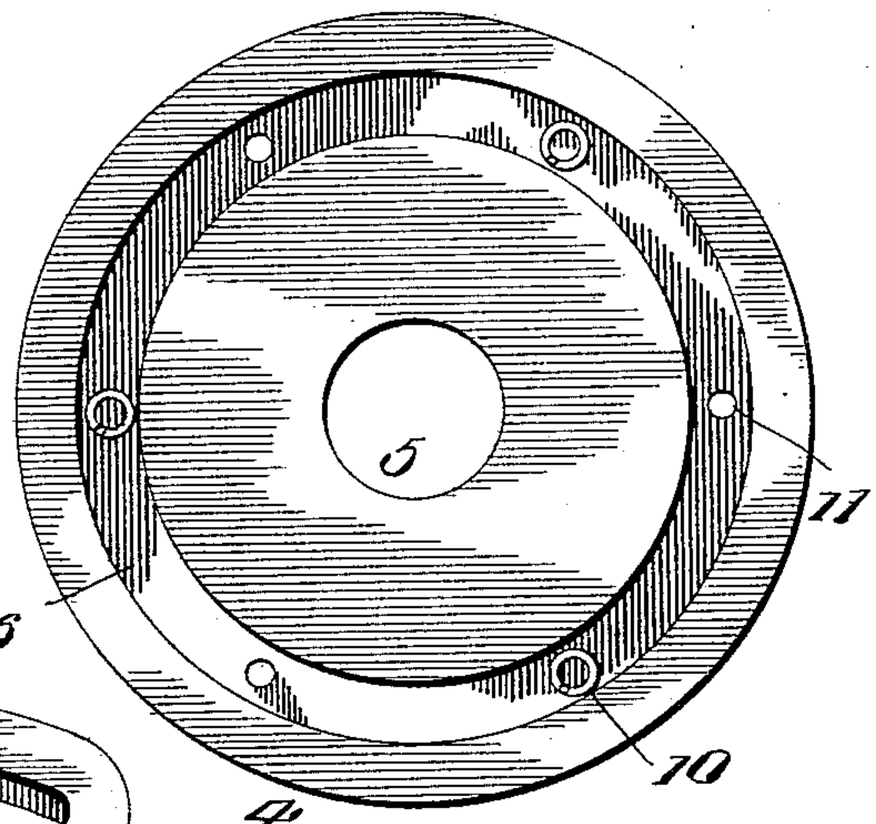
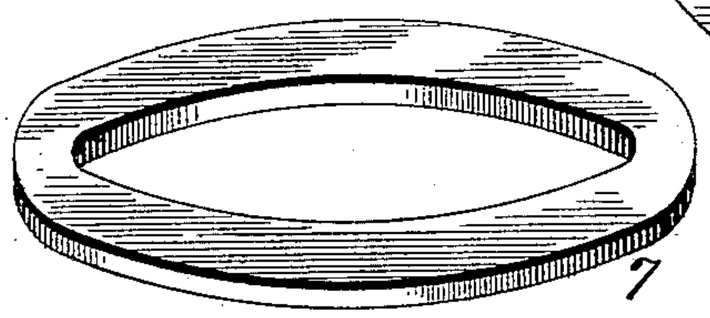


FIG. 4.



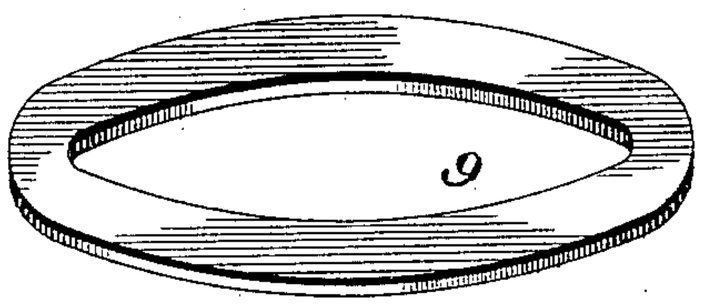
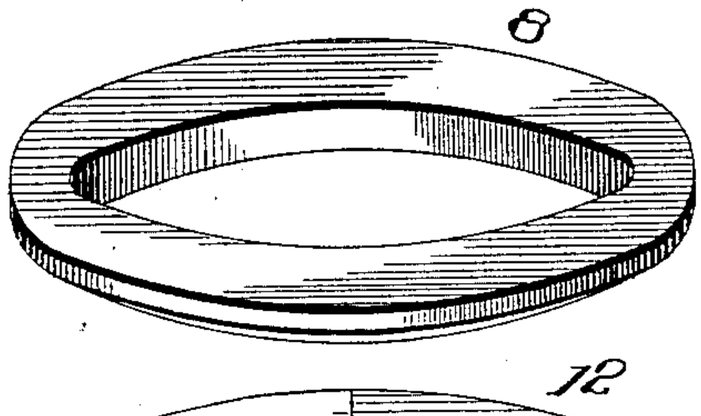
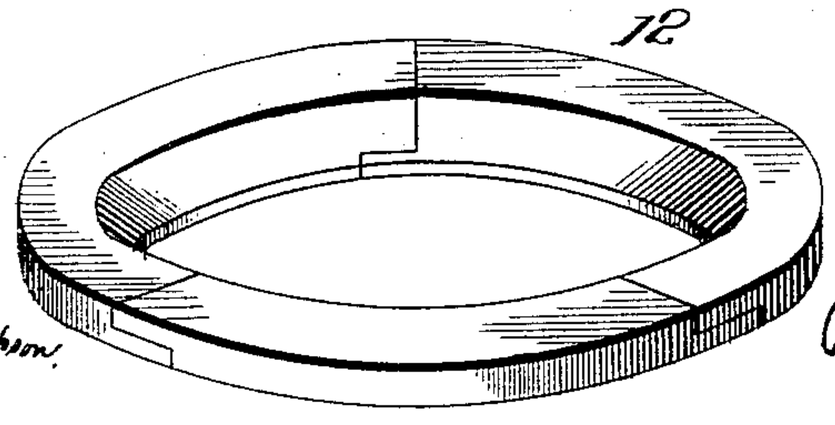
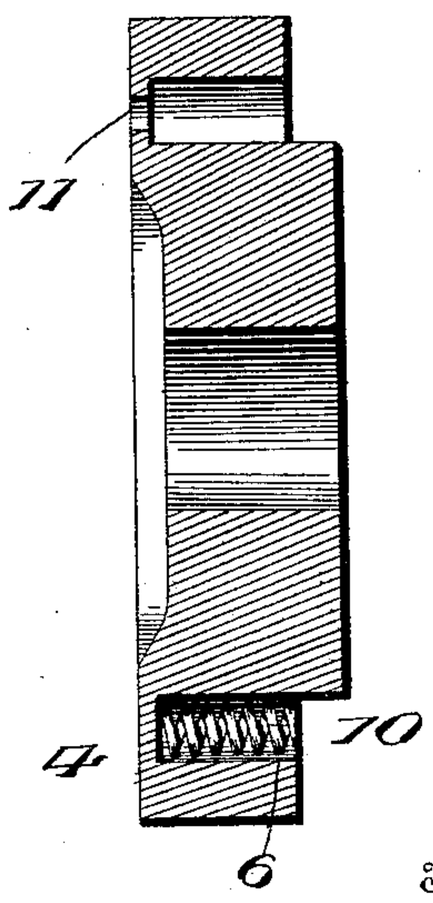


FIG. 3.







Witnesses
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by
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Their Attorneys

UNITED STATES PATENT OFFICE.

WILLIAM ROADMAN, OF KREGAR, PENNSYLVANIA.

PACKING FOR PISTONS.

SPECIFICATION forming part of Letters Patent No. 633,042, dated September 12, 1899.

Application filed May 2, 1899. Serial No. 715,310. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM ROADMAN, a citizen of the United States, residing at Kregar, in the county of Westmoreland and State of Pennsylvania, have invented certain new and useful Improvements in Packing for Pistons; and I do hereby 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.

This invention relates to pistons, plungers, and the like adapted to reciprocate in a cylinder or barrel and requiring a close fit and steam-tight joint so as to obviate a waste of energy and fuel and prevent any cushioning.

The invention consists of a head having an annular chamber in one face near its periphery, a follower and expander located in the annular chamber and seated against springs, an expansible metallic packing-ring having an inner beveled seat to receive the conical portion of the expander, the head having the central portion raised or projected beyond the plane of the edge to receive the follower, the expander, and the expansible packing-ring, and the said annular chamber having ports leading therefrom through the outer face of the head for the admission of the fluid medium, whereby the packing is automatically expanded when the piston or plunger is in operation.

The improvement also consists of the novel features, details of construction, and combinations of parts, which hereinafter will be more fully set forth, illustrated, and finally claimed.

The drawings show two heads applied to a single rod, and this number may be varied according to the extent of the piston or plunger and the nature of the work for which it is designed, and other changes in the form, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings, Figure 1 is a longitudinal section of a piston composed of two heads. Fig. 2 is a plan view of a head. Fig. 3 is a detail view of the follower, gasket, expander, and expansible packing in perspective and disposed in a group in the relation which they will occupy when assembled. Fig. 4 is a detail section of a head.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The rod 1, upon which the elements or parts comprising the piston are mounted, is provided with a shoulder 2 and a threaded end, upon which is mounted a clamp-nut 3 for confining said elements between it and the shoulder 2. Any number of heads may be placed upon the rod 1 according to the purpose for which the piston, plunger, or the like is designed, and, as shown, two heads are provided, the one being a substantial duplicate of the other. Hence a detail description of one only will be given. Each head 4 has a central opening 5 to receive the rod 1 and an annular chamber 6 in one face to receive the follower 7 and expander 8. The central portion of the head upon the chambered side is raised or projected a short distance beyond the plane of the edge of the portion exterior to the chamber, so as to receive the parts 7 and 8 with the interposed gasket or packing-ring 9. A series of springs 10 are located in the chamber 6 and are secured in depressions or seats formed in the bottom thereof. These springs support the follower 7 and press it and the expander 8 outward. Ports 11 are formed in the head 4 and communicate with the annular chamber 6 and admit the motive or fluid medium into said chamber when the piston or the like is in operation, so as to exert an outward pressure against the follower 7 and force the expander 8 against the sectional packing 12 to expand it and maintain a steam-tight joint or close fit between said packing and the walls of the cylinder or barrel in which the piston or plunger is located. The follower 7 is a metallic ring of a width corresponding to the distance between the walls of the chamber 6, so as to fit snugly therein. The expander 8 is a metallic ring equal in width and diametrical extent to the follower 7, so as to fit snugly within the annular chamber 6. The outer side of the expander is made conical to operate by a wedging action when expanding the sectional packing-ring 12. A gasket or packing-ring 9, of

compressed paper, leather, rubber, or like material, is interposed between the follower and expander and its edges bear against the walls of the chamber 6, so as to prevent the escape of the fluid medium when confined within the said chamber 6 and exerting an outward pressure against the follower 7. The expansible packing-ring 12 is composed of a number of sections having their meeting or matching ends halved, whereby provision is had for variation in the diametrical extent of said packing without the formation of any space between the extremities of adjacent sections for the escape of the fluid or motive medium. The side of the packing-ring 12 adjacent to the expander is beveled or formed with a conical seat to receive the conical end of the expander, whereby when the latter is pressed outward the inclined surface of the sections riding upon the sloping walls of the expander will result in increasing the size of the packing-ring 12, whereby its outer edge will be brought into engagement with the walls of the cylinder or barrel and maintain a close joint therewith. A cap-plate 13 is secured to the chambered face of the head and holds the expansible packing, the expander, the gasket, and the follower in proper position when assembled. When two heads are provided, as shown, it is only necessary to secure the cap-plate to one of the heads, as it will form a closure or retainer for the movable parts applied to the other head because of its disposition, being located between the two heads and common to each. When the piston is used in the cylinder of an engine and is alternately subjected to pressure upon opposite sides, it is essential that two heads be provided and arranged upon the rod 1 with their chambered faces subjacent and with their ported faces outermost, so as to admit of the motive agent entering the chambers 6 and forcing the follower and expander outward or against the expansible packing-ring to maintain a steam-tight joint between the piston and cylinder.

Having thus described the invention, what is claimed as new is—

1. In a device of the character set forth, a head having an annular chamber in one face near its outer edge, springs located in said chamber, a follower arranged within said chamber and seated against the springs, an expander placed against the follower and having its outer side made conical, an expansible packing-ring composed of sections having their meeting or matching ends halved, and having the sides adjacent to the expander formed with a conical depression to receive the conical end of said expander, and means for holding the parts in fixed relation when assembled, substantially as set forth.

2. In a device of the character specified, a head formed in one face with an annular chamber having ports leading therefrom, springs located in said chamber, a follower seated upon said spring, an expander placed upon the follower and having its outer end made conical, an expansible packing-ring composed of sections having their meeting ends halved and the side adjacent to the expander formed with a conical depression to receive the conical end of the expander and coöperate therewith and a cap-plate, as and for the purpose described.

3. In a device of the character specified, a head formed in one face with an annular chamber having ports leading therefrom and having the middle portion raised or projecting beyond the plane of the edge portion exterior to the annular chamber, springs located in said chamber, a follower, an expander, a sectional packing-ring, and a cap-plate seated against said central portion of the head and maintaining the parts in proper relation, substantially as set forth.

4. In combination, a rod having a threaded extremity and an outer shoulder a distance from the threaded end, two heads placed upon the rod and having their inner faces formed with corresponding annular chambers near their outer edges and having their middle portions raised or projected, and having ports extending through the outer faces and communicating with the annular chambers, corresponding followers and expanders for the heads, gaskets or packing-rings interposed between the followers and expanders, springs located in the annular chambers and exerting an outward pressure against the followers, and expansible packing-rings composed of sections having conical depressions in the sides adjacent to the expanders to receive the conical ends thereof, a cap-plate common to both heads and interposed between them and secured directly to one of said heads, and a clamp-nut applied to the threaded extremity of the rod to hold the heads and adjunctive parts in assembled relation, substantially as set forth.

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

WILLIAM ROADMAN. [L. S.]

Witnesses:

ROSS PHILLIPPI,

CYRUS GROVE.