(No Model.) 2 Sheets—Sheet 1.

# T. ROBERTS.

## PISTON PACKING.

No. 509,827. Patented Nov. 28, 1893.

*Fig. 1.*

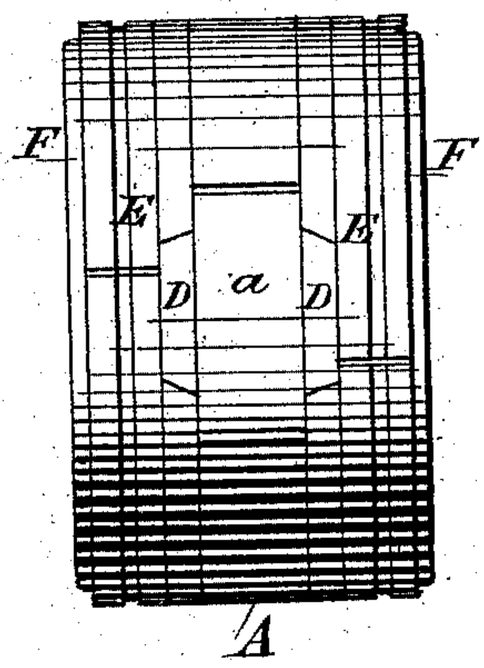



*Fig. 2.*

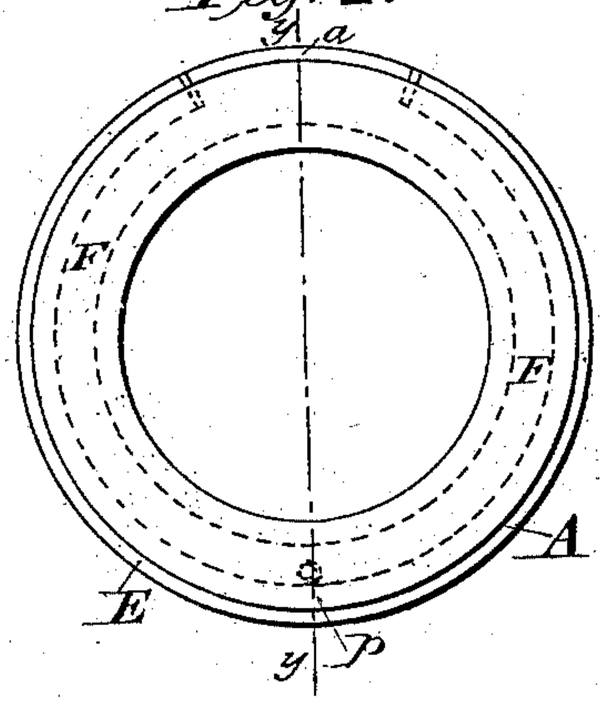



*Fig. 3.*

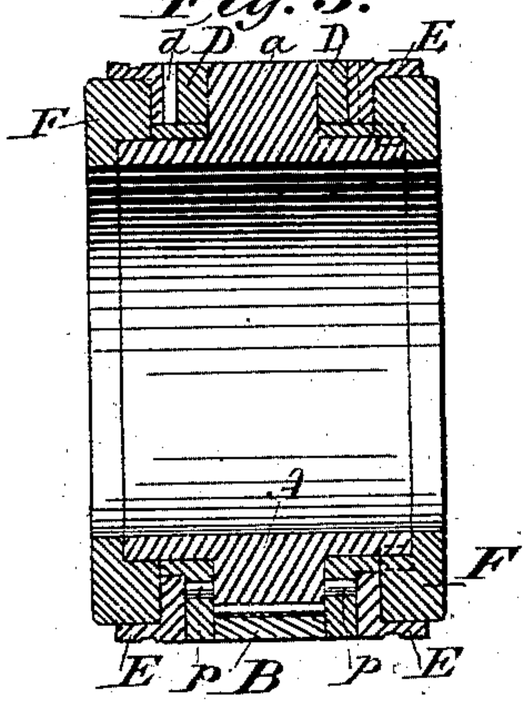



*Fig. 4.*

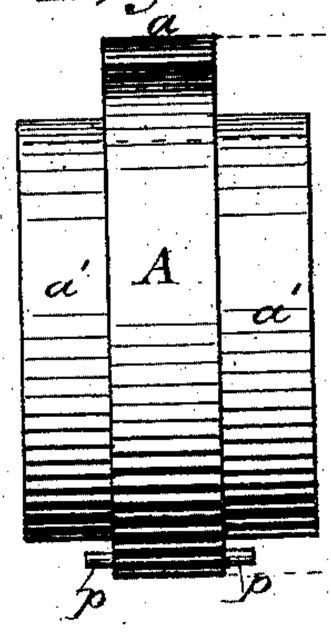



*Fig. 5.*

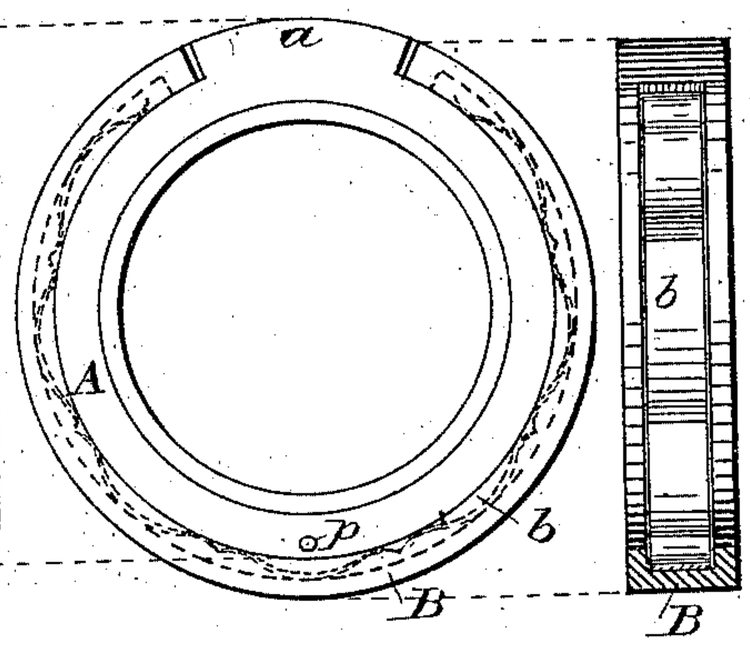
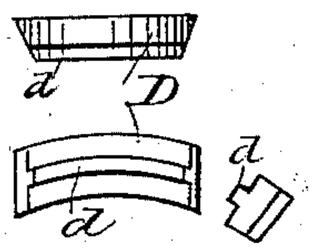



*Fig. 6.*




*Fig. 9.*



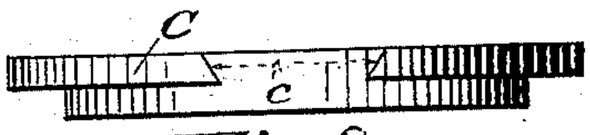
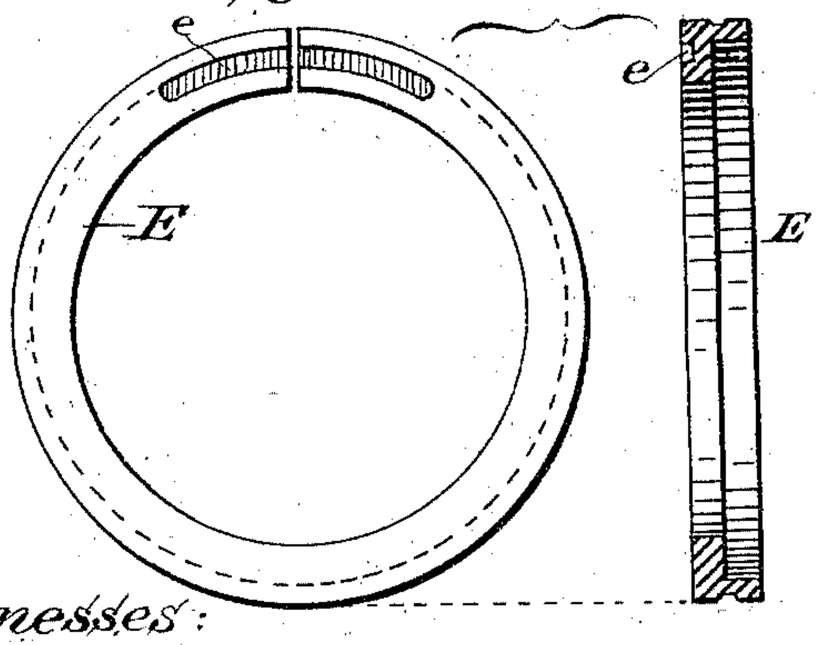
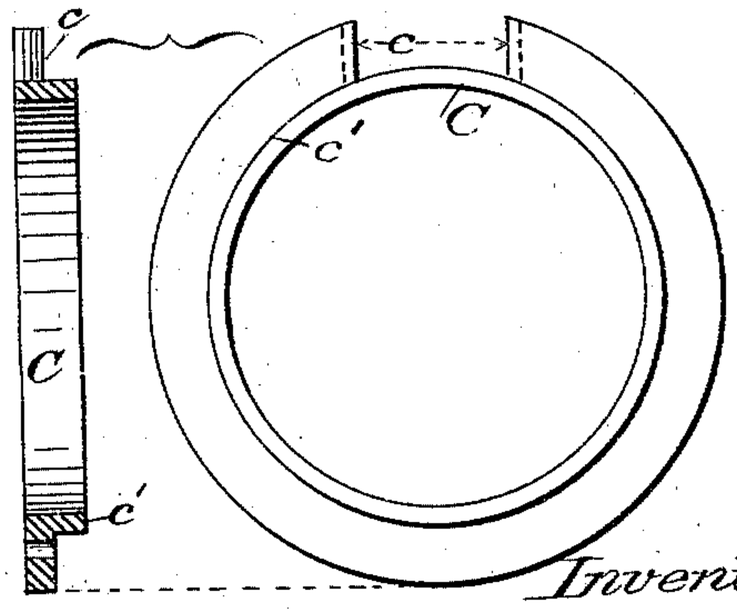




*Fig. 8.*

*Fig. 7.*

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(No Model.) 2 Sheets—Sheet 2.

# T. ROBERTS.

## PISTON PACKING.

No. 509,827. Patented Nov. 28. 1893.

*Fig. 10.*

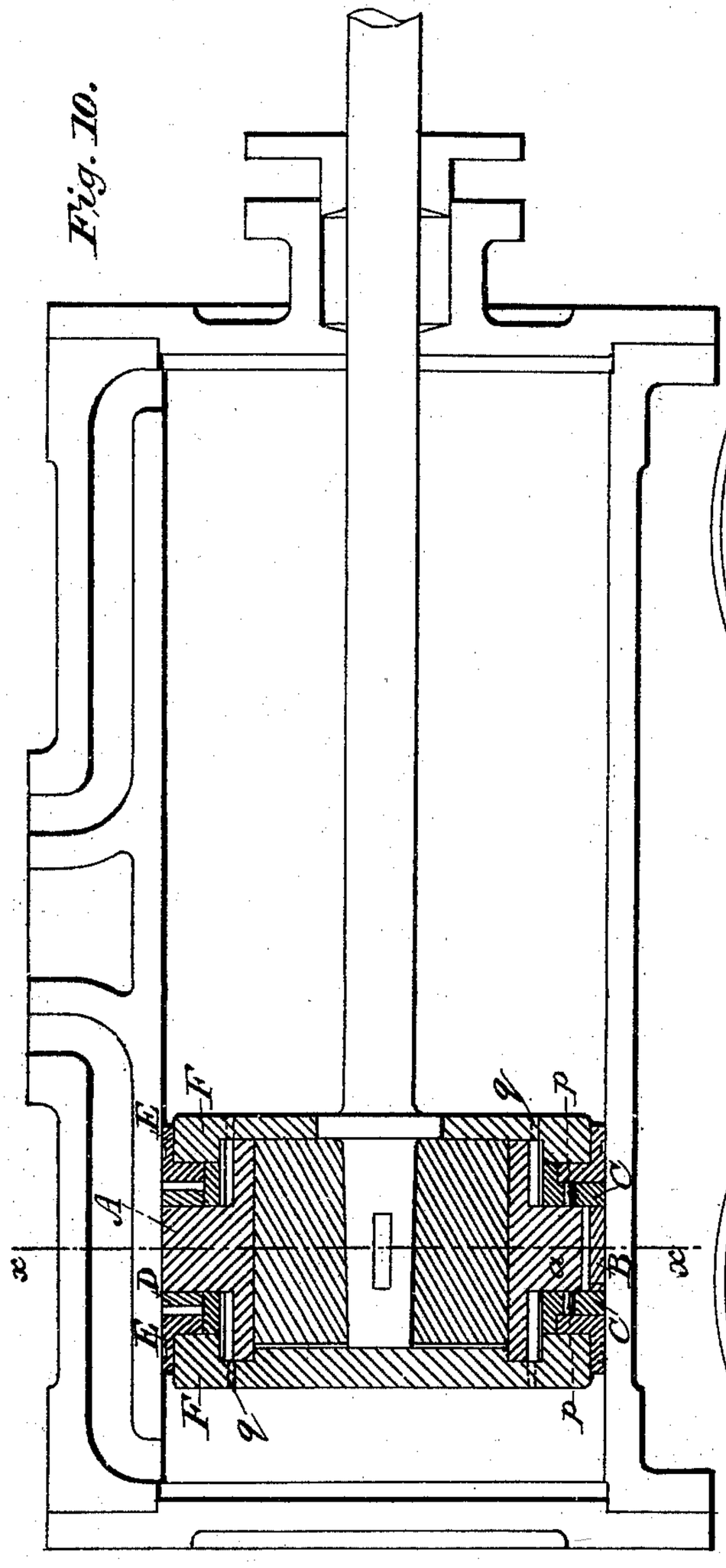
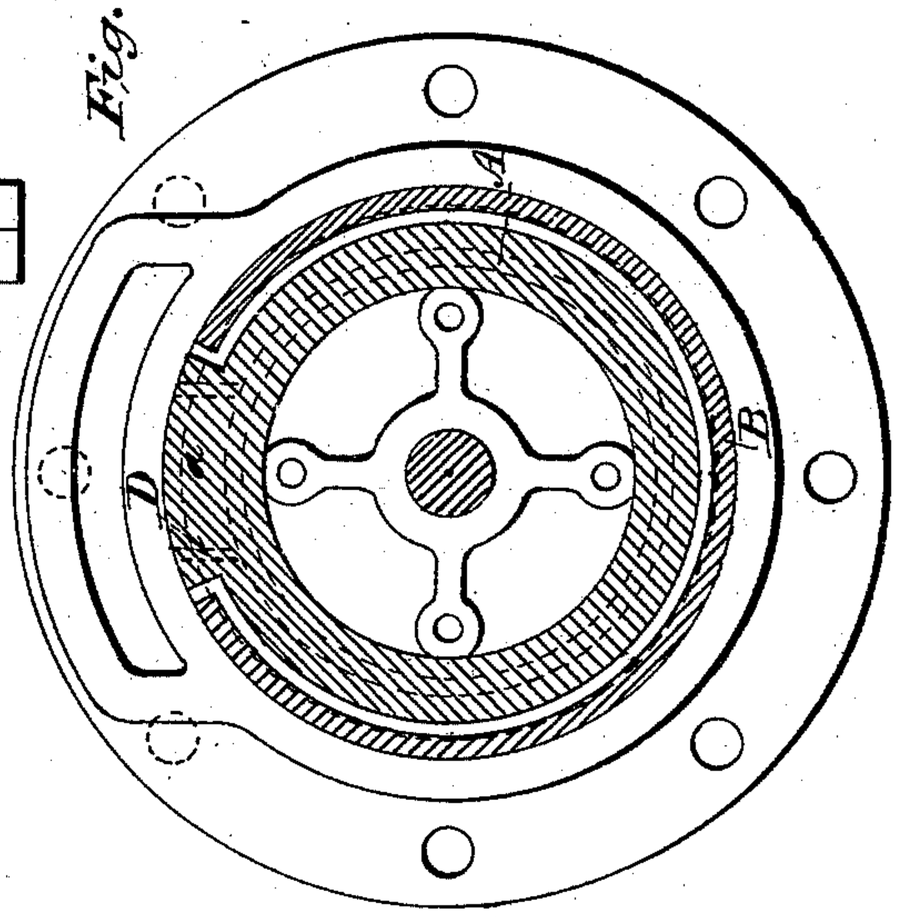



*Fig. 12.*



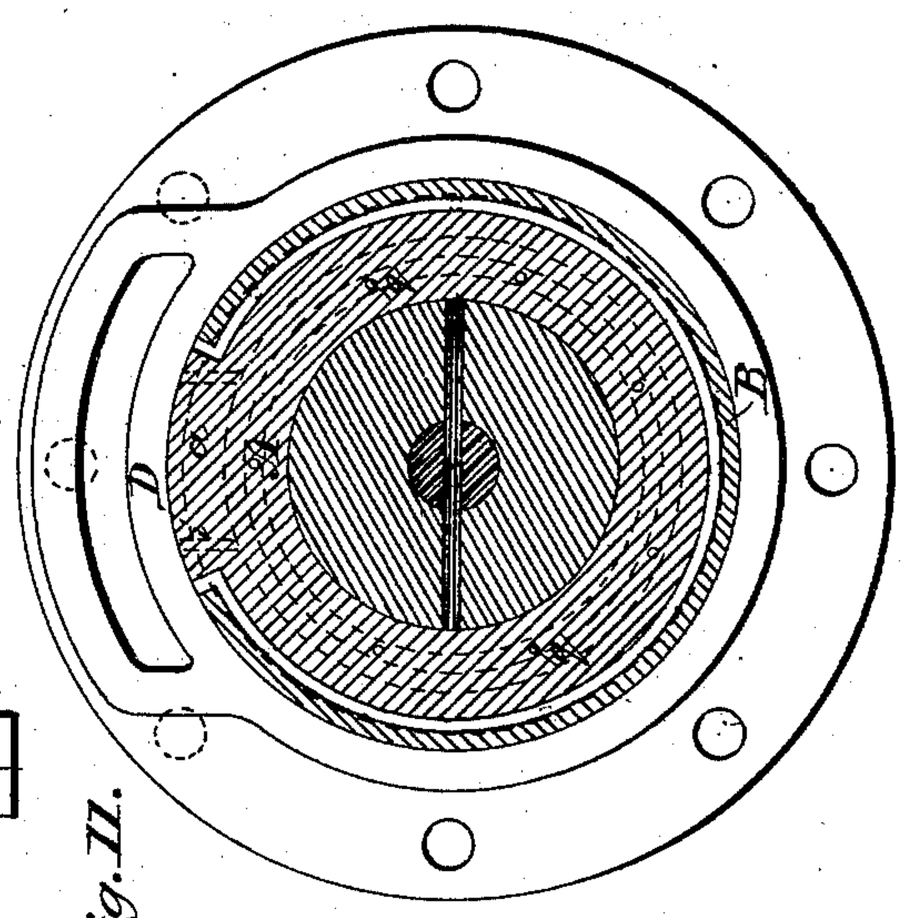




*Fig. 11.*

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# UNITED STATES PATENT OFFICE.

THOMAS ROBERTS, OF BALTIMORE, MARYLAND, ASSIGNOR OF ONE-HALF TO EUGENE WEILLER, OF SAME PLACE.

## PISTON-PACKING.

SPECIFICATION forming part of Letters Patent No. 509,827, dated November 28, 1893.

Application filed July 19, 1893. Serial No. 480,877. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS ROBERTS, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Piston-Packing; 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 the letters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in piston-packing for steam and other engines, and also applicable for other purposes; and the object of the invention is to produce a piston, that will form a perfectly steam-tight packing against the bore of the cylinder, and at the same time will prevent the binding often occurring in engines, and caused usually by expanding the packing-rings, or setting them out with the set screws employed too hard against the inner surface of the cylinder; also to set out the packing automatically; another object is to produce a filling-piece that will not get loose or fall out of its place, after the packing-ring has been worn down to a certain extent, as is the case with those in general use; furthermore to greatly relieve the lower part of the cylinder of the weight of the bull-ring usually employed, and causing the cylinder to wear out, requiring re-boring; and finally to facilitate the manufacture of the piston, by its simplicity, to increase its durability and to reduce its cost.

The invention consists in the construction of certain details and combination of parts, as will be more fully described hereinafter and specifically pointed out in the claims, reference being had to the accompanying drawings and the letters marked thereon.

Like letters indicate similar parts in the different figures of the drawings, in which—

Figure 1 represents a face-view of my improved piston and packing. Fig. 2 is a side view of the same. Fig. 3 is a vertical section on line *y. y.* of Fig. 2. Fig. 4 is an edge view of the bull ring. Fig. 5 is a side-view of the same. Fig. 6 is a section of the segmental piece of the bull-ring. Figs. 7 and 8 are detail views of the packing-rings. Fig. 9 shows detail views of the filling-piece employed. Fig. 10 is a sectional view of a cylinder with my improved packing applied to a solid piston head. Fig. 11 is a cross section on line *x x.* Fig. 12 is a similar view with a spider piston-head.

In the drawings, A represents the center ring, or what is usually termed the bull ring of the piston, and it has the central projection *a*, while the remaining part is cut away, as best seen in Figs. 5 and 6, to receive the segmental piece B, allowing merely a small space between the ends to allow for the expansion of said piece B, and both forming an annular ridge. The piece B is recessed on its inner surface to receive the springs *b* or an elliptical spring. By this means, especially in horizontal or inclined engines, in which the weight of the piston is supported on the bottom of the cylinder, said weight is greatly relieved or compensated for by said piece B, thus preventing cutting or untrue wearing of the cylinder. On each side of the annular ridge the spaces *a'* are formed, to receive the packing rings, consisting of the rings C and E. The ring C is of L-shape-cross-section, and is provided at its upper side with a recess *c*, having its sides beveled, to receive a filling-piece D fitting therein, and it has a projection *d*, that enters into a groove *e* in the side of the ring E, supported on the part *c'* of said ring C. The beveled sides of the recess *c* and filling-piece D are made parallel to each other, and the rings can thus be worn much thinner, than those now in use, while at the same time the filling piece cannot drop out, as at present, often causing great damage. The ring C is supported on the hubs *a'* of the center ring A, while a pin *p*, on each side prevents the rings C from turning. On each side of the packing-rings are arranged the followers F of the piston-head.

In the modification Figs. 10 and 11, the ring A is turned down on its hubs *a'*, so as to form a space, to receive springs for forcing out the packing-rings against the bore. If desired, steam can be admitted through suitable holes *q*, into said space, to set out the rings. The filling-piece D is similar to that used in the other figures, having its ends beveled and

fitting into the recesses *c*, and the packing-rings are also similar.

If desired, the rings C may be provided with ratchet-teeth in the sides of the recess, and the filling-piece with corresponding teeth, and a key with similar teeth placed between, so that they will automatically engage with each other, and hold the filling-piece as the rings wear. This forms a self-adjusting and steam-tight packing, and yet a very easy and light-running piston, and there is no possibility of the filling-piece dropping out, and it is not liable to get out of order.

I am aware that different kinds of packing-rings, as well as filling-pieces have been used and patented, but none with dove-tailed ends, and I disclaim such, but,

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

1. The ring C provided with the dovetailed recess *c* and the filling-piece D fitting into said recess, and having the projection *d*, in combination with the bull ring A provided with springs, substantially as set forth.

2. In piston packing, the combination of the bull ring A carrying the rings F and the rings C; provided with filling piece D, and the rings supporting the rings E with the grooves *e*, all arranged substantially as set forth.

3. The combination of the bull-ring A, having projection *a* and the rings C provided with recesses *c* to receive the filling pieces D having projections *d*, with the rings E, provided with grooves *e*, and the rings F, all constructed and arranged as shown and specified.

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

THOMAS ROBERTS.

Witnesses:

WM. H. ROBERTS,

THOS. C. BAILEY.