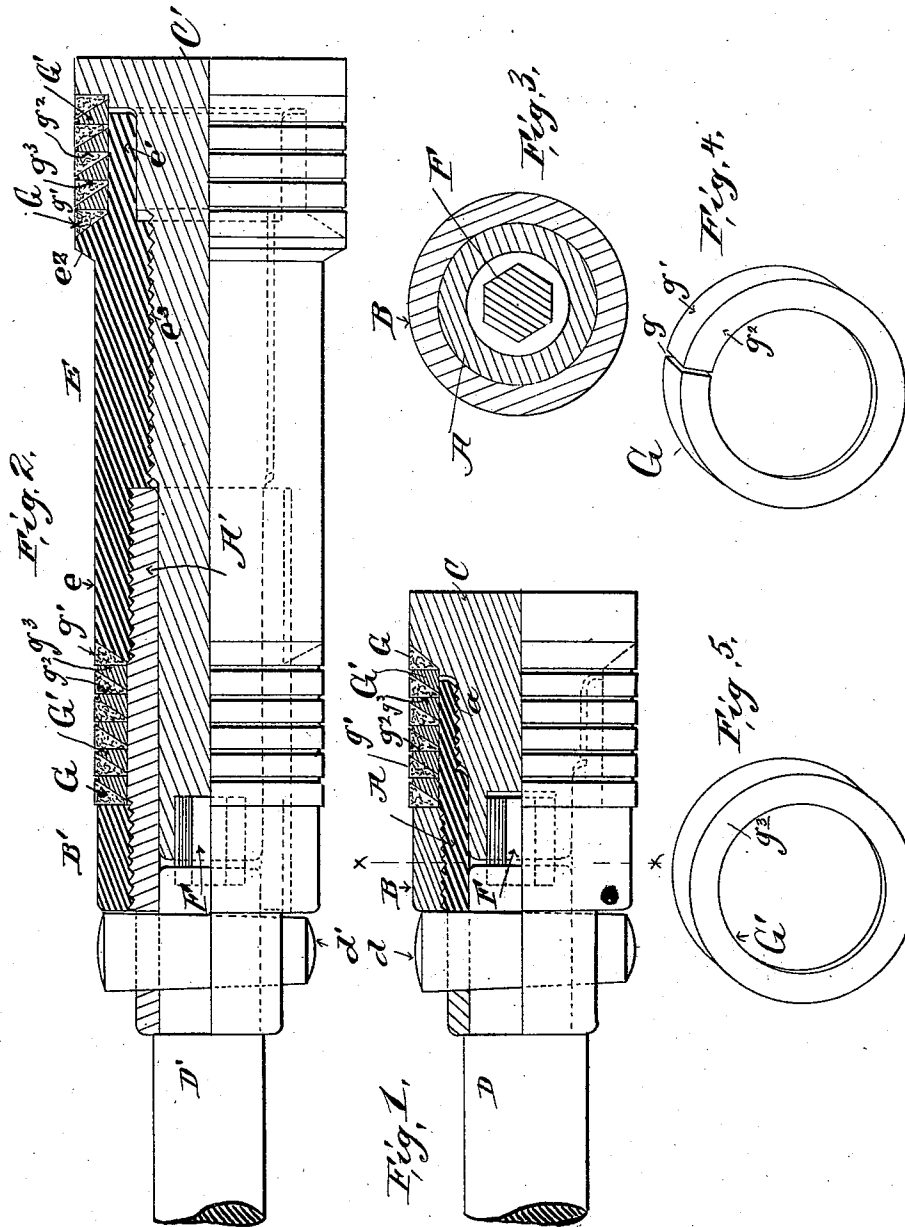


(No Model.)

J. A. THOMPSON.
PISTON PACKING.

No. 549,696.

Patented Nov. 12, 1895.



WITNESSES:

C. W. Benjamin
C. T. Falek.

INVENTOR

James A. Thompson
BY Arden S. Fitch
ATTORNEY

UNITED STATES PATENT OFFICE.

JAMES A. THOMPSON, OF NORTH TARRYTOWN, NEW YORK, ASSIGNOR TO
THE RAND DRILL COMPANY, OF NEW YORK.

PISTON-PACKING.

SPECIFICATION forming part of Letters Patent No. 549,696, dated November 12, 1895.

Application filed February 14, 1895. Serial No. 538,383. (No model.)

To all whom it may concern:

Be it known that I, JAMES A. THOMPSON, a citizen of the United States, residing at North Tarrytown, county of Westchester, State of New York, have invented certain new and useful Improvements in Piston-Packings, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to packings for pistons of cylinders of engines and pumps and is specially applicable to air-compressors, and more particularly to those intended to compress air to a high tension.

My invention consists in the devices hereinafter described, constructed as set forth and combined to operate as specified, and as more at length recited in the claims.

Figure 1 is a side elevation, partly in longitudinal section, of a single piston containing my invention. Fig. 2 is a similar view of a compound piston, showing my invention applied thereto. Fig. 3 is a vertical cross-section of the parts on the line *xx*, Fig. 1; and Figs. 4 and 5 are perspective views of the detached soft-metal rings and interposed hard-metal pressure-rings employed to constitute my piston-packing.

For the effective use of my improved packing I prefer to employ a piston constructed as illustrated in the drawings—that is to say, in a single piston, such as is shown in Fig. 1, I provide a hollow cylindrical body A, upon which and near one end is screw-seated a collar B, constituting a fixed head on the piston, while the head at the opposite end is formed by a flanged follower C, which is screw-seated within the threaded end *a* of said body A and preferably reaches longitudinally within said body, as shown, and constitutes a movable head to the piston. The piston-rod D is fitted into the open end of said body A and is united thereto detachably by a key *d*, passing transversely of the piston body and rod through coincident slots therein, as shown.

In constructing a compound piston such as is shown in Fig. 2 I constitute the body of the piston of the lesser diameter of the hollow cylindrical part A', at or near one end of which is screw-seated the collar B', forming the fixed

head on said piston, and the piston-rod D' is fitted within this said end of said body A' and detachably attached thereto by the key *d'* similarly to the construction shown in Fig. 1. I provide a second hollow cylindrical body E of greater diameter than the body A', and I screw-seat the free end of the latter within the open end of the former, as shown. The said end *e* of the cylinder E where it overlaps the cylinder A' serves to form a movable head for the piston of lesser diameter, while its opposite end *e'* constitutes the piston of greater diameter, the fixed head of which is formed by a circumferential shoulder or flange *e²*, integral with said cylinder E, the other and movable head being constituted by the flanged follower C', which is screw-seated within the threaded end *e³* of said cylinder E and which reaches longitudinally through said united bodies E and A' to near the end of the latter, to which the piston-rod is attached, as shown.

It is evident that when the follower C is screwed farther down in its seat in the body A its flange will more nearly approach the collar B, and that in like manner when the follower C' in the compound piston is screwed farther down in its seat in the body E its flange will approach the shoulder *e²*. By the turning of said followers in their said seats the space between the piston-heads, within which the packing-rings are seated, as shown and hereinafter described, may be lessened or contracted. To prevent the movement of the said followers in their screw-seats while the piston is in operation, I provide the polygonal piece F, which I have found may be preferably hexagonal, as shown, and one end of which I seat in a corresponding recess in the end of the follower C or C', which is adjacent to the end of the piston-rod seated in the body A or A', the other end of said piece F being seated in a similar recess in the end of the piston-rod. The follower C or C' is thus locked to the piston-rod and, hence rendered incapable of turning in its screw-seat so long as this lock prevails. When it is desired to readjust the said follower in its said seat in the piston-body, the key which unites the piston-rod to the piston-body is withdrawn, and the rod is disengaged from said piece F, whereupon when the follower has

been rotated through the distance of one or more of the external faces of said piece F, and thus readjusted in its seat in the piston-body, the piston-rod may be caused to re-engage said piece F, and the key *d* may be reset in its slots in the piston body and rod.

The piston-packing which I preferably employ in connection with the hereinbefore-described piston consists in a series of soft-metal rings, preferably of Babbitt metal, each having a perimetral bevel face seated on the piston-body between the movable heads thereof, together with a series of rigid metal rings, each having a perimetral reversely-beveled face, severally seated between said soft-metal rings on said piston-body with their beveled faces respectively in juxtaposition to the bevel faces of the soft-metal rings, and in constructing these said rings I find it desirable to transversely split the soft-metal rings G, as at *g*, and to form the bevel thereon with the incline thereof from a peripheral edge of the ring inwardly toward the interior face of the ring, so that the peripheral face of the ring will be the wider, as at *g'*, and with the other perimeter of each said ring a plane at right angles to the ring's axis, as at *g''*, while I find it desirable to make the rigid rings G' solid or continue, as shown, and with the incline of the bevel thereon from a peripheral edge of the ring outwardly toward its internal face, so that said internal face is the wider, and with the other perimeter of each said ring a plane at right angles to the ring's axis, as at *g'''*. In assembling the aforesaid rings on the piston the rigid rings are placed alternately with the soft rings with their corresponding faces in juxtaposition, as shown.

When the described rings are assembled, as shown, between the fixed head B and the movable head C on the piston A, the force exerted by the movable head to clamp them in place in their seat will be felt or exerted throughout the series in a right-line direction parallel to the axis of the piston through the

contiguous straight faces or perimeters of said rings, while, owing to the bevel faces on said rings and to the split in the soft-metal rings, the said force, caused by the adjustment or readjustment of the movable head C, as hereinbefore described, will tend to expand the rings G and carry their wide peripheral faces somewhat beyond the narrow intervening peripheral faces of the intermediate solid rigid rings G'.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a cylinder-piston, the combination with the piston-body and a fixed and a movable head thereon, packing-rings seated on said body between said heads, and a piston-rod adapted to be detachably attached to said body, of a polygonal lock-piece seated in corresponding opposed recesses in said movable head and said piston-rod, substantially as and for the purpose set forth.

2. In a cylinder-piston, the combination of a piston-body composed of two hollow cylindrical sections of different diameters united by a screw-joint endwise, a collar seated upon the lesser section at or near the free end thereof, a flanged follower screw-seated in the free end of said greater section and extending through the same and into the lesser section, packing-rings seated on said piston-body between said collar and the adjacent end of the greater section of said body, and between the flange of said follower and a flange on said greater section, together with a polygonal lock-piece seated in a corresponding recess in the end of said follower within said lesser section and adapted to reach into a similar recess in the opposed end of a piston-rod fitted to be detachably attached to said lesser section of said piston-body, substantially as and for the purpose set forth.

JAMES A. THOMPSON.

Witnesses:

W. S. BARNUM,
H. V. CONRAD.