

(No Model.)

F. D. CHILD.  
PISTON PACKING.

No. 423,985.

Patented Mar. 25, 1890.

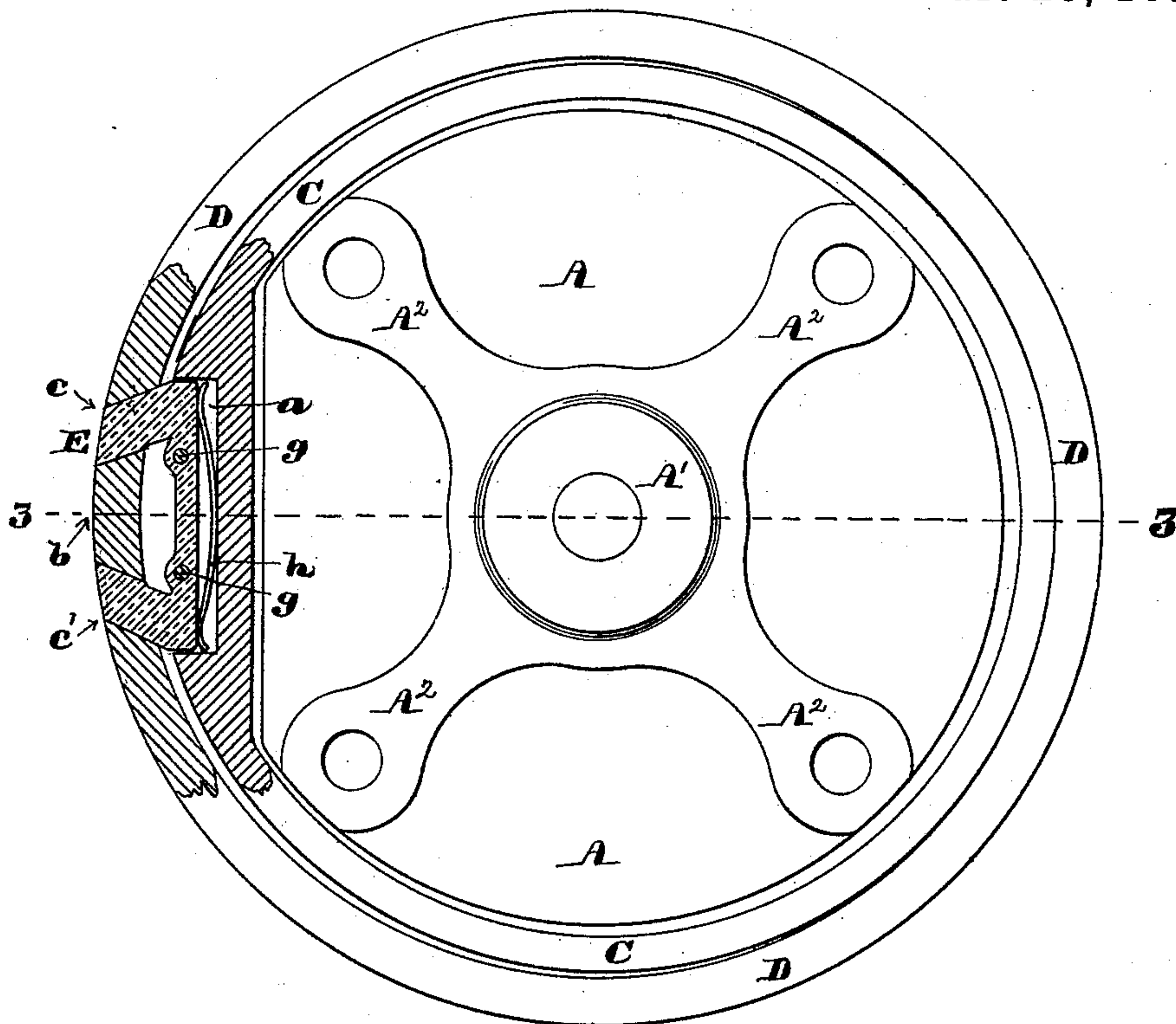


Fig. 1.

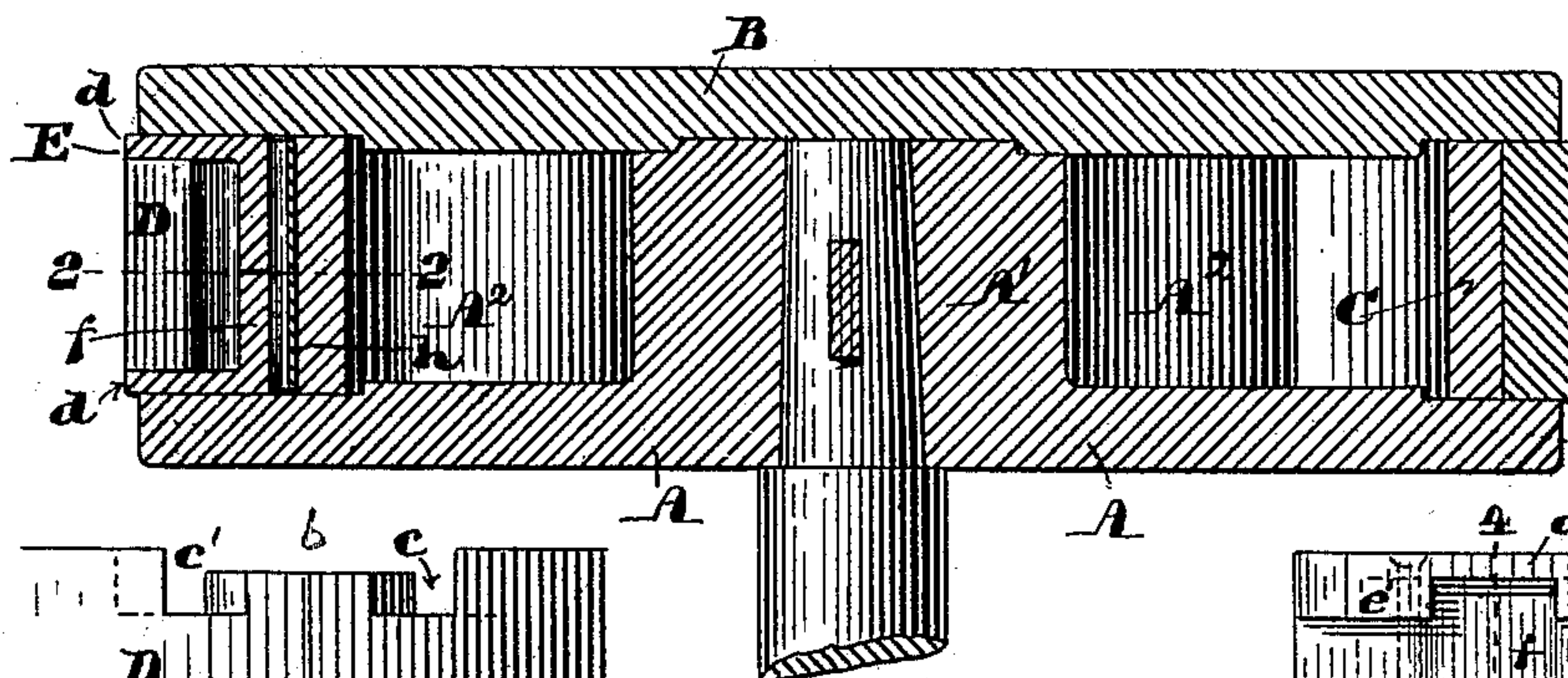


Fig. 2.

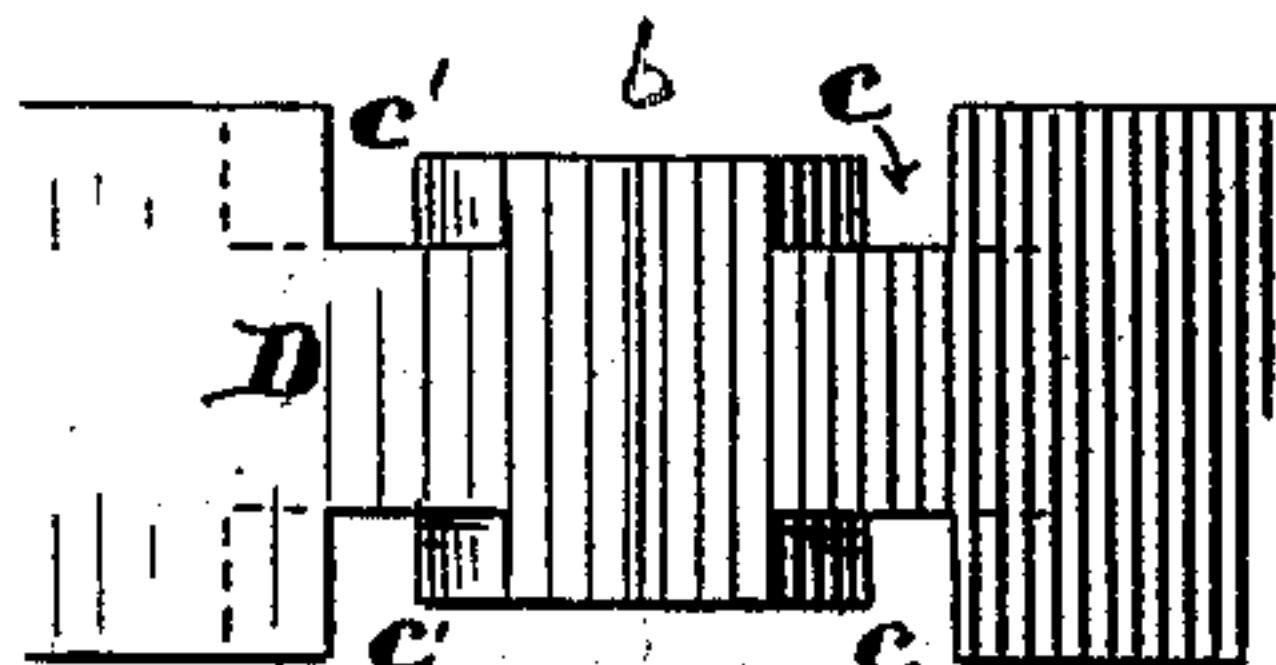


Fig. 3.



Fig. 4.

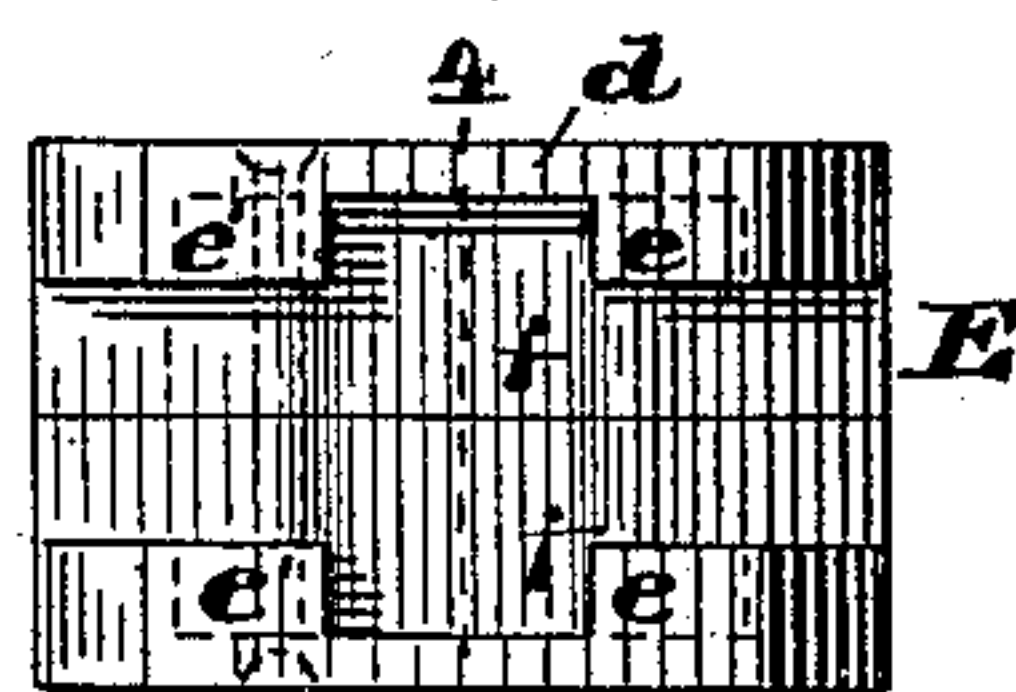


Fig. 5.

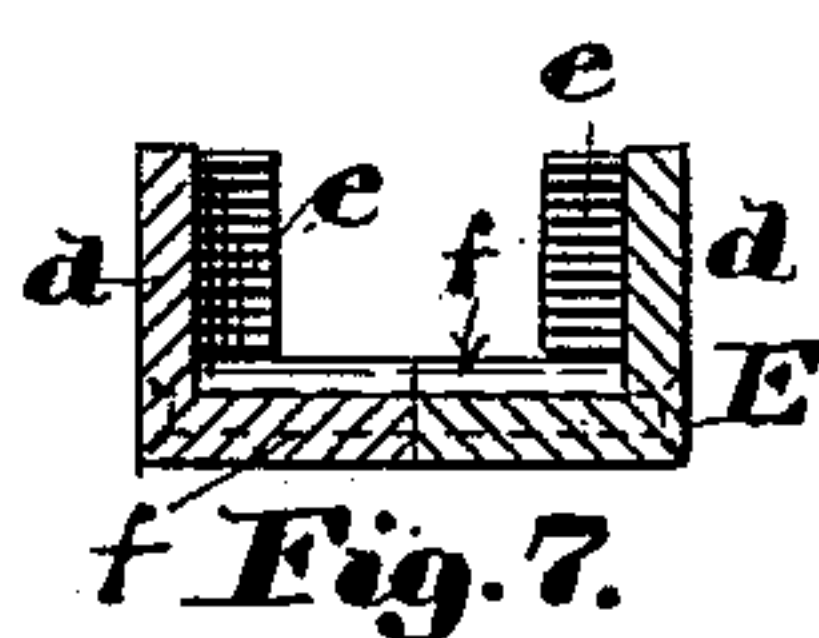


Fig. 7.

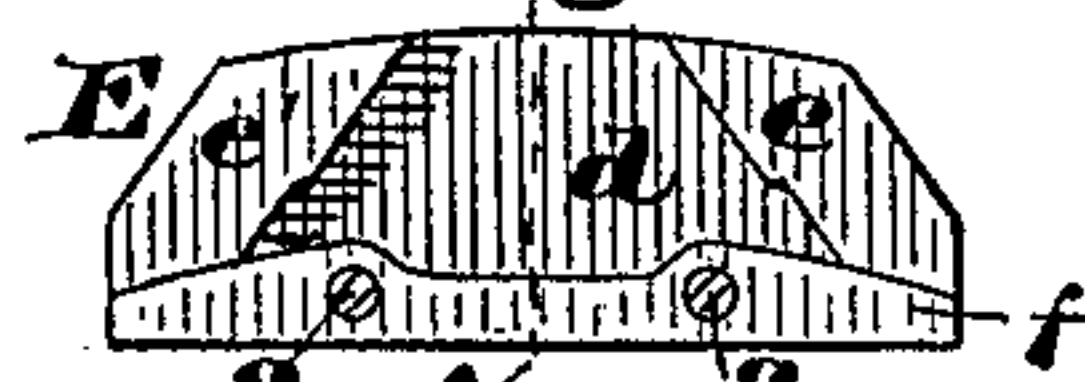


Fig. 6.

Witnesses:

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# UNITED STATES PATENT OFFICE.

FRANKLIN D. CHILD, OF NEWTON, MASSACHUSETTS.

## PISTON-PACKING.

SPECIFICATION forming part of Letters Patent No. 423,985, dated March 25, 1890.

Application filed November 30, 1889. Serial No. 332,106. (No model.)

*To all whom it may concern:*

Be it known that I, FRANKLIN D. CHILD, of Newton, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Piston-Packings, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to the construction of packing-rings for pistons of steam-engines and other purposes, and is an improvement upon the invention described in another application of mine, filed May 28, 1889, Serial No. 312,467; and it consists in certain novel features of construction, arrangement, and combination of parts, which will be readily understood by reference to the description of the drawings and to the claims hereinafter given, and in which my invention is clearly pointed out.

Figure 1 of the drawings is a sectional elevation of the piston-head and packing-rings with the follower removed, the cutting-plane being on line 2 2 on Fig. 2. Fig. 2 is a section on line 3 3 on Fig. 1. Fig. 3 is an exterior elevation of a portion of the expansible packing-ring contiguous to and on each side of the line of separation thereof. Fig. 4 is an edge view of the same. Fig. 5 is an elevation of the locking device, looking toward the axis of the piston. Fig. 6 is an elevation of one half of said locking device, looking at its inner face in a direction parallel to the axis of the piston, and Fig. 7 is a transverse section of the locking device on line 4 4 on Figs. 5 and 6.

In the drawings, A is the piston-head, provided with the central hub A' and the radiating ribs A<sup>2</sup>, to which the follower B is bolted in a well-known manner.

C is an inner endless ring having formed in its periphery the rectangular slot or groove *a*, and clamped firmly in a fixed position between the follower B and the plate of the piston-head A by the bolts which secure the follower in position.

D is the packing-ring proper, cut open at *b*, and having formed in each edge thereof, upon each side of said line of division, the oblique grooves *c* and *c'*, said grooves being inclined in opposite directions relative to the outer and inner surfaces of said ring, the two side walls of each groove being parallel with each other, as shown in Fig. 4. Those portions of

the ring D between the line of separation and the oblique grooves *c* and *c'* are made somewhat narrower than the main body of said ring, as shown in Fig. 3.

E is the locking device, made in two parts, each composed of a side plate *d*, two inwardly-projecting oblique lips or ribs *e e'*, adapted to fit the oblique grooves *c* and *c'* in the ring D, and the inwardly-projecting flange *f*; said flanges *f* on the two halves of said locking device abutting against each other and secured together by rivets *g g* passing through both of said flanges, as shown in Figs. 1, 5, 6, and 7.

In my before-cited pending application a locking device somewhat like the one herein described was shown and claimed; but that locking device was made in one piece, and its opposite ends and the outer sides of the projecting lugs that entered the recess in the ring, as well as the contiguous wall of the recess in the ring, were made radial to the axis of the piston.

I have found by experiment that it is better to make both sides of each groove or recess in the ring oblique to the outer and inner surfaces of the ring and parallel to each other, and to make the two sides of each projecting lip or rib *e* parallel to each other and to said groove or recess in the ring, so that the outer inclined sides of said lips acting upon the contiguous inclined sides of the slots or grooves in the ring shall tend to press the cut ends of the ring D outward as said locking device is moved outward by the pressure of steam between said locking device and the inner ring C, it being assisted by the tension of the spring *h*, placed between said lock and the bottom of the recess or groove *a* in the ring C, while at the same time the inclined inner sides of said lips *e* will prevent the cut ends of the ring D expanding any faster than the outer surface of the lock E is worn away. I have also found that the double form of lock is preferable to the single lock; but to use the double lock having two bars bridging the line of separation in the ring, one at each edge of the ring D, and having locking-lips having two oblique and parallel sides, it is a great advantage in assembling the parts to make said lock in two parts and secure them together by rivets or screws, as may be preferred.



The object of using an inner ring to be clamped between the flange of the piston-head and the follower is to facilitate the adjustment of the piston-head into a position in axial line with the cylinder in a horizontal engine in a well-known manner.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. A cut packing having formed in each edge thereof and upon each side of the line of separation a slot or groove, the two side walls of which are parallel to each other and oblique to the outer and inner surfaces of said ring, with their outer ends nearest to the line of separation of said ring, the slots or grooves upon opposite sides of said line of separation being inclined in opposite directions, in combination with a locking device having inwardly-inclined lips to fit the grooves in said ring and lock the ends of said ring together and bridge the space between the ends of said ring.

2. In combination with a cut packing-ring having parallel-sided slots or grooves formed in its edges upon each side of the line of separation of said ring, said grooves being inclined in opposite directions, a locking device made in two parts secured together by rivets or screws and provided with inwardly-projecting inclined lips made to fit the grooves

in the ring and lock the ends of said ring together and control the degree of expansion of said ring, and at the same time bridge the cut in said ring.

3. The combination, with a piston-head and follower, of the cut packing-ring D, provided with the slots or grooves *c c'*, inclined in opposite directions, with their outer ends nearest to the line of separation of said ring, the locking device E, provided with the lips *e e'*, inclined in opposite directions and arranged to fit the grooves *c c'* and lock the two ends of the ring together and control the degree of expansion thereof, and the endless ring C, having formed in its periphery a rectangular slot to receive the inner connecting-plate of the locking device.

4. The combination, with a piston-head and its follower, of the cut ring D, the endless ring C, the lock E, and the spring *h*, all constructed, arranged, and operating substantially as described, for the purposes specified.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 26th day of November, A. D. 1889.

FRANKLIN D. CHILD.

Witnesses:

N. C. LOMBARD,  
C. A. MCCLURE.