

(No Model.)

3 Sheets—Sheet 1.

L. SCHNABL.
METALLIC PACKING RING.

No. 316,188.

Patented Apr. 21, 1885.

Fig. 1.

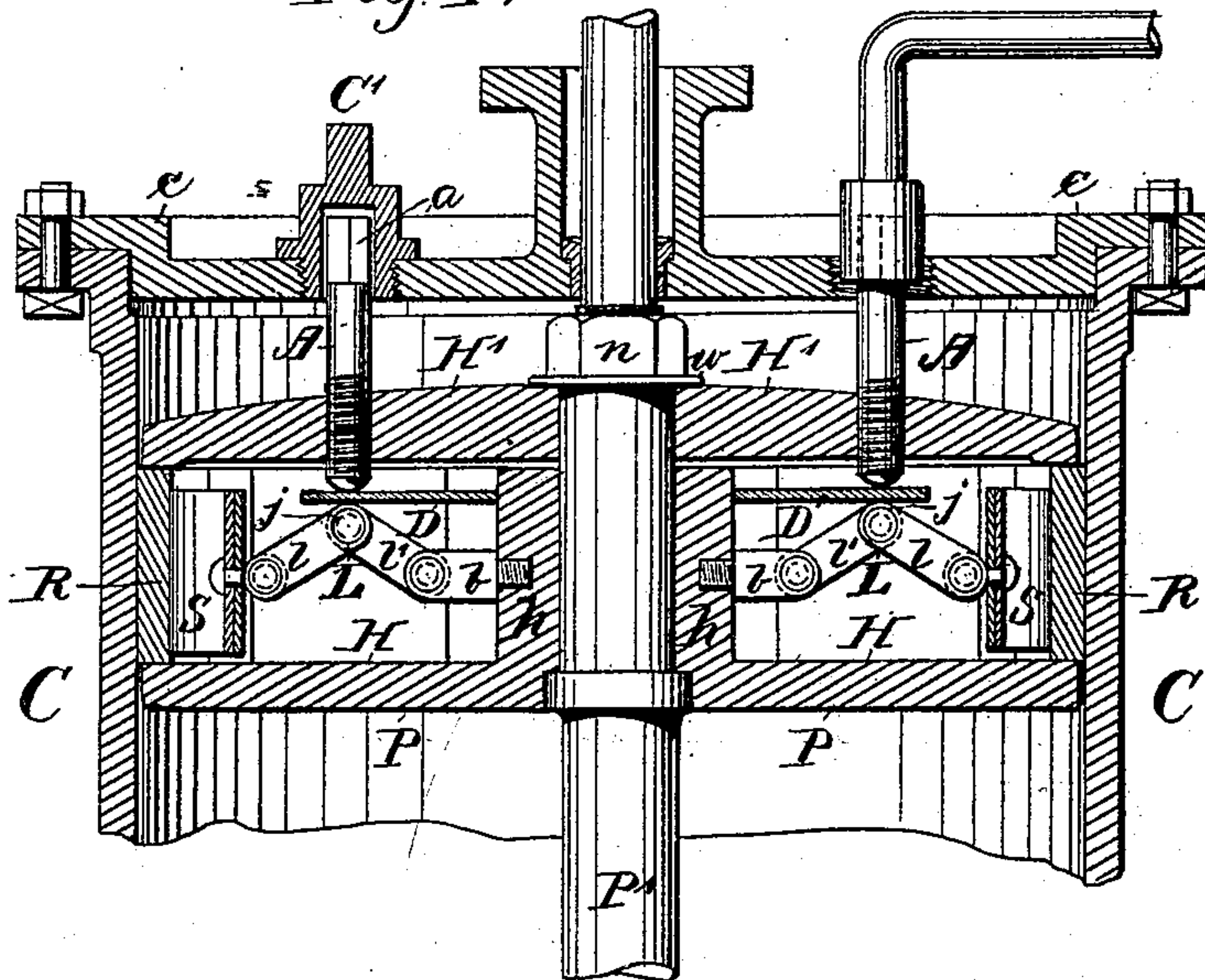
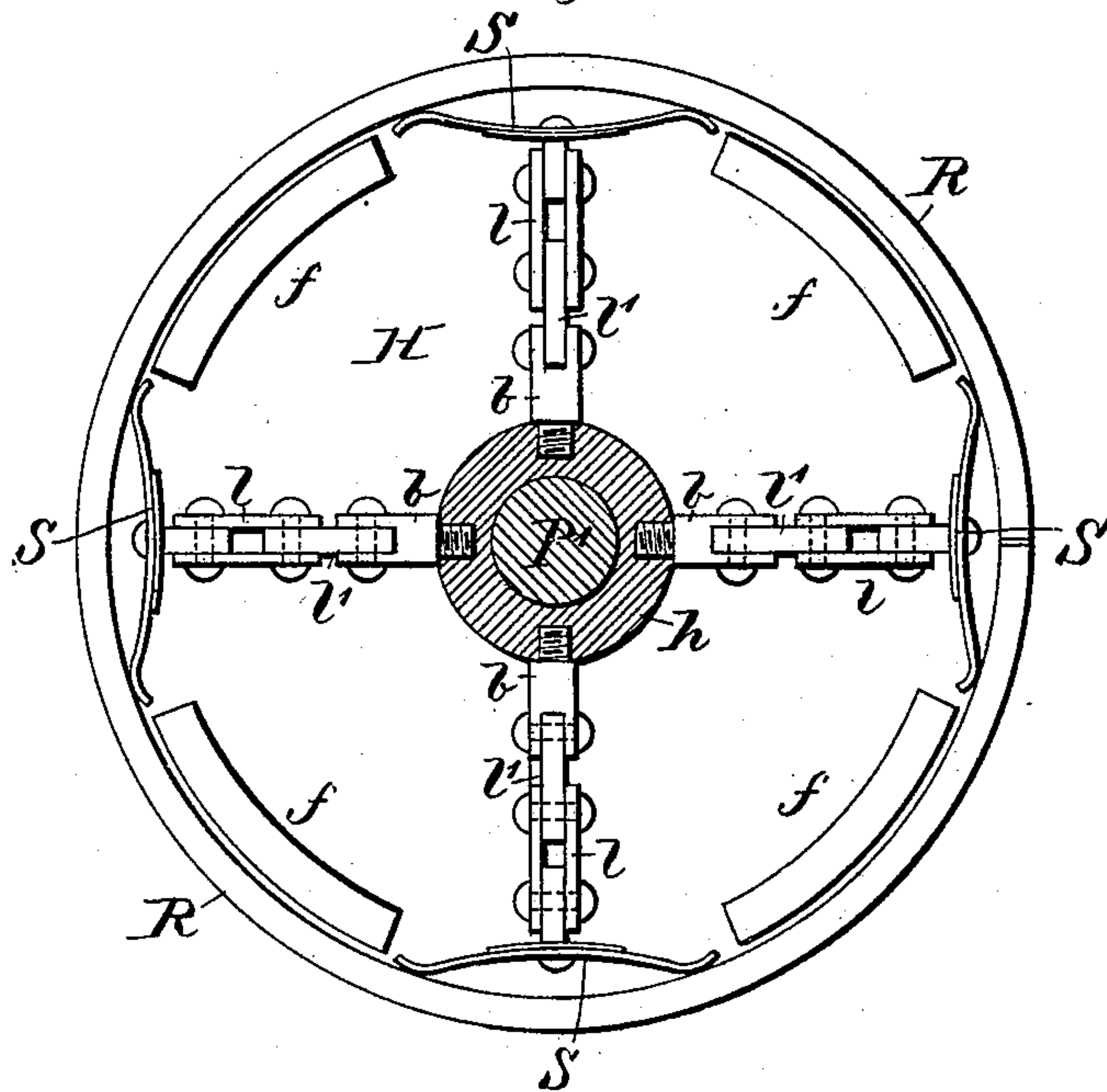


Fig. 2.



Witnesses:
W. E. Boulter
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Inventor:
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per Henry M. his atty

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Fig. 3.

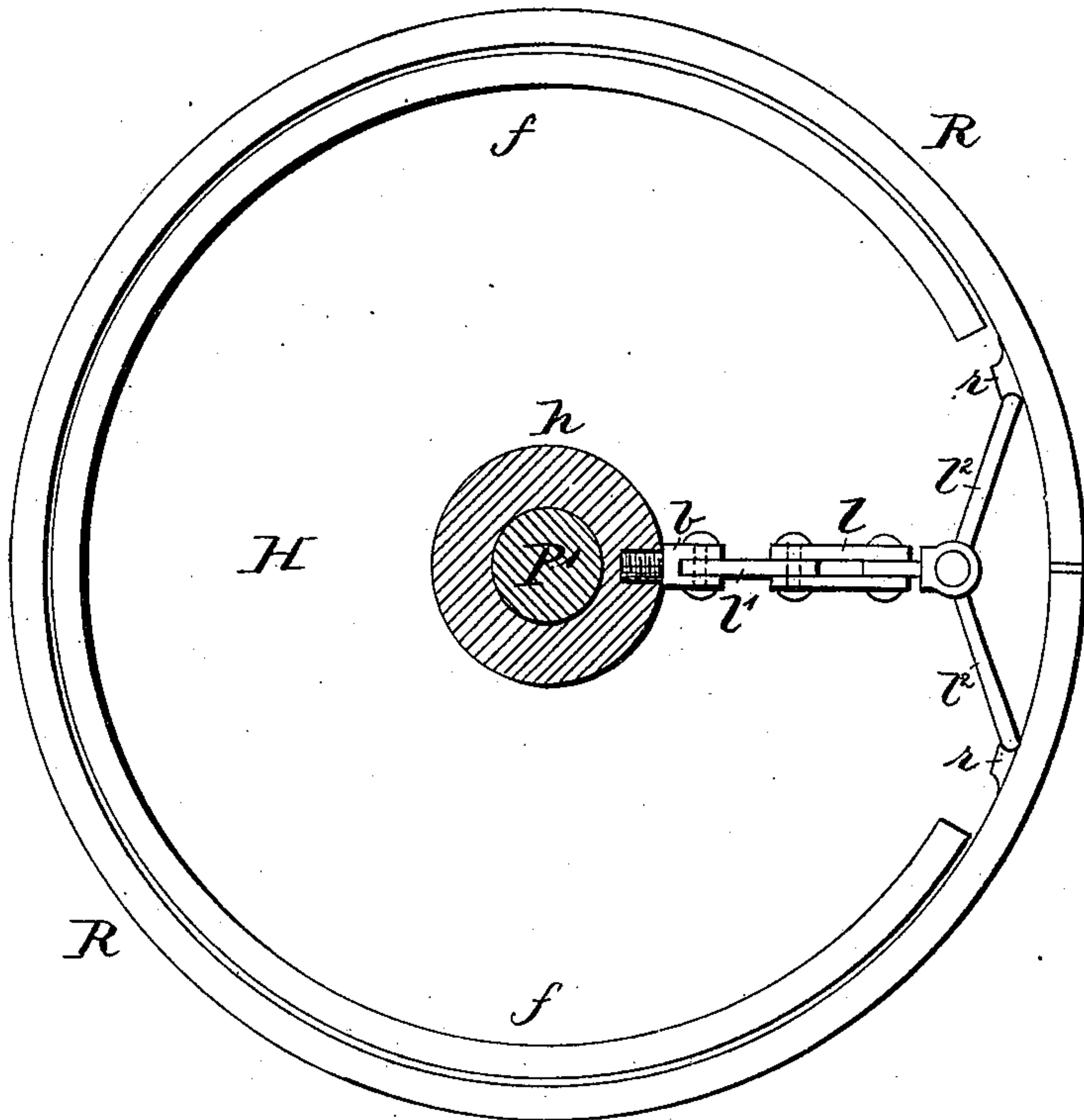
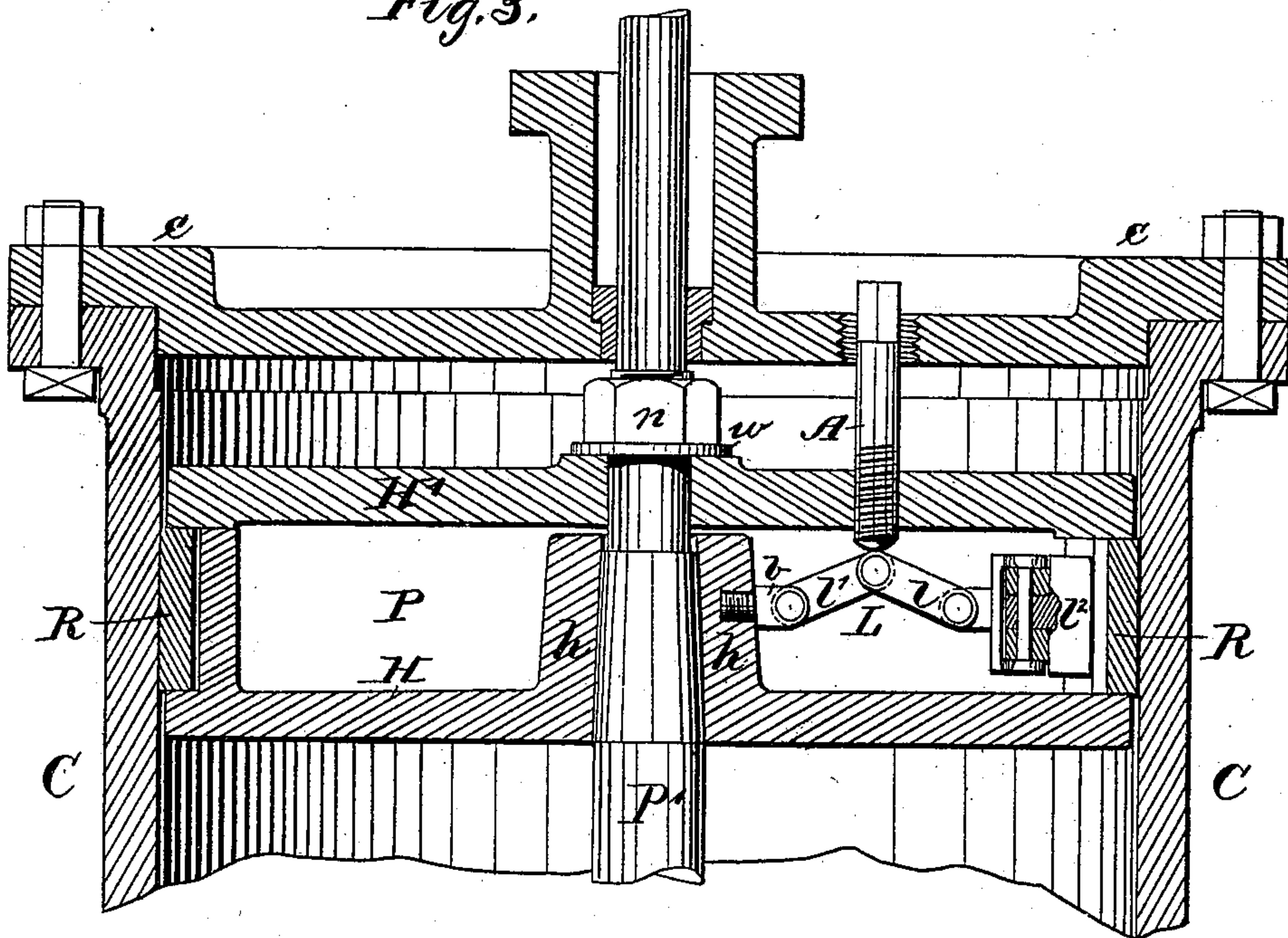


Fig. 4.

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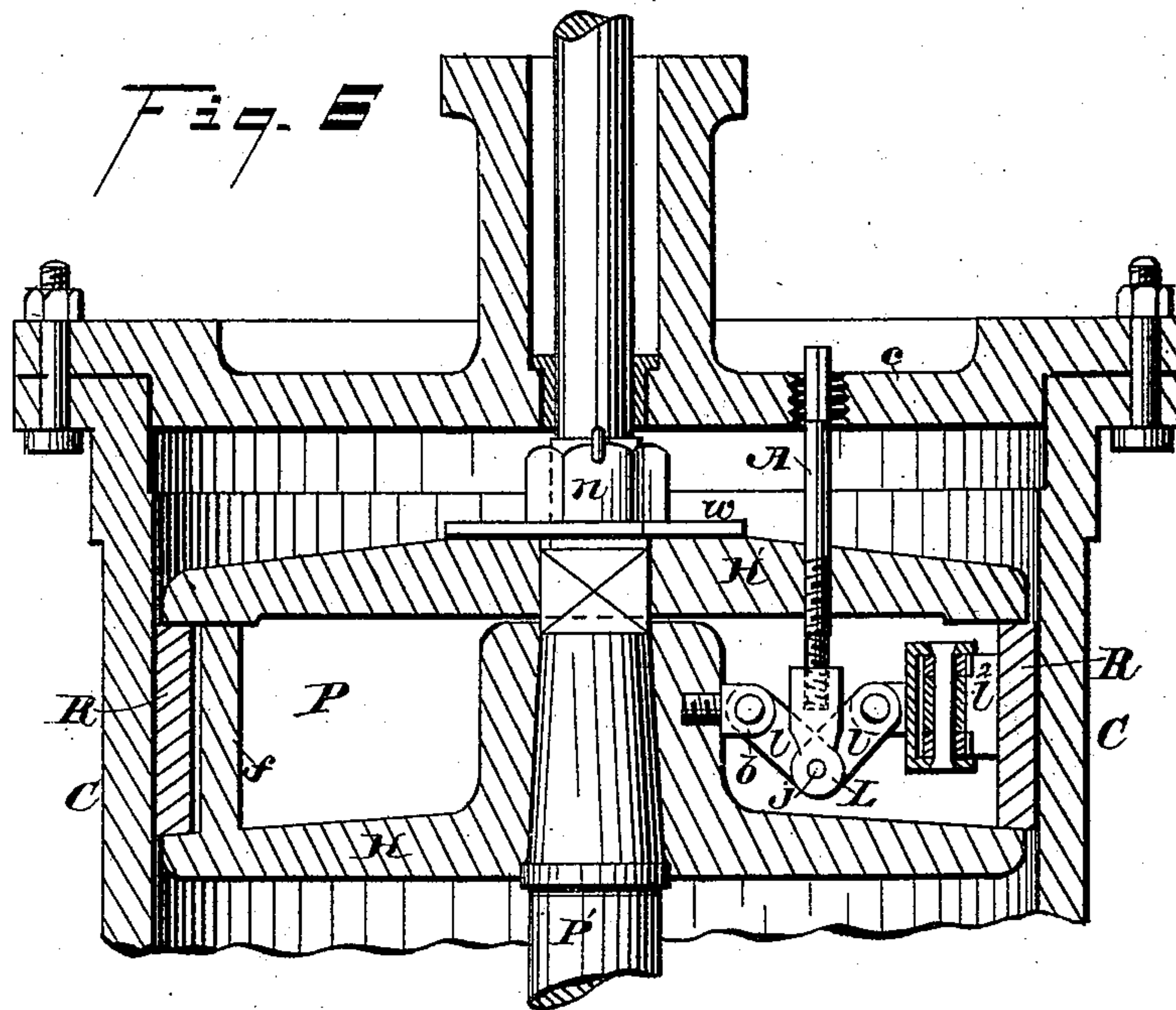
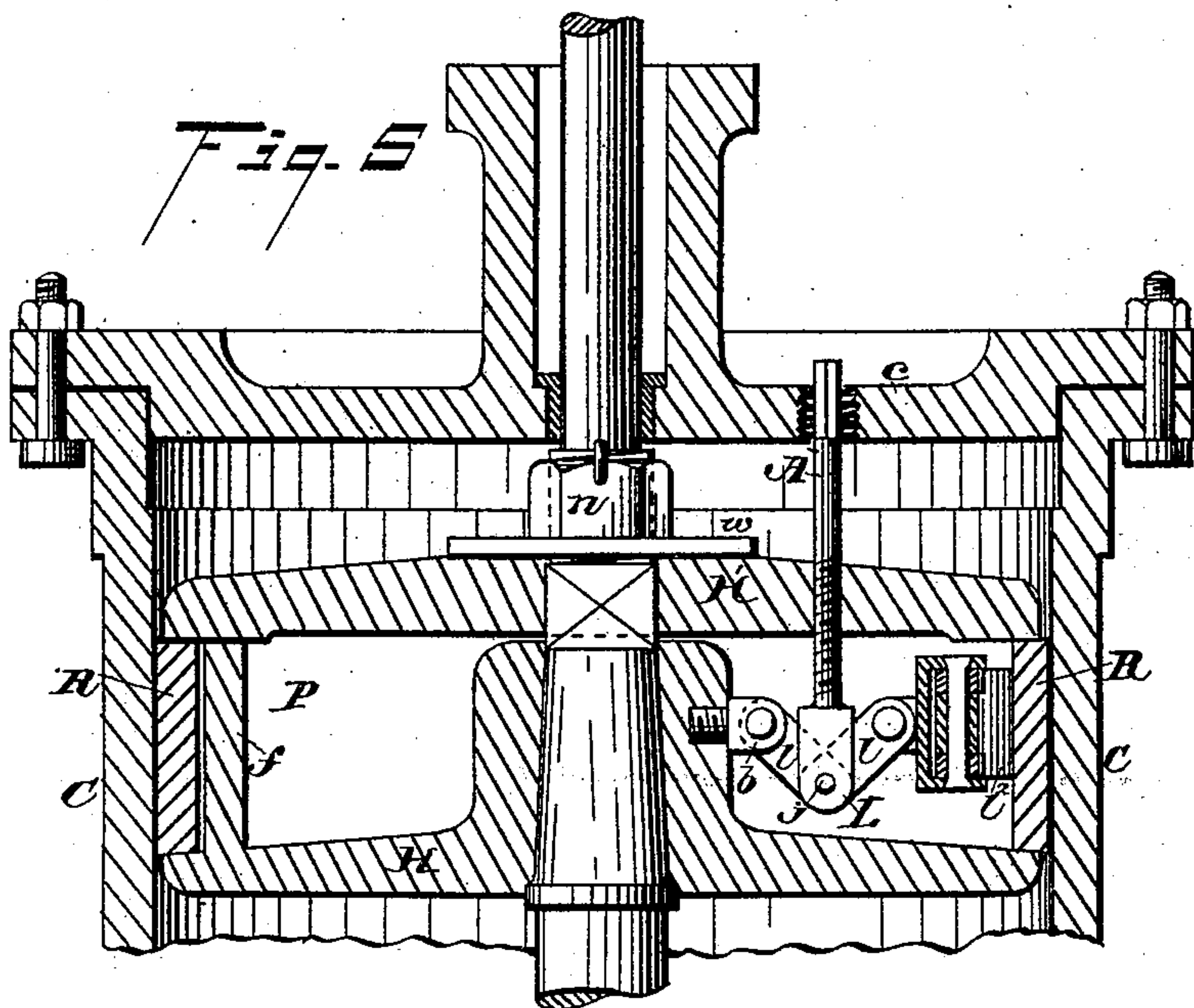
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3 Sheets—Sheet 3.

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No. 316,188.

Patented Apr. 21, 1885.



Attest

W. E. Dutton
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UNITED STATES PATENT OFFICE.

LEOPOLD SCHNABL, OF VIENNA, AUSTRIA-HUNGARY.

METALLIC PACKING-RING.

SPECIFICATION forming part of Letters Patent No. 316,183, dated April 21, 1885.

Application filed October 29, 1884. (No model.) Patented in Belgium October 1, 1884, No. 66,464; in England October 1, 1884, No. 13,051; in Italy November 22, 1884, XVIII, 17,439; XXXIV, 394; in Austria-Hungary December 16, 1884, No. 38,376 and No. 59,191, and in France February 9, 1885, No. 164,563.

To all whom it may concern:

Be it known that I, LEOPOLD SCHNABL, a citizen of Austria-Hungary, residing at Vienna, in the Province of Lower Austria, in the Empire of Austria-Hungary, have invented certain new and useful Improvements in Metallic Packing-Rings; 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, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

This invention relates to devices for adjusting the packing-ring of the piston of steam or other engines; and it consists, principally, of devices by means of which the said packing-ring may be expanded, said devices being preferably arranged to be operated from the outside of the cylinder, whereby the adjustment of the ring is effected without necessitating the removal of one of the cylinder-heads, substantially as hereinafter fully described, and as shown in the accompanying drawings, in which—

Figure 1 is a vertical section of so much of a cylinder and its piston as is necessary to illustrate my invention. Fig. 2 is a transverse section thereof, one of the piston-heads and the adjusting disk or collar being removed. Figs. 3 and 4 are views similar to Figs. 1 and 2, respectively, showing a slight modification in the arrangement of the adjusting devices. Figs. 5 and 6 are views similar to Fig. 1, illustrating still further modifications in the arrangement of the adjusting devices.

C indicates the cylinder, and *c* one of its heads, which, with the exception hereinafter described, are or may be of any usual or preferred construction.

P' is the piston-rod, rigidly secured to a hollow piston, P, in any usual or desired manner.

H is one of the piston-heads, on which is formed a hub, *h*, or bearing for the piston-rod. The shell *f* of the piston formed on head H is provided with openings, through which project the pressure devices described hereinafter,

and upon which shell is seated a packing-ring, R, which is an ordinary split or expansible ring.

H' is the other head of the hollow piston, rigidly secured to the flanges by means of a nut and washer, *n w*, respectively, on the piston-rod, or in any other desired manner.

SS, &c., indicate a series of leaf-springs of approximately semi-elliptical form, secured to one of the members, *l*, of a toggle-joint lever, L, the other member, *l'*, being pivoted in a bearing, *b*, screwed into the hub *h* of the piston-head H.

Upon the joint *j* of the toggle-levers L rests a disk, D, loosely mounted on said hub, upon which disk bear the ends of adjusting-screws A, screwed in suitable apertures formed in the head H' of the piston P. It is obvious that when said screws are screwed in they will exert pressure upon the disk D and through the latter upon the toggle-joints *j*, which will lengthen the levers L, and as their springs S bear against the inner periphery of the packing-ring the said ring will be expanded and made to bear more tightly on the inner periphery of the cylinder C. The heads of these adjusting-screws are squared and may be countersunk in or made to project slightly from the head H' of the piston, so as to admit of applying a key to said heads to rotate the screws. This arrangement, however, would necessitate the removal of the head of the cylinder whenever the adjustment of the packing-ring becomes necessary. To avoid this I make the screws of such a length that when the piston is at the limit of its stroke in the direction of the head *c* of the cylinder C the squared ends *a* of said screws will project through suitable openings formed in the cylinder-head *c*, which openings are normally closed by screw-caps C'.

When an adjustment of the packing-ring becomes necessary, the piston is caused to stop at the limit of movement toward the cylinder-head *c*. The screw-caps C' are removed and the screws A manipulated to more or less straighten the toggle-levers L to properly expand the ring R.

In Figs. 1 and 2 I have shown four toggle-

levers and pressure-springs. It is, however, obvious that a greater or less number of such levers and springs may be employed, nor is it absolutely necessary to employ a bearing-disk, D, as it is obvious that the screws may be made to act directly on the toggle-joints of the levers.

It will be further obvious that instead of pressure-springs rigid bars or arms may be pivoted to the outer end of the toggle-levers and arranged to bear against suitable abutments formed on the packing-ring R. In Figs. 3 and 4 I have illustrated such a modification, but a single toggle-lever, L, being employed, and instead of the pressure-regulating springs S, above described, I have shown the application of arms or bars l^2 , pivoted to the member l of the toggle-lever L and exerting their power against abutments r , formed on the packing-ring R. In this construction of the adjusting devices I have also shown the adjusting-screws as acting directly on the toggle-joint.

Of course if but one set of adjusting devices is employed, the pressure spring or bars or arms should be made to straddle the sectioned portion of the ring R to properly expand the same, as will be readily understood.

The described construction of adjusting devices may be still further modified in that, instead of arranging the toggle-levers L with the axis of the joint above the horizontal plane of said levers, they may be arranged with the axis of the joint below said plane, in which case the adjusting-screws will be arranged to raise the jointed portion of the levers in the direction of their horizontal plane. This may be effected in various ways—as, for instance, by providing the screws A at their ends with a forked bearing and pivoting the same upon the pivot of the toggle-joint, or by connecting a screw-threaded socket to said pivot in which the screw operates to raise the lever at its joint.

Having now described my invention, what I claim is—

1. The combination, with the piston of a steam-engine and its packing-ring, of a toggle-lever, L, secured at one end to the hub of one of the piston-heads and carrying at the op-

posite end a pressure device arranged to impinge upon the inner periphery of the ring, and an adjusting-screw operating through one of the piston-heads upon the said lever to lengthen or shorten the same and regulate the pressure exerted upon said ring, as described, for the purposes specified.

2. The combination, with the piston of a steam-engine and its packing-ring, of a toggle-lever, L, secured at one end to the hub of one of the piston-heads and carrying at its other end a yielding-pressure device arranged to impinge upon the inner periphery of the ring, and an adjusting-screw operating in one of the piston-heads upon said lever to lengthen or shorten the same and regulate the pressure exerted upon said ring, as described, for the purpose specified.

3. The combination, with the piston of a steam-engine, the packing-ring R, and a toggle-lever, L, secured at one end to the hub of one of the piston-heads and carrying at its other end a pressure device arranged to impinge upon the inner periphery of the ring, of a disk, D, bearing upon the toggle-lever, and an adjusting-screw, A, operating through one of the piston-heads upon said disk to lengthen or shorten the lever and regulate the pressure exerted upon said ring, as described, for the purpose specified.

4. The combination, with the cylinder of a steam-engine provided in one of its heads with an opening, the piston P and its packing-ring R, of a toggle-lever, a pressure device connected therewith and arranged to impinge upon the inner periphery of the lever, and an adjusting-screw operating through one of the piston-heads upon the lever to lengthen or shorten the same, said screw being arranged to project outside of the cylinder-head when the piston is at the limit of its movement toward said head, as described, for the purpose specified.

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

LEOPOLD SCHNABL.

Witnesses:

LEOPOLD KOREFF,
CLARENCE M. HYDE.