

(No Model.)

3 Sheets—Sheet 1.

C. T. SLEEPER.

METALLIC PACKING FOR PISTON AND VALVE RODS.

No. 300,653.

Patented June 17, 1884.

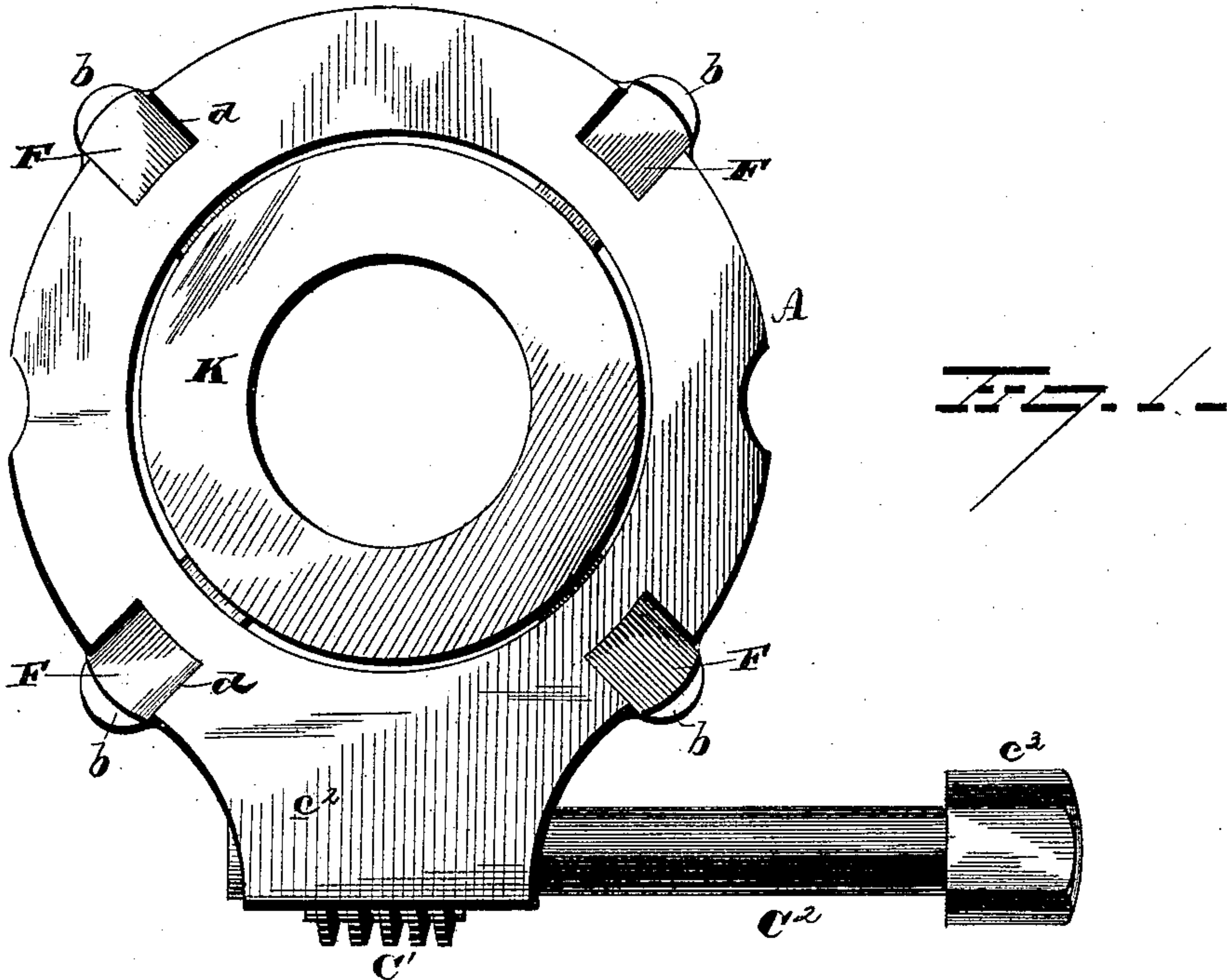


Fig. 1.

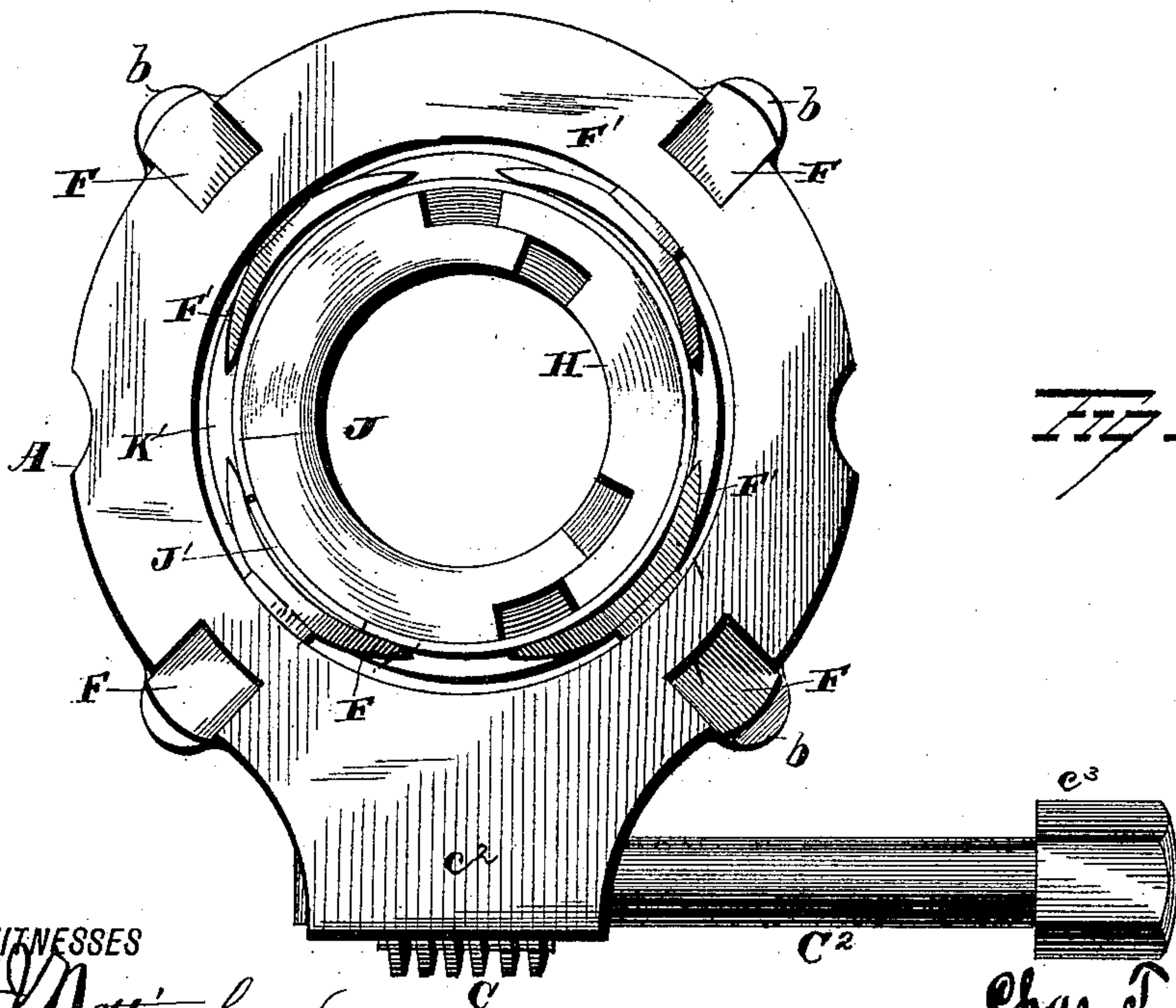


Fig. 2.

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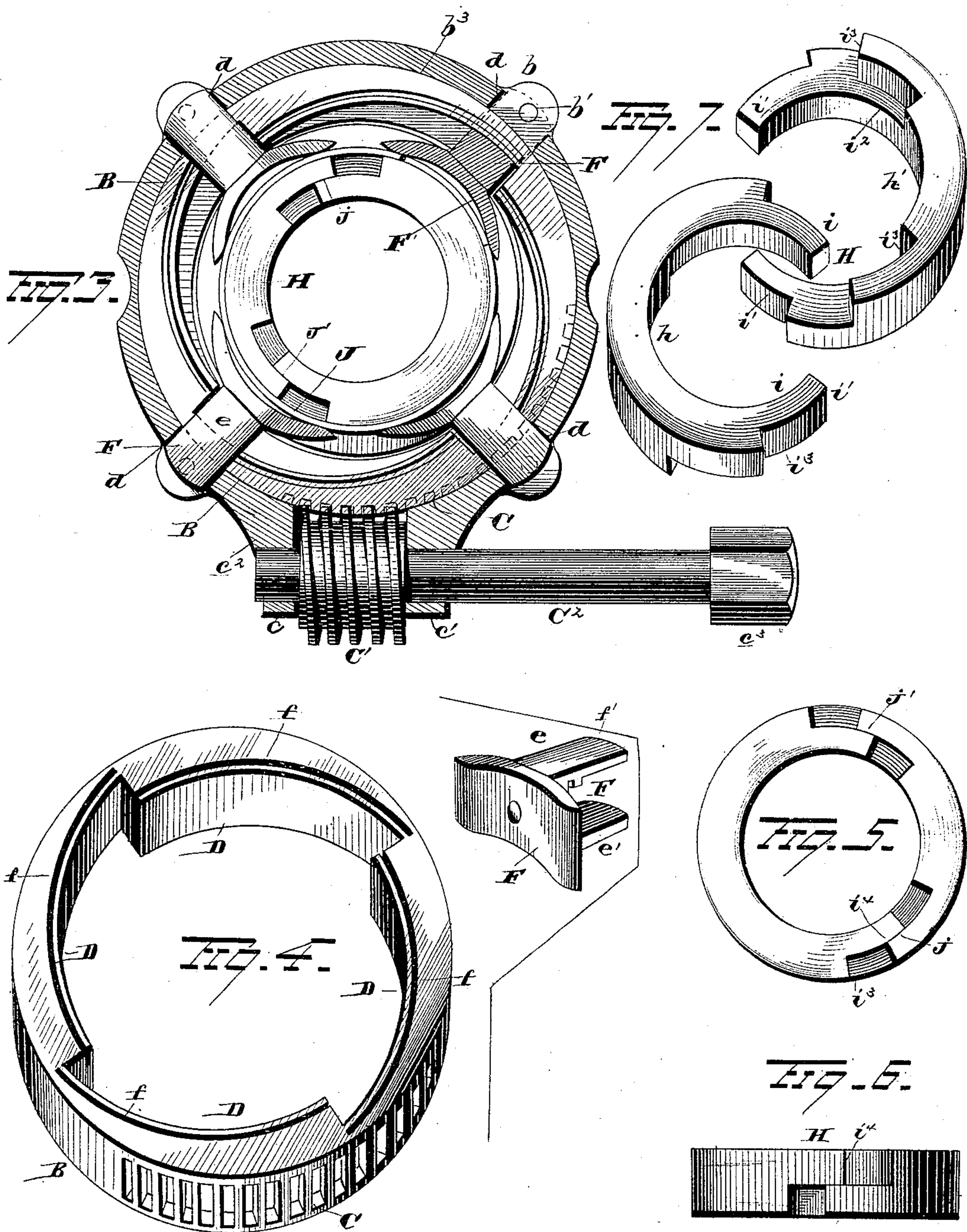
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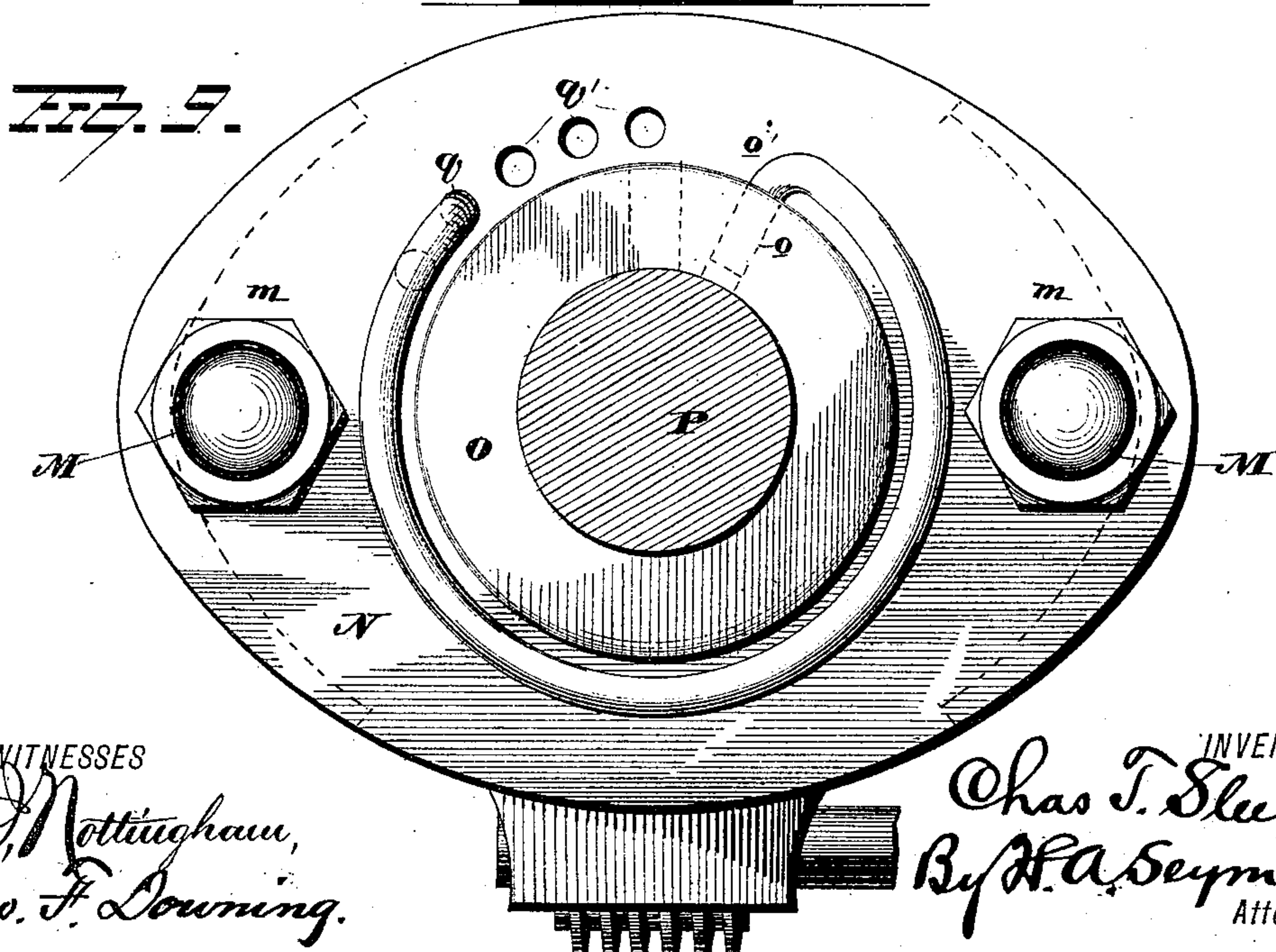
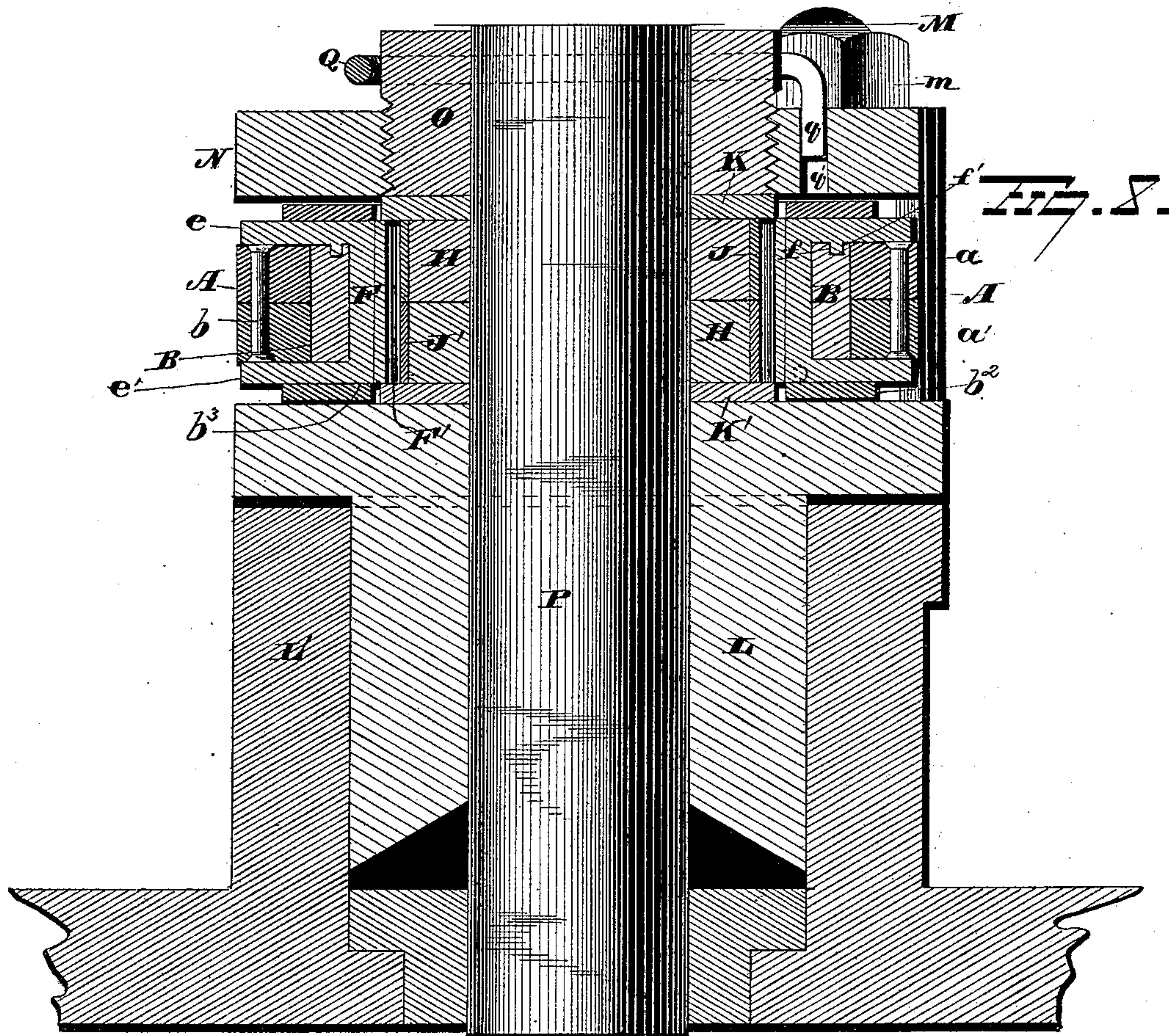
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UNITED STATES PATENT OFFICE.

CHARLES T. SLEEPER, OF CHICAGO, ILLINOIS.

METALLIC PACKING FOR PISTON AND VALVE RODS.

SPECIFICATION forming part of Letters Patent No. 300,653, dated June 17, 1884.

Application filed February 29, 1884. (No model.)

To all whom it may concern:

Be it known that I, CHARLES T. SLEEPER, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful
5 Improvements in Metallic Packing for Piston and Valve Rods, &c.; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable
10 others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in metallic packing for piston and valve rods, &c.

The object of the invention is to provide a metallic packing that shall be complete in it-
15 self, and adapted to be applied to a piston or valve rod on the outside of the ordinary stuffing-box, whereby it may be relied on as the sole means for packing the rod, or may be used in
20 conjunction with and supplemental to an ordinary stuffing-box packing. A further object is to provide a metallic packing that shall be independent of the stuffing-box, and adapted to be self-adjustable laterally, and thereby re-
25 tained in perfect alignment with the moving rod, and thus cause the packing to be subjected to even and uniform wear. A further object is to provide a metallic packing with de-
30 vices for readily expanding and contracting the packing-rings to insure their fitting the rod in a steam-tight manner, and yet prevent both the rod and packing-rings from being subjected to any undue friction or wear. A
35 further object is to provide sectional metallic packing-rings with overlapping joints, as will be hereinafter described, for preventing the escape of steam past the rings.

With these ends in view my invention consists in certain features of construction and combinations of parts, as will hereinafter be
40 described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in side elevation of my improved metallic packing. Fig. 2 is a similar view with
45 one of the rings removed to show the packing-rings. Fig. 3 is a vertical section. Fig. 4 is a detached view in perspective of the cam-ring and the follower. Fig. 5 is a detached plan view of one of the packing-rings. Fig. 6 is an edge view of the packing-ring. Fig. 7 is
50 a view in perspective of one section of the packing-ring. Fig. 8 is a transverse section

of a stuffing-box having my improvement applied thereto, and Fig. 9 is a plan view of the packing applied to a stuffing-box.

A represents a casing or box, consisting of 55 the two sections $a a'$, which are provided with lugs b , through which rivets or screws b' are inserted for securing the two parts of the casing together. Sections $a a'$ are constructed with inwardly-projecting flanges b^2 , thereby 60 forming an internal annular groove, b^3 . Within the groove b^3 is seated the cam-ring B, the periphery of which is provided with a segmental worm-gear, C, with which engages the worm C' on the shaft C^2 , the latter being jour- 65 naled in bearings $c c'$, formed in a projection, c^2 , on the sections of the casing. One end of the shaft C^2 is provided with a handle, c^3 , for turning the shaft. By means of the worm and worm-gear the cam-ring may be turned in 70 either direction and be retained against accidental displacement. Cam-ring B is provided with four cam-surfaces, D, each of which constitutes one-quarter of the circumference of the cam-ring. The casing or box A is slotted 75 at d for the reception of the arms $e e'$ on each one of the followers F, said arms being constructed and arranged to move radially through or within the casing. Each follower is provided with an arc-shaped plate, F' . The 80 cams D are each constructed with a groove, f , on its side, into which is received a lug, f' , that projects from the inner side of one of the arms on the follower. When the cam-ring is rotated in one direction, the cams engage the 85 cross-bars g on the follower and gradually force the follower inwardly toward the center of the casing. When the cam-ring is rotated in the opposite direction, the followers are forced or drawn outwardly by the engage- 90 ments of the lugs f' in the grooves f in the sides of the cams.

Within the interior of the box or casing A are located the two sectional packing-rings H, each one consisting of the two sections $h h'$. 95 Each section is made with the ends reduced in width at $i i'$, which reduced ends enter the interior recesses, i^2 , in the opposite section. The peripheries of the sections are cut away at i^3 , so as to form overlapping joints i^4 on the 100 periphery. Thus it will be observed that when the two sections are interlocked or joined

they will form overlapping joints $j j'$, which will effectually prevent the escape of steam, and yet allow the sections to be contracted in diameter to compensate for wear. These rings
 5 are made of any metal or alloy suitable for the purpose of a metallic packing. Encircling the packing-rings are the two semicircular bands $J J'$, which fit against the rings, and receive the pressure exerted by the followers
 10 to compress the rings. These bands may be made of steel or any hard metal, and prevent the followers becoming embedded in the rings, and thereby insure the free operation of the latter; but, if deemed advisable, these bands
 15 may be dispensed with. Annular rings $K K'$, of slightly less diameter than the inner diameter of the box or casing A , are placed on the outer face or surfaces of the packing-rings to serve as bearings or seats. My improved
 20 packing may be secured in the manner illustrated in Fig. 8. The casing is seated against the end of the gland L of the stuffing-box L' , the ring K resting against the gland and constituting a seat for the casing, with its con-
 25 tained packing.

M represents the studs of the stuffing-box, which extend through the face-plate N , having a flange, n , that rests upon the end of the stuffing-box, thereby forming an interior re-
 30 ceptacle for the casing A . The face-plate is secured in place by the nuts m , screwed onto the outer ends of the studs M . A nut, O , encircles the piston-rod P , and is screwed into the face-plate, the inner end of the nut engag-
 35 ing the ring K' on the outer side of the packing. By regulating the adjustment of the nut O the packing may be retained in snug contact with the end of the gland, and thereby be prevented from moving with the piston-rod,
 40 and yet be allowed a free lateral movement, so as to be self-adjustable, and be retained in perfect adjustment with the piston-rod. The nut O is provided with a socket, o , in its side, into which is received the end o' of the spring
 45 Q , the opposite end of which is bent downwardly, as at q . The face-plate is provided with a series of holes or sockets, q' . When the nut is properly adjusted, the end q of the spring is inserted in one of the holes q' in the
 50 face-plate, and thus the nut is prevented from becoming displaced; and, further, the nut automatically takes up any wear in the face-plate or gland or annular rings seated against the packing. The spring Q constantly tends to
 55 rotate the nut and force it against the ring K' . The continued use of the packing will result in wear of the face-plate, rings $K K'$, or outer surface of the gland, owing to the lateral ad-justment of the packing while in use; and in
 60 order to preserve a steam-tight joint between the packing and the gland or cylinder under all circumstances I have provided the spring Q , which acts on the nut in the manner stated. I do not limit myself to this particular device
 65 for accomplishing this result, as other constructions and arrangement of parts might be employed for this purpose.

From the foregoing it will be observed that the improved packing may be readily applied
 when the ordinary stuffing-boxes are employed 70
 and without necessitating the removal of or any change being made in the stuffing-boxes, so that comparatively little expense is incurred in the application of the improved packing.
 As the adjusting-shaft is located outside of the 75
 stuffing-box, the packing may be readily and quickly contracted in diameter to compensate for any wear, and thereby insure a steam-tight joint. This packing has advantages not
 80 possessed by that type wherein steam or spring pressure is resorted to for setting the packing, as it serves to pack the rod, irrespective of the direction in which pressure is exerted, while in the type referred to the packing will
 85 be operative only when the pressure is outward or in one direction. Again, it has another advantage over the steam or spring actuated packing, in that the rings are mechanically adjusted so as to preserve a uniform and even contact with the moving rod, and
 90 thus obviate any undue wear or friction, while in that type of packing wherein the rings are set by steam or spring pressure the force exerted on the rings is oftentimes sufficiently
 95 powerful to bind the rings upon the rod with such force as to rapidly cut away and destroy the rings. By turning the worm-shaft the cam-ring is rotated, and operates to force the
 100 followers inwardly, and thereby subject the outer peripheries of the packing-rings to a uniform and even inward pressure, and thereby contract their inner diameter sufficiently to cause them to snugly engage the piston-rod and form a steam-tight joint therewith. New
 105 packing-rings may be readily inserted without removing the casing from the rod, it being simply necessary to loosen the nuts retaining the face-plate in place and move the face-plate on the rod a sufficient distance to allow of the
 110 disengagement of the ring seated over the side of the packing-ring. The old rings may be then removed and new ones replaced.

Instead of making the different parts in the manner shown and described, they may be made in half-sections, to enable them to be
 115 applied to the rod without disconnecting the latter.

While I have shown and described one form of packing embodying my invention, I do not restrict myself to the exact construction and
 120 arrangement of parts shown and described, as it is evident that many slight changes in the construction and arrangement of parts might be resorted to without departing from the spirit of my invention.

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

1. In a metallic packing, the combination, with a casing or box and sectional metallic
 130 packing-rings located therein, of followers engaging the rings at different points on their peripheries, and means, substantially as described, for imparting simultaneous movement

to all of said followers, substantially as set forth.

2. In a metallic packing, the combination, with a casing or box and sectional metallic packing-rings located therein, of followers and a cam-ring for contracting the packing-rings, substantially as set forth.

3. In a metallic packing, the combination, with a casing or box and metallic packing-rings located therein, of radially-adjustable followers, a cam-ring for actuating said followers, and worm-gearing for rotating the cam-ring, substantially as set forth.

4. In a metallic packing, the combination, with a casing or box and metallic packing-rings located therein, of radially-adjustable followers and means, substantially as described, for positively and simultaneously moving said followers either inwardly or outwardly, substantially as set forth.

5. In a metallic packing, the combination, with a box or casing and metallic rings located therein, of radially-adjustable followers, bands interposed between the followers and packing-rings, and a cam-ring for actuating said followers, substantially as set forth.

6. In a metallic packing, the combination, with a box or casing and metallic packing-rings located therein, of radially-adjustable followers and a cam-ring, said followers and cam-ring being connected by lugs and grooves, substantially as set forth.

7. In a metallic packing, a box or casing made in two sections, in combination with a cam-ring seated in an annular groove formed on the interior of said sections, substantially as set forth.

8. In a metallic packing, the combination, with a box or casing and a cam-ring seated in an annular groove formed within the casing, said ring being provided with a segmental worm-gear, of a worm-shaft journaled in bearings formed in a projection formed on the box or casing, substantially as set forth.

9. In a metallic packing, the combination, with a box or casing and sectional packing-rings located therein, of followers engaging the packing-rings at different points for contracting the packing, and annular ring-bearings seated against the outer face of the packing-rings, substantially as set forth.

10. The combination, with a stuffing-box, a

box or casing containing adjustable packing-rings, and followers engaging the rings at different points, of an annular ring-bearing seated against the gland of the stuffing-box, and a face-plate for retaining the casing in place, substantially as set forth.

11. A sectional metallic packing-ring for piston and valve rods, and adapted to be contracted in size to compensate for wear, the ends of the sections being formed with double overlapping joints on the sides and periphery of the ring, each section of the ring comprising more than a half-circle, substantially as set forth.

12. The combination, with a stuffing-box, of a casing provided with metallic packing, and a face-plate for retaining the casing between the stuffing-box and face-plate, substantially as set forth.

13. The combination, with a stuffing-box and a box or casing containing adjustable metallic packing-rings, the latter engaging the rod outside of the stuffing-box, of a face-plate and a nut for retaining the box or casing in place, substantially as set forth.

14. The combination, with a stuffing-box and a laterally-adjustable casing containing metallic packing-rings seated against the end of the gland of the stuffing-box, of a face-plate and a nut for retaining the packing-rings against displacement, substantially as set forth.

15. The combination, with a rod, of a detachable casing or box provided with adjustable metallic packing, and means, substantially as described, for allowing the packing a self-lateral adjustment, and for preventing it from moving in the direction of the movement of the rod, substantially as set forth.

16. The combination, with a box or casing provided with adjustable packing, of a device, substantially as described, for automatically compensating for wear of the bearings between the packing and the gland or cylinder, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

CHARLES T. SLEEPER.

Witnesses:

GEO. F. DOWNING,
S. G. NOTTINGHAM.