

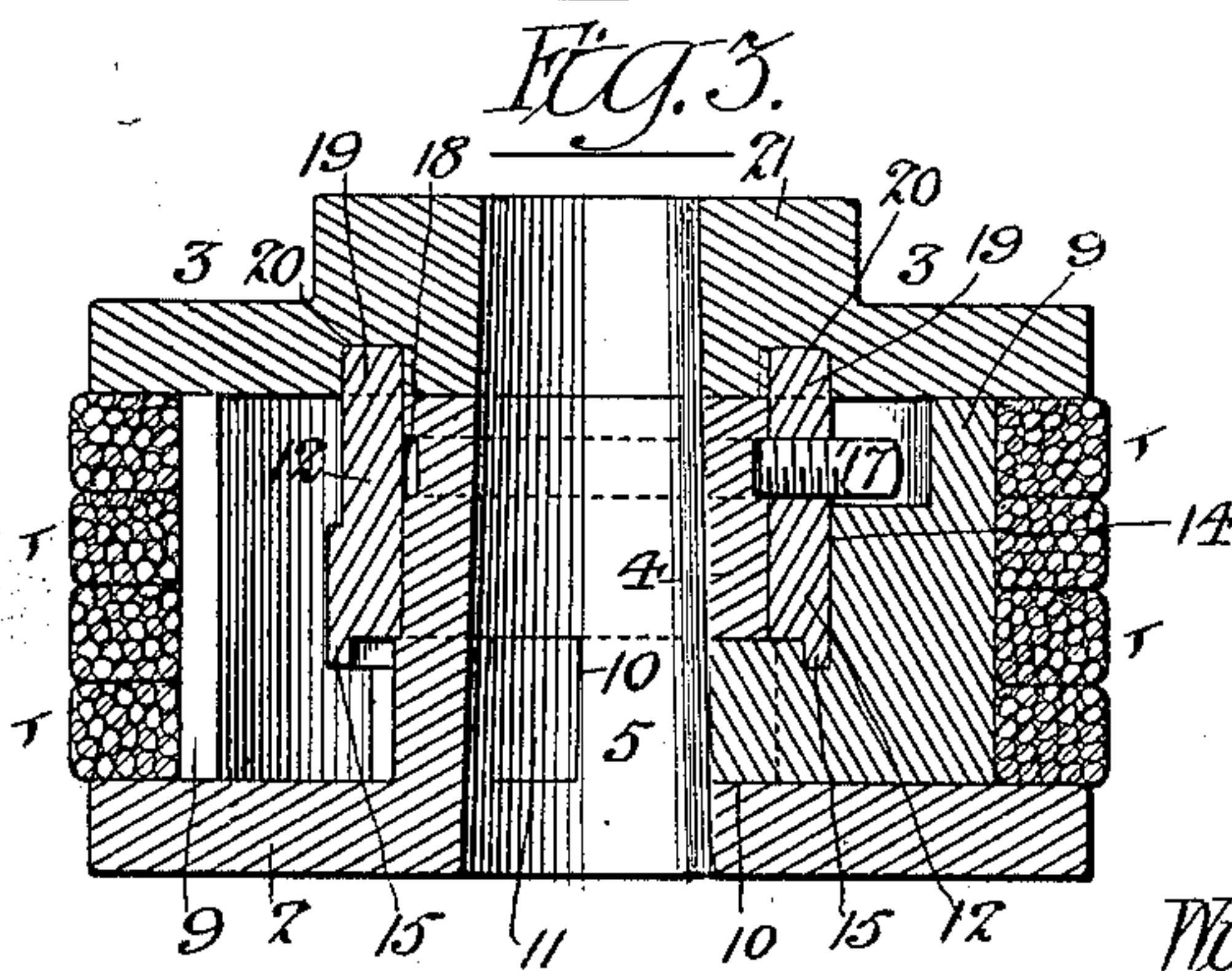
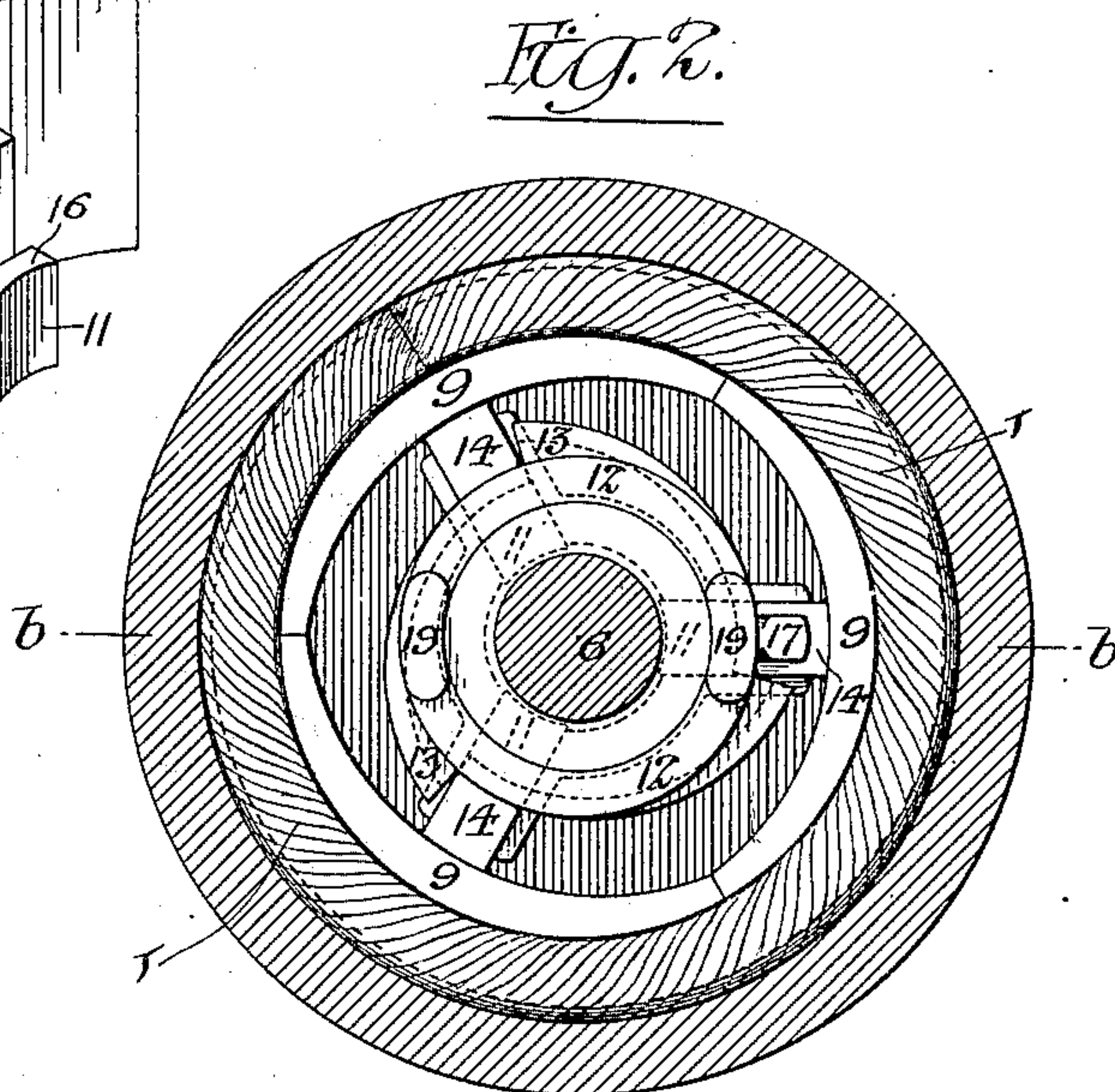
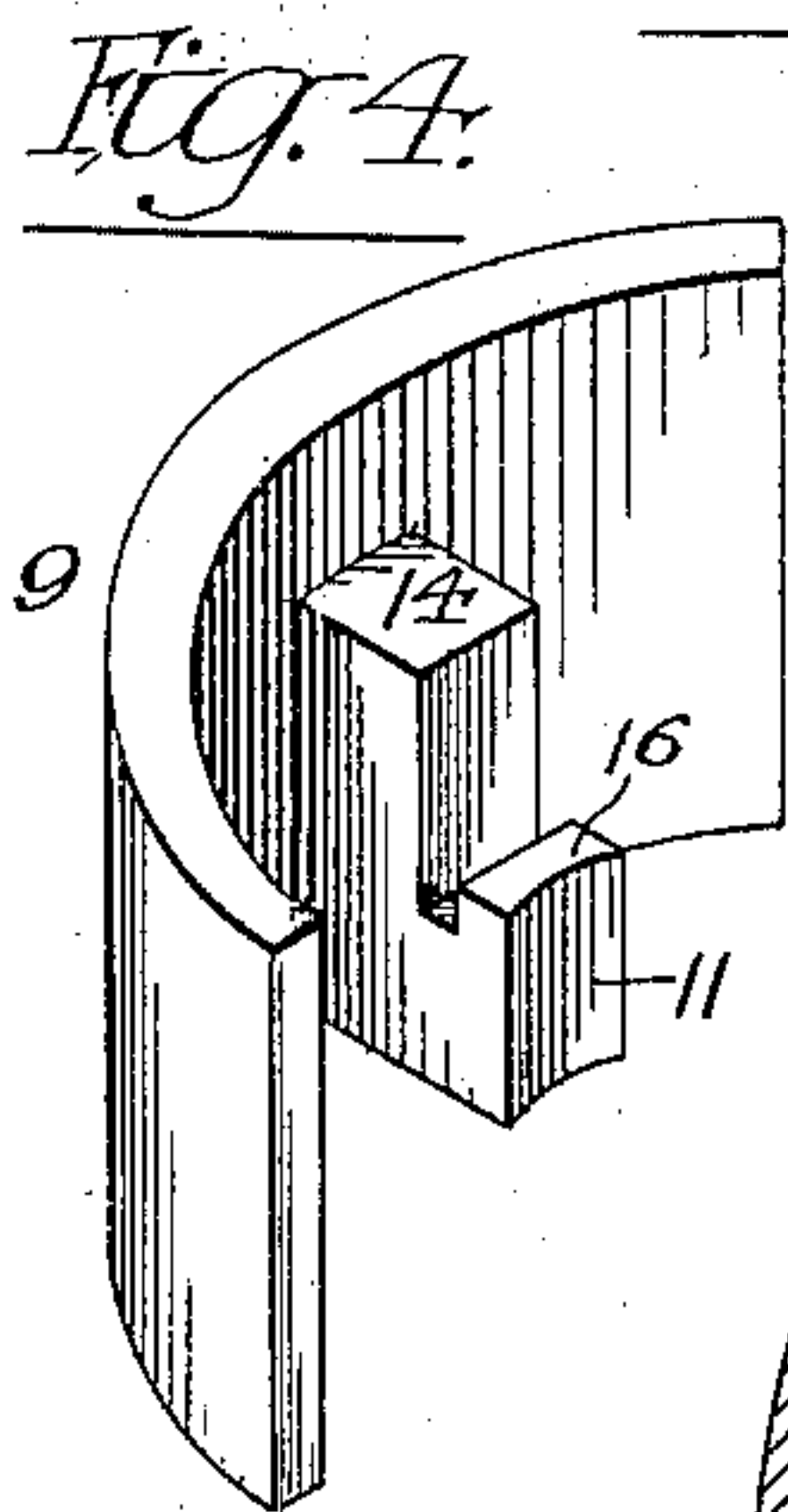
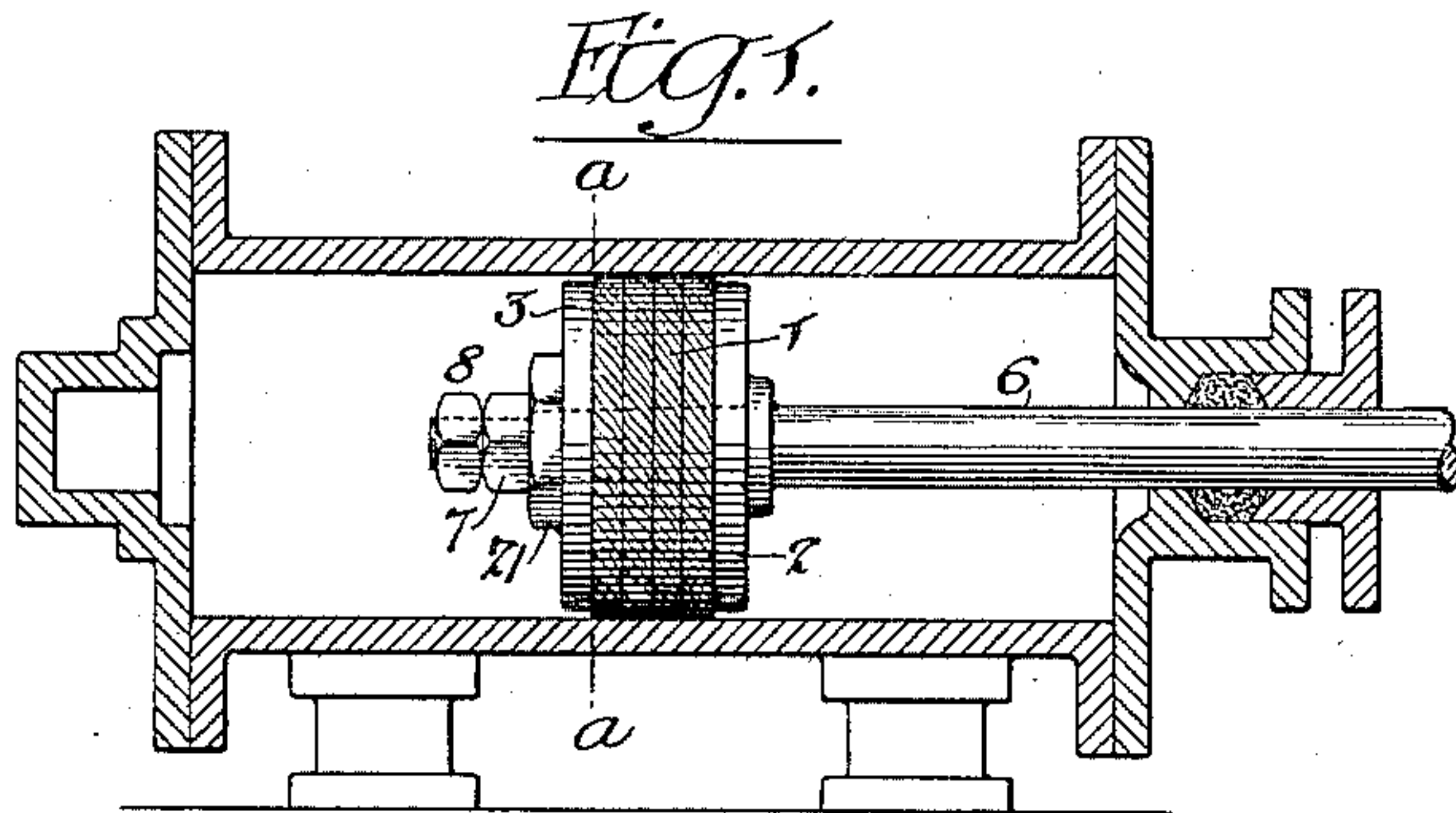
No. 688,635.

Patented Dec. 10, 1901.

W. W. GREEN.
EXPANDING PISTON.

(Application filed Sept. 11, 1901.)

(No Model.)



Witnesses:-

Char. Delong;
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UNITED STATES PATENT OFFICE.

WILLIAM W. GREEN, OF CHESTER, PENNSYLVANIA.

EXPANDING PISTON.

SPECIFICATION forming part of Letters Patent No. 688,635, dated December 10, 1901.

Application filed September 11, 1901. Serial No. 75,040. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM W. GREEN, a citizen of the United States, residing in Chester, in the county of Delaware, State of Pennsylvania, have invented certain Improvements in Expanding Pistons, of which the following is a specification.

My invention relates to certain improvements in that form of piston for pumps, steam-engine cylinders, and the like having self-contained means for expanding the annular packing carried by the same, so that a tight or working fit may always be maintained in the cylinder.

My invention is fully illustrated in the accompanying drawings, in which—

Figure 1 is a sectional view of an ordinary pump-cylinder with a piston arranged therein having the improved expanding means forming the subject of my invention. Fig. 2 is a sectional view of the cylinder and piston-rod, taken on the line *a a*, Fig. 1, with one of the piston-plates removed to show the means for expanding the packing. Fig. 3 is a sectional view of said piston, taken on the line *b b*, Fig. 2; and Fig. 4 is a perspective view of one of the expanding segments.

The object of my invention is to provide the piston with expanding means of such a character that the packing may be set up whenever necessary or desirable without dismantling the piston and when set up may be positively held in the adjusted position without danger of working loose. At the same time such expanding means may be positively retracted when one packing has been worn out and it is necessary to entirely renew the same.

The packing 1, which is preferably of some fibrous material plaited or twisted in the form of a rope, is held between the flange 2 and removable plate 3 of the piston. The flange 2 is provided with a central sleeve 4, having a tapered opening 5, to which the tapered end of the piston-rod 6 is adapted, such rod being held in place by means of suitable nuts 7 and 8. Carried by the piston between the flange 2 and plate 3 are a series of flanged segments 9, adapted to be moved from and toward the piston-rod 6. The sleeve 4 is apertured at 10, and each of said segments is provided with a portion 11, entering said ap-

ertures. Carried by the sleeve 4 is a movable collar 12, having a series of cam-faces 13, adapted to engage shoulders 14 on the portions 11 of the flanged segments. The cams of this sleeve are also undercut and provided with flanges 15, adapted to engage other shoulders or ribs 16 of the segments 9. When the piston is secured together, all of these parts are in operative engagement, and by turning the collar 12 by any suitable means the segments 9 may be moved from and toward the piston-rod. To retain this collar in place and prevent any rise of the same when turning, I provide a set-screw 17, passing through the collar and engaging a groove 18, formed on the exterior of the central sleeve 4.

Various means may be employed for turning the collar 12 so as to move the flanged segments from and toward the piston-rod, and one form of such means I have illustrated. Carried by said collar 12 are a series of lugs 19, adapted to recesses 20 in the plate 3 of the piston. This plate is provided with the engaging portion 21, and when it is desired to expand the packing to make a tighter fit against the walls of the cylinder a spanner-wrench may be put over the nuts 7 and 8 to engage the portion 21, whereby the piston-plate 3 may be given a partial turn in the direction of the arrow, Fig. 2. This will cause radial movement of the flanged segments 9 and the consequent expansion of the packing. The nuts 7 and 8 may then be set up by any suitable means to hold the plate 3 in the newly-adjusted position.

The cams 13, carried by the sleeve or collar 12, are provided with a gradual curve, so that when said sleeve 12 is turned and the plate 3 locked to the piston by the nuts 7 and 8 there will be sufficient frictional contact between the parts to maintain them positively in the expanded position.

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

1. The combination in a piston of the character described, of the flange carried by the same, a movable plate, packing held between said plate and flange, a sleeve carried by the flange, a series of flanged segments radially movable within said sleeve, a collar carried by the sleeve, means for moving said collar,

and means carried by said collar and coacting with the flanged segments for moving the latter radially to expand the packing, substantially as described.

5 2. The combination in a piston of the character described, of the flange, a movable plate, packing held between said flange and plate, a sleeve carried by said flange and adapted to fit over the end of the piston-rod, said sleeve
10 having a series of radial openings, a series of flanged segments radially movable with respect to the piston-rod and having portions adapted to the apertures in the sleeve, lugs formed on said portions, a collar carried by
15 said sleeve having means to engage the lugs of the flanged segments, and means for turning said collar whereby the flanged segments may be given radial movement.

20 3. The combination in a piston of the character described, of the flange, a movable plate, packing held between said flange and plate, a sleeve carried by one flange and adapted to fit over the end of the piston-rod, said sleeve having a series of radial openings, a series of
25 flanged segments radially movable with respect to the piston-rod and having portions adapted to the apertures in the sleeve, lugs formed on said portions, a collar carried by

said sleeve, flanged cams carried by said collar and adapted to engage the lugs of the flanged segments, and means for moving said collar whereby the flanged segments may be given a radial movement. 30

4. The combination in a piston of the character described, of the flange, a movable plate, packing held between said flange and plate, a sleeve having a series of radial openings carried by the flange, a series of flanged segments arranged between the flange and plate of the piston and having portions adapted to the openings in the sleeve, a collar carried by said sleeve, cams carried by said collar and serving to engage the segments whereby they may be given radial movement, and lugs carried by the end of said collar and adapted to engage recesses in the movable plate whereby a partial rotation of said plate will serve to move the sleeve and thereby impart radial movement to the flanged segments. 45

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses. 50

WILLIAM W. GREEN.

Witnesses:

DAVID F. ROSE,
E. GARRETT.