

No. 884,318.

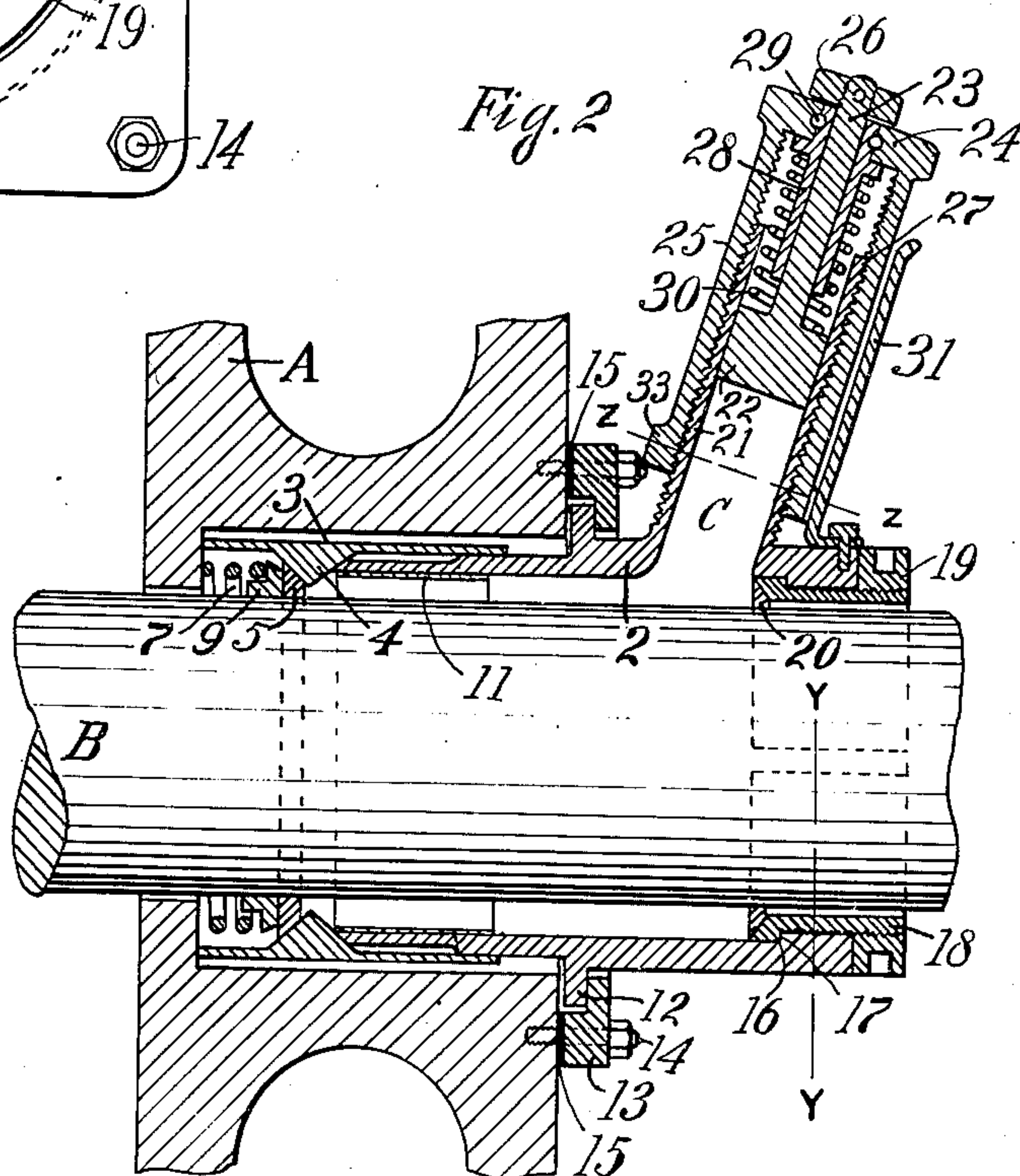
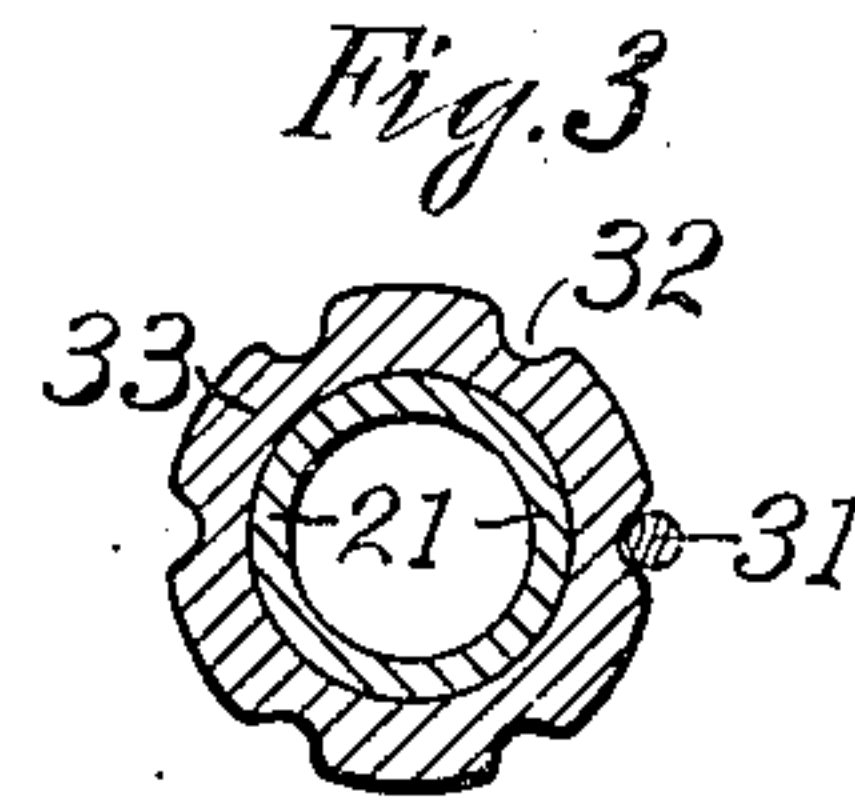
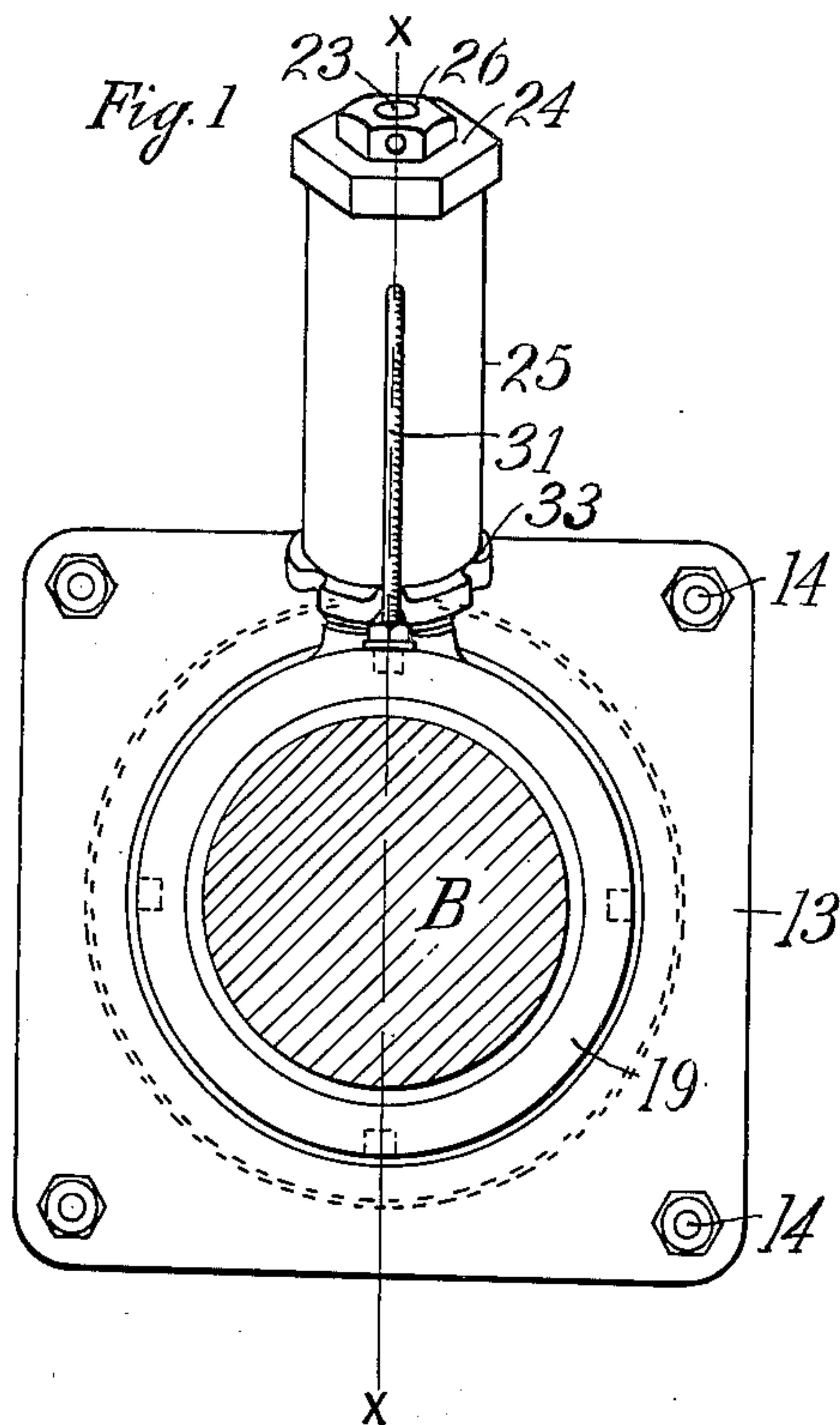
PATENTED APR. 7, 1908.

F. A. DAILEY & B. LONG.

STUFFING BOX.

APPLICATION FILED APR. 29, 1907.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 5

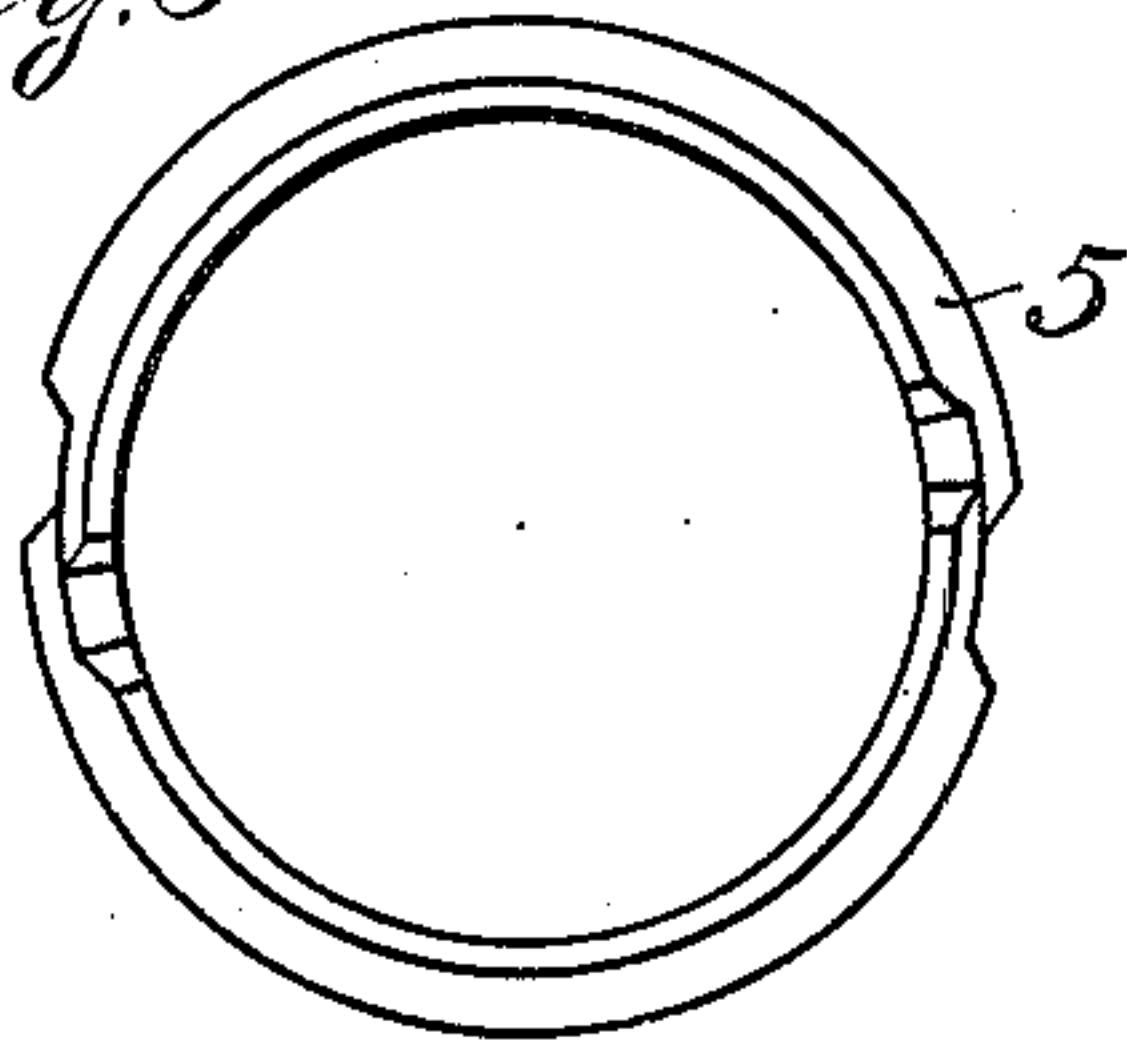


Fig. 6



Fig. 7



Fig. 8

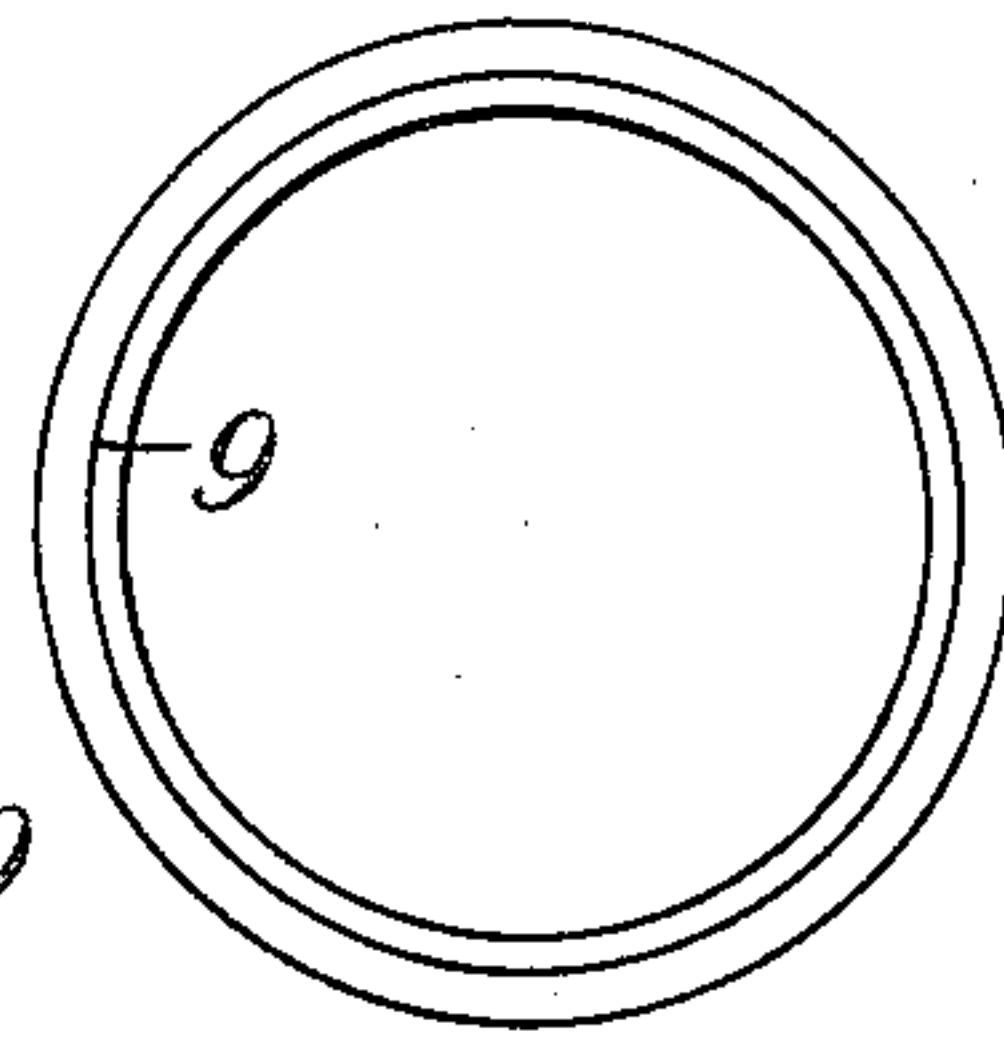


Fig. 9

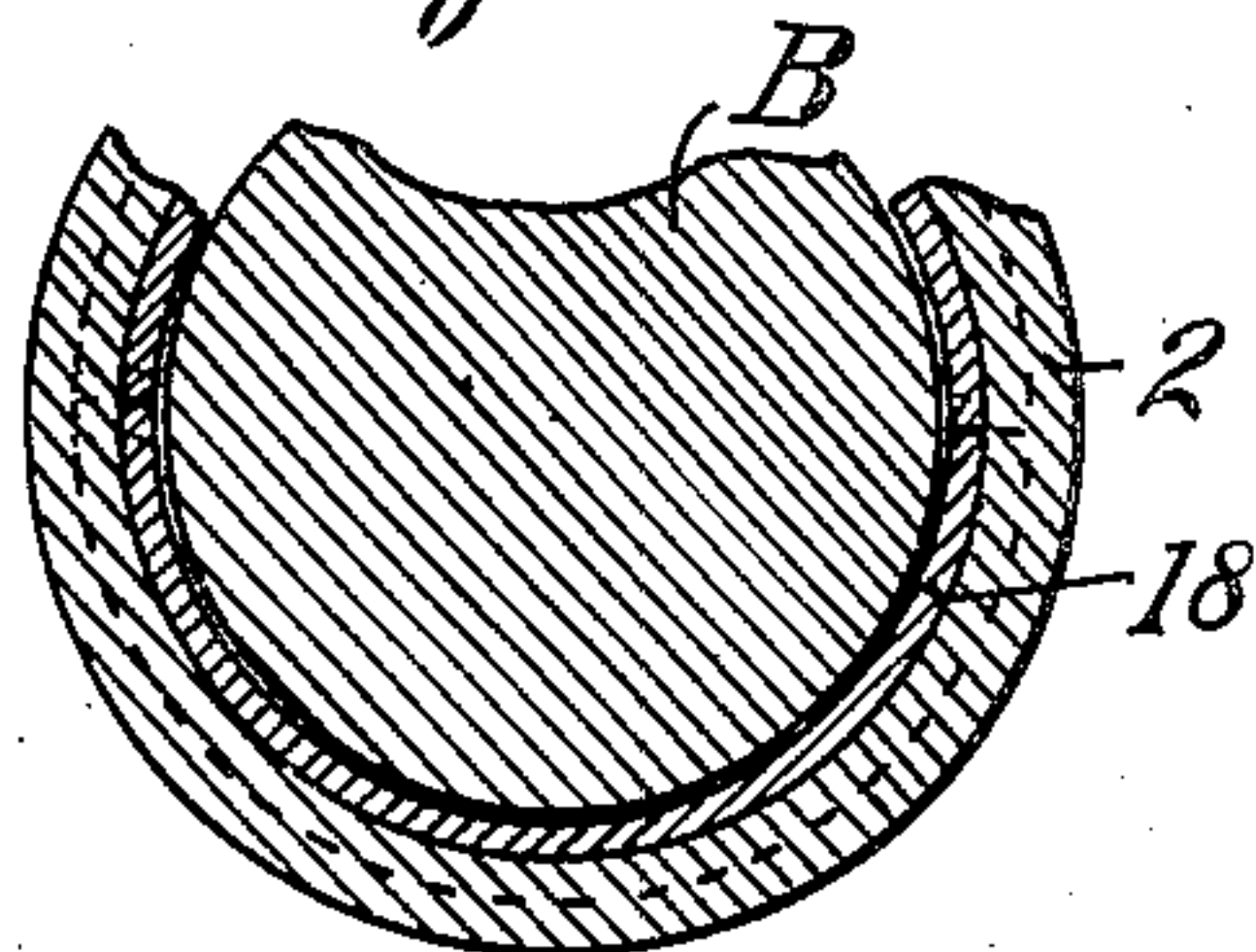


Fig. 4

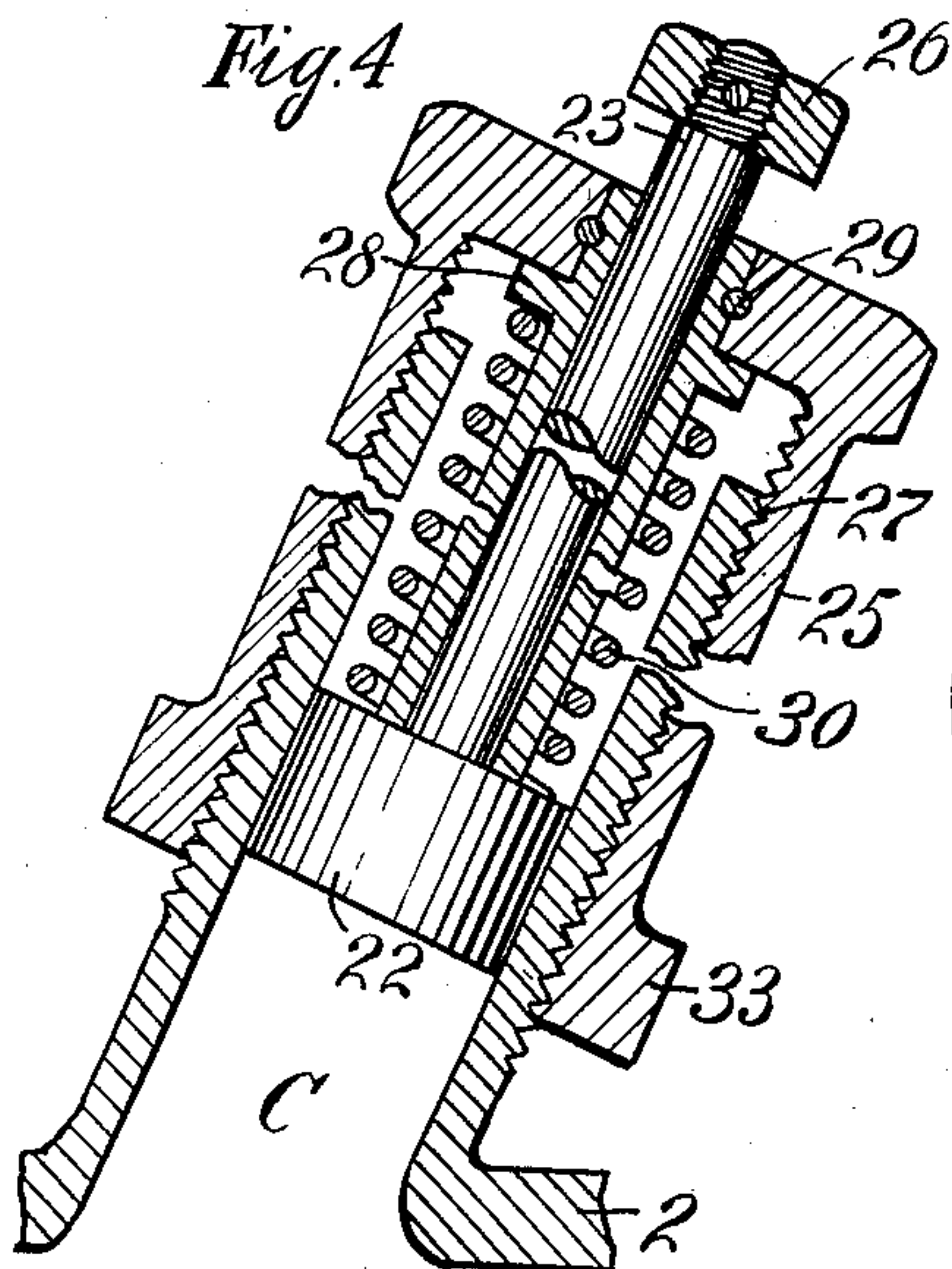
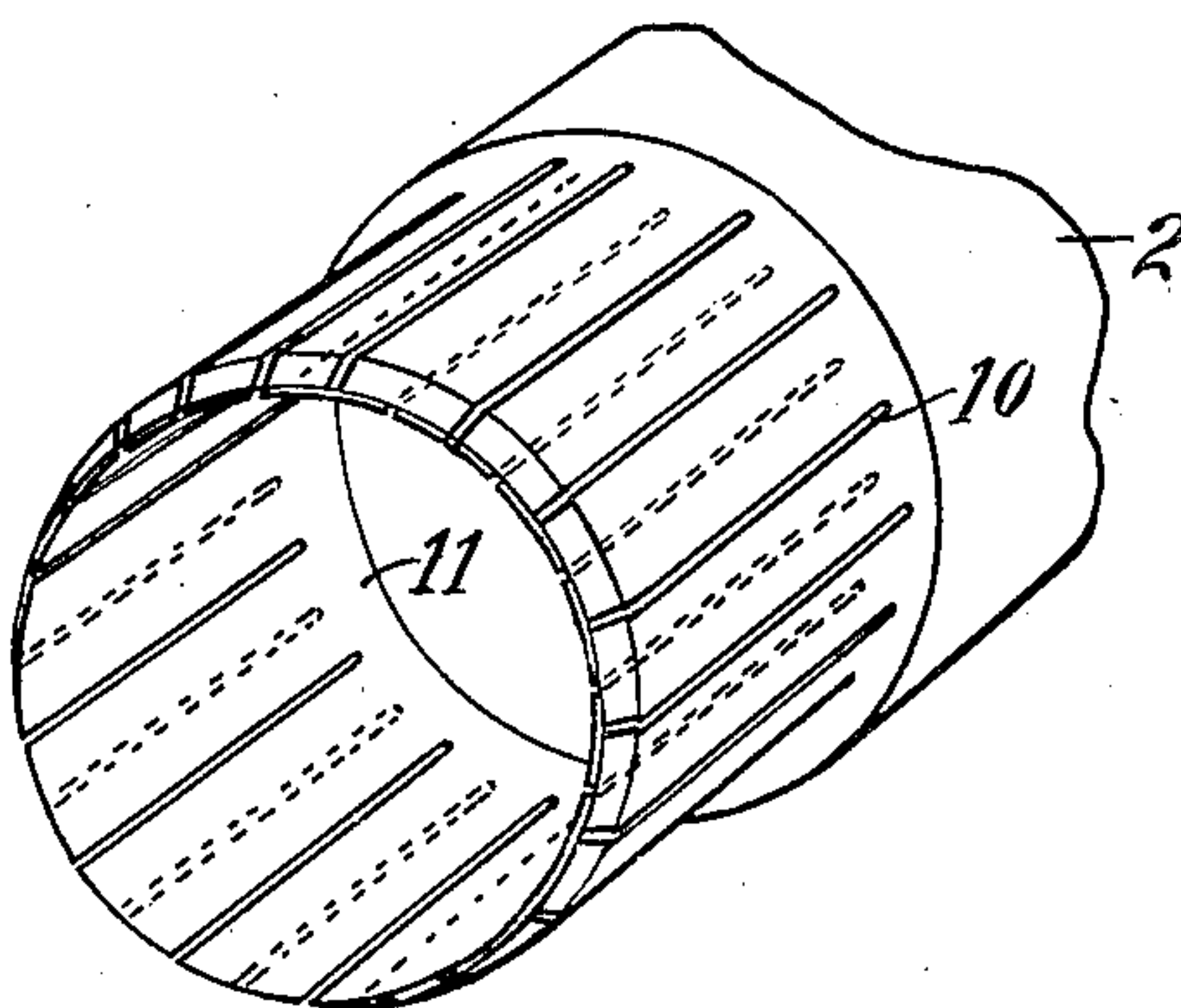


Fig. 10



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# UNITED STATES PATENT OFFICE.

FRED A. DAILEY, OF ST. PAUL, AND BARNEY LONG, OF MINNEAPOLIS, MINNESOTA.

## STUFFING-BOX.

No. 884,318.

Specification of Letters Patent.

Patented April 7, 1908.

Application filed April 29, 1907. Serial No. 370,917.

*To all whom it may concern:*

Be it known that we, FRED A. DAILEY and BARNEY LONG, citizens of the United States, residing, respectively, at St. Paul, in the county of Ramsey and State of Minnesota, and Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Stuffing-Boxes, of which the following is a specification.

Our invention relates to improvements in stuffing boxes, its objects being to provide a stuffing box which may be packed and repacked with plastic packing without removing the gland; which has a communicating chamber in which a reserve supply of packing may be stored and held under pressure, and from which the packing may be forced into the stuffing box proper as needed; and which has means for indicating the pressure upon the packing and the amount of packing which has been fed from the chamber to the stuffing box.

With these objects in view our invention consists in the construction, combination and arrangement of parts hereinafter described and claimed.

In the accompanying drawings, in which is shown the preferred form of our invention, Figure 1 is an end view of a stuffing box embodying our improvements; Fig. 2 is a vertical section through the same on line  $x-x$  of Fig. 1; Fig. 3 is a cross section through the storage chamber on line  $z-z$  of Fig. 2; Fig. 4 is a vertical section through the storage chamber on line  $x-x$  of Fig. 1 on an enlarged scale; Figs. 5 and 6 are front and side views, respectively, of the cooperating members comprising one of the throat rings; Figs. 7 and 8 are side and front views, respectively, of the follower for the back throat ring; Fig. 9 is a vertical section partly broken away on line  $y-y$  of Fig. 2; and Fig. 10 is a perspective view of the inner end of the stuffing box casing, the casing being shown partly broken away.

In the drawings A represents so much of the cylinder head, and B so much of the piston rod, of an ordinary reciprocating engine as is necessary to show the application of our invention to a stuffing box adapted for use with such mechanism.

The cylinder head is counterbored in the usual manner to receive the casing 2 of the stuffing box, and the annular shell 3 of the cone member, which telescopes over the open

rear end of the stuffing box casing so as to form a sliding fit therewith, space enough being left between this shell and the cylinder head to allow for the vibration of the piston rod. The cone member is formed with an annular double cone 4, and the rear end of the stuffing box casing is beveled at the same angle as the cone so as to secure a sliding fit against it. Arranged against the rear end of the cone is the rear throat ring 5 formed of two cooperating halves as illustrated in Figs. 5 and 6. These ring members are arranged with overlapping ends, and are beveled at the same taper as the rear portion of the cone 4 in order to secure a sliding fit against the cone. They are held normally pressed against the cone by means of a coil spring 7 interposed between the shoulder 8 of the cylinder head and the follower ring 9 which abuts against the throat ring.

The rear end of the stuffing box casing is reduced in diameter, and formed with slits 10, as shown in Fig. 10, in order that it may be slightly sprung in when in forced engagement with the cone. To prevent the packing from being squeezed through the slits a similarly slitted sheet lining 11 is arranged within the casing in such manner that its slits will not register with the slits in the casing. The stuffing box is formed exteriorly with an annular flange 12, and is detachably secured to the cylinder head by means of an annular gland 13 which forms a steam tight joint with the flange 12. The gland may be secured to the cylinder head by studs 14, and a steam tight joint is secured between the gland and the cylinder head by arranging between them a gasket 15.

The stuffing box is formed at its forward end with an inwardly projecting shoulder 16 to form an abutment for the shoulder 17 of the front ring 18. This ring is in two halves and is slipped inside the stuffing box from the rear end, and held up against the shoulder 16 by means of a ring nut 19. The inner or rear end of the split ring 18 is beveled off to form a sliding joint with the oppositely beveled front throat ring 20, which is constructed in two halves similar to the back throat ring already described. The space about the piston rod between the throat rings is intended to be filled with plastic packing, not shown.

Near its forward or outer end the stuffing box casing is formed or provided with a tubular chamber C, for the storage and supply



of any suitable plastic packing. This chamber communicates with the stuffing box, and its side wall or walls 21 are preferably integral with the stuffing box, as shown. Working within the chamber is a screw operated ram or plunger; which in the preferred form shown in the drawings is in the shape of a piston 22 having a rod or stem 23 which passes slidingly through the head 24 of a feed-nut 25, and has at its outer end a head or stop-nut 26 to limit its inward movement into the chamber. The feed-nut 25 is preferably arranged on the exterior of the chamber, as shown in the drawings, and has screw-threaded engagement, as at 27, with the chamber-wall 21. The feed-nut may be provided interiorly with a tube or bushing 28 immediately surrounding the piston-rod and centrally secured in the nut-head 24 by pins 29. The piston is held normally pressed in towards the stuffing box by means of a coil spring 30 interposed between the piston and the feed-nut. The spring is preferably of such length and strength as to hold the piston normally thrust into the chamber far enough to bring the stop-nut 26 against the top of the feed-nut 25, as shown in Fig. 2.

The feed-nut 25, when it is arranged exteriorly of the chamber-wall 21 as shown in the drawings, may be held from working back from any in-screwed position by means of a spring 31 secured to the stuffing box casing and adapted to spring into recesses 32 in an annular lug 33 upon the feed-nut 25.

To apply the packing the feed-nut 25 is first unscrewed and withdrawn from the chamber, carrying with it its connected plunger parts. A sufficient amount of prepared plastic packing is then inserted into the chamber, and the piston and feed-nut are replaced. The feed nut is then screwed down until enough of the packing has been forced into the stuffing box proper to fill it and leave the chamber partially filled. The resistance of the packing will force the piston against the spring pressure of its spring 30, and cause the outer end of the piston rod to be thrust out beyond the head of the feed-nut, as illustrated in Fig. 4. In this position the piston will exert a constant elastic pressure against the packing, and as the packing in the stuffing box wears down, the packing in the chamber will be forced in to take its place, and the plunger will gradually move down, under the pressure of its spring 30, until the stop-nut 26 at the end of the piston rod engages the top of the feed-nut, as shown in Fig. 2. By then screwing the feed-nut further down the pressure of the piston upon the packing will be renewed, and the end of the piston rod will again be thrust out through the top of the feed-nut into the position shown in Fig. 4. The stop-nut 26, or rather the outer end of the piston rod, will thus be a telltale to indicate whether or not

pressure is being exerted upon the packing, and the position of the piston rod together with the extent to which the feed-nut has been screwed down will indicate the amount of packing which has passed into the storage chamber. In this way a constant tab can be kept both upon the supply of packing and the pressure to which it is subjected.

By the mechanism described the packing in the chamber and stuffing box can be kept constantly under elastic pressure, the degree of pressure can be varied, and the stuffing box and chamber can be filled and refilled without removing the gland.

If desired, the tube or bushing 28 may be made of considerable length, so as to form a solid abutment for the piston when the spring has been partially compressed, and cause the piston to exert thereafter a positive, unyielding, pressure against the packing.

While, for the purpose of illustration, we have shown our improvements applied to the piston rod stuffing box of an ordinary reciprocating engine, it will be understood that they may be equally well applied to stuffing boxes of any suitable construction, and for use with any desired mechanism; and the details of the device may be modified in various ways without departing from the principle of the invention, the scope of which is defined in the claims.

We claim as our invention:—

1. The combination, with a stuffing box, of a chamber communicating with the interior of the box and extending outwardly therefrom, said chamber being adapted to hold a reserve supply of plastic packing, and a screw operated ram working within the chamber, and adapted, when screwed in, to force a supply of the stored packing from the storage chamber into the stuffing box.

2. The combination, with a stuffing box, of a packing chamber communicating therewith, a feed-nut having screw engagement with the chamber wall, a plunger working within the chamber and having sliding support in the feed-nut, and a spring interposed between the plunger and the feed-nut.

3. The combination, with a stuffing box, of a packing chamber communicating therewith, a feed-nut having screw engagement with the chamber wall, a plunger working within the chamber and having a rod extending slidably through the top of the feed-nut, a stop-nut upon the end of the rod, and a spring interposed between the plunger and the feed-nut.

In testimony whereof we affix our signatures in presence of two witnesses.

FRED A. DAILEY.  
BARNEY LONG.

Witnesses:

ARTHUR P. LOTHROP,  
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