

No. 665,542.

Patented Jan. 8, 1901.

R. E. McCUEN.
THROTTLE STEM PACKING.

(Application filed Mar. 31, 1900.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

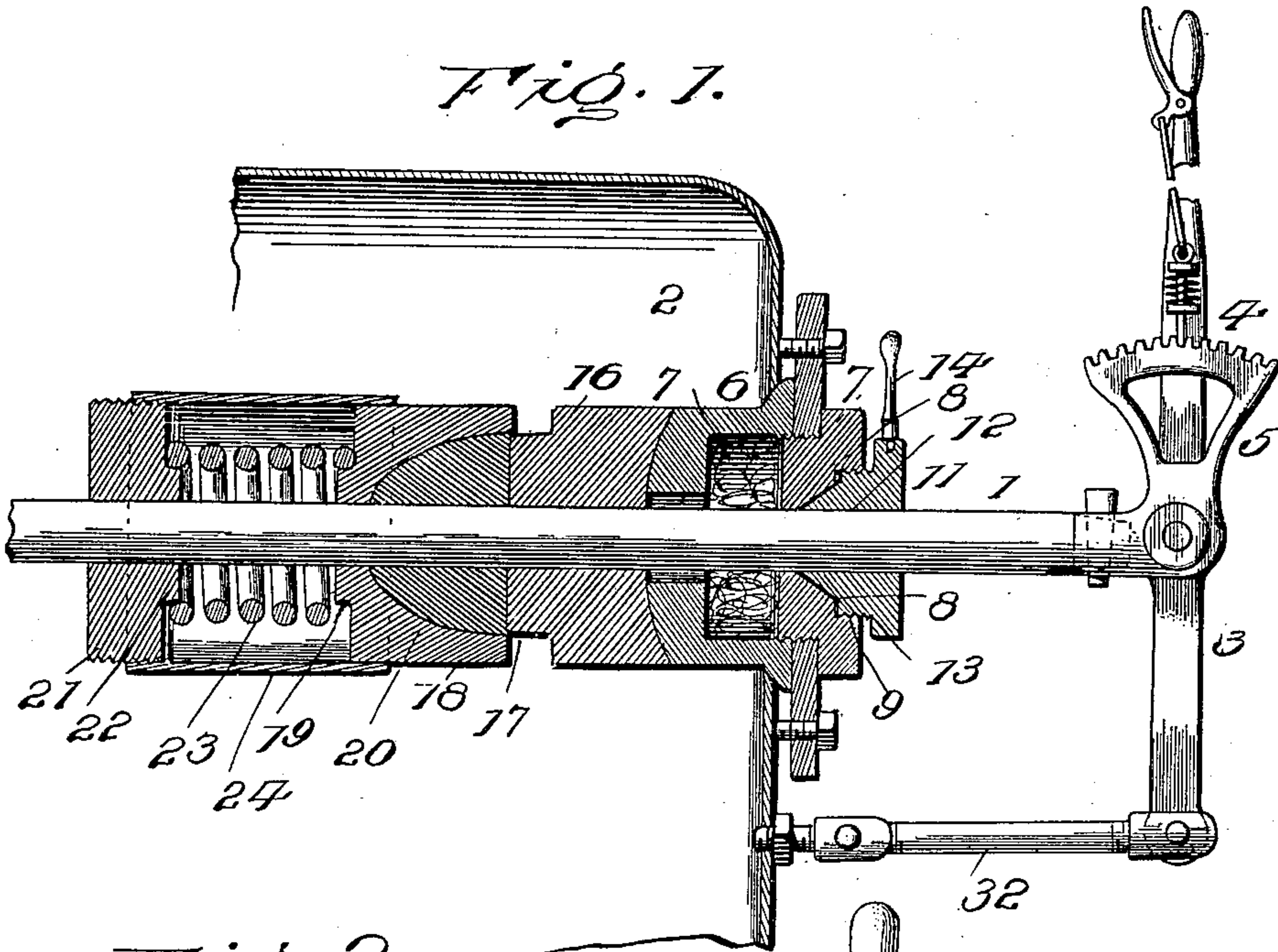


Fig. 2.

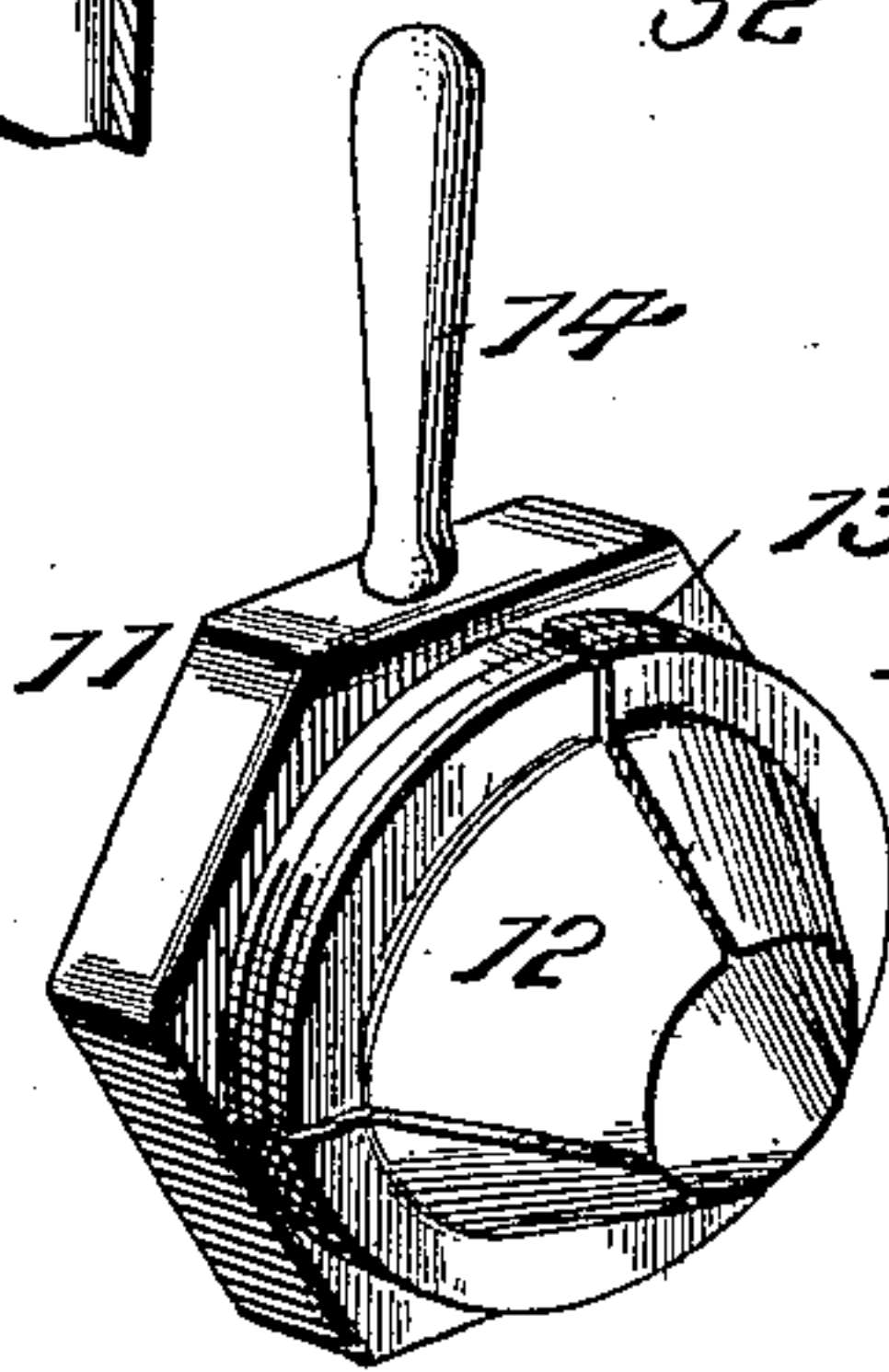
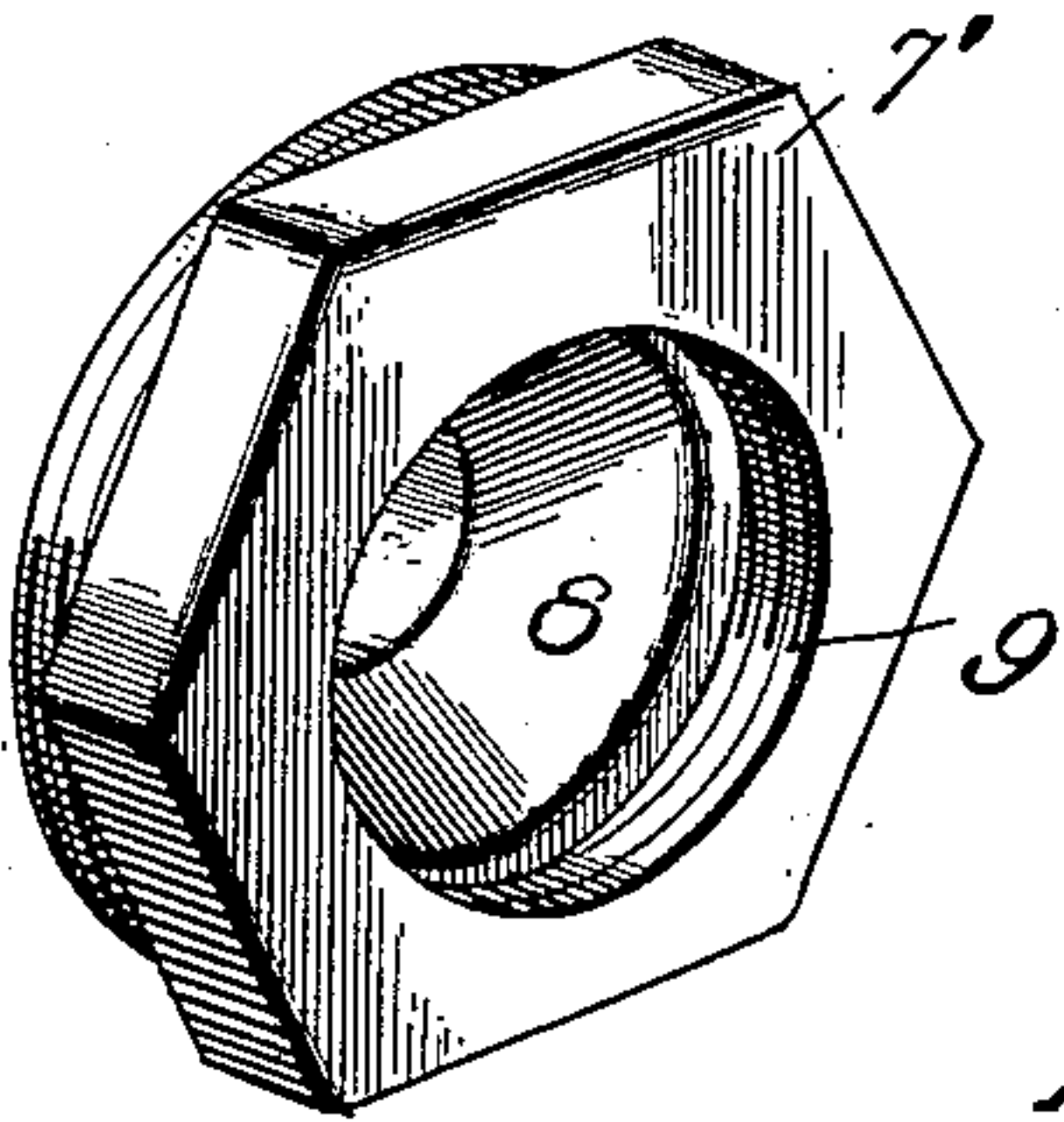
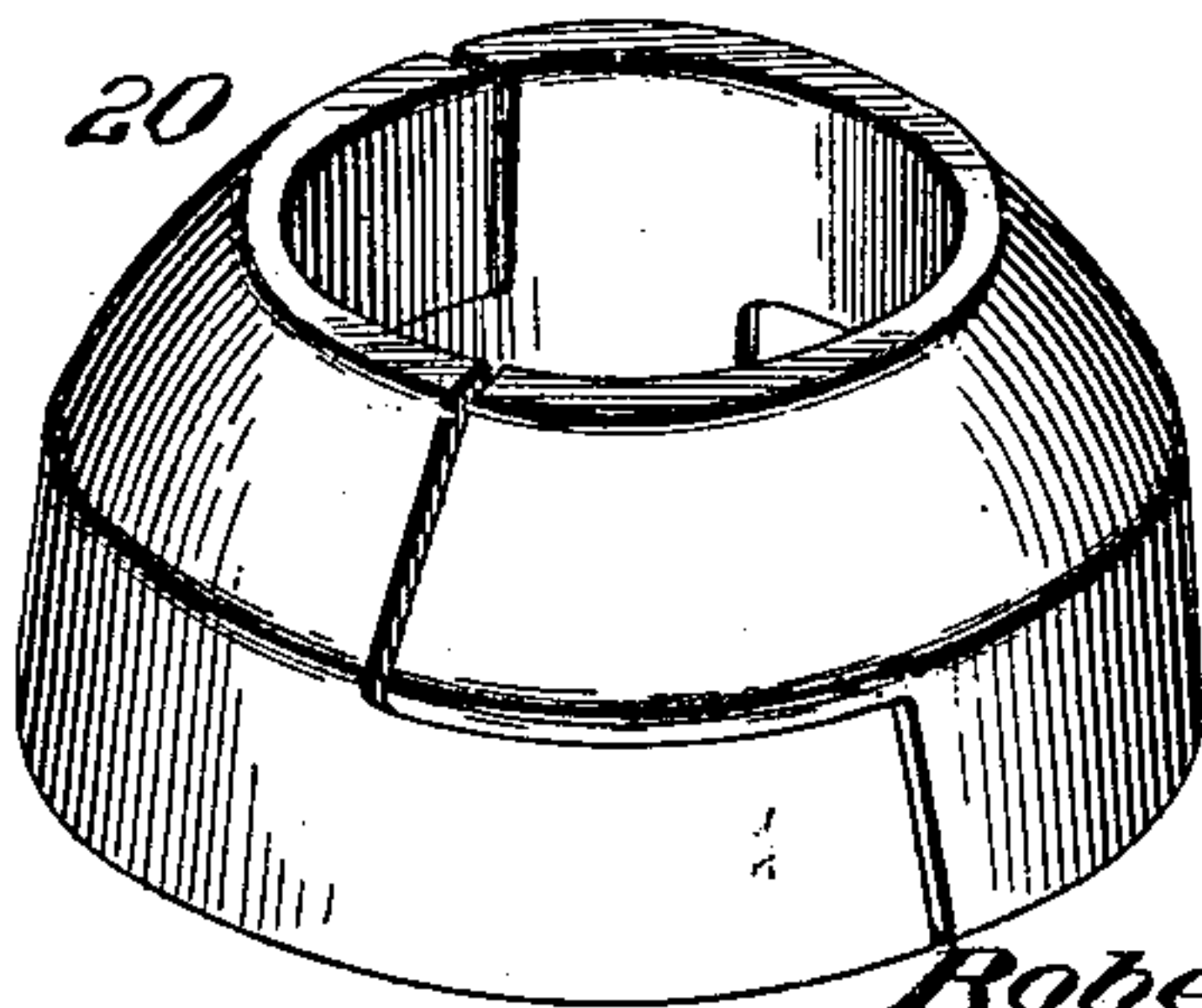


Fig. 3.

Fig. 4.



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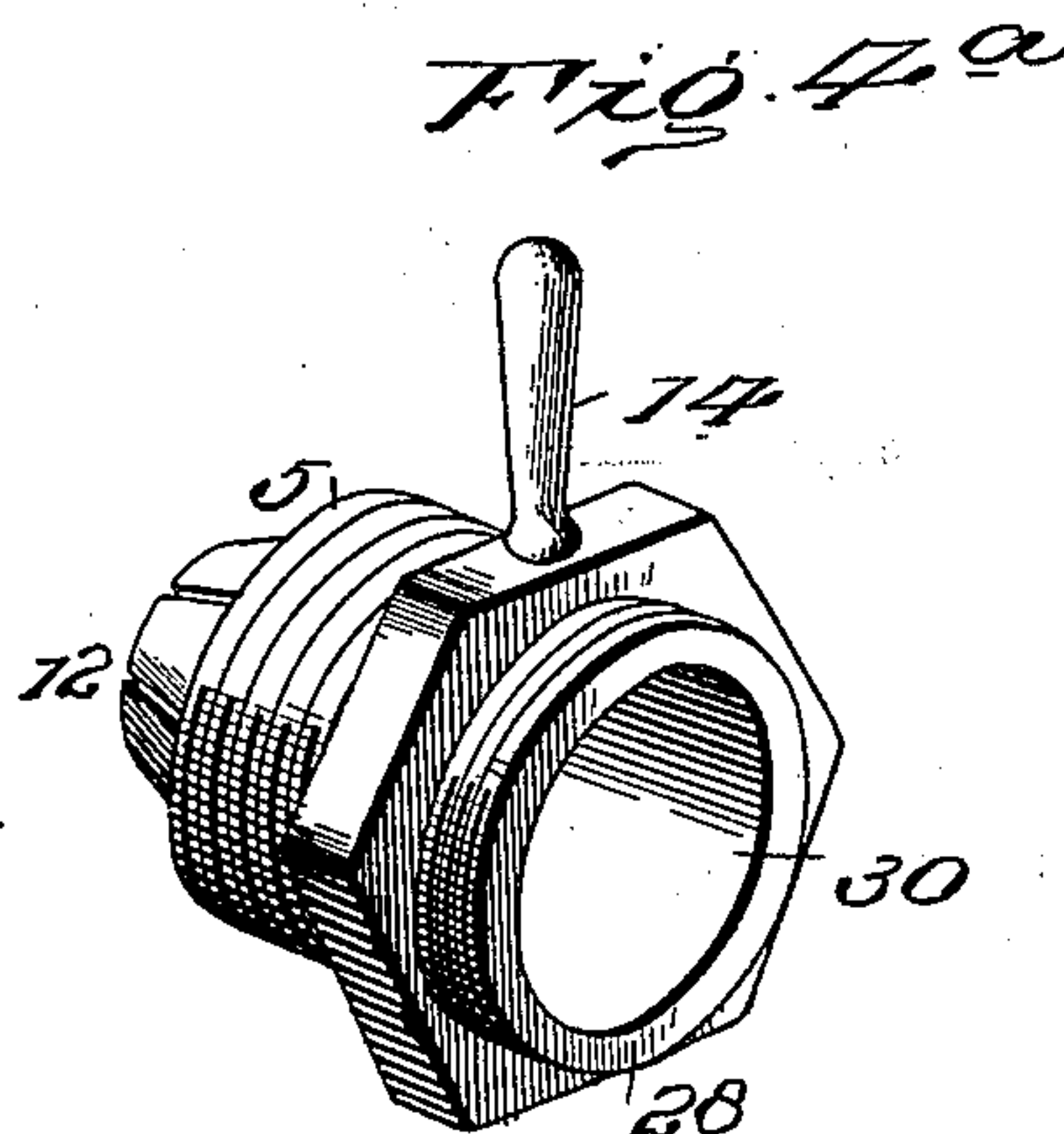
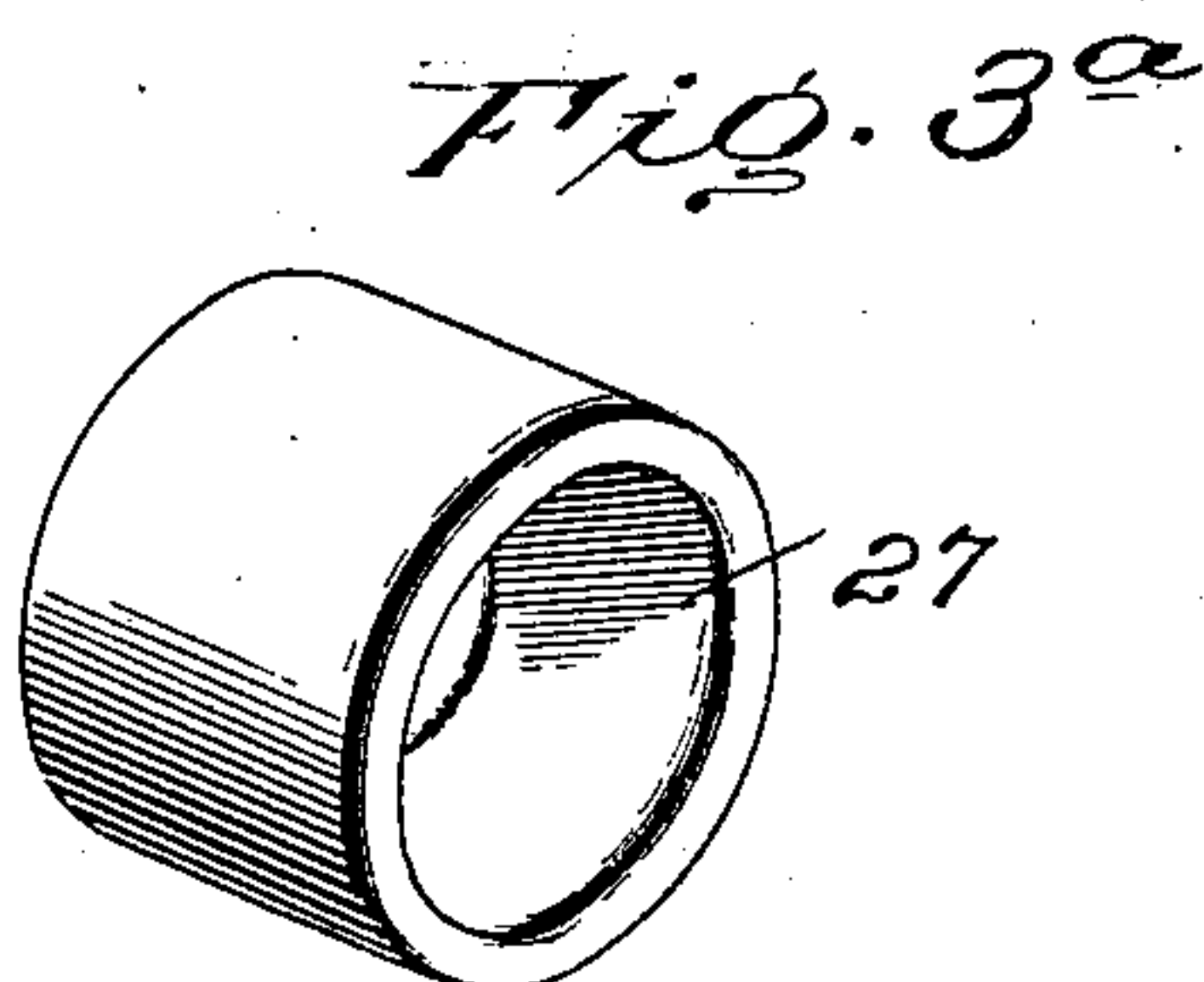
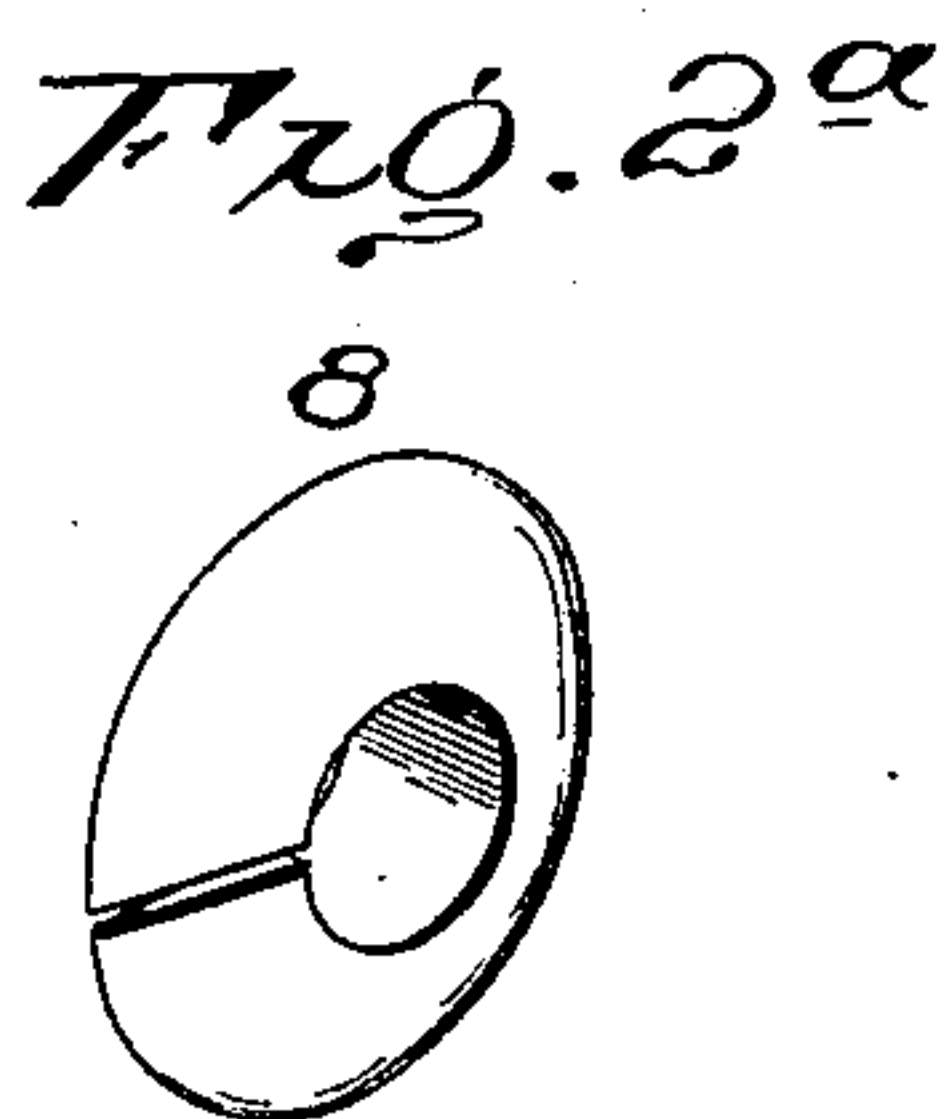
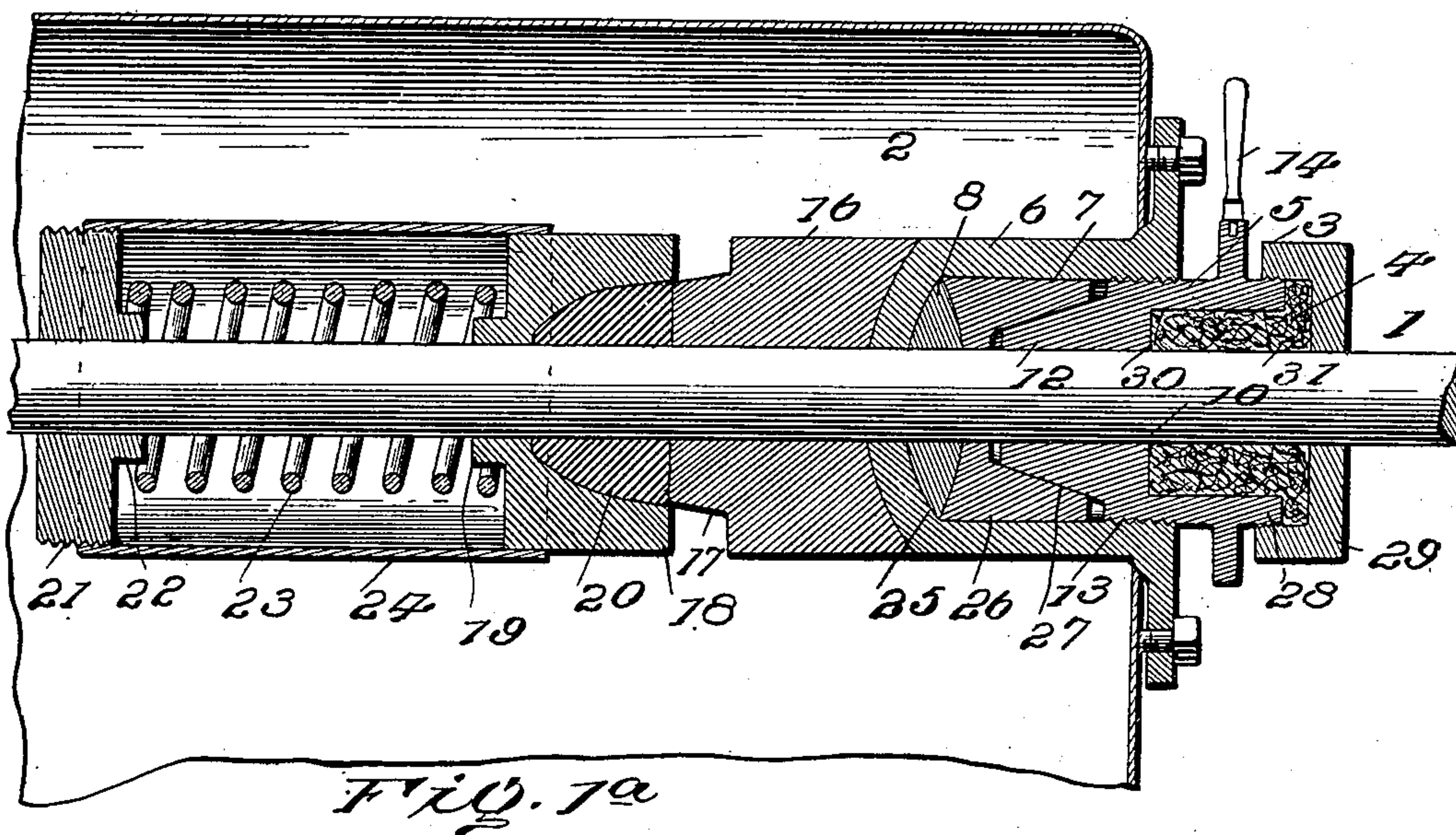
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(Application filed Mar. 31, 1900.)

(No Model.)

2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

ROBERT EMMET McCUEN, OF LEXINGTON, KENTUCKY, ASSIGNOR TO THE
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THROTTLE-STEM PACKING.

SPECIFICATION forming part of Letters Patent No. 665,542, dated January 8, 1901.

Application filed March 31, 1900. Serial No. 10,970. (No model.)

To all whom it may concern:

Be it known that I, ROBERT EMMET McCUEN, a citizen of the United States, residing at Lexington, in the county of Fayette and State of Kentucky, have invented certain new and useful Improvements in Throttle-Stem Packing and Safeguards; 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.

This invention relates to locomotive-throttle-stem packing and means for preventing the throttle-lever from flying open when the locomotive is not taking steam and is left unattended with steam up.

Heretofore throttle-stem-packing devices have, as generally constructed, been made of a cast stuffing-box fastened to the outer surface of the boiler where throttle-stem enters and extending inwardly a sufficient depth, this said stuffing-box having a receptacle for the throttle-stem packing, which packing was of gum or other fibrous composition and was applied around the throttle-rod and compressed into the said stuffing-box by a stuffing-box gland or follower-plate, which said stuffing-box gland was secured to the stuffing-box by bolts or otherwise on the outer surface of the boiler. This device, with other such known devices now in use, is found to be objectionable for the following reasons, viz: that in order to reapply the packing it can only be done when locomotive is dead, or not under steam. If the locomotive is in service and the packing requires renewing, the engineer will have to labor under great difficulties and use the best facilities he has at hand until he reaches a terminal, where the locomotive can be killed or released of steam-boiler pressure sufficient to admit of safely removing the stuffing-box gland in order to then apply the packing with safety. Such devices are furthermore found objectionable from the fact that locomotives are liable to require their throttles packed at any time, and when the occasion arises great expense is incurred for lack of the necessary facilities to repack the locomotive without resorting to the necessity of releasing her of steam. It is further found objectionable from the fact that the gum or fibrous materials,

having no protection, are at all times in contact with the steam at full boiler-pressure, and consequently do not last one-third of the life for which they were intended, thereby incurring an additional expense in conjunction with the expense of the frequent renewals.

Another objectionable feature in the present packing devices is that they are not so constructed with a safeguard to prevent the throttle-lever from flying open and admitting of locomotive taking steam when engine is not intended to be under headway. This is of course distinct from the packing itself; but nevertheless such devices can be so equipped to prevent this liability and at the same time be a part of the throttle-packing.

The objection to a device not having a safeguard to prevent the throttle-lever from flying open is that the lever in frequent cases so does, admitting the steam to the locomotive-cylinders at times when no one has the locomotive in charge, causing the locomotive to become in motion, doing great damage to life and property.

One object of the present invention is to overcome all of the above-noted objections and to provide a locomotive-throttle-stem packing and a throttle-lever safeguard that will admit of the throttle being packed at any and all times as to when or where desired and prevent the throttle-lever from flying open or creeping when the locomotive is not under headway; and a further object is to prevent the full boiler-pressure against the fibrous packing and to sustain the full life of its usage.

For a full description of the invention and the merits thereof, and also to acquire a knowledge of the details of construction of the means for effecting the result, reference is to be had to the following description and the drawings hereto attached.

While the essential and characteristic features of the invention are necessarily susceptible of modification, still the preferred embodiment thereof is illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal section showing the invention operatively related. Fig. 2 is a detail view in perspective of the packing-gland. Fig. 3 is a detail view in perspective of the lock-nut. Fig. 4 is a perspective view

of the sectional metallic packing for the packing-saucer. Fig 1^a is a view similar to Fig. 1, showing the stuffing-box, clamp-nut, and adjunctive parts differently constructed.

5 Fig. 2^a is a detail view in perspective of the soft-metal packing-ring located at the inner end of the stuffing-box. Fig. 3^a is a detail view of the auxiliary gland. Fig. 4^a is a detail view of the modified form of clamp-nut.
10 Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The rod or stem 1 of the throttle-valve extends within the boiler 2 the required distance and is adapted to be operated by means of the hand-lever 3, provided with a hand-operated latch 4 to cooperate with a segment 5, by means of which the stem is held in
20 the desired position. A stuffing-box 6 is bolted or otherwise firmly attached to the boiler and receives a fibrous packing 7, of rubber or any material commonly employed in devices of this and analogous character, so as to secure
25 a steam-tight joint, a gland 7 closing the open side of the stuffing-box 6 and confining the packing 7 in the chamber or space thereof. The outer face of the gland 7 is provided with a conical depression 8 and an enlarged threaded
30 portion 9 to receive a clamp-nut 10, by means of which the stem or throttle-valve 1 is held in the required position against casual movement when the locomotive is under steam and is at rest. The clamp-nut 10 comprises a head 11 and a split portion to correspond with the parts 8 and 9 of the gland 7
35 and adapted to be compressed so as to grip the stem or rod 1 and fix its position when the steam is cut off from the cylinders. The split portion of the clamp-nut comprises a conical part 12 and a threaded portion 13 at the base of the conical portion 12 and intermediate the extremities of the clamp-nut. A handle 14 is fitted to the head portion of
45 the clamp-nut to be grasped when it is required to turn the said clamp-nut either to tighten or release the throttle-valve stem. The parts are so proportioned and disposed that when the split portion of the clamp-nut
50 is advanced into the conical depression of the packing-gland 7 the sections or parts are compressed and caused to grip the sides of the stem 1 and prevent movement thereof in either direction. When backing the clamp-nut, the throttle-valve stem is released and
55 can be operated in the usual manner.

The inner end of the stuffing-box 6 is convex, and a vibrating ring 16, mounted upon the throttle-valve stem 1, has the face abutting against the inner end of the stuffing-box
60 made concave, the joint formed between the abutting faces of the parts 6 and 16 being ground, so as to secure a close joint between them at all relative positions. A boss 17 projects from the rear end or face of the vibrating ring 16 and is adapted to enter the open
65 side of the packing-saucer 18, mounted upon

the throttle-valve stem 1 and having a rear boss 19. The chamber or space formed in the packing-saucer 18 has its inner end made
70 tapering and is adapted to receive a packing 20, of rubber, fibrous material of any nature, or metal, the latter being preferred, and composed of a plurality of sections having their ends halved, so as to allow for contraction
75 and expansion without providing an escape for steam.

A ring or collar 21 is secured to the throttle-valve stem a short distance in the rear of the packing-saucer 18 and has a boss 22 upon
80 its front side, corresponding to the boss 19. A coil-spring 23 encircles the stem 1, and its end portions are fitted to the bosses 19 and 22, which serve to hold the spring clear of the throttle-valve stem. A sleeve 24 is secured
85 to the collar or part 21, preferably by means of a screw-thread connection, and incloses the spring 23 and telescopes with the packing-saucer 18 and is adapted to prevent incrustation or the formation of scales and the
90 accumulation of sediment upon the stem 23 and contiguous parts.

The clamp-nut 10, packing-gland 7, vibrating ring 16, and the packing-saucer 18 fit the throttle-valve stem 1 steam-tight, and the ring
95 16 can vibrate with the stem and will at all times maintain a steam-tight joint with the stuffing-box 6 by reason of the ground joint between subjacent portions thereof. By reason of the steam-tight packing between the
100 parts 16 and 18 and the ground joint between the parts 6 and 16 the packing 7 in the recess or chamber of the stuffing-box 6 can be renewed at any and all times, as it is free from excessive amount of steam and water
105 pressure, and the slight strain thereon will not necessitate frequent renewal of the packing. The packing 7 by reason of its fibrous nature will admit of the free lateral motion of the throttle-stem and at the same time permit of the free working of the stem in and
110 out, according as the throttle is opened or closed.

As shown in Fig. 1^a and the detail views thereof, the stuffing-box 6 is made sufficiently
115 deep to receive the packing-ring 25, of soft metal, as lead or a composition thereof, and the auxiliary gland 26. The ring 25 is split to admit of its compression to fit close about the stem 1 and is double convexed to fit the
120 concave sides of the parts 6 and 26 subjacent thereto. The auxiliary gland 26 is formed in its outer face with a tapering depression 27 to receive the tapering end 12 of the clamp-nut 10, having direct screw-thread connection with the stuffing-box 6. The head 11 is a flange, and a part 28 projects beyond the flange and is externally threaded to receive
125 the gland 29, a chamber 30 being formed in the outer end of the clamp-nut to receive the
130 packing 31.

The construction just described provides, in effect, a double stuffing-box, the parts 6 and 10 constituting one and the outer cham-

bered end of the clamp-nut and the gland 29 forming the other. The part 10 performs the double function of a gland and a stuffing-box, according as it coöperates with the part 6 to compress the packing 25 or with the part 29.

The lever 3 is pivoted between its ends to the stem 1 and is connected by the rod 32 with the boiler 2. The stem 1 has a rectilinear movement, and in order to admit of its adjustment by means of the lever 3 the connecting-rod 32 has pivotal connection with the boiler and lever. The segment 5 is carried by the stem 1, and when the latch 4 engages a notch or adjacent teeth of the segment the stem cannot move. The clamp-nut provides additional means for preventing accidental displacement of the valve when the engine is left standing with steam up.

The coil-spring 23 performs important functions in the related position specified, chief among which may be noted the following:

First. That in working in conjunction with packing-saucer 18 the packing 20 fits the throttle-rod snugly at all times, and that still working with packing-saucer 18 and vibrating ring 16 a self-feeding of the packing 20 is effected, taking up all wear that may arise in the usage of the packing 20.

Second. The spring results in the provision of an automatic non-opening throttle-lever in case the locomotive is under steam but not in service and the engineer has overlooked or neglected to tighten the clamp-nut or locking device. Then this spring has sufficient resistance to prevent the steam, as in old styles, from raising the throttle-valve and admitting steam to cylinders under such occasions.

Third. The spring itself when engine is under headway is then an "equalizing-spring," from the fact that the steam in forcing its way or escaping through the opening of throttle-valve has great tendency to force the valve upward and still further open. Now with the old method this has been found to be another very objectionable feature and caused great complaint on the part of engineers in that in operating the throttle-lever it was found to be very hard to manipulate, especially when the lever was operated to close the valve and shut off steam. By the steam forcing the valve upward, and thereby resisting its closing, the operator or engineer is required to use great strength and at times stand in an upright position to do so, this undertaking being laborious and on occasions causing accidents where such accidents could have been avoided by an equalizing throttle-lever and valve free in its motion. It is claimed that when the engine is under headway and taking steam the pressure of the steam against the under part of the raised valve and the spring with its resistance in the opposite way, this steam regulates the spring and makes it "equalizing," thus working on the throttle-lever in such a manner that it encounters no foreign force in its inward or

outward movement and that it can be operated in any direction in closing or opening with the greatest facility.

Having thus described the invention, what is claimed as new is—

1. In combination with a locomotive-throttle-valve stem and packing therefor, a clamp-nut coöperating with the packing-gland to prevent casual displacement of the throttle-valve stem, substantially as set forth.

2. In combination with a locomotive-throttle-valve stem, a stuffing-box therefor, and a packing-gland for the stuffing-box having a conical depression in its outer side, a clamp-nut having a split conical portion adapted to coöperate with the packing-gland to secure the throttle-valve stem against casual displacement, substantially as set forth.

3. In combination with a locomotive-valve stem, and packing therefor comprising a stuffing-box and a gland, the latter having a tapering recess in its outer face and an enlarged portion internally threaded, a clamp-nut having a split conical portion to enter the tapering depression of the packing-gland and having an enlarged portion at the base of the conical part internally threaded to make screw-thread connection with the aforementioned packing-gland, substantially as specified.

4. In combination with a locomotive-throttle-valve stem and packing therefor comprising a stuffing-box and a packing-gland, the latter having a tapering recess in its outer side and a parallel-sided threaded portion, a clamp-nut provided with a handle and a split portion having a conical end and a parallel-sided threaded portion at the base of the conical end to screw into the enlarged threaded portion of the recess in the packing-gland, substantially as set forth.

5. In combination with a locomotive-throttle-valve stem and packing therefor, a vibrating ring coöperating with the packing and stem and having a steam-tight joint with each, a packing-saucer mounted upon the stem and having its space or chamber made tapering at its inner end and a sectional metallic packing fitted in the chamber of said saucer and having a conical-ended portion and held in place by means of the vibrating ring, substantially as specified.

6. In a locomotive-throttle-valve stem and packing therefor, a vibrating ring coöperating with the stem and packing and having a steam-tight joint with each, a packing-saucer having a rear boss and receiving a packing, a collar movable with the stem and having a boss upon the side facing the packing-saucer, and a coil-spring encircling the stem and having its ends fitted to the bosses of the said collar and packing-saucer, substantially as set forth.

7. In combination with a locomotive-throttle-valve stem and packing therefor, a vibrating ring, a packing-saucer, a collar movable with the stem, a coil-spring interposed be-

tween the packing-saucer and the said collar, and a sleeve encircling the said coil-spring and secured at one end to one of the parts and having telescoping connection at its opposite end with the other part, substantially as set forth.

8. In combination with a locomotive-throttle-valve stem and a fixed packing therefor, a packing mounted upon said stem and movable therewith longitudinally and laterally, and an interposed ring making a steam-tight joint with the said stem and having a projecting portion to enter the chambered member of the inner packing and having its outer face made concave and fitting the inner end of the fixed packing by a ground joint, substantially as set forth.

9. In combination with a locomotive-throttle-valve stem, a fixed stuffing-box, a packing-gland therefor having a recess in its outer side, a clamp-nut adapted to cooperate with said packing-gland to secure the throttle-valve stem against casual displacement, a vibrating ring having a ball-and-socket joint connection with the inner end of the said stuffing-box, a packing-saucer containing a packing, a fixed collar movable with the valve-stem, a coil-spring interposed between said collar and packing-saucer, and a sleeve inclosing the coil-spring and having a telescoping connection at one end with one of the parts and a rigid connection at the opposite

end with another of the parts, substantially as and for the purpose specified.

10. In combination with a locomotive-throttle-valve stem, a duplex packing therefor comprising a stuffing-box, a part cooperating with the stuffing-box and having its outer end chambered to receive packing, and a gland acting conjunctively with the chambered end of the said part, substantially as described.

11. In combination with a locomotive-throttle-valve stem, a stuffing-box, double-convex packing located at the inner end of the box, an auxiliary gland loosely fitted within the said box, and means for compressing the gland and double-convex packing, substantially as described.

12. In combination with a locomotive-throttle-valve stem, a stuffing-box, double-convex packing located at the inner end of the box, an auxiliary gland loosely fitted within the said box, and having its outer end formed with a tapering recess, and a clamp-nut having a tapering end to enter the tapering recess of the said gland and making screw-thread connection with the aforementioned stuffing-box, substantially as specified.

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

ROBERT EMMET McCUEN. [L. S.]

Witnesses:

G. W. HADEN,
L. B. SHROPSHIRE.