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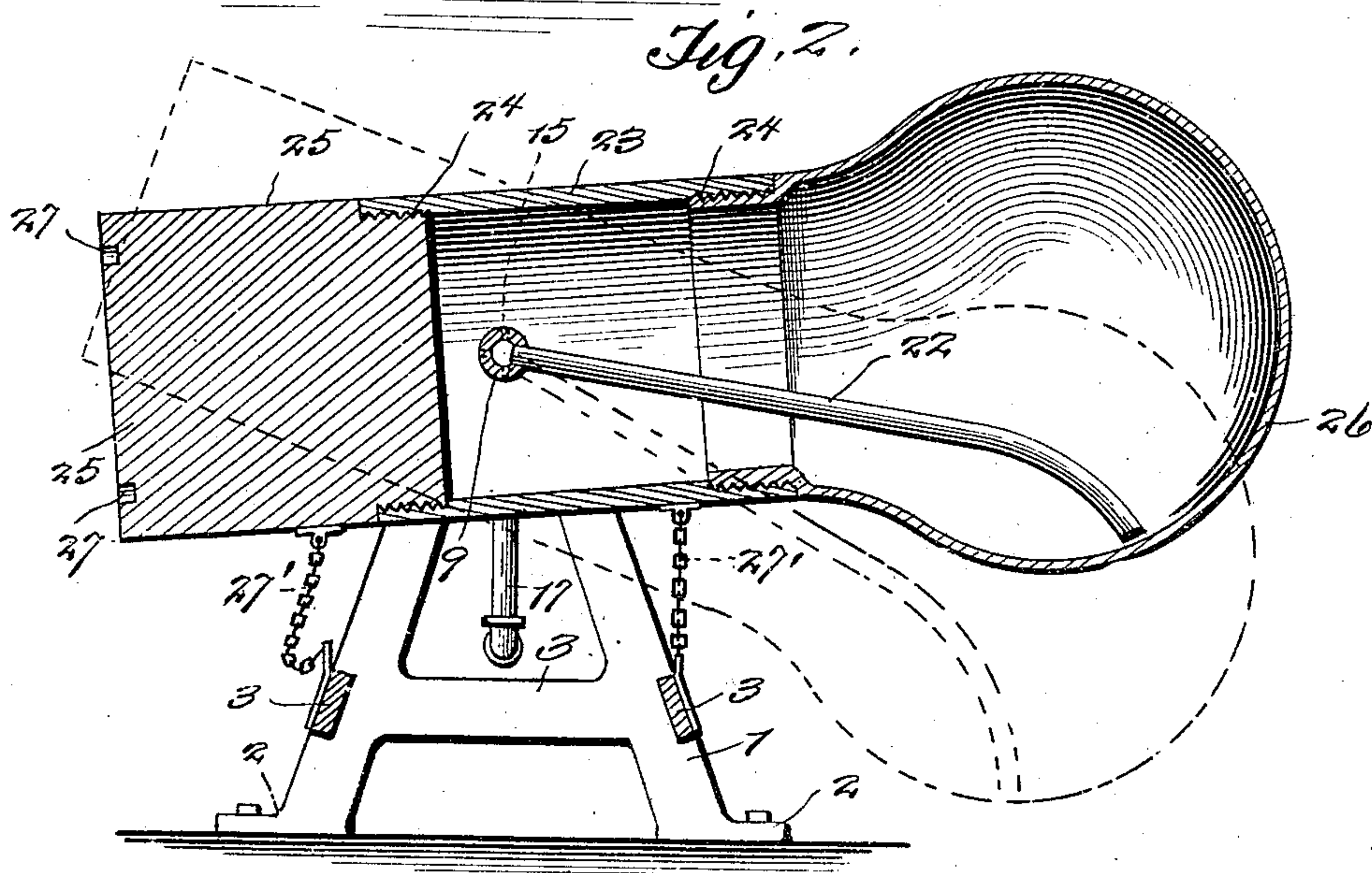
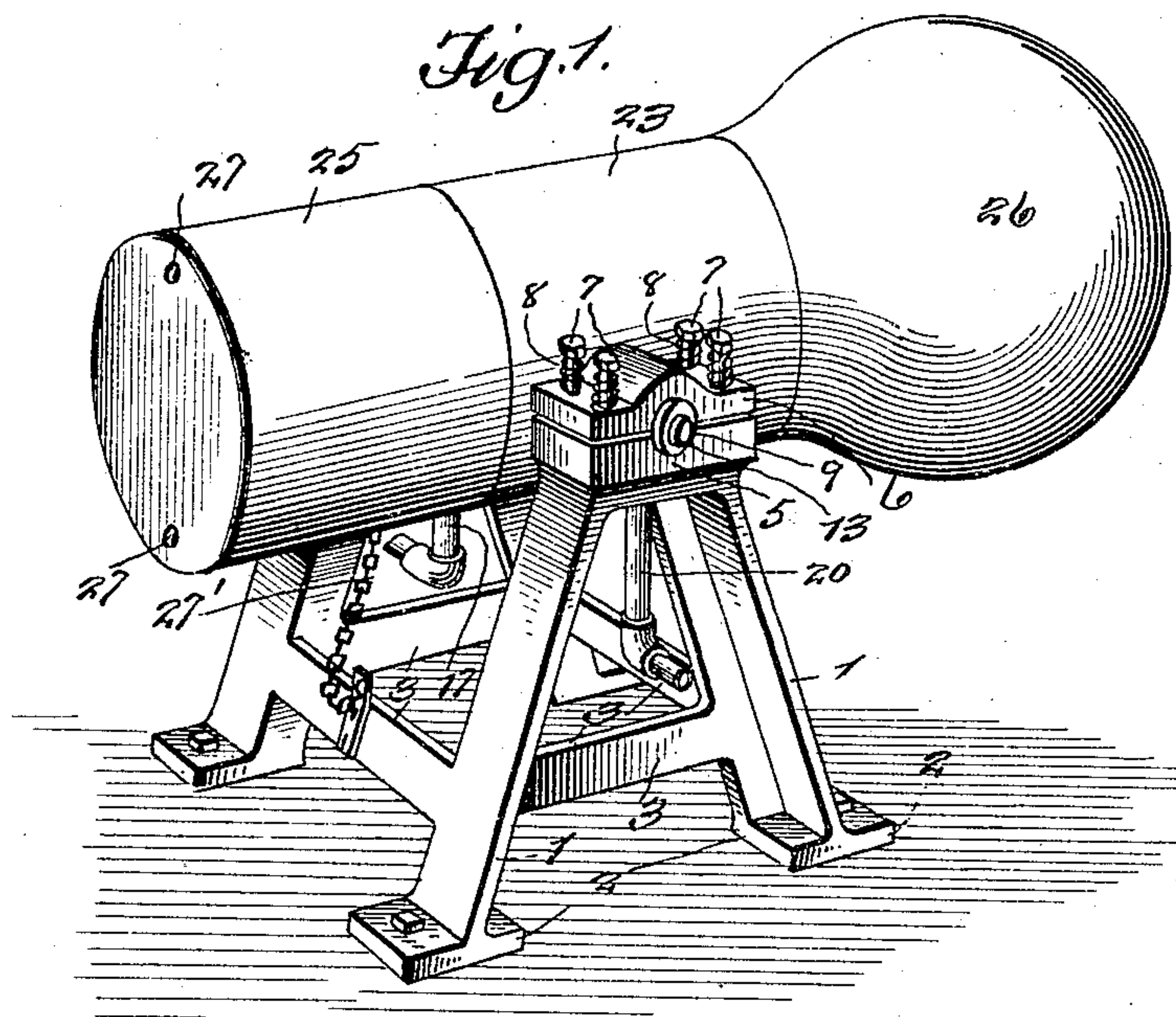
PATENTED FEB. 12, 1907.

W. Y. MOFFAT & T. W. BUTLER.

STEAM TRAP.

APPLICATION FILED MAR. 15, 1906.

2 SHEETS—SHEET 1.



WITNESSES:

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2 SHEETS—SHEET 2.

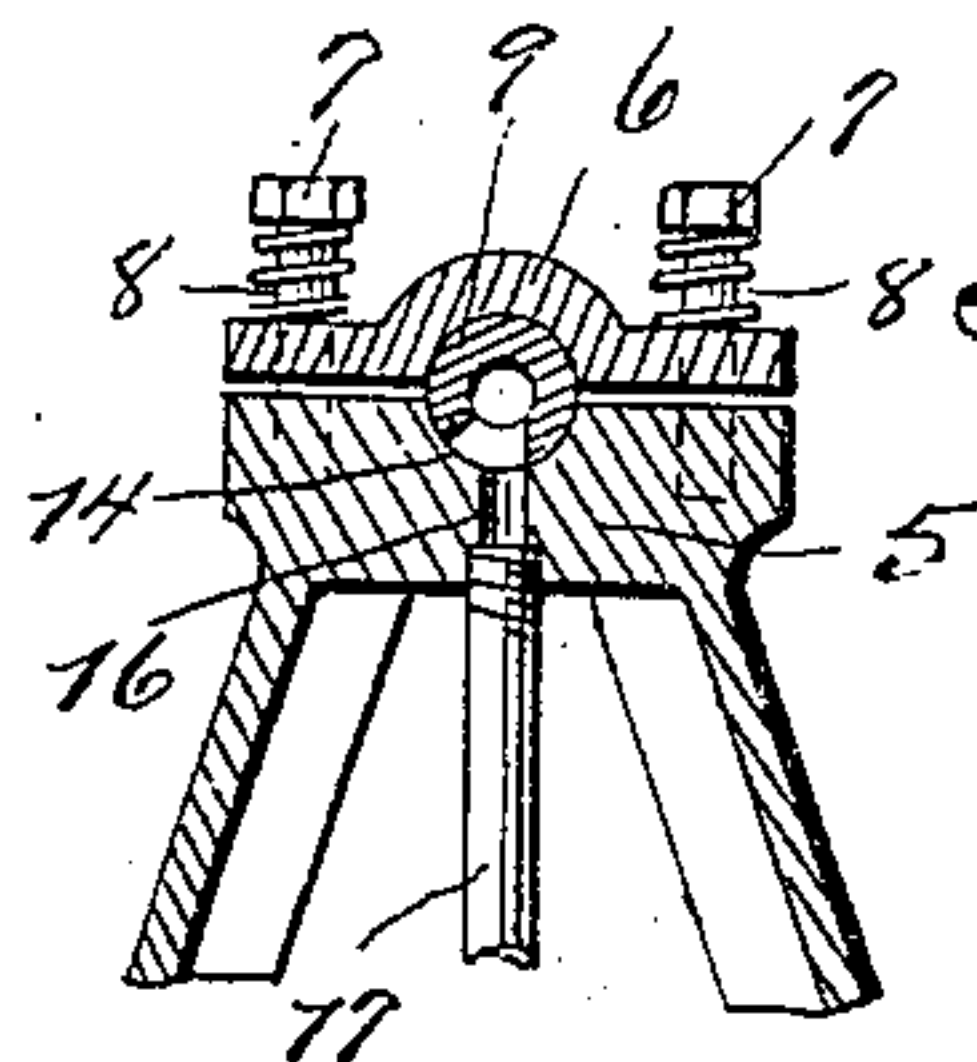
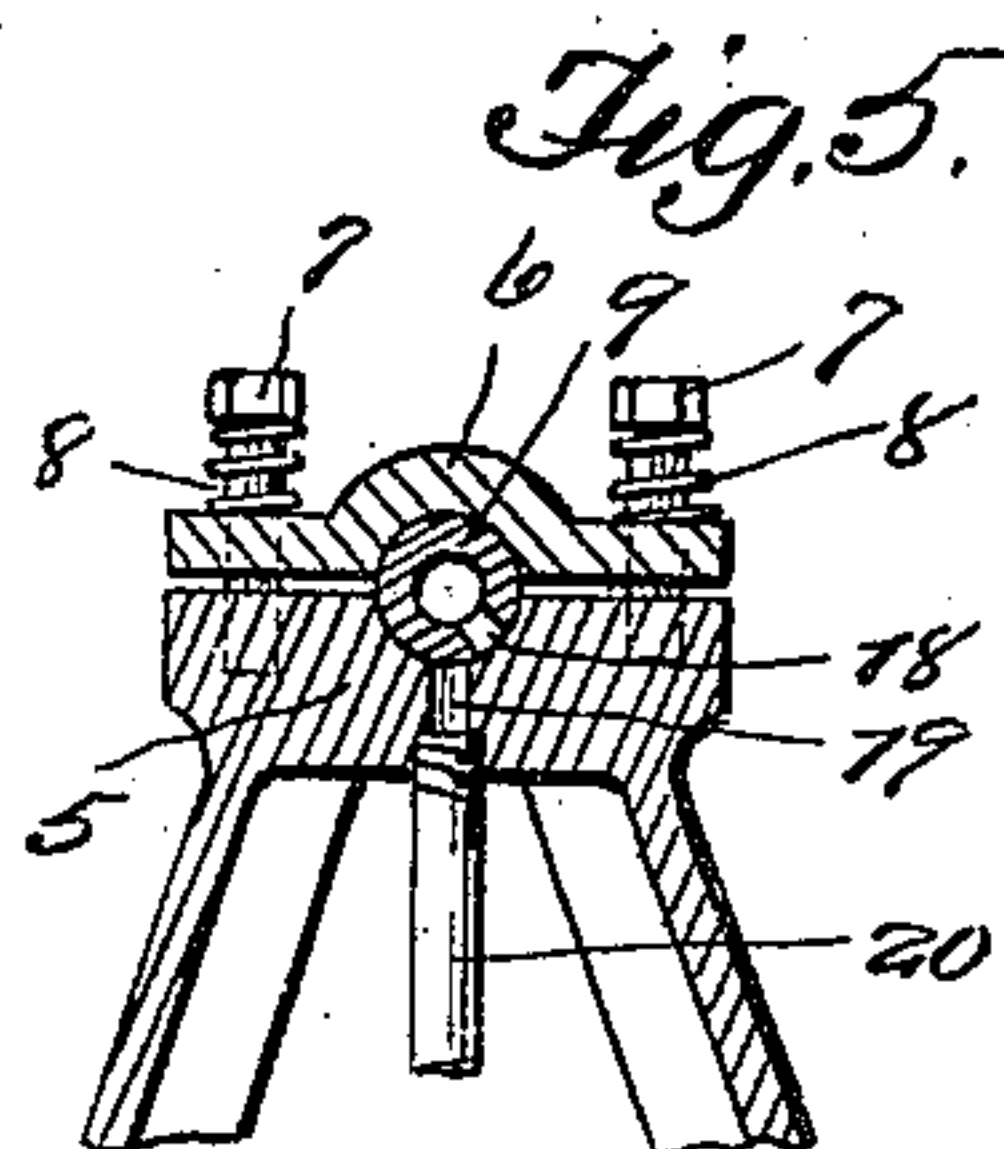
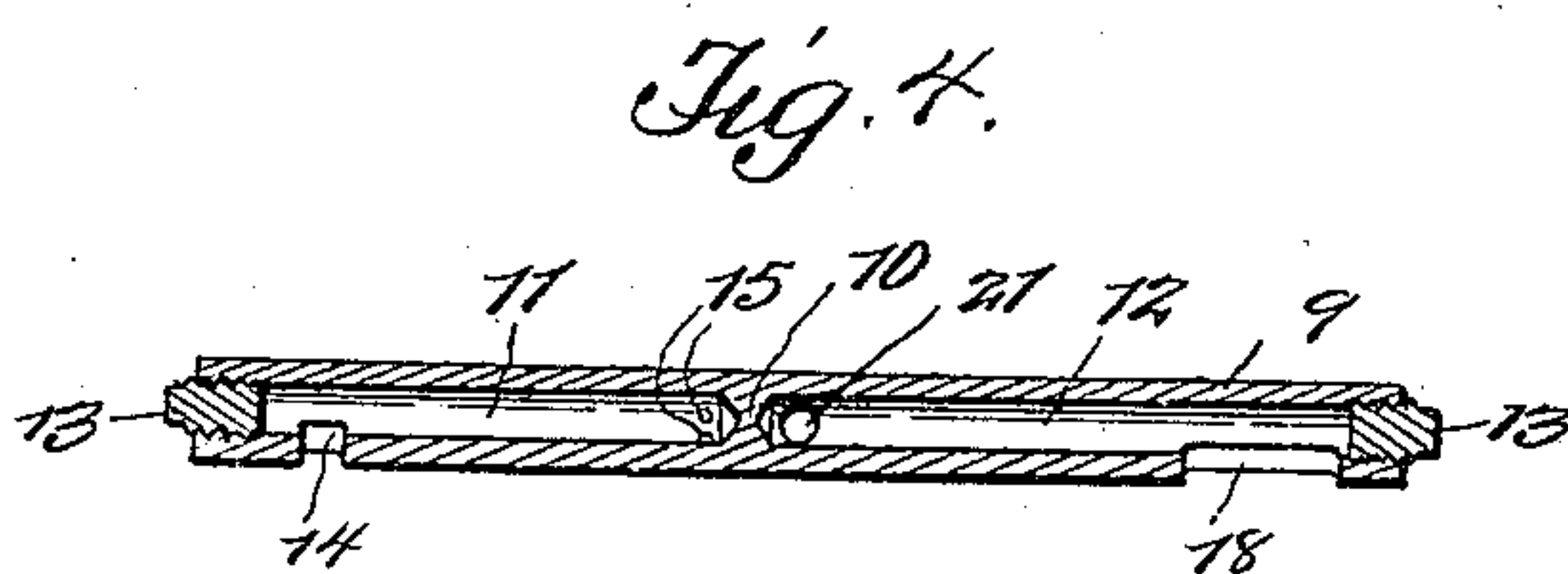
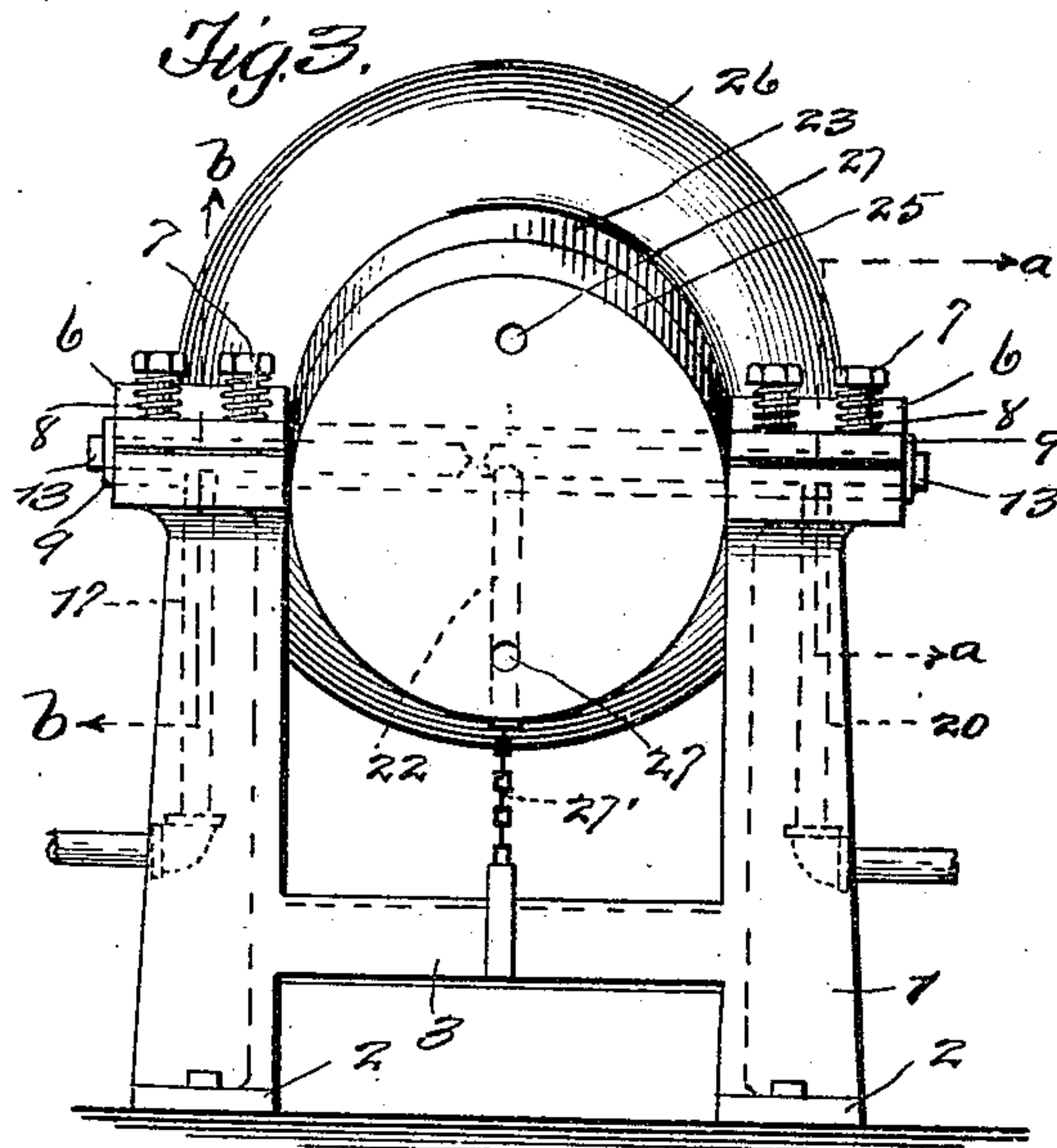
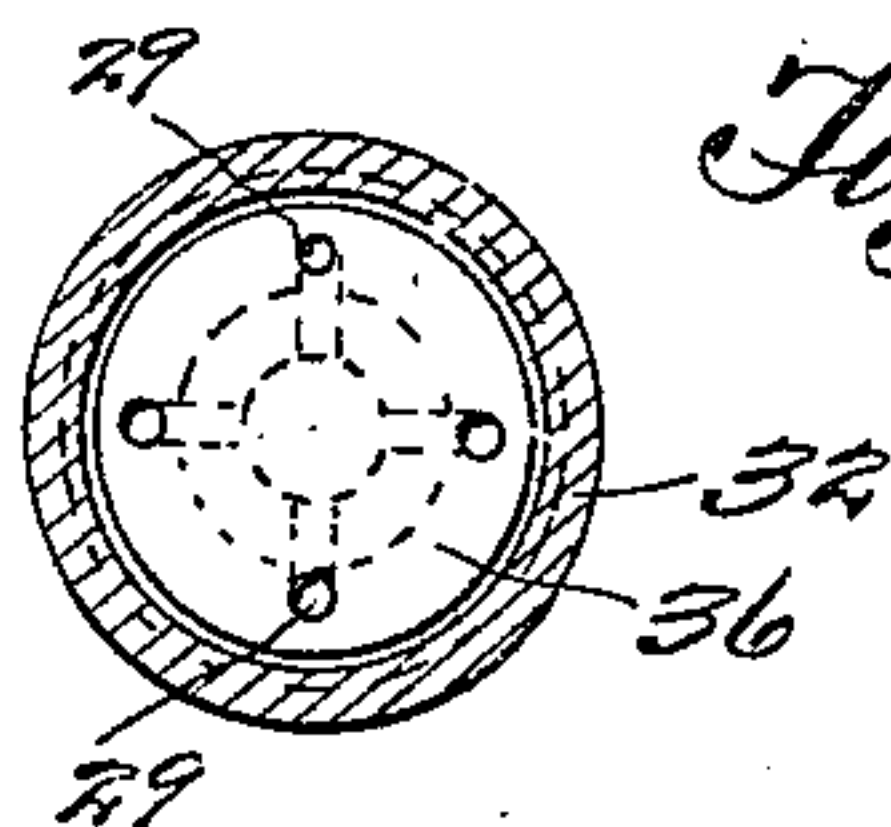
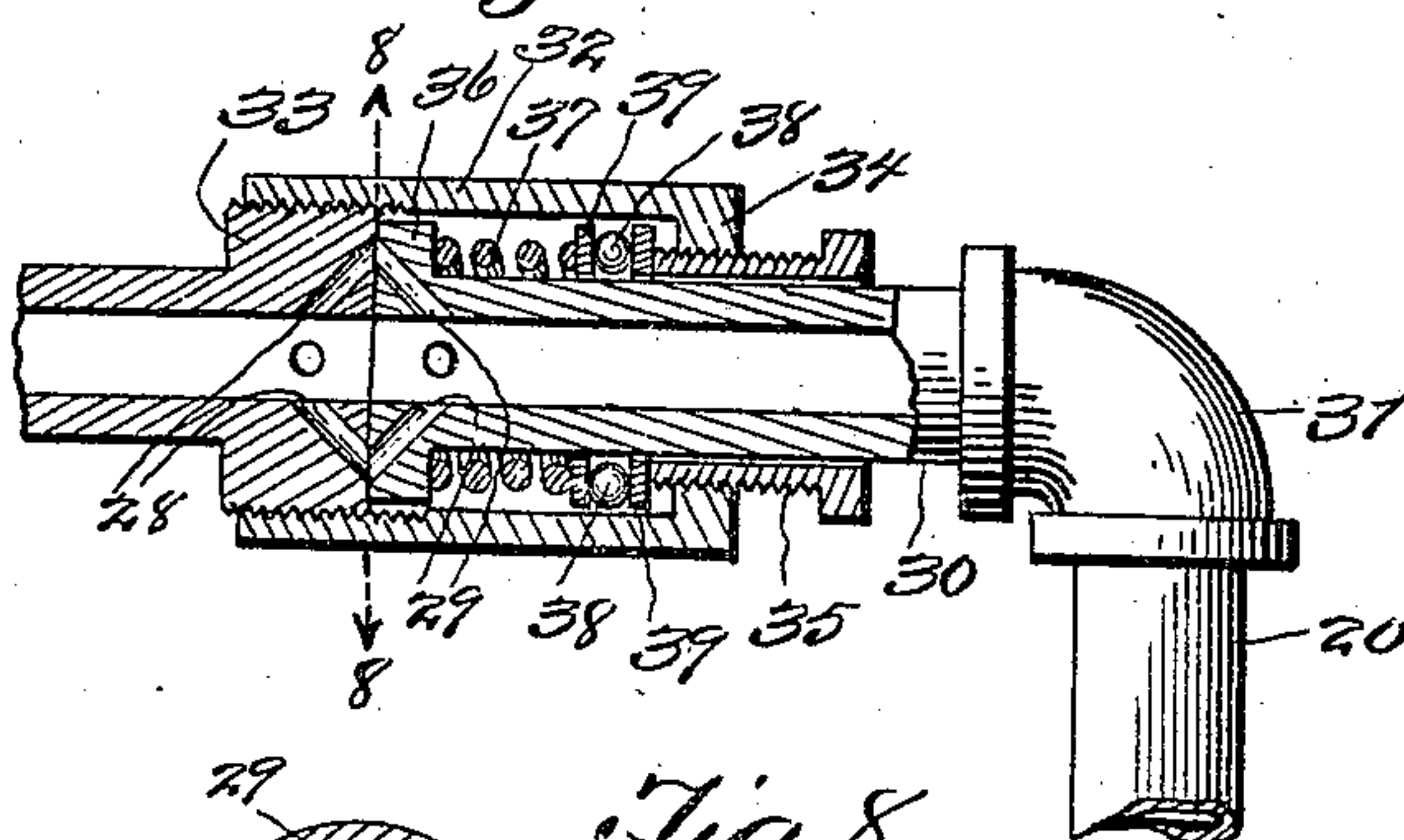


Fig. 6.

Fig. 7.



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STEAM-TRAP.

No. 843,686.

Specification of Letters Patent.

Patented Feb. 12, 1907.

Application filed March 15, 1906. Serial No. 306,255.

To all whom it may concern:

Be it known that we, WILLIAM YOUNG MOFFAT and THOMAS W. BUTLER, citizens of the United States, residing at Dunmore, in the county of Lackawanna and State of Pennsylvania, have invented certain new and useful Improvements in Steam-Traps, of which the following is a specification.

This invention relates to new and useful improvements in steam-traps; and it particularly pertains to a construction in which the steam and water of condensation are constantly injected under pressure into a tiltable basin having a swinging movement under a weight contained therein and in its swinging movement opening a discharge-port, through which the condensed moisture egresses.

In connection with the above general features of construction and operation novel means are provided for regulating the tension at which the basin swings to effect a discharge of its contents, and means are further provided for limiting the basin both in its positive and reactive tilting movements.

The detailed construction will appear in the course of the following description, in which reference is had to the accompanying drawings, forming a part of this specification, like numerals designating like parts throughout the several views therein.

Figure 1 is a perspective view showing the basin and support therefor. Fig. 2 is a longitudinal section. Fig. 3 is a view of one end of the apparatus. Fig. 4 is a longitudinal section of the rocking shaft carrying the basin and journaled in a supporting-frame. Figs. 5 and 6 are details fragmentary sectional views through the shaft and frame on the lines *a a* and *b b* of Fig. 3, showing, respectively, the arrangement of the inlet and outlet passages. Fig. 7 is an enlarged fragmentary longitudinal section showing a modified construction of the shaft and journal therefor, and Fig. 8 is a transverse section on the line 8 8 of Fig. 7.

In the practical embodiment of our invention we employ a supporting-frame of rectangular outline and inverted-V shape, comprising angular standards 1, arranged on opposite sides in converging paths, carrying at their lower ends shoes 2, by which the frame is secured to a foundation and braced by integral cross-bars 3, disposed a short distance above

the shoes 2. The oppositely-disposed pairs of standards 1 converge toward their upper ends and are there united by an integral cross-piece 5, which in each instance forms one member of a bearing and in this function is constructed with a centrally-located concave seat, the complementary member of which bearing is constituted of a plate 6, formed with a corresponding concaved bearing-seat and yieldably superimposed upon the journal member 5, being held thereupon by a bolt 7, extending through the plate 6 and threaded into the member 5 and being retained yieldably in its position by expansive spiral springs 8, surrounding the bolt and restricting the plate 7 in its vertical movement or play.

A hollow shaft 9 is journaled in the frame-bearings, and, as shown in Fig. 4, is constructed with a partition 10 centrally thereof, which divides the shaft 9 into compartments 11 and 12, closed at their ends by plugs 13, threaded therinto. The compartment 11, which, owing to its function, we shall designate the "inlet-chamber," is formed with an inlet-opening 14 in its outer end and at its inner end with a series of discharge-orifices 15. The opening 14 is of sufficient size to be in constant registry with a port 16, formed in the journal member 5 adjacent thereto, which has communication with a steam-injecting conductor 17.

The compartment 12, which we shall designate the "outlet-chamber," is provided at its outer end with an elongated discharge-passage 18, communicating in one position of the trap with a port 19 in the journal member 5 adjacent thereto, which has connection with an ejecting-conductor 20. At its inner end the compartment 12 is formed with an opening 21, which communicates with a laterally-extending tube 22, carried by the shaft 9.

The tube 22 projects at an incline into the receiving-basin, which comprises three elements—to wit, a centrally-located hollow cylinder 23, formed with internally-threaded ends 24, a counterbalance-weight 25, threaded into one end of said cylinder and constituting a closure therefor, and the basin proper, 26, of greater diameter than the cylinder and threaded into the other end thereof.

The weight 25 is formed upon its outer side with diametrically-alined recesses 27 for the

reception of a spanner-wrench in screwing and unscrewing the same in the cylinder 23. The means for limiting the movement of the basin in either direction comprises chains 27', having their ends secured to the standards 1 and to the weight 25 and to the cylinder 23.

In the modified construction shown in Figs. 7 and 8 the direct-outlet port 18 is eliminated, and in lieu thereof a series of axially-inclined radially-extending passages 28 are provided in the end of the shaft 9. The passages 28 are designed in one position of the shaft 9 to enter into registry with similarly-constructed passages 29, provided in the end of a pipe 30, united by an elbow-joint 31 to the ejection-conductor 20. The pipe 30 is stationary and extends between the bearing-plates of the supporting-frame.

In the modified construction a different form of bearing is employed, which is adapted to compensate for wear, comprising a casing 32, threaded upon the enlarged end 33 of the shaft 9 and provided at its free end with an annular inturned flange 34, which is threaded to receive a retaining-bushing 35. The pipe 30 is provided on its free end with a flange 36, and a spiral expansive spring 37 is interposed between the flange 36 and the bushing 35. Ball-bearings 38 are arranged adjacent to the bushing 35 between spacing annuli 39, arranged on each side thereof. The bearings 38 and annuli 39 serve to compensate for friction when the bushing 35 is tightened to take up wear between the parts. It is apparent that by enlarging either of the passages 28 or 29 the bearing illustrated in Figs. 7 and 8 may be applied to the inlet end of the compartment 9 as advantageously as to the outlet end, as shown.

In operation it is assumed that the trap is in the position shown in Fig. 2 and the steam and particles of moisture carried therewith enter the inlet-chamber 11 of the shaft 9 through the pipe 17, port 16, and opening 14. Under the requisite pressure the steam is forced through the openings 15 into the basin 26, where it is condensed, and when the amount of moisture in the basin 26 possesses sufficient weight to overcome the counter-balance 25 the basin swings into the position illustrated in dotted lines in Fig. 2. During the swinging movement of the basin the inlet-opening 14, owing to its width, is constantly in registry with the port 16, so that the pressure of steam entering through pipe 17 is always maintained; but the outlet-opening 18 does not completely register with the port 19 until the basin shall have reached the termination of its downwardly-swinging movement, at which time the pressure of the steam within the basin will force the condensation through the tube 22 and into the outlet-chamber 12 of the shaft 9, whence it continuously egresses through opening 18, port 19, and conductor 20. When the condensed

moisture has been ejected from the basin 26, the structure, under the influence of the weight 25, will swing back to initial position and the operation above described is continued *ad infinitum*. The swinging movement of the basin in either direction is limited by the chains 27'.

The modified construction shown in Figs. 7 and 8 operates in the manner above described, the ports 28 and 29 being in registry in the lowermost position of the basin and the contents thereof egressing therethrough and being out of registry in the normal position of the basin.

Having thus fully described the invention, what we claim as new, and desire to secure by Letters Patent, is—

1. A steam-trap comprising a basin having a weighted end, a hollow shaft extending transversely through said basin and having rigid connection therewith, and bearings in which the ends of said shaft are journaled, said shaft being provided with a central partition dividing the same into independent compartments, one of said compartments serving as an inlet-chamber and being formed at its free end with an opening adapted to be in constant registry with an inlet-conductor, and at its other end with openings communicating with the interior of the basin, and the other of said compartments serving as an outlet-chamber and being formed at its free end with an opening adapted to be in registry in a predetermined position of the basin with an outlet-conductor and at its other end with an opening communicating with the interior of the basin.

2. A steam-trap comprising a basin having a weighted end, a hollow shaft extending transversely through said basin and having rigid connection therewith, and bearing in which the ends of said shaft are journaled, said shaft being provided with a central partition dividing the same into independent compartments severally having communication with the interior of the basin, one of said compartments serving as an inlet-chamber, and being formed at its free end with an enlarged opening adapted to be in constant registry in any position of the basin with an inlet-conductor extending through the adjacent bearing and the other of said compartments serving as an outlet-chamber and being formed with an opening adapted to be in registry with an outlet-conductor provided in the adjacent bearing for the end of the shaft in a predetermined position.

3. A steam-trap comprising a basin, having a weighted end, a hollow shaft extending transversely through said basin and having rigid connection therewith, bearings in which the ends of said shaft are journaled, conductors extending through said bearings and communicating with said shaft adjacent to the ends thereof and adjustable means em-

bodied in said bearing for taking up wear between the shaft and the conductors in their contacting relation, said shaft being formed with a central partition dividing the same
5 into independent compartments severally having communication with the basin-interior.

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

WILLIAM YOUNG MOFFAT.
THOMAS W. BUTLER.

Witnesses:

T. B. JACKSON,
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