

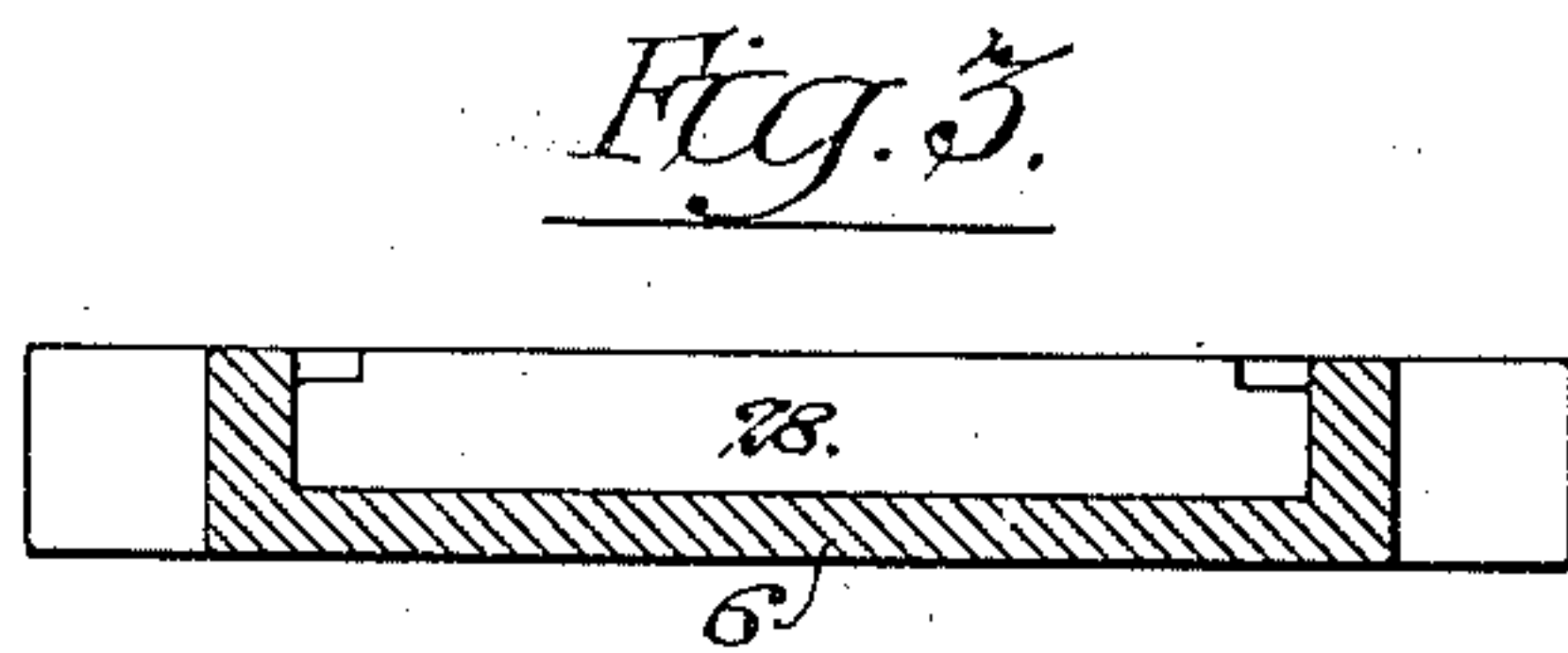
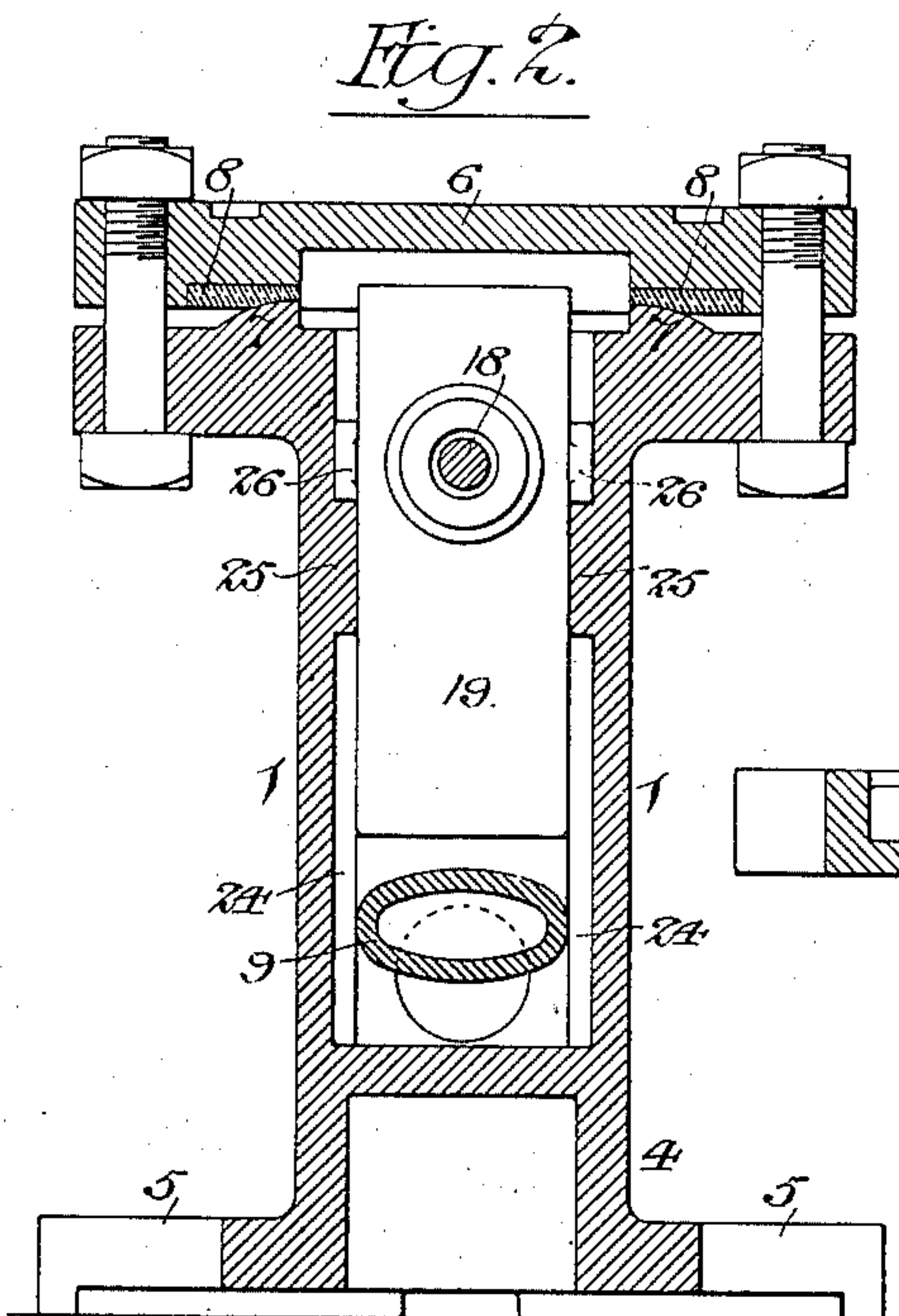
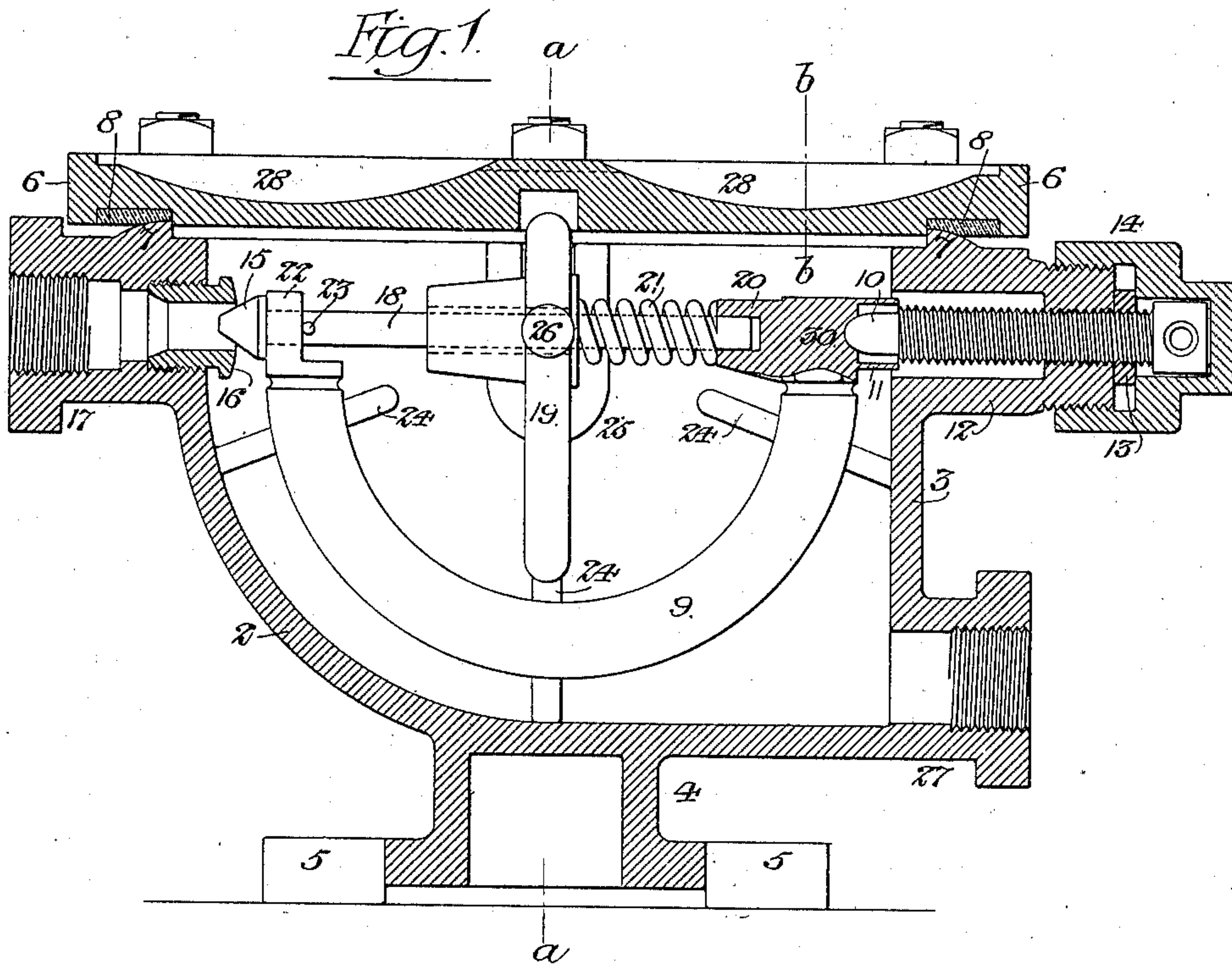
No. 652,562.

Patented June 26, 1900.

C. W. LYON.  
STEAM TRAP.

(Application filed Oct. 23, 1899.)

(No Model.)



*Witnesses:*  
*Charles Debow,*  
*John W. Whithead.*

*Inventor:-*  
*Charles W. Lyon,*  
*by his Attorneys:-*  
*Horton & Horton*



# UNITED STATES PATENT OFFICE.

CHARLES W. LYON, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO  
HIMSELF AND AARON E. CARPENTER, OF SAME PLACE.

## STEAM-TRAP.

SPECIFICATION forming part of Letters Patent No. 652,562, dated June 26, 1900.

Application filed October 23, 1899. Serial No. 734,558. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES W. LYON, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain  
5 Improvements in Steam-Traps, of which the following is a specification.

My invention relates to that class of steam-traps which contain an expansion vessel filled with fluid which is readily susceptible to ex-  
10 pansion and contraction by slight changes of temperature, the objects of my invention being to simplify and cheapen the construction of such a trap and to render it more efficient in action than usual.

15 In the accompanying drawings, Figure 1 is a vertical section of a steam-trap constructed in accordance with my invention. Fig. 2 is a transverse section of the same on the line *a a*, Fig. 1; and Fig. 3 is a transverse section  
20 on the line *b b*, Fig. 1.

The casing of the trap has opposite parallel sides 1, a rounded end 2, forming a quarter-circle, a straight end 3, and a stem or shank 4, which is expanded at the bottom, so as to  
25 form a foot 5, whereby the casing can be secured to any available support, the open end of the casing being furnished with a cap or cover 6, which is secured in place by suitable bolts and nuts or other equivalent fastenings.  
30 Surrounding the mouth or open end of the casing is a projecting rib 7, which has an abrupt shoulder at one side and a convex outer face bearing upon a rectangular packing-strip 8, contained in a recess of like shape  
35 formed in the inner side of the cap or cover 6, the purpose of this rib with abrupt shoulder and convex outer face, in connection with a rectangular packing-strip, being to concentrate the pressure upon a limited area of the  
40 latter at the junction of the abrupt and convex faces of the rib, so as to more readily form a tight joint, the convex-faced rib under a given amount of pressure indenting the packing-strip to a much greater extent than would  
45 a flat-faced rib, thereby preventing leakage due to inequalities in the surface of the rib. Hence I have found that with a rib of this character it is not necessary to plane the face of the rib in order to insure a tight joint, a  
50 rough finishing with a file being all that is necessary.

The curved expansion vessel 9 occupies the lower portion of the chamber within the casing of the trap and bears at one end against a set-screw 10, which is adapted to a threaded  
55 opening in the outer end of a hollow boss 12, which projects from the end 3 of the casing, a lock-nut 13 serving to secure the set-screw 10 in position after adjustment, and a cap 14, screwed onto the externally-threaded end of  
60 the boss 12, serving to protect and conceal the head of the set-screw 10, so as to prevent tampering with the same by ignorant or malicious persons, since a proper adjustment of this set-screw is necessary in order that the  
65 trap may best perform its intended function. The opposite end of the expansion vessel 9 bears upon a valve 15, which operates in conjunction with a valve-seat 16, screwed into the end 2 of the casing, said end having a  
70 projecting boss 17 internally threaded for the reception of the pipe which is to be trapped.

The valve 15 has a stem 18, which passes through a central opening in a bearing-plate 19 and rests at its opposite end in a boss 20,  
75 formed upon the head 30 of the expansion vessel 9, a spring 21 interposed between the plate 19 and the boss serving to keep said head 30 of the vessel 9 constantly in engagement with the end of the set-screw 10, so that  
80 the latter thus constitutes a fixed abutment for the expansion vessel, the expansion of the latter having the effect of closing the valve 15 against its seat, while the contraction of the vessel has the effect of withdrawing the  
85 valve from its seat, the head 22 of the vessel in that case acting upon a pin 23, which projects from the valve-stem 18. The head 30 of the expansion vessel also has a boss 11, which projects into the opening surrounding  
90 the set-screw 10, and thus prevents the expansion vessel from dropping down to the bottom of the casing 1 if the set-screw 10 should be inadvertently withdrawn to such  
95 an extent as to fail to engage with the boss 11.

The expansion vessel is maintained laterally in central position within the casing by means of internal ribs 24 on the opposite sides of said casing, and in addition to these ribs there are other internal ribs 25, which are  
100 slotted for the reception of trunnions 26 upon the plate 19, said slots extending to the upper



edges of the sides 1 of the casing, so that said plate 19, with the valve-stem and expansion vessel carried thereby, can be readily inserted into place in the casing and as readily withdrawn therefrom. Hence these parts can be properly fitted together outside of the casing, and the matter of assembling the parts of the trap is thereby materially facilitated, with consequent reduction in expense.

10 The end 3 of the casing has at the bottom a projecting boss 27, internally threaded for the reception of the drain-pipe, through which the water of condensation is discharged from the trap.

15 The cap or cover 6 of the casing has a recess 28 therein forming chambers or receptacles for cold water, the use of such cold water being resorted to when it is desired to effect the contraction of the vessel 9 more rapidly than would be possible under the normal conditions of working of the trap.

The rounding of the end 2 of the casing serves to contract the area of the chamber within the casing and insures the complete drainage of said chamber, the outlet 27 being at the lowest point of the chamber whether the casing is set horizontally or vertically.

25 The valve-seat 16 is detachable from the casing, so that in the event of its becoming worn it may be readily removed and a new seat substituted for it.

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

35 1. The combination in a steam-trap, of the casing, with the expansion vessel, a valve operated thereby, and a bearing-plate carrying said expansion vessel and valve, and removably seated in the casing, substantially as specified.

40 2. The combination, in a steam-trap, of the expansion vessel, the casing having an abutment for said expansion vessel, and a valve-seat, the valve and its stem, and a central bearing-plate having an opening for the reception of said valve-stem, said plate having

portions adapted to seats in the casing, and from which it is readily removable, substantially as specified.

3. The combination, in a steam-trap, of the expansion vessel, with the casing having an abutment for said vessel, and a valve-seat, the valve and its stem engaged by said expansion vessel, a bearing-plate having an opening for the reception of said stem, and having portions adapted to seats in the casing from which it is readily removable, and a spring interposed between said bearing-plate and that end of the expansion vessel which is in contact with the abutment in the casing, substantially as specified.

4. The combination, in a steam-trap, of the expansion vessel, with a casing having an abutment for said vessel, and a valve-seat, the valve and its stem engaged by said expansion vessel, a bearing-plate having an opening for the reception of said valve-stem and having trunnions at the sides, slotted internal ribs on the sides of the casing forming seats for said trunnions, and a spring interposed between the bearing-plate and that end of the expansion vessel which is in contact with the abutment in the casing, substantially as specified.

5. The combination in a steam-trap, of an expansion vessel of semicircular form, and a casing having a rounded end conforming to the shape of said expansion vessel and a flat bottom leading directly from said rounded end to the outlet, substantially as specified.

6. The combination in a steam-trap, of an expansion vessel, a valve operated thereby, and a casing having a cap or cover with water chambers or receptacles therein, substantially as specified.

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

CHARLES W. LYON.

Witnesses:

F. E. BECHTOLD,  
JOS. H. KLEIN.