

L. D. MAGER.  
FEED VALVE FOR STEAM BOILERS.  
APPLICATION FILED OCT. 12, 1908.

944,683.

Patented Dec. 28, 1909.

Fig. 1.

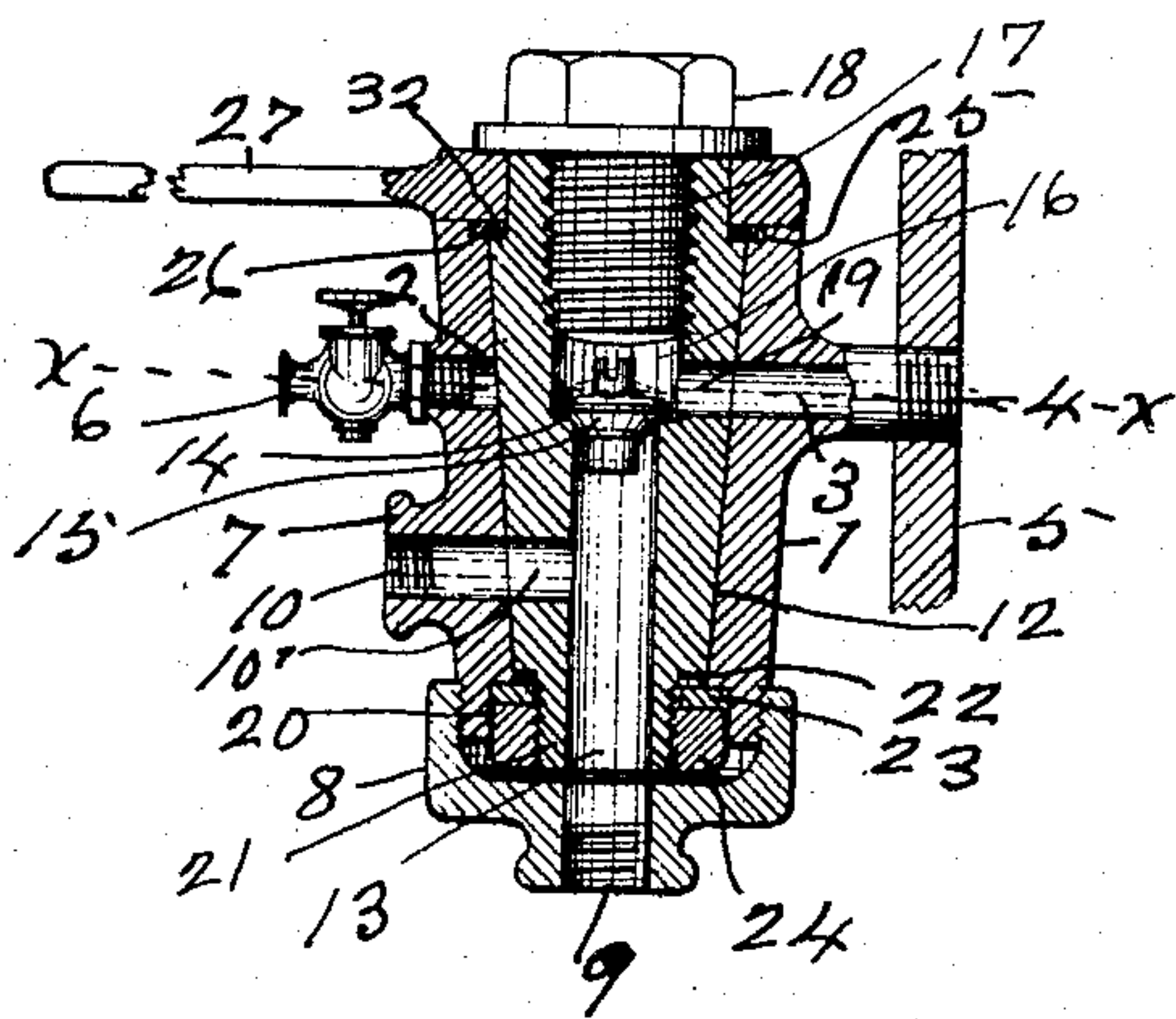


Fig. 2.

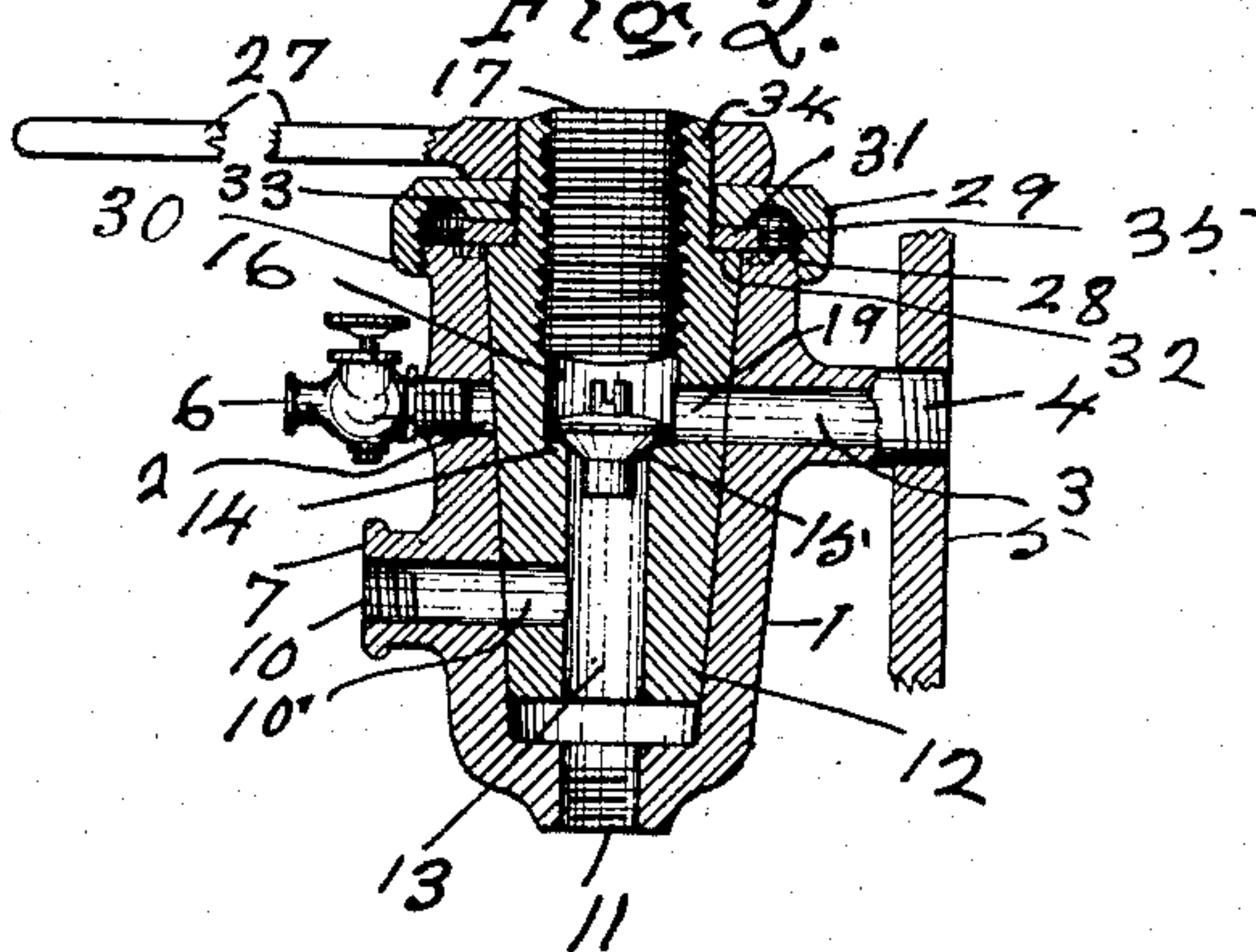


Fig. 3.

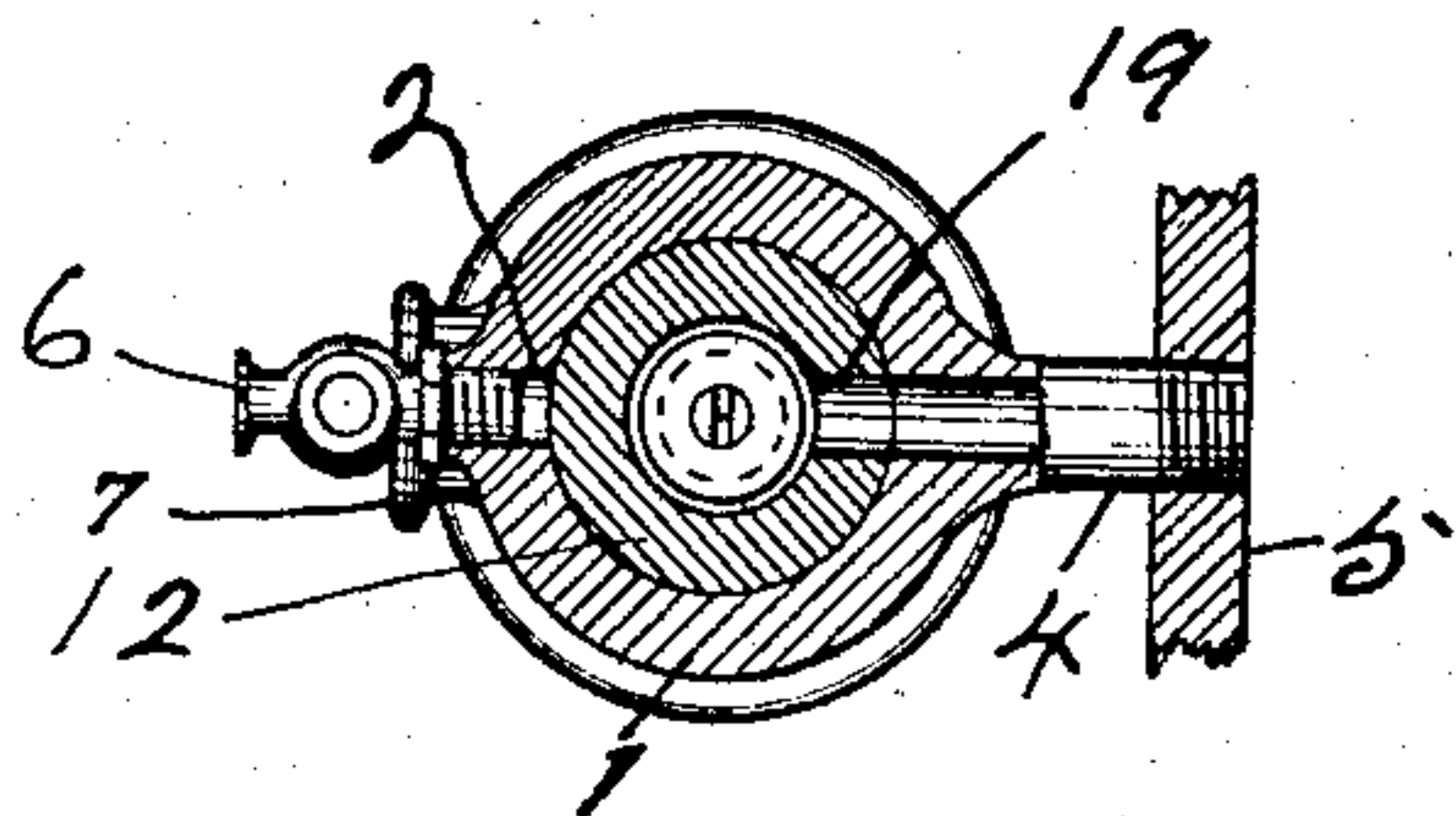


Fig. 4.

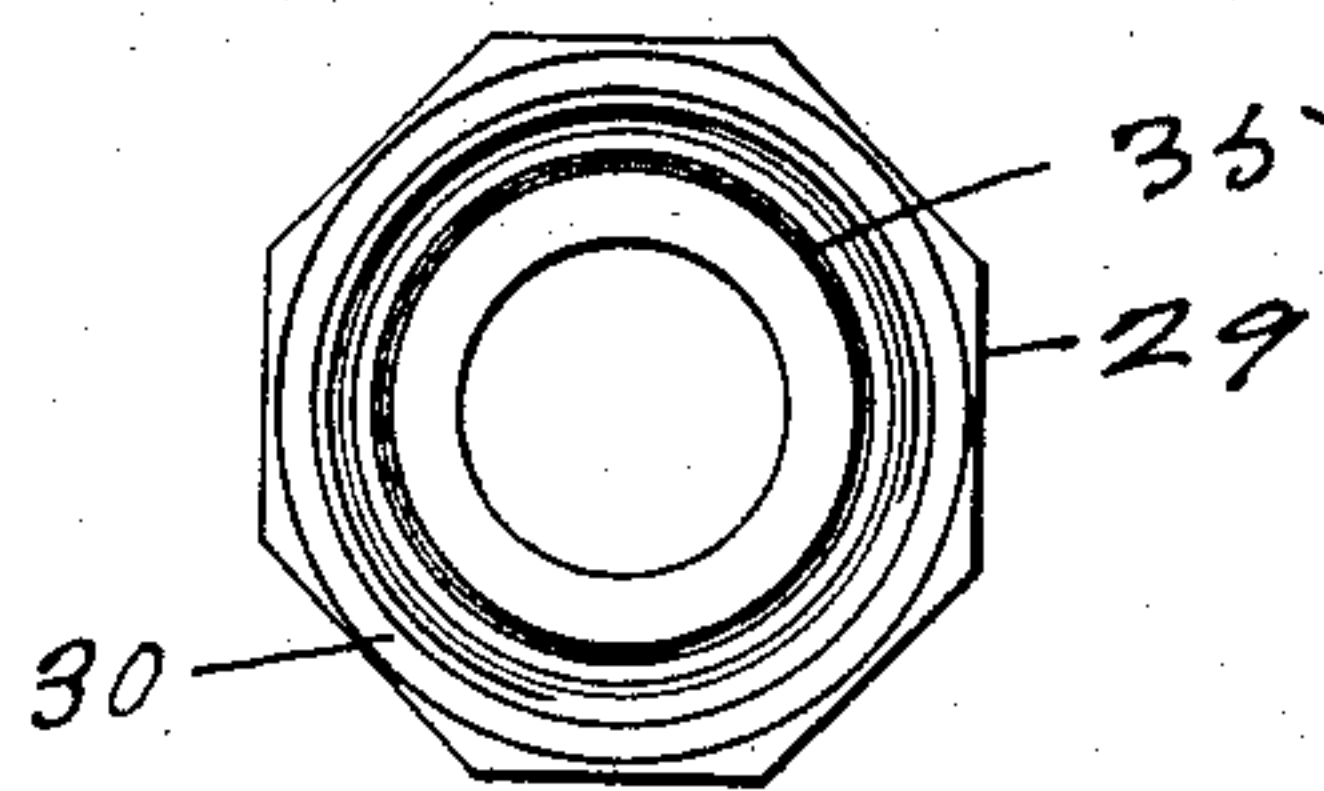


Fig. 5.

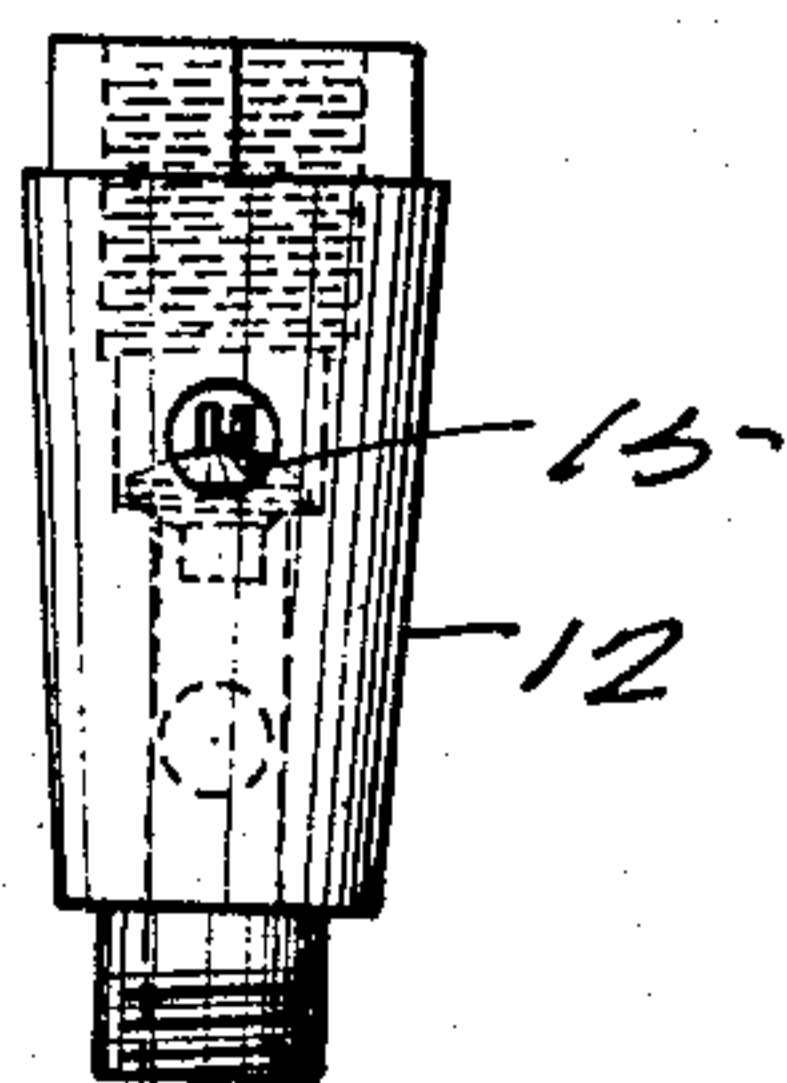
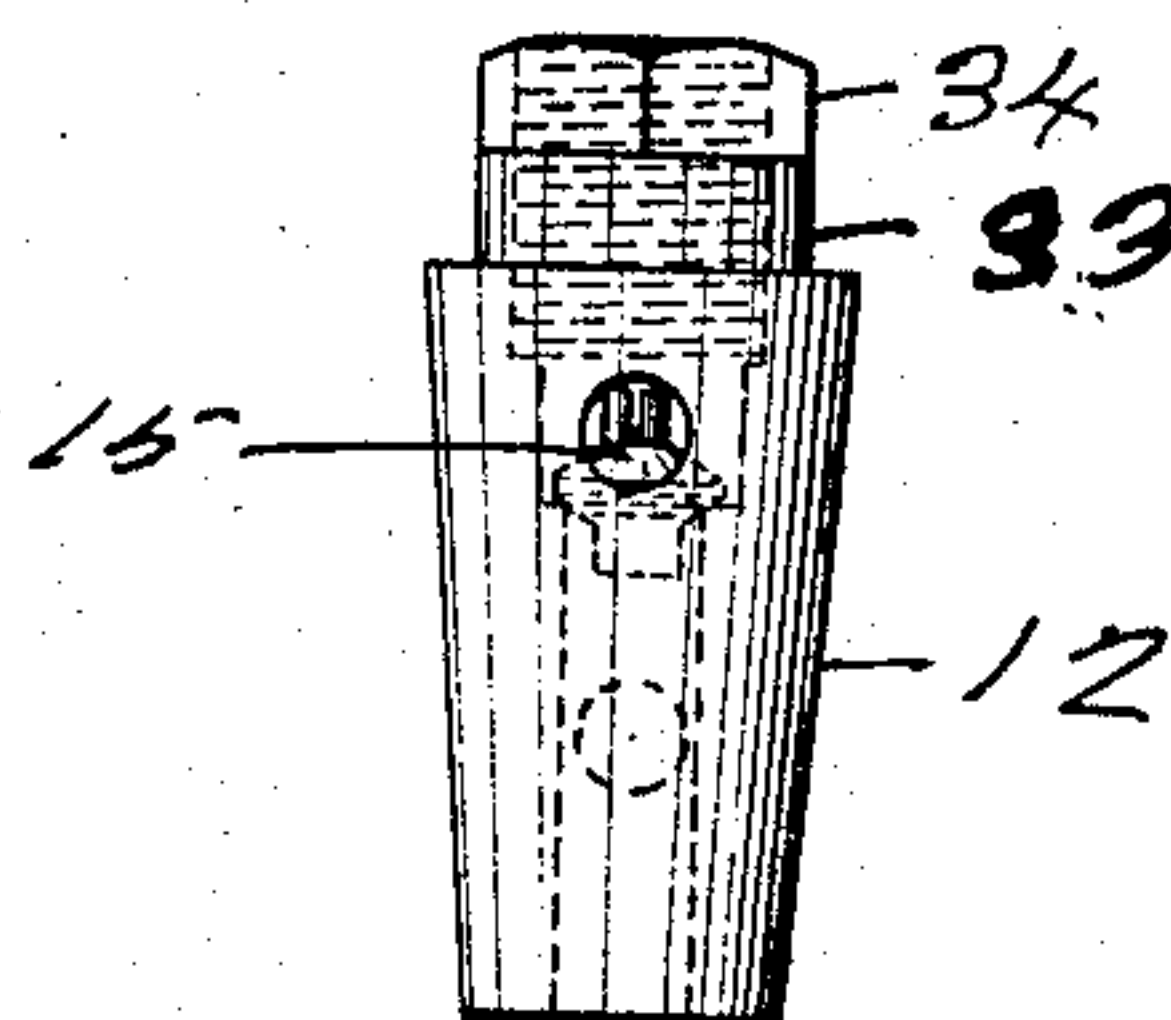


Fig. 6.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

LEO D. MAGER, OF GARRETT, INDIANA.

FEED-VALVE FOR STEAM-BOILERS.

944,683.

Specification of Letters Patent.

Patented Dec. 28, 1909.

Application filed October 12, 1908. Serial No. 457,238.

*To all whom it may concern:*

Be it known that I, LEO D. MAGER, a citizen of the United States, residing at Garrett, in the county of Dekalb, in the State of Indiana, have invented certain new and useful Improvements in Feed-Valves for Steam-Boilers; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to improvements in feed valves for steam boilers.

The object of my present invention is to provide a cheap, simple, efficient and convenient feed-valve in which the check valve can readily be removed for cleaning or repairs without any interference or the necessity of interfering with the cut-off valve, or with its connections with the steam boiler, and also without waiting for the boiler to cool.

My invention consists of a valve casing which in use is mounted in a suitable lateral opening in the boiler; a hollow cone-shaped cut-off valve rotatably mounted in the casing in vertical arrangement, and provided in its hollow interior with an annular check-valve seat; a check-valve loosely mounted in the hollow interior of the cut-off valve and normally seated on the said annular seat; and detachable means for limiting the upward movement of the check-valve under the impulse of the inflowing liquid.

The principal novel feature of my invention resides in the construction by which the check-valve can readily and conveniently be removed for cleaning or repairs, and then replaced without disturbing the cut-off valve or its connections with the boiler.

Another novel feature is the coöperative relation or combination of the try-cock with applicant's special form of cut-off valve.

Similar reference numerals indicate like parts throughout the several views of the drawings in which—

Figure 1 is a vertical central section of my invention showing its connection with the boiler, of which a sectional fragment is shown. Fig. 2 is a similar view of a slightly modified form of the same, showing a different

arrangement of the means for securing the cut-off valve in position. Fig. 3 is a cross-section of Fig. 1 on the line  $x-x$ , and Fig. 4 is a detail bottom plan of the screw-cap shown in Fig. 2. Fig. 5 is a detail of that form of cut-off valve shown in Fig. 1 and Fig. 6 is a detail of that form of cut-off valve shown in Fig. 2.

The valve casing 1 of suitable metal and in vertical arrangement and frusto-conical in contour, is open at its upper end and may have its lower end closed with a screw cap or not as desired, and has diametrically opposite radial openings 2 and 3, the latter of which openings has an externally screw-threaded boss 4 which is secured in a suitable opening in the boiler shell 5. A proper try-cock 6 is mounted in the outer end of the opening 2 by a screw-threaded connection, as shown. The casing 1 also has a lateral screw-threaded boss 7 into which one end of the feed pipe is secured when a horizontal feed is desired.

The open lower end of the casing 1 may be externally screw-threaded and surmounted by a screw-threaded cap 8, as shown in Fig. 1, having a concentric screw-threaded opening 9 in which one end of the water feed is secured when a vertical feed is desired in which case the opening 10 in the boss 7 is properly closed. Instead of employing the cap 8 the bottom of the casing 1 may be provided with a concentric screw-threaded opening 11 in which the adjacent end of the feed pipe is secured in a well understood manner.

In the casing 1 is rotatively mounted a conical cut-off valve 12 having a central longitudinal opening 13 the upper end of which is materially enlarged in cross-section. The lower end of this enlarged portion of the central opening 13 has a properly beveled annular valve seat 14 for the check valve 15 which is loosely mounted thereon and is normally maintained in position by gravity. The upper portion of the enlarged portion 16 of the central opening 13 is screw-threaded, and is closed by the removable screw-plug 17 which may have an integral cap 18, Fig. 1 if desired for the purpose hereafter described.

The valve 12 has a lateral opening 19 adapted to register with the opening 3 of the valve casing when the valve is open. This



opening 19 is arranged above the check-valve as shown. The valve 12 also has a lateral opening 10' adapted to register with the opening 10 in the casing 1 when the valve 12 is open.

As shown in Fig. 1, the valve casing has the inner face of its lower end provided with an annular recess as shown at 20, and the lower end of the valve 12 is reduced in cross section and externally screw-threaded as shown at 21. On this reduced portion 21 is loosely mounted a steam-tight packing ring 22, and a metal washer 23 adjacent to the said ring, and nut 24 which firmly secures the packing ring in position. As the washer 23 engages the upper end of the recess 20 it is evident that vertical displacement of the valve 12 under the pressure of the inflowing water is impossible in use. The inner face of the upper end of the valve casing has an annular recess at 25. The upper end of the valve 12 is slightly reduced in cross-section, and has a felt ring 26 thereon which also snugly fills the recess 25 and is kept saturated with oil, whereby it forms an automatic lubricating device for the valve 12. On this reduced upper end of the valve 12, which has angular sides, Fig. 5, is loosely mounted a proper detachable operating handle 27, which is secured in position thereon by the cap 18 of the screw plug 17. This handle 27 may be either fixed or integral if desired.

In Fig. 2 is shown a different arrangement of the means for securing the valve 12 against longitudinal displacement as follows: The outer face of the upper end of the valve casing 1 has a screw-threaded portion 28 to which is secured the screw-cap 29 by the engagement of its pendent internally screw-threaded flange 30 therewith. A metal washer 31 engages the shoulder 32 of the valve 12 and the oiling ring 26, and is held in position by means of the cap 29. In this modified form of the valve 12 the reduced portion of its upper end has a cylindrical portion 33, Fig. 6, to receive the washer 31 and the cap 29, and a terminal angular portion 34 to loosely receive the operating handle 27. The cap 29 has an annular recess adapted to receive the upper end of the valve casing when it is necessary to tighten up the cap 29 to compensate for wear on the valve 12.

The operation of my invention thus described is obvious and briefly stated is as follows: Assuming for example, that the horizontal feed is preferred the operator closes the vertical opening 9 in the cap 8 if he uses the form shown in Fig. 1, or he closes the opening 11 if he uses the form shown in Fig. 2, and then connects his feed pipe to the lateral opening 10. He then opens the cut-off valve by rotating the same,

by means of the handle 27, until the inlet opening 10 registers with the opening 10', and the opening 19 registers with the opening 3. The function and operation of the try valve 6 is too well understood to require any description as by opening the same the operator can see whether or not the valve 12 is leaking and needs regrinding or other attention. It is obvious that when it is desired to remove the check-valve 15 for cleaning, regrinding or repairs, the operator can readily do so by simply closing the cut-off valve 12 by rotating the same, and then unscrewing the plug 17, after which the check-valve can conveniently be lifted from its seat and removed, and that all this can be done without disturbing the connections of the cut-off valve with the boiler, and without waiting for the steam to go down or the boiler to cool which is a material saving of both time and labor. Of course, either the lateral openings 10 and 10' or the vertical openings 9 and 11 can be entirely omitted if desired, though I prefer the use of both.

Having thus described my invention and the manner of employing the same what I desire to secure by Letters Patent is:

1. In feed-valves for steam boilers, a vertical valve casing having an outlet port and one or more inlet ports; a frusto-conical cut-off valve rotatably mounted in the said casing, and having a central longitudinal opening, and provided with ports in register with the said valve casing ports; a check-valve loosely seated in the said longitudinal opening below the said outlet ports; means for securing the cut-off valve against vertical displacement; means for rotating the cut-off valve; removable means for closing the upper end of the said longitudinal opening; and a try-cock mounted in the valve casing in coöperative relation with the cut-off valve, as described.

2. A steam-boiler feed-valve consisting of a vertical valve casing having outlet and inlet ports; a try-valve fixed in a suitable opening in the casing and in coöperative relation with the cut-off valve; a cut-off valve rotatively mounted in the casing and having a longitudinal central opening, the upper portion of which is of enlarged diameter and partially screw-threaded, and provided with inlet and outlet ports in register with the casing ports respectively; an annular valve seat at the lower end of the enlarged portion of the said longitudinal opening; a check-valve loosely seated on the said valve seat; a screw-plug removably mounted in the said screw-threaded portion of the said longitudinal opening for limiting the upward movement of the check-valve; and means for securing the cut-off valve on its seat.

3. A valve casing having inlet and outlet ports; a conical cut-off valve loosely seated



in the casing, the said valve having a central longitudinal opening in communication with the valve-casing ports; an annular valve seat substantially midway of the said opening; a check-valve mounted on the said  
5 valve seat; removable means mounted in the upper end of the said opening for limiting the vertical play of the check-valve; a try-cock mounted in the valve casing in coöper-  
10 ative relation with the cut-off valve; and

means for firmly securing the cut-off valve upon its seat.

Signed by me at Garrett, Dekalb county, State of Indiana, this 7th day of October, 1908.

LEO D. MAGER.

Witnesses:

J. D. BRINKERHOFF,  
H. W. MOUNTZ.