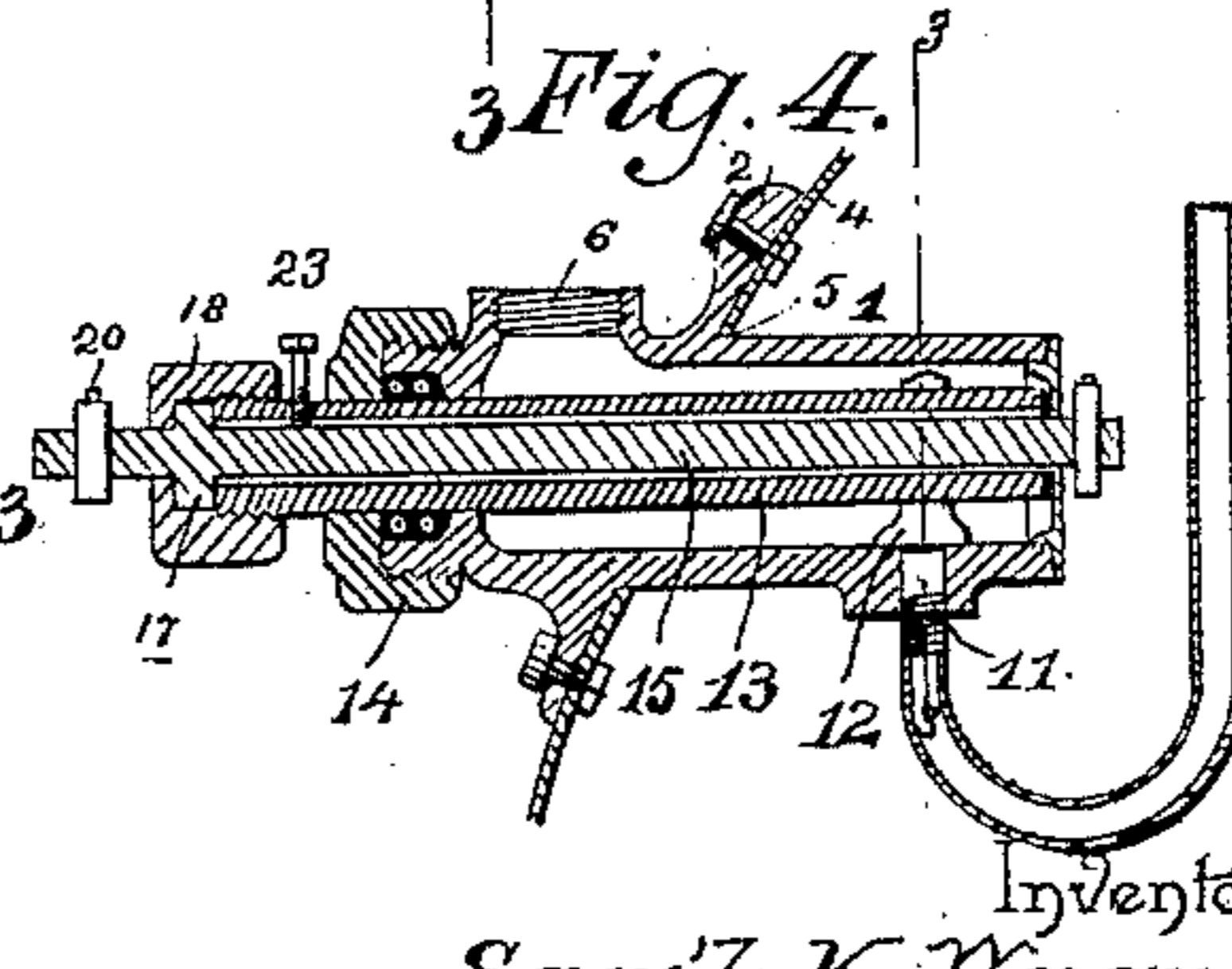
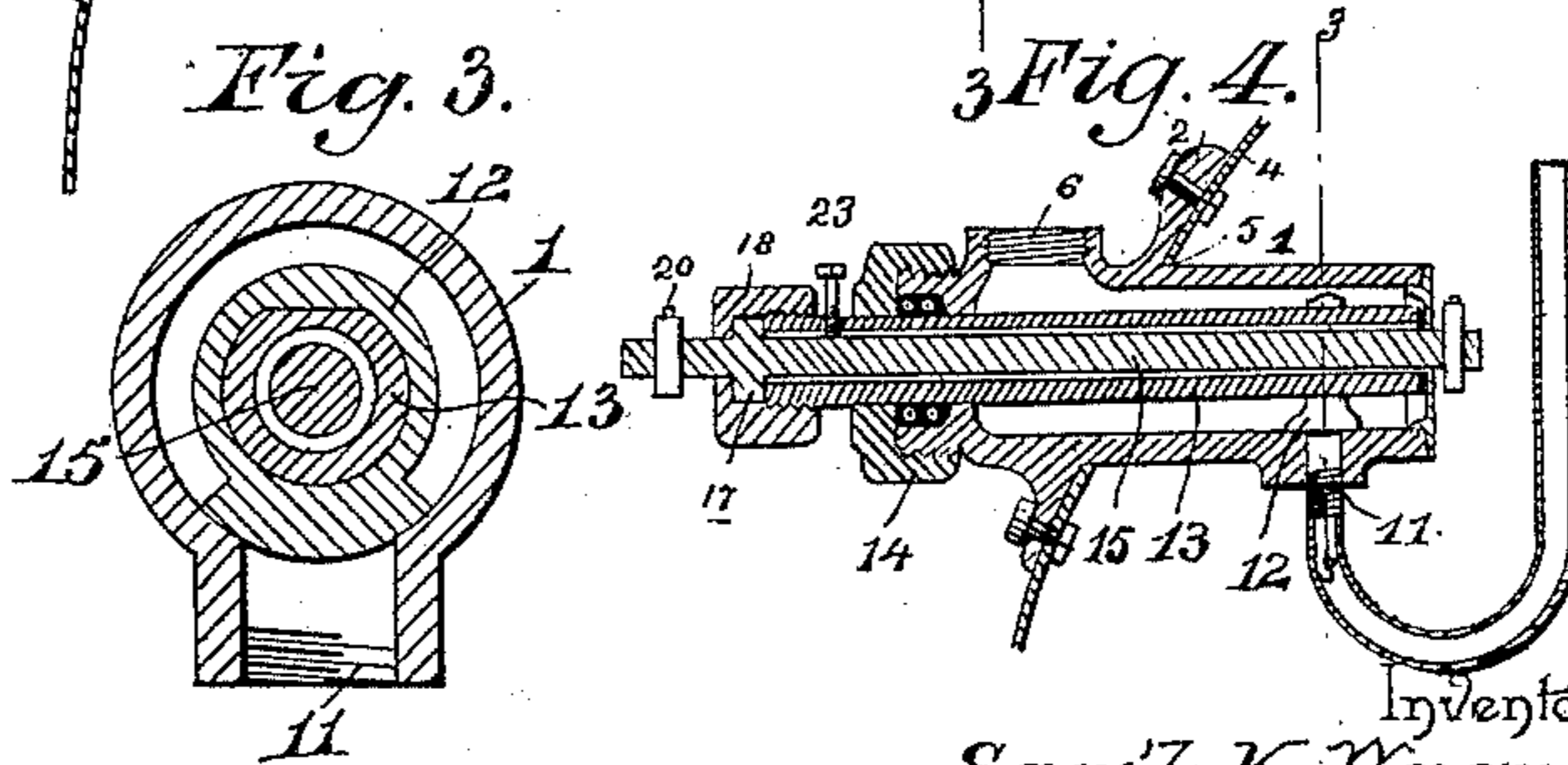
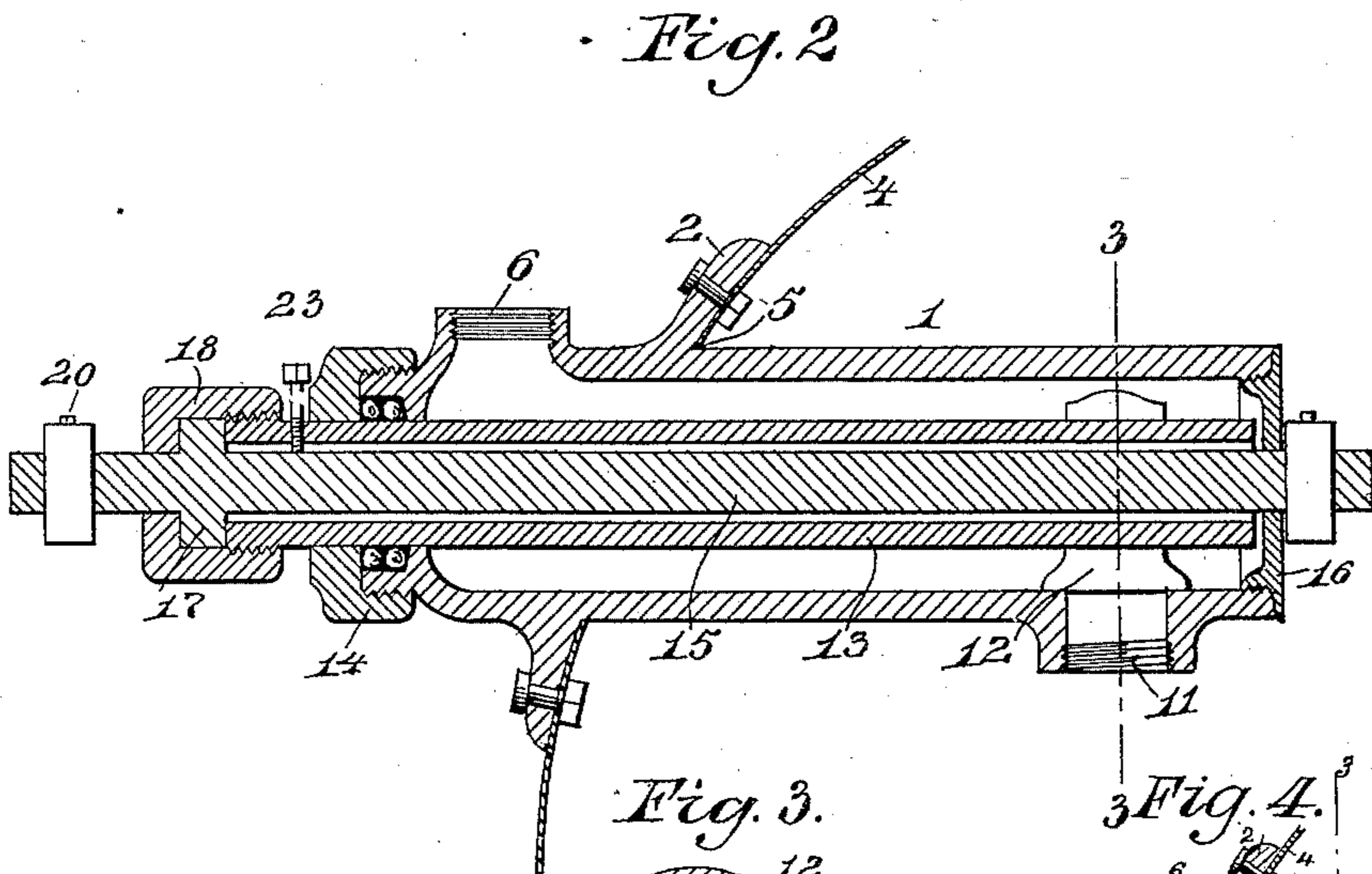
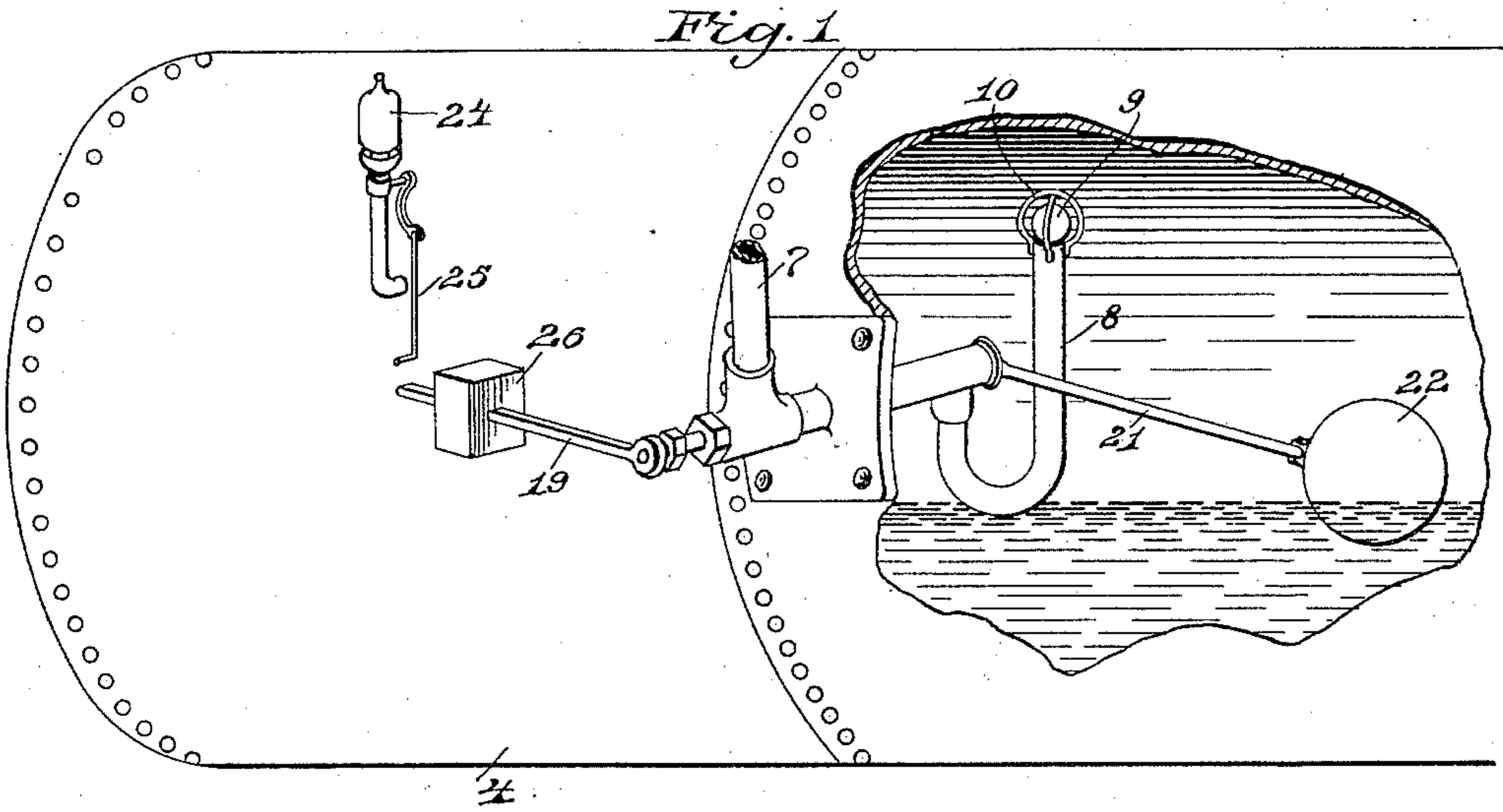


(No Model.)

S. K. WAGNER & H. T. BENNETT.  
FEED WATER REGULATOR.

No. 452,975.

Patented May 26, 1891.



Witnesses

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# UNITED STATES PATENT OFFICE.

SAMUEL K. WAGNER AND HARRY T. BENNETT, OF LATROBE,  
PENNSYLVANIA.

## FEED-WATER REGULATOR.

SPECIFICATION forming part of Letters Patent No. 452,975, dated May 26, 1891.

Application filed December 23, 1890. Serial No. 375,643. (No model.)

*To all whom it may concern:*

Be it known that we, SAMUEL K. WAGNER and HARRY T. BENNETT, citizens of the United States, residing at Latrobe, in the county of Westmoreland and State of Pennsylvania, have invented a new and useful Feed-Water Regulator, of which the following is a specification.

This invention relates to feed-water regulators for controlling and regulating the supply of feed-water to steam-boilers; and it has for its object to provide a device of this class which shall be simple in construction, by which the supply of feed-water shall be automatically regulated, and which shall be adapted to sound an alarm when for any reason the pump or injector shall fail to operate, thus causing the water to sink below the safety-line.

With these ends in view the invention consists in the improved construction, arrangement, and combination of parts, which will be hereinafter fully described, and particularly pointed out in the claims.

In the drawings hereto annexed, Figure 1 is a perspective view showing a boiler to which our invention has been applied, a portion of the boiler-casing having been broken away for the purpose of showing the construction more clearly. Fig. 2 is a vertical sectional view taken longitudinally through the stem carrying the valve, whereby the admission of feed-water is controlled. Fig. 3 is a sectional view taken on the line 3 3 in Fig. 2. Fig. 4 is a longitudinal vertical sectional view illustrating a modification, which consists in dispensing with the check-valve 9.

Like numerals of reference indicate like parts in all the figures.

1 designates a cylindrical tubular casing, which is provided near its outer end with flanges 2, by means of which it may be bolted upon the boiler 4, the side of which is provided with an opening 5 for the admission of the inner end of the casing 1. The latter is provided near its outer end with a screw-threaded flange opening 6, with which the feed-water-supply pipe 7 is to be connected. Near its inner end the casing 1 has a U-shaped pipe 8, at the upper end of which is

mounted a ball check-valve 9 confined within a suitable cage 10. The opening 11, which communicates with the U-shaped pipe 8, is ground to form a seat for a valve 12, which is mounted upon a tubular stem 13, the outer end of which extends through the outer end of the casing 1, which is provided with a packing-gland 14 to make a steam-tight joint.

15 designates a solid stem, which extends through the tubular stem 13 and through the plug of cap 16 at the inner end of the casing 1. The outer end of the stem 15 has an annular flange 17 bearing against the outer end of the tubular stem 13, with which it is connected by a cap-nut 18. The extreme outer end of the stem 15 extends through the nut 18 and is provided with an arm or lever 19, secured thereon by means of a set-screw 20. The inner end of the stem 15, which projects through the plug 16, carries an arm or lever 21, provided with a float 22. In addition to the nut 18 a set-screw 23 may be used for the purpose of connecting the stem 15 with the tubular stem 13.

23 designates an alarm-whistle suitably attached to the boiler, and the operating-lever of which has a depending rod 25 lying in the path of the arm or lever 19. The latter is provided with a counterbalance-weight 26, which is adjustably mounted thereon and which balances the float 22 so as to insure the easy operation of the device.

The operation and advantages of this invention will be readily understood from the foregoing description, taken in connection with the drawings hereto annexed. When the water in the boiler falls below the desired point the float sinks, thus causing the tubular stem 13, which is connected by the nut 18 with the stem 15, carrying the float, to rotate, thus operating the valve and admitting the feed-water through the pipe 7, casing 1, and pipe 8. The check-valve 9 prevents back-pressure. When the water rises in the boiler, the operation is reversed and the opening 11 is closed by the valve 12. When for any reason the water-feeding mechanism fails to operate and the water sinks below the safety-line, the arm or lever 19 will be raised far enough to strike the rod 25 and sound an

alarm. If the tubular stem carrying the valve 12 should become displaced, it may be readily adjusted by simply loosening the nut 18 and set-screw 23, (when the latter is used,) thus 5 permitting the tubular stem to be adjusted to any desired position with relation to the solid stem 15. In case repairs should be necessary the tubular stem carrying the valve 12 may be turned to such a position as to uncover the opening 11, and the supply of feed- 10 water may then be controlled by means of an ordinary globe-valve. Owing to this construction the tubular valve-carrying stem may also be readily adjusted with relation to 15 the float-carrying stem without removing the device from the boiler, so as to regulate the admission of feed-water at any desired point.

When desired, the check-valve 9 may be dispensed with, and the device may then be 20 used to regulate the outward passage of steam for the purpose of operating the water-feeding mechanism. This construction, as shown in Fig. 4, will involve no change in the general construction and operation of the device.

25 Having thus described our invention, what we claim is—

1. In a device of the class described, the combination of a tubular casing having openings near its inner and outer ends, a tubular 30 stem mounted in said casing and carrying a valve adapted to close one of said openings, a stem extending through and connected with said tubular stem, a lever mounted upon the said inner stem and carrying a float, and an 35 arm or lever mounted upon the outer end of said stem and carrying a counter-weight, substantially as set forth.

2. In a device of the class described, the combination of the tubular casing having 40 openings near its inner and outer ends, a tubular stem mounted in said casing and having a valve adapted to close one of said openings, a solid stem extending through the tubular stem or casing and having an arm carry- 45 ing a float, and means for adjustably connecting the said tubular with the said solid stem, substantially as set forth.

3. In a device of the class described, the combination of the tubular casing having 50 openings near its inner and outer ends, a tubu-

lar stem extending through the outer end of said casing and carrying a valve, a solid stem extending through the tubular stem or casing and having an annular flange or collar, a packing-gland, a cap-nut connecting the tubu- 55 lar stem adjustably with the solid stem, a float connected with the inner end of the latter, a weighted arm on the outer end of said solid stem, and an alarm-whistle having a depending operating-rod lying in the path of 60 said weighted arm, substantially as and for the purpose set forth.

4. In a device of the class described, the tubular casing having the openings near its inner and outer ends, in combination with the 65 tubular stem carrying a valve, a solid stem connected adjustably with said tubular stem and carrying a float and a counterweighted arm, and a U-shaped pipe connected with the opening at the inner end of the casing and 70 having a check-valve at its upper end, substantially as set forth.

5. In a device of the class described, the combination of the tubular casing having 75 openings near its inner and outer ends, the tubular stem mounted in the outer end of said casing and carrying a valve adapted to close one of the openings in the latter, a plug or cap at the inner end of said casing, a solid 80 stem extending through said tubular stem and through the plug or cap and provided near its outer end with an annular flange or collar bearing against the outer end of the tubular stem, the cap-nut connecting the solid 85 stem adjustably with the tubular stem, a lever mounted upon the inner end of the solid stem and carrying a float, and a counterweighted arm secured at the outer end of said solid stem, substantially as and for the purpose set 90 forth.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in presence of two witnesses.

SAMUEL K. WAGNER.

HARRY T. <sup>his</sup> × BENNETT.  
mark

Witnesses:

W. R. FORSYTHE,  
D. W. ULAM.