No. 787,327. PATENTED APR. 11, 1905.

G. H. DWORZEK.

DEVICE FOR AUTOMATICALLY REDUCING PRESSURE IN WATER PIPES.

APPLICATION FILED DEC 27, 1904.

FIG. 1

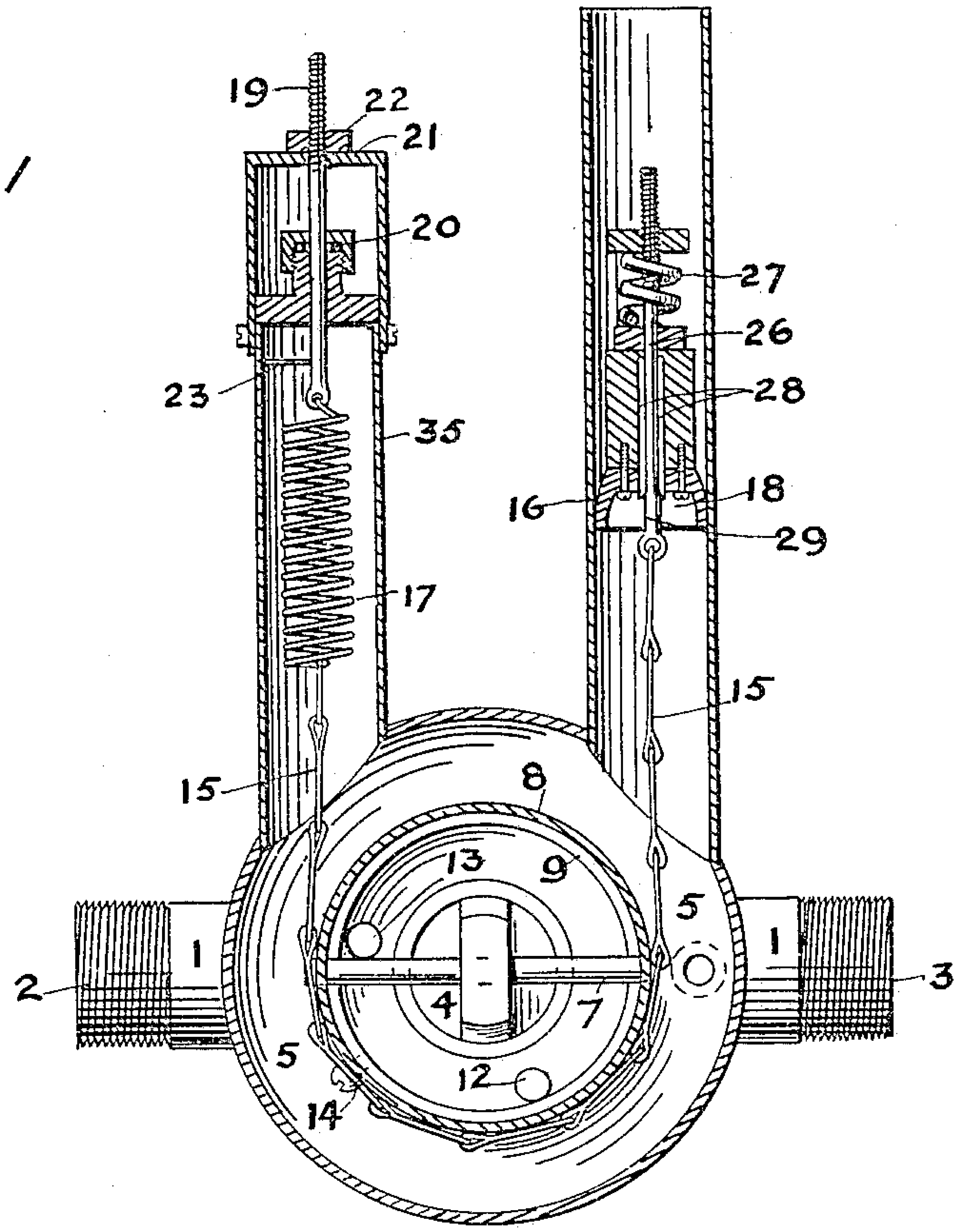
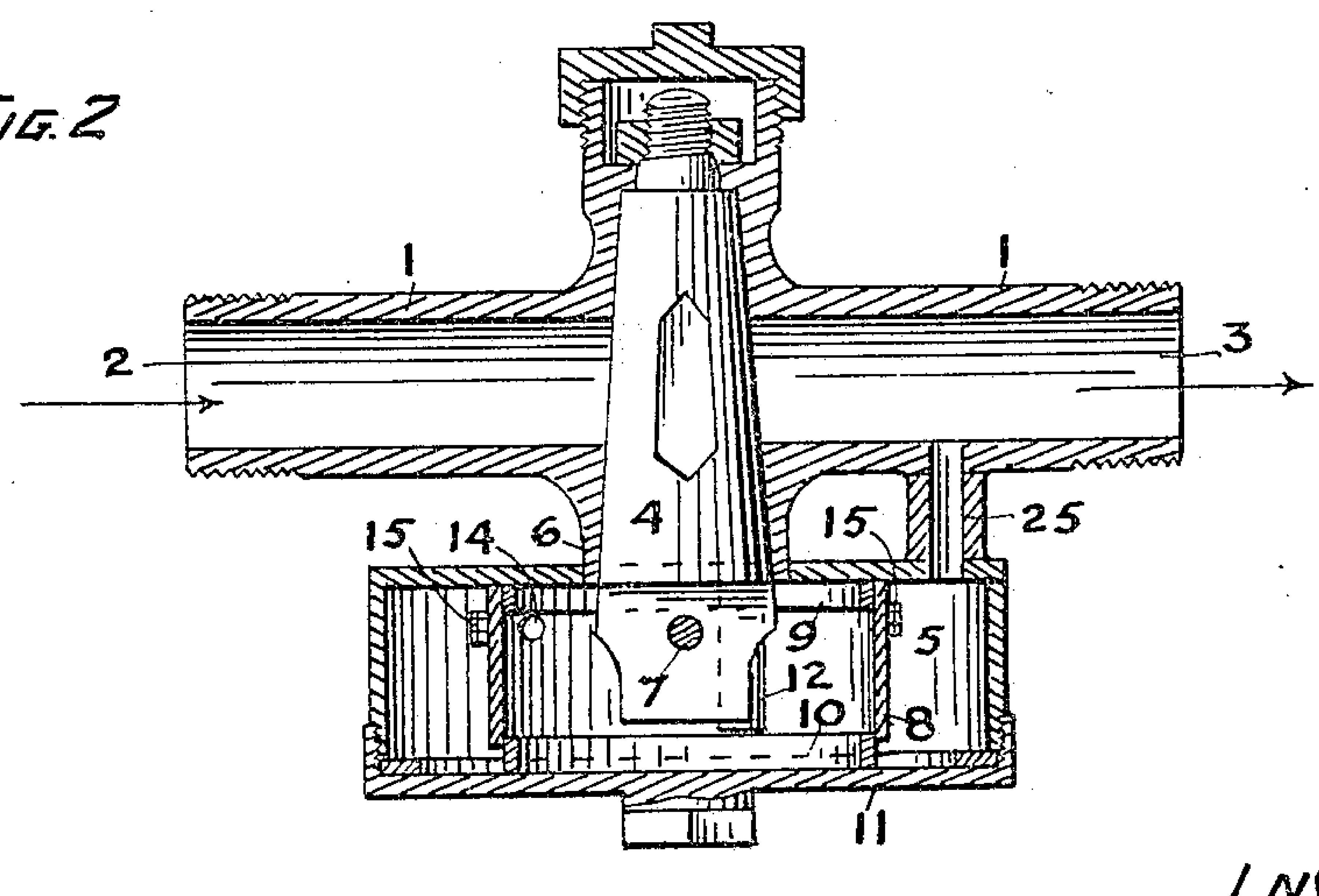


FIG. 2



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UNITED STATES PATENT OFFICE.

GUSTAVE H. DWORZEK, OF SAN FRANCISCO, CALIFORNIA.

DEVICE FOR AUTOMATICALLY REDUCING PRESSURE IN WATER-PIPES.

SPECIFICATION forming part of Letters Patent No. 787,327, dated April 11, 1905.

Application filed December 27, 1904. Serial No. 238,359.

To all whom it may concern:

Be it known that I, GUSTAVE H. DWORZEK, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Devices for Automatically Reducing Pressure in Water-Pipes, of which the following is a specification.

This invention relates to a device for reducing the pressure of water in passing to a boiler, and especially to a domestic boiler, it being frequently the case that the pressure in the city main is too high, so that the strain on the boiler is too great, whereby without a device of this character the boiler soon gives way under the long-continued high strain. With this device the pressure is automatically reduced to any magnitude which may be found adapted for the strength of the boiler and for the height in the building to which the water has to be raised from the boiler.

In the accompanying drawings, Figure 1 is a longitudinal vertical section of the device. Fig. 2 is a longitudinal horizontal section thereof.

Referring to the drawings, 1 represents a pipe having an inlet 2, adapted to be connected with a water supply and an outlet 3, adapted to be connected with the boiler. In said pipe is a rotary conical valve 4, the head of which extends into a chamber 5, secured upon the seat 6 for the valve, and through said head passes a bar 7, the ends of which pass through and are secured to a ring 8. Said ring oscillates in the chamber with the valve, being guided by an annular flange or guide 9, secured to the wall of the chamber, and also a second annular flange or guide 10, secured to the cap 11, which is screwed upon the rim of said annular chamber, both of said guides being within the ring. From the wall of said chamber extend posts 12 13, which limit the movement of the bar, and therefore of the valve. To said ring is attached, as shown at 14, a chain 15, which passes around the ring, its ends passing into two upstanding tubes 16, forming extensions from the chamber. One end of the chain is attached to a spring 17 in the tube 15 and the other end of the chain is connected indirectly (as will be presently described) with a plunger 18 in the tube 16. The upper end of said spring is attached to an adjusting-rod 19, which passes through the head of the tube and through suitable packing 20 at said head and then passes through a bridge 21, secured upon the end of the tube, said rod being threaded at its end and there being a nut 22 upon said threaded end. By turning said nut the rod can be moved in or out, and thus the spring can be adjusted, and in order to prevent said rod turning with the nut it is provided with a finger 23, which engages a vertically-grooved thickened portion 24 of the tube near the top thereof.

The chamber 5 being connected with the pipe 1 by means of a short pipe or conduit 25, when the water is first turned on from the main and flowsi nto the boiler part of the water also flows into the chamber 5, filling the same and also filling the tubular extensions, and when the boiler is filled the pressure immediately begin to rise in the chamber and the water forces the plunger upward in the tube 16 against the tension of the spring 17, thereby turning the valve 4 and reducing the size of the aperture therethrough, and thus reducing the pressure. The parts may be so arranged that the pressure may be kept down to any desired magnitude by closing the valve entirely when the pressure passes that magnitude. Then as soon as water is drawn off from the boiler, so that the pressure falls, the valve is opened, admitting water until the desired pressure is again reached.

I also provide an overflow or safety device which permits the water to overflow when the pressure in the boiler is excessive, since the boiler is then not connected with the city main and there would be no escape for the pressure. For this purpose the plunger is not attached directly to the chain 15, but slides on a rod 26 and presses against a coiled spring 27, passing around said rod and supported by the upper end of the rod. When the pressure in the boiler is excessive, the water compresses the short coiled spring 27 and causes the plunger 18 to slide upward on the rod 26. It thereby permits water to escape along channels 28, which were heretofore closed by the thickened lower portion 29 of the rod. When

the water escapes, the pressure is reduced and the plunger returns to its former position under the action of the spring 27.

It will be seen that the device may be adjusted to any degree of pressure by increasing or diminishing the tension of the spring 17, also that it takes up little room and can readily be interposed in the pipe leading to the boiler.

I claim—

1. A device of the character described, comprising a pipe having an inlet and an outlet, a valve therebetween, a chamber connected with the pipe between the valve and outlet, a tubular extension from said chamber, a plunger therein, a ring in said chamber attached to said valve, a chain around said ring attached thereto and to the plunger, and a spring resisting the turning of the ring by said plunger, substantially as described.

2. A device of the character described, comprising a pipe having an inlet and an outlet, a valve therein, a chamber connected with the pipe between the valve and outlet, tubular extensions from said chamber, a ring in said chamber attached to said valve, a plunger in one of said extensions, a chain attaching said plunger to said ring, and a spring in the other extension also attached by a chain to said ring, substantially as described.

3. A device of the character described, comprising a pipe having an inlet and an outlet, a valve therein, a chamber connected with the pipe between the valve and outlet, tubular extensions from said chamber, a ring in said chamber attached to said valve, a plunger in one of said extensions, a chain attaching said plunger to said ring, a spring in the other extension also attached by a chain to said ring, and means for adjusting the tension of said spring, substantially as described.

4. A device of the character described, comprising a pipe having an inlet and an outlet, a valve therein, a chamber connected with the pipe between the valve and outlet, tubular extensions from said chamber, a ring in said chamber attached to said valve, a plunger in one of said extensions, a chain yieldably attaching said plunger to said ring, and a spring in the other extension also attached by a chain to said ring, substantially as described.

5. A device of the character described, comprising a pipe having an inlet and an outlet, a valve therebetween, a chamber connected with said pipe between said valve and outlet and having tubular extensions, a ring in said chamber connected with the valve, a plunger in one of said extensions, a rod passing through said plunger, the plunger having overflow-channels around the rod, a spring interposed between said plunger and a stop upon the rod, a chain connecting said rod and ring, and a spring in the outer extension also connected by a chain with said ring, substantially as described.

In witness whereof I have hereunto set my hand in the presence of two subscribing witnesses.

GUSTAVE H. DWORZEK.

Witnesses:

FRANCIS M. WRIGHT,

BESSIE GORFINKEL.