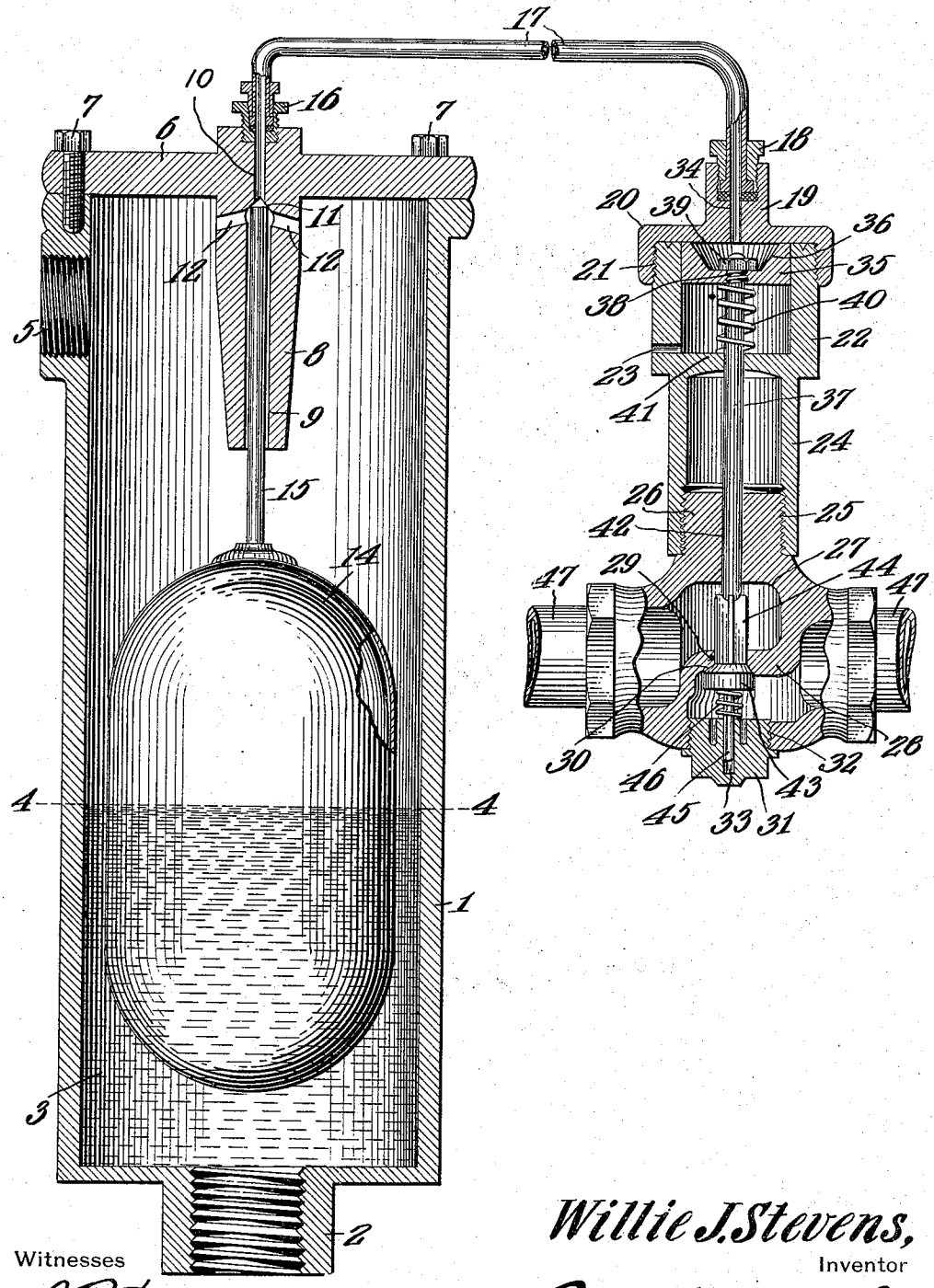
W. J. STEVENS.

BOILER FEED WATER REGULATOR.

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1,156,941. Patented Oct. 19, 1915.



Witnesses

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WILLIE JUDSON STEVENS, OF PORTLAND, MAINE, ASSIGNOR TO STEVENS REGULATOR CO., OF PORTLAND, MAINE.

BOILER FEED-WATER REGULATOR.

1,156,941. Specification of Letters Patent. Patented Oct. 19, 1915.

Application filed August 24, 1914. Serial No. 858,381.

To all whom it may concern:

Be it known that I, WILLIE JUDSON STEVENS, a citizen of the United States, residing at Portland, in the county of Cumberland and State of Maine, have invented a new and useful Boiler Feed-Water Regulator, of which the following is a specification.

The device forming the subject matter of this application is a boiler feed water regulator, and one object of the present invention is to provide novel means for admitting steam into the pipe which forms a connection between the float tank and the valve casing.

Another object of the invention is to improve the construction of the valve and the fluid pressure cylinder and the piston which controls the movements of the valve.

It is within the scope of the invention to improve generally and to enhance the utility of, devices of that type to which the present invention appertains.

With the above and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

The invention is illustrated in a single sectional figure, wherein sundry parts appear in elevation.

In carrying out the invention there is provided a tank 1 equipped adjacent its lower end with a water inlet 2, the water 3 in the tank 1 standing at a level indicated by the line 4—4 which line represents the height of the water in the boiler (not shown.) The tank 1 is provided with a steam inlet 5 at one side and adjacent its upper end, and a closure 6 for the tank 1 is provided, the closure 6 being held in place by means of lag screws 7 or in any other suitable manner. The closure 6 is provided with an inwardly projecting sleeve 8 having a bore 9 prolonged as indicated at 10 to extend through the closure 6, there being a seat 11 formed in the intermediate portion of the bore 9, and the sleeve 8 having steam inlets 12 which form communications between the bore 9 and the interior of the tank 1.

Mounted in the tank 1 is a float 14 having a stem 15 which is slidably received in the bore 9 of the sleeve 8 and is guided thereby, the upper end of the stem 15 coöperating with the seat 11 to cut off the steam inlets 12.

Connected with inclosure 6 is a gland 16 holding one end of a pipe 17, the other end of the pipe 17 being connected by means of a gland 18 with a neck 19 constituting a part of a cap 20, the neck 19 being provided with a bore indicated at 34.

The cap 20 constitutes a part of the mechanism for controlling the admission valve hereinafter described, and with this end in view, the cap 20 is threaded as indicated at 21 upon a cylinder 22 provided with a bleed port 23, the cylinder 22 including an extension 24 threaded as indicated at 25 to a nipple 26 formed upon a valve casing 27 having an intermediate diaphragm 28 equipped with an opening 29, there being a valve seat 30 in the diaphragm 28 at the lower end of the opening 29. A plug 31 is threaded into the bottom of the valve casing 27, as shown at 32, the plug 31 having an axial passage 33. A piston structure operates in the cylinder 22, the piston structure comprising a piston head 35, having a concavity 36 in its upper face. A valve stem 37 is threaded into the head 35 as indicated at 38 and may be held in place for adjustment by means of a nut 39. A compression spring 40 abuts against the lower face of the piston head 35 and against the upper face of the bottom 41 of the cylinder 22. The valve stem 37 is slidably received in the bottom 41 of the cylinder 22 and is guided thereby, the stem 37 being slidably received in and guided by the bore 42 of the nipple 26. Secured to the valve stem 37 is a valve 43 which is upwardly movable to register in the seat 30 of the diaphragm 28, the valve having the usual wings 44, serving to guide the valve, but permitting the fluid to pass through the opening 29 when the valve is depressed. The lower end 45 of the stem 37 is reduced in diameter and is slidably received in the axial passage 33 of the plug 31. A compression spring 46 surrounds the lower end 45 of the valve stem and abuts against the plug 31 and the valve 43.

Pipes 47 communicate with the ends of the valve casing 27. These pipes 47 may be a part of the water supply system for the

boiler, or they may represent the steam supply pipes which lead to the pump (not shown).

In practical operation, as the level of the water in the tank 1 falls, the float 14 will move downwardly, carrying the stem 15 downwardly, so that the upper end of the stem no longer coöperates with the seat 11 which is formed in the sleeve 8. Thereupon steam which is within the tank 1 will pass through the steam inlets 12 and enter the pipe 17 by way of the part 10 of the bore of the sleeve 8, the steam being admitted from the pipe 17 upon top of the piston head 35, the concavity indicated at 26 serving to afford sufficient pressure area upon the piston head. When the piston head 35 is thus subjected to fluid pressure, the stem 37 will be forced downwardly, moving the valve 43 off the seat 30 in the diaphragm 28, and thus a passage will be established through the valve casing 27. By the operation above described, the springs 40 and 46 will be put under compression, and so soon as the water has risen sufficiently in the tank 1, the stem 15, coöperating with the seat 11 will cut off the fluid pressure pipe 17. Owing to condensation in the pipe 17 and under the assisting action of the compression springs 46 and 40, the stem 37 will move upwardly and the valve 43 will engage again in the seat 30.

It is to be observed that the piston head 35 abuts against the cap 20 simultaneously with the engagement between the valve 43 and the seat 30. The utility of this operation resides in the fact that there is no tendency for the valve 43 to be strained or broken off, should the same close somewhat abruptly. The position of the piston head 35 on the stem 37 may be adjusted because, as indicated at 38, the head is threaded on the stem, the head being held in adjusted positions on the stem by means of the nut 39. This operation permits the head 39 to be adjusted with respect to the valve 43 so that when the head 35 is in abutment with the cap 20, the valve 43 will be engaged with the seat 30.

It is to be observed that the plug 31 exercises three functions. First, it constitutes means whereby the valve casing 27 may be opened, to effect a grinding up or a cleaning of the seat 30; secondly, it constitutes a guide for the lower end 45 of the valve stem 37; and third, it constitutes means whereby the tension of the spring may be adjusted.

Having thus described the invention, what is claimed is:—

In boiler feed water regulator, a valve casing having a seat; a cylinder comprising a cross wall; a cap on the cylinder and provided with a fluid pressure inlet; a stem slidable in the cross wall; a valve on the stem and coöperating with the seat; a primary spring coacting with the valve and the casing to hold the valve seated; a head on the stem, one end face of the head bearing against the cap and the periphery of the head being engaged slidably with the cylinder, the cap having a concavity into which the inlet opens when said end face of the head is in contact with the cap, the head being adjustable longitudinally of the stem to permit the head to abut against the cap when the valve coöperates with the seat, thereby to reduce the strain on the valve; a securing means adjustable on the stem and engaging the head to hold the head against longitudinal movement on the stem in the direction of the cap, the securing means being housed in the concavity whereby said end of the head may abut against the cap; and a secondary spring engaging both the head and the cross wall, the secondary spring constituting an assisting means for the primary spring and constituting also means for holding the head against movement on the stem in the direction of the cross wall.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

WILLIE JUDSON STEVENS.

Witnesses:
DENNIS W. SEXTON,
JAMES NITTON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."