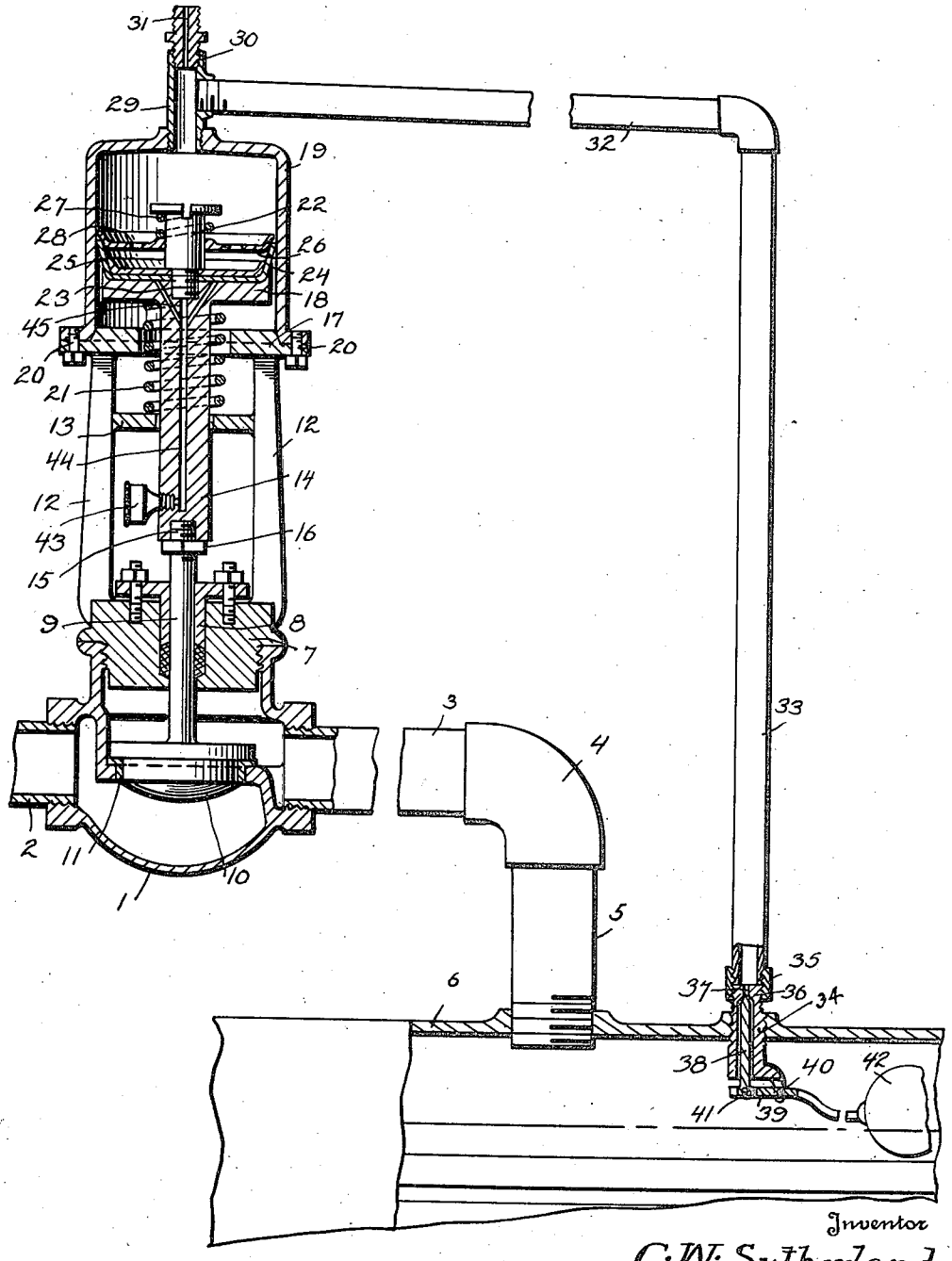
C. W. SUTHERLAND.

FEED WATER REGULATOR.

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1,209,355. Patented Dec. 19, 1916.



Inventor

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Witnesses

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CHARLES W. SUTHERLAND, OF CHARLEROI, PENNSYLVANIA.

FEED-WATER REGULATOR.

1,209,355. Specification of Letters Patent. Patented Dec. 19, 1916.

Application filed February 17, 1915. Serial No. 8,865.

To all whom it may concern:

Be it known that I, CHARLES W. SUTHERLAND, a citizen of the United States, residing at Charleroi, in the county of Washington and State of Pennsylvania, have invented certain new and useful Improvements in Feed-Water Regulators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to feed water regulators for steam boilers, and the principal object of the invention is to provide a device of comparatively simple construction which will maintain a uniform water level in the boiler and which will operate automatically.

The foregoing and other objects may be attained by means of the construction illustrated in the accompanying drawing, in which the figure is a vertical sectional view and partial elevation of a feed water regulator made in accordance with this invention and shown broken away in part.

Referring to the drawing, the numeral 1 designates a globe valve casing, having a water supply pipe 2 connected at one side thereof and a discharge pipe 3 connected to the opposite side and leading through an elbow 4 and branch pipe 5 to a steam boiler 6.

Connected to the upper end of the valve casing 1 is a stuffing box or plug 7, and a gland 8 through the plug 7 provides a steam tight joint for the valve stem 9 of a suitable valve head 10. The valve head is seated against a suitable seat 11. Connected to the upper end of the plug or stuffing box 7 are vertical members 12 forming an open cage having integral guide members 13. The stem 9 is adjustably connected to a valve stem by means of the threaded end 15 of the stem 9 extending in a threaded socket at the lower end of the piston-stem 14, a lock nut 16 holds the stems 9 and 14 in adjusted position. The stem 14 extends through the guides 13 and through a plate 17 connected to the upper ends of the arms 12. The stem 14 is provided with a valve head 18 at its upper end, and said valve head is mounted in a casing 19 supported upon the plate 17 and secured thereto by bolts 20. A spiral spring 21 bears at its upper end against the head 18, while its lower end is seated on the guide members 13, and the stress of the spring 21 is exerted to lift the head 18 and hence the valve head 10 from its seat to permit a flow of water through the supply pipe 2 into the boiler. The casing 19 forms a cylinder for a piston head comprising a stud 22 having a reduced end 23 mounted in the valve head 18, and a washer 24 forms a packing for the piston head, and is turned up around its periphery as shown in the drawing to bear against the inner wall of the cylinder or casing 19. A metal washer 25 is mounted on top of the packing 24, and a sliding cap 26 is connected to the stud 22 and forced down against the outer edges of the packing 24 by means of a spring 27. The cap 26 is provided with small openings 28 for the passage of steam to assist in making a steam tight packing for the piston head. At the upper end of the cylinder or casing 19 is a tube 29, having a vent tube 30 in its upper end, said tube being provided with a small bore 31.

A small tube 32 is connected to the tube 29 and extends down through a branch tube 33 to a valve casing 34, said valve casing being threaded in a boiler shell and connected to the tube 33 by a threaded collar 35. A valve seat 36, having a small duct 37 is disposed in the valve casing 34, and a needle valve 38 is mounted in the casing 34, the lower end of the valve being connected inside the boiler to a float rod 39, said rod being pivoted at 40 to lugs on the valve casing and connected by a pivot 41 to the needle valve 38. The float rod 39 carries a ball float 42.

An oil cup 43 of force feed type, is mounted in the valve stem 14, and said stem is provided with an oil duct 44 leading through branch passages 45 to the top of the valve head 18, from which the oil is forced out against the inner walls of the cylinder 19 to keep the same properly lubricated.

The operation of the invention may be briefly described as follows: When the water in the boiler 6 is low, the valve 10 is unseated and the water flows from the supply pipe 2 into the discharge pipe 3 and from thence to the boiler. As the float 42 rises the needle valve 38 is unseated and steam will pass up through the pipe 33 into the pipe 32 and from thence into the tube 29, and the force of the steam will reseat the valve 10 against the stress of the spring 21.

From the foregoing it will be obvious that a feed water regulator made in accordance with this invention will operate efficiently to maintain a uniform water level.

Various changes may be made in the details of construction without departing from the spirit and scope of the invention as defined in the claim.

What is claimed is:—

A device of the character set forth comprising a valve casing, a valve mounted therein, a plurality of vertical members secured to the casing, guide members formed on said vertical members, a plate secured to the upper ends of the vertical members and having an opening therein, a cylinder detachably secured to the plate, a piston stem slidable in the plate and guide members, means for adjustably securing the piston stem to the valve, a piston head on said piston stem and located within the cylinder, a washer on said piston head and having its periphery turned upwardly into an engagement with the wall of the cylinder, a metal washer on said washer, a stud extending through the washers and into the piston head, a sliding cap on said stud engaging the upturned peripheral portion of said washer, a spring on the stud for forcing the cap downwardly to hold the said peripheral portion of the washer in engagement with the wall of the cylinder, a spring acting on said piston for unseating the valve, and means for admitting pressure into the cylinder to act on the piston to seat the valve.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES W. SUTHERLAND.

Witnesses:
GEO. W. RISBECK,
ELROY C. HARRIS.