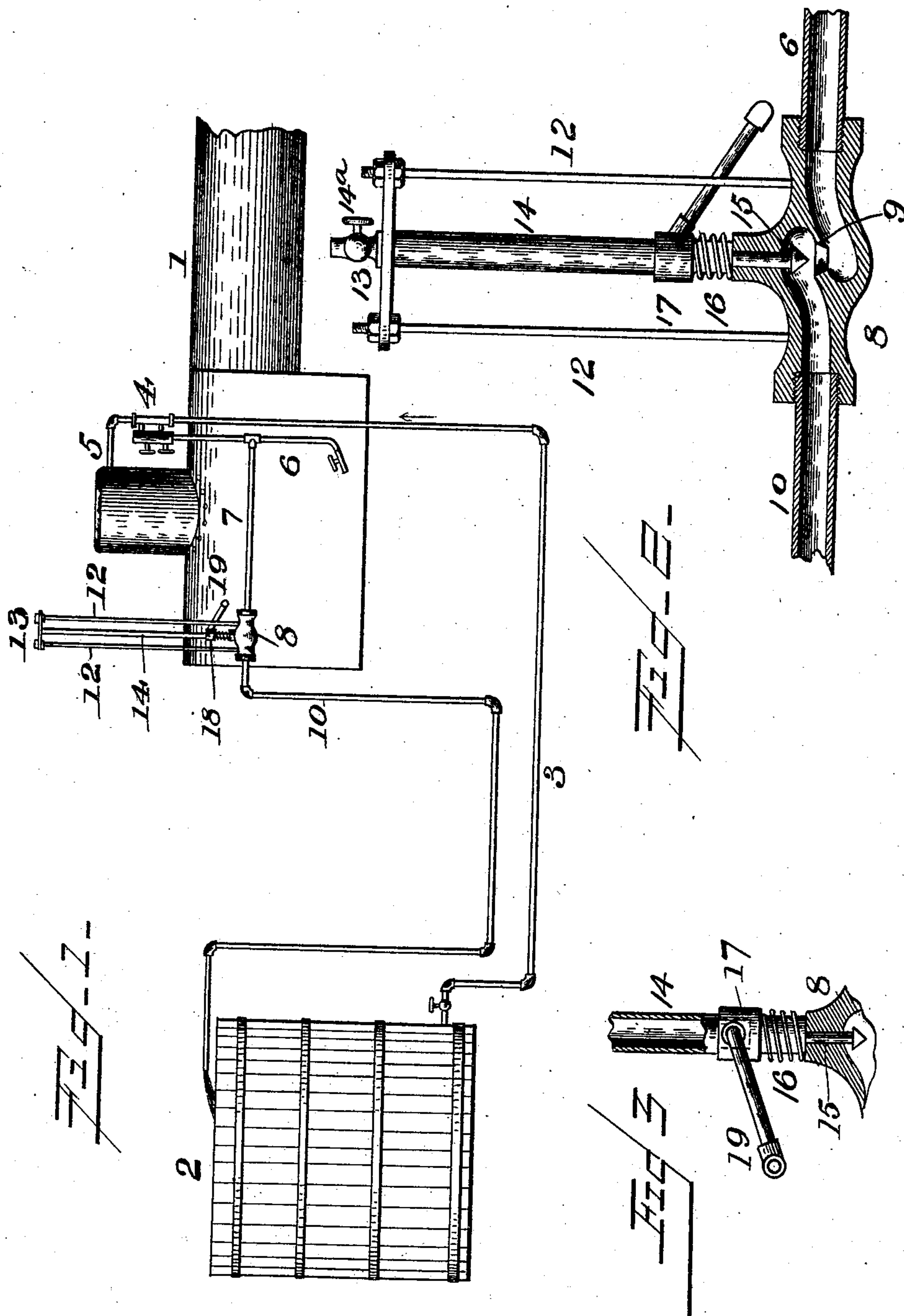


(No Model.)

A. E. HARMS.
FEED WATER REGULATOR.

No. 501,834.

Patented July 18, 1893.



WITNESSES:
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UNITED STATES PATENT OFFICE.

AUGUST E. HARMS, OF PIKEVILLE, NEW YORK.

FEED-WATER REGULATOR.

SPECIFICATION forming part of Letters Patent No. 501,834, dated July 18, 1893.

Application filed February 15, 1893. Serial No. 462,418. (No model.)

To all whom it may concern:

Be it known that I, AUGUST E. HARMS, a citizen of the United States, and a resident of Pikeville, in the county of Allegany and State of New York, have invented certain new and useful Improvements in Feed-Water Regulators; 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 a part of this specification.

My invention relates to improvements in feed-water regulators for steam boilers whereby any overplus of water which may be fed to the boiler after a certain predetermined level has been reached, will be automatically conveyed back to the source of supply.

The object of the invention is to provide an improved device of the above character which shall possess superior advantages with respect to simplicity and efficiency in operation.

The invention consists in the novel construction and combination of parts hereinafter fully described and claimed.

In the accompanying drawings: Figure 1 is a side elevation of a portion of a steam boiler with my improvements applied thereto. Fig. 2 is a detail sectional view of the regulator. Fig. 3 is a detail sectional view of the lower end of the contracting and expanding pipe.

In the said drawings the reference numeral 1 designates a steam boiler, 2 a water supply tank, 3 a supply pipe leading to an inspirator 4; 5 pipe leading from steam down to inspirator, and 6 pipe leading from inspirator to boiler. All these parts may be of any ordinary or suitable construction and form no part of the present invention. Intermediate of the inspirator and the upper end of pipe 6, is a horizontal pipe 7, connected with a valve casing 8, having a valve seat 9. This casing is also connected with a pipe 10, leading to the supply tank.

Connected with casing 8 is what I term a regulator, comprising two vertical rods 12 secured to said casing at their lower ends and their upper ends connected together by means of a cross-head 13. Passing through a cen-

tral aperture in the crosshead and secured thereto, is a vertical pipe 14 provided with a pet cock 14^a, passing through an aperture in the upper side of the valve casing and provided with a valve 15, adapted to engage with the valve seat 9. A coiled spring 16 embraces this pipe near the lower end, one end of which bears against the valve casing and the other end against a bushing 17, secured to said pipe. Above the bushing 17 the pipe 14 is provided with a coupling 18 having a pipe 19, leading to the boiler, just above low water level.

The operation is as follows: The inspirator is set in operation and causes the water from the supply tank to be fed to the boiler in the usual manner. When the water reaches the pipe 19, it will flow therein and into the pipe 14, cooling and contracting the same and causing the valve to be raised from the seat. The water will now pass from pipe 6, through pipe 7 and the valve casing to pipe 10, and from thence to supply tank 2. When the water falls below the level of where pipe 19 enters the boiler, the water in pipe 14 will flow back into the boiler and steam will take its place, which heating the pipe 14 will expand the same and cause the valve to be closed, when the water from the inspirator will again be fed to the boiler until the proper level is reached, when the first described operation is repeated and so on, thus automatically regulating the supply of water in the boiler. The coiled spring assists in opening the valve when the pipe 14 is contracted during the operation of the device.

It will be noted that the valve casing and the pipe 19 are located intermediate of the first and third try cocks, so that the water level will never fall below the first cock nor rise above the third one.

While I have shown the invention as used in connection with an inspirator, it is evident that a pump or other feed device may be employed without departing from the principle of my invention.

It will be noted that the valve closes very quickly as the steam heats and expands the pipe 14 in a very few seconds, while in opening, it moves much slower as it takes longer to cool and contract the same.

Having thus described my invention, what I claim is—

5 In a water regulating device for steam boilers, the combination with a boiler, and inspirator and a pipe leading therefrom to the boiler, of the horizontal pipe connected with said pipe, the valve casing having a valve seat, the pipe connected therewith and leading to a supply tank, the vertical expansible
10 and contractible pipe communicating with said casing and provided with a valve, having a collar, a coiled spring, a pet cock, a coup-

ling and a pipe leading to the boiler, the vertical rods secured to the valve casing, and the cross-head to which said rods and vertical pipe 15 are secured, substantially as described.

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

AUGUST E. HARMS.

Witnesses:

H. J. TORREY,
E. A. CHILDS.