

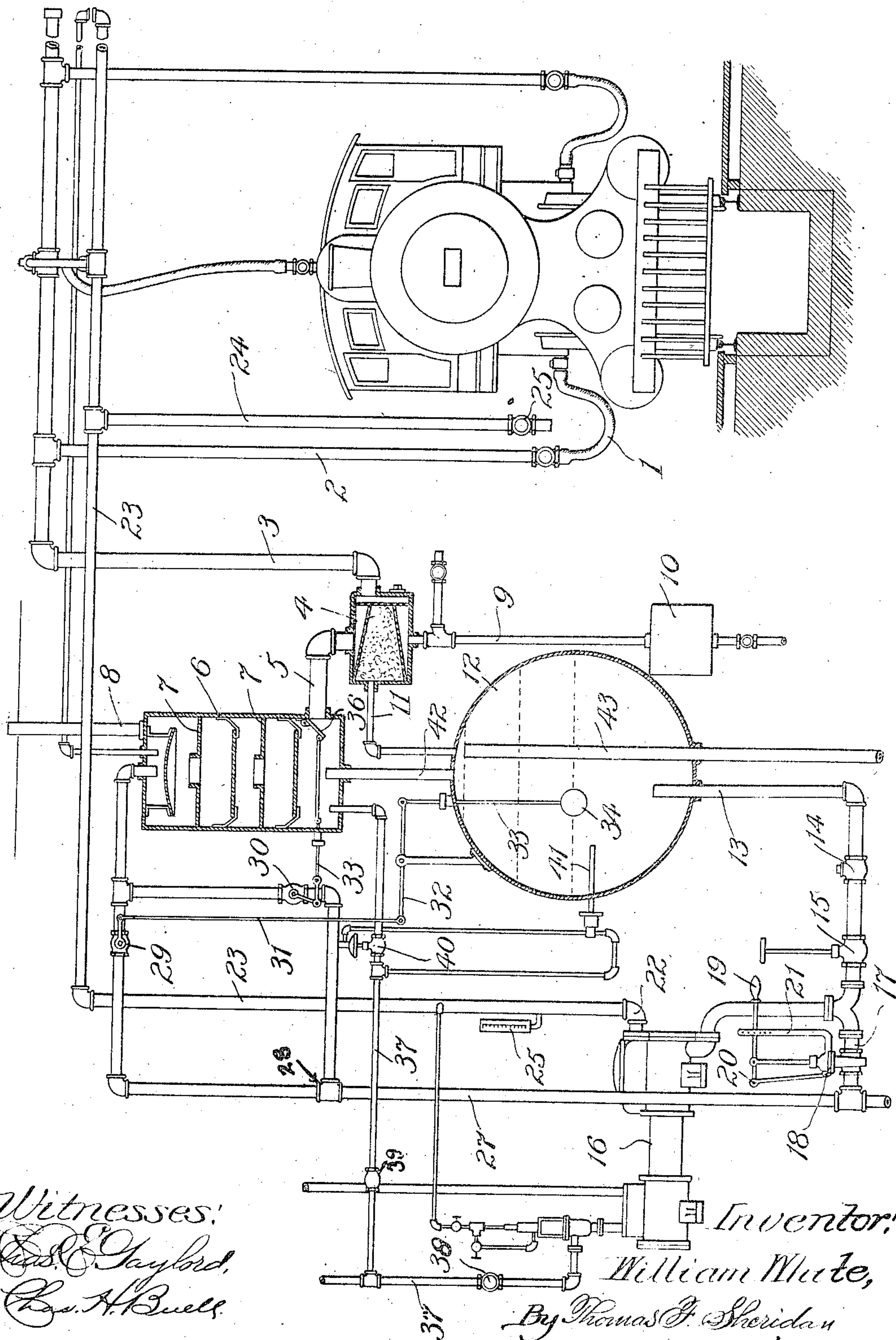
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W. WHITE.

SYSTEM OF WASHING AND FILLING LOCOMOTIVE BOILERS.

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UNITED STATES PATENT OFFICE.

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SYSTEM OF WASHING AND FILLING LOCOMOTIVE-BOILERS.

No. 847,388.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM WHITE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Systems of Washing and Filling Locomotive-Boilers, of which the following is a specification.

My invention relates to locomotive boiler-washing systems, and has for its object the provision of an economic system for using the steam and water taken from locomotives brought into the roundhouse for washing out locomotives and for heating additional water to be used for the same purpose and for refilling the locomotives.

Other objects of my invention are the provision of a manually-controlled valve for regulating the quantity of tempering-water and means for maintaining such quantity at or below a predetermined amount.

My invention is illustrated in the accompanying drawing, forming a part of this specification.

Referring to the figure, I have shown a locomotive connected through flexible hose 1 and pipes 2 and 3 with the upper portion of a filtering and separating chamber 4. From the top of this chamber the steam-pipe 5 extends into the water-heater 6, which is provided with a plurality of horizontal shelves 7, arranged one above the other, and at the top with a vapor-opening 8, which leads to the free air. The filtering and separating chamber is provided with a drain-pipe 9, leading from the base of the chamber to the sludge-chamber 10 and with the filtered-water exit 11, which connects with the top of the main storage-tank 12.

Leading from the base of tank 12 is the exit-pipe 13, provided with the one-way valve 14 and the ordinary cut-off valve 15 and connecting with the suction side of the steam-operated pump 16. Also connecting with the suction side of this pump is a cold-water-supply pipe 17, having the manually-operated valve 18 therein, arranged to be controlled by the lever 19. This lever is fulcrumed at 20 and moves between limbs of the upright forked member 21. This member is provided with a plurality of holes running in line through both of the forks such that a pin may be inserted to prevent the handle 20 being raised above a certain limit. This pin is preferably provided with means for locking or sealing it in a certain

position, and another pin may be supplied for insertion beneath the lever 20 to prevent the lever from moving downward to cut off the supply of water through the valve. The object of this arrangement is to put the maximum cold-water supply in the hands of the roundhouse foreman, but at the same time to allow any of the roundhouse hands to decrease the amount of cold-water supply by lowering the lever 20.

The pressure-water exit 22, leading from the pump, is connected through the distributing-pipe 23 to the different parts of the roundhouse, where it is provided with branch pipes 24 and cut-off valves 25, where the hose may be attached for either filling or washing the boilers. The pipe 22 is provided near the pump with a thermometer 25 for determining the temperature of the water as it leaves the pump.

The cold-water-supply pipe 27 leads directly to the T-joint 28, and thence by way of one branch through the automatically-controlled valve 29 to the top of heater 7 and by way of the other branch through the automatically-controlled valve 30 to the top of the tank through the same opening. This automatically-controlled valve 29 is connected by rod 31, lever 32, and rod 33, with the float 34 and is adapted to be opened whenever the float falls below a predetermined line in the storage-tank. The valve 30 is connected by a rod 33 with the hinged gate 36, which is adapted to be moved by steam passing from the pipe 5 into the heating-tank. An opening in the base of the heating-tank 6 is connected by the pipe 42 with the top of the storage-tank, which is supplied with the overflow-pipe 43, which reaches almost to the top of the tank. The live-steam pipe 37 supplies steam through the throttle-valve 38 for operating the pump and also through the manually-operated cut-off 39 and diaphragm-valve 40 to the lower part of the heating-tank. The valve 40 is controlled by the thermostat 41, which extends into the storage-tank and is controlled by the temperature of the water therein.

In the operation of my system the locomotive is brought into the roundhouse full of hot water and steam, and the flexible pipes 1 are connected to the several outlets shown in the drawing and the valves are opened so that the pressure in the boiler will force the water and steam through the pipe 3 into the upper part of the filtering and separating

tank 4. From this tank the steam passes directly through the pipe 5 into the heater 6, where it is brought into contact with sufficient amount of cold water to form a mixture of the desired temperature to be admitted into the storage-tank 12, as will be hereinafter described. The water which is carried off from the engine contains a large amount of scaly sediment, which passes, together with a small amount of water, through the pipe 9 into the sludge-tank 10. The hot water which passes through the filter in the chamber 4 is carried directly to the storage-tank by the pipe 11. The water in the storage-tank is normally maintained at the level shown by the dotted line 50, and whenever the water is drawn off so that it falls below this line the float 34 will sink, and thereby operate the valve 29, which admits cold water to the top of the heating-tank and which will eventually bring the water-level again to its normal position in the storage-tank. Whenever the condition is such that cold water pours into the top of the heating-tank when steam is not being admitted through the pipe 5 it is necessary, in order to maintain the temperature of the water in the storage-tank at a predetermined degree, to admit live steam into the lower part of the heating-tank. This is done by means of the valve 40, which is regulated by the thermostat 41, the latter being governed by the temperature of the water in the storage-tank. It will be seen that when the water in the tank decreases in temperature sufficiently to open the valve 40 steam will be admitted into the heating-tank and hot water will be caused to pass down the pipe 42 and into the storage-tank.

The pump 16 normally draws its water-supply from both the hot-water tank and the cold-water-supply pipe in proportion to the size of the openings from such sources to the pump. It will be seen that when it is desired to furnish water for washing purposes the water directly from the supply-tank will be too hot, and the manually-operated valve 18 will have to be opened, such that cold water will be mixed with the hot water to temper it. It is not desirable to put this entirely in the hands of the unskilled labor about the round-house, in that they would be liable to supply too much cold water, and therefore wash the engines with water which was below the most desirable temperature. It will be seen that by my arrangement the hot water as it leaves the storage-tank is automatically maintained at a substantially constant temperature, and therefore in order to deliver water to the distributing-pipe at a predetermined temperature less than that of the hot water it is only necessary to mix with the hot water a predetermined amount of cold water, and as the temperature of the cold water only varies appreciably with the season of the year the

valve 18 only requires its minimum limit of opening to be adjusted in accordance with the change of season. For filling purposes, the cold water may be entirely cut off, and the supply can then be pumped directly from the hot-water-supply tank to the distributing-pipe 23.

One branch of the cold-water-supply pipe, which leads to the top of the heating-tank, is provided with the valve 30, which is connected, through the rod 35, with the hinged gate 36 within the lower part of the heating-tank. The steam, which enters the heating-tank through pipe 5, will open the gate 36 to a greater or less angle in proportion to the amount of steam being passed in, and at the same time the valve 30 will be operated to admit cold water in a proper proportion to make the resulting mixture of substantially the temperature desired in the storage-tank.

By this description it is seen that I have provided a system of regulation which does not depend upon the temperature of the water passing through the supply-pipe, but rather upon the quantity of water passing therethrough, and that my system, while being manually controlled in certain of its parts, is not entirely under the control of the laborers.

While I have shown and described certain details for accomplishing the result herein specified, I do not wish to be unduly limited thereto, it being understood that the same may be accomplished by the use of apparatus varying somewhat in structure from my disclosure.

I claim—

1. A locomotive-boiler washing and filling system, comprising a hot-water supply, means for maintaining the hot water at constant temperature and a cold-water supply, a distributing-pipe, and means for admitting to the distributing-pipe hot and cold water in fixed predetermined proportions.

2. A locomotive-boiler washing and filling system, comprising a hot-water supply, means for maintaining the hot water at constant temperature and a cold-water supply, a distributing-pipe, and means for admitting to the distributing-pipe hot and cold water in predetermined proportions and for varying the amount of cold water to vary the proportion of the mixture.

3. A locomotive-boiler washing and filling system, comprising a hot-water supply, means to maintain the water in the hot-water supply at substantially constant temperature and a tempering-water supply, a distributing-pipe connected with each, and means for limiting the tempering-water supply and for regulating such supply below the limit.

4. A locomotive-boiler washing and filling system comprising a hot-water supply, means for maintaining the water in the hot-water supply at substantially constant tempera-

ture, a distributing-pipe, means for admitting a fixed quantity of hot water to the distributing-pipe, a cold-water supply, and means for admitting a predetermined quantity of cold water to the distributing-pipe.

5 5. A locomotive-boiler washing and filling system, comprising a hot-water supply and a tempering-water supply, a distributing-pipe connected to each, a valve in connection with
10 the tempering-water supply, and means for placing the control of the maximum opening of such valve under seal and for permitting the regulation of such valve below the maximum.

6. A locomotive-boiler washing and filling system, comprising a hot-water supply and a tempering-water supply, a distributing-pipe connecting with each, a valve in the connection with the hot-water pipe permitting a flow in one direction only therethrough, and
20 a valve in the cold-water connecting-pipe, such latter valve having a predetermined maximum opening regulated according to the season of the year.

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Witnesses:

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