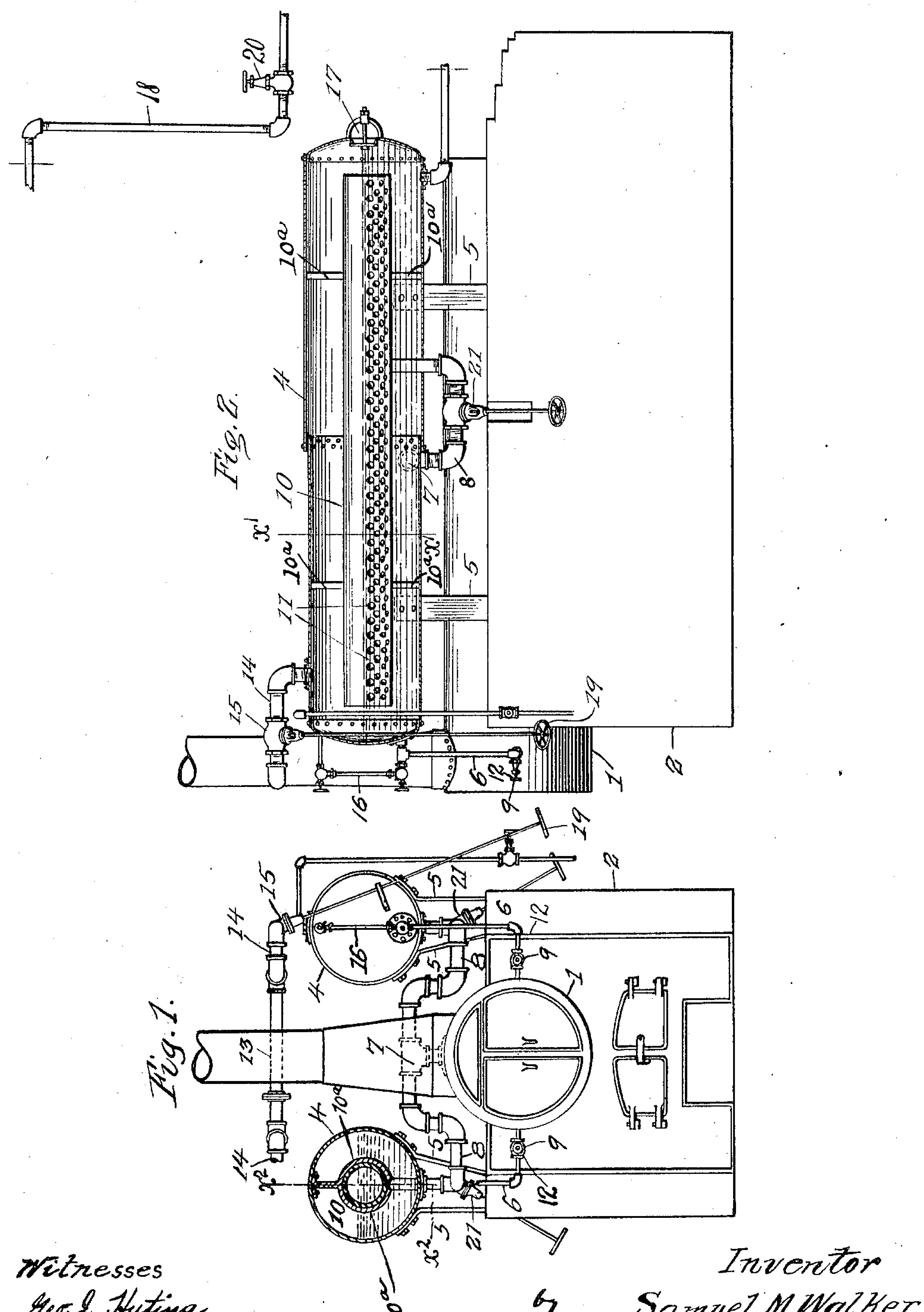
S. M. WALKER.

WATER FEED, HEATER, AND PURIFIER FOR STEAM BOILERS.

APPLICATION FILED MAY 13, 1909.

998,816. Patented July 25, 1911.



Witnesses

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UNITED STATES PATENT OFFICE.

SAMUEL M. WALKER, OF LOS ANGELES, CALIFORNIA.

WATER FEED, HEATER, AND PURIFIER FOR STEAM-BOILERS.

998,816. Specification of Letters Patent. Patented July 25, 1911.

Application filed May 13, 1909. Serial No. 495,814.

To all whom it may concern:

Be it known that I, SAMUEL M. WALKER, a citizen of the United States of America, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Water Feed, Heater, and Purifier for Steam-Boilers, of which the following is a specification.

One object of the present invention is to provide improved means for feeding water to steam boilers without the use of injectors or pumps.

Another object of the invention is to provide improved means for heating the water before it reaches the boiler. One object of such heating is to purify the water by causing separation of the dissolved minerals constituting hardness in the water, and another advantage of such preliminary heating is to reduce the strain on the boiler and economize in the amount of heat used.

Other objects of the invention will appear hereinafter.

The accompanying drawings illustrate the invention and referring thereto: Figure 1 is a front elevation of the boiler with the invention applied thereto, one of the feeder and purifying elements being shown in section on line x'—x' Fig. 2. Fig. 2 is a section on line x^2—x^2 Fig. 1; the blow off pipe with its valve being broken off and located above the boiler.

1 designates a boiler shell and 2 designates in a general way the furnace or fire box for heating and supporting the boiler shell. The boiler is shown as of the usual tubular type but may be of any type whatever.

The water feeding and purifying means comprises two horizontally arranged drums, shells or water receivers 4 supported by suitable means 5 one at each side of the boiler and above the boiler so that water will flow by gravity from said drums to the boiler, a pipe connection 6 being provided from the lower part of the outer end of each drum 4 to the boiler shell 1 for this purpose. Each pipe connection 6 has a valve 9, operated by a handle 12. Boiler shell 1 is provided with a surmounting steam outlet pipe 7 having a branch 8 leading laterally downwardly and transversely and longitudinally under each shell 4 and upwardly into said shell, said branch terminating in a centrally arranged cylinder or tubular header 10 perforated on its under half, as at 11, and its upper half imperforate, said header 10 extending longitudinally within the drum 4 and supported in its central position by twin frames 10^a. A valve 21 is provided in the longitudinal part of each branch 8. A water supply connection 13 from any suitable source, for example, a city main, is connected by branches 14 to the top of each drum or shell 4 to supply water thereto, a valve 15 being provided in each branch 14 with operating handle 19. Each drum or shell 4 is provided at one end with a water gage 16 and at the other end with a manhole 17. A blow-off pipe 18 is provided from one end of each drum 4, said blow-off pipe having a valve 20.

The operation is as follows: Water is turned on by a valve 15 to one of the drums 4, the other valve 15 being closed, and at the same time one of the valves 21 is opened to allow steam to pass to the other drum 4, which is assumed to be already charged with water. Such steam, entering header 10 and passing through perforations 11 is distributed through the water and heats the same. The water being thus raised to or above the boiling point is caused to deposit mineral matter therein contained, and is thereby purified. At the same time, the admission of steam to this drum equalizes the pressure thereon with the boiler pressure and allows water to flow from this drum to boiler shell 1, by gravity, through pipe 6, the valve 9 of this pipe being open, and the valve 9 from the pipe 6 from the other drum 4 being closed. The water thus feeds to the boiler by gravity, and when the feeding drum 4 has been emptied the blow-out valve 20 is opened to blow out the deposits, and said valve 20 is then closed and the valves 9 and 21 of this drum are closed and the valve 15 of said drum is opened, so as to recharge it with water; the valves 9, 15 and 21 of the other drum are operated to admit steam thereto and allow water to flow therefrom to the boiler. Thus the feeding operation proceeds, the water feeding from each drum alternately, while the other drum is being heated.

What I claim is:

A water feed, heater and purifier for steam boilers, comprising a firebox, a boiler shell supported by the firebox, two horizontally arranged drums supported on the firebox, one on each side of and above the boiler shell, pipe connections each having a

valve and extending from the lower part of the outer end of the drums to the boiler shell, a centrally arranged steam outlet pipe, surmounting the top of the boiler shell, provided with transverse branches each having a valve and extending laterally, downwardly and across the fire box and longitudinally parallel with the boiler shell and beneath and upwardly into their respective drums, longitudinal tubular headers, each having a perforated lower half with which the branch pipes connect and an imperforate upper half and twin frames whereby the tubular headers are supported centrally within their respective drums, water supply connection, provided with branches each having a valve and connected with the top of the drums and blow off pipes having valves and connected with their respective drums.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 6th day of May, 1909.

SAMUEL M. WALKER.

In presence of—
ARTHUR P. KNIGHT,
P. H. SHELTON.