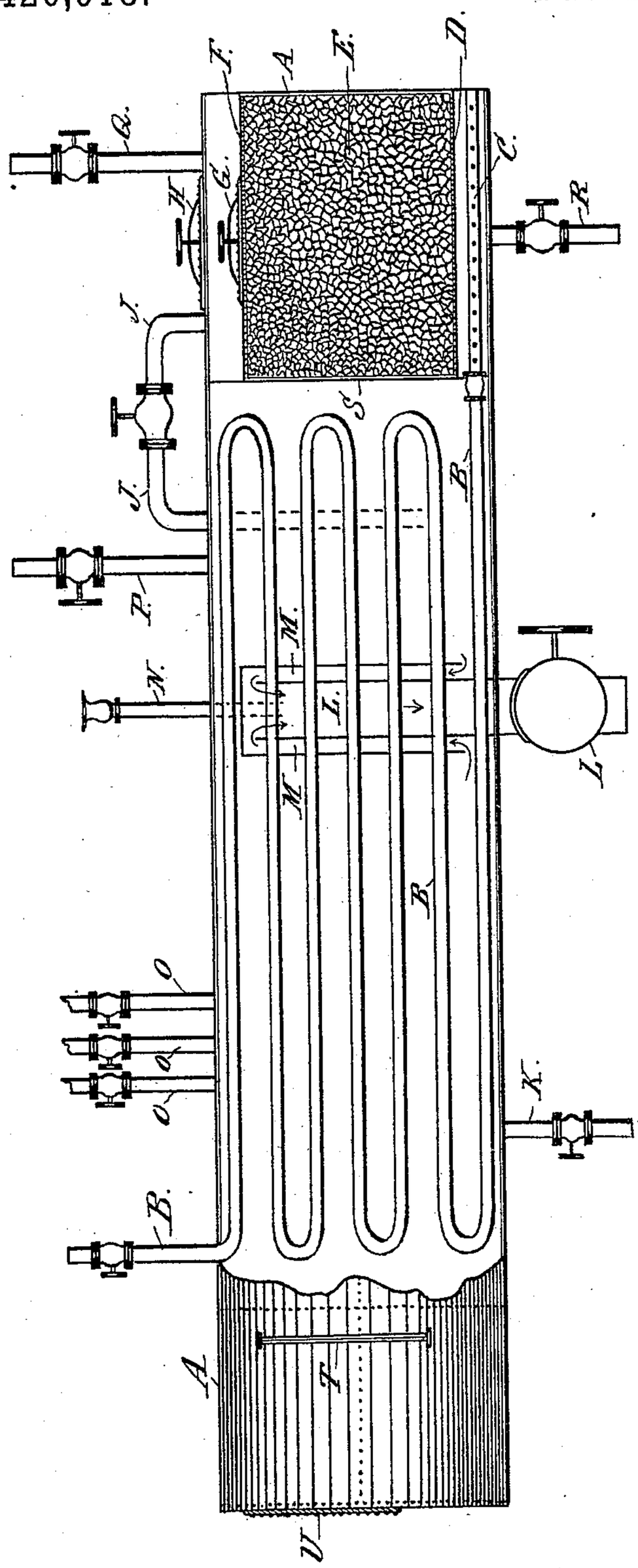
(No Model.)

# J. B. CHURCHILL.

## FEED WATER HEATER AND FILTER.

No. 426,918. Patented Apr. 29, 1890.




WITNESSES:

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# UNITED STATES PATENT OFFICE.

JOEL B. CHURCHILL, OF LAKELAND, LOUISIANA.

## FEED-WATER HEATER AND FILTER.

SPECIFICATION forming part of Letters Patent No. 426,918, dated April 29, 1890.

Application filed February 3, 1890. Serial No. 339,080. (No model.)

*To all whom it may concern:*

Be it known that I, JOEL BIRMINGHAM CHURCHILL, a citizen of the United States, residing at Lakeland, in the parish of Point Coupee and State of Louisiana, have invented certain new and useful Improvements in a Combined Filter and Feed-Water Heater; and I do 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.

My invention relates to an improvement in a combined filter and heater in which a coil placed within an extended heater is made to operate in conjunction with an overflow-pipe and filter-chamber placed within the heater; and the objects of my improvements are to provide a device that will filter and heat water outside of a boiler by use of the exhaust-steam. I attain these objects by the mechanism illustrated in the accompanying drawing, in which the figure is a side view of my improvements with the wall of the heater broken away to show the interior.

In constructing my device I take an external heater, as shown by A, and within this heater I place a coil of pipe, as B, and upon one end of same I attach a perforated pipe C, which extends under filtering-plate D, said plate forming the base of a filtering-chamber, and in which is placed filtering material E, and over which is placed perforated plate F, in which there is a man-hole G, and just over same and within the heater A is a man-hole H.

S indicates a partition between the filter-chamber and the heating-chamber.

Leading from the filter-chamber is the pipe J, one end of which enters the side of heater A.

Within the shell A is placed an overflow-pipe L, said pipe being placed within the pipe M and extending upward to within a few inches of the top of pipe M.

Connected to pipe M and extending beyond the heater A is an air-pipe N.

O indicates manifold pipes, through which flows the exhaust-steam from the pumps and engine and which heats the unfiltered water as it flows through the pipes B within the heater and the filtered water as it flows from pipe J into the heater.

K is an outlet-pipe through which the filtered water flows to the boilers.

P indicates an exhaust-pipe, which can be used for the escape of the steam if the water should become warmer than is necessary.

Q is a pipe admitting steam when it becomes necessary to clean out the filtering-chamber.

R is a blow-out pipe for cleaning filter.

Near one end of the heater A, I place a gage, as shown by T, and in the end of said heater is a man-hole, as shown by U.

The mode of operation is as follows: The pipe B is connected to a tank or other reservoir from which the unfiltered water is drawn and flows through the coil and through perforated pipe C, thence through perforated plate F, and passes through pipe J into heater A in a filtered condition, being heated in its passage by exhaust-steam flowing through pipes O and the water rising within the heater and within the pipe M until it reaches a point indicated by arrows, when it overflows, and by means of air-pipe N all siphoning is prevented. The heated and filtered water is fed to the boilers by means of pipe K.

A striking advantage of my invention is that no space is taken up by placing filters within the boilers, the water being fed to the boilers in a filtered and heated condition, and the exhaust-steam is utilized.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

In a combined filter and heater such as described, the coil B, placed with the heater, in combination with the overflow-pipes L and M, the air-pipe N, for preventing siphoning, the manifold pipes O, for the introduction of exhaust-steam within the heater, the exhaust-pipe P, and feed-pipe K, as set forth.

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

JOEL B. CHURCHILL.

Witnesses:

CHAS. S. BARRETT,

PERCY D. PARKS.