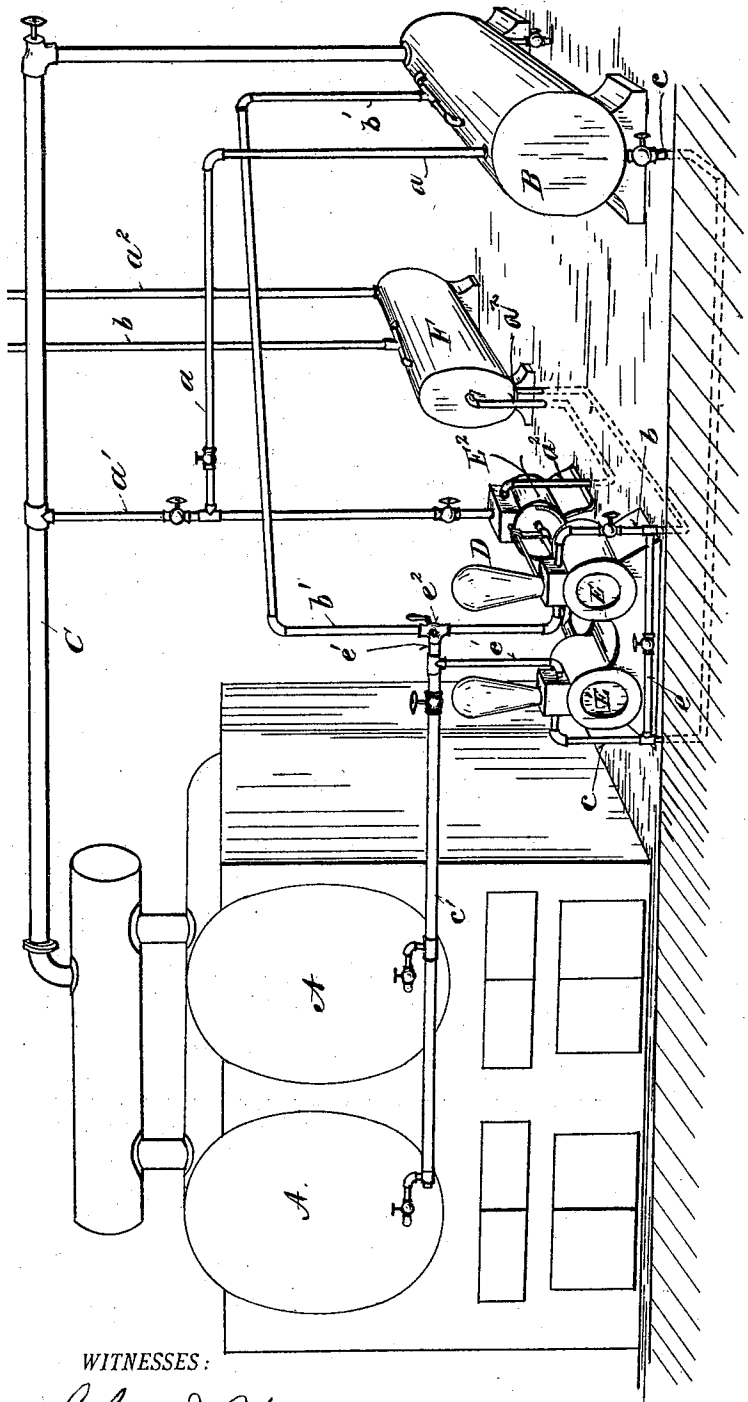
(No Model.)

J. J. HOPPES & E. C. GWYN.

DEVICE FOR PURIFYING FEED WATER.

No. 503,209. Patented Aug. 15, 1893.



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JOHN J. HOPPES AND EDWARD C. GWYN, OF SPRINGFIELD, OHIO, ASSIGNORS TO THE HOPPES MANUFACTURING COMPANY, OF SAME PLACE.

DEVICE FOR PURIFYING FEED-WATER.

SPECIFICATION forming part of Letters Patent No. 503,209, dated August 15, 1893.

Application filed January 26, 1891. Serial No. 379,194. (No model.)

To all whom it may concern:

Be it known that we, JOHN J. HOPPES and EDWARD C. GWYN, citizens of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Devices for Purifying Feed-Water, of which the following is a specification.

Our invention relates to purifying feed-water for steam-boilers and especially relates to that class of purifiers known as live steam purifiers in which the purifier proper is connected directly to the boiler or boilers so as to receive the full pressure of steam in said boilers and be subjected to the same or substantially the same condition as the water in the boilers.

The object of our invention is to provide means for positively feeding said purifiers and positively discharging the same into the boilers. We obtain these objects by the constructions shown in the accompanying drawing which is a perspective view illustrating means for obtaining said objects.

In the said drawing A A represents the boilers and B, the purifier.

C is a steam-pipe which connects the boilers to the purifier.

It has been common heretofore to place the purifier B, at some point above the boilers so that the water forced into the purifier by a feed-pump or other well known means, would feed by gravity from said purifier into the boiler or boilers; the pressure being substantially the same in the purifier and boilers. By the use of our improved devices the purifier B, may be placed in any desired position, either above or below the water line in the boilers. In the drawing it is shown arranged on the floor of the boiler room.

The water is fed to the purifier in the ordinary way under pressure preferably by means of a steam pump boiler feeder, and in order that the feed water may be positively discharged from said purifier and into the boiler we employ a double pump or two pumps operated simultaneously by the same motive power. This double pump is illustrated at D, in the drawing; the pump cylinders E and E′ being connected to and operated from a common steam cylinder E^2.

F is an exhaust steam heater through which the exhaust steam from the pump is adapted to pass; the feed-water being preferably passed through the exhaust heater before it is forced into the purifier. This construction, however, forms no part of our invention and may or may not be employed, as desired.

We preferably operate the pump D, by steam drawn through a suitable pipe *a*, from the purifier, so as to create a circulation through said purifier, and to remove all the air or gases therefrom; a branch pipe *a′*, and suitable valves in said pipes being preferably provided so that the steam may be taken directly from the boiler in case the purifier is cut-off for cleaning or otherwise. a^2 represents the exhaust steam pipe from the pump which passes through the heater F, as before described. The water to supply the purifier enters through a pipe *b*, from any suitable source of supply, and passes through the heater F, when a heater is employed. Otherwise it is drawn directly from the source of supply. It enters the pump cylinder E, as the pump is operated, and is forced through the pipe *b′*, into the purifier. From the purifier the water is passed through a pipe *c*, to the pump cylinder E′, and thence through the pipe *c′*, to the boilers, by the action of the pump.

To provide for feeding the boilers in case the purifier is disconnected for cleaning or otherwise, we preferably connect the pipes *b* and *c*, as shown at *e*, and provide a suitable valve therein so that the water may be drawn direct from the source of supply into the pump cylinder E′, and forced directly into the boiler. We also preferably connect the pipes *c′* and *b′*, by a branch *e′*; suitable valves being provided whereby both pump cylinders may be caused to discharge through the discharge pipe *c′*, into the boiler, if desired; this being preferably accomplished by the use of a three-way valve e^2, arranged in the pipe *b′*, so that a communication may be established from the pump E, through the branch *e′*, while the pipe *b′*, is cut-off, or vice versa. Suitable valves are preferably provided in all of the pipes so that each or any may be cut-off or a communication established therein, as desired.

It will be seen that by this construction

means are provided whereby a definite quantity of water is forced into the purifier by the action of the pump at the same time a similar quantity is discharged therefrom, thus furnishing a positive feed for the boilers as well as a positive feed for the purifier and preventing any unusual accumulation of water in the purifier.

By the connections, as described, it will be seen that either or both pumps may be shut off, as desired, and one or both be operated to pump water directly into the boiler.

It is evident that the special form or construction of purifier, pump or boiler has nothing to do with the invention, as these may be modified, as desired, to accomplish the result.

Instead of having the pumping cylinders side by side, as indicated in the drawing, and connected to the same steam cylinder, the steam cylinder may be arranged in the center with the pump cylinders at each end, or they may be otherwise arranged without departing from the spirit of our invention.

Having thus described our invention, we claim—

1. The combination with a steam boiler and a purifier connected directly thereto, of a pump for supplying said purifier, and a simultaneously operated pump for discharging water from said purifier into the boiler, and a branch connection between the supply pipes of the respective pumps, and suitable supply-valves in said branch connection, substantially as specified.

2. The combination with the steam boilers and a purifier connected directly thereto, of two simultaneously operated pumps adapted to discharge respectively into the purifier and into the boilers, the supply-pipe of one of said pumps being connected to the purifier and provided with a branch connection to the supply-pipe of the other pump, and a branch connection with suitable stop-valves between the discharge pipes of the respective pumps, substantially as specified.

In testimony whereof we have hereunto set our hands this 22d day of January, A. D. 1891.

JOHN J. HOPPES.
EDWARD C. GWYN.

Witnesses:
R. D. BALDWIN,
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