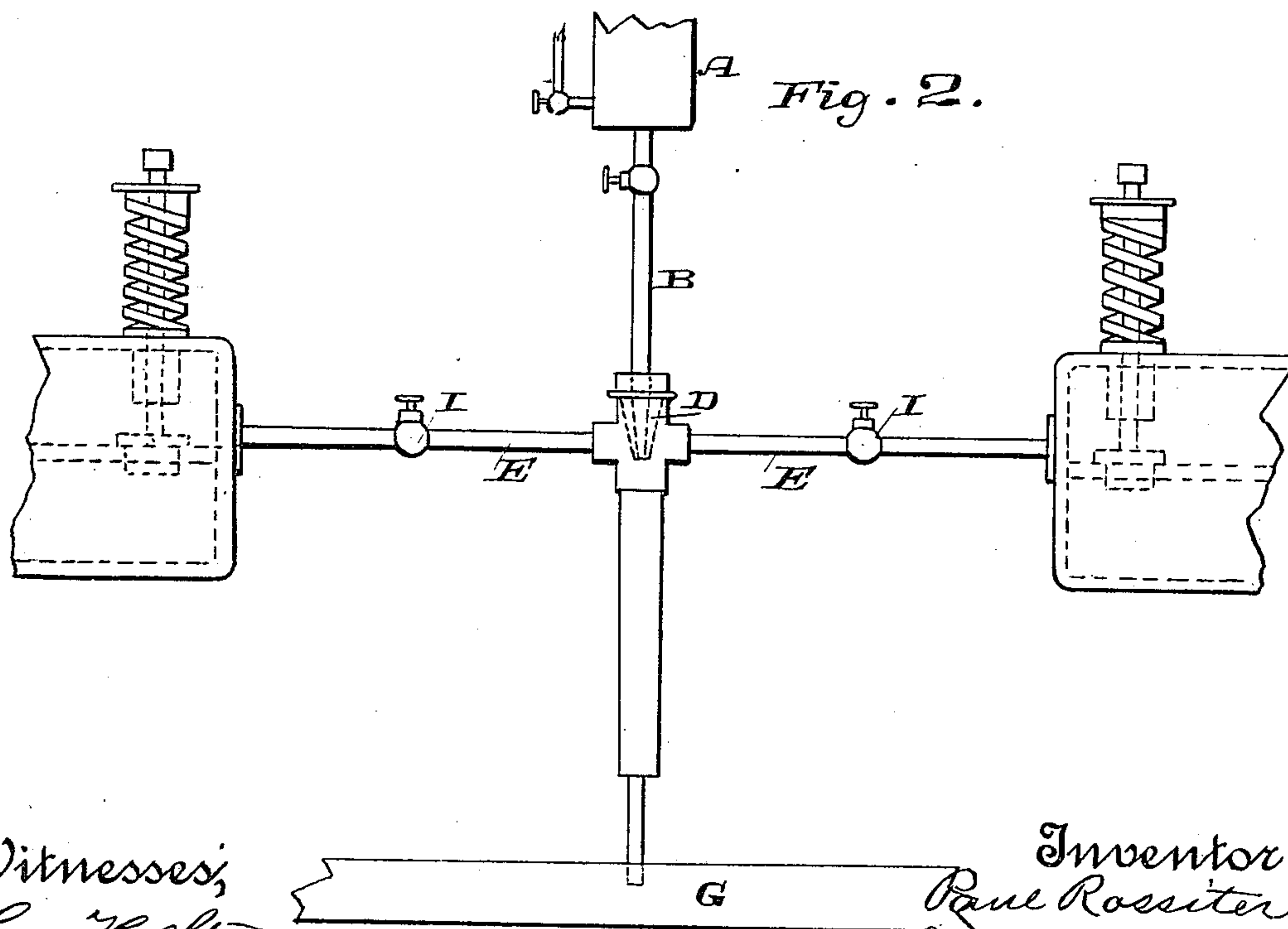
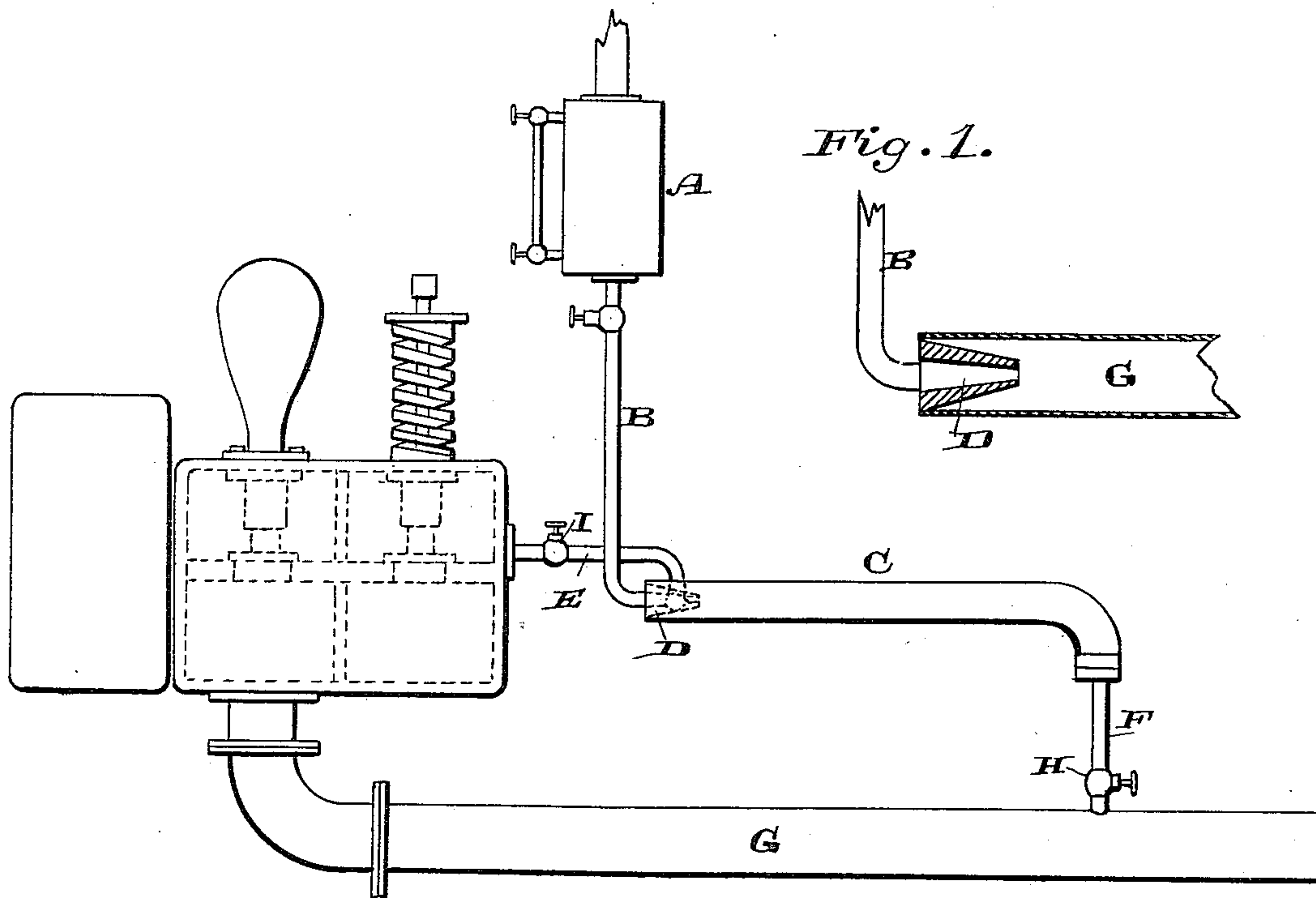


(No Model.)

P. ROSSITER.
FEED WATER HEATER.

No. 362,904.

Patented May 10, 1887.



Witnesses,
Geo. H. Strong.
J. H. House.

Inventor,
Paul Rossiter
By Dewey & Co.
attys

UNITED STATES PATENT OFFICE.

PAUL ROSSITER, OF SAN FRANCISCO, CALIFORNIA.

FEED-WATER HEATER.

SPECIFICATION forming part of Letters Patent No. 352,904, dated May 10, 1887.

Application filed January 21, 1887. Serial No. 225,044. (No model.)

To all whom it may concern:

Be it known that I, PAUL ROSSITER, of the city and county of San Francisco, State of California, have invented an Improvement in Feed-Water Heaters; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to a feed-water heater and drainer from the jackets of steam-cylinders; and it consists of a connection and mechanism whereby the steam used for the jackets of steam-cylinders, &c., to prevent condensation and variation of temperature of the cylinders and pistons, is carried directly into the main feed-pipe, and thence to the boiler, without itself passing into the hot well or condenser.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a side elevation showing the arrangement of my apparatus for a horizontal pipe and connected with the single force-pump. Fig. 2 is a view showing the arrangement with the vertical pipe and connected with two pumps.

The cylinders of marine and some other engines are usually surrounded by an exterior jacket, into which live steam from the boilers is allowed to pass, and this heat serves to maintain an even temperature within the cylinder and pistons and prevents too great variation and condensation within the cylinder. The water of condensation, escaping from this jacket, passes into a receiver, through which it is usually carried to the hot well or condenser, from which it is pumped back into the boiler with other condensed water, in the usual manner. This causes considerable loss of temperature during the passage, and also the heating up of the air-pump valves and other parts.

In my invention the water is taken directly from the receiver and delivered into the main feed-pipe, so that it is carried directly into the boiler and several degrees higher in temperature than could otherwise be accomplished.

In my present drawings I have only shown such parts as are necessary to understand my particular invention, the different portions of the engine-pump and connecting-pipes being omitted, except such as relate to my device.

A is the receiver, into which the steam from the jacket around the cylinder and such wa-

ter as may be condensed therefrom pass. B is a pipe leading downwardly from the bottom of this receiver. In Fig. 1 this pipe is bent so as to discharge at right angles into the pipe C, and in Fig. 2 it discharges vertically into the same pipe. At the end of the pipe B, where it discharges into C, I have fitted a reducing nozzle, D, which is made slightly smaller at the discharge end, and which opens into the pipe C, as shown. At one or more sides of this nozzle are pipes E, having one end connected with the pipe C, the opposite ends being connected with the force pump between the suction and discharge valves. The pipe C is also connected by means of a pipe, F, with the main feed-pipe G, through which water is carried from the force-pump to the boiler. A valve or cock is fitted into pipe E, and this is slightly opened, so that while the pump is at work some water may be forced or sprayed into the pipe C, so as to unite with that which escapes from the nozzle D. This action takes place when the pressure from the pump is applied, and when the suction takes place a portion of the water is again withdrawn through the pipe E. This produces a current through the pipe C and the connection F into the main feed-pipe, which carries all the water of condensation from the receiver A directly into the boiler.

As the jacket around the steam-cylinder receives its steam directly from the boiler, and as the main feed-pipe G is also connected directly with the boiler, the pressures should be nearly equal, with the balance in favor of that through the main feed-pipe, because the action of the pump must lift the valves to overcome their friction, and it would appear that in consequence of this the water would naturally pass backward through the pipe B and into the receiver A, instead of being carried onward through the pipe G. If the small pipe E is removed, this result will take place; but by having this connecting-pipe E between the suction and discharge valves of the pump and opening into the pipe C, as shown, the alternate forcing of a small quantity of water into the pipe C and withdrawing it again by the suction of the pump produces the result before described and causes a constant flow of water into the main feed-pipe.

The height of the water in the receiver A is shown by the gage-glass, and it may be kept at any height by means of the valves H and I. The amount of heat which can be put into the
5 feed-water depends upon the size of the orifice in the nozzle D or the amount of steam that may be passing through the engine-jackets.

By keeping the jacket-receiver just free of water, with a pressure on the jackets equal to
10 that in the high-pressure steam-chest or the main steam-pipe, I have been able to gain about 9° Fahrenheit at the check-valve, where the water enters the boiler, over what could be produced when this apparatus was not used.
15 This shows a great saving of the fresh water and a uniform temperature of the water entering the boilers. In addition to this, as before stated, the air-pump valves and other parts are relieved of considerable heat.

20 It will be manifest that the arrangement of the apparatus may be varied somewhat without materially altering its character or operation, as shown in Fig. 2.

Having thus described my invention, what I claim as new, and desire to secure by Letters 25 Patent, is—

1. The receiver A and a pipe leading therefrom and having a contracted nozzle, in combination with a pipe extending from near the nozzle to the force-pump between the suction 30 and discharge valves, substantially as herein described.

2. A pipe and nozzle opening into a pipe which has one end connected with the boiler-feed pipe, and the other end, into which the 35 nozzle opens, connected with the force-pump between the suction and discharge valves, substantially as herein described.

In witness whereof I have hereunto set my hand.

PAUL ROSSITER.

Witnesses:

S. H. NOURSE,
H. C. LEE.