

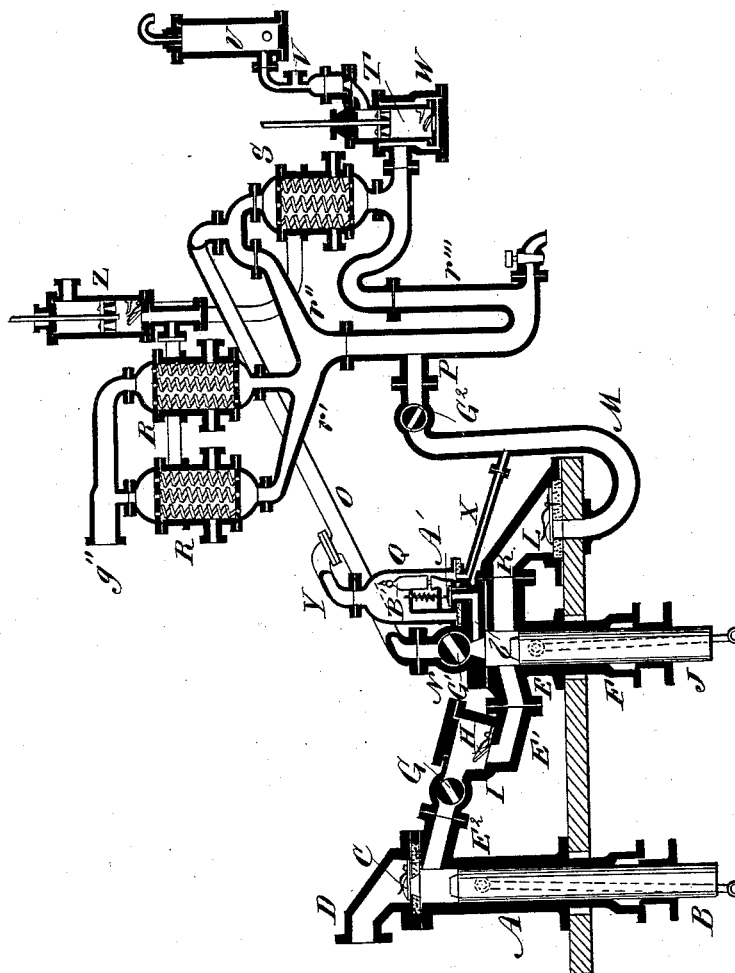
(No Model.)

J. HOUPPT.

COMBINED FEED PUMP AND CONDENSING APPARATUS.

No. 307,047.

Patented Oct. 21, 1884.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

JOHN HOUP, OF SPRINGTOWN, PENNSYLVANIA.

## COMBINED FEED-PUMP AND CONDENSING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 307,047, dated October 21, 1884.

Application filed July 2, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN HOUP, of Springtown, in the county of Bucks and State of Pennsylvania, have invented a new and Improved Combined Feed-Pump and Condensing Apparatus, of which the following is a full, clear, and exact description.

This invention more particularly relates to combined feed-pumps for steam-boilers of marine engines and condensing apparatus for supplying hot fresh water thereto, substantially as described in Letters Patent No. 296,009, granted to me April 1, 1884; and it mainly consists in a loaded or safety-valve and whistle or alarm attachment to said devices, for the purpose of indicating the internal pressure and working condition of the auxiliary force or feed pump forming part of the apparatus.

The condensing and boiler-feeding apparatus for steam-engines described in my above-named Letters Patent used a primary and a secondary condenser, and included a combination, with the primary condenser or moderator for direct application to or connection with the engine-cylinder, and arranged intermediately of said cylinder and the secondary condenser, and with a feed or force pump in controllable connection with the duct which passed off the hot water of condensation from the primary condenser, of a pipe or duct in controllable connection with said force or feed pump, and with the secondary condenser for drawing off accumulated vapor from the pump; and said apparatus, furthermore, included a combination, with the primary condenser or moderator and secondary condenser of such compound condensing apparatus, of a compound plunger, force, or feed pump adapted to supply to the boiler of an engine hot fresh water of condensation from the primary condenser.

The invention which is the subject of this specification combines with the auxiliary force-pump and secondary condenser a chamber, in combination with said force-pump, fitted with a loaded or safety valve and alarm or whistle, and escape-pipes for hot water and vapor collecting in said chamber, substantially as hereinafter specified, and for the purposes hereinbefore named.

Reference is to be had to the accompanying drawing, forming part of this specification, in which the figure represents a vertical sec-

tion of a combined feed-pump and condensing apparatus with safety-valve and steam-whistle attached, all in accordance with my invention. 55

A indicates the cylinder of the feed-pump proper, and B its plunger; C, the delivery-valve of the pump, arranged at the upper or discharge end of the cylinder A under cover of an outlet-branch, D, connecting with the 60 boiler.

E E' E" indicate the hot-water-supply pipe to the upper or discharge end of the cylinder A from the cylinder F of the auxiliary force or feed pump, the plunger of which is indicated by the letter J. 65

G is a gage-cock fitted to said pipe, and H a spring check-valve arranged within a chamber, I, between said pumps.

L indicates the inlet-valve of the auxiliary 70 pump, and K M N O P are the pipe-connections between the hot-water feed-pump and the condensing apparatus.

R is the primary surface-condenser; S, the secondary surface-condenser or save-all; T, the 75 air-pump; U, the upper hot-well, and V the hot-water-boiler supply-pipe. The pipe N, which is controlled by a cock, G', serves, in conjunction with the pipe O, to connect the pump F with the upper end of the secondary 80 condenser S or pipe r" leading thereto. The pipe O is an elevating one and inclines upwardly from the pump-cylinder F to draw off the hot pure vapor from the compound plunger-pump by the air-pump T of the condensing apparatus, and thereby utilizing said vapor, instead of allowing it to become an annoyance, in equalizing and overcoming back-pressure on the receiving-valves of the pure hot-water feed-pump. The primary condenser R 90 R, which first receives the exhaust-steam by an inlet, g", has the hot water of condensation passed off from it by the pipes r' r'" into the lower hot-well, W, for transmission to the boiler, and M is the pipe controlled by a cock, 95 G", and connected with the pipe r', through which the hot fresh water at a higher temperature than could be afforded by the ordinary condenser is drawn by the compound force-pump and forced into the boiler. 100

Z indicates the circulating-pump of the condenser.

Q is a safety-valve and whistle or alarm chamber in communication below by a pas-

sage, *b*, with the space or chamber immediately above the plunger J of the auxiliary force-pump. Said chamber Q is also connected below by a pipe, X, with the pipe M for escape of any accumulated hot water, and is connected above by a pipe, Y, with the elevating-pipe O for escape of hot vapor from said chamber. A' is a safety-valve within the chamber Q, and B' a vapor or steam whistle therein. These devices, which, by means of the pipes X Y, are connected with the secondary condenser, serve to indicate the internal pressure and working condition of the auxiliary force or feed pump, the valve A' rising and the whistle or alarm B' being sounded whenever the pressure is excessive.

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

1. In a combined feed-pump for boilers and condensing apparatus, the combination, with the pump and condensing apparatus, of a chamber in communication with both, and a safety-valve and whistle or alarm arranged within said chamber, substantially as and for the purposes specified.

2. The combination, with the auxiliary boiler force and feed pump F J, the secondary con-

denser S, and the hot-water and vapor pipes M O, connecting said pump and condenser, of the chamber Q, the duct *b*, connecting said chamber with the pump, the hot-water-escape pipe X, and hot-vapor-escape pipe Y from said chamber, and the safety-valve A', and alarm or whistle B', arranged within said chamber; essentially as described.

3. In condensing and boiler-feeding apparatus for steam-engines in which a primary and secondary condenser are used, and in which a compound plunger force or feed pump for supplying the boiler with pure hot water is combined with the condensing apparatus, the combination, with the pump-cylinders A F and their valves and connections, and with the primary condenser R and secondary condenser S, of the air-pump T, the hot-wells U W, the pipes *r' r'' r'''*, the hot-water pipes P M, the hot-vapor pipe O, the pipes or ducts X Y *b*, the valve-chamber Q, the loaded or safety valve A', and the whistle or alarm B', substantially as shown and described.

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Witnesses:

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