(No Model.)

J. HOUPT.

COMPOUND FEED PUMP FOR STEAM BOILERS.

No. 285,622. Patented Sept. 25, 1883.

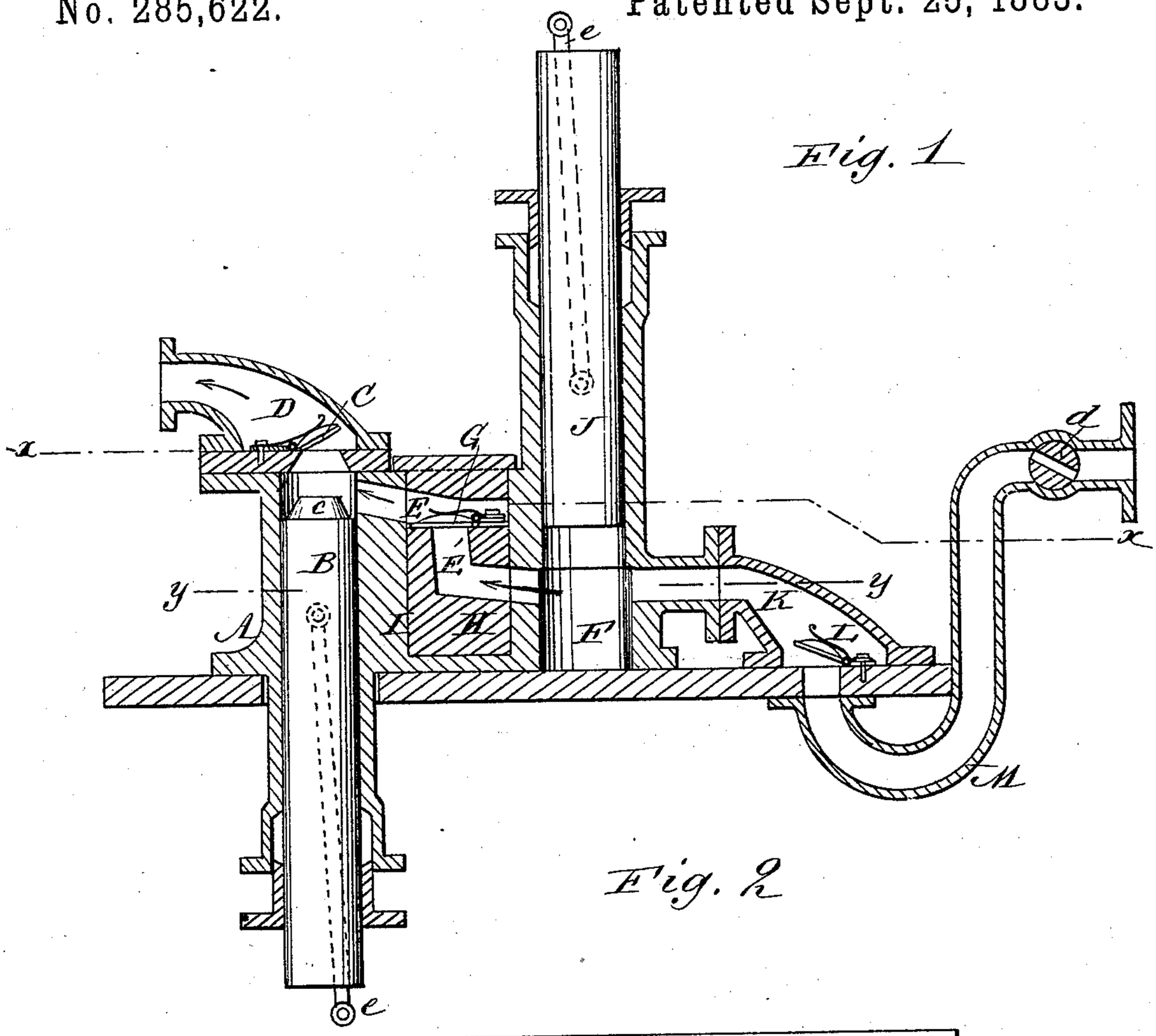

Fig. 1

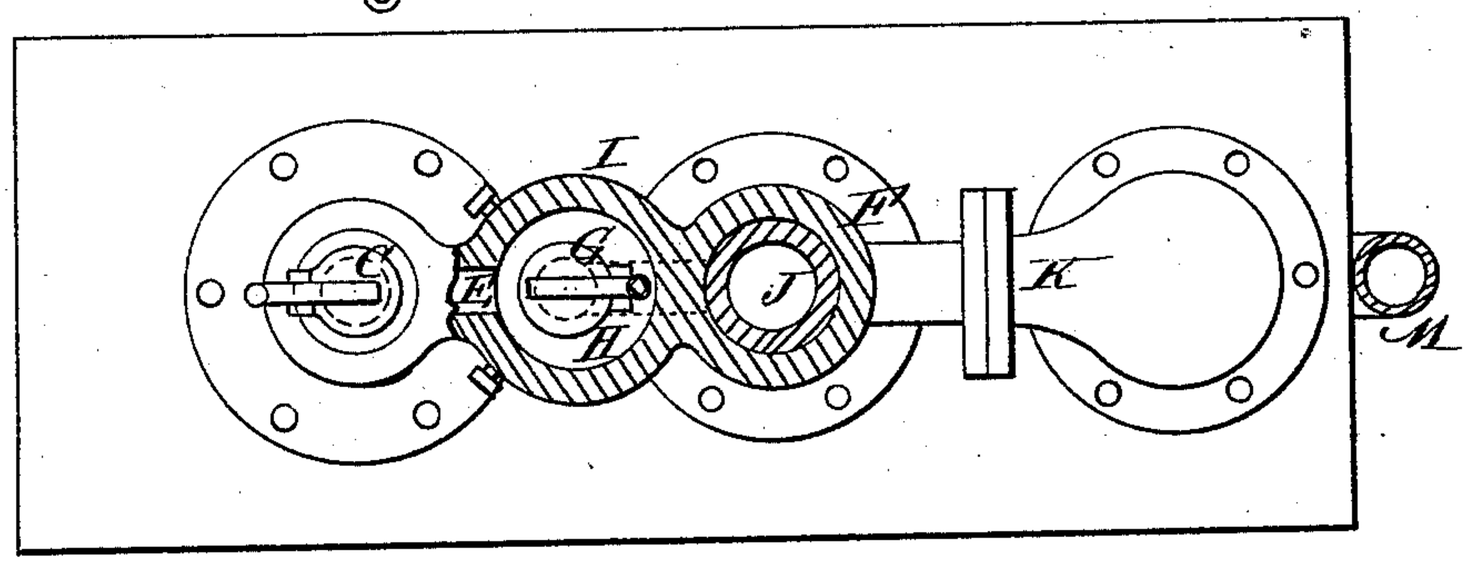

Fig. 2

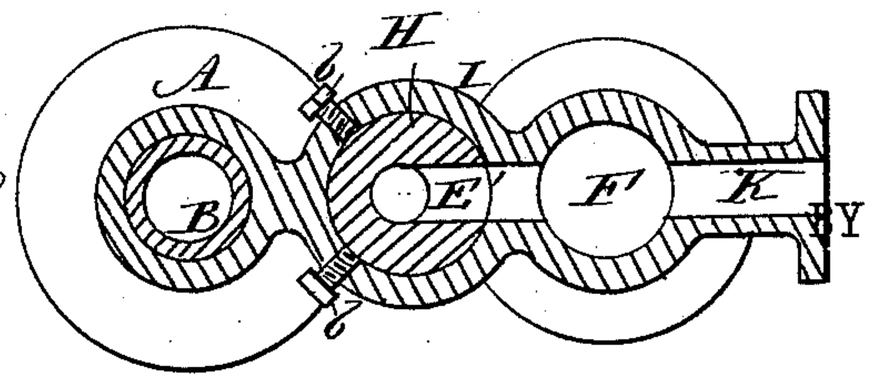

Fig. 3

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JOHN HOUPT, OF SPRINGTOWN, PENNSYLVANIA.

COMPOUND FEED-PUMP FOR STEAM-BOILERS.

SPECIFICATION forming part of Letters Patent No. 285,622, dated September 25, 1883.

Application filed April 23, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOHN HOUPT, of Springtown, in the county of Bucks and State of Pennsylvania, have invented certain new and useful Improvements in Compound Feed-Pumps for Steam-Boilers, of which the following is a full, clear, and exact description.

This invention relates to hot-water-feed pumps for steam-boilers, constructed to operate upon the same general principles as the pump described in reissued Letters Patent No. 10,177, granted me August 8, 1882, and has a like object in view—namely, the supplying of steam-boilers, with hot water at a higher temperature, and with a greater uniformity of pressure than is practicable with feed-pumps of ordinary construction, thus economizing fuel, and tending to prevent explosions due to the water becoming too low in the boiler in consequence of the defective working of the hot-water-feed pump, and which is most liable to occur when the water accidentally attains a very high temperature in the heater, more especially the heater of a high-pressure engine.

In the present invention, as in my previous one above referred to, the force-pump which supplies the water to the boiler has combined with it an auxiliary pump, with check-valve between them, said auxiliary pump being arranged between the first-named pump and the heater, and both pumps working simultaneously in like directions to produce an artificial pulsation and overcome any undue back-pressure in the cylinder and supply-pipe; but I simplify the construction by using elongated plungers in said pumps, instead of pistons having valves in them, as also in other respects; and my invention is embodied in the construction and combination of parts, substantially as hereinafter shown and described.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 represents a vertical section of my improved compound hot-water-feed pump for steam-boilers. Fig. 2 is a horizontal section of the same on the irregular line *x x* in Fig. 1; and Fig. 3 is a further horizontal section, in part, upon the line *y y*, Fig. 1.

A in the drawings indicates the vertical cylinder of the feed-pump proper, provided with an elongated plunger, B, arranged to pass out through the bottom or one end of said cylinder, and of the same diameter, or thereabout, throughout its entire length as the interior of such cylinder. C is the delivery-valve of said pump, arranged at the upper or discharge end of the cylinder A, within or under cover of an outlet branch, D, which connects with the boiler.

E E′ indicate the hot-water-supply pipe or passage to the upper or discharge end of the cylinder A from the cylinder F of the auxiliary pump. This passage, within which is the spring check-valve G, is partly formed within or through a plug-seat, H, for said valve, arranged within a chamber, I, such seat being held to its place in said chamber by set-screws *b b*, whereby the check-valve and its seat may be readily taken out for repairs.

The inner or upper end of the plunger B is constructed with a projection, *c*, which enters within the aperture closed by the outlet or discharge valve C, whereby said plunger in its upstroke is made to work close up to the said valve when closed.

J is the elongated plunger of the auxiliary pump, arranged to pass out through the upper end of the cylinder F, and K is the inlet of the auxiliary pump, fitted with an inlet valve, L.

M is the tube, having a regulating-cock, *d*, which connects the auxiliary pump with the heater or source of supply that is not shown, but which, in practice, is arranged above the level of the pump-cylinder A, so that the pump will be always primed and supplied by the gravitation of the feed-water itself, independent of the pressure of the atmosphere.

Both plungers B J reciprocate together and in the same direction simultaneously, and by making them hollow they may be worked from any suitable mechanism by rods *e e*, pivoted within them, as shown by dotted lines in Fig. 1.

The general action is the same as in the compound pump described in reissue Letters Patent No. 10,177, hereinbefore referred to, both plungers reciprocating together and in the same direction, and keeping up a constant supply of hot water, and producing an arti-

ficial pulsation, which overcomes any undue back-pressure that may arise from the formation of steam in the pump-cylinder and supply-pipes owing to the high temparture attained by the surrounding materials, so that it is practicable to supply a steam-boiler with water of higher temperature than by means of the ordinary feed-pump, by reason of there being greatly less danger of explosion from the rapid formation of steam in the cylinder and supply-pipes.

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

1. In a pump for feeding hot water to steam-boilers, the combination of the cylinder A, opening upward, and having the valve D and the elongated plunger B, with the supply passage or pipe E E′, within which is located the valve G, and the cylinder F, opening downward, and having the elongated plunger J, the latter cylinder and plunger being arranged intermediately between the supply end and discharge end of the pipe and the former cylinder and plunger, substantially as and for the purpose set forth.

2. In a pump for feeding hot water to steam-boilers, the combination, with the cylinder A, the elongated plunger B, and the outlet and check valves C G, of the auxiliary feed-pump, consisting of cylinder F, elongated plunger J, and valve L, the plungers B and J being adapted to perform their strokes simultaneously in the same direction, substantially as specified.

3. The externally-removable plug valve-seat H, check-valve G, and chamber I, in combination with the pump-cylinders A F, the elongated plungers B J, the valves C L, and the ducts or passages D, E, E′, and K, essentially as and for the purposes herein set forth.

4. In a pump for feeding hot water to steam-boilers, the combination of the hollow elongated plungers B J, with their operating-rods *e e*, the pump-cylinders A F, the valves C, G, and L, the passages D E E′ K, the externally-removable plug valve-seat H, with its chamber I, and the tube M, with its regulating-cock *d*, substantially as shown and described.

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Witnesses:
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