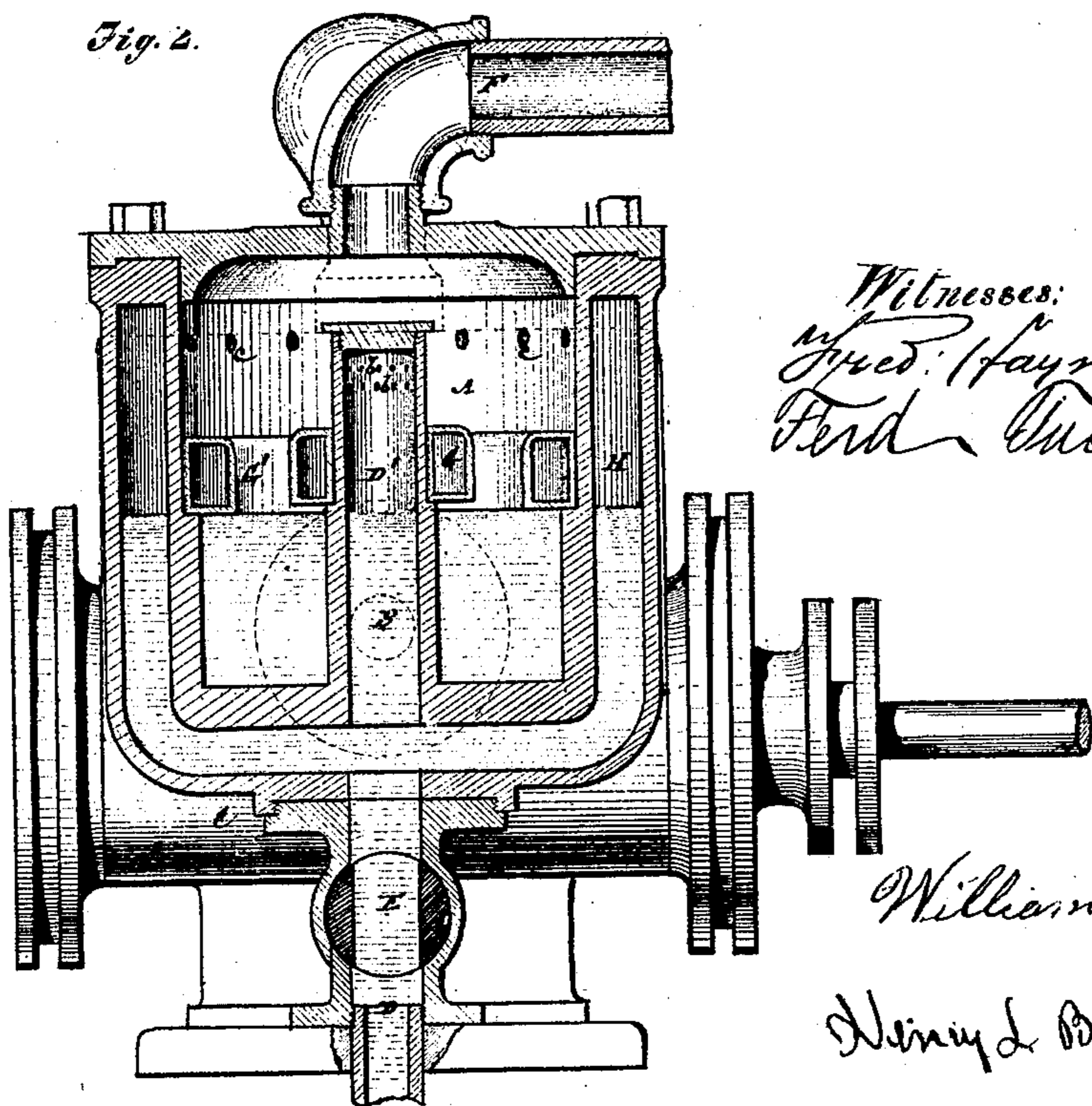
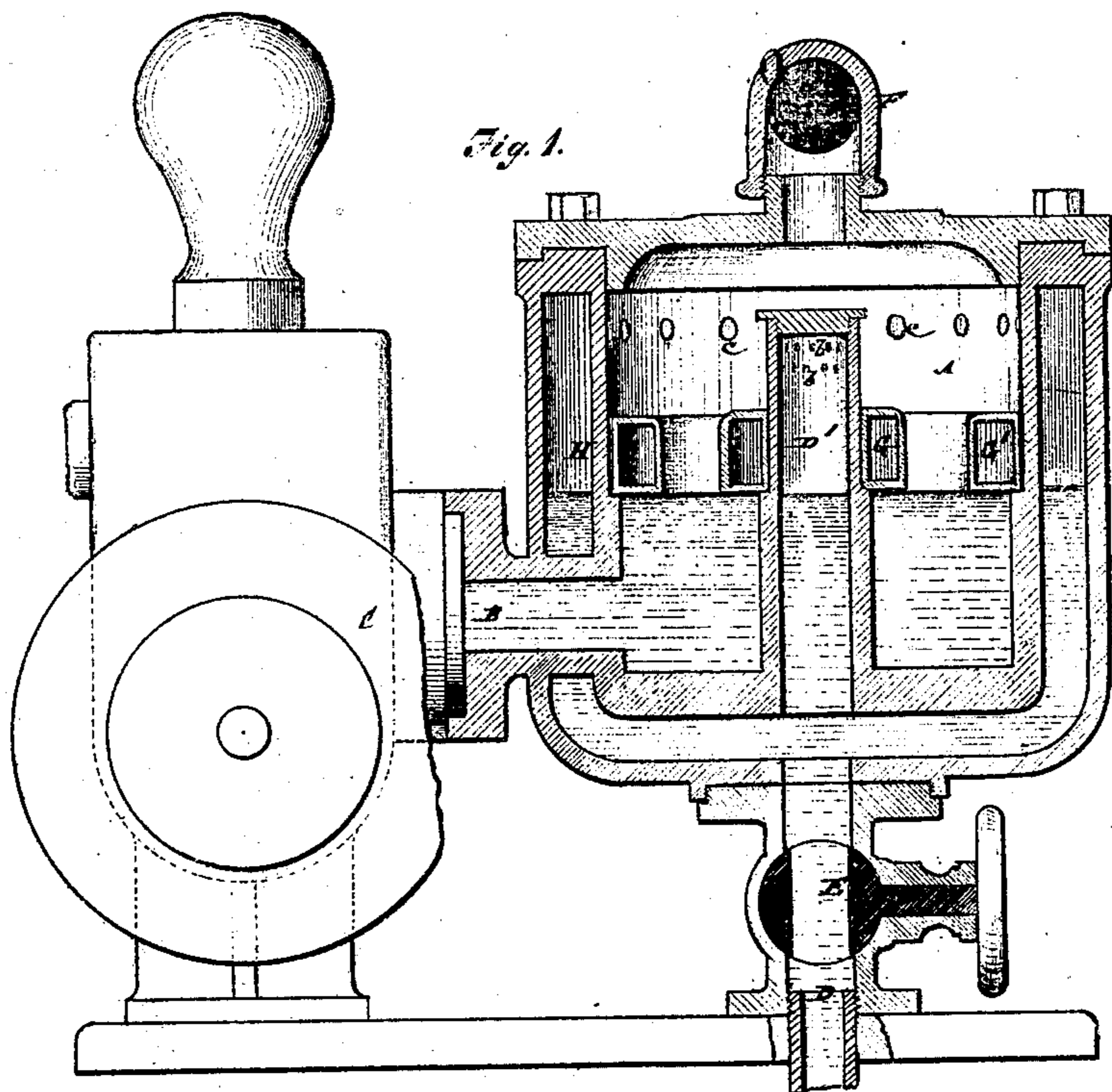


*Craig & Brewster,*

*Steam Condenser.*

*No. 109113.*

*Patented Nov. 8. 1870.*



*Witnesses:*  
*Fred. Haynes*  
*Fred. Quech*

*William Craig*  
*Henry L. Brewster*

# UNITED STATES PATENT OFFICE.

WILLIAM CRAIG, OF NEWARK, NEW JERSEY, AND HENRY L. BREVOORT,  
OF BROOKLYN, NEW YORK.

## IMPROVEMENT IN CONDENSERS FOR STEAM-PUMPS.

Specification forming part of Letters Patent No. 109,113, dated November 8, 1870.

*To all whom it may concern:*

Be it known that we, WILLIAM CRAIG, of Newark, in the county of Essex and State of New Jersey, and HENRY L. BREVOORT, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Condensers for Steam-Pumps, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, forming part of this specification, and in which—

Figures 1 and 2 represent sectional elevations, at right angles to each other, of a condenser constructed in accordance with our improvement, and as applied to a steam-pump.

Similar letters of reference indicate corresponding parts.

Our improvement relates to the application, to a steam-pump, of a condenser, by means of which a vacuum may be produced on the exhaust side of the steam-piston at each stroke of the pump, and the heat of the exhaust-steam be communicated to the water forced by the pump; and our improvement includes a perforated suction-pipe, or extension from the suction-pipe leading up into the condenser and float, operating as a valve by the rise and fall of the water in the condenser, to open and close communication between the suction-pipe and condenser. The suction-pipe it is preferred to provide with a hand-valve, whereby the passage of water up said pipe into the condenser may be controlled, as required, and the float, which automatically prevents flooding of the condenser, be relieved from constant or excessive motion.

The improvement also includes a water-chamber, arranged to surround the condenser, and in communication with the suction-pipe, by which it is supplied; also, in communication above, by perforations, with the condenser, under control of a float within the condenser operating as a valve, as and for the like purpose as the float which controls the perforations in the suction-pipe.

In some cases this outer water-jacket, which serves to absorb the heat that otherwise would pass through the exterior of the condenser, may be omitted; or it might, in conjunction with its floating valve, as described, be used exclusively and without the co-operation of

the perforated suction-pipe and its floating valve.

Referring to the accompanying drawing, A is a chamber or condenser, connected by a branch, B, with the inlet of the water-cylinder C of a steam-pump, which latter may be of ordinary or any suitable construction. D is the suction-pipe, fitted with a valve, E, controllable by hand. Connected with the suction-pipe D is an upper extension, D', of said pipe, the same being arranged to lead up into the condenser, and having a series of perforations, *b*, in the upper portion of it, preferably of greater area in the aggregate than the suction-pipe or its extension D'.

The exhaust-steam from the steam-cylinder of the pump enters the condenser by a pipe, F, and, coming in contact with the water entering the condenser through the upper portion of the pipe D', is immediately condensed, thereby producing a vacuum on the exhaust side of the steam-piston, which augments the power of the pump and communicates the heat of the exhaust-steam to the water forced by the pump that draws its supply by the pipe B from the condenser.

The pipe D' is fitted with a float, G, arranged to encircle said pipe on the outside, and free to rise and fall up and down it. This float rises when the water stands unduly high in the condenser A, and, operating as a valve, closes the perforations *b* in the pipe; nor will said float fall again to re-establish free communication between the condenser and the suction-pipe until the pump has made one or more strokes and drawn the surplus water from the condenser or chamber A. This closing action of the float G on the pipe D' prevents the condensing-chamber A from becoming choked with water and passage of the latter by the pipe F into the steam-cylinder of the pump.

Arranged to surround the condensing-chamber A is a water-jacket, H, which is in communication by a lower water-space or branches with the suction-pipe D, by which it is supplied with water. This water-jacket H takes up the heat from the exhaust-steam, which otherwise would pass through the exterior or shell of the condenser, and imparts the same to the water forced by the pump, said water-

jacket being in communication above, by the perforations *c*, with the condensing-chamber A, which provision practically converts the water-jacket H into a water-supply course or passage to the condenser similar to the perforated extension-pipe D', and by means of a second float, G', that rises and falls with the water in the condenser, the perforations *c* are automatically closed or opened in like manner to the perforations *b* as controlled by the float G, and for a like purpose or purposes.

While it is considered preferable to employ both means for supplying the condenser with water, either the perforated internal pipe D', with its float G, or the jacket H, with its valve-float G', may be used separately, if desired.

The floats G G' may either be sustained by their own buoyancy or be supported by balance-weights, and have their limits of stroke controlled by suitable stops.

When the pump is required to be stopped for any considerable time the valve E is closed, or, in case of it being necessary to run the

pump slowly for a lengthened period, said valve may be partially closed, thereby relieving the floats G G', or either of them, from constant or excessive motion.

What is here claimed, and desired to be secured by Letters Patent, is—

1. The combination, with the perforated suction-pipe or extension D' thereof, of the float G, operating as a valve to control in an automatic manner the ingress of water to the condenser, essentially as and for the purpose or purposes herein set forth.

2. The water-jacket H, in communication with the suction-pipe D below and with the condenser A above, in combination with the float G', operating as an automatic valve to the discharge-apertures of the jacket, substantially as described.

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Witnesses:

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FERD. TUSCH.