

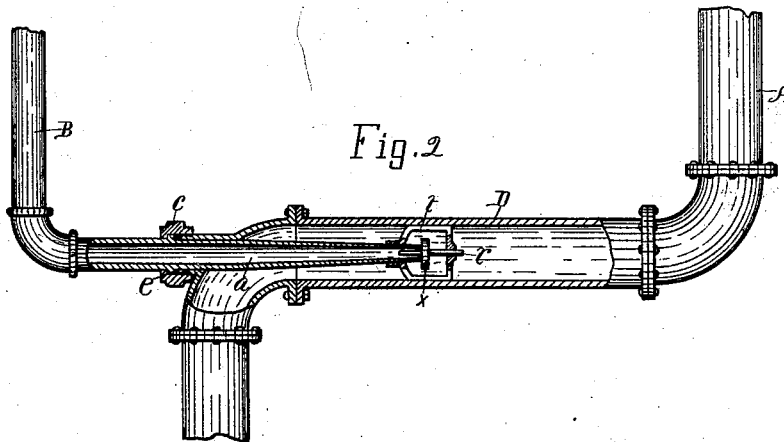
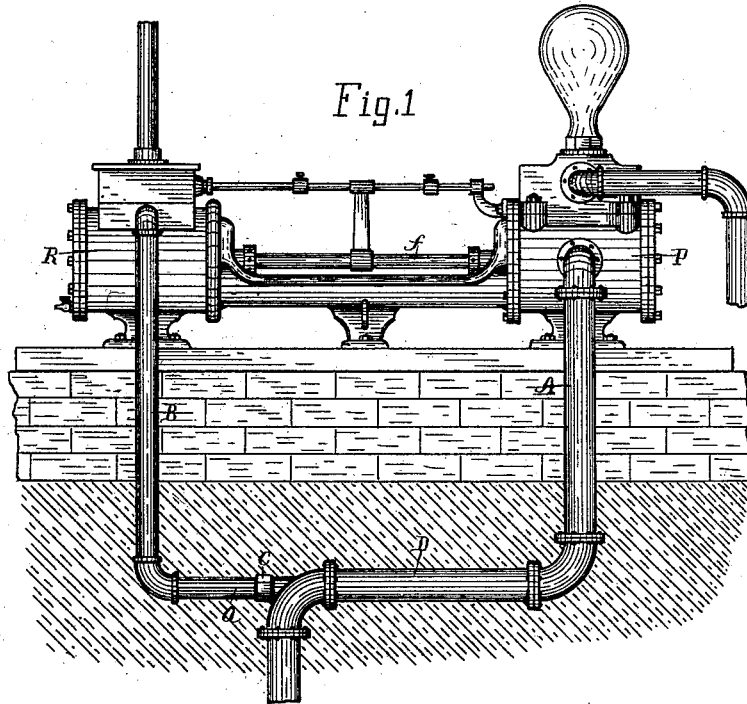
(No Model.)

W. S. WANDELL.

HEATER AND CONDENSER FOR STEAM FORCE PUMPS.

No. 347,215.

Patented Aug. 10, 1886.



Witnesses.  
John B Perkins  
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Atty.

# UNITED STATES PATENT OFFICE.

WILBER S. WANDELL, OF VICKSBURG, MICHIGAN.

## HEATER AND CONDENSER FOR STEAM FORCE-PUMPS.

SPECIFICATION forming part of Letters Patent No. 347,215, dated August 10, 1886.

Application filed October 10, 1885. Serial No. 179,508. (No model.)

*To all whom it may concern:*

Be it known that I, WILBER S. WANDELL, a citizen of the United States, residing at Vicksburg, county of Kalamazoo, State of Michigan, have invented a new and useful Heater and Condenser for Steam Force-Pumps, of which the following is a specification.

This invention has for its object certain improvements in constructions for injecting exhaust-steam into the suction-pipe of the pump in the direction of the flow of the water through said pipe, said invention consisting of the combination of a valve, hereinafter described, combined with the injection-nozzle.

In the drawings forming a part of this specification, Figure 1 is an elevation of an ordinary steam force-pump, with the ground below the base-support in section, and having my invention connected; and Fig. 2 shows an enlarged elevation of pipes in Fig. 1, portions being broken, and in longitudinal section.

Referring to the drawings and the letters marked thereon, R is the steam-cylinder of the pump; *f*, the piston-rod; P, the pump; B, the steam-exhaust pipe; A D, the suction-pipe, which in use extends to a water supply; and E is the water-discharge pipe of the pump, (here shown broken away,) which in many cases connects with a water-tank, as in the case of force-pump and water-tank at a railway-station, to which use my invention is especially suitable. No well or water-supply is here shown, the lower end of the suction-pipe being broken. The exhaust-pipe B terminates in a tapered nozzle, *a*, which is inserted through the elbow of the suction-pipe and extends into the horizontal portion of said pipe, Fig. 2. The term "horizontal" as applied to this part of the suction-pipe it will be of course understood simply describes the position this pipe happens to occupy in the drawings, it being obvious that the position and angles of the several pipes and specific portions of them will vary in different uses.

Referring to Fig. 2, the flow of the water being toward the right in the horizontal portion of the suction-pipe, it will be seen that the exhaust-steam from the engine in being inducted into the suction-pipe through the nozzle *a* would enter in the direction of the

flow of the water, but would enter in a partially or wholly condensed state, caused by the contact of the flowing cold water with the long nozzle *a*. This nozzle is tapered, which retards the passage of steam into the suction-pipe, thereby causing a greater condensation than would be the case if the nozzle were all the way of a size. A suitable stuffing-box or packing, *e*, is employed when necessary to make a tight joint where the nozzle of the exhaust-pipe enters the suction-pipe. A suitable valve should be employed at the end of the nozzle in the suction-pipe D, so made that the receding or back flow of the water when the pump is at rest will close the nozzle, thereby preventing the latter from acting as a vent to the suction-pipe, and so made that the pressure of steam or the flow of the water will open the valve when the pump is in operation. In Fig. 2, *x* shows a valve resting against the end of the nozzle, and having a stem loosely entering the nozzle on one side, and a stem, *r*, loosely passed through a hole of a skeleton frame, *t*, connecting the nozzle. It will be observed that the valve flares out where it rests against the nozzle much larger than the nozzle, so that the flowing water contacts with said flange or enlargement and moves the valve away from contact with the end of the nozzle to permit the escape of steam. The back water when the pump is at rest contacts with the flaring valve and forces it back against the nozzle, thus closing the latter to exclude air and water.

Having thus described my invention, what I claim as new is—

The combination of the suction-pipe, the nozzle entering said pipe in the direction of the flow of the water, and the flanged valve larger than the end of the nozzle, having a stem entering the nozzle, and a stem adapted to play in a guide-support in the suction-pipe, substantially as set forth.

In testimony of the foregoing I have hereunto subscribed my name in presence of two witnesses.

WILBER S. WANDELL.

Witnesses:

E. L. HINDES,  
JOHN H. CHASE.