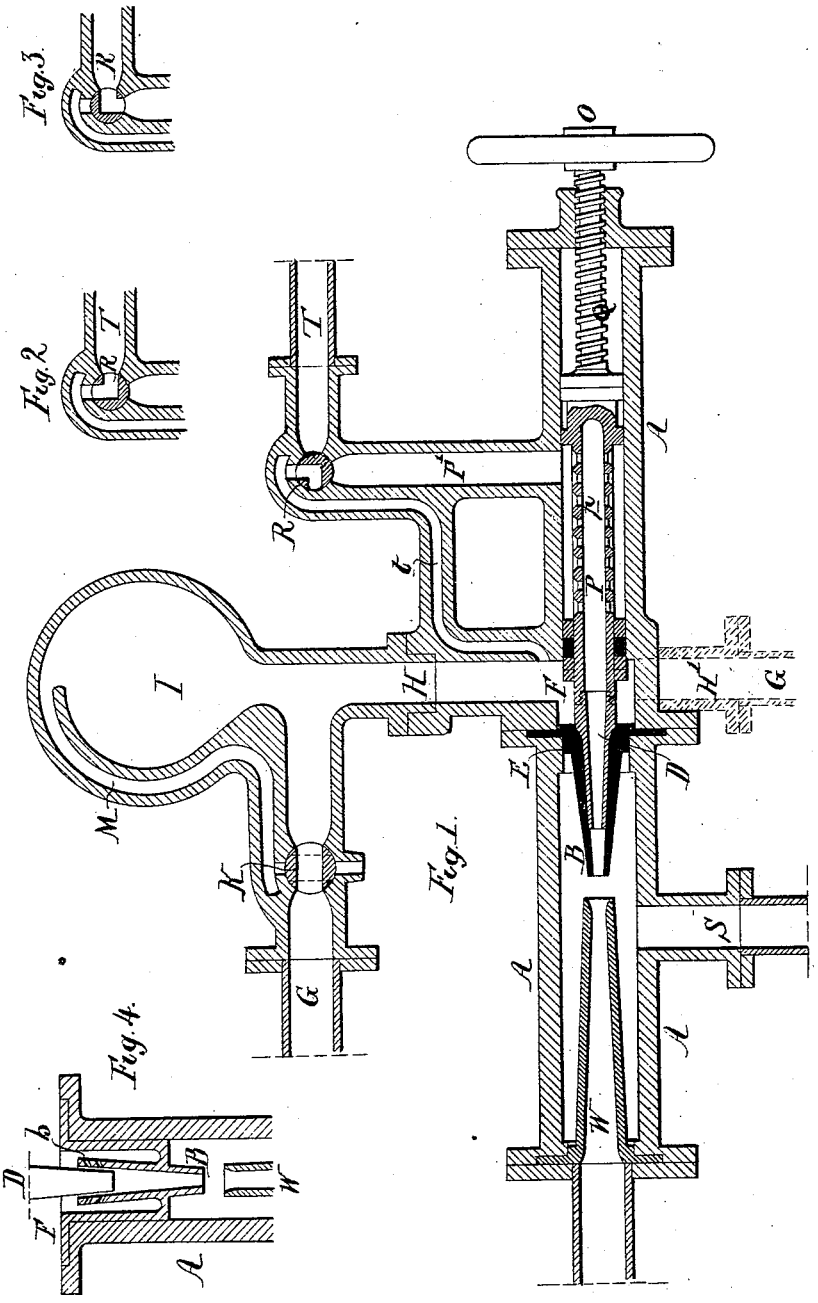
P. VABE & H. CUAU.

Apparatus for Drawing or Raising Water, &c.

No. 166,657. Patented Aug. 10, 1875.



Witnesses, Hubert Howson
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Philibert Vabe and
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UNITED STATES PATENT OFFICE.

PHILIBERT VABE AND HIPPOLYTE CUAU, OF PARIS, FRANCE.

IMPROVEMENT IN APPARATUS FOR DRAWING OR RAISING WATER, &c.

Specification forming part of Letters Patent No. **166,657**, dated August 10, 1875; application filed May 31, 1875.

To all whom it may concern:

Be it known that we, PHILIBERT VABE and HIPPOLYTE CUAU, both of Paris, in the Republic of France, have invented certain Improvements in Injectors, of which the following is a specification:

The object of our invention is to so construct an injector that its operation will be facilitated, and that it will operate at a greater distance from the water-supply than ordinary injectors; and this object we attain in the manner which we will now proceed to describe, reference being had to the accompanying drawing, in which—

Figure 1 is a sectional view of an injector with our improvements; Figs. 2 and 3, views of part of the improvement, and Fig. 4 a modification of our invention.

In the outer casing A of the injector are the usual combining-nozzle B, overflow-pipe S, and discharge-tube W. Into this nozzle B projects the tapering point D of the hollow piston P, which is controlled by the handle O on the end of the screw-stem Q. The interior of this piston communicates with the steam-pipe T through the perforations *p*, passage P′, and cock R.

When the piston P is screwed down, as in Fig. 1, the tapered plug D forms a tight joint with the valve-seat E of the nozzle B, so as to intercept communication between the water-chamber F and discharge-tube W. This water-chamber communicates with the steam-pipe T through the passage *t* and cock R, and with the water-pipe or suction-tube G through the opening H, vessel I, and cock K. Air can enter the upper part of this vessel I through the passage M when the cock K is turned to the position shown by dotted lines.

The movable parts of the apparatus being in the position shown in Fig. 1, in order to put the injector in operation the cock R is first turned to the position shown in Fig. 2, when the steam will rush through the passage *t* into the vessel I and water-pipe G. The cock R being then turned to its first position, Fig. 1, the steam thus cut off will be condensed, and a vacuum will be created, when the water will rise into the vessel I and water-chamber F. The cock K is now turned to the position shown by dotted lines, and the piston P drawn back, when air will enter the upper part of the vessel I through the channel M, and the water will flow out through the nozzle B. The tube G meanwhile, not being in communication with the vessel, remains full of water. The cock K is then turned back to its normal position, the flow of water continuing on account of the atmospheric pressure, and the cock R is turned to the position shown in Fig. 3, when the steam, entering the interior of the piston P, and combining with the water in the nozzle B, will pass with the same through the discharge-tube W, as in ordinary injectors.

The object of the above-described manipulation is to effect the raising of a sufficient volume of water to start the injector when the reservoir from which the water is drawn is situated at a point below the same.

The flow of steam is regulated by the cock R, and the flow of water by the piston P, which thus serves the twofold purpose of a steam-passage and water-regulator.

In some cases—as, for instance, when the feed-water is of a comparatively low temperature—the vessel I and cock K may be dispensed with, the tube G being in direct communication with the chamber F through the passage H′, as shown by dotted lines, Fig. 1, the method of putting the injector in operation being the same as above described.

In the modification, Fig. 4, the water-chamber F is continued for some distance below the top of the tube B, and in the latter is a series of small openings, *b*, so that the water, passing through these openings in small jets, will have a better condensing effect on the steam.

It will be seen that by the addition of our improvements to ordinary injectors, aspirators, and apparatus performing like duties, the latter can be situated at a much greater distance from the water-supply than heretofore, and that they can be much more readily set in operation.

We claim as our invention—

1. A perforated hollow piston, P, communicating with the steam-pipe T, and forming a water-regulator, with the combining-tube B of an injector, in combination with the water-passage communicating, through the cock R,

with the steam-pipe, all substantially as set forth.

2. The combination of the vessel I, its air-passage M, and the cock K with the water-pipe G and water-chamber F, communicating with the steam-pipe, all substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

PHILIBERT VABE.
HIPPOLYTE CUAU.

Witnesses:
ALFRED COING,
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