

G. HIBBERD.
Ejectors.

No. 141,349.

Patented July 29, 1873.

FIG. 1.

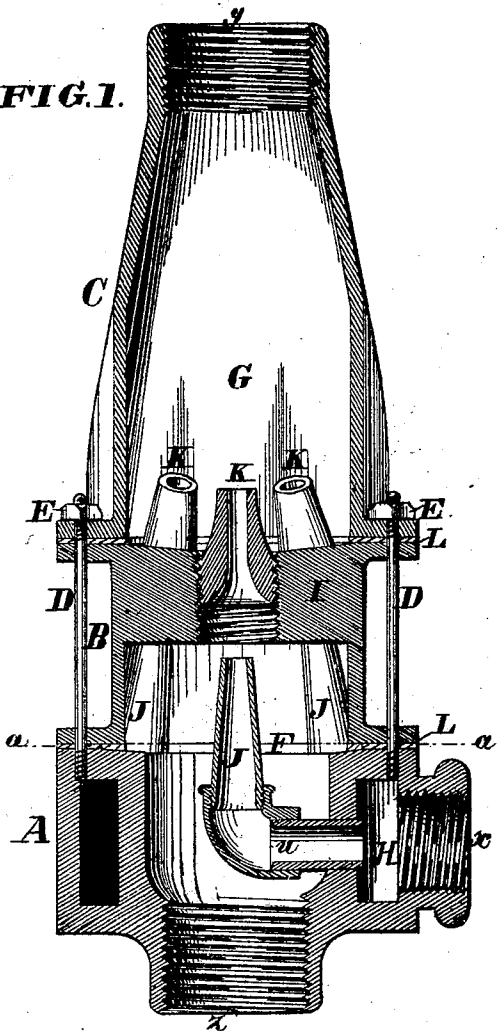


FIG. 2.

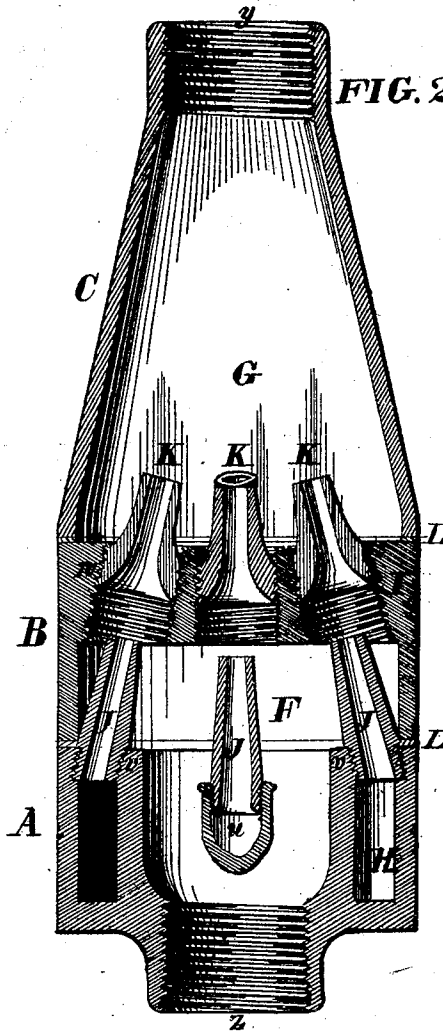


FIG. 3.

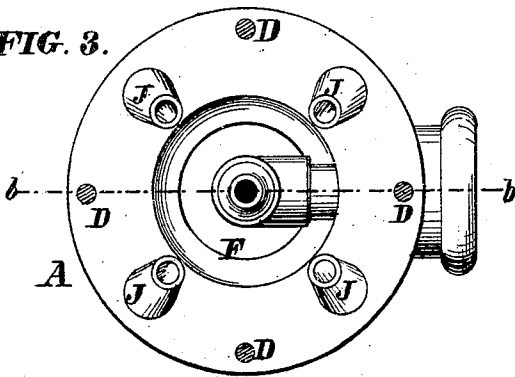
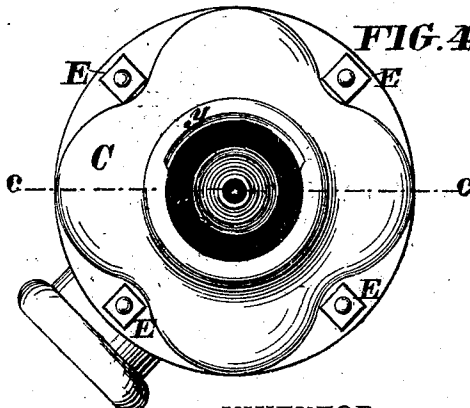


FIG. 4.



WITNESSES.

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UNITED STATES PATENT OFFICE.

GEORGE HIBBERD, OF WHEELING, WEST VIRGINIA.

IMPROVEMENT IN EJECTORS.

Specification forming part of Letters Patent No. **141,349**, dated July 29, 1873; application filed July 10, 1873.

To all whom it may concern:

Be it known that I, GEORGE HIBBERD, of Wheeling, in the county of Ohio, West Virginia, have invented an Improved Siphon Pump or Ejector, of which the following is a specification:

This invention relates to an improved siphon-pump for elevating water, the same having two or more steam-nozzles and two or more water-nozzles arranged to operate within one and the same pipe or conduit of large diameter. The invention consists, primarily, in a plurality of steam-nozzles and water-nozzles converging toward a central point in a chamber common to all, so as to concentrate their streams and thus augment the aggregate effect. The forcing-jets may be of steam, compressed air, or water under pressure, and the nozzles are, by preference, of the adjustable form and peculiar shape described in my former patent, dated October 25, 1870.

Figures 1 and 2 represent vertical longitudinal sections of the improved pump taken in different planes. Fig. 3 is a plan view of the lower section of the pump. Fig. 4 is a plan view of the complete pump.

The line *a*, Fig. 1, indicates the plane of Fig. 3. The line *b*, Fig. 3, indicates the plane of Fig. 1, and the line *c*, Fig. 4, indicates the plane of Fig. 2.

The cylinder or stock of this pump is cast in three sections, A B C, which are united by one set of stud-bolts, D, and nuts E. In the illustration the pump is arranged vertically, which is not essential, but it will be thus described. A screw-neck, *z*, is formed on the bottom of the lower section A of the stock for the attachment of a suction-pipe. This opens into a suction-chamber, F, formed within the base and middle sections A B. A force-chamber, G, is formed within the upper section C, and at the upper end of this the outlet or discharge *y* is formed. This may be arranged in line with the inlet, as represented, or at any angle thereto, as may be required. Within the base-section A, around the suction-chamber F, a steam-chest, H, is formed, and a lateral neck, *x*, is provided as its inlet. The top of the middle section consists of a diaphragm, I, which separates the suction and force cham-

bers. A series of screw-threaded perforations, *w*, are formed in this, and a corresponding series of screw-threaded perforations, *v*, are formed in the top of the base-section A, to communicate with the annular steam-chest H. An inwardly-projecting elbow-pipe, *u*, forms a corresponding central socket. Steam-nozzles J are screwed into the sockets *v*, and water-nozzles K into the perforations *w*, to complete the apparatus. By means of the screw-joints the nozzles may be readily adjusted to the most effective position for every individual apparatus. Gaskets L are placed between the sections of the stock to form tight joints, and they are then clamped together by applying the nuts E to the screws D. The middle and upper sections B C of the stock are preferably conformed in transverse section to the general outline of the group of nozzles when three or more nozzles are employed, as in the illustration. The spaces thus formed, being provided with end flanges *t*, accommodate, in the most advantageous manner, the bolts D and nuts E, so that these do not increase the bulk of the apparatus. The bolts D are anchored in the top of the base-section A, as represented in Fig. 1.

It will be observed that the stock as thus constructed can be very readily cast and taken apart for adjusting the nozzles or for removing obstructions with the greatest facility. The plurality of jets, acting within a force-chamber common to all, serve to elevate a larger body to a given height, or a given body of water to a greater height with a given pressure of steam, or even with a lower pressure. By employing a sufficient number a pump with a discharge ten or more inches in diameter may be operated. For a pump with a discharge one inch in diameter two steam-nozzles and two water-nozzles will be sufficient. With this number the pump-sections are preferably all round. To concentrate the jets or streams from the several nozzles they are arranged radially, as clearly illustrated in the drawing, so as to converge toward a given point in the force-chamber. The central nozzles, when such are employed, are vertical. The water in the force-chamber is supported in great part by the upper surface of the diaphragm I be-

tween the water-nozzles, which facilitates the operation by reducing the tendency to reflow.

The following is claimed herein as new:

1. The improved siphon-pump herein described, having a plurality of steam-nozzles, J, and water-nozzles K, arranged so as to converge toward a given central point in the force-chamber or discharge-pipe, so as to concentrate their jets or streams, as set forth.
2. The combination of the inlet z, suction-

chamber F, force-chamber G, perforated diaphragm I, annular steam-chest H, and nozzles J K, as specified.

In testimony of which invention I hereunto set my hand this 2d day of July, 1873.

GEORGE HIBBERD.

Witnesses:

WM. LUOTHART,
R. S. BROWN.