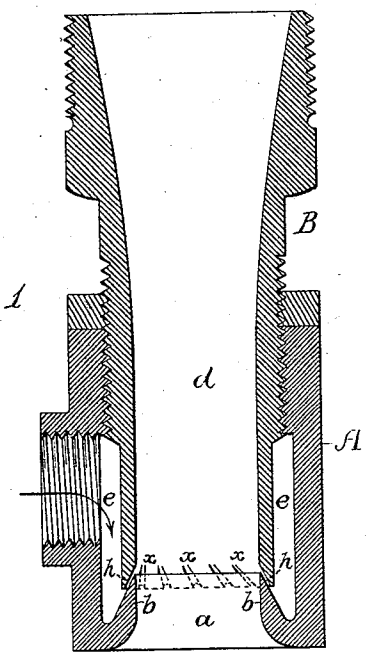
(Model.)

# W. HUSTON.

## EJECTOR.

No. 284,962. Patented Sept. 11, 1883.

Fig. 1



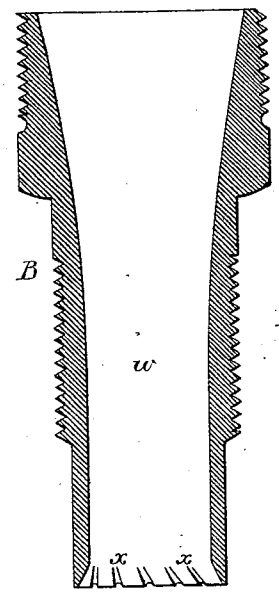




Fig. 2.

Fig. 3.

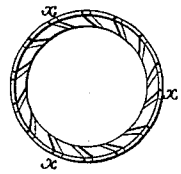



Fig. 4.

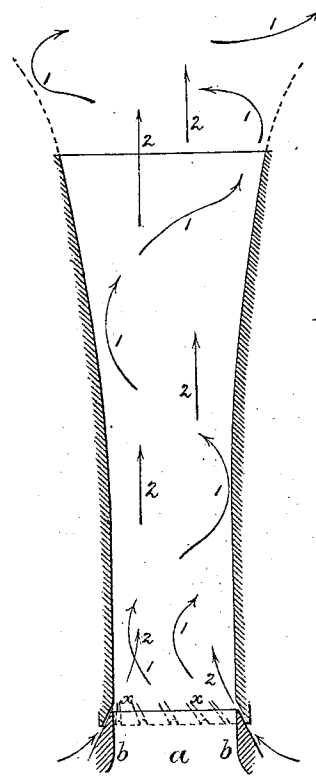
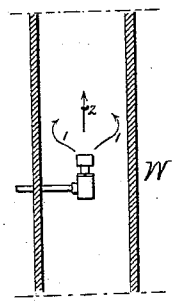



Fig. 5.




Witnesses
James F. Johnson
Harry Smith

Inventor
William Huston
by his Attorneys
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N. PETERS. Photo-Lithographer. Washington, D. C.

# UNITED STATES PATENT OFFICE.

WILLIAM HUSTON, OF WILMINGTON, DELAWARE, ASSIGNOR OF ONE-HALF TO HENRY N. WICKERSHAM, OF SAME PLACE.

## EJECTOR.

SPECIFICATION forming part of Letters Patent No. 284,962, dated September 11, 1883.

Application filed May 7, 1883. (Model.)

*To all whom it may concern:*

Be it known that I, WILLIAM HUSTON, a citizen of the United States, and a resident of Wilmington, Delaware, have invented certain Improvements in Ejectors, of which the following is a specification.

My invention consists, mainly, in increasing the efficacy of ejectors by causing the fluid under pressure to deviate from a direct course as it passes into the discharge-passage between the end of the latter and the end of the suction-passage, as explained hereinafter.

In the accompanying drawings, Figure 1 is a section of an ejector by which my invention is carried into effect; Fig. 2, a section of part of the ejector; Fig. 3, an inverted plan view of the tube, Fig. 2; Fig. 4, a diagram illustrating my invention, and Fig. 5 an illustration of the application of the ejector to the increasing of the draft in a chimney.

It should be understood in the outset that I do not desire to restrict myself to any particular mode of constructing the ejector, the views, Figs. 1, 2, 3, giving an example of a simple device by which my invention may be carried into effect.

There is a chest or casing, A, in one end of which is the inlet or suction opening, *a*, surrounded by an annular rib, *b*, beveled on the outside. A tube, B, projects into the chest, the interior of this tube forming the discharge-passage *d*, and within the chest is the annular receiving-chamber *e*, to which any fluid under pressure is admitted.

Between the annular rib *b* and the end of the tube *d* is an annular tapering passage, *h*, which forms a communication between the receiving-chamber and discharge-passage, the suction-passage *a* terminating and the discharge-pipe commencing at this communication *h*.

I make no general claim to the above-described parts, the main feature of my invention consisting in causing the fluid under pressure, or a portion of that fluid, to deviate from a direct course as it enters the discharge-passage *d*. This is accomplished in the device by forming inclined notches *x* in the inner beveled end of the tube B, these notches imparting to the fluid under pressure, or a portion of it, a whirling motion as it rushes through the discharge-passage, the induced fluid entering at the inlet or suction opening. Substantially the same effect will be produced by forming inclined grooves or notches on the annular rib *b* at the point where the communication *h* occurs between the receiving-chamber and discharge-passage; or both the rib and beveled end of the tube may be notched.

The difference between the action of the fluid under pressure in an ordinary ejector and that of the fluid in the improved ejector may be further explained by reference to the diagram Fig. 4. In the one case the fluid has a tendency to take a comparatively direct course, as indicated by the arrows 2 in the said diagram, whereas such of the fluid under pressure as may come under the influence of the inclined notches will deviate laterally and pursue the whirling course indicated by the arrows 1.

Should the end of the tube B be adjusted so as to bear against the annular rib *b*, there will be no communication between the receiving-chamber and discharge-passage, excepting through a series of orifices formed by the inclined notches, and all the fluid under pressure will have a whirling course imparted to it; but when there is an annular communication between the receiving-chamber and discharge-passage, as in the drawings, a portion only of the fluid will come under the influence of the inclined notches and will deviate laterally from a direct course, the remaining fluid pursuing a comparatively direct course. I have found by many and long continued tests, and by comparison with other ejectors, that by thus causing the fluid under pressure, or a portion of it to deviate laterally as it is entering the discharge-passage *d*, a much better effect is produced than by the ordinary ejector. Without attempting to give positive philosophical reasons for this result, I may state that in testing the instrument of which the drawings are an exact representation, by introducing steam under pressure into the receiving-chamber while the instrument was exposed above and below, part of the steam escaped from the discharge-passage in a direct course,

but the greater portion in widely-diffused whirling volumes, and that the exhausting effect at the suction-opening was much more powerful than in ordinary ejectors, even when a very small amount of steam was used. In other words, the tests showed that the inductive force of an ejector made according to my invention was much greater than that of an ordinary ejector.

It will be unnecessary to enumerate the many uses to which my improved ejector may be applied. It will suffice to say that it may be used as other ejectors are used whenever it is desirable to put in motion any fluid, elastic or non-elastic, by another fluid, elastic or non-elastic, and under pressure. I may, however, refer to one application of my invention. When the ejector was placed in a tube, W, to test its capacity for increasing the draft of a chimney, it was found to be more effective than an ordinary ejector, owing, doubtless, to the escape laterally of widely-diffused whirling volumes of steam. This application of the invention is shown on a reduced scale in Fig. 5. As shown in the drawings, the discharge-passage increases in diameter from about the point *w*, Fig. 2, to the outlet end.

It should be understood that the main feature of my invention is restricted to the mode of causing fluid under pressure to deviate from a direct course in an ejector at the point illustrated and described to bring about the desired result. Steam has been introduced in whirling jets into the body of an ejector at a different point, as in the Patent No. 159,256, granted February 2, 1875.

I claim as my invention—

1. The mode herein described of increasing the efficiency of ejectors, the said mode consisting in causing the fluid under pressure, or part thereof, to deviate from a direct course laterally, as it passes inward through the annular communication between an outer steam-chamber and the discharge-passage, substantially as set forth.

2. The combination, in an ejector, of the outer chest or casing, A, the tube B, forming the discharge-chamber, the rib *d*, forming the termination of the suction-passage, with inclined grooves in the end of the said tube, or in the rib where the annular tapering passage forms a communication between the said chest and discharge-tube, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM HUSTON.

Witnesses:

HENRY HOWSON, Jr.,

HARRY SMITH.