(No Model.)

T. E. JONES.

FLUID EJECTOR.

No. 419,126. Patented Jan. 7, 1890.

Fig. 1.

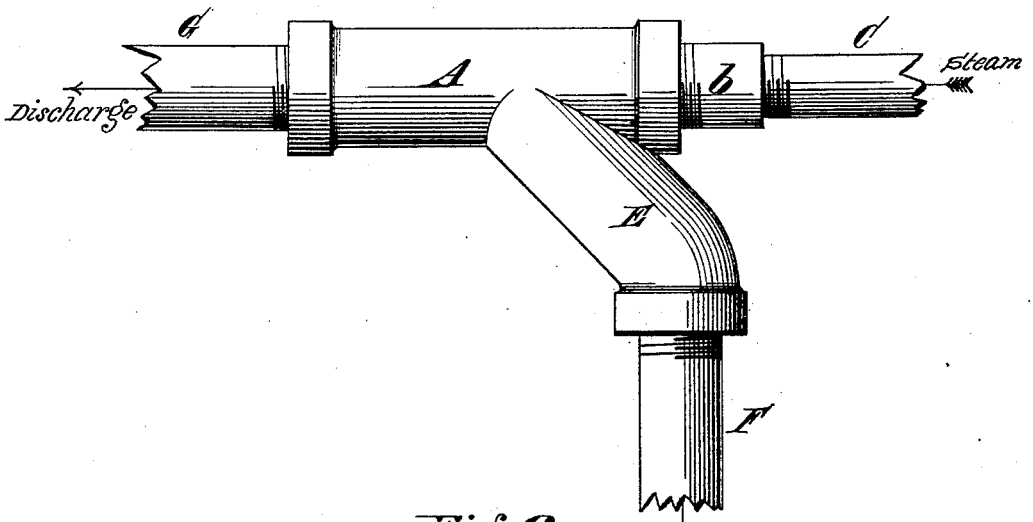

Fig. 2.

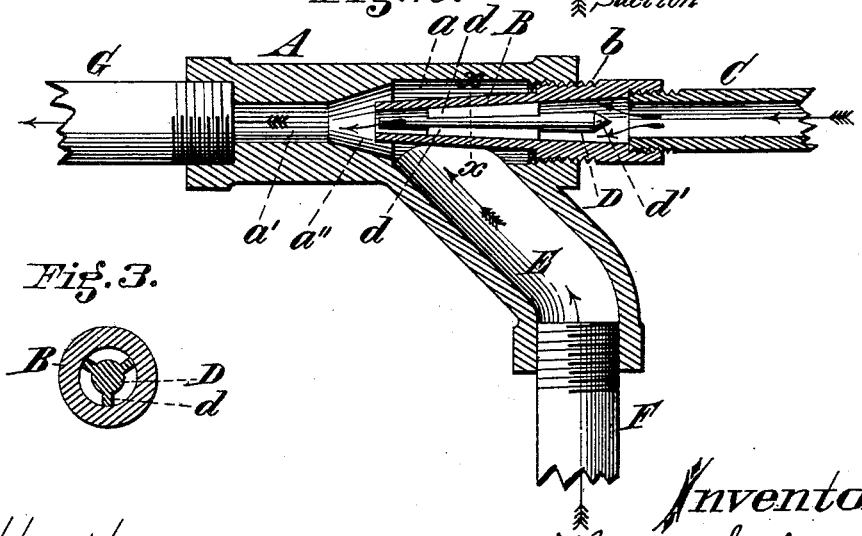

Fig. 3.

Attest

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UNITED STATES PATENT OFFICE.

THOMAS E. JONES, OF CINCINNATI, OHIO.

FLUID-EJECTOR.

SPECIFICATION forming part of Letters Patent No. 419,126, dated January 7, 1890.

Application filed August 16, 1889. Serial No. 320,975. (No model.)

To all whom it may concern:

Be it known that I, THOMAS E. JONES, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Fluid-Ejectors, of which the following is a specification.

My invention relates to improvements in ejectors which are adapted to the purpose of lifting or expelling liquids from cellars, cisterns, wells, or other receptacles to be drained, all of which will be fully hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a longitudinal elevation of my improvements, showing the several pipes leading thereto and therefrom broken off; Fig. 2, a central longitudinal section, partly in elevation, of the same; and Fig. 3 a transverse section on line *x x*, Fig. 2, of the ejector-nozzle or jet-tube having an internal concentric core or stem for effecting an annular discharge of the steam-blast.

A represents the shell or casing containing the ejector-chamber *a*, into which the tapered steam-jet tube or nozzle B projects concentrically therewith, as customary.

b represents the enlarged fastening end of nozzle B, which is partially screw-threaded for engagement with the threaded inlet-orifice of shell A.

C represents the supply or pressure pipe for conveying the steam, air, or other lifting and propelling force to the nozzle, its externally-threaded end engaging the internally-threaded mouth of the end *b* of said nozzle.

D represents a longitudinal bar or core supported by and concentrically within nozzle B by means of longitudinal wings or ribs *d*, projecting radially therefrom and suitably tapered to correspond with the taper bore of the nozzle, as shown in Figs. 2 and 3. The rear end *d'* of the core D is preferably made conical, as clearly shown in Fig. 2, to facilitate the action of the steam-blast and its proper delivery into the annulus or space surrounding said core, and the fore end lies within the discharge-orifice of the nozzle approximately on a line with it or a trifle to the rear. In this manner the steam is delivered to the vacuum-chamber in a thin broad annular ring at a point slightly within the rear end of the contracted throat or mouth. The core is also wholly within the steam supply or nozzle and needs no stem or handle with the accompanying packing required by the old-style cores, and it can thus be placed in a direct line with the supply, which permits of the full force of the steam being utilized, and also reduces the condensation of steam to a minimum, and also enables the ejector to be used with water of a very high temperature.

A suitable controlling or regulating valve is placed in the pressure-pipe, as customary, and as its construction and exact location are optional with the user I do not deem it essential or necessary to either show or describe it herein.

E represents a hollow Y-branch projecting at an angle of forty-five degrees (more or less, as desired) from the lower rear end of shell A, and receiving within its internally-threaded orifice the threaded upper end of the usual suction or lifting pipe F. The inner end of the Y-branch E terminates within the ejector or vacuum chamber *a* slightly in rear of the discharge end of the nozzle, which in practice I have found to be the most suitable and effectual position for the vacuum or suction point in the device.

a' represents a contracted aperture or passage-way in the delivery end of shell A, and *a''* an expanded or funnel-shaped throat leading from the ejector-chamber *a* thereto.

G represents the discharge-pipe, having a screw-threaded end, which engages the internally-threaded orifice at said delivery end of shell A, and designed to deliver the liquid lifted by the steam-blast, as customary.

In the operation of my ejector the steam or air blast or other lifting and propelling force is liberated from the pressure-pipe into the nozzle, the jet issuing therefrom being a broad annular or circular one occasioned by the presence of the core or partial filling D in said nozzle, thus materially economizing in the use of steam, particularly in continuous ejecting or pumping, and at the same time securing the full effect and benefit of its pressure in a suitable volume to take in a broad surface or

space and readily form the desired vacuum in the ejector-chamber. The Y-branch conducts the liquid to be lifted to the ejector-chamber in such a continuous or direct line and manner that there is practically no impeding collision with the upper part of said chamber or the ejecting-fluid, and the friction in the shell throughout in such connection is thereby reduced to a minimum.

The nozzle is rendered longitudinally adjustable to adapt the device to different elevations or lifts (or depths of liquid) by grasping the enlarged partially-threaded end *b* thereof and turning it inwardly or outwardly, as the case may be. When turned inwardly, so as to project the jet end toward the contracted orifice *a'*, it serves to raise the liquid from a lower or greater depth, and when withdrawn or turned outwardly it raises the liquid from a less or higher stage.

I have found in practice that my ejector, as herein shown and described, is well adapted to pump either hot or cold water, and it is also well adapted to be used as a boiler-feeder, as is obvious.

I claim—

1. A fluid-ejector composed of a shell or casing having a suitable ejector or vacuum chamber, a pressure-pipe terminating in a nozzle which is supported concentrically within said chamber, a core or partial filling-bar supported by and within said nozzle, a suction-pipe leading into the branch of said shell, and a discharge-pipe leading from the delivery end of said shell, substantially as herein set forth.

2. An ejector-nozzle or jet-tube having an internal longitudinal core or filling-bar of less diameter than the bore of said nozzle and supported thereby in such a position that its fore end lies within and approximately on a line with the discharge-orifice of said jet-tube and delivers the steam under full head in an annular or circular blast, substantially as herein set forth.

3. An ejector-nozzle having a taper bore, a core or partial filling-bar to form an annular passage-way therein for the steam, said core having tapering radial supporting wings or ribs and its rear end conical, substantially as herein set forth.

4. A fluid-ejector consisting of a shell or casing having a longitudinal bore, a supply-pipe communicating with the same on a direct line with the supply-pipe, a nozzle in the chamber of the casing, and an independent core supported concentrically within the same and in a direct line with the steam-supply, substantially as herein set forth.

In testimony of which invention I have hereunto set my hand.

THOMAS E. JONES.

Witnesses:

JOHN E. JONES,

C. B. DONALDSON.