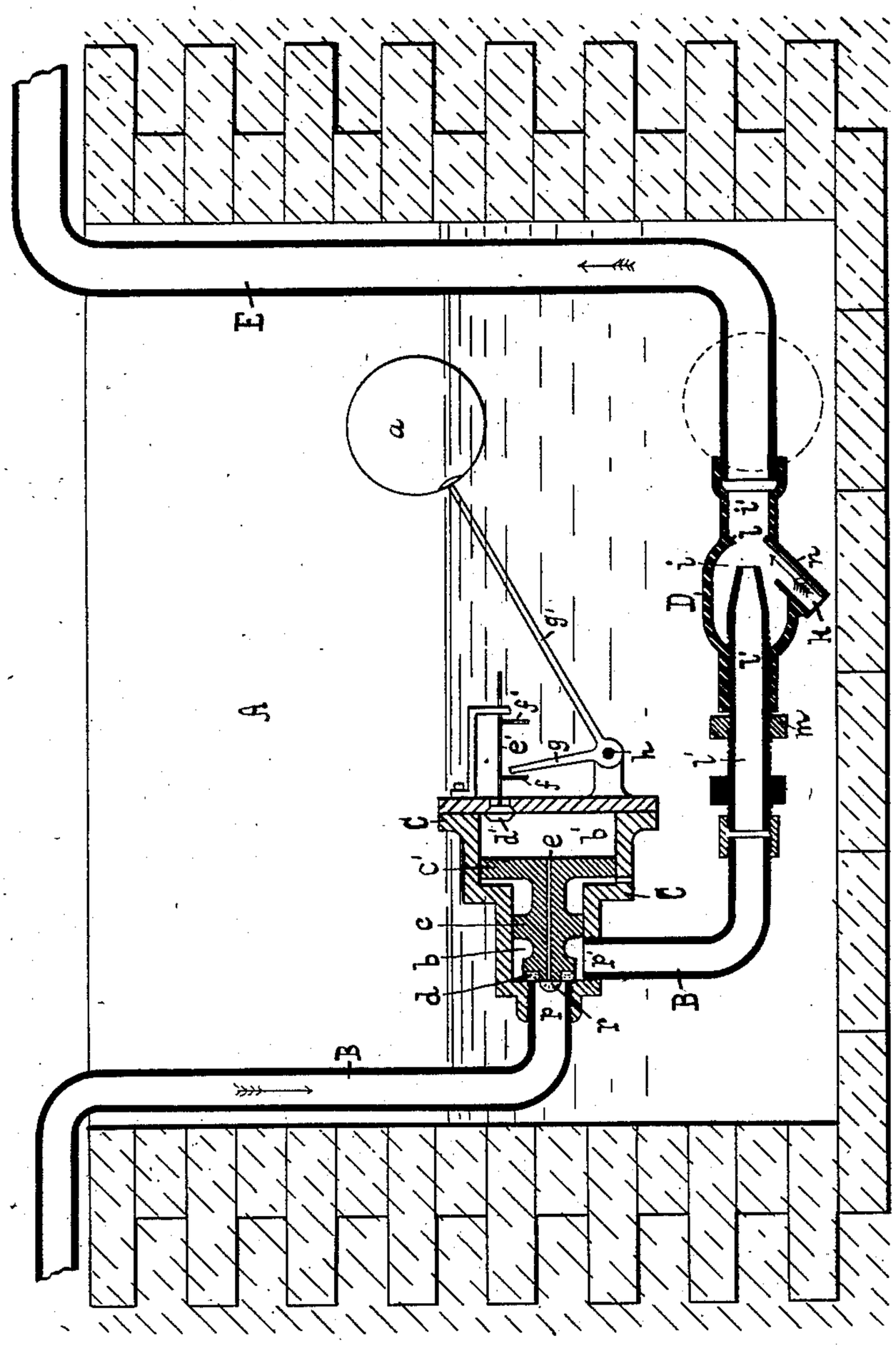
(No Model.)

G. HAYDN.

FLUID EJECTOR FOR DRAINING CELLARS.

No. 318,185. Patented May 19. 1885.



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UNITED STATES PATENT OFFICE.

GEORGE HAYDN, OF BALTIMORE, MARYLAND, ASSIGNOR OF TWO-THIRDS TO BENJAMIN B. FRIEDENWALD AND JOSEPH FRIEDENWALD, BOTH OF SAME PLACE.

FLUID-EJECTOR FOR DRAINING CELLARS.

SPECIFICATION forming part of Letters Patent No. 318,185, dated May 19, 1885.

Application filed November 15, 1884. (No model.)

To all whom it may concern:

Be it known that I, GEORGE HAYDN, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Fluid-Ejectors, of which the following is a specification, reference being had to the accompanying drawing.

My invention relates to improvements in fluid-ejectors for cellars, &c., and has for its objects means by which the full fluid-pressure is at once permitted to act on the ejector, certain constructions of the ejector whereby the same is effectual in its operation, and arrangements whereby a certain amount of water is permitted to accumulate in the well before the ejector is put in operation, and also the same permitted to operate until all (or nearly so) of the water is ejected before stopping the same. I attain these objects by mechanism illustrated in the accompanying drawing, which is a sectional view through the well and the entire device.

Similar letters refer to similar parts throughout the several views.

The well A may be constructed in any suitable manner below the surface of the area which is to be drained, and in which is placed the ejector and the operating devices fully explained hereinafter.

The supply-pipe B is constructed of any suitable material, and is provided with a controlling or cut-off valve, C, and connected to the ejector D, the pipe being supplied with water under pressure, hydrostatic or otherwise. The valve C is so arranged that it will permit the full pressure of the water in the pipe B to act at once on the ejector D, and consists of a cylindrical chamber having different diameters, *b* and *b'*, provided with corresponding piston-heads *c* and *c'*, to which is connected the valve *d*, and through which runs a small port, *e*, one end of which is protected with a screen, *r*, the small diameter *b* containing the inlet-port *p* and the outlet-port *p'*, through which the water passes to the ejector, and where it is cut off by the valve *d*, the large diameter *b'* containing a valve, *d'*, which is attached to the stem *e'*, from which are two projections, *f* and *f'*, by which the valve *d* is operated by the end of the rod *g* coming in contact therewith. The float-ball *a* is attached to the rod *g'*, which is pivoted to the valve-case at *h* in any suitable manner, and projects upward, so that the end *g* will come in contact with the projection *f* when the ball *a* has reached a certain height, and when down will bring it in contact with the projection *f'*.

The ejector D consists of a chamber, *i*, provided with an incline ingress-port, *k*, by which as the water is drawn in it is moving in a similar direction with the water that is being ejected, thus facilitating the operation, an annular projection, *l*, whose inner diameter is less than that of the outer chamber, *i'*, which permits the water to freely flow therefrom, an adjustable nozzle, *l'*, which may be adjusted in or outward to regulate the height the water is to be forced, as the closer the nozzle is to the projection *l* the greater the height the water may be lifted, and the quantity less, or vice versa, and when adjusted to the desired place is securely held by a jam-nut, *m*. The ingress-port *k* is provided with an incline neck, *n*, projecting from the casing of the chamber *i*, by which the incline passage of the port *k* is lengthened, and which directs the flow of water in the same direction better than if only an angular hole. The discharge-pipe E is connected to the egress-port of the ejector D and runs to the desired discharging-place.

The operation is as follows: When the well has filled to a certain height with water, (and, as shown in the drawing, is in the position just previous to operating the valve,) the ball *a*, being floated thereon, brings the end of the lever *g* in contact with the projection *f* on the stem *e'*. When the water slightly rises in the well, (above the point shown in the drawing,) it opens the valve *d'*, thus permitting the water to escape from the chamber *b'*, and thereby releasing the pressure on the large piston *c'*, which is maintained from the water in the supply-pipe through the small port *e* as long as the valve *d'* is closed. On releasing the same, as above stated, the pressure is then only on the face of the valve *d*, which forces the pistons forward and opens communication from the supply-pipe to the ejector, permitting the full head of the water to immediately act on the ejector and puts the same in operation, which ejects the water from the well, and continues so until nearly all the water is ejected therefrom. The ball floating thereon then brings

the lever *g* in contact with the projection *f'*, (when the water is nearly all ejected,) which closes the valve *d'*, and thereby confining the water which passes through the port *e* in the chamber *b'*, and the piston-head *c'*, being larger in diameter than the piston *c*, forces the same back and seats the valve *d*, thereby quickly closing the communication and stopping the operation until the well again fills to the required height. By this arrangement the water is permitted to accumulate in a sufficient quantity before the ejector is put in operation, and then permitted to operate until nearly all of the same is ejected before stopping, by which the apparatus is not so frequently put in operation as though the float *a* were connected directly to the valve *d*. By my device the full pressure of the water is at once applied to the ejector and so maintained until shut off, which insures the operation of the same, as the full pressure is most desirable when the momentum of the water in the well is to be overcome, and also having the inlet-port *k* on an incline, (as before stated,) which starts the water in the direction it is to be forced, greatly facilitating its movement, and assists the operation, especially so when the water is nearly all ejected and the static pressure of the well-water thereby nearly removed.

Having fully described my invention, what I claim, and wish to secure by United States Letters Patent, is—

1. In a fluid-ejector, the combination of the discharge-pipe E, the ejector D, the supply-pipe B, the float-ball *a*, and the valve C, provided with piston-heads of different diameters, and the valve *d'*, which is operated by the ball *a* and intervening mechanism therefor, as herein set forth.

2. In a fluid-ejector, the combination of the discharge-pipe E, the ejector D, the supply-pipe B, the valve C, the float-ball *a*, attached to a lever which is pivoted, and intervening mechanism, substantially as described, that will permit the ball to travel a certain distance either way without operating the valve C, for the purpose as herein set forth.

3. In a fluid-ejector, the supply-pipe B, provided with a cut-off valve therein, constructed substantially as described, the discharge-pipe E, the ejector D, and the inclined port *k*, in combination with the adjustable nozzle *l'*, whereby the fluid to be ejected is directed in the desired course, and the amount discharged regulated according to the height it is to be lifted, as herein set forth.

4. In a fluid-ejector, the discharge-pipe E, the supply-pipe B, the ejector D, and the float *a*, attached to a pivoted lever, in combination with mechanism, substantially as shown, by means of which the cut-off valve is instantly opened when the float reaches its given level, and the full force of the fluid is applied to the ejector independently of any further movement of the float.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE HAYDN.

Witnesses:
G. A. BOYDEN,
WM. B. NELSON.