

No. 680,383.

Patented Aug. 13, 1901.

C. E. KEMP.  
FLUID EJECTOR.

(Application filed Dec. 24, 1900.)

(No Model.)

Fig. 1.

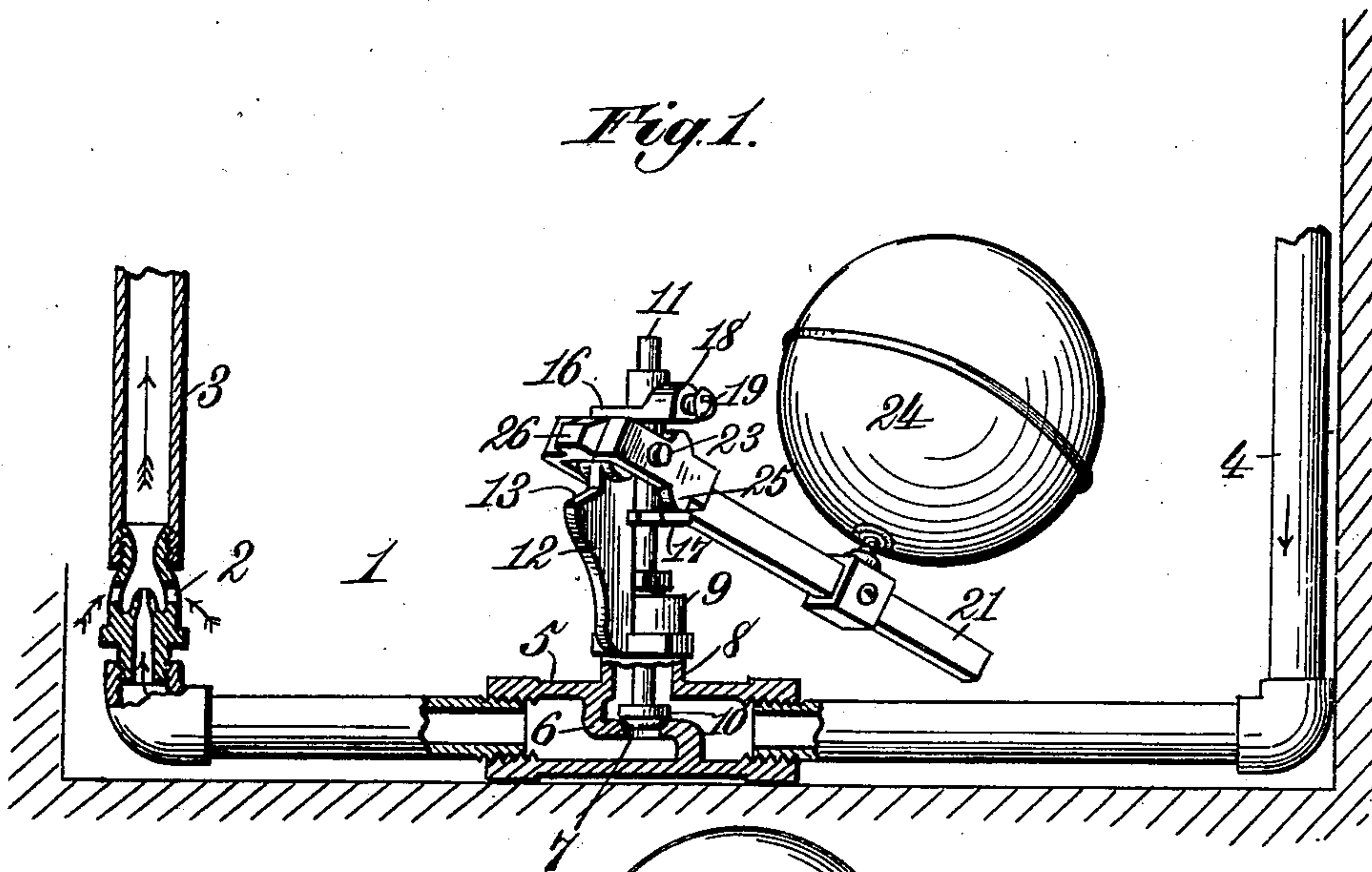


Fig. 2.

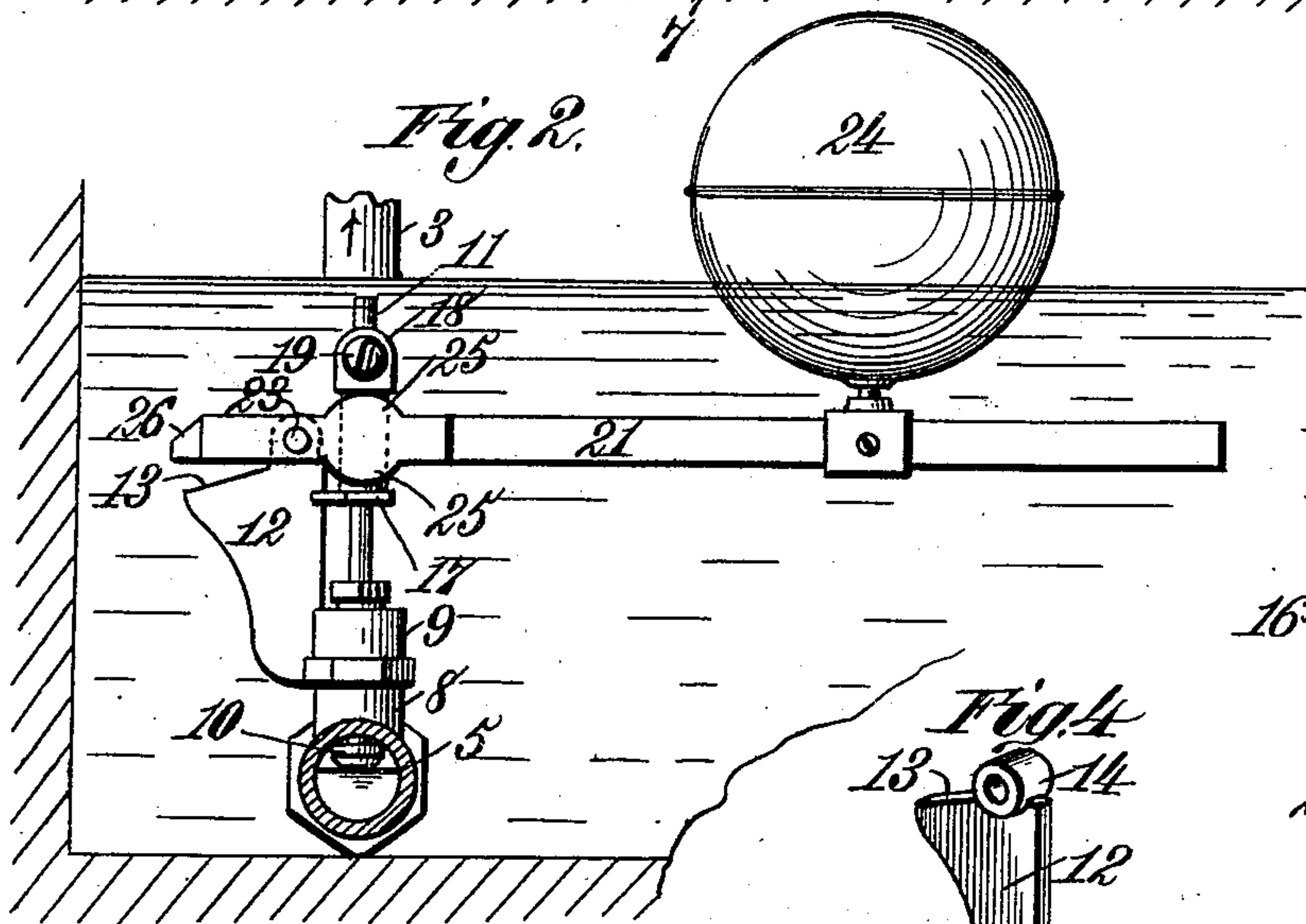


Fig. 3.

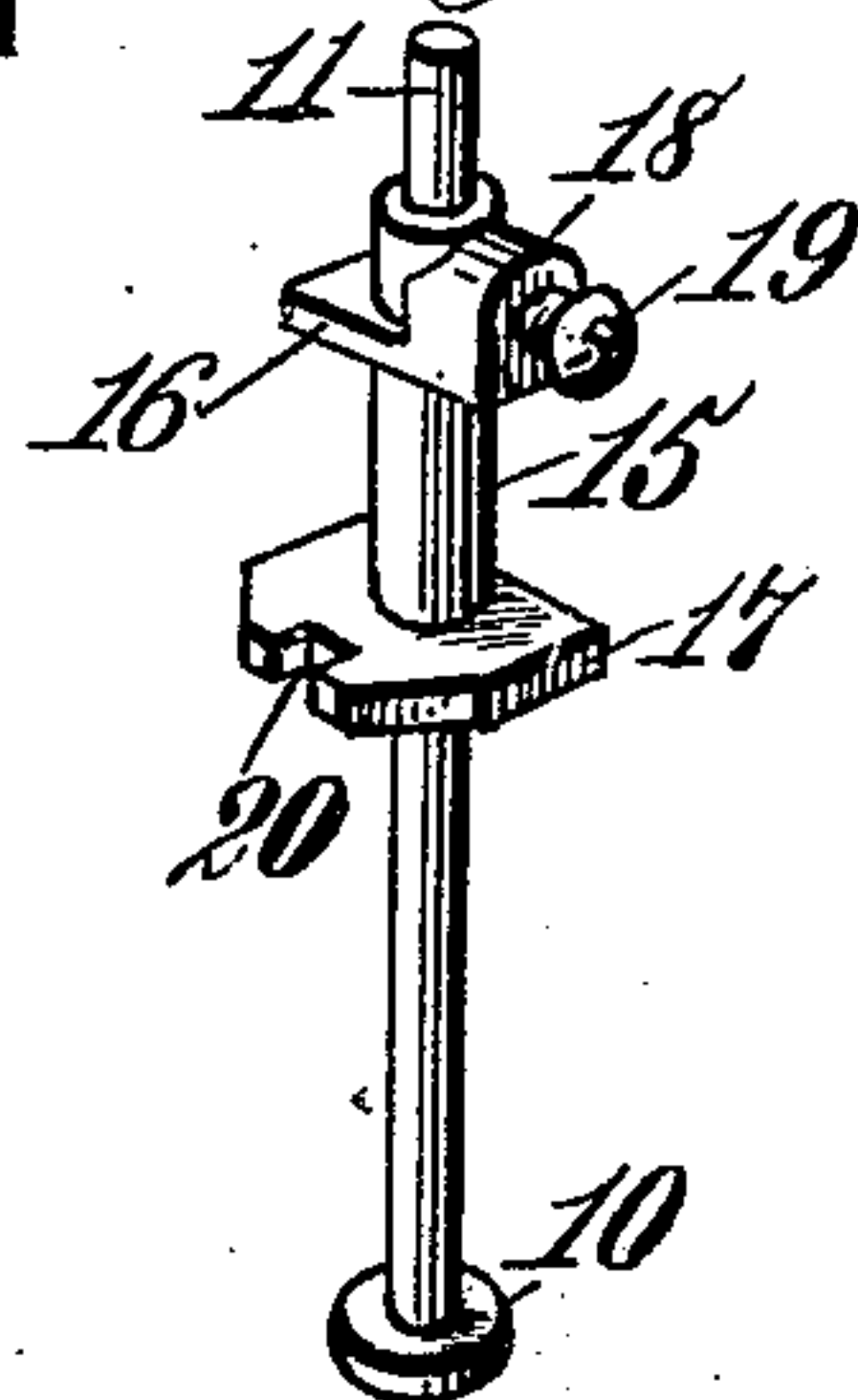


Fig. 4.

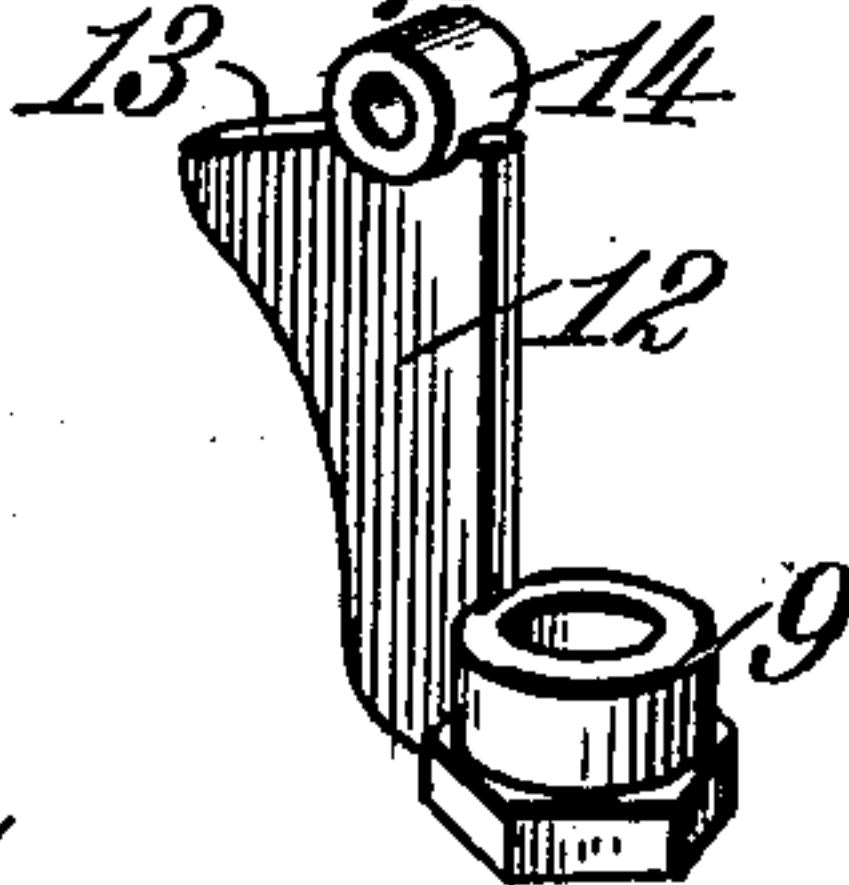


Fig. 5.



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# UNITED STATES PATENT OFFICE.

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TO CLARENCE M. KEMP, OF SAME PLACE.

## FLUID-EJECTOR.

SPECIFICATION forming part of Letters Patent No. 680,383, dated August 13, 1901.

Application filed December 24, 1900. Serial No. 40,874. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES E. KEMP, a citizen of the United States, residing at Baltimore, Maryland, have invented certain new and useful Improvements in Fluid-Ejectors, of which the following is a specification.

This invention relates to fluid-ejectors for draining cellars and the like, and has for its object to provide improved means for controlling the fluid-pressure that is admitted to the ejector, by means of which the fluid-pressure supply is quickly admitted to and shut off from the ejector and with but little friction on the operative parts.

It also has for its object to greatly simplify the means for operating the fluid-pressure-controlling valve.

Finally, it has for its object to improve and render more efficient the valve-operating mechanism and lessen the cost of its manufacture.

To these ends the invention consists in the features and in the construction and arrangement of parts hereinafter described, and particularly pointed out in the claims following the description, reference being had to the accompanying drawings, forming a part of this specification, wherein—

Figure 1 is a view in elevation, partly in section, of my improved device. Fig. 2 is a similar view taken at a right angle to Fig. 1. Fig. 3 is a detail perspective view of the valve and the shouldered sleeve adjustably mounted on the valve-stem. Fig. 4 is a similar view of the standard or support on which the float-lever is fulcrumed, and Fig. 5 is a top plan view of the float-lever.

Referring to the drawings, the numeral 1 indicates the well, which, as usual, is sunk in the bottom of the cellar or other place to be drained and in which is located the ejector and operating mechanism hereinafter described.

The numeral 2 indicates the ejector, which may be of any approved or preferred construction; 3, the discharge-pipe, and 4 the supply-pipe through which the fluid-pressure is supplied to the ejector. The fluid-pressure employed for the purpose may consist of water, air, or steam; but I prefer to connect the supply-pipe to a water-main, reservoir, or the

like. Interposed between two horizontal sections of the supply-pipe is a cylindrical valve-casing 5, divided by a diaphragm or partition 6 of well-known construction and having formed therein an apertured valve-seat 7. Formed integrally with the valve-casing is an upwardly-projecting nipple 8, which is closed at its upper end by a centrally-apertured thimble 9 screwed thereon. A valve 10 is arranged to seat on and close the apertured valve-seat 7 and is provided with an upwardly-projecting stem 11, which extends through the central aperture in the thimble 9 and is adapted to freely reciprocate therein. Formed integrally with or attached to the thimble 9 is a vertical upwardly-extending standard 12, comprising a flat and relatively thin web, the upper end of which is beveled off or inclined outwardly and downwardly, as at 13, and for the purpose hereinafter explained, and projecting above said inclined portion is a perforated ear or lug 14, constituting a bearing for the pivot of the float-lever.

On the valve-stem 11 is fitted a sleeve 15, provided at its opposite extremities with flanges 16 and 17, the uppermost 16 of which is oblong, as most clearly shown in Fig. 3 of the drawings, and is provided at one end with an integral hollow and threaded boss 18, through which passes a set-screw 19, that is arranged to engage the valve-stem 11 and hold the sleeve thereon in any position to which it may be adjusted on the valve-stem. The edge of the lower flange 17 is notched or recessed, as at 20, and the walls of said notch or recess loosely embrace the opposite sides of the standard 12 and are adapted to freely move thereon, whereby the sleeve is prevented from turning, for the purpose hereinafter made apparent.

The numeral 21 indicates the float-lever, which is forked or bifurcated at one end, as at 22, to form a yoke which straddles the sleeve 15 and ear or lug 14 and is fulcrumed on the latter by a pivot-pin 23, which passes through suitable perforations formed in the sides of the yoke and through the perforation in the ear or lug. The float-lever is adapted to freely oscillate about the pin 23 as a center and has adjustably mounted on



its longer arm a ball-float 24 of ordinary construction. The sides of the yoke straddle the sleeve 15 between the flanges 16 and 17, and on the upper and lower edges of said sides are formed curved or segment-shaped cams or bearing-faces 25, which are arranged to engage the flanges as the float-lever rises and falls and have a rolling or rocking motion thereon similar to an eccentric. Formed on the rear or outer end of the yoke is a lug 26, which is arranged to engage the inclined upper edge 13 of the standard 12 and arrest the upward movement of the float-lever.

The operation of my improved device is as follows: Normally the weight of the float and float-lever will hold the longer end of the latter depressed in the position shown in Fig. 1, in which position the valve 10 will be held to its seat by the pressure of the water in an obvious manner, thus cutting off the fluid-pressure from the ejector 2. As the water collects and rises in the well, however, it raises the float 24 and with it the lever 21, and as the lever is raised the cams or segment-shaped bearing-faces 25 on the upper edges of the yoke 22 abut the under side of the flange 16 on the sleeve 15 and exert an upward or lifting action on said flange. As the cams or bearing-faces have a rolling contact with said flange, and as the float is subject to water accumulating about it, it has a tendency to rise and carry the lever with it, but not until there is sufficient accumulation of well-water to amount to a raising force or buoyancy exerted against the float to overcome the pressure of the water upon the valve is there any movement given to the float and its connections to the valve. As soon as the buoyancy force is sufficient to overcome the pressure of water on the valve the float jumps upward, causing the valve to leave its seat quickly, and the water or other fluid pressure immediately rushes to the ejector, and through the latter into the discharge-pipe 3, inspiring or drawing in with it the water in the well and discharging through the pipe 3 into any suitable drain. This operation is continued until the water in the well has fallen to such a level that the float and float-lever again drop to their former position, and in assuming this position the cams or segment-shaped bearing-faces 25 on the lower side of the yoke bear with a rolling contact on the upper side of the flange 17 on the sleeve 15 and force the valve-stem 11 downward, thereby forcing the valve to its seat and shutting off the fluid-pressure from the ejector. The valve is carried downward to its seat only a part of the way through the float-lever's action and the balance of the way quickly by the action of the pressure-water, which carries the valve wholly to its seat and holds it tightly there, which operation is caused by the valve getting into the way of the pressure-water's current. The valve will be held to its seat until the water again rises in the well, both by the weight of the float

and float-lever and by the fluid-pressure. By providing the inclined portion 13 on the standard and the lug 26 on the yoke 22 the upward movement of the float-lever will be arrested and limited when the float jumps upward, which might otherwise result in serious disarrangement or injury of the parts and put the device out of operation at the very time when it is most needed for service. By providing the cams or segment-shaped bearing-faces on the upper and lower edges of the yoke they exert a rocking cam action on the flanges 16 and 17, thereby making the valve very sensitive to the motions of the float-lever and causing the float to exert its action in a most effective manner, while at the same time creating but little friction on the rubbing parts and causing a direct up-and-down movement to the valve-stem.

By making the upper flange 16 oblong, as shown, the yoke may be readily set in place on the sleeve by causing the major axis of the said flange to register with the major axis of the yoke, in which position the flanges will readily pass through the yoke, and after having been passed through the sleeve can then be turned until the flange 15 lies crosswise of the yoke, when the notched edge of the lower flange will engage the standard 12 in the manner before described and prevent the sleeve from turning. The sleeve can be fixed on the valve-stem at any desired height by the set-screw 19, and it will be obvious that by adjusting the sleeve on the stem the float and float-lever can be set to cause the valve to be operated at different heights of water in the well.

Having described my invention, what I claim is—

1. In an apparatus of the character described, the combination with an ejector and a pressure and discharge pipe, of a valve in the pressure-pipe, a sleeve fixed on the stem of said valve and provided with a flange on its upper and lower ends, a float-lever fulcrumed near one end and provided with a yoke straddling said sleeve between the flanges, cams on the upper and lower edges of said yoke and arranged to engage the adjacent faces of said flanges, and a float on the float-lever, substantially as described.

2. In an apparatus of the character described, the combination with an ejector and a pressure and discharge pipe, of a valve in the pressure-pipe, a sleeve adjustably fixed on the stem of said valve and provided with a flange on its upper and lower ends, a float-lever fulcrumed near one end and provided with a yoke straddling said sleeve between the flanges, cams on the upper and lower edges of said yoke and arranged to engage the adjacent faces of said flanges, and a float on the float-lever, substantially as described.

3. In an apparatus of the character described, the combination with an ejector and a pressure and discharge pipe, of a valve in the pressure-pipe, a sleeve fixed on the stem



of said valve and provided with a flange on its upper and lower ends, a float-lever fulcrumed near one end and provided with a yoke straddling said sleeve between the flanges, and a float on the float-lever, substantially as described.

4. In an apparatus of the character described, the combination with an ejector and a pressure and discharge pipe, of a valve in the pressure-pipe, a sleeve movably mounted on the stem of the valve and provided with a flange at its upper and lower ends, an internally-threaded boss formed on one of said flanges, a set-screw fitted in said boss and engaging the valve-stem to hold the sleeve in its adjusted position, a float-lever fulcrumed near one end and provided with a yoke straddling said sleeve between the flanges, and a float on the float-lever, substantially as described.

5. In an apparatus of the character described, the combination with an ejector and a pressure and discharge pipe, of a valve in the pressure-pipe, a sleeve fixed on the stem of said valve and provided with a flange on its upper and lower ends, the uppermost flange being oblong, a float-lever fulcrumed near one end and provided with a yoke straddling said sleeve between the flanges, means for preventing the sleeve from turning relatively to the yoke, and a float mounted on the float-lever, substantially as described and for the purpose specified.

6. In an apparatus of the character described, the combination with an ejector and a pressure and discharge pipe, of a valve in the pressure-pipe, a sleeve fixed on the stem of said valve and provided with a flange on its upper and lower ends, the uppermost flange being oblong a float-lever fulcrumed near one end and provided with a yoke straddling the sleeve between the flanges, means for holding the sleeve with its oblong flange transversely to the major axis of the yoke, and a float mounted on the float-lever, substantially as described.

7. In an apparatus of the character described, the combination with an ejector and a pressure and discharge pipe, of a valve in the pressure-pipe, a sleeve fixed on the stem

of said valve and provided with a flange on its upper and lower ends, the uppermost flange being oblong and the lowermost flange being provided with a notch or recess in one edge, a fixed web or standard engaging said notch or recess and preventing said sleeve from turning, a float-lever fulcrumed near one end and provided with a yoke straddling the sleeve between the flanges, and a float mounted on the float-lever, substantially as described.

8. In an apparatus of the character described, the combination with an ejector and a pressure and discharge pipe, of a valve in the pressure-pipe, a sleeve fixed on the stem of said valve and provided with a flange on its upper and lower ends, the uppermost flange being oblong and the lowermost flange being provided with a notch or recess in one edge, a fixed web or standard engaging said notch or recess and operating to prevent the sleeve from turning, a float-lever fulcrumed near one end and provided with a yoke straddling the sleeve between the flanges, a lug on the rear end of said yoke arranged to engage the upper end of the standard and limit the upward movement of the float-lever, and a float mounted on the float-lever, substantially as described.

9. In an apparatus of the character described, the combination with an ejector and a pressure and discharge pipe, an upright standard projecting vertically from the valve-casing and provided on its upper end with a perforated lug or ear, a sleeve fixed on the stem of said valve and provided with a flange on its upper and lower ends, a float-lever provided at one end with a yoke embracing the lug or ear and fulcrumed thereon by a pivot-pin, said yoke straddling the sleeve between the said flanges, and a float mounted on the free end of said float-lever, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

CHARLES E. KEMP.

Witnesses:

JOHN S. COLE,

CHARLES I. PURNELL.