(No Model.) 2 Sheets—Sheet 1.

E. N. GAUDRON.

FUNNEL.

No. 542,248. Patented July 9, 1895.

Fig 1

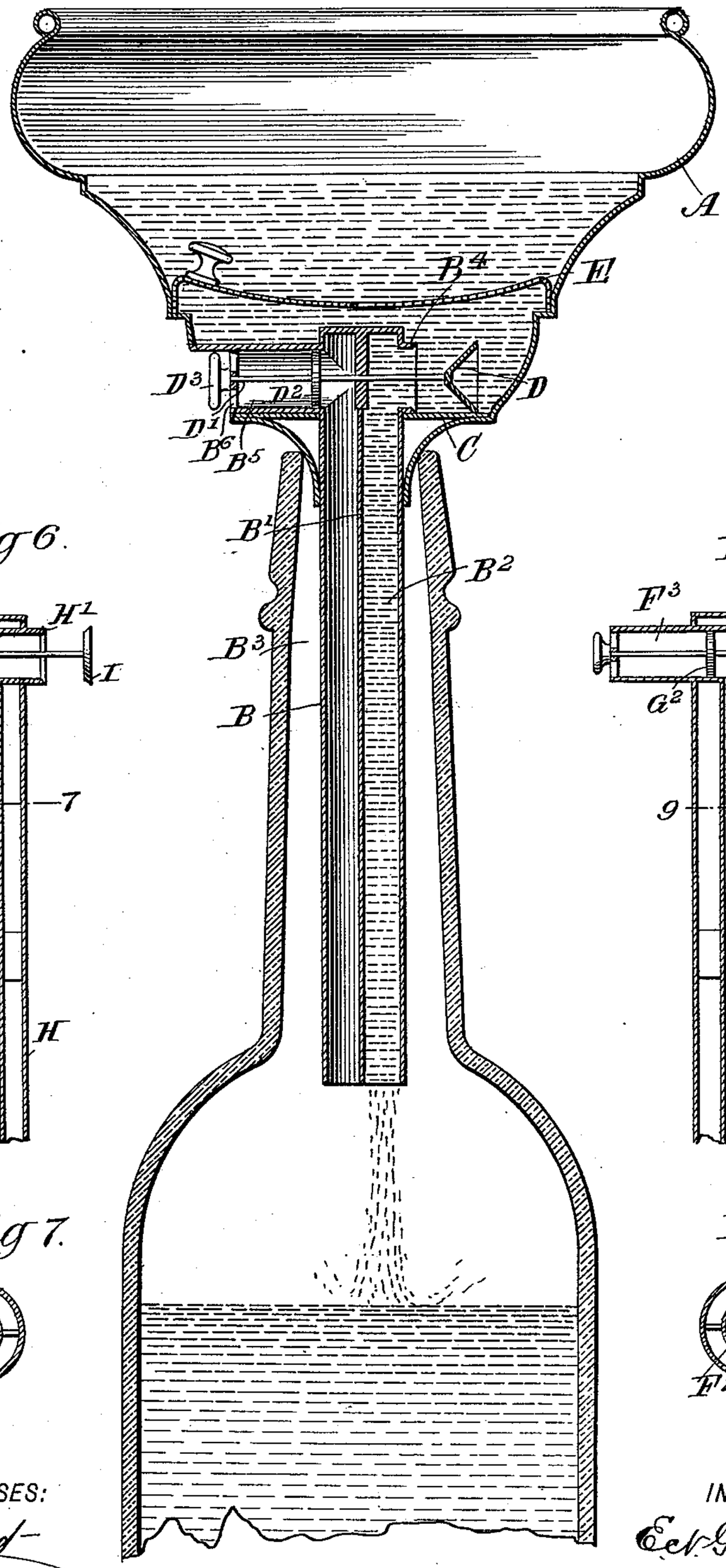


Fig 6.

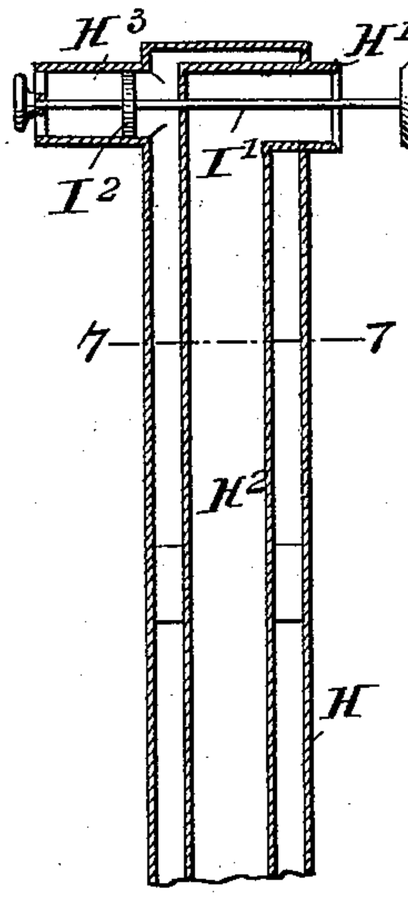


Fig 8.

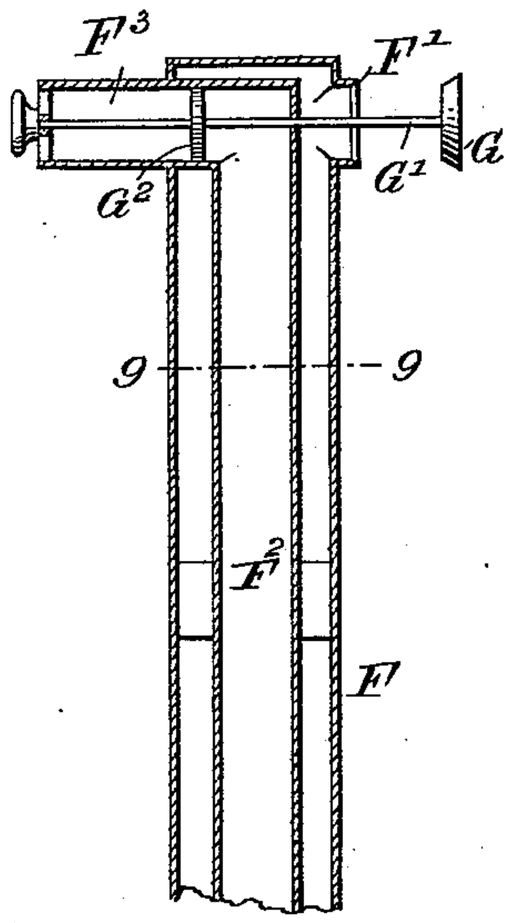


Fig 7.

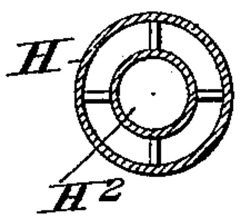
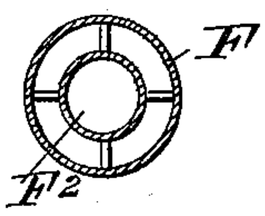


Fig 9.



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(No Model.) 2 Sheets—Sheet 2.

E. N. GAUDRON.

FUNNEL.

No. 542,248. Patented July 9, 1895.

Fig 2.

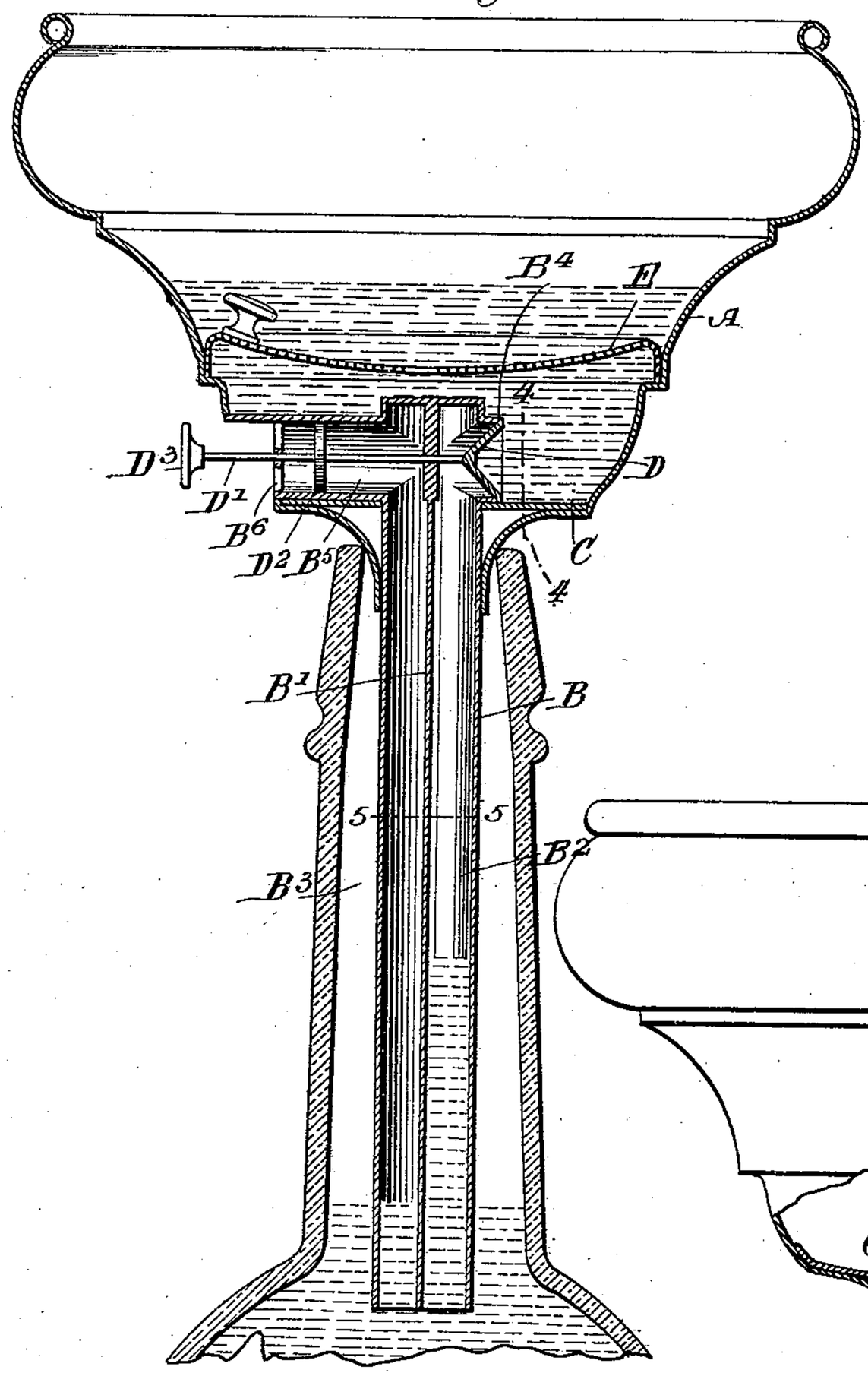


Fig 3.

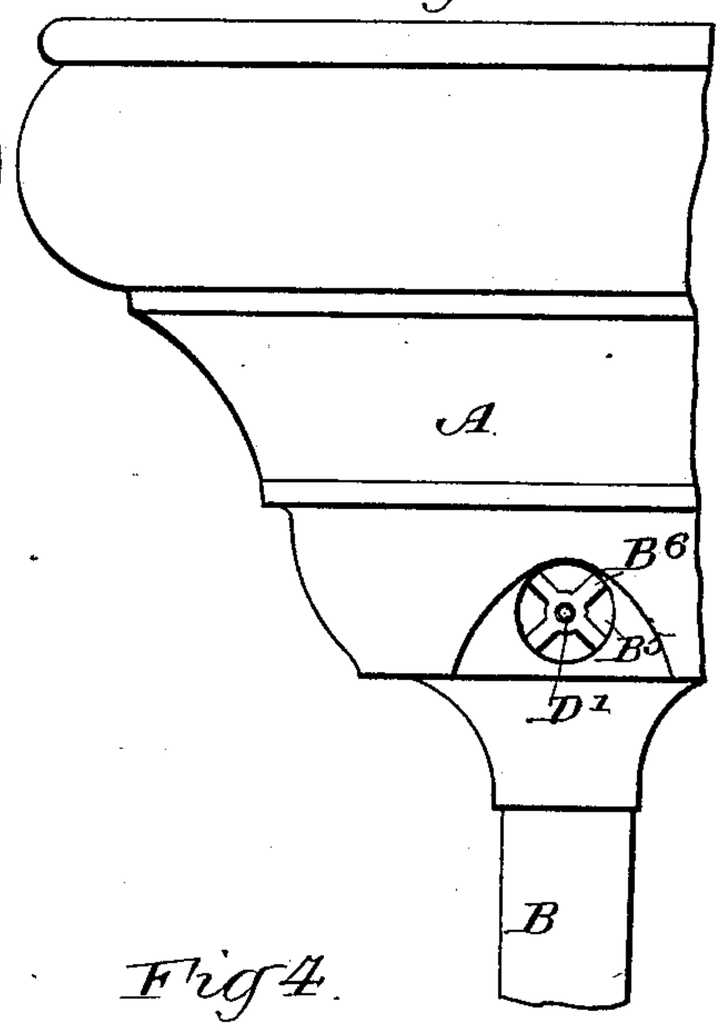


Fig 4.

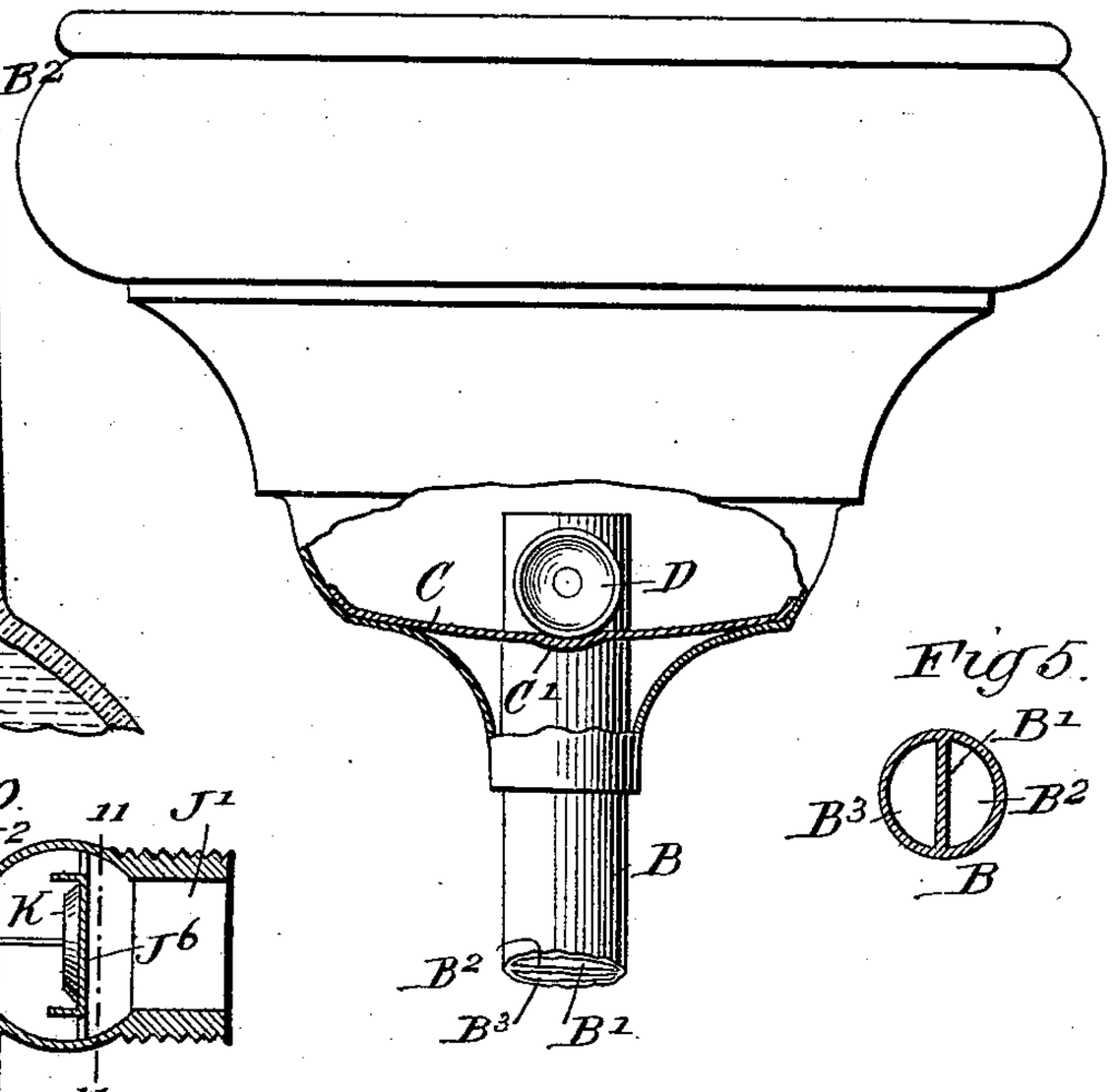


Fig 5.

Fig 10.

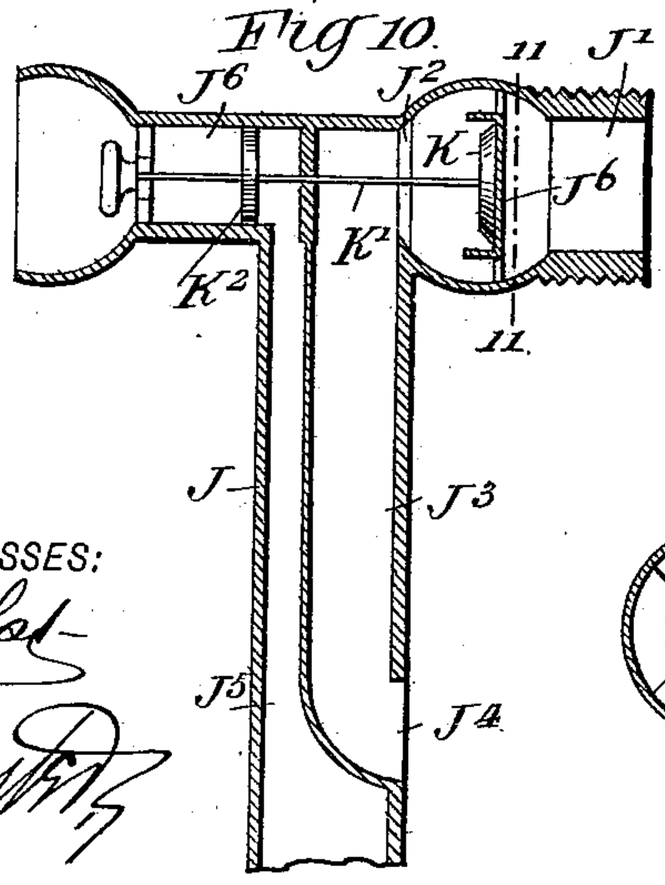
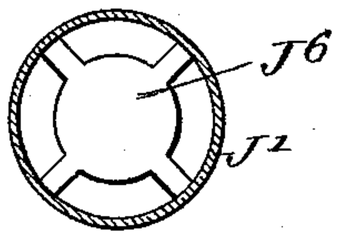


Fig 11.



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UNITED STATES PATENT OFFICE.

EDWARD N. GAUDRON, OF BROOKLYN, NEW YORK, ASSIGNOR OF ONE-HALF TO IONS GRAHAM HEWISON, OF SAME PLACE.

FUNNEL.

SPECIFICATION forming part of Letters Patent No. 542,248, dated July 9, 1895.

Application filed July 7, 1894. Serial No. 516,789. (No model.)

To all whom it may concern:

Be it known that I, EDWARD N. GAUDRON, of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Funnel, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved funnel designed for conveniently filling liquids into bottles, lamp-founts, barrels, and other vessels without danger of overflowing.

The invention consists of an air-controlled cut-off valve mechanism comprising a valve and a piston, of which the valve controls the inlet of the liquid from the funnel-body to the nozzle, and the piston controls the said valve to force the latter to shut.

The invention further consists of a piston, a valve, a liquid-chamber, and a compressed-air chamber, all arranged in such a manner that the valve closes the liquid-chamber by the action of compressed air on the said piston.

The invention also consists of certain parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side elevation of the improvement, showing the valve open. Fig. 2 is a similar view of the same, showing the valve closed. Fig. 3 is an end elevation of part of the improvement. Fig. 4 is a transverse section of the same on the line 4 4 of Fig. 2. Fig. 5 is a sectional plan view of the nozzle on the line 5 5 of Fig. 2. Fig. 6 is a sectional side elevation of a modified form of the improvement. Fig. 7 is a sectional plan view of the same on the line 7 7 of Fig. 6. Fig. 8 is a sectional side elevation of another modified form of the improvement. Fig. 9 is a sectional plan view of the same on the line 9 9 of Fig. 8. Fig. 10 is a sectional side elevation of the improvement as arranged for filling barrels, and Fig. 11 is a transverse section of the same on the line 11 11 of Fig. 10.

The improved funnel is provided with a funnel-body A, from which extends a nozzle B, preferably made in the shape of a pipe, having its upper end projecting through a dished bottom C, arranged in the funnel-body A, as is plainly shown in Figs. 1, 2, and 4. The upper end of the nozzle B is closed, and the said nozzle is preferably provided with a transverse partition B′, extending from the closed top to the lower end of the nozzle, the said partition forming a liquid-inlet chamber B^2 and a compressed-air chamber B^3.

The upper end of the liquid-chamber B^2 is formed with a valve-seat B^4, extending sidewise into the funnel-body A, directly above the bottom C, and the upper end of the compressed-air chamber B^3 opens into a cylinder B^5, arranged in alignment with the seat B^4, the said cylinder extending through one side of the funnel-body A to the outer air.

The seat B^4 is adapted to be closed by a valve D on one end of the piston-stem D′, which carries the piston D^2, operating in the cylinder B^5. The outer end of the stem D′ is guided in a suitable cross B^6, held in the outer open end of the cylinder B^5, and on the extreme outer end of the stem D′ is secured a knob D^3, adapted to be taken hold of by the operator. The lower part of the valve D is guided in a channel C′, formed in a dished bottom C, so that the liquid poured into the funnel-body A readily drains into the said channel C′, opening into the liquid-chamber B^2. (See Fig. 4.)

In the funnel-body A, above the upper closed end of the nozzle D, is arranged a strainer E, so as to prevent impurities from passing to and through the nozzle D.

The operation is as follows: When the piston is in the position shown in Fig. 1, then the valve D is away from the seat B^4 and the piston D^2 is in its innermost position in the cylinder B^5. The liquid poured into the funnel-body A can readily flow through the open valve-seat B^4 into the liquid-chamber B^2 and down the same into the vessel to be filled. When the liquid rises in the vessel until it finally becomes almost filled, then the liquid

enters the lower end of the nozzle B, and consequently passes into the compressed-air chamber B^3, in which it rises, and thereby compresses the air contained in the said chamber B^3. The compressed air in the said chamber B^3 acts on the piston D^2, so as to finally force the latter out, whereby the valve D is forced to its seat B^4, thereby closing the upper end of the liquid-chamber B^2, and consequently preventing the further flow of the liquid from the funnel-body A into the vessel, thereby preventing overflow. The surplus liquid contained in the funnel-body A will remain there until the funnel is moved onto an empty vessel, and the valve D is again opened by the operator pressing with his finger the knob D^3 inward. In doing so the piston-valve is moved back to its normal position. (Shown in Fig. 1.)

It will be seen that by the arrangement described the liquid in the vessel to be filled is used as a piston in the compressed-air chamber B^3 to compress the air therein and to actuate the piston for forcing the valve D to its seat B^4, which piston D^2 forms, in effect, a movable wall or diaphragm for the compressed-air chamber.

I do not limit myself to forming the liquid-chamber and the compressed-air chamber by a transverse partition in the nozzle B, as this may be greatly varied—for instance, as shown in Fig. 6, in which the nozzle H is provided with an inner concentric tube H^2, bent at its upper end through one side of the nozzle to form the valve-seat H′ for the valve I on the piston-stem, while the nozzle H is formed at its upper end with the cylinder H^3, in which operates the piston I^2, connected by the stem I′ with the valve I. When the latter is open, as shown in Fig. 6, then the liquid poured into the body A flows through the seat H′ into the concentric tube H^2 to fill the vessel until the lower end of the nozzle is closed and the liquid rises in the nozzle to compress the air and to actuate the piston I^2 to force the valve I to its seat H′.

As shown in Fig. 8, the nozzle F is provided at its upper end and at one side with the valve-seat F′, and the concentric tube F^2 connects at its upper end with the cylinder F^3, containing the piston G^2, connected by the stem G′ with the valve G, adapted to be seated on the seat F′. When the liquid rises in the vessel, it finally passes into the tube F^2 to compress the air therein and to actuate the piston G^2 to force the valve G to its seat.

As illustrated in Fig. 10, the funnel is arranged for filling barrels, and in this case the funnel-body is dispensed with and the nozzle J is provided at its upper end with an inlet-tube J′, connected by hose or other means with the liquid-supply. In this inlet-pipe J′ is arranged a valve-seat J^2, adapted to be closed by a valve K, connected by a stem K′ with a piston K^2. The nozzle J is provided with a partition forming the liquid-chamber J^3, connected at its upper end with the seat J^2 and having its lower end J^4 opening at one side of the nozzle J. The compressed-air chamber J^5 extends from the lower end of the nozzle J to the cylinder J^6, in which operates the piston K^2 of the piston-valve K. A stop J^6 for the valve K is also arranged in the inlet-pipe J′ to limit the opening movement of the said valve. The operation is the same as previously described in reference to the previously-described forms.

It will be seen that when the valve D begins to close by the action of the compressed air against the piston D^2 then the suction action of the water flowing through the nozzle B greatly assists in rapidly seating the valve on its seat. The pressure of the remaining liquid in the funnel-body securely holds the valve D closed to permit of moving the funnel to another bottle without danger of losing any of the liquid in the funnel-body.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. A funnel, provided with a piston and a valve, of which the valve controls the inlet of the liquid from the funnel body to the vessel, and the piston controls the said valve to force the latter shut, substantially as shown and described.

2. A funnel, provided with a liquid chamber, a compressed air chamber, a piston, and a valve, all arranged in such a manner that the air compressed in the said compressed air chamber acts on the said piston to force the valve shut on the said liquid chamber, substantially as shown and described.

3. A funnel, comprising a piston, a valve, and a divided funnel nozzle forming a liquid chamber and a compressed air chamber, the said liquid chamber opening at its upper end into the funnel body and being adapted to be closed by the said valve, while the upper end of the compressed air chamber connects with the said piston to actuate the latter and to force the said valve shut on the said upper end of the liquid chamber, substantially as shown and described.

4. A funnel, comprising a funnel body, an inlet or nozzle held on the said funnel body, and having a liquid chamber opening into the said funnel body, a compressed air chamber leading to a cylinder, a piston and a valve of which the valve is adapted to be seated on a seat in the upper end of the said liquid chamber, and the piston is held to operate in the cylinder and is adapted to be actuated by the compressed air in the compressed air chamber, substantially as shown and described.

5. A funnel, comprising a funnel body, a nozzle extending from the said funnel body, a dished bottom in the said funnel and having a depressed channel opening into the said

nozzle, and a valve fitted to slide in the said channel and adapted to close the seat in the upper end of the said nozzle, substantially as shown and described.

6. A funnel having a liquid chamber provided with a cut-off valve, and a compressed air chamber provided with a movable wall adapted to be moved by the rise of the air pressure in the air chamber, said cut-off valve being connected to said movable wall and adapted to be operated thereby, substantially as set forth.

EDWARD N. GAUDRON.

Witnesses:
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JNO. M. RITTER.