

(No Model.)

R. W. ELLIOTT.
APPARATUS FOR RAISING LIQUIDS.

No. 597,273.

Patented Jan. 11, 1898.

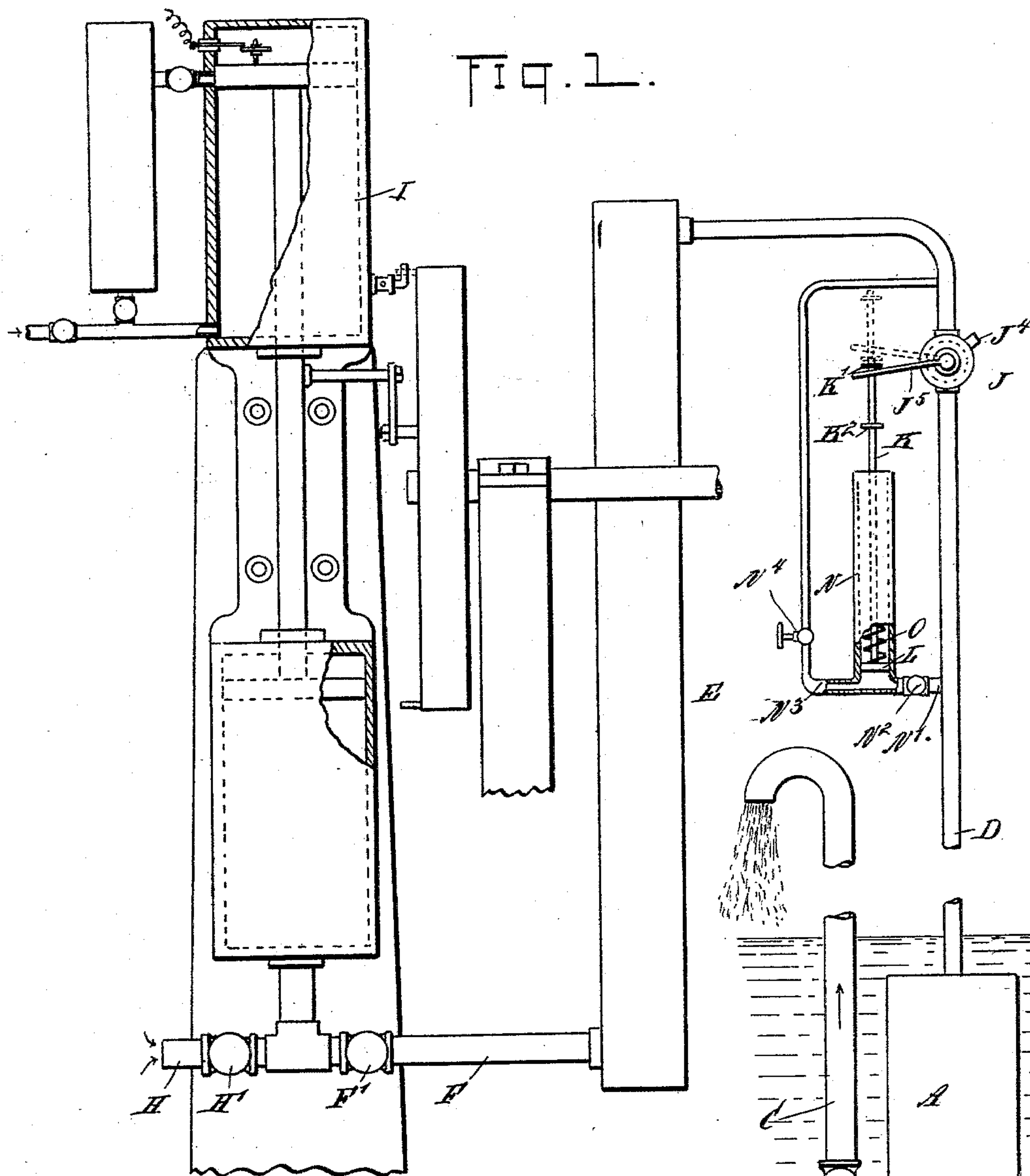


Fig. 1.

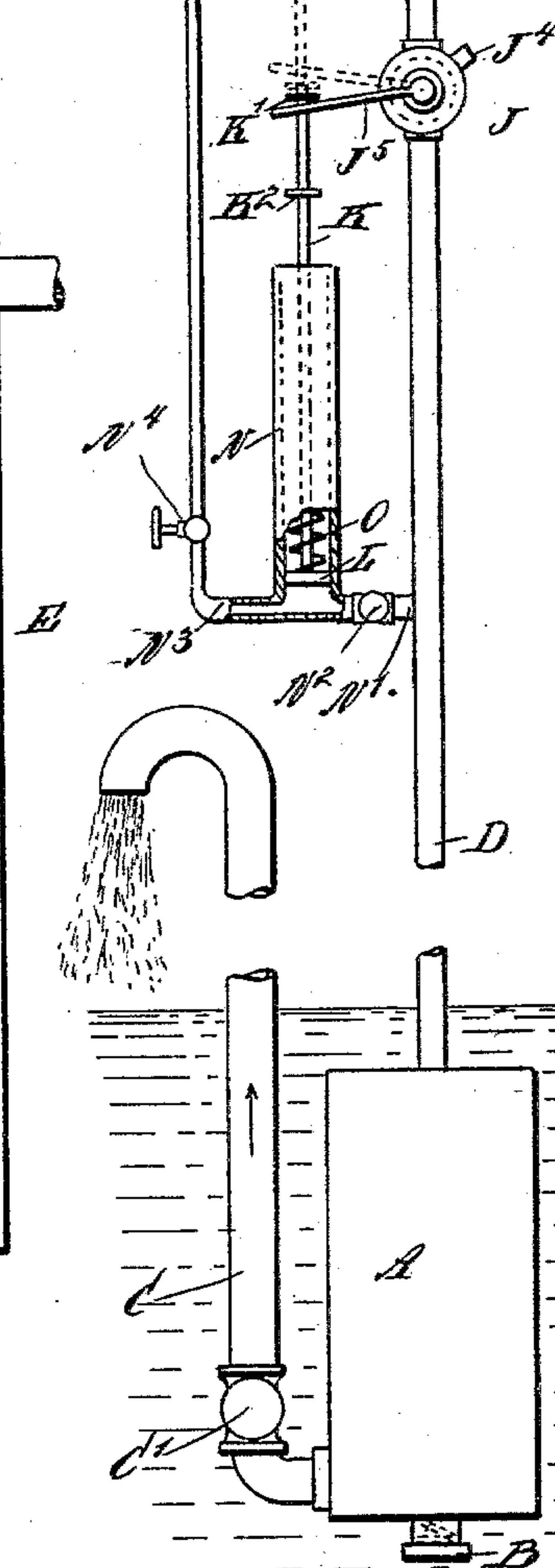
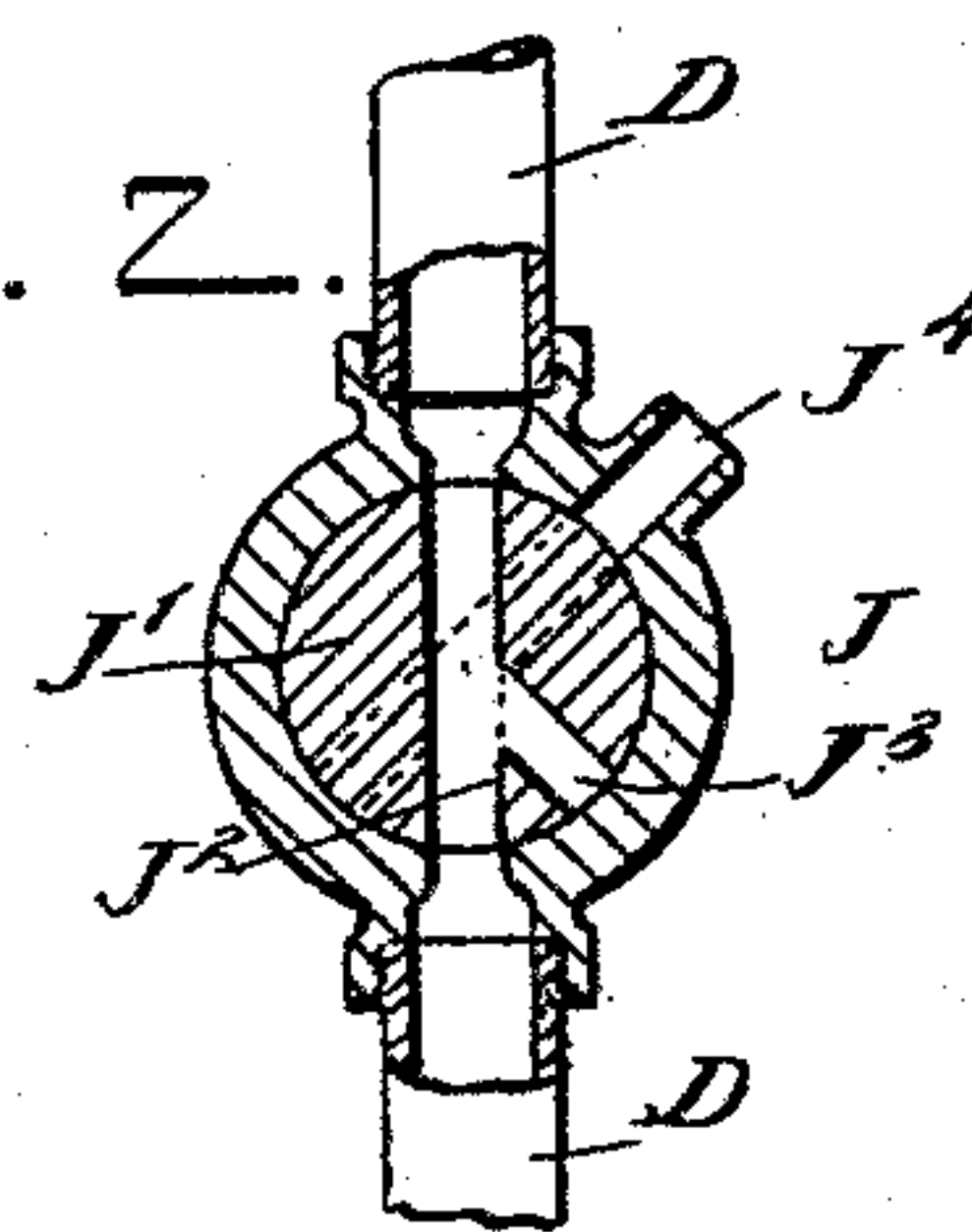


Fig. 2



WITNESSES :

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UNITED STATES PATENT OFFICE.

RALPH W. ELLIOTT, OF BRENTWOOD, CALIFORNIA, ASSIGNOR OF ONE-HALF TO JAMES D. DARBY AND DICK H. RICE, OF SAME PLACE.

APPARATUS FOR RAISING LIQUIDS.

SPECIFICATION forming part of Letters Patent No. 597,273, dated January 11, 1898.

Application filed June 23, 1897. Serial No. 641,890. (No model.)

To all whom it may concern:

Be it known that I, RALPH W. ELLIOTT, of Brentwood, in the county of Contra Costa and State of California, have invented a new and Improved Apparatus for Raising Liquids, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved apparatus for raising liquids by the use of compressed air and in a very simple and economical manner.

The invention consists principally of a reservoir containing compressed air, a vessel submerged in the liquid to be raised and having a suction-valve and a valved discharge-pipe, a pipe having a valve and connecting the said reservoir with the said vessel, and a device for automatically opening and closing the said valve and controlled by the pressure and exhaust of the air in the said pipe.

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 characters of reference indicate corresponding parts in both figures.

Figure 1 is a side elevation of the improvement, with parts in section; and Fig. 2 is an enlarged sectional side elevation of the air-controlling valve.

The improved apparatus for raising liquids is provided with a vessel A, submerged in the liquid to be raised and provided at its bottom with a suction-valve B for allowing the liquid to pass into the said vessel, as hereinafter more fully described, the liquid being discharged from the vessel through an outlet-pipe C, having a check-valve C' for preventing a return flow of the liquid to the vessel A. From the top of the vessel A leads an air-pipe D, connected with a reservoir E, containing compressed air, and connected by a pipe F, having a valve F', with the cylinder G of an air-compressor, the said cylinder having an inlet-pipe H, provided with a valve H'. The piston in the air-compressor is driven by a motor I.

In the air-pipe D is arranged a valve J, having a plug J', formed with a diametrical

bore J² for forming a straight passage for the air through the pipe D from the reservoir E into the vessel A, and from the said bore J² leads a branch bore J³, adapted to register with an outlet J⁴, formed in the body of the valve. On the stem of the plug J' is secured an arm J⁵, adapted to be engaged by collars K' K², secured to a piston-rod K, carrying a piston L, fitted to slide in a cylinder N, the said piston being normally held in a lowermost position by the action of a spring O, coiled on the piston-rod and pressing on the said piston.

The cylinder N is connected at its lower end by a pipe N', containing a check-valve N², with the pipe D below the valve J, and a second pipe N³ connects the lower end of the said cylinder with the pipe above the valve J, and this pipe N³ is provided with a globe or like valve N⁴ for regulating the amount of air passing from the reservoir E directly into the cylinder N, to act on the piston L therein and to move the latter upward, so as to cause the collar K² to swing the arm J⁵ and close the plug J' and to shut off the air from the reservoir E to the vessel A. When this takes place, the lower end of the pipe D is connected by the bore J³ with the outlet J⁴ to permit air to escape from the said pipe D and vessel A to reduce the pressure in the latter and to allow the water to open the valve B and fill the vessel with the liquid. When the air exhausts from the lower end of the pipe D, then the valve N² opens, so that the air is let out from the cylinder N, and consequently the spring O forces the piston L downward, whereby the collar K' finally acts on the arm J⁵ to again open the valve J and allow air to pass from the reservoir E through the pipe D into the vessel A to press on the liquid contained therein and force the liquid through the pipe C to the desired place of discharge. When this takes place, the pressure of the air passing into the pipe N³ acts on the piston L to again raise the same, as previously described, and to cause an automatic opening of the said valve to the outer air, so as to refill the vessel A, as previously explained.

Thus it will be seen that by the arrangement described the valve J is automatically controlled, so as to allow compressed air to

pass to the vessel A and force the liquid contained therein through the discharge-pipe, and when such discharge has taken place the air is allowed to escape from the said vessel to permit the liquid to refill the same through the suction-valve B.

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

- 10 1. An apparatus for raising liquids, comprising a vessel submerged in the liquid to be raised, and having a suction-valve and a valved discharge-pipe, an air-pipe connecting the said vessel with a compressed-air supply,
- 15 a valve in the said air-pipe, a device controlled by the pressure of the air in the said air-pipe and controlling the said valve in the air-pipe, the said device comprising a cylinder connected with the air-pipe above and below the said valve, a spring-pressed piston on
- 20 the said cylinder, and a piston-rod having col-

lars adapted to alternately engage an arm on the said valve, substantially as shown and described.

- 25 2. An apparatus for raising liquids, provided with a valve in the compressed-air-supply pipe, a device for automatically controlling the said valve and comprising a cylinder having valved connections with the said pipe above and below the said valve, a piston in the said cylinder, collars held on the piston-rod of the said piston, and an arm adapted to be engaged alternately by the said collars, to turn the said valve and open and close the pipe, and to connect the lower end thereof with the outer air, substantially as shown and
- 30 described.
- 35

RALPH W. ELLIOTT.

Witnesses:

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