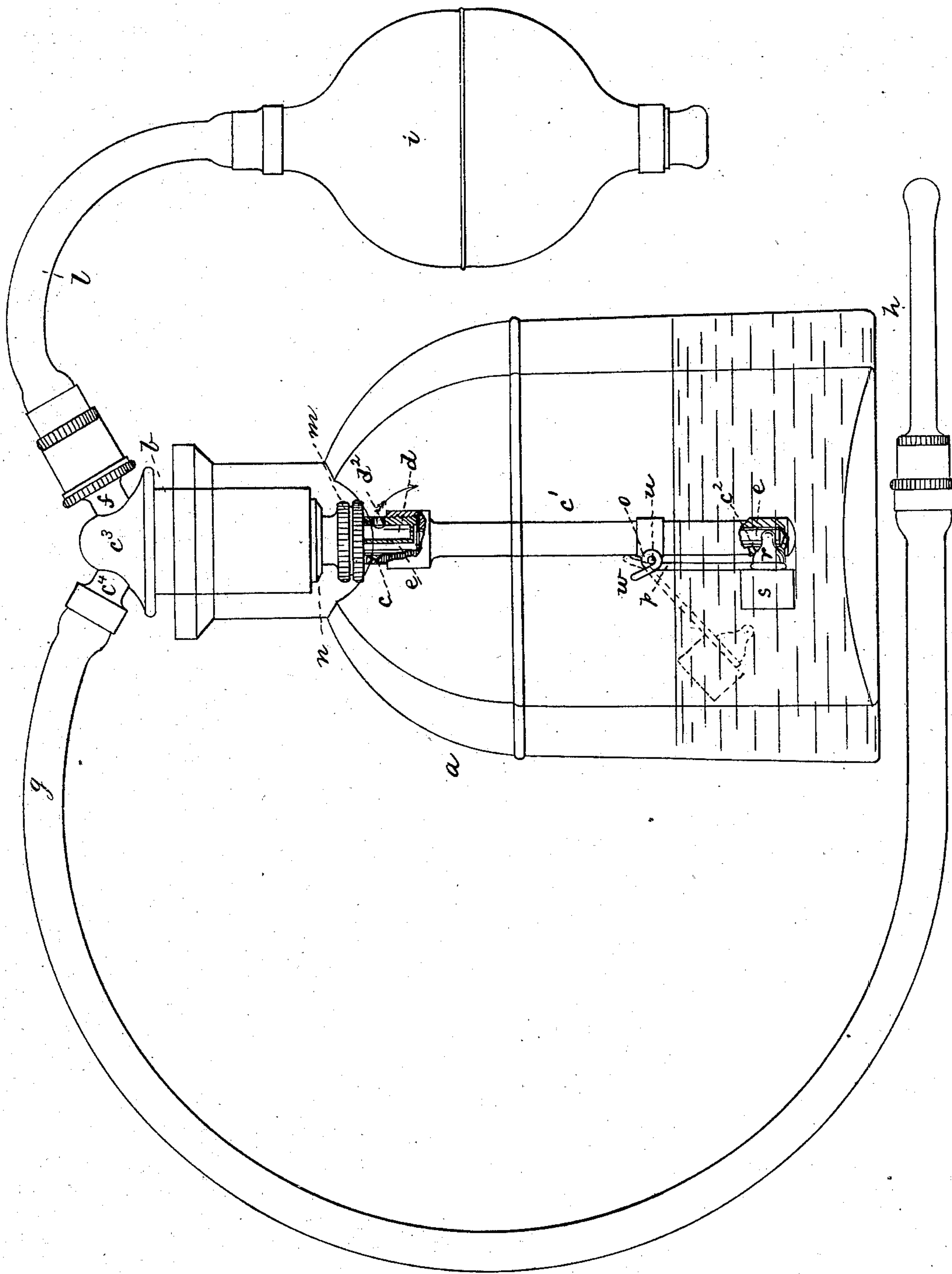


(Model.)

R. LOCKWOOD.
Syringe Apparatus.

No. 239,331.

Patented March 29, 1881.



Witnesses.

L. F. Connor.

Arthur Reynolds.

Inventor.

Rhodes Lockwood.
by Crosby Gregory, Atty.

UNITED STATES PATENT OFFICE.

RHODES LOCKWOOD, OF CHARLESTOWN, ASSIGNOR TO DAVIDSON RUBBER COMPANY, OF BOSTON, MASSACHUSETTS.

SYRINGE APPARATUS.

SPECIFICATION forming part of Letters Patent No. 239,331, dated March 29, 1881.

Application filed January 24, 1881. (Model.)

To all whom it may concern:

Be it known that I, RHODES LOCKWOOD, of Charlestown, county of Suffolk, State of Massachusetts, have invented an Improvement in Syringe Apparatus, of which the following description, in connection with the accompanying drawing, is a specification.

This invention in syringe apparatus is an improvement on that described in United States Letters Patent No. 206,653, granted to Charles Weed, to which reference may be had.

My invention is an improvement in that class of syringe having a valve to prevent the entrance of air into the discharge-pipe when the liquid is low in the receptacle, and has for its object to provide the apparatus with a pivoted valve controlled by a float which will fall and close a valve-seat in the outlet-pipe when the liquid in the bottle or vessel is nearly exhausted or forced out by atmospheric pressure upon its surface, the said valve effectually checking the passage of air into the outlet-pipe, and thence through the discharge-pipe.

The drawing represents, in side elevation, my improved syringe or liquid-discharging apparatus, a portion of the outlet-pipe being broken out to show the liquid and air passages and valve-seat, the bottle or vessel being partially filled with liquid.

The bottle *a* is of proper size to hold the desired quantity of material.

The stopper *b*, of cork or india-rubber, and fitted into the neck of the bottle, receives within it an outlet-pipe tube, *c c'*, composed of metal or other material, and suitably divided to form a liquid-passage, *e*, and an air-passage, *d*. The portion *c'* of the outlet-pipe is prolonged down nearly to the bottom of the bottle, where it is provided at one side with a valve-seat, *c²*. The passage *e* extends through the entire length of the pipe *c c'*. At its upper end the outlet-pipe has upon it a cap, *c³*, provided with two branches, *c⁴ f*, each in communication with one of the said passages, *e* or *d*. The branch *c⁴*, in connection with the liquid-passage *e* referred to, has the flexible tube *g* joined with it, the tube being provided with the usual discharge-pipe *h*.

The air-passage *d* terminates near the lower end of the part *c* of the pipe *c c'*; and at the end

of passage *d* the part *c* is provided with an air-hole, *d²*. The branch *f*, in communication with the passage *d*, has applied to it the tube *l*, having attached to it the flexible bulb *i* common to bulb-syringes. By means of this bulb air may be forced into the passage *d* and out through the air-hole *d²* into the vessel or bottle, and upon the liquid therein, the air so forced into the bottle being kept under sufficient pressure by the bulb to act upon the surface of the liquid in the bottle and force it into the tube *c c'* up along the passage *e* and out through the flexible tube *g* and discharge-pipe *h*.

The nut *m* on the tube *c*, acting against the washer *n*, enables the under side of the cap *c³* and washer at the lower end of the stopper to pinch the upper and lower ends of the cork or stopper *b* snugly. Upon the extension *c'* I have placed a lug, *o*, which serves as a pivot for the pivoted lever *p*, upon which is mounted loosely the valve *r*, the latter having connected with it a float, *s*, of cork or other light material, the valve being made conical, or otherwise suitably shaped to readily enter and fit the seat *c²* closely. So long as a proper amount of the liquid remains in the vessel or bottle the valve, by reason of its connected float *s*, will be held up, as shown in dotted lines, leaving the valve-seat *c²* open for the flow of liquid into tube *c' c*, the pressure of the air upon the surface of the liquid causing it to be forced up into the passage *e* and out through the discharge-pipe *h*, as described. Before the liquid becomes so far exhausted as to permit air to enter the passage *e* the float *s*, being no longer sustained by the liquid, permits the valve *r* to fall sufficiently to enter and come to a bearing in the seat *c²* and plug the passage *e*, thus completely obviating the escape from the interior of the bottle of the air forced therein by the bulb *i*. The valve is carried by the pivoted lever, which is permitted to rise or turn upward from the seat for but a short distance, owing to the contact with the pipe of the fender *w*. Were it not for this fender the arm or lever *p* might be so far turned upward as to strike the bottle, and be bent or injured when drawing out the stopper *b*. The arm *p* carrying the valve being pivoted, as shown, to the outlet-pipe, is always free to swing to-

ward and from the tube, and never bends or gets caught, as it would be likely to do if guided on a rod, and with such pivoted arm and loosely connected valve the latter is always sure to enter the valve-seat at the proper time.

The bottle will be provided with a suitable graduated scale blown therein to indicate the quantity of liquid placed in it.

10 The apparatus may be employed to advantage for all purposes wherein it is desired to force a liquid into the person.

The valve *r* is held loosely in the arm *p*, and is made conical, so that as it comes in contact 15 with the seat *c*² it will be free to adapt itself to the said seat, be drawn therein by the fluid, and fit the seat closely.

I claim—

1. The vessel *a*, the stopper, the tube *c c'*, 20 provided with the passages *e d*, air-hole *d*² and valve-seat *c*², and the bulb *i*, its connected tube *l*, and the tube *g* and discharge-pipe *h*, combined with the valve *r* and float, and the pivoted carrying-arm *p*, with which the valve 25 and float are loosely connected, the said valve

operating to check the outward flow of air from the said bottle when the liquid is nearly exhausted, substantially as described.

2. The vessel *a*, and stopper and tube *c c'*, and valve-seat *c*² therein, combined with the 30 pivoted arm *p*, the loosely-connected valve and its attached float, the valve plugging the seat before the surface of the liquid reaches the level of the opening in the valve-seat, thus preventing the escape of air from the vessel 35 *a*, substantially as described.

3. The combination, with the tube *c c'*, having passage *e* and valve-seat, with the pivoted arm *p*, valve *r*, held loosely by the said arm, and the float *s*, of the fender *w*, to limit 40 the upward movement of the arm *p*, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

RHODES LOCKWOOD.

Witnesses:

JOS. P. LIVERMORE,
ARTHUR REYNOLDS.