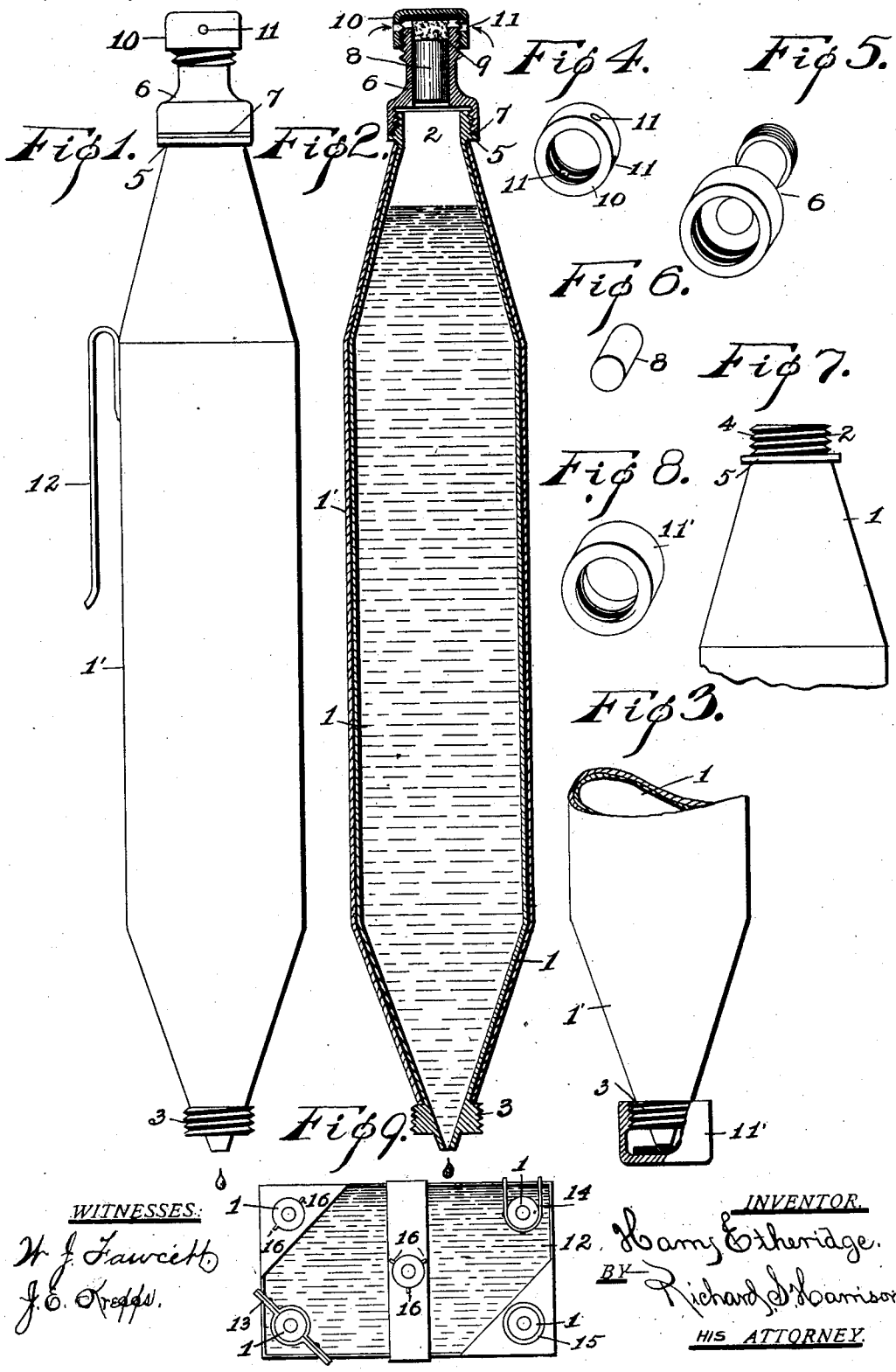
No. 678,462. Patented July 16, 1901.

H. ETHERIDGE.

COAGULANT FEEDER.

(Application filed Jan. 28, 1901.)

(No Model.)



WITNESSES:

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COAGULANT-FEEDER.

SPECIFICATION forming part of Letters Patent No. 678,462, dated July 16, 1901.

Application filed January 28, 1901. Serial No. 45,000. (No model.)

To all whom it may concern:

Be it known that I, HARRY ETHERIDGE, a subject of Edward VII of Great Britain, residing at McKeesport, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Devices for Automatically Feeding Liquids; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

This invention has for its object the provision of a device for automatically "dripping" or feeding a certain quantity of liquid into a receptacle containing other liquids or combining the same with another body of liquid or solid matter in a certain time.

In the treatment of waters, (impregnated with sulfates, carbonates, &c.,) particularly that which is used for steam generation, with lime, soda-ash, trisodium phosphate, oils, and other compounds for the purpose of neutralizing the same previous to entering the boiler it is necessary that the said compounds should be fed or applied in a regular or reliable manner, (free from clogging and salting,) so as to prevent a flushing or a scarcity of the compound in the water.

In the accompanying drawings I have illustrated a form of device by which the above object may be accomplished.

In said drawings, Figure 1 is a vertical side view of the device. Fig. 2 is a vertical side view of the device in section, showing the interior arrangement. Fig. 3 is a vertical side view of the lower portion of the device. Fig. 4 is a perspective view of the cap for admitting the air-supply to the device. Fig. 5 is a perspective view of the extension-cap or resistance-plug holder. Fig. 6 is a perspective view of the resistance-plug. Fig. 7 is a side view of the upper portion of the device with parts removed. Fig. 8 is a perspective view of the base-cap. Fig. 9 is a plan view showing several of the devices arranged upon a receptacle to feed the liquid therein.

In said drawings the numeral 1 designates a reservoir inclosed within an asbestos or felt covering 1′ and having its lower end conically reduced to a point and its upper end partly reduced in like manner, but terminating in a neck 2, said reservoir being provided with an exterior-threaded shoulder 3 near the lower end thereof and a threaded portion 4 and annular flange 5 at the neck or upper end. An extension-cap or resistance-plug holder 6 is threadably secured upon the neck of the reservoir. This extension-cap has an exterior thread formed upon its upper end and engages at its lower end with a leather or rubber gasket 7 to prevent leakage. Fitted tightly within the upper end of said extension-cap is a plug or stopper 8. This plug is composed of any porous material, preferably chalk, so as to partly resist the entrance of air to the reservoir. Loosely inserted in said cap over the top of the porous plug is the sponge 9, which is intended to exclude dust and prevent possible clogging of the plug-pores. A cap 10 is threadably secured to the top of the extension-cap 5. This cap is provided with a number of small openings or ports 11 for the admission of air, the quantity of which may be increased or decreased by adjusting the cap.

To charge the reservoir with liquid, a cap 11′ is screwed onto the bottom or lower end, as shown at Fig. 3. The cap 10 and extension-cap or plug-holder 6 are then removed and the liquid or solution placed within the reservoir. After the reservoir is filled to a suitable height, similar to that shown at Fig. 2, the cap 10 and plug-holder 6 are replaced in position and the device suspended by means of the hook 12 or other means over the receptacle or tank into which the liquid is to be received. When the device is placed in position, the lower cap 11′ is removed. When this cap is removed, the liquid within the reservoir will be held in suspension until sufficient air will pass through the porous or high-resistance plug of chalk to dissipate the vacuum formed between the top of the liquid and the bottom of the resistance-plug, when the solution will begin to drip in measured quantities and continue doing so until the liquid has been fed out.

Should it be necessary to increase or diminish the discharge of the liquid, the cap 10 is screwed down or unscrewed, as the case may require. Should it be required to entirely stop the discharge of liquid, the said cap 10 is screwed down tight, cutting off the

air-supply, and so establish a vacuum between the top of the liquid and the resistance or porous body, at which time the discharge will cease. The cap 11′ may be screwed onto the discharge end and stop the discharge of the liquid, if preferable.

The rate at which the liquid is fed or discharged depends not alone upon the quantity of air entering the cap-ports, but upon the dimensions of and the material employed in the resisting body or plug—namely, the greater the resistance the slower the feed and the smaller the resistance the faster will be the discharge. The air being required to pass through the sponge before entering the porous stopper is strained or purified of all foreign matter, effectually protecting the pores of the stopper.

The dimensions of the discharge-orifice in a practical working device will be minute in comparison to the reservoir-body, but will not be required less than three-sixteenths of an inch.

The asbestos or felt covering is intended to protect the solution from any changes of external temperature that may occur in places where this device may be employed.

The tapered or conical form given the ends of the reservoir is not essential to the operation of the device; but it is preferable to form the lower or discharge end in such manner, so as to cause any settling that may be in the solution to fall to the lowest point and pass out of the discharge-orifice.

In Fig. 9 I have shown several ways in which the device may be suspended, in which the numeral 12 designates the receptacle or tank. 13 is a strap attached to the device. 14 is another form of strap. 15 indicates an annular flange about the body of the device. 16 indicates extending lugs.

I do not wish to confine myself to the use of a high-resistance stopper of the form shown, as a thin disk or covering composed of any suitable material having the required porosity or resistance may be employed as an equivalent. Other parts entering into the construction of the device may likewise be modified or altered without departing from the scope of my invention.

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

1. A device for automatically discharging, or feeding liquids in a measurable, or uniform quantity, comprising a liquid-confining reservoir having an air-inlet opening and a discharge-orifice separate from said inlet-opening, said air-inlet being provided with a body of sufficient porosity as will permit air to enter said reservoir in such quantity that when the air-pressure therein becomes approximately equal to that surrounding said reservoir a minute quantity of the liquid will be discharged therefrom and then momentarily cease discharging until the approximate equality of air-pressure is again established.

2. A device for automatically discharging, or feeding liquids in a measurable, or uniform quantity, comprising a liquid-confining reservoir having an air-inlet opening and a discharge-orifice separate from said inlet-opening, said air-inlet being provided with a body of sufficient porosity as will permit air to enter said reservoir in such quantity that when the air-pressure therein becomes approximately equal to that surrounding said reservoir a minute quantity of the liquid will be discharged therefrom and then momentarily cease discharging until the approximate equality of air-pressure is again established, and a means of arresting, or straining dust from the air previous to passing through said porous body.

3. A device for automatically discharging, or feeding liquids in a measurable, or uniform quantity, comprising a liquid-confining reservoir having an air-inlet opening and a discharge-orifice separate from said inlet-opening, said air-inlet being provided with a body of sufficient porosity as will permit air to enter said reservoir in such quantity that when the air-pressure therein becomes approximately equal to that surrounding said reservoir a minute quantity of the liquid will be discharged therefrom and then momentarily cease discharging until the approximate equality of air-pressure is again established, a means of arresting, or straining dust from the air previous to passing through said porous body, and a covering of non-conducting material for said reservoir whereby the vacuum-space therein is kept at approximately normal temperature to cause a regularity in the discharge of liquid.

4. A device for automatically discharging, or feeding liquids in a measurable, or uniform quantity, comprising a liquid-confining reservoir having an air-inlet opening and a discharge-orifice separate from said inlet-opening, said air-inlet being provided with a body of sufficient porosity as will permit air to enter said reservoir in such quantity that when the air-pressure therein becomes approximately equal to that surrounding said reservoir a minute quantity of the liquid will be discharged therefrom and then momentarily cease discharging until the approximate equality of air-pressure is again established, a means of increasing, or diminishing the supply of air to pass through said porous body, and a means of arresting, or straining dust from the air previous to passing through said porous body.

5. A device for automatically discharging, or feeding liquids in a measurable, or uniform quantity, comprising a liquid-confining reservoir having an air-inlet opening and a discharge-orifice separate from said inlet-opening, said air-inlet being provided with a body of sufficient porosity as will permit air to enter said reservoir in such quantity that when the air-pressure therein becomes approximately equal to that surrounding said res-

ervoir a minute quantity of the liquid will be discharged therefrom and then momentarily cease discharging until the approximate equality of air-pressure is again established, a means of increasing or diminishing the supply of air to pass through said porous body, a means of arresting or straining dust from the air previous to passing through said porous body, and a covering of non-conducting material for said reservoir whereby the vacuum-space therein is kept at an approximately normal temperature to cause a regularity in the discharge of liquid.

In testimony whereof I have hereunto affixed my signature in the presence of two subscribing witnesses.

HARRY ETHERIDGE.

Witnesses:
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