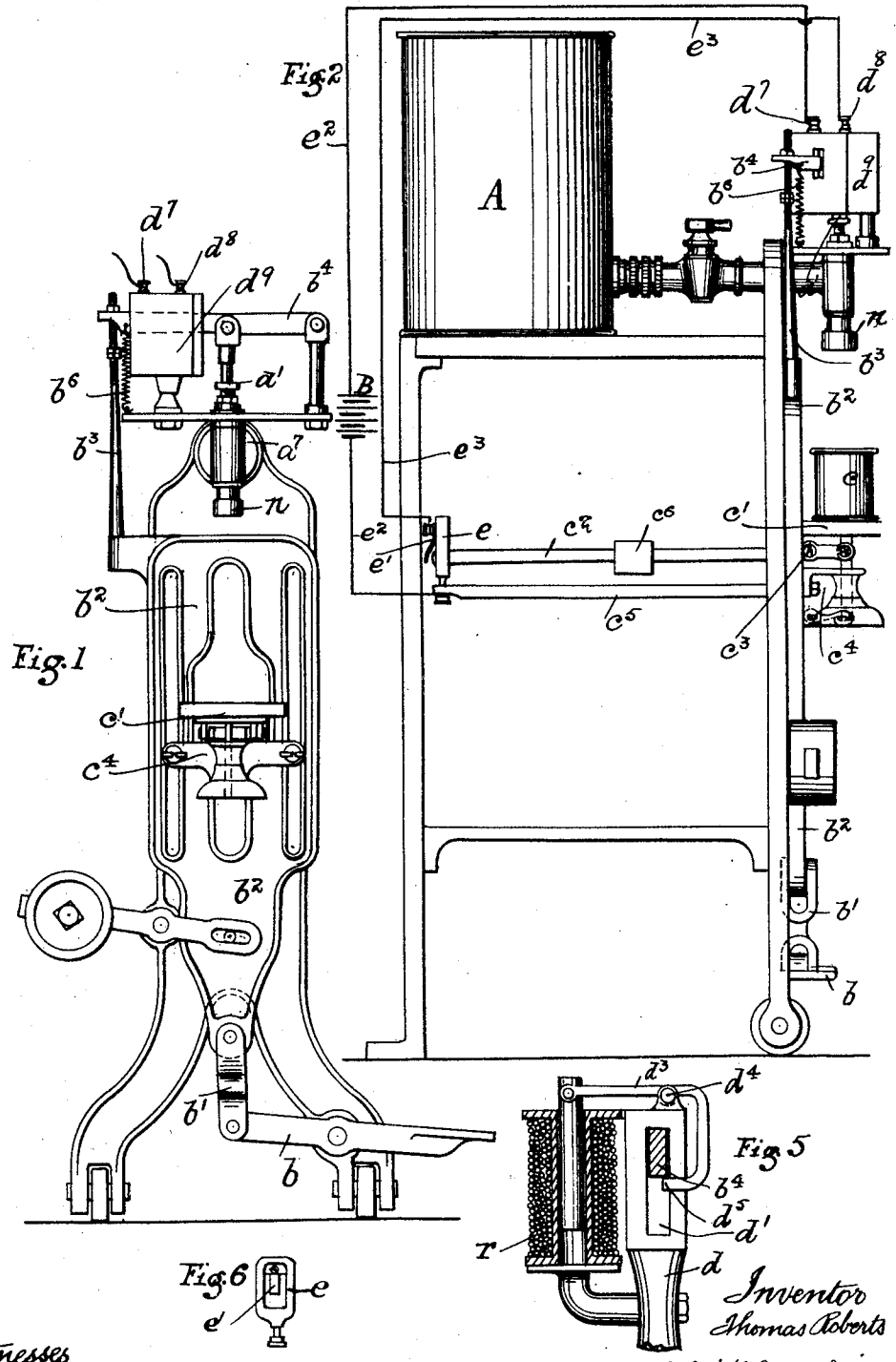
No. 788,945. PATENTED MAY 2, 1905.

T. ROBERTS.

MECHANISM FOR FILLING RECEPTACLES.

APPLICATION FILED MAR. 26, 1904.

4 SHEETS—SHEET 1.



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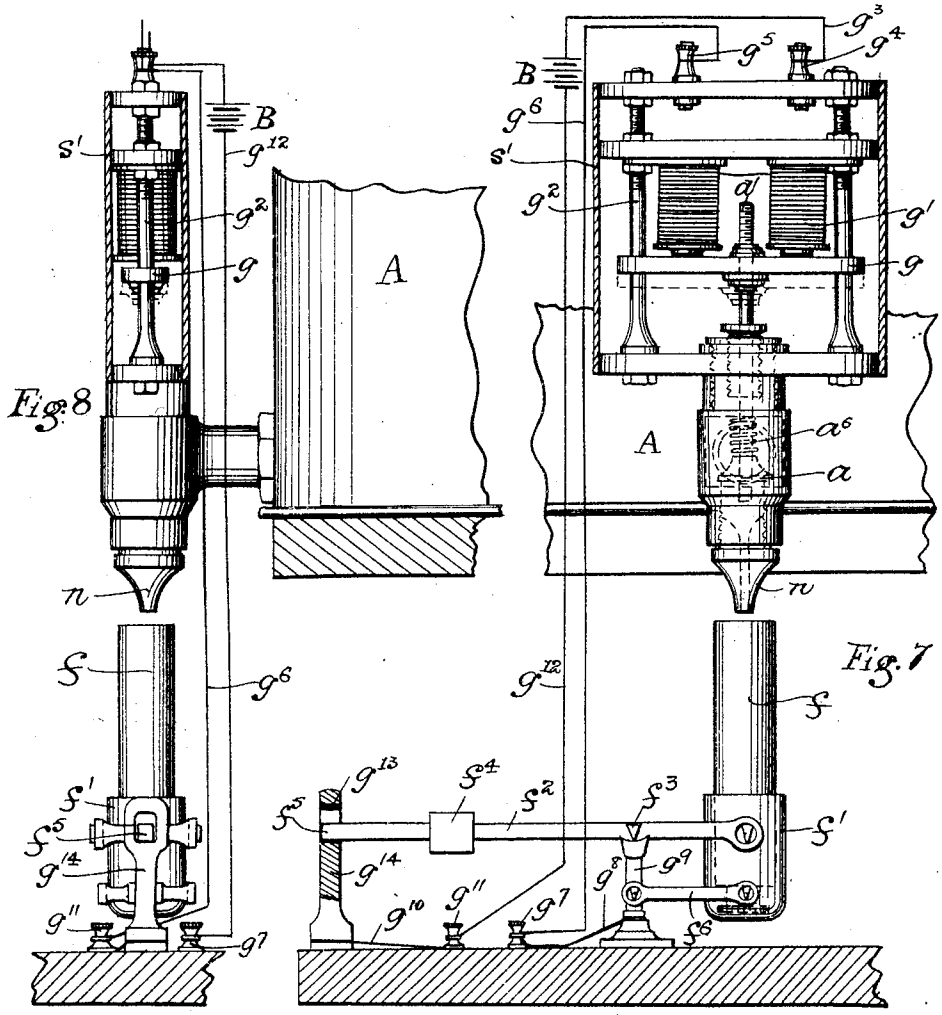

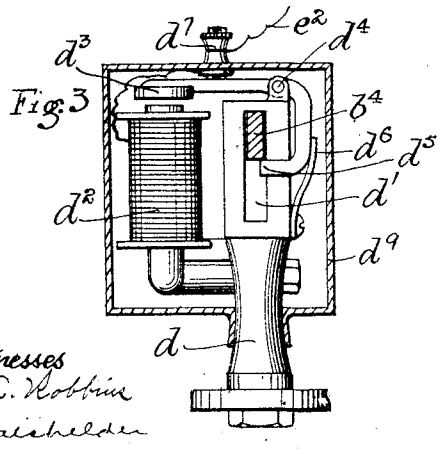

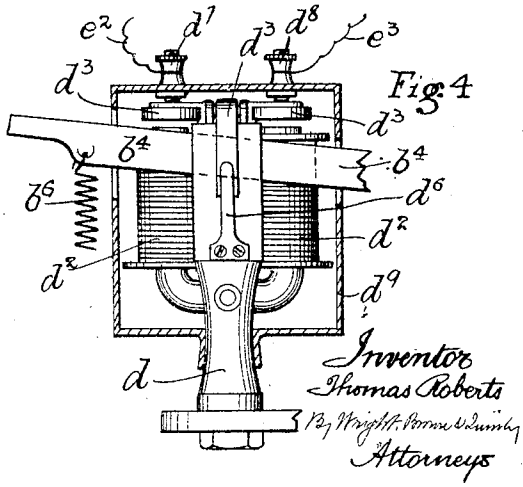

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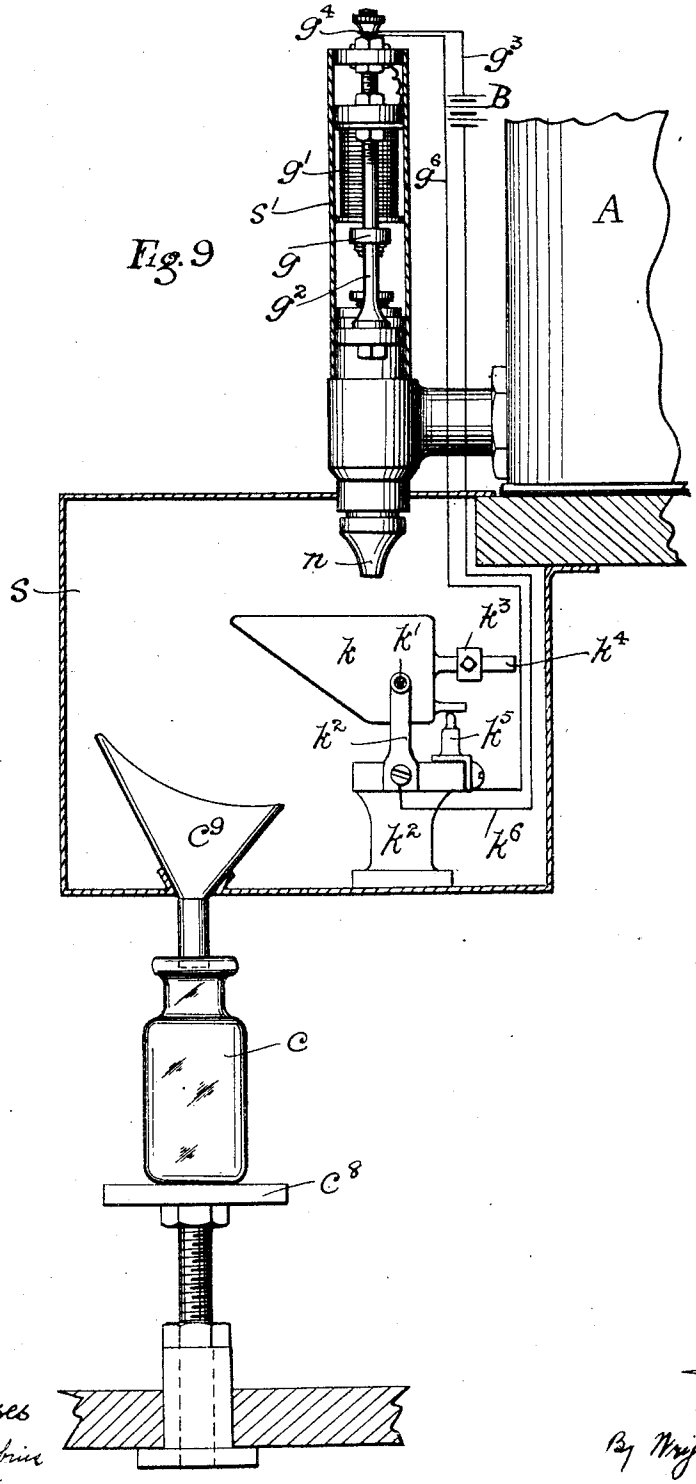
4 SHEETS—SHEET 3.

Fig. 9



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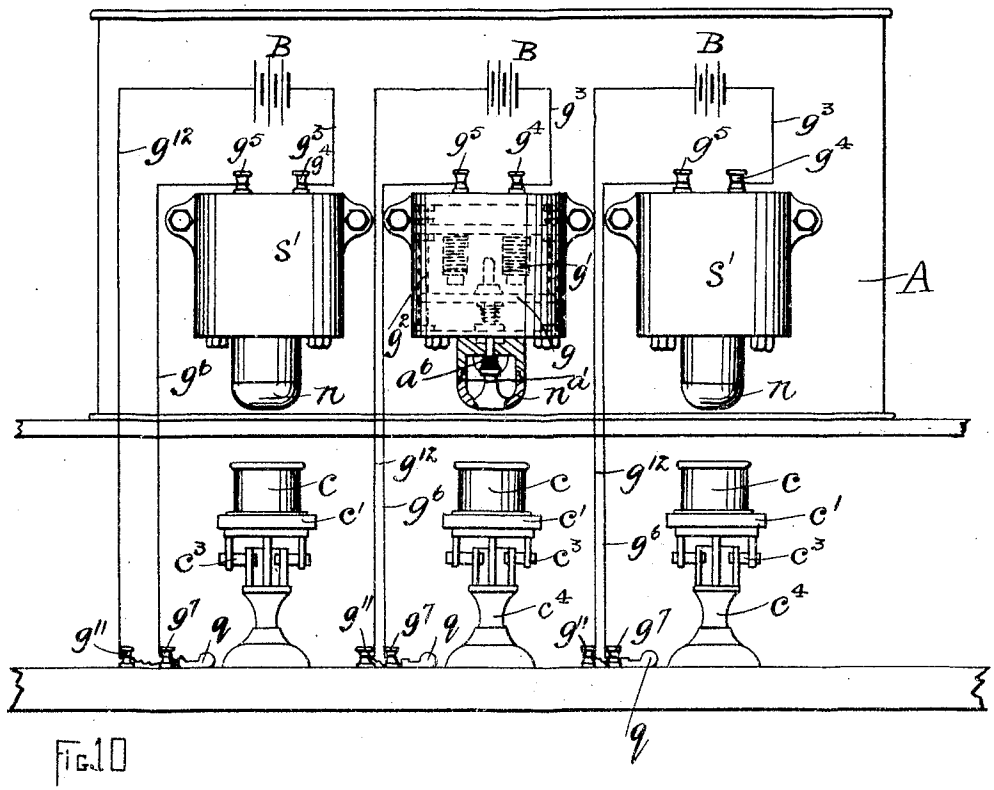

FIG. 10

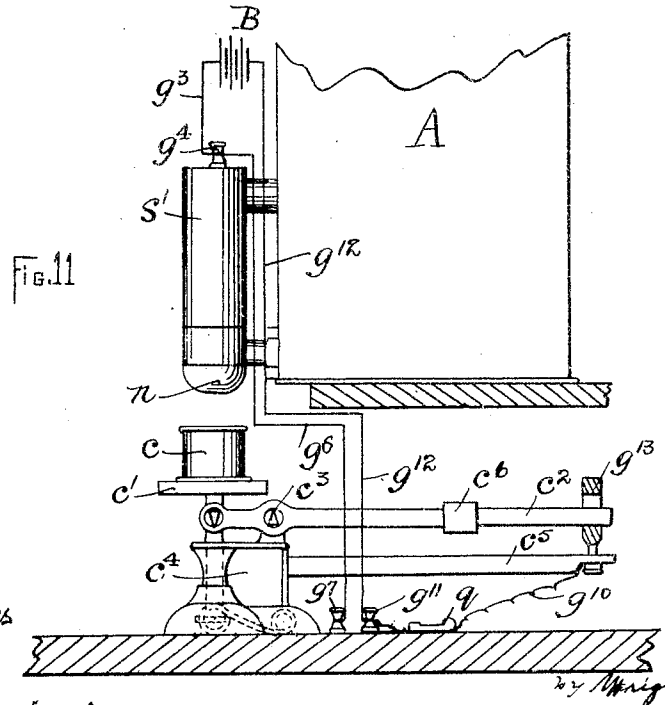

FIG. 11

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No. 788,945. Patented May 2, 1905.

UNITED STATES PATENT OFFICE.

THOMAS ROBERTS, OF BOLTON, ENGLAND.

MECHANISM FOR FILLING RECEPTACLES.

SPECIFICATION forming part of Letters Patent No. 788,945, dated May 2, 1905.

Application filed March 26, 1904. Serial No. 200,179.

To all whom it may concern:

Be it known that I, THOMAS ROBERTS, a subject of the King of Great Britain, and a resident of 33 Deane road, Bolton, in the county of Lancaster, England, have invented certain new and Improved Mechanism for Filling Receptacles, of which the following description, together with the accompanying sheets of drawings, is a specification.

My invention relates to machines or mechanism for use in filling bottles, jars, cans, canisters, or the like with liquid or semiliquid substances; and it consists in the construction of or the application of means to such machines or mechanism whereby the feeding of the liquid or semiliquid substances is arrested automatically by the making or breaking of an electrical circuit when the desired quantity has been supplied to the bottle or other receptacle.

In carrying my invention into effect I make use of the devices constructed and arranged as hereinafter described and as illustrated by the accompanying drawings, in which—

Figures 1 and 2 are front and side elevations, respectively, of a machine for filling bottles, cans, or other receptacles having my improvements applied thereto. Figs. 3 and 4 are part-sectional front and side elevations, respectively, drawn to an enlarged scale, of portions of said machine hereinafter described. Figs. 5 and 6 are detail drawings of parts hereinafter referred to. Figs. 7 and 8 are front and side elevations, respectively, of means for use in filling collapsible tubes constructed in accordance with my said invention. Fig. 9 is a side elevation of a modified form of my improved apparatus. Figs. 10 and 11 are front and side elevations, respectively, showing a series of my improved devices mounted in proximity with each other.

Similar letters of reference indicate similar parts throughout the several views.

Figs. 1 and 2 illustrate a machine for filling bottles, jars, or the like in which the valve-spindle a' is raised to open the supply-valve, mounted within the casing a^7, by means of the foot-lever b, link b', slide b^2, rod b^3, and lever b^4. The valve-spindle a' is returned quickly to its seat by means of the spring b^6 and the weight of the other parts connected to it. Said spindle is threaded, as shown, whereby the valve may be adjustably secured thereto. The receptacles c to be filled with liquid from the tank A are placed upon the scale pan or plate c', the arm c^2 of which is fulcrumed at c^3 to the supports c^4, carried by the slide b^2. Fixed to the support d within the slot d', in which operates the lever b^4, is an electromagnet d^2, the armature d^3 of which is fulcrumed at d^4 to said support d, while its other end, d^5, (or a pin connected thereto,) is formed, as shown, so that it may be moved beneath or within an opening in the lever b^4, when the latter is in its raised position, by means of the spring d^6. Upon the stationary arm c^5 of the weighing device is mounted the bracket e, which carries a contact-piece e', the latter being insulated from said bracket. Wires or conductors e^2 e^3 are connected to the bracket e and contact-piece e', respectively, and to the terminals d^7 d^8, mounted on the casing d^9, which contains the electromagnet d^2. It will thus be seen that an electrical circuit may be completed or closed when the arm c^2 is in contact with the piece e', said circuit extending from the battery or generator B, through the conductor e^3, terminal d^7, electromagnet d^2, terminal d^8, conductor e^2, contact e', arm c^2, and framework of the weighing device, through the arm c^5 and conductor e^3, to said battery B. By these means I am enabled to fill into each of the tins or other receptacles c a predetermined quantity of liquid, the valve being opened by the foot-lever b and held open by the armature d^3 and lever b^4 until said quantity of liquid has been supplied, when by the descending of the scale-pan c' the arm c^2 is moved to complete the electrical circuit and cause the armature d^3 to withdraw its end d^5 from beneath said lever b^4 and allow the latter to descend and close the valve. The quantity of liquid to be filled into the receptacles c is adjusted or regulated by means of the sliding weight c^6.

In Figs. 7 and 8 I have illustrated a device for filling collapsible tubes f. The valve-spindle a' is adjustably connected to the armature g of the electromagnet g', said spindle being threaded, as shown, said armature mov-

ing over the guides or supports g^2. The valve a is held in its open position by the electromagnet g' and is closed when the circuit is broken by the spring a^6. The collapsible tube f is placed in the cup or receptacle f' when being filled, and the latter is carried by the lever-arm f^2, fulcrumed at f^3 and provided with an adjustable weight f^4. In the drawings the valve a is shown as being open, and the electric circuit from the battery B is completed through the medium of the wire g^3, terminal g^4, electromagnet g', terminal g^5, wire g^6, terminal g^7, conductor g^8, pillar g^9, arm f^2, post g^{14}, conductor g^{10}, terminal g^{11}, and conductor g^{12}. This circuit remains closed until the predetermined quantity of liquid has been received by the tube f, when the arm f^2 oscillates and its end f^5 comes into contact with the insulated part g^{13}, thus breaking the circuit and allowing the valve a to be returned to its seat by the spring a^6. The cup f' is guided, so as to move vertically in order to keep the tube f in an upright position, by means of the lever-arm f^6, connected to said cup and to the pillar g^9.

Fig. 9 illustrates a device for delivering measured quantities of liquid into bottles or other receptacles by means of a vessel k, which is fulcrumed at k' upon the support k^2 and which moves on its said fulcrum when a certain predetermined quantity of liquid has been fed thereto to so cause said liquid to be passed into the bottle or other receptacle c, mounted on the adjustable support c^8, (which may be raised and lowered by means of a foot-lever and counterweight,) through the medium of the funnel c^9. By means of the adjustable weight k^3, mounted on the arm k^4, the amount of liquid desired to be fed to the vessel k in order to cause it to oscillate may be varied. The means for opening and closing the supply-valve are or may be similar to those illustrated by Figs. 7 and 8, so that during the time that the liquid is being fed to the vessel k the electrical circuit from the source B is completed through the conductor g^3, terminals g^4 and g^5, electromagnet g', conductor g^6, terminal k^5, vessel k, bearings k^2, and conductor k^6.

In Figs. 10 and 11 I have illustrated a series of devices for use in filling liquids, all of which are connected to one tank or receiver A. The valves a shown in these figures are especially applicable for the filling of paint or similar substances into cans c, and these latter are mounted upon weighing devices similar to those illustrated by Fig. 1, the electrical circuit being completed and broken in a similar manner to that indicated by Figs. 7 and 8.

In the several drawings the nozzles through which the liquids pass to the bottles or receptacles are indicated by the letter n, and these may be interchangeable as desired in accordance with the requirements of the varied liquids being filled.

The wires or conductors may be laid or fixed as desired, so as not to interfere in any way with the operations of the machine or attendant, while the source of electricity B may be a battery, dynamo, storage battery. or any suitable kind of generator.

The varied forms of mechanism shown and described may be mounted upon suitable framework and the liquid to be filled led thereto by pipes or conductors, or they may be mounted upon supply-tanks A, as shown by the several figures. Whenever convenient, the parts of mechanism are protected by guards or covers, as those marked d^9 and s s'.

Switches of any ordinary or well-known kind, as those marked q q, Figs. 10 and 11, may be employed in any of the varied devices to arrest the operations of the machines or mechanism when desired.

It will readily be seen that I may make use of my improved devices in connection with other forms of valves employed for filling liquids into receptacles, such as sliding or sluice valves and the like.

In devices where a long lift of the valve is required the armature or core of the magnet or solenoid may be raised by a hand or foot lever, the electrical circuit being broken and closed as hereinbefore described.

Instead of making use of electromagnets as above described I may, whenever desired, employ solenoids as shown at r, Fig. 5, to attain the same results, and in the arrangement illustrated by the said Fig. 5 I employ the spring d^6 to act upon the end d^5 of the lever carrying the core of the solenoid in a manner similar to that shown in Fig. 3.

Having thus described the nature and object of my said invention, what I claim is—

1. A device of the character described comprising a reciprocating member, a supply-valve adjustably connected thereto, a guide for said member, means for raising said member and retaining it in an elevated position, whereby said valve is opened, a weighing device, and means controlled thereby for automatically releasing said member, whereby said valve is closed.

2. A device of the character described comprising a frame or support, a reciprocating member, a supply-valve adjustably secured thereto, a guide for said member carried by said frame or support, means for raising said member and retaining it in an elevated position, whereby said valve is opened, a weighing device, and means controlled thereby for automatically releasing said member, whereby said valve is closed.

3. A device of the character described comprising a supply-valve, a reciprocating member adjustably connected with said valve, a guide for said member, means for raising said

member whereby the valve is opened, means carried by said guide for automatically engaging said member, and a weighing device adapted to control said engaging means.

4. A device of the character described comprising a supply-valve, a pivoted arm connected to the stem thereof, a guide for said arm, means for raising said arm, whereby said valve is opened, an electromagnet supported by said guide, a pivoted catch operated by said magnet and adapted to engage said arm, and a weighing device adapted to control the circuit to said magnet.

5. A device of the character described comprising a frame or support, an arm pivotally mounted therein, a supply-valve adjustably connected to said arm, means for guiding said arm, means for raising said arm whereby said valve is opened, a catch adapted to automatically engage said arm when raised, means for returning said arm to its normal position when disengaged from said catch, and a weighing device adapted to automatically control said catch.

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

THOMAS ROBERTS.

Witnesses:

JAMES HENRY ELLISON,

JOHN WHITEHEAD.