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W. M. MILLER

FLUID DELIVERY CONTROLLING MEANS

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Fig. 1.

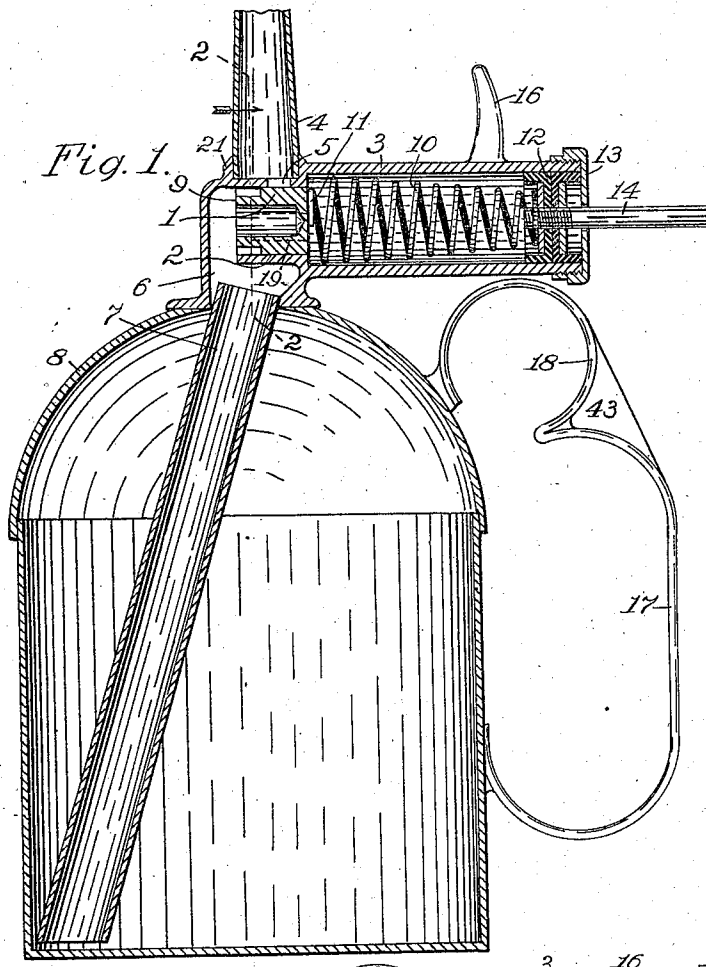
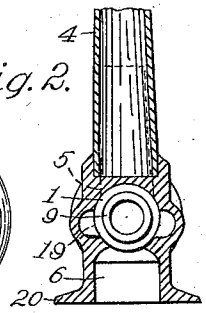


Fig. 2.



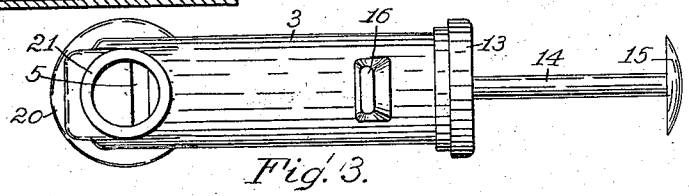


Fig. 3.

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UNITED STATES PATENT OFFICE.

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FLUID-DELIVERY-CONTROLLING MEANS.

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My invention relates to improvements in fluid-delivery controlling means, and the object of my improvements is to supply mechanical means for controlling the delivery of a fluid or liquid from any source of supply by way of an intermediate cylinder, casing or receptacle to a delivery-port, spout or conduit, and particularly to control such delivery by means which in operation employ alternate suction and compression.

This object I have attained by the means which are hereinafter described and claimed, and which are illustrated in the accompanying drawings, and in which similar structures are indicated by the same numerals.

In said drawings, Fig. 1 is a vertical central section of an oil-can equipped with my improved means for controlling its fluid delivery, some of the elements being shown in elevation. Fig. 2 is a detail cross section on the broken line 2—2 of Fig. 1 of the cylinder and a portion of the delivery-spout, the piston-valve being shown in elevation. Fig. 3 is a top plan of the valve-casing.

One example which embodies my improvements is that which is illustrated in Figs. 1 to 3 inclusive, being an oil-can adapted for manual actuation of its controlling piston-valve. The oil-can 8 has communication at the diminished top with the depending neck 6 of a horizontal casing 3 and its included cylinder 2 containing a conforming reciprocatory piston-valve 1. An open ended tube 7 has its upper end fitted in said neck to depend at an inclination toward the bottom of the can. The lower end of the neck 6 is widened at 20 and welded or brazed to the open top of the can. The numeral 4 denotes a spout mounted in an annular seat 21 on the top of one end of the casing 3 and communicating by way of the delivery-port 5 with the forward part of the casing which contains the cylinder 2, the latter being of slightly less diameter than the diameter of the main casing to the rear, the rear open end of which has a screw-cap 13 provided with a central hole to receive the plunger stem 14 having an outer terminal disk 15.

Upon the top of the casing 3 at the rear is an upwardly projecting curved finger-hold 16, while below said casing is a looped handle 17 on the oil-can 8 whose upper part is crimped inwardly to provide a smaller finger-hold 18 whose outer interval is filled by a stiffening plate 43, whereby when the handle 17 is grasped, the fore-finger of the user may be hooked about the upper finger-hold 16, and the finger next thereto inserted in the finger-hold 18, giving a secure grip and perfect manual control to the user while the thumb on the same hand is used to press upon the disk 15 to push it forwardly in the operation of the piston-valve 1.

The piston-valve 1 is a hollow or cupped cylinder in shape with its open end diminished at 9, this diminished annular part serving as a stop against the abutting end wall of the cylinder to limit the movement of the valve in that direction.

A plunger-head 12 is mounted within the casing 3 on the end of the stem 14, having elastic packing to effect a tight joint. A conical coiled compression spring 10 is positioned in the casing 3 and has one end engaging said plunger-head 12. The other end extremity of said spring is bent inwardly radially at 11 to contact with and serve as a stop for the imperforate head of the piston-valve 1. The spring 10 and piston-valve 1 are removable only through the wider part of the casing 3 when the closure 13 is taken off.

When the plunger-head 12 is pressed in to compress the spring 10, the latter resiliently pushes the piston-valve 1 to the left or front until stopped by the projection 9 engaging the cylinder end wall. When the handle 15 is then released, the spring reacts toward the right or rear pushing the plunger-head 12 in that direction, and the partial vacuum thereby caused in the casing by suction draws to the rear the valve 1, and causes suction in the cylinder 2 and the tube 7, oil rising by way of the tube into the neck 6 and passing thence through the pair of side ports or passages 19 (see Fig. 2) into the casing 3. The annular space around the diminished part 9 of the valve gives the requisite clearance for the oil to the ports 19 when the valve 1 has moved to the rear sufficiently. This fills the hollow casing 3 with oil. Subsequent compression of said spring returns the valve 1, because the push of the plunger is transmitted to the valve by the oil in the casing to return the valve. In its return to the front, the rear end of the valve uncovers the delivery-port 5 and oil is ejected

from the casing therethrough into the spout 4.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is:

1. A valvular device, comprising a valve-chamber having an interior cylinder intermediate its ends and an enlarged spring-barrel opening into one end of the cylinder, the valve-chamber having a port positioned within said cylinder intermediate the ends of the latter, an unconnected imperforate floating plunger reciprocably fitting said cylinder and having that end opposite the spring-barrel diminished to be limited in its travel by impact with the facing end wall of the valve-chamber, and a coiled spring mounted in said spring-barrel to have one terminal stopped by a shoulder between the cylinder and spring-barrel and the terminal bent diametrically inwardly to serve as a limiting stop for said plunger, and means for releasably compressing said spring including means for producing alternate suction and pressure on the plunger.

2. A valvular device, comprising a valve-chamber having a port at one end and having a cylinder intermediate its ends, and having its end part opposite said port enlarged at a shoulder to serve as a spring-barrel and suction-chamber, a coiled spring in said spring-barrel having one end occasionally engaged with said shoulder and having a terminal bent inwardly, an imperforate plunger in said spring-barrel fitting it and occasionally engaging the outer end of said spring, said spring-barrel having an apertured removable end-closure, said plunger having a stem projecting through said apertured end-closure, an unconnected imperforate floating plunger fitting said cylinder reciprocably to control the delivery of said spring-barrel into the cylinder, said cylinder having a port intermediate its ends, and the last-mentioned plunger controlling said port, and said last-mentioned plunger being stopped at one limit of its travel by the inwardly projecting terminal of said spring.

3. A valvular device, comprising a valve-chamber having a port at one end and having a cylinder intermediate its ends, and having its end part opposite said port enlarged at a shoulder to serve as a spring-barrel and suction-chamber, a coiled spring in said spring-barrel having one end occasionally engaged with said shoulder and having a terminal bent inwardly, an imperforate plunger in said spring-barrel fitting it reciprocably and occasionally contacting with the outer end of said spring, said spring-barrel having a removable apertured end-closure, said plunger having a stem projecting through the apertured end-closure, an unconnected imperforate floating plunger fitting said cylinder reciprocably and stopped at one limit of its travel by the inwardly turned terminal of said spring, said cylinder having a port intermediate its ends controlled by the last-mentioned plunger, and the cylinder wall having at opposite sides longitudinal recesses separated from said port to serve as conduits communicating between the ported end of the valve-chamber and said intermediate port at a certain position of the last-mentioned plunger.

4. A device of the character described, characterized by the inclusion of a differential cylinder, an unconnected floating piston in one differential part of said cylinder, a plunger in the other differential part of said cylinder, and a resilient member intermediate said piston and plunger adapted to alternately serve as an elastic cushion for the plunger and as an end-stop for the piston.

Signed at Waterloo, Iowa, this 19th day of June, 1923.

WALTER M. MILLER.