

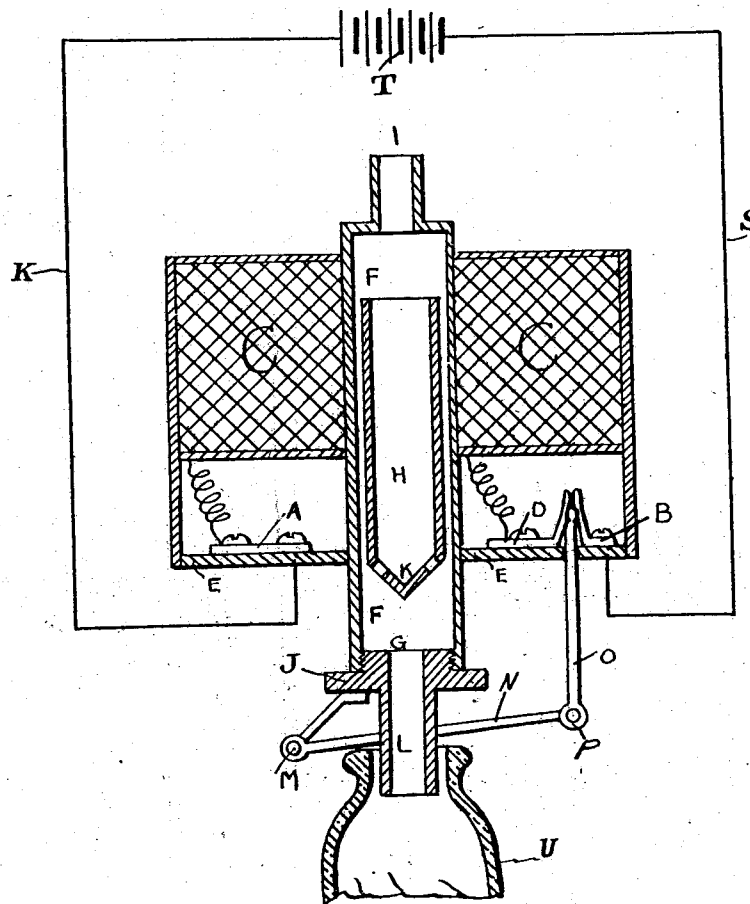
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A. G. JACKSON

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ELECTRICAL DEVICE FOR CONTROLLING THE FLOW OF LIQUIDS

Filed Dec. 13, 1922



Inventor

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UNITED STATES PATENT OFFICE.

ALFRED GEORGE JACKSON, OF BRISBANE, QUEENSLAND, AUSTRALIA.

ELECTRICAL DEVICE FOR CONTROLLING THE FLOW OF LIQUIDS.

Application filed December 13, 1922. Serial No. 606,667.

To all whom it may concern:

Be it known that I, ALFRED GEORGE JACKSON, subject of the King of the United Kingdom of Great Britain and Ireland, residing at Brisbane, in the State of Queensland, Commonwealth of Australia, have invented new and useful Improvements in Electrical Devices for Controlling the Flow of Liquids, of which the following is a specification.

My invention relates to devices for controlling the flow of liquids, and has reference more particularly to apparatus suitable for use in filling bottles and containers with liquid and so constructed that the operator in holding a container against the filling nozzle closes an electric circuit which controls the movements of the valve in such a manner that the placing of a container in position for filling, automatically starts the flow of liquid, and the removal of such container stops the flow of liquid.

The object of my invention is to prevent waste of liquid and allow the worker to have free use of both hands for handling the containers, giving greater speed and accuracy of filling.

I attain my object by connecting the liquid supply to a delivery tube or valve casing at the delivery end of which is an aperture adapted to be closed by a plunger either iron or part iron surrounded by a coil or solenoid outside the delivery tube, the plunger thus acting in the two-fold capacity of a valve and a magnetic core. The solenoid, when energized by an electric current, lifts the valve off its seat thereby allowing the liquid to flow, the stoppage of the current through the solenoid allowing the valve to close immediately by gravity. The energizing of the solenoid is attained by the movement of a suitable switch which is operated by the act of placing a container in filling position, to close the circuit through the solenoid and current supply.

The drawing accompanying and forming part of this specification is a vertical sectional view of an apparatus embodying the features of the present invention and showing diagrammatically the electrical connections and the source of energy.

In the apparatus shown in the drawing, F indicates a delivery tube having an inlet I adapted to be connected to a supply of liquid by any convenient means.

The outlet nozzle L may be screwed into the delivery tube for convenience of inspection

tion of the valve seat G on which normally rests the plunger H made wholly or partly of iron.

The delivery tube is made of non-magnetic material and is surrounded by the wire coil or solenoid C, disposed in such position that the plunger H is drawn off the valve seat G when the solenoid is energized and returns to its original position by gravity or stoppage of the energizing current in the solenoid.

A plate N through which nozzle L passes is hinged at M to a bracket fixed to the nozzle or bottom J of the delivery tube. At the point P near the free end of the plate N a rod O is hinged which extends towards the contact points B and D and has its free end in close proximity thereto. As shown in the drawing, the rod O is adapted to make contact with the points B and D, thus completing the circuit through them to the solenoid whenever the plate N is raised, the rod being composed of or tipped with conducting material. The ends of the coil C are connected to terminals A and D, while terminals A and B are connected by wires R and S respectively to an electric supply T. It will thus be seen that when a bottle U is placed under the nozzle L and the plate N is pushed upward thereby to the extent that the rod O makes the connection between the two contacts B and D the electric circuit will be closed and solenoid C will be energized, the iron plunger being thereby drawn into the solenoid and opening the valve. The movement of the plunger will depend on the energizing and de-energizing of the solenoid.

The terminals A, B, and D, are attached to the insulating plate E, which itself is conveniently attached to the solenoid and delivery tube, or if a metal plate is used insulated therefrom electrically by well known means.

If the plunger H is made with only slight clearance in the delivery tube, the plunger may be in the form of a tube with apertures at K as shown, to allow of the free flow of liquid, said apertures being disposed in such position as not to interfere with the closing of the valve upon the seat G. The end of plunger H may be of rubber, metal or other material suitable for the liquid used and to make a close seating. It will be seen that the valve mechanism is operated entirely by

electromagnetic means from outside the pipe or delivery tube, thus avoiding the use of any rod or lever or any openings, glands or packing. The consequent elimination of friction and leakage render this mechanism well suited for use in controlling the flow of hot liquids, and especially those which are of a corrosive character.

The de-energizing of the solenoid in the structure above described is effected by the removal of the vessel from filling position, which permits the plate N to drop and thus withdraw the rod O from between the terminals B and D.

What I do claim as my invention and desire to secure by Letters Patent is:—

1. A device of the character described, comprising a valve casing having an inlet port and an outlet port, a movable plunger of magnetic material within said casing and adapted to close said outlet port; an electric coil encircling said casing and in normally open circuit with a source of electrical energy, a pivoted lever disposed below said casing and adapted when swung in one direction to close the circuit through said coil thereby to operate the plunger to open said outlet port.

2. A device of the class described, comprising a valve casing having an inlet port and an outlet port, a hollow plunger of magnetic material within said casing adapted to permit the passage of a liquid therethrough and having means for closing the outlet port, an electric coil encircling said casing and in normally open circuit with a source of electrical energy, a pivoted lever disposed below said casing and adapted when swung in one direction to close the circuit through said coil thereby to operate the plunger to open said outlet port.

3. A device of the class described, comprising a casing having an inlet port, a nozzle having an outlet port removably secured in said casing, a movable magnetic plunger within the casing and adapted to close said outlet port, an electric coil encircling said casing and adapted when energized to raise said plunger from its port-closing position, a vertically movable member encircling said nozzle, and means carried by said member for closing a circuit through said coil when the member is moved in one direction.

In testimony whereof he has signed his name to this specification.

ALFRED GEORGE JACKSON.