No. 744,817. PATENTED NOV. 24, 1903.

A. SUNDH.

PROTECTED SWITCH MECHANISM.

APPLICATION FILED JULY 14, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

FIG. 1.

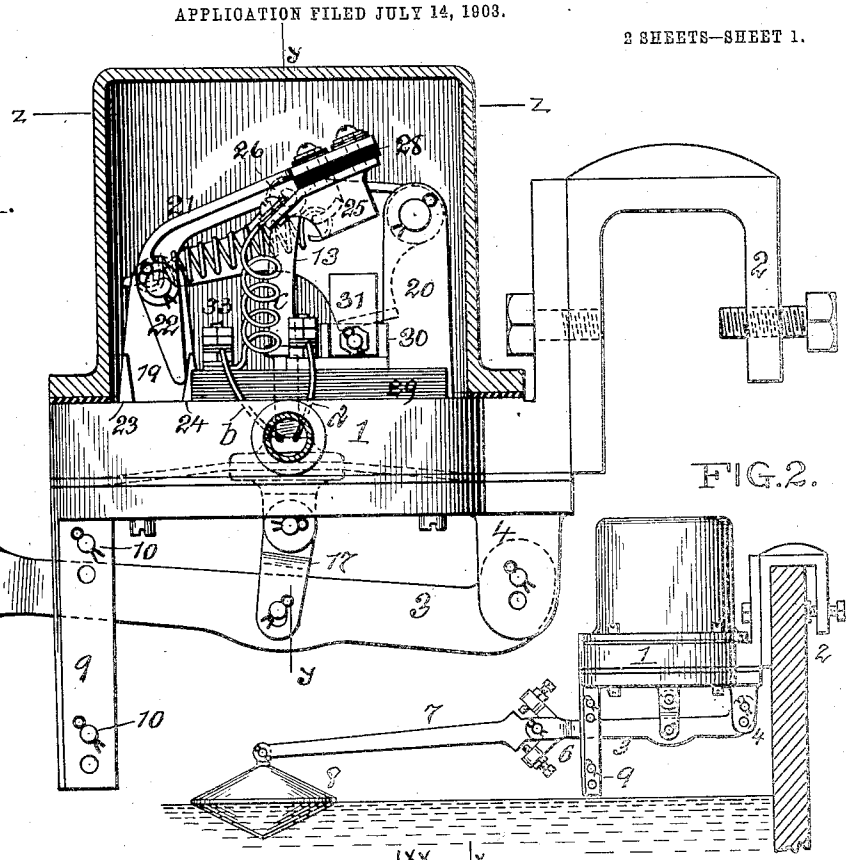


FIG. 2.

FIG. 3.

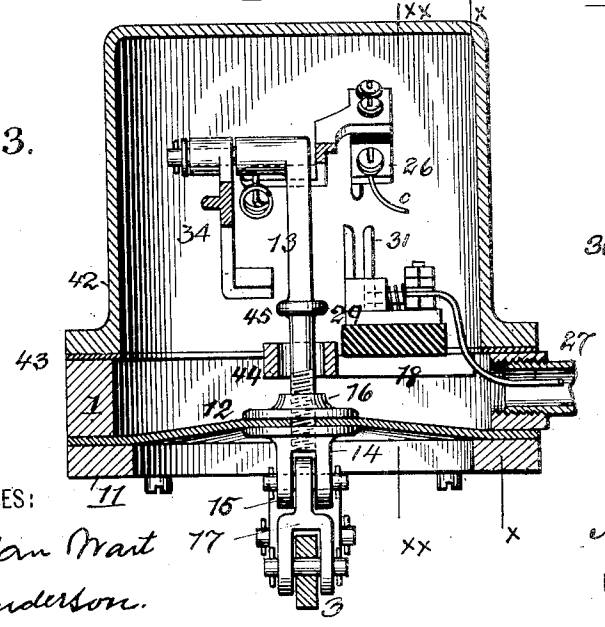
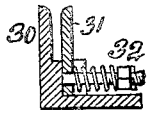


FIG. 4.



WITNESSES:

J. R. Van Wart

A. Henderson.

INVENTOR

August Sundh

BY Paul Synnestvedt

his ATTORNEY

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PROTECTED SWITCH MECHANISM.

APPLICATION FILED JULY 14, 1903.

NO MODEL. 2 SHEETS—SHEET 2.

FIG. 5.

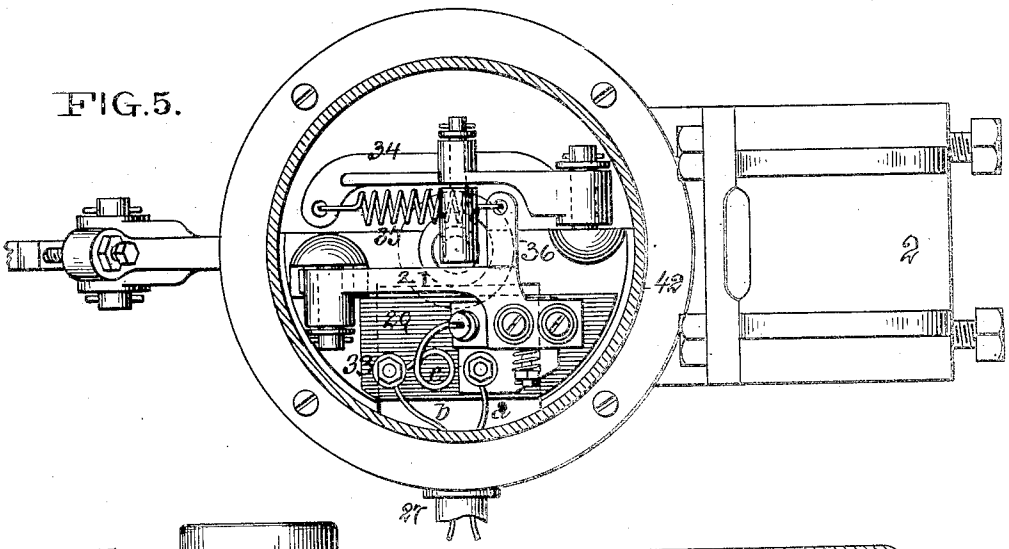


FIG. 7.

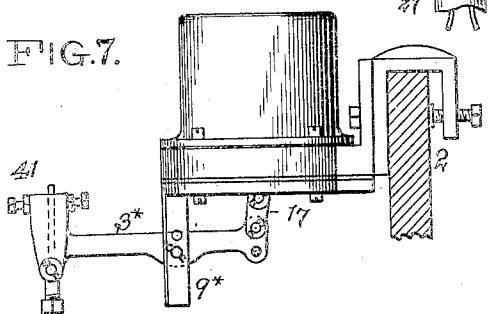


FIG. 6.

WITNESSES:

J. A Van Wart

A. Henderson

INVENTOR

August Sundh

BY Carl Benjamin

His ATTORNEY

No. 744,817. Patented November 24, 1903.

UNITED STATES PATENT OFFICE.

AUGUST SUNDH, OF YONKERS, NEW YORK.

PROTECTED SWITCH MECHANISM.

SPECIFICATION forming part of Letters Patent No. 744,817, dated November 24, 1903.

Application filed July 14, 1903. Serial No. 165,443. (No model.)

To all whom it may concern:

Be it known that I, AUGUST SUNDH, of Yonkers, Westchester county, New York, have invented a new and useful Improvement in Protected Switch Mechanisms, of which the following is a specification.

The invention relates to circuit-closing mechanism, and more particularly a switch-lever which is operated automatically, as by a float, in a liquid-reservoir to control the supply thereto in accordance with changes in the liquid-level.

The invention consists in the combination of a circuit-controlling lever, a box hermetically inclosing the same and having a flexible side, and means connected to said flexible side for mechanically actuating said lever; also, in the combinations hereinafter more particularly set forth.

In the accompanying drawings, Figure 1 is a section on the line *x x* of Fig. 3, showing the switch-lever open. Fig. 2 is an elevation showing the arrangement of the float and the mode of attaching the device to the wall of a tank. Fig. 3 is a section on the line *y y* of Fig. 1. Fig. 4 is a detailed section of the spring-terminal which receives the contact-plate of the switch-lever. Fig. 5 is a horizontal section on the line *z z* of Fig. 1. Fig. 6 is a section on the line *xx xx* of Fig. 3, showing the switch-lever closed. Fig. 7 is a side elevation showing a modification of the float.

Similar characters of reference indicate like parts.

1 is a supporting-bracket in ring form provided with the screw-clamp 2, by which the device may be secured to the edge of a tank or reservoir, as shown in Fig. 2.

3 is the body portion of the operating-lever, pivoted at 4 and provided with yoke-arms 5, through which pass set-screws 6. To the end of this body portion is pivoted the arm 7, which carries the float 8. The object of the yoke 5 is to permit the float to rise or fall for a predetermined distance with the liquid-level without operating the switch mechanism. The extent of this movement is regulated by the screws 6. The lever 3 passes through a guide 9, in which may be arranged limiting stop-pins 10.

Secured to the bottom of the ring bracket 1 by means of a ring 11 and suitable fastening-screws is a tight diaphragm 12, of leather, rubber, or other flexible material. Through said diaphragm passes the switch-rod 13, which is threaded at its end to receive the nut 14, having jaws 15 on the under side and a nut 16 on the upper side of said diaphragm. By means of nuts 14 and 16 a tight joint is made at the point where the diaphragm is traversed by the operating-rod. The lever 3 is connected to the jaws 15 of nut 14 by a link 17.

Above the bracket-ring is a supporting-plate 18, having two standards 19 20. Standard 19 has pivoted to it the bell-crank switch-lever 21. One arm 22 of said lever moves between the limiting-stops 23 24. The other arm has secured to it a contact-plate 25, to which is connected the clamping-screw 26 for the circuit-wire *c*. Plate 25 is insulated at 28 from the lever-arm. Also on the supporting-plate 18 is a plate 29, of insulating material, which carries a shouldered plate 30, against which a loose plate 31 is held in elastic contact by means of the adjustable helical spring 32. When the switch-lever is moved to close circuit, its plate 25 is received between the plates 30 and 31. The circuit-wires *a* and *b*, which pass to the switch through a tube 27, inserted in the ring-wall, are connected, respectively, to a binding-post on plate 30 and a binding-post 33 on insulating-plate 29. Binding-post 33 connects by wire *c* to clamping-screw 26.

Standard 20 carries pivoted arm 34, the free end of which is attached by a helical spring 35 to an offset 36 on switch-lever 21. To said arm is pivoted the upper end of the rod 13. The rod 13 passes through a fixed ring 44 and has an enlargement 45, adapted to make contact with said ring and so limit the descent of said rod.

The operation of the device is as follows: The switch-lever is normally open. So long as the liquid-level in the tank or reservoir does not fall below the predetermined amount the apparatus is unaffected. If, however, the lever descends sufficiently far to throw the weight of float and lever on the rod 13, that rod draws down the pivoted arm 34, thus dis-

placing the abutment of spring 35 and causing the same to snap the switch-lever into closed position. Circuit is then established to any suitable alarm or signaling device or to a pump or other means for bringing a new supply of liquid to the tank. When the liquid regains its proper level, the float rises, lifting the rod 13 and arm 34, which again displaces the abutment of spring 35 to such a position as will cause said spring to snap open the switch-lever, thus breaking circuit.

In the modification shown in Figs. 6 and 7 the pivoted float 8 is replaced by a cylindrical float 37, which is free to move up and down on the rod 38 between the limiting-stops 39 40. The rod 38 is pivoted at the end of lever 3* and is provided on its side with limiting-screws 41. The lever is pivoted centrally in the guide 9*, so that the operation of the switch mechanism by this form of float and lever is just the reverse of that of the float and lever shown in Fig. 1.

The mechanism is protected by an inverted-cup cover 42, which is flanged below to rest upon a packing-gasket 43 on the upper surface of ring 1, where it is held in place by screws, as shown.

It will be observed that by this construction all of the working mechanism is completely inclosed and protected, so that the device may be freely exposed to the weather or to fumes without danger of injury.

I claim—

1. A circuit-controlling lever, a box hermetically inclosing the same and having a flexible side, means connected to said flexible side for mechanically actuating said lever, a liquid-reservoir, and a float in said reservoir controlling said means.

2. An electric switch mechanism, a box therefor, a flexible diaphragm closing said box, an operating-rod for said mechanism extending through and forming a tight joint with said diaphragm, and means for actuating said mechanism connected to said rod.

3. An electric switch mechanism, a box therefor, a flexible diaphragm closing said box, an operating-rod for said mechanism extending through and forming a tight joint with said diaphragm, a liquid-reservoir, and a float in said reservoir connected to and actuating said rod.

4. An electric switch mechanism, a box therefor, a flexible diaphragm closing said box, an operating-rod for said mechanism extending through and forming a tight joint with said diaphragm, a liquid-reservoir, a clamping device for attaching said box to said reservoir and a float in said reservoir connected to and actuating said rod.

5. The combination of a ring bracket, a flexible diaphragm secured thereto, electric switch mechanism on said bracket, an operating-rod for said mechanism extending through and forming a tight joint with said diaphragm, means for actuating said rod, and a box covering said mechanism and supported on said bracket.

6. The combination of a ring bracket, a flexible diaphragm secured thereto, a switch lever and terminal, a pivoted arm, a helical spring connecting said lever and said arm, said lever, terminal and arm being supported on said bracket, an operating-rod for said arm extending through and forming a tight joint with said diaphragm, means for actuating said rod to move said arm on its pivot and thereby to actuate said switch-lever through said spring.

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

AUGUST SUNDH.

Witnesses:
I. A. VAN WART,
J. LOESCH.