

W. L. HAMILTON.
AUTOMATIC PRESSURE OPERATED SWITCH.
APPLICATION FILED SEPT. 10, 1918.

1,421,940.

Patented July 4, 1922.

2 SHEETS—SHEET 1.

Fig. 1.

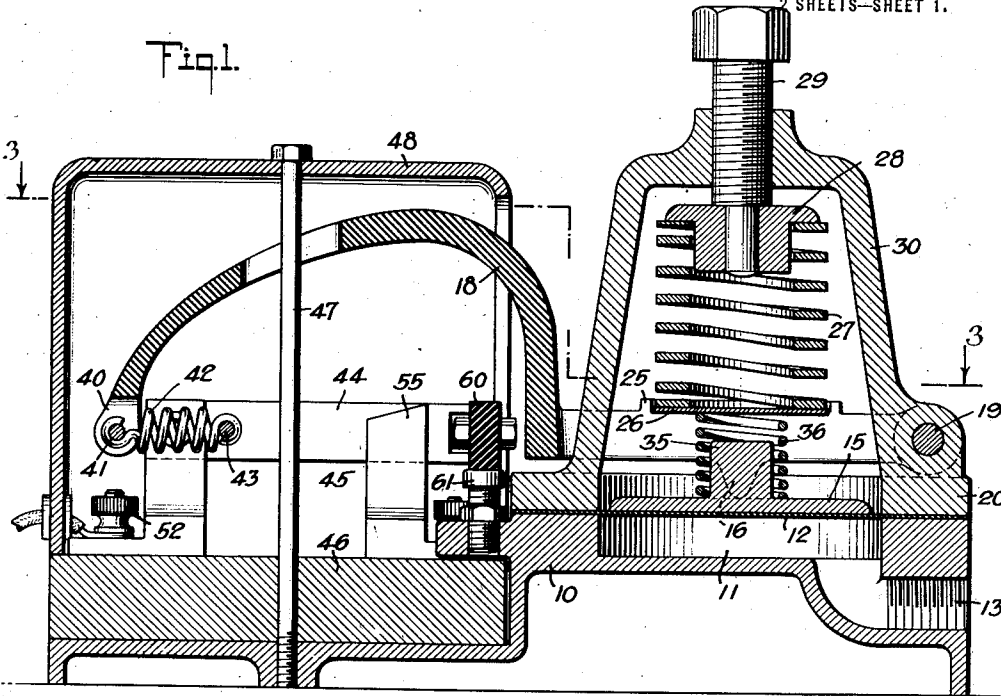
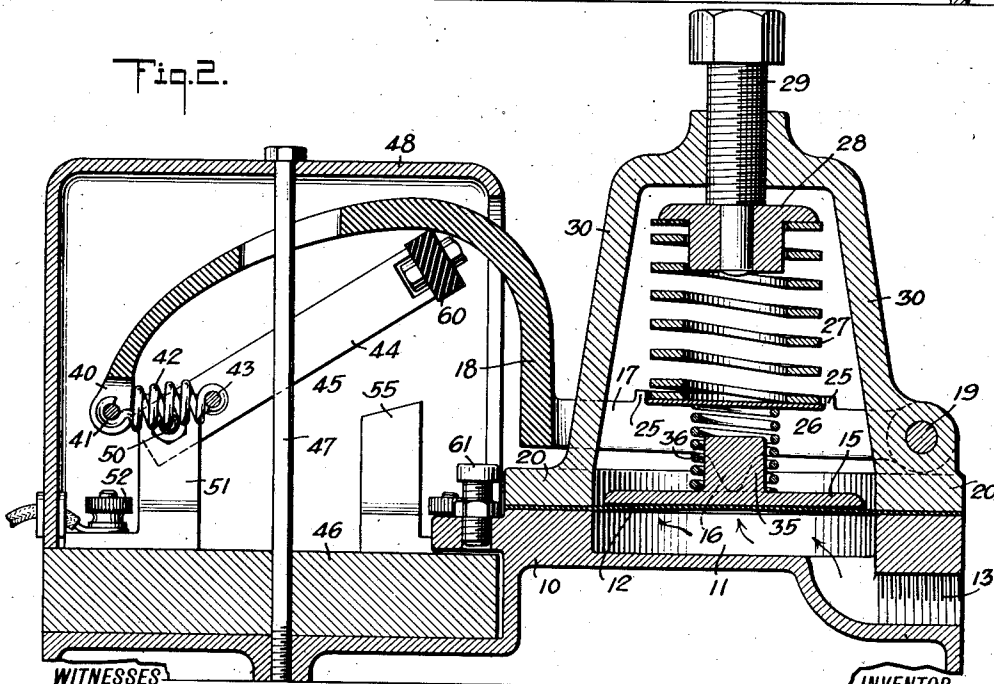


Fig. 2.



WITNESSES

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Fig. 3.

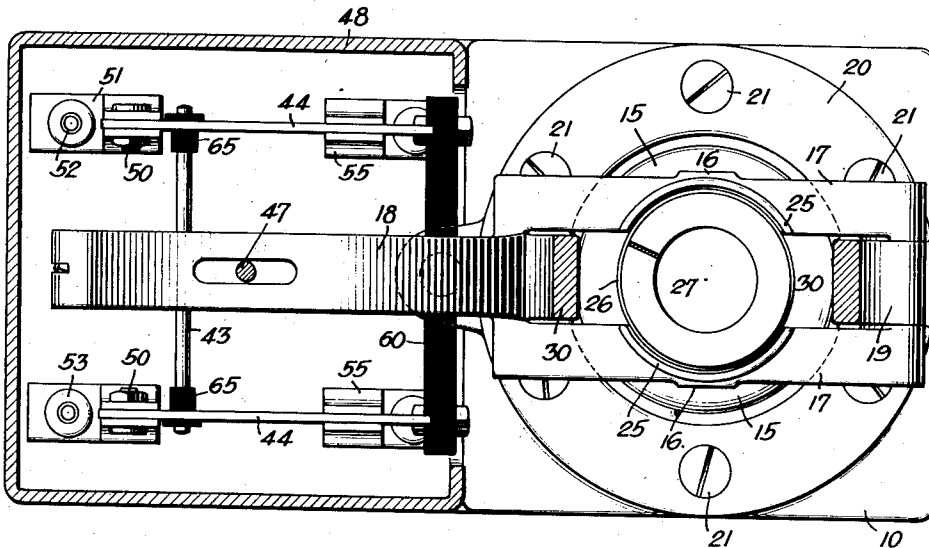
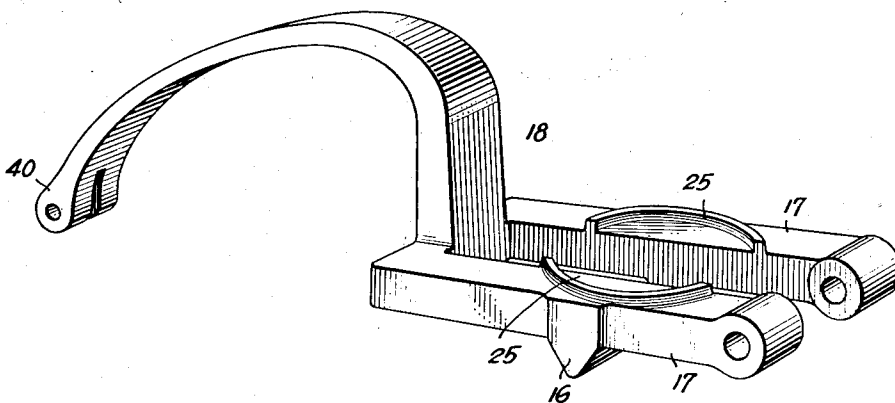


Fig. 4.



WITNESSES

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UNITED STATES PATENT OFFICE.

WILLIAM L. HAMILTON, OF BANGOR, MICHIGAN.

AUTOMATIC PRESSURE-OPERATED SWITCH.

1,421,940.

Specification of Letters Patent.

Patented July 4, 1922.

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To all whom it may concern:

Be it known that I, WILLIAM L. HAMILTON, a citizen of the United States, and a resident of Bangor, in the county of Van Buren and State of Michigan, have invented a new and Improved Automatic Pressure-Operated Switch, of which the following is a full, clear, and exact description.

The invention relates to electric motors used for operating pumps, and its object is to provide a new and improved automatic pressure operated switch arranged to automatically stop the electric motor as soon as the desired pressure is reached and to restart the motor immediately after the pressure decreases below the predetermined pressure to be maintained by the switch. Another object is to provide a pressure operated switch which is very simple, durable in construction and exceedingly quick in stopping the motor whenever the desired pressure is reached.

A practical embodiment of the invention is represented in the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a sectional side elevation of the automatic pressure operated switch with the parts in normal position;

Figure 2 is a similar view of the same with the electric switch in open position;

Figure 3 is a sectional plan view of the automatic pressure operated switch on the line 3—3 of Figure 1; and

Figure 4 is a perspective view of the controlling lever.

The support 10 of the automatic pressure operated switch is provided with a chamber 11 closed on top by a diaphragm 12 and provided at one side with an inlet 13 connected with a reservoir containing compressed air or other fluid under pressure pumped into the reservoir by a pump actuated by an electric motor.

On the top of the diaphragm 12 rests loosely a plate 15 engaged by lugs 16 depending from the fork members 17 of a lever 18 fulcrumed at 19 on the top of a ring 20 resting on the top margin of the diaphragm 12 and secured to the support 10 by screws 21. The fork members 17 of the lever 18 are provided on top with a seat 25 in which is seated a pressure plate 26 engaged by the lower end of a spring 27 supported at the top by a plate 28 en-

gaged by an adjusting screw 29 screwing in a bracket 30 forming part of the ring 20. By adjusting the screw 29 the tension of the spring 27 can be regulated according to the pressure to be maintained in the reservoir. The top of the plate 15 is provided with a boss 35 projecting into the lower end of a light spring 36 interposed between the plates 15 and 26. The spring 36 holds the plate 15 centrally in position on the top of the diaphragm 12, it being understood that the upper portion of the spring 36 extends between the fork members 17 of the lever 18. The free end of the lever 18 is preferably provided with a fork 40 carrying a transverse pin 41 connected with one end of a tension spring 42 and attached at its other end to a rod 43 forming part of the movable member 44 of a knife switch 45 mounted on a base 46 held on the support 10 by the use of a screw rod 47 which also serves to hold the switch casing 48 in position on the base 46. The movable member 44 of the electric switch is fulcrumed at 50 on brackets 51 attached to the base 46 and provided with the usual binding posts 52, 53 connected with the electric motor so that when the switch 45 is in closed position the motor is running and when the switch is opened the motor is stopped. When the switch is in closed position the centers of the pins 41 and 43 are below the center of the fulcrum 50 and the tension spring 42 now securely holds the movable member 44 of the switch 45 in closed position, that is, in engagement with the fixed contacts 55. When the pressure in the reservoir and consequently in the chamber 11 exceeds a normal predetermined pressure then the diaphragm 12 is moved upward a sufficient distance to cause the lever 18 to swing upward by the action of the plate 15 and lugs 16. When the lever has swung upward a distance to locate the center of the pin 41 above the center of the fulcrum 50 then the tension spring 42 imparts a sudden swinging motion to the movable member 44 of the switch 45 whereby the movable member 44 is moved out of engagement with the fixed contacts 55, the circuit is broken and the motor is stopped. When the pressure in the reservoir and that in the chamber 11 falls below the normal pressure then the spring 27 swings the lever 18 downward, and when

the center of the pin 41 passes below the center of the fulcrum 50 then the switch member 44 is quickly swung downward into engagement with the contacts 55 to close the switch and to re-start the motor.

In practice, the movable switch member 44 is made of two side pieces connected with each other by a crossbar 60 of hard rubber or other insulating material and adapted to rest on an adjustable stop screw 61 attached to the support 10. The upward movement of the switch member 44 is limited by the crossbar 60 abutting against the under side of the lever 18, as plainly shown in Figure 2. The pin 43 is connected with the side pieces of the movable member 40 by insulating blocks 65, as plainly indicated in Figure 3.

The automatic pressure controller shown and described is very simple and durable in construction and not liable to get easily out of order. It will also be noticed that the spring 27 of the pressure controller can be readily adjusted to the pressure to be maintained in the reservoir and the switch is exceedingly quick in action both in opening and closing.

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

1. In a pressure regulator, a diaphragm exposed to pump pressure, a lever having depending lugs, a spring supporting plate held on the lever, a spring bearing on the

said supporting plate, a pressure plate on the said diaphragm and engaged by the said lugs, the said pressure plate having a rising boss, a light spring interposed between the said pressure plate and the under side of the said supporting plate, the light spring engaging the said boss, a switch having a pivoted member, and a tension spring connecting the free end of the said lever with the said pivoted switch member.

2. In a pressure regulator, a support, a diaphragm exposed to pressure, a pivoted and spring pressed lever actuated by the diaphragm, said lever being provided with an opening, a base carried by the support, a switch mounted on the base, and having a pivoted member, a casing mounted on the base and into which the lever extends, a rod securing the casing base and support together, said rod passing through the aperture of the lever, and a tension spring connecting the lever with the movable member of the switch.

3. In an automatic pressure actuated switch, a diaphragm exposed to pump pressure, a lever having depending lugs, a spring bearing on the lever, a pressure plate on said diaphragm and engaged by said lugs, a light spring interposed between said pressure plate and the lever, a switch having a pivoted member, and a tension spring connecting the free end of said lever with said pivoted switch member.

WILLIAM L. HAMILTON.