

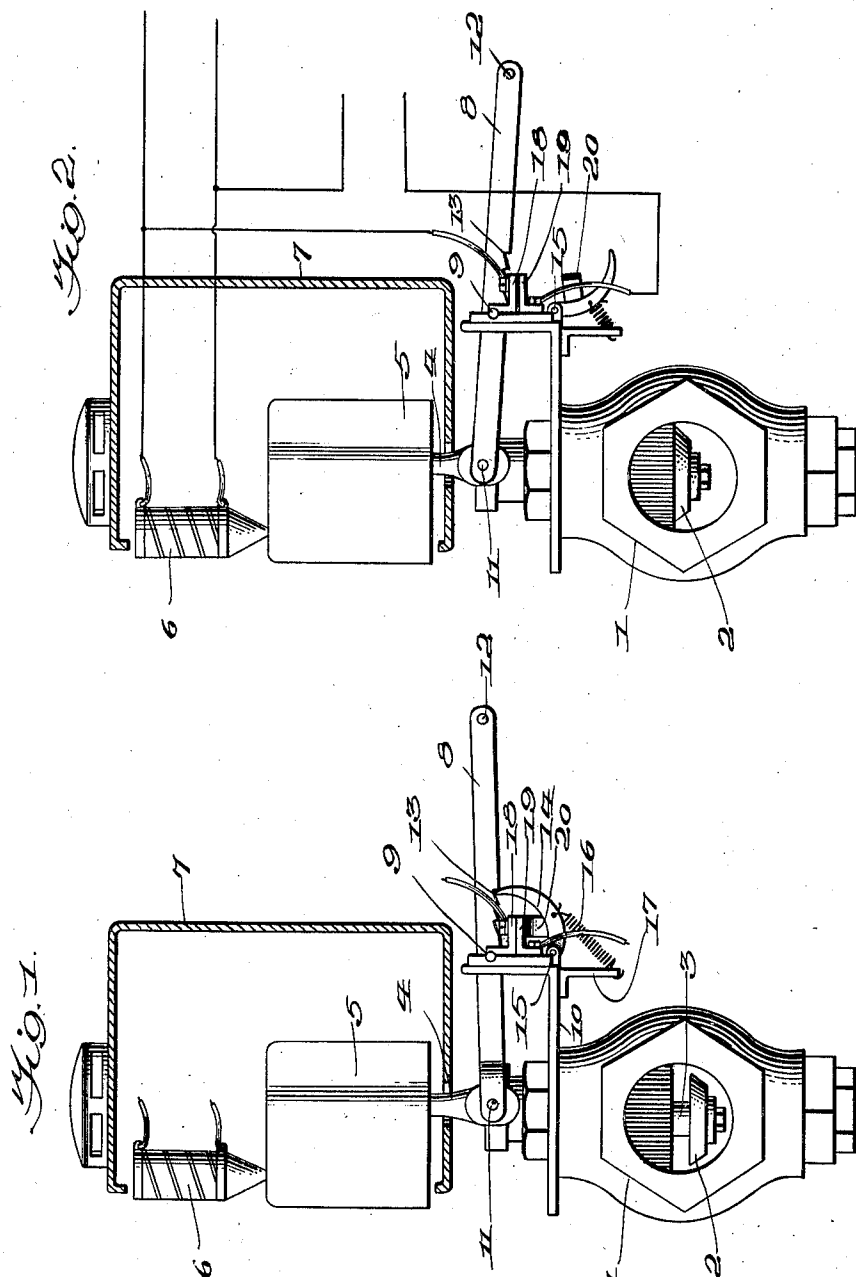
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MOTOR OPERATED VALVE

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MOTOR OPERATED VALVE

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This invention relates to an improvement in motor operated valves.

The invention deals particularly with valves having a manually operated hand lever supplementing a power motor for controlling a valve in which the hand lever is kept in a position according to the valve opening by a suitable support, which support controls an electrical circuit serving as an auxiliary capacity until it is released by the normal manipulation or actuation of the motor.

It frequently happens that the motor circuit becomes broken by reason of a failure in the source of electrical supply or for some other reason, and it is the object of this invention to provide for an auxiliary source of supply by means of a secondary circuit to actuate the valve whenever the main circuit fails by reason of such break therein.

Any type of valve may be used as found suitable and may be adapted for controlling gas, steam, hot-water or air, and likewise the type of motor may be varied as found desirable, using, for instance, any of the electric, steam, vapor, magnetic or pressure motors for actuating the valve.

The invention is so constructed that it may be applied to any standard make of valve, permitting an installation of the invention thereto without interrupting the normal operation of the valve and its associate mechanism.

In the accompanying drawing:

Fig. 1 is a side elevation partly in section showing an application of the invention with the valve open; and

Fig. 2 is a similar view showing the valve closed.

The invention is described and illustrated in connection with an ordinary control valve for a fluid supply line, in which the valve casing is designated generally by the numeral 1 and is provided with a valve 2 adapted to seat against the bottom of the usual opening in the valve casing for regulating the passage of fluid therethrough. This valve 2 is supported by a valve stem 3, which extends upwardly through the casing and is connected at its upper end with a connecting rod 4, which extends into a suitable bellows 5, which

is of the ordinary type of vapor bellows, to be actuated by an electric heating element 6.

The bellows 5 and heating element 6 are mounted in a small casing 7 which serves to enclose the same. The electrical heating element 6 for the bellows may extend to any suitable source of electrical supply and may be regulated as found desirable, such as by means of a thermostatic control or other type of control switch.

A hand lever 8 is pivotally supported as at 9 to a bracket 10, which extends outwardly from the valve casing 1 and is supported thereby, the inner end of which hand lever 8 is pivotally connected as at 11 with the connecting rod 4, which extends between the bellows 5 and the valve stem 3 so as to be operatively connected therewith for manually actuating the valve.

This lever 8 not only permits manual operation of the valve but it makes it possible to hook up a connection with the end of the lever to some auxiliary check or draft at some remote point. For instance, when the valve is used to control the supply line for gas to a burner, when the valve is open an additional draft intake in the burner should also be opened, and this may be accomplished by connecting the intake with the outer end of the lever 8, which lever is provided with an opening 12 for this purpose.

The lower edge of the lever 8 has ratchet teeth 13 formed therein in position to be engaged by a pawl or support 14 pivoted as at 15 to the supporting bracket 10. A spring 16 has one end connected with the pawl 14 and the opposite end attached to an auxiliary bracket 17, which extends downward from the bracket 14, thus normally tending to pull the pawl to a lower position out of contact with the ratchet teeth 13 when released by such ratchet teeth.

Carried by and extending outwardly from the supporting bracket 10 are spring contact plates 18 and 19 arranged in alignment with each other and at least the lowermost plate 19 is sufficiently flexible to be bent into contact with the plate 18 when engaged by a projection 20 carried by and extending upwardly from the pawl 14. The plates 18 and

19 are electrically connected with the electrical heating element or control for the bellows 5 and with the main source of current supply, so that when contact is made between them an auxiliary circuit is closed through the electrical element for supplying power thereto upon the return of power at the main source in the event that the main circuit should become broken because of a failure in the supply of the electric current thereto.

In the operation of the invention, the valve 2 is normally opened by the motive power which, in the form illustrated, is the bellows 5 controlled by the electrical heating element 6. When this takes place, the lever 8 is caused to be moved up and down with the action of the valve stem.

In the event that the connection of the motive power with its source of supply is broken and it is desired to open the valve, this may be done by manually moving the lever 8 to a position sufficient to open the valve approximately three-fourths of its customary distance. Upon moving the lever upward to this extent, the pawl 14 may be engaged in one of the ratchet teeth 13, thus propping the lever up and keeping the valve in its three-fourths open position by means of the pawl.

As the pawl is manually moved to a position shown in Fig. 1, against the tension of the spring 16, the abutment 20 engages the plate 19 of the switch, forcing this plate against the plate 18, which closes the auxiliary electrical circuit to the main source of supply and the electrical heating element 6, so that the valve is mechanically held open so long as the main circuit remains broken, but when the main circuit is closed by reason of the fact that it had been fixed, if it was broken down or by any other means, the current is supplied again to the auxiliary circuit which results in the mechanism assuming an "on" or open position, thus completely opening the valve. This action, which causes a further opening of the valve, is sufficient to move the lever away from the pawl 14, and the spring 16 connected with the latter serves to pull this pawl downward to its position shown in Fig. 2, which releases the pressure against the plate 19 and breaks the auxiliary circuit, when the circuit is resumed in the main circuit.

This leaves the complete assembly controlled as initially by the main circuit and its source of supply, and whether the valve would remain open would depend upon the control means for the main circuit, such as a thermostat.

I claim:

1. A motor controlled valve comprising a valve element, electrically responsive means for actuating said valve element, a lever operatively connected with said valve element, a pawl arranged to engage said lever to hold

the same in a predetermined position, and spring contacts pressed together only when the pawl engages the lever.

2. A motor controlled valve comprising a valve element, electrical responsive means for actuating said valve element, a connecting rod arranged between the actuating means and the valve element, a manually actuated lever operatively connected with said connecting rod and having ratchet teeth therein, a pawl in position to engage the ratchet teeth, and an electric switch responsive to a predetermined position of the pawl for controlling an auxiliary circuit to the electrically responsive actuating element.

3. A device of the character described comprising a cut-off element, electrically responsive means for actuating said element, means connecting said electrically responsive means with the cut-off element, a lever pivotally connected with said connecting means, an electric switch, and a pawl for the lever and actuating the switch when acting on the lever.

4. A device of the character described comprising a cut-off element, electrically responsive means for actuating said element, means connecting said electrically responsive means with the cut-off element, a manually actuated lever pivotally connected with said connecting means for actuating the cut-off element independently of the electrically responsive means, an electric switch, and a pawl for the manually actuated lever and actuating the switch when acting on the lever.

5. A valve structure of the character described comprising a valve, electrically responsive means for actuating said valve, means connecting said electrically responsive means with the valve for actuating the same, a manually actuated lever pivotally connected with said connecting means for actuating said valve independently of the electrically responsive means, an electric switch, and a pawl for engaging the manually actuated lever and actuating the switch when engaging the lever.

6. In a device of the character described, the combination of a valve, a valve stem connected therewith, an electrically actuated motor connected with and for actuating said valve stem, a source of electric power for the motor, a lever connected with the valve, a pawl for acting on the lever to hold the valve in a partially open position, an auxiliary electric supply circuit, and a circuit breaker associated with the pawl and actuated thereby when acting on the lever to connect the auxiliary circuit with the motor.

7. In a device of the character described, the combination of a valve, a valve stem for actuating said valve, an electrically actuated vapor motor connected with and for actuating the valve stem, a main source of electric power for the motor, a lever connected with the valve, a pawl for acting on the lever to hold the valve in a partially open position

upon failure of the source of electric power, an auxiliary electric supply circuit, and a circuit breaker associated with the pawl and actuated thereby when acting on the lever to connect the auxiliary circuit with the motor.

8. In a device of the character described, the combination of a valve, a valve stem for actuating said valve, an electrically actuated vapor motor connected with and for actuating the valve stem, a main source of electric power for the motor, a lever connected with the valve, a pawl for acting on the lever to hold the valve in a partially open position upon failure of the source of electric power, an auxiliary electric supply circuit, a circuit breaker associated with the pawl and actuated thereby when acting on the lever to connect the auxiliary circuit with the motor, said lever being movable by the motor when acted on by the main source of power to move the lever sufficiently to release the pawl and break the auxiliary circuit.

9. In a device of the character described, the combination of a valve, a valve stem for actuating said valve, an electrically actuated vapor motor connected with and for actuating the valve stem, a lever pivotally connected with the valve stem, for actuating the same upon failure of the motor, a pivotal support for the lever, a pawl for engaging the outer end of the lever on the opposite side of the pivotal support from the valve stem to hold the lever in a set position, and a circuit closer in position to be actuated by the pawl when engaging the lever for connecting an auxiliary source of power with the motor.

In testimony whereof I affix my signature.
ROBERT T. WILLIAMS.

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