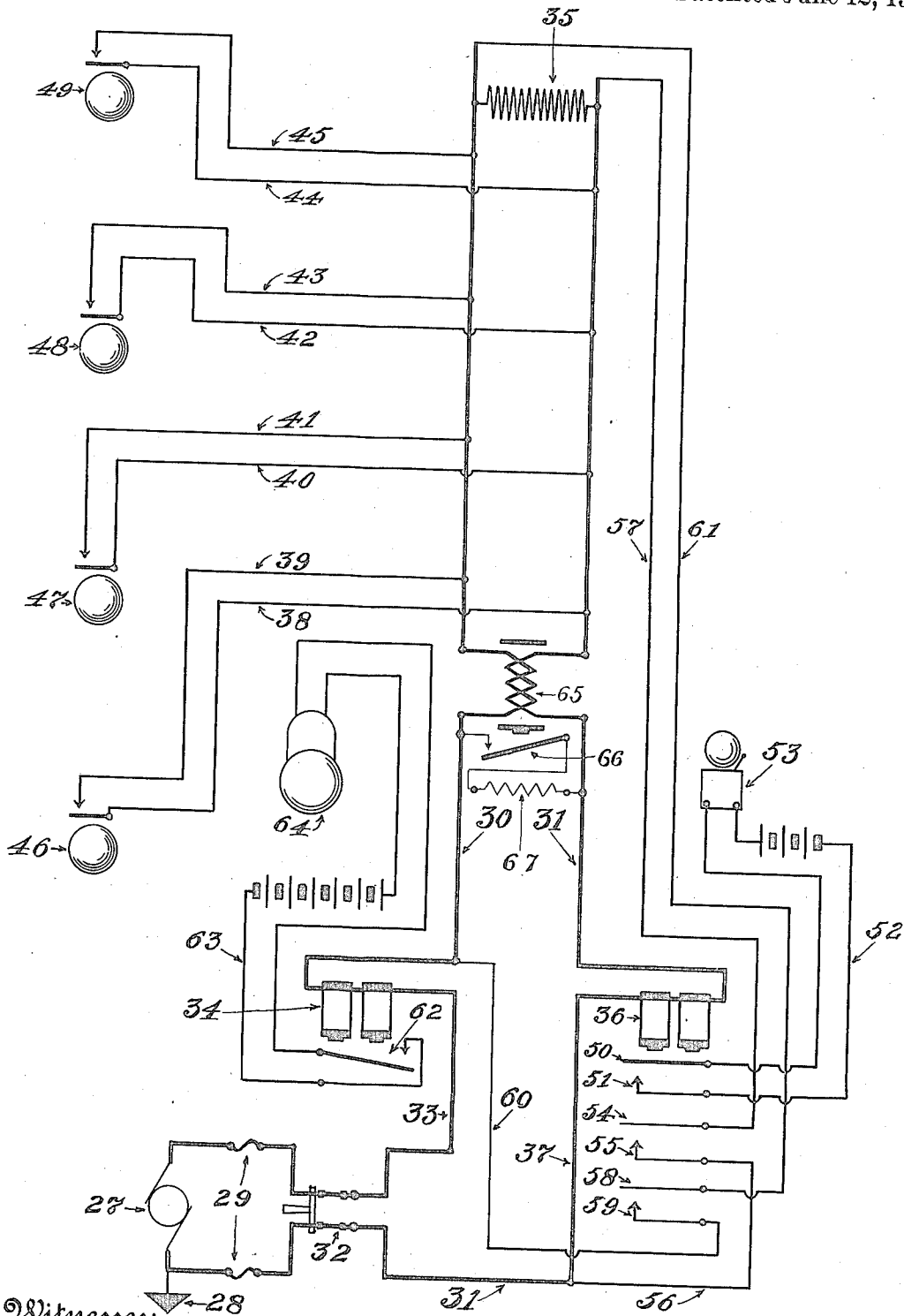


A. GOLDSTEIN.
ELECTRICAL THERMOSTAT AND CIRCUIT.
APPLICATION FILED NOV. 18, 1914.

1,229,939.

Patented June 12, 1917.



Witnesses:
Frank W. White
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UNITED STATES PATENT OFFICE

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ELECTRICAL THERMOSTAT AND CIRCUIT.

1,229,939.

Specification of Letters Patent. Patented June 12, 1917.

Application filed November 18, 1914. Serial No. 872,680.

To all whom it may concern:

Be it known that I, ALBERT GOLDSTEIN, a citizen of the United States, residing at 2508 Broadway, in the city of New York, county of New York, and State of New York, have invented certain new and useful Improvements in Electrical Thermostats and Circuits, of which the following is a full, clear, and exact description.

My invention relates to thermostatic electrical fire alarm systems of the type in which air expansion in a closed chamber actuates a diaphragm to close a circuit in which are suitable instruments to produce audible and visual differentiated alarm signals, and a circuit arranged to operate through the functioning of said thermostat and under electrical supervision of a nature to cause an alarm of trouble to be given in the event of either a broken or grounded wire, also to give a fire alarm notwithstanding the presence of either of such circuit troubles.

The invention consists of a circuit adapted to the functioning of said thermostat normally conveying a current of electricity, the volume of which is reduced by a resistance to a quantity insufficient to operate the fire alarm relay but sufficient to hold the armature of the trouble relay away from its contacts, a means for conducting the electrical current supply to the opposite side of a conductor in the event of either a broken wire or grounded wire, so as to maintain the system in an operative condition, at the same time causing a trouble alarm to be sounded, said trouble alarm to be continuous so long as the trouble exists on the said circuit, all as more particularly pointed out in the specification and claims.

While the system may have broad application it has been especially designed for operation in connection with my co-pending application, Serial No. 55,100, for Letters Patent covering a thermostat.

The terms thermostat, circuit closer, or thermostatic circuit closer, as herein used, are intended to include any type of automatic or manual device, arranged to effect a cross in an electrical signaling circuit.

In the accompanying drawing I have diagrammatically illustrated an embodiment of my invention.

The drawing which is to be taken in connection with this specification illustrates a diagrammatic view of a circuit adapted to

respond to the functioning of said thermostat or circuit closer as follows:

A source of electrical energy 27, the negative side of which is grounded at 28, feeds an electrical current through the fuses 29 and the main control switch 32 to the wires 30 and 31 of a simple series circuit. In series with this circuit are placed the fire alarm relay 34 and the trouble alarm relay 36 in the sides of the circuit numbered 30 and 31, respectively. A high resistance 35 closes the circuit at a point beyond the last thermostat, and permits enough current to flow over the circuit to energize the trouble relay 36 but not enough to energize the fire alarm relay 34. Bridging the two wires 30 and 31 of the circuit are the several thermostats 46, 47, 48 and 49, being connected by the circuit pairs of wires 38 and 39, 40 and 41, 42 and 43 and 44 and 45.

The function of the thermostat is to establish a cross between the wires 30 and 31, shunting out the resistance 35, energizing the fire alarm relay through the increased current flow due to the decreased circuit resistance, and setting in motion the devices placed upon the fire alarm circuit, which may be a mechanically operated digit wheel device or otherwise, but for convenience is simply represented as a typical gong. No trouble signal is given for an accidental cross upon the circuit.

Following the operation of the circuit when thus conditioned for the sending of an alarm of fire, it will be seen that a cross is established between the wires 30 and 31, shunting out of circuit the resistance 35, causing the relay 34 to attract its armature 62 and closing the local or fire alarm circuit 63 and actuating the fire alarm device 64 located thereon, which as previously stated may be a mechanically actuated digit wheel device or otherwise.

In the event of a break in a wire as in 30, the cessation of current flow due to the open circuit causes the trouble relay 36 to fail, dropping its armature 50 out of the influence of its magnetic field, closing the switch 50—51, establishing a closed circuit in the local or trouble circuit 52 causing the trouble bell 53 to ring continuously until the circuit is repaired at the break and the armature 50 can be restored manually to its normal position. At the failure of the relay 36, the switch 54—55 is also closed forming

the wire 31 into a loop by means of the tap wire 56 and the wire 57 extended from the extremity of the side 31 of the circuit—similarly also, the switch 58—59 is closed forming the wire 30 into a loop by means of the tap wire 60 and the wire 61 extended from the extremity of the side 30 of the circuit.

Thus it is seen that each side 30—31 of the main circuit is supplied with current from both of its ends and the system is maintained in an operative condition though either or both of the wires 30 and 31 may be broken or open circuited.

In the event of a ground between the ground 28 on the negative side of the source of supply 27 and any part of the main circuit, the differentially wound relay 65 is unbalanced and its contacts 66 caused to close, thereby bridging a high resistance 67 across the circuit, the current flow being so diminished as to cause the trouble alarm relay 36 to fail and function the circuit as in the case of a break.

I claim:

1. An electrical alarm system comprising a source of current, a metallic circuit in series with such current source, circuit closing devices in normally open bridges across such metallic circuit, a resistance across the two sides of the circuit beyond the farthest circuit closing device in such circuit, signaling means responsive to increased current flow from a cross upon such circuit, signal producing means responsive to cessation of the current from a break upon such circuit, such means being functioned so that the first named means will be responsive only from the effect of a cross and the last named means will be responsive to a cessation of current from a break upon such circuit, and means to condition the circuit so that the first named means will be responsive to the effect of a cross, notwithstanding the presence of said cessation of current in the second mentioned means, due to a break upon such circuit.

2. An electrical alarm system comprising a source of current grounded at its negative pole, a metallic circuit in series with such current source, circuit closing devices in normally open bridges across such metallic circuit, a resistance across the two sides of the circuit beyond the farthest circuit closing device in such circuit, signaling means responsive to increased current flow from a cross upon such circuit, means responsive to an interruption of the current from the presence of a ground, said signaling means, and the last named means being functioned so that the first named means

will be responsive only from the effect of a cross and the last named means will be responsive only from the presence of a ground, and means to condition the circuit so that the first named means will be responsive to the effect of a cross, notwithstanding the presence of said cause of interruption.

3. An electrical alarm system comprising a source of current grounded at its negative pole, a metallic circuit in series with such current source, circuit closing devices in normally open bridges across such metallic circuit, a resistance across the two sides of the circuit beyond the farthest circuit closing device in such circuit, a signaling means responsive to increased current flow from a cross upon such circuit, a signal producing means responsive to cessation of the current from a break or ground upon such circuit, such means being functioned so that the first named means will be responsive only from the effect of a cross and the last named means will be responsive only from the effect of an interruption of the current, from the presence of a ground or break, and means to condition the circuit so that the first named means will be responsive to the effect of a cross, notwithstanding the presence of either of said causes of interruption.

4. An electrical alarm system comprising a source of current grounded at its negative pole, a metallic circuit in series with such current source, circuit closing devices in normally open bridges across such metallic circuit, a resistance across the two sides of the circuit beyond the farthest circuit closing device in such circuit, a signaling means responsive to increased current flow from a cross upon such circuit, a signal producing means responsive to cessation of the current from a break upon such circuit and means responsive to an interruption of the current from the presence of a ground, such means being functioned so that the first named means will be responsive only from the effect of a cross and the last named means will be responsive only from the effect of an interruption of the current, from the presence of a ground or break, and condition the circuit so that the first named means will be responsive to the effect of a cross, notwithstanding the presence of either of said causes of interruption.

In testimony whereof I have affixed my signature in presence of two witnesses.

ALBERT GOLDSTEIN.

Witnesses:

FRANK W. WHITE,
MINNIE NEWMAN.