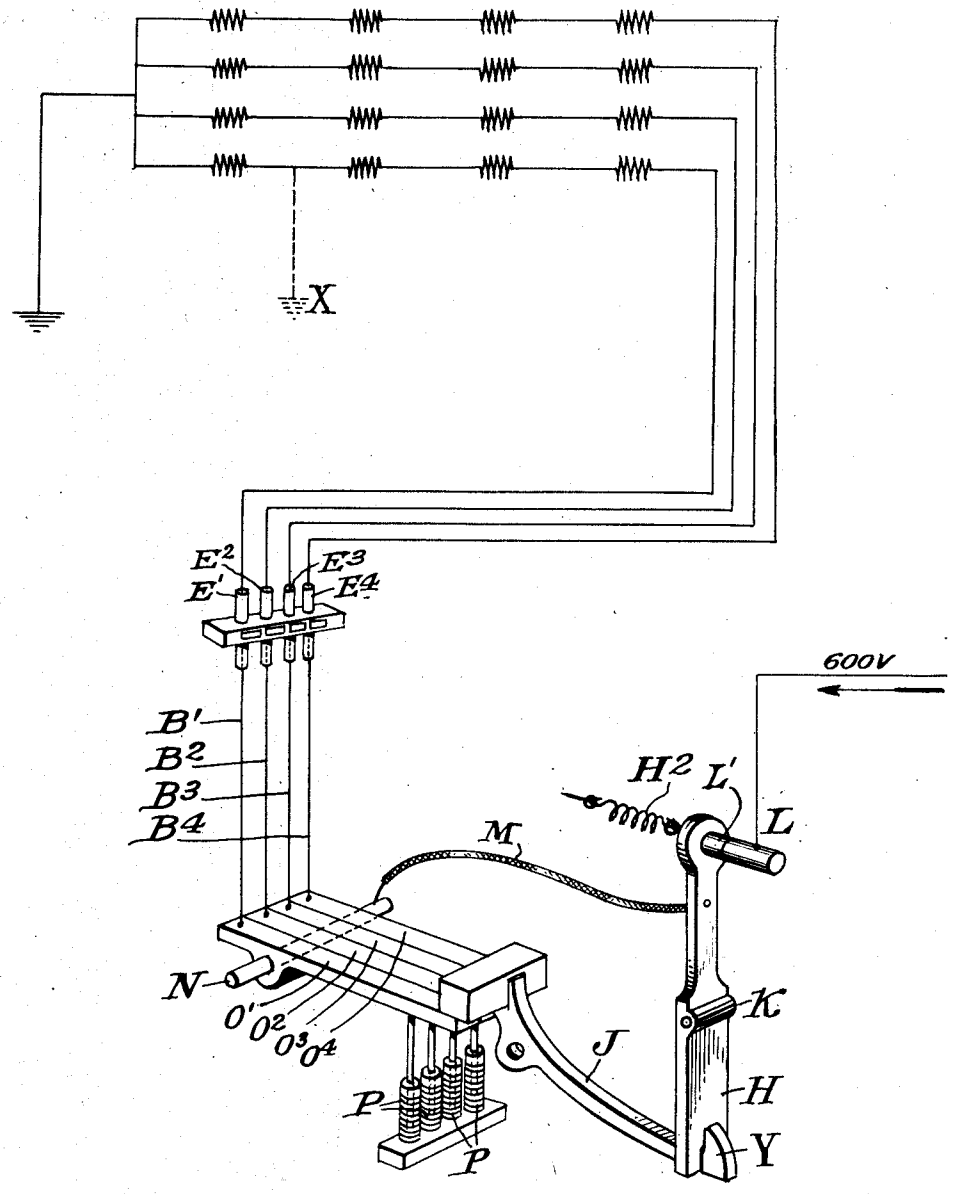
July 12, 1927. 1,635,674

L. P. HYNES

OVERLOAD RELAY FOR ELECTRIC HEATERS

Filed Aug. 30, 1922



Inventor,
Lee P. Hynes,
By his Attorney
E. M. Bentley

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UNITED STATES PATENT OFFICE.

LEE P. HYNES, OF ALBANY, NEW YORK, ASSIGNOR TO CONSOLIDATED CAR-HEATING COMPANY, OF ALBANY, NEW YORK, A CORPORATION OF WEST VIRGINIA.

OVERLOAD RELAY FOR ELECTRIC HEATERS.

Application filed August 30, 1922. Serial No. 585,304.

For a detailed description of the present form of my invention, reference may be had to the following specification and to the accompanying drawings forming a part thereof.

My invention relates to a protective device for electric heaters which is in the nature of an overload relay which, although a unitary device, will respond to an excessive current in any one of a series of heater circuits such as might be produced by an accidental ground connection at a point in the circuit sufficiently near the positive terminal to cause a material reduction in the resistance of the circuit and a resulting current of a dangerous magnitude.

Referring to the drawing, O^1, O^2, O^3, O^4 represent a series of parallel control levers having a common pivot pin N and each one normally pressed upward by its individual spring P. Pivotally mounted adjacent to the control levers is a latch lever J weighted at one end and widened at the same end so as to rest upon and engage the contiguous ends of all of said levers. The other end of the lever J is provided with latch Y which normally engages the end of a switch lever H which is pivoted at K and provided with a spring H^2 that constantly tends to separate the switch contacts L L'. To the opposite end of each of the levers O^1, O^2, O^3, O^4 is attached an expansible tension wire of German silver or other suitable alloy which will expand rapidly when heated. The several wires are marked B^1, B^2, B^3 and B^4 and they are severally connected to adjustable terminal screws E^1, E^2, E^3, E^4, which, in turn, are severally connected to heater circuits each of which contains a number of heater coils in series.

Under normal conditions the switch H will be latched shut connecting the several heater circuits to the main circuit by the closure of contacts L L'. The current will then flow from H, by jumper M, to the spindle N on which the group of levers is pivoted. Thence it will flow to each of the heater circuits through respective wires B^1, B^2, B^3, B^4. If one of the heater circuits becomes grounded, as at the point X, the result will be to short-circuit the last section of heater resistance and thereby cause a material increase in the current which flows to that particular heater-circuit through tension wire B'. Thereupon that wire will expand allowing the left end of lever O^1 to drop and the right end to rise, lifting lever J and unlatching switch-lever H, which then acts to open the main supply circuit at contacts L L'. In like manner a ground on any one of the several heater circuits will produce the breaking of the supply circuit for all the heater circuits at the same contacts L L'.

What I claim as new and desire to secure by Letters Patent is:

1. An overload relay for a plurality of electric heater circuits comprising a supply switch for two or more heater circuits, a plurality of spring-pressed control levers, one for each circuit, thermal means engaging the respective levers at one end to normally hold them against movement under the spring tension thereon, so that movement of the levers is automatically controlled by said thermal means and a latch lever having one end engaging all of said control levers and the other end in engagement with said switch.

2. An overload relay for a plurality of electric heater circuits comprising a supply switch for two or more heater circuits, a plurality of spring-pressed control levers, one for each circuit, thermal means engaging the respective levers at one end to normally hold them against movement under the spring tension thereon, so that movement of the levers is automatically controlled by said thermal means and a latch member having a weighted end resting on all of said control levers, the other end of said latch lever being in normal engagement with said switch.

3. An overload relay for a plurality of electric heater circuits comprising a supply switch for two or more heater circuits, a plurality of spring-pressed control levers, one for each circuit, thermal means engaging the respective levers at one end to normally hold them against movement under the spring tension thereon, so that movement of the levers is automatically controlled by said thermal means and a latch having a widened portion at one end engaging all of said control levers and having its other end in normal engagement with said switch.

4. An overload relay for a plurality of electric heater circuits comprising a supply switch for two or more heater circuits, a

supply switch lever normally biased to move to open circuit position, a plurality of control levers one of which is included in each of said circuits, a latch lever having one end engaging all of said control levers, its other end being in engagement with said supply switch lever to hold said lever in closed circuit position, means normally tending to move said control levers in a direction to disengage the latch lever from the said switch lever, and thermal wires engaging the respective control levers at one end to normally hold them against movement in opposition to the means normally tending to move them, so that movement of the levers is automatically controlled by said thermal means.

5. An overload relay for a plurality of electric heater circuits comprising a supply switch for two or more heater circuits, a supply switch lever normally biased to move to open circuit position, a plurality of control levers, one for each circuit, a latch lever having a widened and weighted portion resting upon one end of all of said control levers, the other end of the latch lever engaging said supply switch lever, springs tending to move the levers in a direction to cause disengagement of the latch lever, and thermal wires to hold said levers against movement under the tension of said springs.

Signed at Albany, county of Albany and State of New York, this 23rd day of August, 1922.

L. P. HYNES.