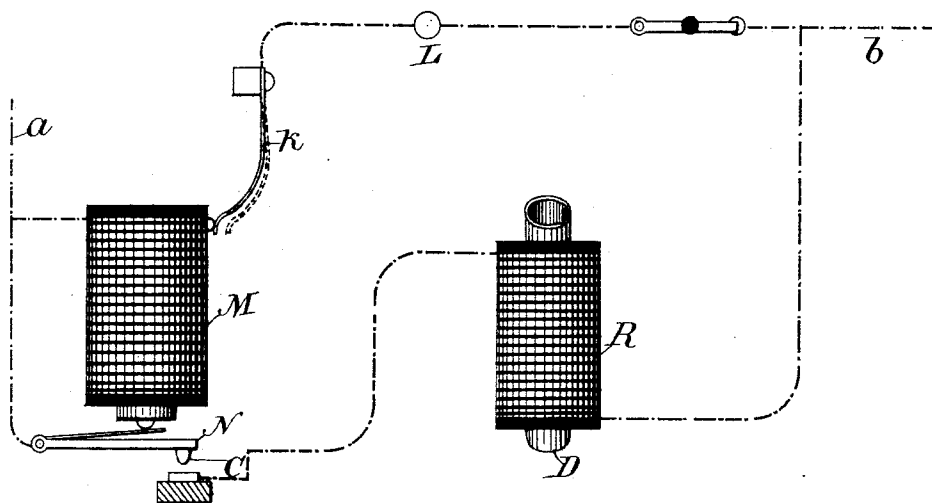


(No Model.)

E. THOMSON & E. W. RICE, Jr.
ELECTRIC CURRENT DISTRIBUTER.

No. 543,198.

Patented July 23, 1895.



ATTEST:

J. A. Hurd
Wm. H. Capel

INVENTORS:

Elihu Thomson
Edwin W. Rice Jr

By H. C. Townsend
Attorney

UNITED STATES PATENT OFFICE.

ELIHU THOMSON, OF SWAMPSCOTT, AND EDWIN W. RICE JR., OF LYNN,
MASSACHUSETTS, ASSIGNORS TO THE THOMSON-HOUSTON ELECTRIC COM-
PANY, OF CONNECTICUT.

ELECTRIC-CURRENT DISTRIBUTER.

SPECIFICATION forming part of Letters Patent No. 543,198, dated July 23, 1895.

Original application filed April 24, 1884, Serial No. 127,792. Divided and this application filed October 3, 1892. Serial No. 447,604. (No model.)

To all whom it may concern:

Be it known that we, ELIHU THOMSON, residing at Swampscott, and EDWIN W. RICE, Jr., residing at Lynn, in the county of Essex and State of Massachusetts, citizens of the United States, have invented a certain new and useful Electric-Current Distributer, of which the following is a specification.

Our invention relates to electric switches or safety devices designed to prevent injury to an apparatus in an electric circuit from abnormal flow of current therein.

Our invention consists, essentially, in holding or retaining the switch or cut-out device in normal position by means of some material which is adapted to fuse or soften by heat, and is placed in such relation to a conductor, subject to overheating under abnormal conditions, as to be fused or softened sufficiently to release the switch.

Our invention consists, also, in details of construction and combinations of devices hereinafter described, and more particularly specified in the claims.

Our present application forms a division of an application filed by us April 24, 1884, Serial No. 127,792.

In the accompanying drawing, we have illustrated one form of apparatus in which the invention may be embodied.

M and L are devices in the electric circuit to be protected. L is an electric lamp or other translating device, and M represents the wire coils of an electromagnet. The circuit for these devices is supplied with current from the wires *a b* in any usual or proper manner.

K is a circuit-opening switch designed to operate under abnormal conditions and open the circuit containing L and M.

The operation of the device K might be used to bring other switches into operation, as will be presently described.

The switch or safety device K, as shown, is a spring normally held in circuit-closing position by means of a drop of solder, which holds it down so as to complete the circuit of the coil M, the contact being upon the coil itself—as, for example, upon its outer layer. The spring K has a bias, which tends to throw it

away from the coil when the solder fuses or softens. Normally, the heat generated in the coil by the passage of the current is insufficient to melt the solder and release the switch; but when the coil heats abnormally by current in the circuit to be protected the joint is melted and the circuit is opened by the spring-switch.

The abnormal heating of the coil or conductor or melting or softening of the solder might be used to bring into operation a shunting-switch, which is normally in circuit-opening position so long as the spring K is held by the solder. Thus, for instance, if the coils M be the coils of the electromagnet to be energized the magnet may be used to operate on an armature N and thereby hold the contact C away from opposite contact, through which, when contact is established, a shunt is formed around the circuit containing M and L. This shunt may include a resistance R, or such resistance might be dispensed with. When the resistance R is employed, it is preferably wound upon a tube D, of brass, copper, or other good conductor, preferably open at top and bottom for circulation of air, and is preferably made of German silver, as the resistance of this material changes but slightly with the temperature. The tube D acts inductively to prevent spark at the opening of the contact C.

Our invention is adapted for use on an electric circuit carrying such a small current that the ordinary fuse-wire cannot safely be employed on account of its weakness and consequent liability to accidental rupture or breakage.

In our invention the heat generated in the circuit when under abnormal conditions can accumulate and act on the fusible metal or material, which is softened by heat and is placed adjacent to the conductor in which the heat is generated, the material so softened or fused serving to control the circuits or connections so as to prevent any damage from an abnormal flow of current.

What we claim as our invention is—

1. In an electric circuit, the combination of an electro-magnetic coil subject to overheat-

ing under abnormal conditions, a fusible material arranged to receive heat from the said coil when overheated and serving to retain the circuit controller in its normal position
5 during normal work in the coil, and means for causing the operation of the circuit controller on the softening or melting of the fusible material owing to the heat accumulated in the coil.
10 2. In an electric circuit, the combination, of an electro-magnet and an armature controlled thereby, of a biased circuit breaker in the circuit of the coil of the magnet, and soft
15 solder holding said circuit breaker against its bias in electrical contact with the coil.

3. The combination with a switch and a circuit controlled by the same, of an artificial resistance connected to the said circuit and consisting of a coil wound upon a tube of conducting material open at both ends to provide a circulation of air and to prevent sparking, substantially as set forth. 20

Signed at Lynn, in the county of Essex and State of Massachusetts, this 26th day of September, A. D. 1892.

ELIHU THOMSON.
EDWIN W. RICE, JR.

Witnesses:

JOHN W. GIBBONEY,
BENJAMIN B. HULL.