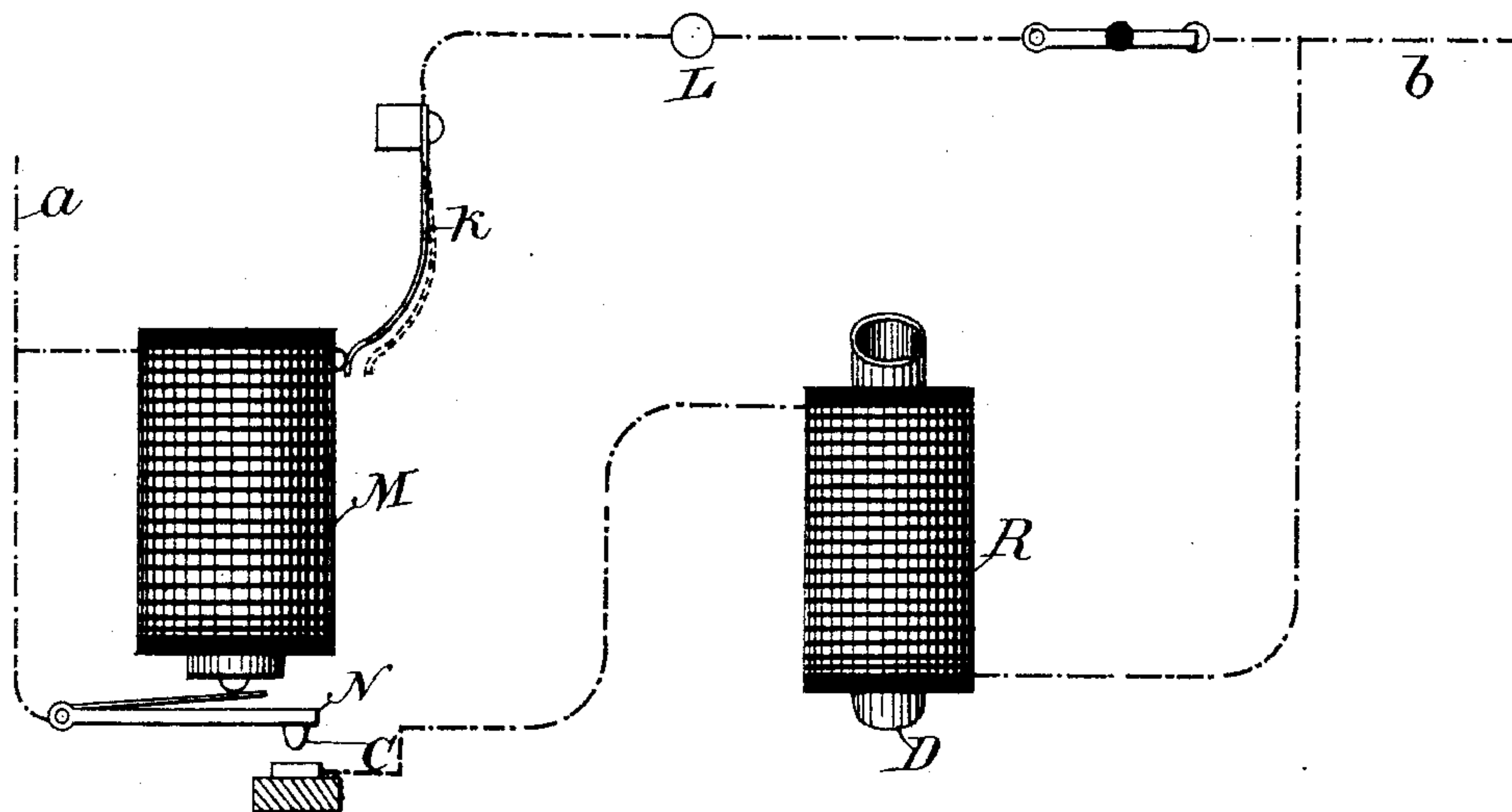


(No Model.)

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

No. 543,198.

Patented July 23, 1895.



ATTEST:
J. A. Hurdle
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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, re-
siding at Swampscott, and EDWIN W. RICE,
Jr., residing at Lynn, in the county of Essex
5 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
10 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 hold-
ing or retaining the switch or cut-out device
15 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 con-
ditions, as to be fused or softened sufficiently
20 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.

25 Our present application forms a division of
an application filed by us April 24, 1884, Se-
rial No. 127,792.

In the accompanying drawing, we have
illustrated one form of apparatus in which
30 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
35 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.

40 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 posi-
45 tion 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 50
softens. Normally, the heat generated in the
coil by the passage of the current is insuffi-
cient to melt the solder and release the switch;
but when the coil heats abnormally by cur-
rent in the circuit to be protected the joint is 55
melted and the circuit is opened by the spring-
switch.

The abnormal heating of the coil or con-
ductor or melting or softening of the solder
might be used to bring into operation a shunt- 60
ing-switch, which is normally in circuit-open-
ing 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 en-
ergized the magnet may be used to operate 65
on an armature N and thereby hold the con-
tact 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 70
R, or such resistance might be dispensed with.
When the resistance R is employed, it is pref-
erably wound upon a tube D, of brass, cop-
per, or other good conductor, preferably open
at top and bottom for circulation of air, and 75
is preferably made of German silver, as the
resistance of this material changes but slightly
with the temperature. The tube D acts in-
ductively to prevent spark at the opening of
the contact C. 80

Our invention is adapted for use on an elec-
tric circuit carrying such a small current that
the ordinary fuse-wire cannot safely be em-
ployed on account of its weakness and con-
sequent liability to accidental rupture or 85
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 90
placed adjacent to the conductor in which the
heat is generated, the material so softened or
fused serving to control the circuits or con-
nections so as to prevent any damage from
an abnormal flow of current. 95

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 solder holding said circuit breaker against
15 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.