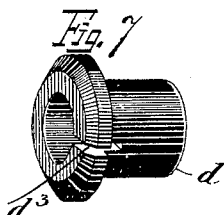
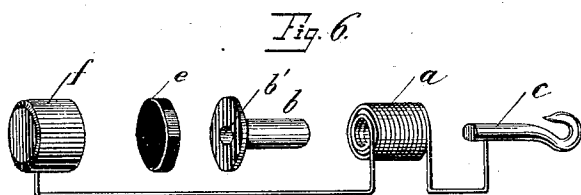
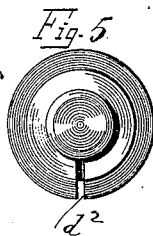
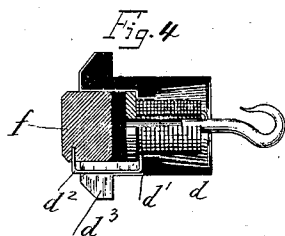
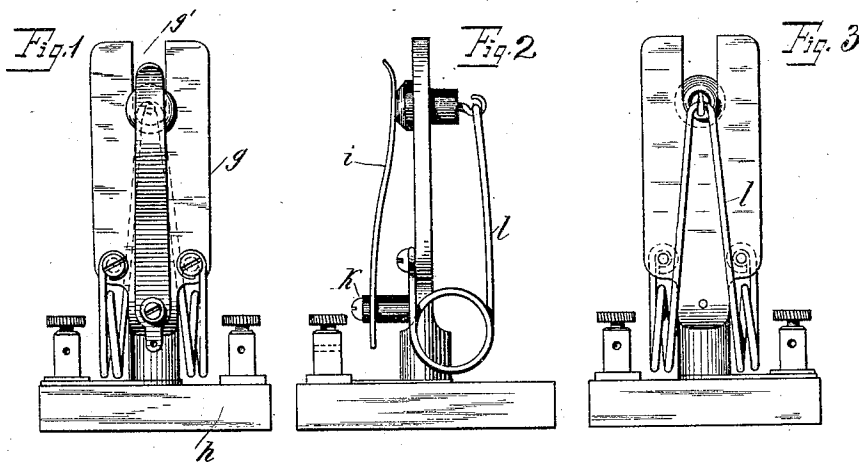


(No Model.)

F. R. McBERTY.
STRONG CURRENT ARRESTER.

No. 544,368.

Patented Aug. 13, 1895.



WITNESSES:
George L. Cragg.
Walter Clyde Jones.

INVENTOR:
Frank R. Mc. Bertie.
by Barton & Brown Att'y's

UNITED STATES PATENT OFFICE.

FRANK R. McBERTY, OF DOWNER'S GROVE, ASSIGNOR TO THE WESTERN
ELECTRIC COMPANY, OF CHICAGO, ILLINOIS.

STRONG-CURRENT ARRESTER.

SPECIFICATION forming part of Letters Patent No. 544,368, dated August 13, 1895.

Application filed May 31, 1894. Serial No. 513,062. (No model.)

To all whom it may concern:

Be it known that I, FRANK R. McBERTY, a citizen of the United States, residing at Downer's Grove, in the county of Du Page and State of Illinois, have invented a certain new and useful Improvement in Strong-Current Arresters, (Case No. 14,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to electrical-instrument protectors designed to prevent the passage of abnormally-strong currents through the protected appliances, such as telephone or telegraphic instruments. It relates particularly to that class of such instruments in which a circuit-switch is operated by the heat generated by the abnormal current.

My invention consists in certain details of construction and organization with the object of insuring the normal continuity of the circuit through the device and of creating a break in the line-circuit, when actuated by the passage of an abnormal current, with such suddenness and of such extent as to prevent the formation of any arc.

In my invention I provide a very small "heating-coil" of fine wire, wound upon a thin metallic tube or spool, in whose central perforation a longitudinally-movable stem is secured with a suitable fusible conducting cement or solder, and a strained spring tending to withdraw the stem from the spool. The fine-wire heating-coil is included in circuit with the instruments to be protected, the circuit being completed through the metallic spool, the conducting-cement, and the movable stem. The connections between the different parts of the circuit within the protecting device may be made with solder in all cases, thus insuring perfect conductivity and freedom from accidental interruptions of the circuit in the devices. Upon the passage of an abnormal current through the heating-coil the heat generated in the latter, being transmitted to the metallic spool upon which it is wound, fuses or dissipates the solder or cement securing the stem in place, whereupon the latter is instantly withdrawn to a considerable distance by the strained spring acting

upon it, creating an instantaneous rupture of large extent in the circuit.

My invention also comprises certain minor details of construction designed to simplify the construction and facilitate the replacement of the heating-coil.

My invention is illustrated in the accompanying drawings, wherein—

Figure 1 represents a front elevation of my improved strong-current arrester. Fig. 2 is a side elevation thereof. Fig. 3 is a rear elevation. Fig. 4 is an enlarged sectional view of the heating-coil and its inclosing tube. Fig. 5 is an end elevation of the same. Fig. 6 represents the different parts of the heating-coil separated to disclose their arrangement with relation to each other. Fig. 7 is a perspective view of the inclosing case or sheath of the heating-coil.

The construction of the "heating-coil," by which term I choose to designate not only the fine-wire coil but the parts immediately accessory to it, is shown in Figs. 4, 5, 6, and 7, and this, being the essential element of the device, may be described first.

The heating-coil is constructed as follows: A coil *a* of fine wire is wound upon a small thin metal spool *b*. For protecting delicate instruments the coil may be constructed of No. 36 German-silver wire and may have a resistance of five ohms. The spool *b* should be of some material which is a good conductor of heat, of low specific heat, and made as small and thin as possible, so that it may rapidly acquire a high temperature with the application of a small amount of heat. A stem *c*, formed at one end into a hook, is secured in the tubular end of spool *b* by a very small amount of easily-fusible solder. The spool *b*, with the coil wound upon it, and the stem *c*, soldered in place, are placed in a tubular opening in a cylindrical block *d* of hard rubber. The opening in block *d* has a shoulder *d'* formed in it, against which the flange *b'* of spool *b* bears. A small disk *e* of insulating material is then forced in upon the flange to keep the spool in place, and finally a cylindrical block or stud *f* of metal is pressed in over the disk *e*. One extremity of coil *a* is soldered to the spool *b*, and is thus connected with the stem *c*, while

the other extremity of the coil is soldered to block *f*, being led out through a slot *d*³ in the block *d*. The block *d* is provided with a flange *d*³ for retaining it in place in a stand-
 5 ard provided for it, as will be described. I designate this entire device, represented in Figs. 4 to 7, inclusive, the "heating-coil." This heating-coil is fixed in a slot *g*' in a frame or
 10 insulated spring *i*, secured by a screw *k* passing through insulating-bushings to the plate *g*, bears upon the block *f*, making firm electrical contact with it and pressing the flange *d*³ of the cylinder *d* against the plate *g*, thus re-
 15 taining the heating-coil firmly in place. A double-wire spring *l*, having its two extremities secured to the plate *g*, is formed into a loop, which projects upward and engages the hook upon the extremity of stem *c*, tending
 20 to withdraw the stem from the spool *b*. This form of spring is adapted to obtain a great range of movement, so that when the stem *c* is released it will be withdrawn to a great distance to prevent the formation of an arc.
 25 The protective instrument is included in line-circuit with the apparatus to be protected by connecting one extremity of the severed line with the spring *i* by means of a binding-
 30 post and the other extremity with the spring *l*. The points of contact between spring *i* and block *f* and between hook *c* and spring *l* may be faced with platinum, or may be soldered, if it is desired to have a continuous metallic
 35 conductor through the entire instrument, without interfering with its efficiency as a strong-current arrester. If an abnormal current finds circuit through the protective de-
 40 vice, the heat generated in resistance-coil *a*, even though comparatively slight in amount, permits the latter to be quickly withdrawn, interrupting the circuit through the apparatus. The used heating-coil may be readily withdrawn from slot *g*' and another inserted,

the spring *l* being brought into engagement 45 with the hook *c*, as before.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination with a heating coil, of a 50 small quantity of conducting material adapted to be fused by the heat of the coil, a switch spring held under tension by said fusible conducting material, and an electric circuit including said heating coil, fusible material 55 and spring switch in series, whereby the fusing of said fusible material permits the movement of said spring switch to open the circuit; substantially as described.

2. The combination with a small resistance 60 coil, of a spool of good heat conducting material upon which the coil is wound, a stem secured to said spool by easily fusible solder, a spring adapted to move said stem out of contact with the spool when the solder is 65 fused, and an electric circuit including said coil, spool, solder and stem in series; whereby the detachment of said stem from the spool effects the opening of the circuit.

3. The combination with the flanged spool 70 *b*, the coil *a* wound thereon, and the stem *c* soldered in the spool, of the perforated cylinder *d* having the shoulder *d*' against which the flange of spool *b* rests and the contact block *f* forming one terminal of the resist- 75 ance coil, substantially as described.

4. In combination the slotted plate *g*, the cylinder *d* having a flange *d*³ and containing the coil *a*, spool *b*, projecting hook *c* and the contact block *f*, the spring *l* tending to with- 80 draw hook *c*, and a spring *i* bearing upon the contact block *f*, substantially as described.

In witness whereof I hereunto subscribe my name this 5th day of March, A. D. 1894.

FRANK R. MCBERTY.

Witnesses:

ELLA EDLER,

DUNCAN E. WILLETT.