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F. K. SINGER.

LIGHTNING ARRESTER.

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Fig. 1.

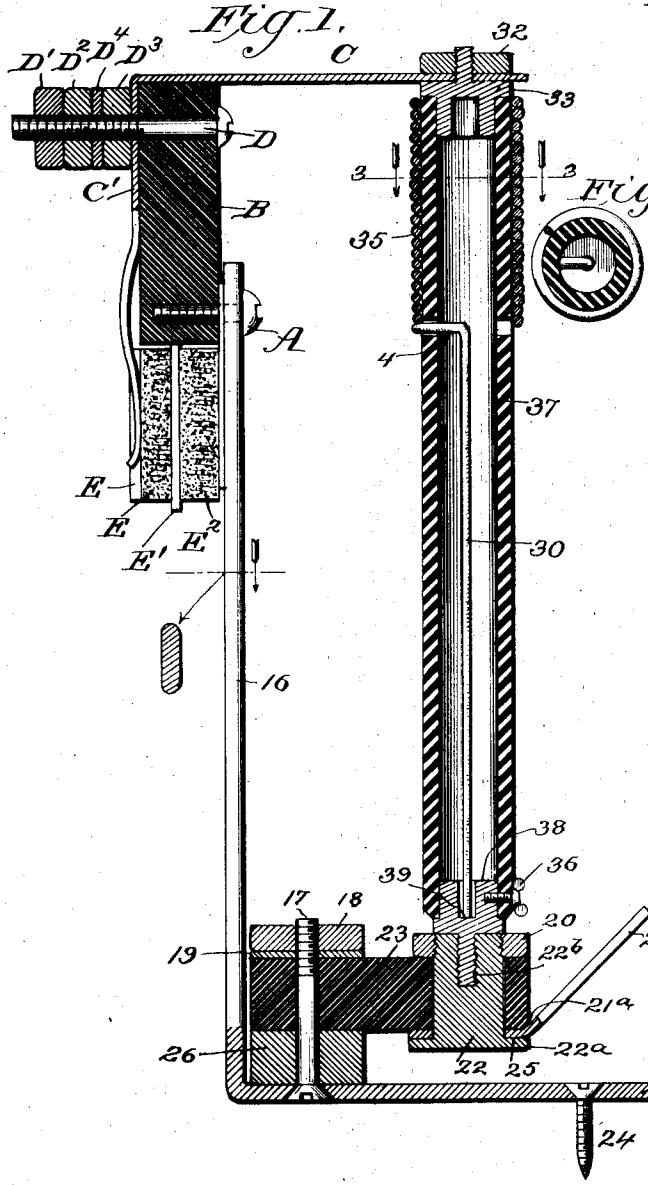
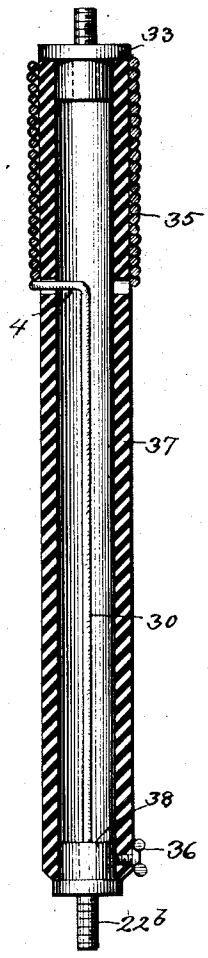


Fig. 3.

Fig. 2



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LIGHTNING-ARRESTER.

No. 814,482. Specification of Letters Patent. Patented March 6, 1906.

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To all whom it may concern:

Be it known that I, FRANK K. SINGER, a citizen of the United States, and a resident of Wheeling, in the county of Ohio and State of West Virginia, have made certain new and useful Improvements in Lightning-Arresters, of which the following is a specification.

My invention is an improvement in lightning-arresters, being especially designed to provide a lightning-protector for telephone-cables, &c.; and the invention consists in certain novel constructions and combinations of parts, as will be hereinafter described and claimed.

In the drawings, Figure 1 is a sectional elevation of an apparatus embodying my invention, and Fig. 2 is a detail longitudinal section of the fuse detached. Fig. 3 is a detail cross-section on about line 3 3 of Fig. 1.

In the construction shown I provide a frame having a metal bar or strap 16, bent at its lower end, forming the base portion 16^a. To the upper end of the frame 16 is secured at A the hard-rubber block B, the frame 16 extending along the inner side of the block near its lower end, while along the opposite side of the block extends the downwardly-projecting wing C′ of the German-silver fuse and carbon holding plate C, whose top wing extends across the upper end of the block B and over to and connects with the upper end of the fuse, as shown in Fig. 1.

In securing the plate C to the block B, I employ a screw D, which may be a brass machine terminal screw and is provided with the hexagonal nuts D′, D^2, and D^3 and with the copper washer D^4. The depending wing C′ of the plate C extends below the block B and alongside a line carbon block E, which fits against a plate E′, of mica, one thirty-second of an inch thick and which separates it from a carbon ground-plate E^2, forming a spark-gap, as shown in Fig. 1.

As shown in Fig. 1, an insulating strip or block 23 is secured by a flat-head brass machine-screw 17 to the base 16^a of the frame, a nut 18 and copper washer 19 being provided on the screw 17 above the block 23 and a hexagonal brass block 26 being interposed between the insulating-block 23 and the base 16^a, as shown in Fig. 1. A brass terminal and fuse-socket 22, having a head 22^a at its lower end, fits from below in an opening in the insulating-block 23 and receives above the said block a brass hexagonal block 20, which secures the brass terminal and fuse-socket in place. This socket 22 has a threaded socket 22^b in its upper end, in which screws the threaded tenon at the lower end of the fuse-tube, as presently described. A cable connection 21 is soldered in connection with the socket-block 22 at 25, and this connection 21, which may be a German-silver spring, fits at 21^a in a nick in the insulating-block 23 and being soldered at 25 to the block 22 operates to prevent the block 22 from turning, and it also serves to hold the cable connection 21 from getting loose or out of place. A flat-head iron screw 24 may be employed for securing the base 16^a in place.

The fuse-tube is provided at its lower end with a brass terminal 38, having a depending threaded tenon which screws into the socket 22^b of the brass terminal 22, and at the upper end of the tube I provide a hexagonal nut 32, which binds the German-silver fuse-holder C or 6 against a metal cap 33 at the upper end of the fiber tube 37, to which cap 33 the upper end of the choke-coil 35 is soldered, such choke-coil being disposed around the upper end of the fuse-tube 37 and being soldered at its lower end at 4 to the three-ampere ribbon fuse 30, which is disposed within the fuse-tube 37 and extends down therein to the brass terminal 22, as shown in Fig. 1. The choke-coil 35 comprises about twenty turns of No. 22 triple-covered wire, shellac-varnished, and the fuse-tube 37 is a fiber tube, shellac-varnished. The tube 37 is secured by a flat-head brass machine-screw 36 to the terminal 38, a soldered connection 39 being effected between the lower end of the fuse 30 and the terminal 38, as will be understood from Fig. 1 of the drawings.

It will be noticed that the circuit in Fig. 1 is from the line to the choke-coil, through the choke-coil and three-ampere fuse to the cable.

In Fig. 1 I show a construction of the parts forming the spark-gap, in which the spark-gap occurs at the lower end of the block B, a line carbon block E, mica plate E′, and ground-plate E^2 being provided, as before described.

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

1. The combination substantially as herein described of the fuse-holding tube, the fuse within the tube, the choke-coil outside the tube, suitable terminals, and a spark-gap device in connection therewith.

2. In an apparatus, substantially as described, the combination of a frame, a non-

conducting block supported thereon and having a fuse-holding line-plate and spark-gap devices coöperating therewith, a fuse-holding tube connected at one end with the said line-plate, a terminal block having a plate for connection with the cable, and connected with the other end of the fuse-tube, a fuse-strip in the said tube and a choke-coil wound about the tube and in electrical connection at one end with the line-plate and at its other end with the fuse, substantially as set forth.

3. The combination with the frame having an upright and a base portion, a non-conducting block on the base portion, a terminal block supported by the non-conducting block and having a plate for cable connection, a non-conducting block supported on the upright of the frame, a line-connection plate, a screw securing said plate to the block, spark-gap devices in connection with said plate, a tubular casing extending between said line-connection plate and the lower terminal, a fuse-strip in the lower portion of the tubular casing and a choke-coil around the upper portion of said tubular casing and having at one end electrical connection with the line connection and at its other end electrical connection, with the fuse-strip, substantially as set forth.

4. In a lightning-arrester the combination of a frame, a tubular non-conducting casing, a choke-coil on the outer side of the casing, a fuse within the casing and connected at one end with one end of the choke-coil, a terminal with which the outer end of the choke-coil connects at one end of the casing, a terminal with which the outer end of the fuse connects at the opposite end of the casing, a ground-plate and spark-gap devices attached to the frame and independent of the casing, substantially as set forth.

5. A lightning-arrester comprising an insulating-tube, a choke-coil on the outer side of said tube, a fuse within the tube, terminals with which said coil and fuse are electrically connected, and a spark-gap and ground-plate independent of the fuse and choke-coil, substantially as set forth.

6. A lightning-arrester comprising a framing, a fuse-holding plate connected with the framing, a ground-block, devices connected with the fuse-holding plate and forming with the ground-block a spark-gap, a terminal opposite the fuse-holding plate and having an attached cable connection, a casing extending between the fuse-holding plate and opposite terminal and having an insulating-tube, a fuse therein and connected with the lower terminal and a choke-coil surrounding the insulating-tube and having electrical connection at one end with the fuse within said tube and electrical connection at its other end with the fuse-holding plate, substantially as set forth.

7. A lightning-arrester, comprising a non-conducting base-block, a terminal block supported by said base-block and having a plate for cable connection, a line-connection plate, a non-conducting block to which said plate is secured, spark-gap devices in connection with the line-connection plate, a tubular casing extending between said line-connection plate and the terminal on the base-block, a fuse-strip in one end of said tube, and a choke-coil around the other end of the tube and having at one end electrical connection with the line connection and at the other end electrical connection with the fuse-strip, substantially as set forth.

8. In a lightning-arrester the combination with the opposite terminals and insulating-supports therefor, of the combined fuse and choke-coil extending between said terminals and electrically connected therewith, the said fuse and choke-coil comprising the tube, the fuse within the tube, and the choke-coil outside the tube and connected with the fuse, substantially as set forth.

9. In a lightning-arrester the combination of opposite insulating-blocks, a terminal block supported by one insulating-block, a terminal plate supported by the other insulating-block, a ground-block and means carried by the insulating-block supporting the plate and coöperating with the ground-block in forming a spark-gap, and the combined fuse and choke-coil extending between the terminal block and terminal plate, substantially as set forth.

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