G. W. KOTTS.

LIGHTNING ARRESTER.

APPLICATION FILED NOV. 30, 1917.

1,268,733. Patented June 4, 1918.

Fig. 1.

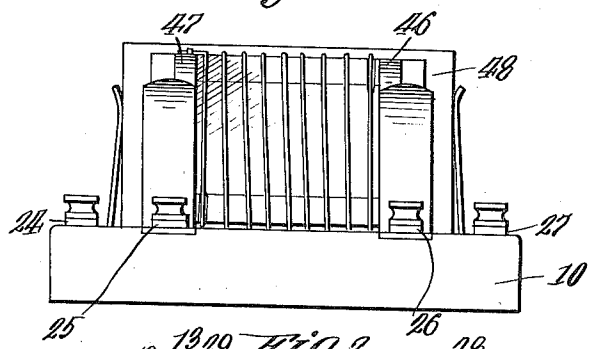


Fig. 2.

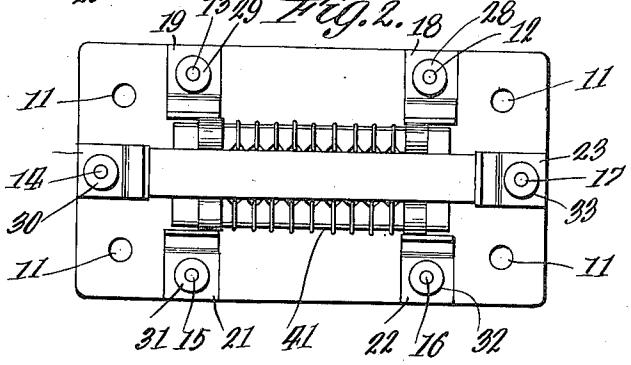


Fig. 3.

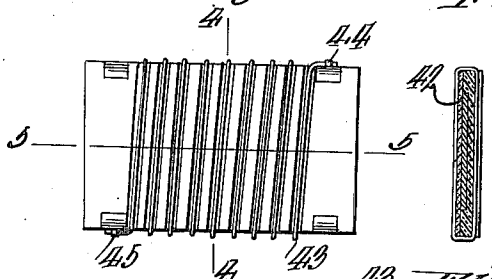


Fig. 4.

Fig. 6.

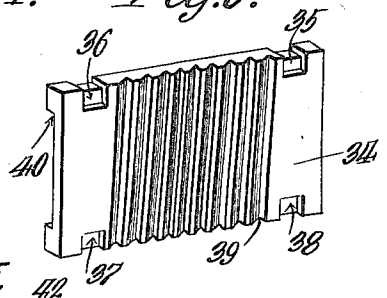
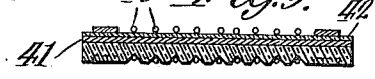


Fig. 5.



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LIGHTNING-ARRESTER.

1,268,733. Specification of Letters Patent. Patented June 4, 1918.

Application filed November 30, 1917. Serial No. 204,757.

To all whom it may concern:

Be it known that I, GARRETT W. KOTTS, a citizen of the United States, residing at Hope, in the county of Steele and State of North Dakota, have invented certain new and useful Improvements in Lightning-Arresters, of which the following is a specification.

This invention is a lightning arrester more particularly adapted for use in connection with telephone and telegraph lines wherein the use is made of a number of points that will permit the escape of static electricity to the ground at convenient points and thus protect the transmission lines and their instruments.

One object of the invention is to provide a lightning arrester that may be inserted in a transmission line to protect the same and at the same time afford a path of relatively low resistance for the passage of static electricity to the ground.

Another object of the invention is to provide an arrester wherein its several operative parts may be quickly and easily replaced should the same become damaged on the passage of the static current.

Still another object of the invention is to provide a base with line terminals and mounting thereon suitable plates having wires wound therein and forming said terminals as clips to engage with the terminals of the wires wound on the plates.

A further object is to provide a lightning arrester having spaced wire wound plates that are separated by an air gap, said plates being held in their spaced relation by the agency of suitable clips that serve to permit a quick renewal of damaged plates.

A still further object is to provide a substantially rectangular plate having grooves formed upon one flat side and transversely of the plate, said plate being provided with recesses spaced on the edges, and upon the other flat side forming a recess or groove in which is adapted to be seated a conducting plate that is covered by suitable insulating material, such as mica, which serves to insulate the convolutions of wire from contact with said conducting plate.

Broadly stated the invention comprises a base having terminals thereon, a clip connected to each terminal, removable members mounted therebetween, and composed of spaced plates having wire wound thereon in grooves formed transversely of one side of each plate, each of said plates having a longitudinal recess formed in the ungrooved side, said wire being provided with terminals that are disposed in suitable notches or recesses formed in the edges of said plates, and a conducting plate interposed between the wire wound plates and having its ends adapted to be engaged with clips mounted at the ends of the base, said base and wire wound plates being formed of suitable insulating material.

One practical form of construction and assembly will be described and illustrated in the accompanying drawings, in which:—

Figure 1 is a side elevation of the assembled arrester,

Fig. 2 is a top plan view,

Fig. 3 is a side elevation of one of the static plates showing the grooved side with the wire wound thereon, and connected to the terminals,

Fig. 4 is a sectional view on the line 4—4 of Fig. 3,

Fig. 5 is a sectional view on the line 5—5 of Fig. 3, and

Fig. 6 is a perspective view of one of the static plates stripped of its wire and terminals.

In the preferred embodiment about to be described, the base 10 may be of any suitable insulating material such as porcelain. This base 10 may be provided with the holes indicated at 11 that will serve as passages for suitable holding means such as screws (not shown). These holes 11 are preferably formed adjacent the corners of the base 10 as shown more particularly in Fig. 2.

The base 10 is further provided with suitable holes through which are adapted to pass the screws 12, 13, 14, 15, 16, and 17, that have their heads embedded in the base of the receptacle in suitable recesses formed therein. The screws projecting through the base are adapted to engage with the clips 18, 19, 20, 21, 22, and 23. These screws have also mounted upon them suitable flat threaded washers as indicated at 24, 25, 26, and 27. These washers are adapted to be screwed into engagement with the upper sides of the clips, and to engage with the upper ends of the screws there are provided suitable thumb nuts 28, 29, 30, 31, 32, and 33. These thumb nuts when coöperating with the washers 24, 25, 26, and 27 will serve as terminals for holding suitable conducting wires.

The clips 18 to 23 inclusive are substantially L-shaped with the vertical limbs free to engage with removable members. The clips are preferably formed of resilient material and have their upper ends slightly bent to provide for disengaging them from contact with the members.

As shown in Fig. 6 the plate 34 is preferably rectangular in shape and on its longitudinal sides it is provided with the recesses or notches 35, 36, 37, and 38. Upon one flat side of the plate 34 there are formed suitable wire holding and spacing grooves 39. As shown more particularly in Fig. 3 these grooves are slightly displaced and extend transversely across the plate. The plate 34 is preferably formed of suitable insulating material and upon the side opposite to the grooves there is formed a recess 40.

This recess is adapted to receive the conducting plate 41. As shown more particularly in Figs. 4 and 5 the conducting plate 41 is seen engaging and disposed within the groove 40. These figures also show a covering plate 42 formed of suitable insulating material such as mica. As shown more particularly in Fig. 4 the insulation 42 lies in a position that is substantially flat on the grooved or recessed side. The plate 41 has one of its surfaces flush with the sides of the plate 34.

The plate 34 has wound thereon, to lie in the grooves 39, a wire 43. This wire is provided with the terminals 44 and 45. These terminals are connected with suitable strips 46 and 47 that extend on the longitudinal grooved side and are bent to engage in the recesses 35 and 38 and 36 and 37. Thus the strips 46 and 47 extend transversely, and as they are preferably formed of conducting material they form conducting means to engage with the clips which may be either 18, 19, 21, or 22.

As shown in Fig. 1 the strip 46 engages with the clip 22, and the strip 47 engages with the clip 21. These terminals 31 and 32, which are connected with the clips 21 and 22 will serve as terminals for suitable line wires. As shown in Figs. 1 and 2 two of the assembled plates 34 are employed. The plates 34 are separated by means of a conductor which may be in the form of a block of carbon 48. The ends of the carbon block 48 are adapted to engage with the clips 20 and 23.

The clips 18 and 19 engage with the plate mounted upon the opposite side of the carbon plate 48. The ends of the plates are so formed that they preferably lie adjacent the carbon block 48. The wire 43, wound in the grooves 39, is preferably so positioned that the several convolutions are spaced from the carbon block. This will provide an air gap across which static electricity may jump in case there is an unusual amount upon the line wires connected with the terminals.

The ground wires are preferably connected under the thumb nuts 30 and 33, while the line wires are preferably connected under the thumb nuts 28, 29, 31, and 32.

What I claims is:—

1. A lightning arrester, which comprises a base formed of insulating material, and having terminals thereon, L-shaped clips connected with said terminals, a conducting plate having a negative resistance coefficient adapted to receive static discharges, said plate being engageable by oppositely positioned clips, and a plurality of wire wound grooved plates having suitable terminals that are adapted to engage with the remaining clips when positioned upon each side of the conducting plate, said wire wound plates being in contact with the conducting plate and the grooves serving to space the wire from contact with said conductor plate.

2. A lightning arrester, which comprises a base formed of insulating material, having terminals thereon, L-shaped clips connected with said terminals, a conducting plate engaged by and contacting with two of the clips, a plurality of insulating plates, having grooves formed transversely on one face, and with notches adjacent the ends, said plates being further provided with a groove formed upon the opposite face, a wire adapted to be wound in the transverse grooves, and provided with terminals that are connected with suitable conducting strips that are bent so that their ends engage with the recesses, said grooves spacing the wire from the conducting plate to provide leakage paths for the static current to jump from the wire to the conducting plate.

3. A lightning arrester, which comprises a base formed of insulating material, clips mounted thereon, said clips including terminals, a conducting plate serving as a static plate having its ends adapted to be engaged with two of the clips, said plate being arranged longitudinally of the base, a pair of insulating members having wire wound thereon, said wire being connected with suitable terminals that are adapted to form contacts, one face of each of the members being grooved transversely and the grooves slightly displaced so that the wire will be wound in an approximately helical form and the convolutions will be insulated and spaced from each other, each of said members being provided on the side opposite to the transverse grooves with a longitudinal groove that is adapted to receive a conducting plate, suitable insulating material mounted on said plate to lie flush in said latter groove, and suitable insulating material disposed over said other insulating material, the clips and terminals mounted upon the

sides of the base, being adapted to receive line wires so that the wire on the members will be inserted therewith, and the terminals connected with the conducting plate serving as ground terminals.

4. A lightning arrester, which comprises a base having terminals thereon, clips connected to the terminals, a plurality of separable plates adapted to be held together when inserted between the clips, two of said plates being provided with transverse grooves and having wire there around and in the grooves, terminals for said wire extending transversely across the plates adjacent their ends for contact with the clips, said grooves serving to permit the convolutions of the wire to lie approximately flush with the side of the plate, and a carbon plate adapted to have its ends engaged by clips, said carbon plate being interposed between the wire wound plates, said latter plates when assembled have their grooved sides in contact with the carbon plate.

5. A wire wound plate for a lightning arrester, which comprises a plate composed of insulating material and having grooves formed transversely on one side of the plate, said plate having recesses formed in the edges of the plate for receiving clip terminals, one lateral face of the plate being provided with a longitudinally extending groove for receiving a metal plate, clips serving as contacts secured in the edge recesses and extending transversely over the plate adjacent its ends, wire wound transversely over the plate and in the grooves and having its ends connected to the clip terminals, and insulating means inserted between the metal plates and the convolutions passing thereon.

6. A plate for a lightning arrester, which comprises a plate formed of insulating material and provided on its edges adjacent the ends with recesses, one side of the plate having a groove extending longitudinally, the opposite side of the plate being provided with grooves formed transversely and inclined from one edge to the other, said grooves being adapted to receive wire, and said recesses on the edges being adapted to receive terminals for the wire and to form contacts.

In testimony whereof I affix my signature in presence of two witnesses.

GARRETT W. KOTTS.

Witnesses:
M. B. CASSELL,
ELLA SONSTRUD.