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J. COUGNARD
DOUBLE-ACTING LIGHTNING PROTECTOR
FOR ELECTRIC INSTALLATIONS
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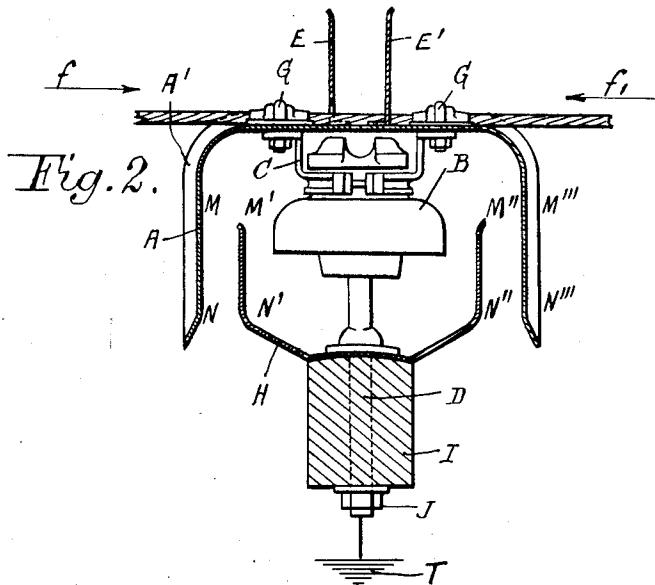
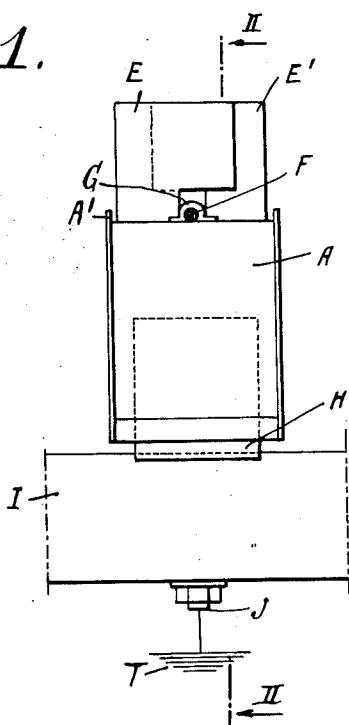


Fig. 1.



Inventor
Jerôme Cougnard
Attorneys
Robert Dastier

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DOUBLE-ACTING LIGHTNING PROTECTOR
FOR ELECTRIC INSTALLATIONS

Jérôme Cougnard, Nanterre, France

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7 Claims. (Cl. 174—140)

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The present invention has for its object to provide lightning protection means for high-tension and other electric transmission lines and associated devices.

The means according to the invention stop the ionized clouds constituting the lightning surge whirl which may arrive from either side of an insulator and they cause said clouds to be neutralized so that they cease to be conductive and are prevented from establishing short-circuits from parts under tension to ground through which the transmission power current might pass and cause a following current detrimental to the electric installations.

As an example, and for purposes of illustration only, a practical embodiment of the invention is shown in the annexed drawing wherein:

Fig. 1 is an elevation of the lightning protection means according to the invention, viewed in the direction of the transmission line;

Fig. 2 is a vertical section taken on line II—II of Fig. 1.

The lightning protection means shown in the drawing comprise an inverted U-shaped conducting plate A formed like a trough, the edges A' of the trough being directed outwardly so as to enable it to receive and stop the ionized air accompanying the lightning surge. The plate A is mounted by its upper web portion on an insulator B, by means of clips C, and carries at its top two upwardly directed screens E and E' which are disposed in staggered relation to one another, as shown in Fig. 1. On top of the plate A are further mounted cable-sockets G for attaching the cable F of the electric transmission line on either side of the insulator.

The combined action of the staggered screens E, E' is equivalent with that of a single screen mounted across the top of the plate A. It lies therefore within the scope of the invention to use a single screen instead of the screens E, E'. However, the staggered screens as shown are more advantageous in that they make it possible to put the line cable F into place without the necessity of cutting the same.

A second U- or V-shaped plate H is mounted on the support I of the insulator and is connected to the ground T, at J, through the rod D which carries the insulator. The plates A and H are disposed in such manner that the surfaces M'N' and M''N'' of the plate H are substantially parallel with the surfaces MN and M'''N''' of the plate A.

The width of the plate H is about 10% less than the width of the plate A (see Fig. 1), so that

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the ionized cloud can never short-circuit the surfaces MN, M'N' and M''N'', M'''N'''.

The distance between the plates A and H depends on the voltage of the line. This distance is generally determined in such manner that the striking voltage between the plates A and H is about 20% less than the striking test voltage of the line-associated devices to be protected.

The lightning protection means according to 10 the invention is always placed in the open. The conducting cable F of the transmission line must always arrive substantially perpendicularly to the surface MN of the plate A which forms a shield.

The apparatus comprises no resistance, no capacity, no self-induction and no closed space in which air might be confined.

The apparatus shown and described operates as follows:

When the apparatus is reached by a lightning 20 surge in the shape of a whirling ionized cloud advancing along the line F either in the direction of the arrow f or in the direction of the arrow f₁, the shield formed by the plate A and completed by the screens E, E' stops the lightning surge which is received in the trough of the surge where it is neutralized, the ionized atoms charging themselves with electrons. Being neutralized, the ionized air becomes insulating and can no more initiate a leakage of the line power 25 current to the ground and produce a current surge which would be deadly for the line-associated devices to be protected. The plate H drains to the ground the electromagnetic waves resulting from the neutralization of the whirl cloud, without initiating a following current.

The apparatus thus neutralizes the lightning surge, prevents the striking over of the line current to the ground and avoids the burning out of the line-associated devices to be protected.

40 It will be understood that modifications of degree are possible in the size, shape and arrangement of parts without departing from the spirit of the invention or the scope of the appended claims.

45 I claim:

1. In lightning protection means for electric transmission lines and associated devices, an insulator, an inverted U-shaped conducting plate having an upper web portion mounted on said insulator and two side portions depending from said web portion, attachment means on said web portion for attaching thereto the line to be protected, at least one upwardly extending screen 50 mounted on said web portion and a grounded conducting plate facing the inner side of each of

said depending side portions, said depending side portions and said screen being disposed in substantially right-angular cross relation to said line so as to stop lightning surges arriving from either side along the line.

2. In lightning protection means for electric transmission lines and associated devices, an insulator, an inverted U-shaped conducting plate having an upper web portion mounted on said insulator and two side portions depending from said web portion, attachment means on said web portion for attaching thereto the line to be protected, two upwardly extending screens mounted on said web portion, said screens being disposed in staggered relation to one another, and a grounded plate facing the inner side of each of said depending side portions, said depending side portions and said screens being disposed in substantially right-angular cross relation to said line so as to stop lightning surges arriving from either side along the line.

3. In lightning protection means for electric transmission lines and associated devices, an insulator, an inverted U-shaped conducting plate having an upper web portion mounted on said insulator and two side portions depending from said web portion, said conducting plate being formed like a trough having its concave side directed outwardly, attachment means on said web portion for attaching thereto the line to be protected, at least one upwardly extending screen mounted on said web portion and a grounded conducting plate facing the inner side of each of said depending side portions, said depending side portions and said screen being disposed in substantially right-angular cross relation to said line so as to stop lightning surges arriving from either side along the line.

4. In lightning protection means for electric transmission lines and associated devices, a support, an insulator mounted on said support, an inverted U-shaped conducting plate having an upper web portion mounted on said insulator and two side portions depending from said web portion, attachment means on said web portion for attaching thereto the line to be protected, at least one upwardly extending screen mounted on said web portion and a grounded U-shaped conducting plate mounted on said support and having two upwardly extending side portions, one of said upwardly extending side portions facing the inner side of one of said depending side portions and the other of said upwardly extending side portions facing the inner side of the other of said depending side portions, said depending side portions and said screen being disposed in substantially right-angular cross relation to said line so as to stop lightning surges arriving from either side along the line.

5. In lightning protection means for electric transmission lines and associated devices, an insulator, an inverted U-shaped conducting plate having an upper web portion mounted on said insulator and two side portions depending from said web portion, attachment means on said web portion for attaching thereto the line to be protected, at least one upwardly extending screen mounted on said web portion and a grounded plate 10 facing the inner side of each of said depending side portions, said grounded conducting plates being substantially parallel with said depending side portions, and said depending side portions and said screen being disposed in substantially right-angular cross relation to said line so as to stop lightning surges arriving from either side along the line.

6. In lightning protection means for electric transmission lines and associated devices, an insulator, an inverted U-shaped conducting plate having an upper web portion mounted on said insulator and two side portions depending from said web portion, attachment means on said web portion for attaching thereto the line to be protected, at least one upwardly extending screen mounted on said web portion and a grounded conducting plate facing the inner side of each of said depending side portions, said grounded conducting plates being of smaller width than 20 said inverted U-shaped conducting plate, and said depending side portions and said screen being disposed in substantially right-angular cross relation to said line so as to stop lightning surges arriving from either side along the line.

7. In lightning protection means for electric transmission lines and associated devices, an insulator, an inverted U-shaped conducting plate having an upper web portion mounted on said insulator and two side portions depending from 30 said web portion, attachment means on said web portion for attaching thereto the line to be protected, at least one upwardly extending screen mounted on said web portion and a grounded conducting plate facing the inner side of each of said depending side portions, said depending side portions and said screen being disposed in substantially right-angular cross relation to said line so as to stop lightning surges arriving from either side along the line, and the distance between said grounded conducting plates and said inverted U-shaped conducting plate being such that the striking voltage therebetween is smaller than the striking test voltage of the line-associated devices to be protected.

JÉRÔME COUGNARD.

No references cited.