W. T. GODDARD.

INSULATING HIGH VOLTAGE TRANSMISSION LINES.

APPLICATION FILED AUG. 22, 1908.

911,973. Patented Feb. 9, 1909.

Fig. 1.

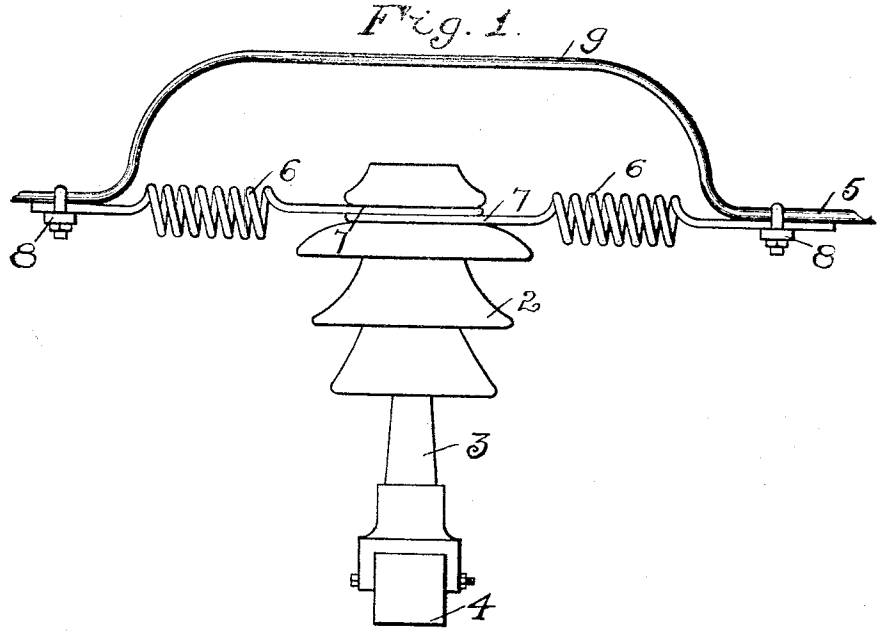
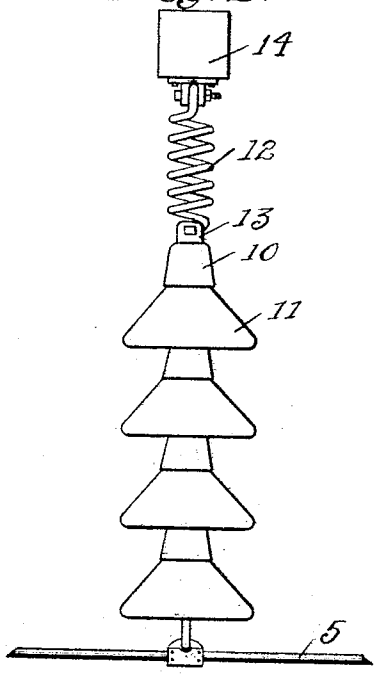


Fig. 2.



Witnesses

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UNITED STATES PATENT OFFICE.

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INSULATING HIGH-VOLTAGE TRANSMISSION-LINES.

No. 911,973. Specification of Letters Patent. Patented Feb. 9, 1909.

Application filed August 22, 1908. Serial No. 449,773.

To all whom it may concern:

Be it known that I, WALTER T. GODDARD, of Victor, in the county of Ontario and State of New York, have invented certain new and useful Improvements in Insulating High-Voltage Transmission-Lines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the reference-numerals marked thereon.

The present invention relates to insulating high voltage transmission lines and it has for an object to protect the usual dielectric insulators against breaking down from lightning or any high frequency discharge.

To this and other ends the invention consists in certain improvements and combinations of parts all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings: Figure 1 is a view showing what is termed a pin insulator and a high resistance interposed in series between the high voltage line and the ground; Fig. 2 is a view showing an underhung insulator and a high resistance interposed in series between a high voltage line and the ground.

The conventional line insulator is in reality a condenser of very small capacity, which, at normal voltage and frequencies, conducts a very small current with but a small heating effect. However, a surge or induced charge from lightning or the release of a bound charge may cause a highly oscillatory discharge producing a heavy current flow through the insulator; and the heat thereby generated cracks the dielectric and permits of dynamic current flow, and if the frequency becomes high enough produces a short circuit to the earth. In this invention this difficulty is obviated by interposing in series with an insulator between a high voltage line and the earth a high resistance which protects the insulator against excessive current flow. In the drawings I have shown two arrangements for accomplishing this result but it is apparent that there are numerous other ways of securing it.

In Fig. 1 there is employed an under supported insulator 2 which in this instance is formed of the usual series of petticoat sections arranged on a pin 3 that is connected with the ground by the support or tower 4, a portion only of the latter being shown. The high voltage line wire 5 instead of being connected directly to the insulator is connected to a high resistance which in this instance is in the form of an impedance comprising two steel coils 6, each connected at one end to the insulator 2 by a surrounding loop 7 and at its other end to the line wire 5 by a clamp 8 or other suitable securing devices, the coils being horizontally arranged and line wire being looped at 9 so as not to interfere with the coils or the insulator.

The construction shown in Fig. 2 has the resistance arranged between the earth and the insulator instead of between the latter and the conductor. Further, the insulator is of the underhung type consisting of alternate sections of metal 10 and porcelain 11. The resistance here is in the form of a single impedance coil 12 which at one end is secured between two ears 13 on the upper metallic section 10 and at its other end to the support or tower 14 that is connected with the earth. The line wire 5 is supported at the lower end of the insulator.

The operation of this invention, if the resistance be in the form of a coil, is to produce a counter electromotive force which reduces the current flow due to the high frequency to a minimum and thus prevents cracking of the insulator.

With this invention it is possible practically to eliminate the cost for repairs of the insulators due to excessive flow of current; and as the loss from the cracking of insulators is a big item in the working of high transmission lines this invention will pay for its installation in a very short time.

I claim as my invention:

1. The combination with a high voltage transmission line, and a support connected with the earth, of an insulator and high resistance interposed in series between the line wire and the support.

2. The combination with a high voltage transmission line and a support connected with the earth, of an insulator and an impedance interposed in series between the line wire and the support.

3. The combination with an insulator, of an impedance arranged to protect the insulator against heavy current flow.

4. The combination with a high voltage transmission line and a support, of an insulator and a device arranged in series with the latter between the line and the support, adapted to generate a counter electromotive force to protect the insulator against cracking.

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Witnesses:
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