Oct. 3, 1933. R. R. PITTMAN 1,928,820

WOOD STRUCTURE PROTECTIVE MEANS

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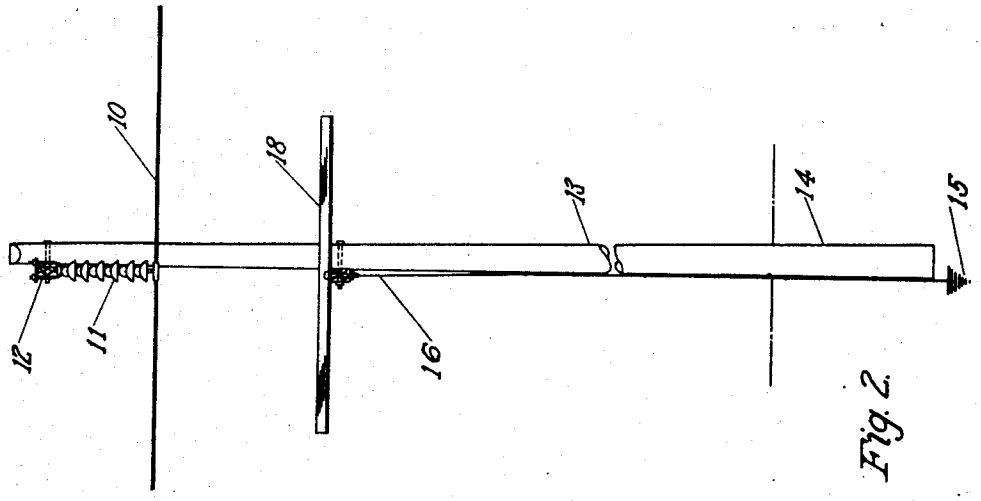


Fig. 2.

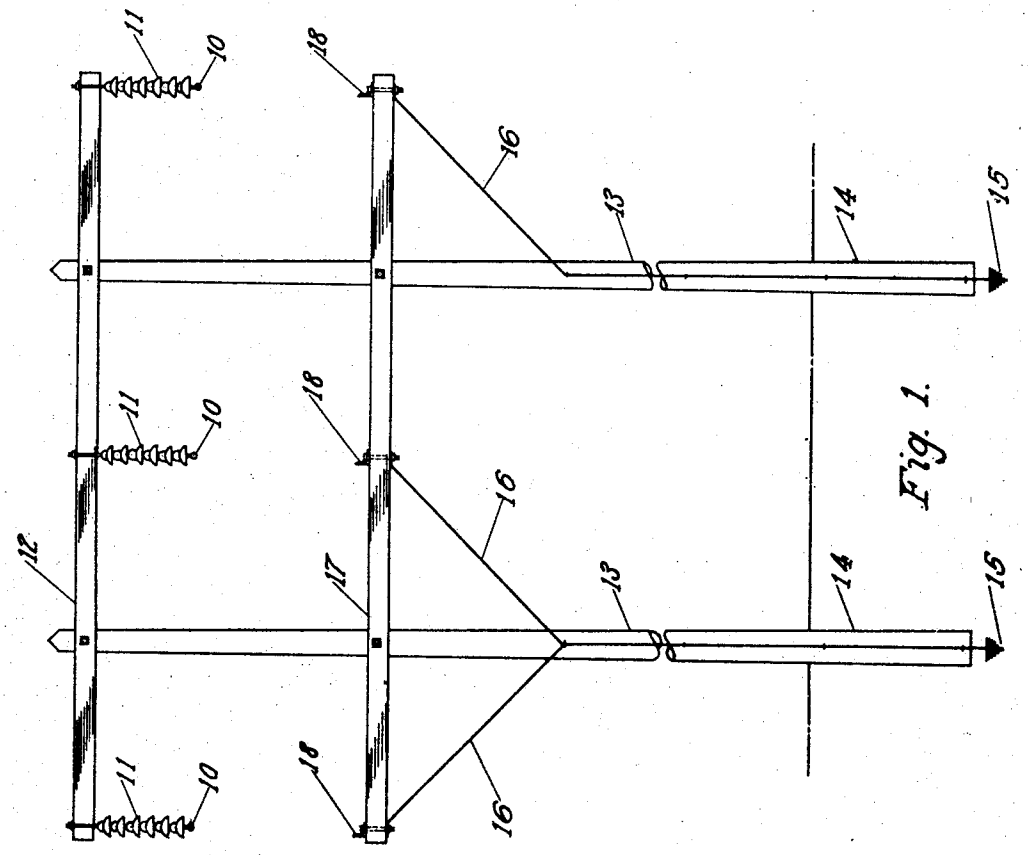


Fig. 1.

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WOOD STRUCTURE PROTECTIVE MEANS

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4 Claims. (Cl. 173—251)

This invention relates to wood pole structures used for supporting electric transmission lines and has special reference to means for protecting the wooden members of such structures from such damage as might be caused by lightning.

It is now generally recognized that a wood pole structure possesses certain desirable insulating qualities with reference to voltages caused by lightning discharges. It is desirable, however, to provide some means of preventing the flow of lightning currents through the wooden members of the structure as otherwise damage from splintering or burning is almost certain to result. The use of properly dimensioned and located horn gaps in parallel with the wooden members is one well known method of preventing damage to the structure, but such methods necessarily use but a small portion of the total insulating value available.

With the above facts in view, I have devised the present invention which has for its principal object the provision of a protective arrangement, which operates to prevent the occurrence of lightning flashovers over the insulators and/or the wooden members of the structure, such as poles and cross arms.

Another object of the invention is to provide a protective device for the purpose which will permit the use of a maximum length and therefore maximum insulation of the wooden members, while at the same time safeguarding the same against burning or other destruction.

A more specific object of the invention is to provide a protective device, consisting of a suitably grounded metal member supported parallel and in spaced relation to the line wire, said member extending an equal distance on either side of the supporting structure.

An additional object of the invention is to provide an arrangement for the purpose specified which is simple and inexpensive to make and install, positive and efficient in service and a general improvement in the art.

In the drawing:

Figure 1 is a front elevation of a wooden supporting structure, showing an embodiment of the invention; and

Figure 2 is a side elevation of the same structure.

Referring more particularly to the drawing, the numeral 13 designates upright wooden supporting poles with a wooden cross arm 12, from which are supported strings of insulators 11, carrying line wires 10. Poles 13 are suitably anchored in the ground as at 14.

In carrying out the invention I provide a second or lower wooden cross arm 17, suitably mounted below and parallel to wooden cross arm 12. Metal members 18 are supported in any suitable manner on wooden cross arm 17, so that the said members are parallel to line wires 10 and approximately vertically displaced from line wires 10. Metal members 18 are connected to ground by wires 16 and pole grounds 15. Other equivalent ground arrangements can of course be used, except that it would not be desirable to carry the ground wire up the pole above wooden cross arm 17 as this would lower the flashover strength of the structure.

Metal members 18 may be varied somewhat in size, length and shape, the best arrangement being determined by the other physical dimensions of the structure and the average height of the conductor 10 above the ground. A small section steel angle is shown in the drawing as I have found this to be a convenient and inexpensive arrangement.

Assuming that the installation has been effected, as shown and described or in an equivalent manner, it is apparent that any lightning discharge transmitted along line wire 10 will, before arriving at insulator 11 be reduced in value through the action resulting from charging the condenser formed by conductor 10, metal member 18 and the air dielectric separating them. Inasmuch as a condenser cannot be flashed over until it is fully electrically charged it is apparent that the voltage rise at a point on the conductor 10 near insulator 11 will be delayed in time. It is therefore readily seen that the flashover will take place from the end of metal member 18 to line conductor 10 at a considerable distance from insulator 11. The result so obtained is equivalent to raising the insulating value of the wood structure insofar as the prevention of a flashover on the said wood members is concerned.

From the arrangement as shown it is of course apparent that almost the entire insulating value of the wooden structure is utilized.

It is believed that from the foregoing that the construction, operation and advantages will be readily understood by one skilled in the art without further explanation.

While I have shown and sketched one preferred embodiment of the invention, it should be understood that the disclosure is merely an exemplification of the principles involved, as the right is reserved to make all such changes in the details of the construction as will widen the

field of utility and increase the adaptability of the device provided such changes constitute no departure from the spirit of the invention or the scope of the claims hereunto appended.

Having thus described the invention, I claim:

1. In a wooden supporting structure for transmission lines comprising a pair of wooden poles and a first upper wooden cross arm carrying suspension insulators for supporting the transmission line conductors, means including a second lower cross arm and a plurality of metallic members mounted thereon substantially vertically below said conductors for forming conductor-to-ground arc paths in shunt with said insulators and a portion of said wooden structure, said metallic members being connected to ground.

2. In combination a transmission line, a suspension insulator supporting said line, a wooden structure supporting said insulator, and means forming an arcing gap in shunt with a portion of said structure and said insulator, said means comprising a grounded metal member mounted below, parallel to and spaced from a transmission line conductor and extending for an equal distance on either side of said structure, the said distance being less than the distance between adjacent structures of the said transmission line.

3. In a supporting structure for transmission lines including two wooden cross arms one mounted vertically above the other, a string of insulators supported from upper arm and a line wire carried by the said string of insulators, a discontinuous metal member supported by the lower arm at right angles to the said arm and parallel and in spaced relation to the line wire, said metal member being connected to ground.

4. In a wooden supporting structure for transmission lines a wooden cross arm, having mounted thereon insulator strings carrying transmission line wires, a second wooden cross arm mounted vertically below the first mentioned arm, discontinuous metal members supported on the second arm in such a manner that the metal member extends an equal distance in a direction perpendicular to the arm and parallel and in spaced relation to the line wire and the said metal member connected to ground.

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