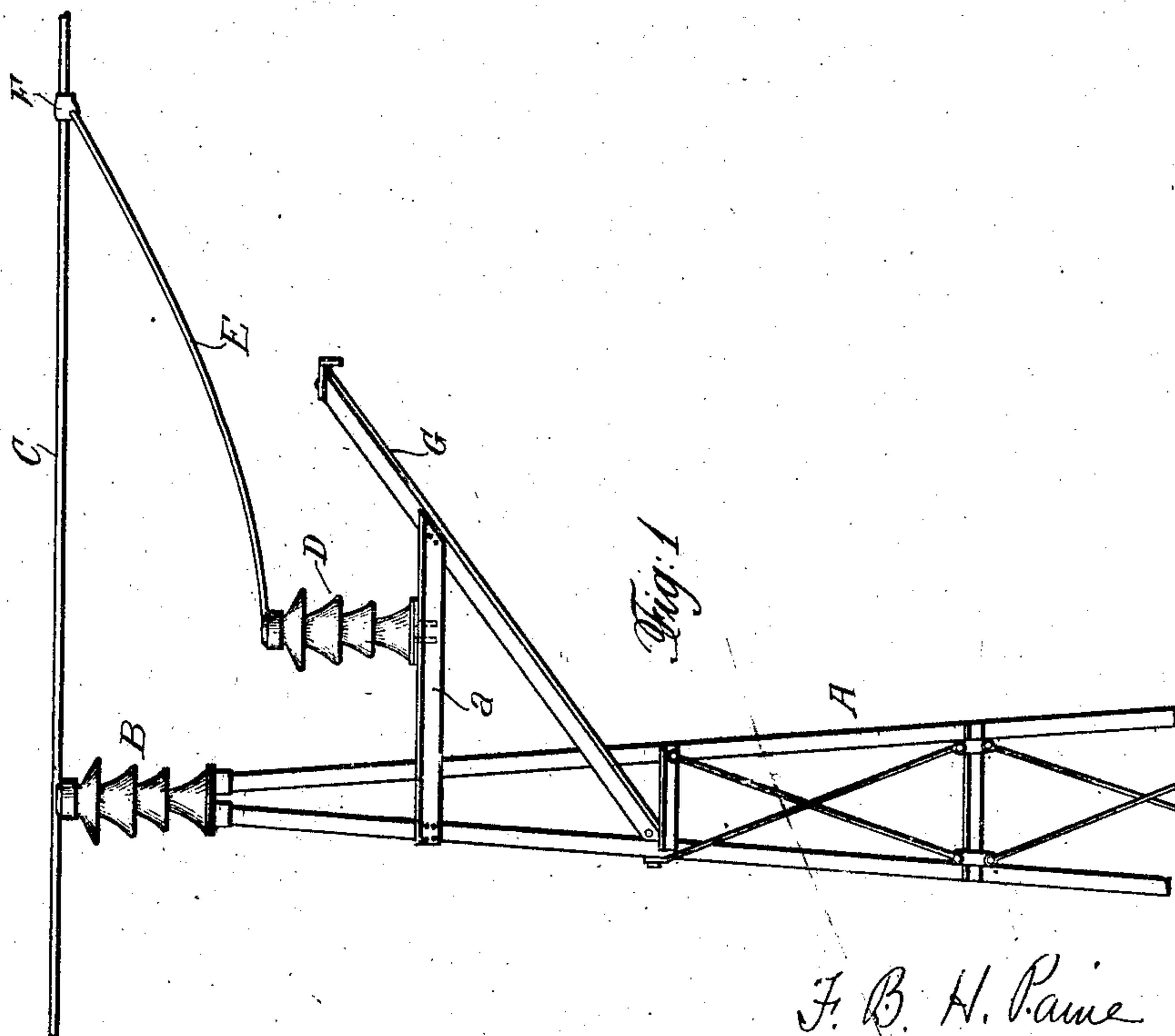
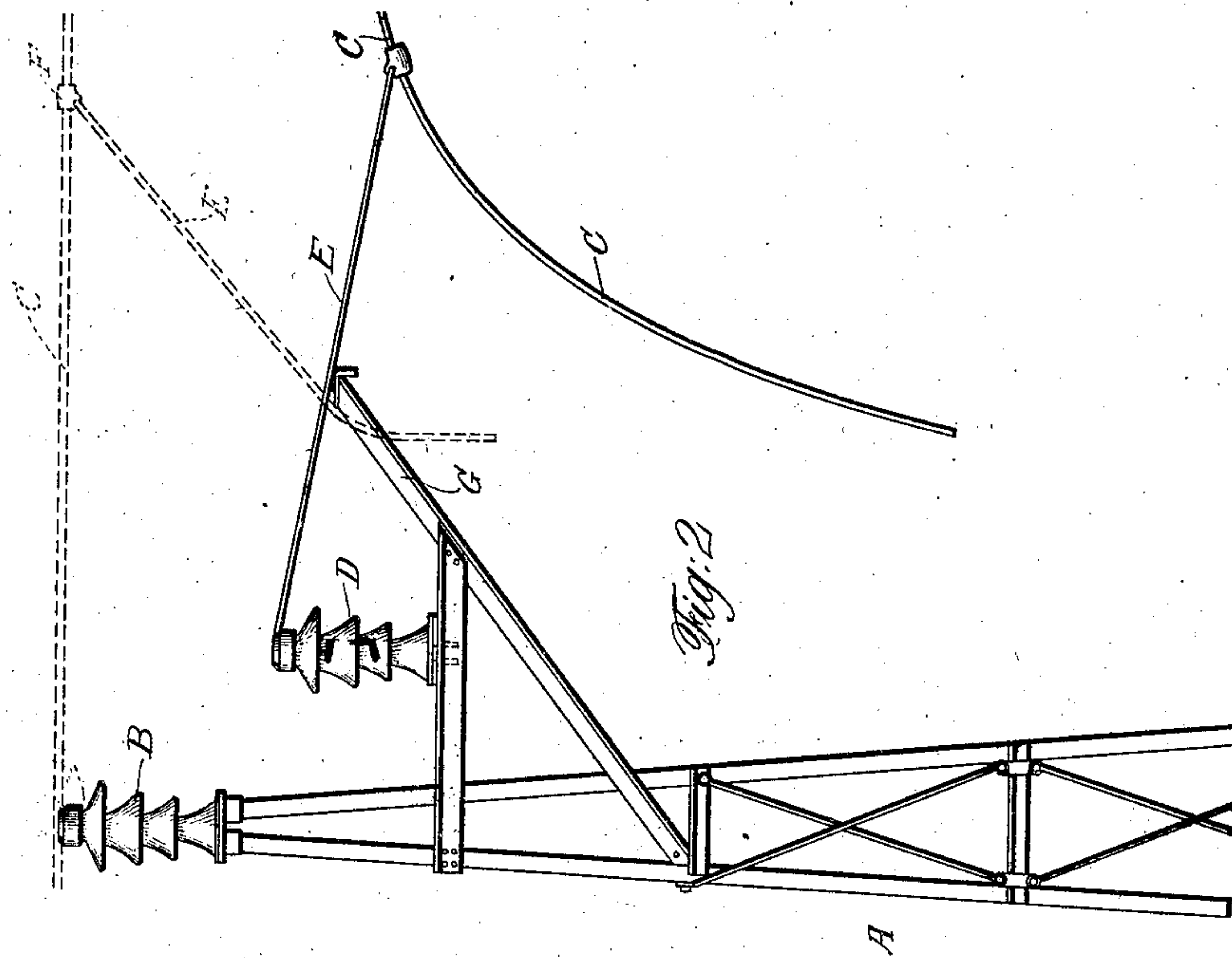


No. 889,803.

PATENTED JUNE 2, 1908.

F. B. H. PAINE.
SUPPORT FOR ELECTRICAL CONDUCTORS.

APPLICATION FILED JUNE 20, 1906.



Witnesses
John C. Gempier
Edm Harris

F. B. H. Paine
Inventor
By his Attorney Richard C. Gempier

UNITED STATES PATENT OFFICE

FRANCIS B. H. PAINE, OF BUFFALO, NEW YORK, ASSIGNOR TO NIAGARA, LOCKPORT AND ONTARIO POWER COMPANY, A CORPORATION OF NEW YORK.

SUPPORT FOR ELECTRICAL CONDUCTORS.

No. 889,803

Specification of Letters Patent.

Patented June 2, 1908.

Application filed June 20, 1906. Serial No. 322,533.

To all whom it may concern:

Be it known that I, FRANCIS B. H. PAINE, a citizen of the United States, and a resident of Buffalo, New York, have invented certain new and useful Improvements in Supports for Electrical Conductors, of which the following is a specification.

My invention relates to the support of electrical transmission lines, especially high tension lines, and is especially adapted for the support of these lines where they cross railroads or at any point where it would be dangerous to have a line wire fall to the ground or upon buildings or rolling stock. In these high tension lines there is little danger of any breakage of the line wire between the points of support, but there is danger that the line wire may break at the insulator supporting it, due to the deterioration of the wire caused by arcing, friction or other causes. By my invention I not only make sure that such a failure at the insulating support will not cause the line wire to fall to the ground or upon buildings or rolling stock, but I immediately ground the line wire so that notice may be given to the station of the defect, and so that the line wire is automatically disconnected at the generating station as is usually done when a line wire becomes grounded. To this end I support the line wire in the ordinary manner from the usual insulator or insulators and I also provide an auxiliary insulator or insulators connected to the line wire in such a way that the wire will be positively supported upon failure of the usual insulating support. I also provide a grounded contact arm that is in such a position as to be put into connection with the line wire upon failure at the usual insulating support. To effect this I rigidly attach to the line wire at a short distance away from its connection with the usual insulator, a short conductor or wire which is firmly attached to a second insulator. This short connecting conductor is so arranged that upon failure of the usual insulating support, the line wire will drop sufficiently to throw its weight upon this connecting conductor and the auxiliary support, and in doing so will carry the connecting conductor into engagement with the grounded contact arm. In this manner the line wire only falls a short distance and is then positively held by the connecting cable and the auxiliary insulator, being grounded because of its contact with

the arm so that any desired signal may be given at the power house. By this arrangement I also am enabled to ground the line wire and give notice thereof at the power station should the connection between the short conductor and the auxiliary insulator fail. I thus support the line wire by the two insulators coöperatively and prevent its falling to the ground if either insulator fails, while grounding it when either insulator fails. In this way it becomes impossible for the line wire to fall to the ground charged with its ordinary electro-motive force. Moreover, if there should be a break of the wire between the points of support the falling of the wire would instantly cause it to become effectively grounded.

Figure 1 of the drawings accompanying this specification illustrates a single line wire supported in accordance with my invention. Fig. 2 shows the same structure indicating the position of the grounded wire upon failure of either insulating support.

A represents the standard or tower supporting the insulators and is, in this case, shown as a metallic framework.

B represents one of the usual insulators for high tension transmission lines.

C is the high tension wire firmly attached in any suitable manner to the insulator B. It is assumed that at the right hand side of the tower A there is a railroad track or a road or building where it would be dangerous to permit the conductor C to fall. To prevent this I have provided a second insulator D, in the present instance carried below, and to one side of the insulator B and independently supported from the tower A at the cross arm *a*. To this auxiliary insulator D is firmly attached, in any suitable manner, the end of a short metallic connector E, which is rigidly clamped or otherwise secured at F to the line wire C. At a sufficient distance below the conductor E to make sure that there will be no arcing under normal circumstances, I provide the contact arm G which is, in the present case, a metallic arm directly grounded upon the tower A.

The results of a breakage of the line wire at the insulator B, or of the breakage of the insulator, are shown in full lines in Fig. 2. The auxiliary insulator D has been put into service and supports the entire weight of the line wire through the connection E. The line wire has fallen until the auxiliary insulator comes

into service to sustain it and in falling has brought the conductor E into contact with the contact arm G thereby grounding the line wire. The relative positions of D, F and G should be such as to insure contact between E and G when the weight of the line wire is thrown upon the auxiliary insulator while at the same time preserving sufficient normal distance between E and G to prevent the arc leaping across the gap.

If instead of the failure of the support at B, there should be a failure of the support at D, the condition will then be that shown in dotted lines in Fig. 2. The conductor C has not changed its position, but the failure of the support at D causes the short conductor E to fall loosely against the contact arm and so ground it and the line wire to which it is attached, thus enabling the defect to be known at the power station so that it can be remedied before any further defect could occur. Preferably the grounding of the line wire, as above described, would be utilized to open a circuit breaker in the station and thus render the line wire completely dead until the defect has been repaired.

I believe that I have shown in a general way the preferable location of the insulators B and D and the contact arm G, the line wire C and the conductor E, but these locations may obviously be varied greatly without departing from the mode of operation of my invention.

While I have described my invention with special reference to the support of the modern high tension transmission line, it will be understood that it may be desirable to employ my invention for other electrical conductors that are to be supported adjacently to high tension transmission lines.

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

1. A high tension line conductor, two insulators to which said conductor is attached and a fixed contact forming part of an electric circuit and so located as to be electrically connected to the conductor when it becomes disconnected from either of the insulators.

2. In a high tension transmission line, two insulators suitably supported, a line wire connected to both of said insulators so as to be supported by either, and a contact forming part of an electric circuit and arranged to make engagement with the line wire when the support afforded by one of the insulators fails.

3. In a high tension transmission line, two insulators suitably supported, a line wire directly attached to one of said insulators, a short conductor electrically and mechanically connected to the line wire and attached to the other of said insulators, the two insulators and said conductor being so arranged

that the line wire or attached conductor will move when one of the insulating supports fails, and a contact in the line of said movement included in a circuit by contact with the conductor or line wire.

4. In a high tension transmission line, a line wire, a contact forming part of an electric circuit, two insulators attached to said line wire and adapted to independently support the same in electrical connection with said contact but coöperatively maintaining said wire disconnected electrically therefrom.

5. In a high tension transmission line, a line wire, an insulating support therefor, an auxiliary insulating support, a connecting conductor attached thereto and to the line wire, and a grounded contact in the line of movement of the line-wire or connecting conductor when one of the supports for the line wire fails.

6. In a high tension transmission line, a line wire, an insulating support therefor, an auxiliary insulating support, a connecting conductor attached thereto and attached and electrically connected to the line wire, and a contact forming part of an electric circuit and in the line of movement of the line wire or connecting conductor when one of the supports for the line wire fails.

7. The combination with the standard, the insulator supported thereby and the line wire attached to the insulator, of an auxiliary insulating support carried by the pole, a short conductor attached to the auxiliary insulating support and to the line wire, and a fixed contact forming part of an electric circuit and arm carried by the standard and extending underneath the short conductor and adapted to be engaged by the same when carrying the weight of the line wire because of the failure of the primary support for the line wire.

8. In a high tension transmission line, an insulator supporting the same in normal position, an auxiliary insulator, a short conductor attached to the line wire and the auxiliary insulator and adapted to support the line wire in a different position, and a fixed contact forming part of an electric circuit and in the range of movement of the short conductor.

9. An electrical conductor, a fixed grounded contact, two insulating supports arranged to coöperatively maintain the conductors out of engagement with said contact but to independently support the conductor in engagement therewith.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses.

FRANCIS B. H. PAINE.

Witnesses:

H. H. HIGGINS,
J. S. COLLINS.