R. J. M. DANLEY & H. S. BOLTON.

HIGH TENSION SWITCH.

APPLICATION FILED JAN. 9, 1914.

1,102,728. **Patented July 7, 1914.**

Fig. 1.

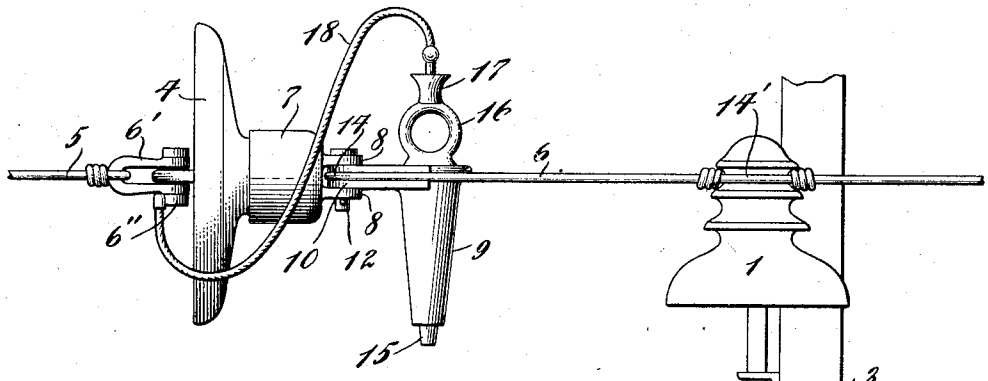
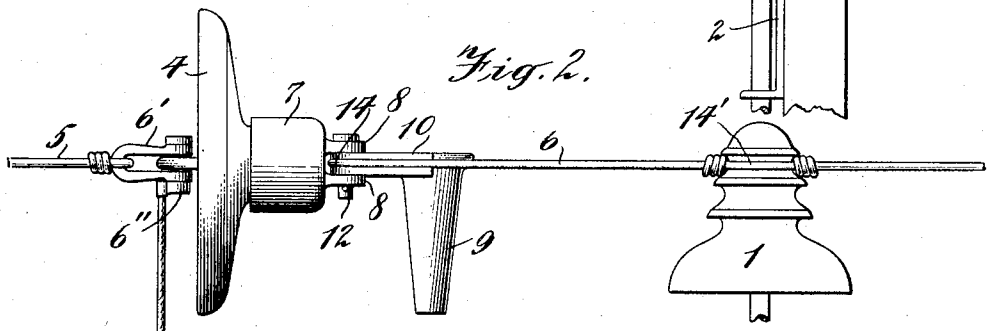


Fig. 2.



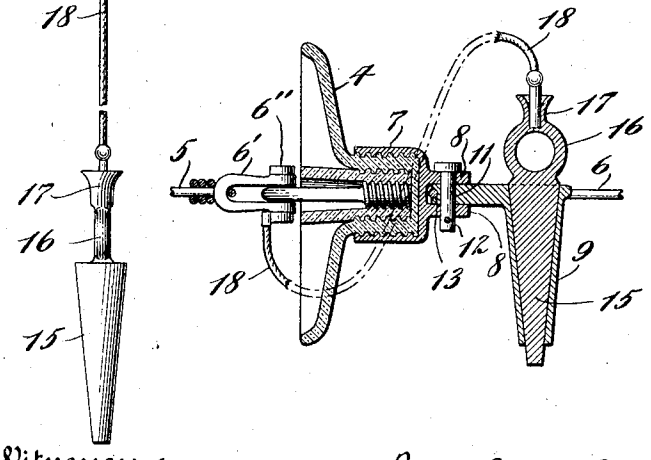


Fig. 3.



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UNITED STATES PATENT OFFICE.

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HIGH-TENSION SWITCH.

1,102,728. Specification of Letters Patent. Patented July 7, 1914.

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To all whom it may concern:

Be it known that we, ROBERT J. M. DANLEY and HENRY S. BOLTON, citizens of the United States, residing at Toluca, Mexico, have invented certain new and useful Improvements in High-Tension Switches, of which the following is a full, clear, and exact description.

This invention relates to electric switches and more specifically to sectionalizing or disconnecting switches for high tension lines and has for one of its objects the construction of a switch of a comparatively cheap and simple construction, which avoids the use of special cross arms or other supporting structures, and which may be interposed in a length of line with facility without necessitating the dead ending or grounding of any portion of the line wires.

Another object of our invention is to so construct and arrange the switch elements that they may be readily opened and closed from a distance, and when closed will maintain good electrical contact by the weight of one of the elements, without danger of the switch being inadvertently opened.

With these and other objects in view, our invention consists of a socket, interposed between the two alining conductors of the line and electrically insulated from one of them in combination with a plug mechanically and electrically connected to the other of said conductors, which plug is adapted to fit into said socket and electrically connect the two conductors together.

More specifically, our invention contemplates supporting the socket, which is preferably open at both ends, with its axis substantially vertical and making the plug of such weight that when it is dropped into the socket, it will maintain the parts in good electrical contact.

In the drawings: Figure 1 is a side view of a portion of a high tension line with a disconnecting switch embodying the features or our invention interposed therein, the switch being shown in closed position; Fig. 2 is a similar view showing the switch in open position; and Fig. 3 is a central vertical section through the switch elements.

Referring to the drawings, a length of an overhead high tension line is shown which is suitably supported in the usual manner, one of such supports being shown which comprises a petticoat insulator 1 of the usual construction carried by a cross-arm 2, mounted on a pole 3. Interposed in this length of line, is an insulator 4, which mechanically connects, but electrically insulates, the two alining line wires 5 and 6. A disk insulator of a type which is ordinarily used in high tension work is shown, but the particular type of insulator forms no part of the present invention and any desired form may be used which will withstand the disruptive electrical discharges occurring in high tension lines. The line wire 5 is suitably secured to the insulator 4 by means of a pivoted eye 6′ which is carried by a stud 6″ projecting laterally therefrom.

A metallic sleeve 7 which is carried by the reduced portion of the disk insulator is provided with spaced ears 8 at its outer end. One element of the switch which comprises a tapered socket 9, preferably cone-shaped and open at both ends, is provided with a flange 10 projecting laterally from one side of the socket at its upper end. This flange has a circular opening 11 through which a pin 12 passes to rotatably support a socket between the spaced lugs 8. The peripheral edge of the flange 10 is curved and has an annular groove 13 formed therein. The line wire 6 which is supported on the insulator 1 extends in the form of a loop 14, around the peripheral edge of the flange 10 and fits into the groove 13 therein, the free end of the wire being brought back and secured to the line wire at a point to the rear of the petticoat insulator 1. This insulator has an annular groove therein adjacent its top in which the extremities of the loop 14 are secured as at 14′ to maintain the loop in substantially a horizontal plane, which will in turn support the plug socket 9 with its axis substantially vertical. As the shell or socket 9 is open at the bottom and remains in this vertical position it will not accumulate water or dirt even if it is not used for long periods of time.

A switch plug 15 which is preferably solid and tapered to fit snugly within the plug socket 9, has attached thereto at its upper end a ring 16 which is of a relatively large diameter and projecting from the top of the ring is a knob 17 having a centrally disposed counterbored recess therein in which is secured one end of a flexible conductor 18, the other end of which is connected both electrically and mechanically to the line wire 5. The length of the plug 15 is sufficient to permit its end to project beyond the lower open end of the plug socket 9 when in place therein, so that if the plug should become stuck or frozen, it may be readily removed by striking its lower end.

The plug and plug socket may be of any desired conductive material which will withstand climatic conditions, but a heavy metal, such as brass should preferably be used for the solid plug, so that when it is dropped into the plug socket it will maintain good electrical connection therewith due to its own weight.

In the open position of the switch, the plug 15 hangs vertically as shown in Fig. 2. To close the switch, the ring 16 carried by the plug 15 is engaged by a switch hook which may consist of any form of hook mounted on an insulating rod so that the switch may be operated from a distance, the ring 12 being of sufficiently large diameter to insure that the plug may be easily located even at night. The plug is then carried on the switch hook to a point directly above the plug socket and dropped thereinto where it fits snugly and maintains the parts in good electrical contact, without any danger of inadvertent displacement.

Since a single insulator suffices to maintain the two alining line wires of the line, and also the switch elements when in their open position, insulated from each other, there is no necessity of dead ending any portion of the line wires which frequently causes trouble due to the breaking down of the insulators. Furthermore, since the switch is located at an unsupported point in the line, it may readily be installed at a comparatively low cost without requiring any special form of cross arming or other supporting structures, especially adapting the switch for use with existing high tension lines.

Having described our invention, we claim:

1. A high tension disconnecting switch comprising an insulator interposed in a length of line at an unsupported point, said insulator being mechanically connected to the two alining wires of the line, a switch element supported by said insulator and electrically insulated from one of said wires and a second switch element electrically and mechanically connected to that one of said line wires from which the first named switch element is insulated.

2. A high tension disconnecting switch comprising a conductive socket interposed in a length of line, said socket being mechanically connected to the two alining wires of the line and electrically insulated from one of them, a plug adapted to fit into said socket, and means for electrically and mechanically connecting said plug to that one of the line wires from which said socket is insulated.

3. A high tension disconnecting switch comprising a conductive socket interposed in a length of line, said socket being supported in vertical position between the two alining line wires of the line and electrically connected to one of said wires and insulated from the other, a plug adapted to fit into said socket, and means for electrically and mechanically connecting said plug to said other of said line wires.

4. A high tension switch comprising a conductive socket open at both ends interposed in a length of line, said socket being supported in substantially a vertical position between the two alining wires of the line and means for electrically connecting said socket to one of said wires and for insulating it from the other and a conductive plug greater in length than said socket adapted to fit therein, said plug being electrically and mechanically connected to said other of the line wires.

5. A high tension disconnecting switch comprising a conductive socket interposed in a length of line, and means for electrically connecting said socket to one of the two alining wires of the line and for insulating it from the other, a solid conductive plug and means for electrically and mechanically connecting said plug to said other of said wires, said plug being adapted to fit snugly in said socket and to maintain good electrical contact therewith due to its own weight.

6. The combination with the two alining line wires of a line, of an insulator mechanically connected to one of said wires, a conductive socket mounted on said insulator, the other of said line wires having a loop therein passing around said socket, means for supporting said loop to maintain said socket in a substantially vertical position, and a plug, mechanically and electrically connected to said first named line wire, adapted to fit into said socket.

7. The combination with two alining wires of a line, of an insulator mechanically connected to one of said wires, a conductive socket mounted on said insulator, means for connecting the other line wire to said insu-

lator and for maintaining said socket in a substantially vertical position, means for electrically connecting said socket to one of said wires and for insulating it from the other, a plug for said socket and means for mechanically and electrically connecting said plug to that one of the line wires from which the socket is insulated.

In witness whereof, we subscribe our signatures, in the presence of two witnesses.

ROBERT J. M. DANLEY.
HENRY S. BOLTON.

Witnesses:
KYLE B. PRICE,
JOHN D. VAN HORN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."