April 2, 1929. E. H. JACOBS 1,707,479

SWITCH

Filed Nov. 3, 1924

Fig. 1.

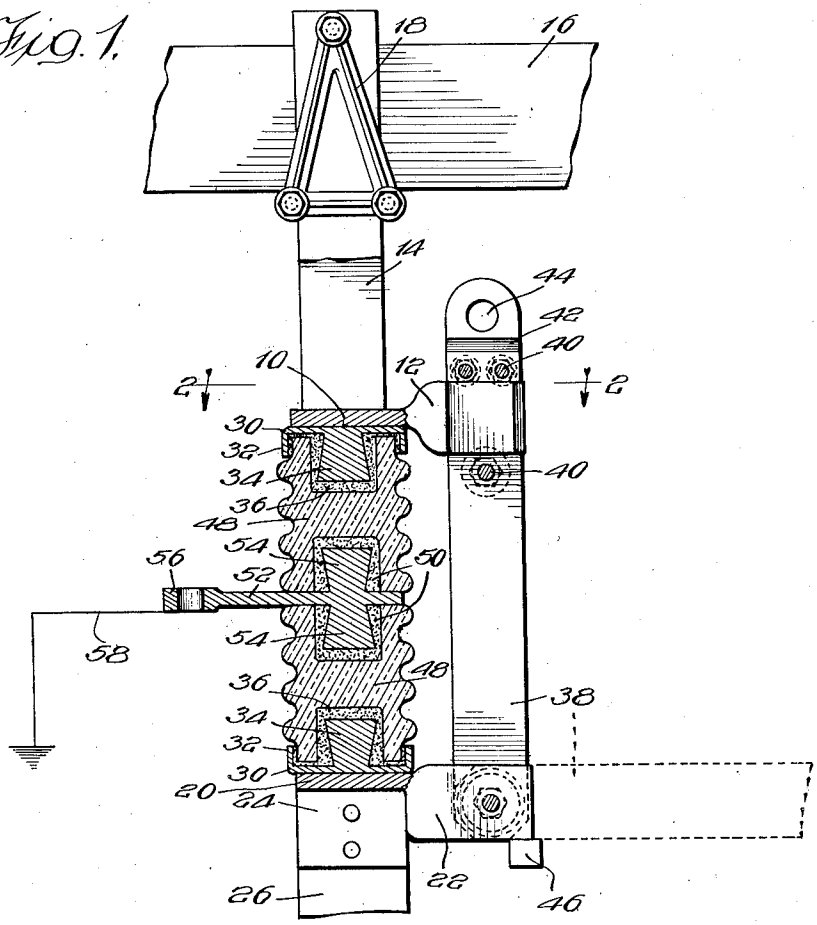
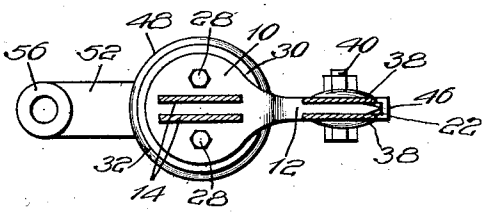


Fig. 2.



Witnesses:
W. F. Kilroy
Harry O. Glasgow

Inventor:
Ernest H. Jacobs
By Brown Critchlow & Flynn
Attys

Patented Apr. 2, 1929. 1,707,479

UNITED STATES PATENT OFFICE.

ERNEST H. JACOBS, OF CHICAGO, ILLINOIS, ASSIGNOR TO ELECTRICAL ENGINEERS EQUIPMENT CO., OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

SWITCH.

Application filed November 3, 1924. Serial No. 747,512.

My invention relates to the construction of transmission lines for electrical power, and more specifically to an improved electrical connection and disconnecting means between a bus bar or other source of current and a line to be connected thereto.

Among the objects of the invention may be included the provision of a much simpler and cheaper form of switch to give the same service as the standard switch with a large grounded base plate and two spaced insulators separately mounted thereon to carry the switch.

A further object involves securing the same degree of safety for the simplified construction as obtained for the former type.

Other objects and advantages of the invention will become apparent as the description proceeds.

In the accompanying drawings:—

Fig. 1 is a side elevation partly in section and Fig. 2 a section on line 2—2 of Fig 1 indicating the construction of a connection and switch embodying the principles of the invention.

The upper terminal 10 is preferably a one-piece casting having a horizontal switch terminal 12 projecting laterally therefrom, and spaced connecting and supporting bars 14 extending up to be clamped to the bus bar 16 by clamps 18.

The lower terminal 20 is preferably also of one piece construction comprising the laterally projecting switch terminal 22 and the downwardly projecting flange 24 to which the line member 26 may be suitably bolted.

Both terminals are suitably attached as by means of bolts 28 to caps 30, each comprising a cover plate portion lying in contact with the terminal, an outer flange 32 and an inner expanded base 34. The insulator structure connecting the caps has suitable pockets for receiving the bases 34, and a filling of cement 36 firmly fastens the parts together, and seals the annular clearance between flanges 32 and the insulator structure.

The switch illustrated comprises floating blades 38 pivoted to switch terminal 22, and held in suitable engagement with terminal 12 when the switch is closed by cross bolts 40. The ends of the blades projecting beyond bolts 40 may be offset at 42 into contact, and apertured at 44 for the reception of a tool for opening the switch.

Switch terminal 22 has a stop block 46 against which the lower edges of blade 38 engage when the switch is opened 90 degrees, to limit further movement.

From the foregoing it will now be apparent that the insulators 48, 48 lying end to end between the bus bars 16 and 26 and with the intermediate grounding member 52 constitutes a unitary structure which is supported by the bus bars 16 and 26 and mounts the switch therebetween without additional supporting frames or the like.

Additional tower structures, or the like, between the bus bars 16 and 26 are avoided and a generally improved and simplified mounting is provided for mounting a switch, or the like, between the bus bar 16 and line bus 26.

If the insulating structure were a single insulator, any defect in the insulator might result in electrical connection between line 26 and bus bar 16 when the switch was open. This would be a serious defect from the standpoint of safety. To provide complete safety, I form the insulating structure of two duplicate insulators 48, placed end to end and united by cement 50 to a grounding plate 52 having expanded bases 54 extending in both directions into the pockets in the insulators. The plate is formed with a laterally projecting eye 56 for connection to any suitable ground, as indicated diagrammatically at 58.

I preferably make each insulator 48 of ample dielectric strength to withstand the full voltage to be carried by the insulating structure as a whole. Thus a defect in either insulator, would connect the line on that side to the grounding plate, without any risk of potential being delivered to the other line when the switch has been opened. Electrically, this constitutes the structure the full equivalent of the much more expensive switch structure comprising a large grounded base plate forming the supports for two spaced insulators and terminals surmounting the same to be connected by a switch.

Without further elaboration, the foregoing will so fully explain the gist of my invention, that others may, by applying current knowledge, readily adapt the same for use under various conditions of service, without eliminating certain features which may properly be said to constitute the essential items of novelty involved, which items are

intended to be defined and secured to me by the following claims.

I claim:—

1. In a switch, in combination, a unitary insulator structure, connections at the ends thereof extending parallel to the axis thereof and running to the lines to be connected and disconnected, switch terminals at the ends projecting laterally perpendicular to the insulator axis, a switch blade pivoted on one terminal and movable into and out of contact with the other terminal, said insulator structure being supported by said connections, said insulator structure comprising two co-axial insulators placed end to end, and a grounding plate between the juxtaposed ends, either insulator being of ample insulating strength for the voltage to be endured by the structure.

2. In a switch, in combination, a unitary insulator structure, connections at the ends thereof running to the lines to be connected and disconnected, switch terminals at the ends, a switch blade pivoted on one terminal and movable into and out of contact with the other terminal, said insulator structure being supported by said connections, said insulator structure comprising two co-axial insulators placed end to end, and a grounding plate between the juxtaposed ends, either insulator being of ample insulating strength for the voltage to be endured by the structure.

3. In a switch, in combination, a unitary insulator structure, connections at the ends thereof running to the lines to be connected and disconnected, switch terminals at the ends, a switch blade pivoted on one terminal and movable into and out of contact with the other terminal, said insulator structure comprising two co-axial insulators secured to the opposite sides of a metallic plate.

4. In a switch, in combination, a unitary insulator structure, connections at the ends thereof running to the lines to be connected and disconnected, switch terminals at the ends, a switch blade pivoted on one terminal and movable into and out of contact with the other terminal, said insulator structure comprising two co-axial insulators placed end to end, and a grounding plate between the juxtaposed ends, either insulator being of ample insulating strength for the voltage to be endured by the structure.

5. In a switch, in combination, switch terminals, a switch blade pivoted on one terminal and movable into and out of contact with the other terminal, and a unitary insulator structure supporting both switch terminals, said insulator structure comprising two co-axial insulators, placed end to end, and a grounding plate between the juxtaposed ends, either insulator being of ample insulating strength for the voltage to be endured by the structure.

6. In a switch, in combination, switch terminals, a switch blade pivoted on one terminal and movable into and out of contact with the other terminal, a unitary insulator structure comprising two co-axial insulators placed end to end, and a grounding plate between the juxtaposed ends, either insulator being of ample insulating strength for the voltage to be endured by the structure.

7. In combination, a unitary insulating structure comprising an intermediate ground member and insulating sections, one on each side of said ground member and joined rigidly thereto into a unitary structure, terminal members, one on each side of said insulating sections, a movable switch member for connecting and disconnecting said terminal members, and means on said terminal members for connecting the line conductors thereto.

8. In a switch, in combination, a unitary insulator structure, connections at the end thereof running to the line to be connected and disconnected, switch terminals at the end, a switch blade pivoted on one terminal and movable into and out of contact with the other terminal, said insulator structure comprising a plurality of co-axial insulators placed end to end, and a grounding plate between the juxtaposed ends having expanded bases extending in opposite direction into said insulator, and means for making grounding connection thereto.

9. In combination, a pair of bus bars, a unitary insulator structure comprising a pair of insulators lying end to end between said bus bars and supported thereby, terminal members at the ends of said insulator structure, means for connecting and disconnecting said terminal members, and an intermediate grounding member between the insulators.

10. In a switch, in combination, a unitary insulator structure, connections at the ends thereof running to the lines to be connected and disconnected, switch terminals at the ends, a switch blade pivoted on one terminal and movable into and out of contact with the other terminal, said insulator structure comprising a plurality of co-axial insulators placed end to end, a grounding plate secured between the juxtaposed ends of said insulators, said grounding plate having a laterally projecting portion for making grounding connection thereto and lying substantially opposite said switch blade.

11. In combination, a unitary insulator structure comprising a pair of insulators lying end to end and an intermediate grounding member between said insulators, line connections at the ends of said insulator structure, terminals at the ends of said structure and means for connecting and disconnecting said terminals.

12. In a switch, the combination of a rigid unitary insulator structure, a pair of switch terminals, one rigidly mounted upon each of the opposite ends of said insulator structure and rigidly supported by said insulator structure as a unitary part thereof, said switch terminals each having a projection projecting laterally from said insulator structure and a switch blade member pivoted upon the lateral projection of one of said terminals and swingable into and out of contact with the lateral projection of the other terminal, said switch member lying along the side of said insulator structure in closed position, and means on said switch terminals for connecting said terminals to the lines to be connected and disconnected.

13. In a switch, the combination of a rigid unitary insulator structure, a pair of switch terminals, one rigidly mounted upon each of the opposite ends of said insulator structure and rigidly supported by said insulator structure, said switch terminals each having a projection projecting laterally from said insulator structure, a switch blade member pivoted upon the lateral projection of one of said terminals and swingable into and out of contact with the lateral projection of the other terminal, said blade member lying along the side of the insulator structure in closed position.

14. A switch, the combination of a rigid unitary insulator structure, a pair of switch terminals, one rigidly mounted upon each of the opposite ends of said insulator structure and rigidly supported by said insulator structure, said switch terminals each having a projection projecting laterally from said insulator structure, a switch blade member pivoted upon the lateral projection of one of said terminals and swingable into and out of contact with the lateral projection of the other terminal, said switch member lying along the side of the insulator structure in closed position, a connecting member rigid with one of said switch terminals and extending longitudinally therefrom for connecting said terminal to one of the lines to be connected, and means for connecting the other switch terminal to the other line to be connected.

15. In a switch, the combination of a rigid unitary insulator structure, a pair of fittings, one rigidly cemented to each of the opposite ends of said insulator structure and rigidly supported by said insulator structure, a pair of switch terminals each rigidly attached at one end to one of said fittings and rigidly supported upon the ends of the insulator and projecting at their opposite ends laterally from the insulator structure, and a switch member pivoted upon the laterally projecting end of one of said switch terminals and swingable into and out of contact with the laterally projecting end of the other terminal.

16. In a switch, the combination of a rigid unitary insulator structure, a pair of fittings, one rigidly cemented to each of the opposite ends of said insulator structure and rigidly supported by said insulator structure, a pair of switch terminals each rigidly attached at one end to one of said fittings and rigidly supported upon the ends of the insulator and projecting at their opposite ends laterally from the insulator structure, a switch member pivoted upon the laterally projecting end of one of said switch terminals and swingable into and out of contact with the laterally projecting end of the other terminal, and means on said switch terminals for connecting said terminals to the lines to be connected and disconnected.

In witness whereof, I hereunto subscribe my name this 30th day of October, 1924.

ERNEST H. JACOBS.