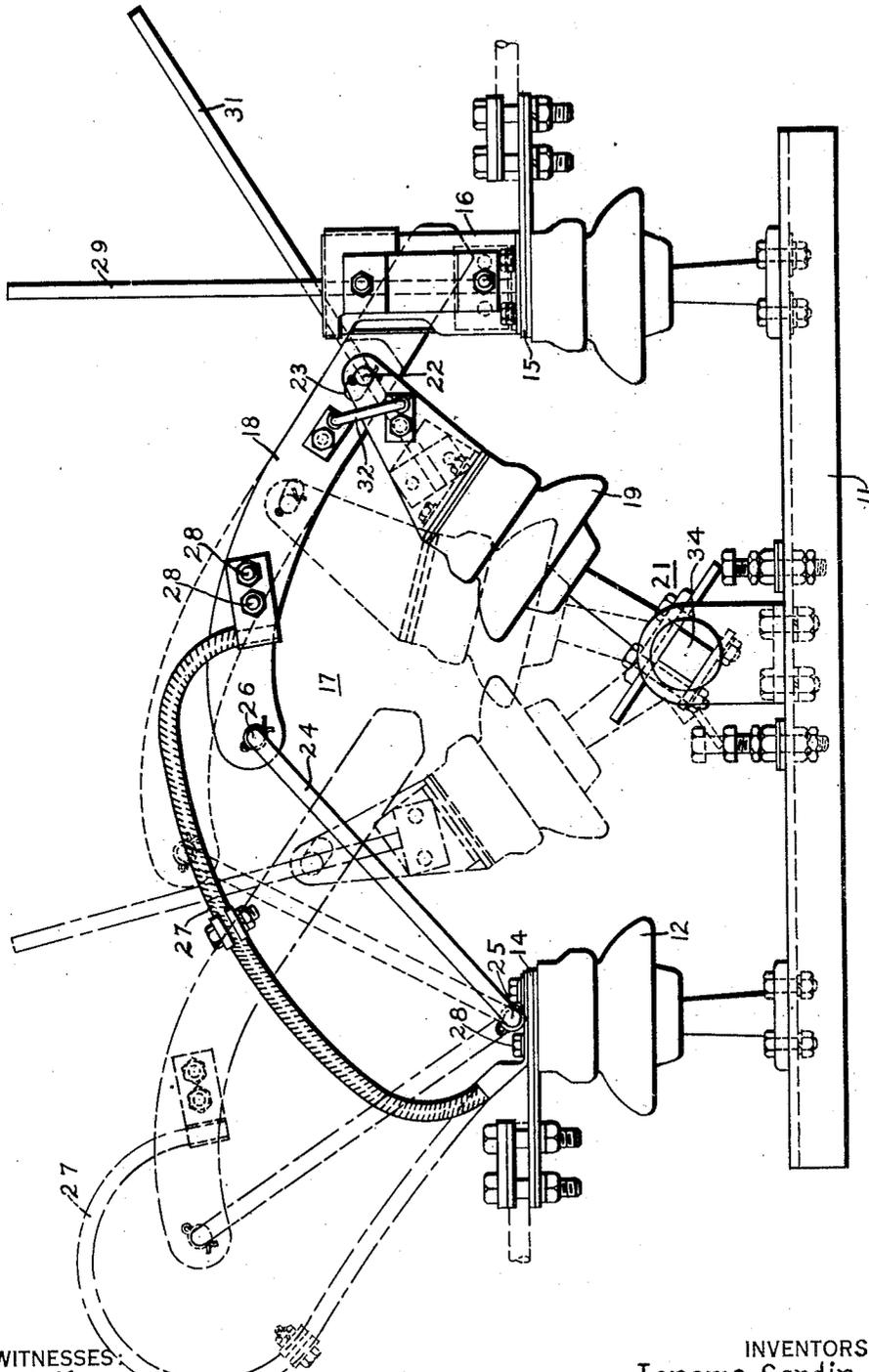


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J. SANDIN ET AL  
DISCONNECTING SWITCH

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# UNITED STATES PATENT OFFICE

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## DISCONNECTING SWITCH

Application filed April 2, 1927. Serial No. 180,379.

Our invention relates to switches and particularly to switches of the type known as disconnecting switches.

It is an object of our invention to provide a switch mechanism for interrupting the current flow in transmission lines at power houses, substations, transformer towers and the like for outdoor installations, particularly where the use of an automatic circuit breaker would be undesirable.

Heretofore, it has been the general practice, in the construction of switch mechanisms of this type, to provide a base member, a pair of spaced insulators, terminals for line wires on the insulators and a flexible shunt for making and breaking the connection between the terminals. A pair of links is usually provided for supporting the flexible shunt, the shunt being so fastened to the support as to come into contact therewith at a number of points.

The above-mentioned type of construction is undesirable because the friction of the shunt against the support causes wear and abrasion and also necessitates the use of considerable force to open and close the switch.

In Patent No. 1,705,684 issued March 19, 1929, assigned to Westinghouse Electric & Manufacturing Company, means is disclosed for predetermining the positions of the flexible shunt with respect to the support and for maintaining the shunt clear of all the members of the switch mechanism.

In our present invention, we make one member of the link-pair in the form of a copper switch blade and arrange it to engage the stationary jaws of the switch when the latter is closed. A glance at the drawing will render this construction evident. The blade is of such length as to render the use of a very long shunt unnecessary, thereby eliminating many difficulties that arise in the case of switches where long shunts are employed.

Another object of our invention is to provide a mechanism for causing the blade to engage, and be disengaged from the contact jaws with a straight-line motion. The desirability of this feature will be obvious to

those acquainted with the disconnecting-switch art.

Another object of our invention is to provide a disconnecting switch having a blade of such length as to reduce materially the length of the flexible shunt usually employed in a switch of this type, thereby preventing the shunt from twisting about in a more or less haphazard manner and coming into contact, at random, with other parts of the switch structure, and permitting the utilization of larger strands to prolong the life of the shunt.

Another object of our invention is to provide a disconnecting switch having means for producing a camming action on the switch blade during its initial opening movement and for thereafter guiding the blade in a straight-line movement with respect to the switch contact jaws.

These and other objects that may be made apparent throughout the further description of our invention are attained by means of the apparatus hereinafter described, and illustrated in the accompanying drawings, wherein

The single figure is a side view, in elevation, of a switch mechanism embodying our invention.

Our invention is best described by referring to the drawing wherein we provide a base member 11 which supports a pair of spaced insulators 12 and 13, terminal blocks 14 and 15 disposed on the respective insulators 12 and 13, contact jaws 16 disposed on the terminal member 15 and a mechanism 17 for electrically connecting the terminal member 14 to the contact jaw 16, the mechanism being adapted for effecting engagement with, or disengagement from the contact jaws in predetermined directions.

The mechanism 17 for cooperating with the contact jaws 16 comprises a blade 18 supported, at one end, by a link 24 and, at its other end, by an insulator 19 rotatably mounted in any suitable manner, as shown at 21. The insulator 19 has a pin 22 disposed on its upper end to engage a slot 23 provided in the blade member 18 to receive it and adapted to form a lost-motion connection between the blade 18 and the insulator 19.

The link 24 has its lower end connected to the terminal member 14, by means of a pivot 25 and its upper end connected to the switch blade by means of a pivot 26. The link thus supports the switch blade and predetermines its direction of travel to and from its closed position, as will be more fully explained hereinafter. A flexible shunt 27 electrically connects the terminal 14 to the blade 18, being fastened to the latter by any suitable means, such as screws 28.

The usual arcing horns 29 and 31 are provided to relieve the blade 18 and contact jaws 16 of any need to break the arc incident to the opening of the switch. The arcing horn 31 is rigidly connected to the rotatable insulator 19 and is electrically connected to the blade 18 by means of a flexible lead 32 so that the blade is left free to respond to the camming action caused by the movement of the stud 22 in the slot 23 of the blade, in accordance with the following description.

In the drawing, the switch mechanism has, for the sake of clearness, been illustrated in three different positions; "closed" position, denoted by heavy lines, "out" position, denoted by dotted lines, and "open" position, denoted by broken lines. To move the switch from its closed to its open position, the shaft 34 is rotatively actuated, by any suitable means, (not shown) in a counter-clockwise direction, thereby turning the insulator 19 to the left. The slot 23 is so disposed that movement of the stud 22 therein causes a slight camming action upon the blade 18, thus breaking any corrosive seal or ice-coating that may have formed between it and the contact jaws. The initial force effecting the actual opening movement of the blade 18 is produced by the stud 22 pressing against the left face of the slot 23. The blade, being pivotally supported at one end by the stud 22 and at the other end by the pivot 26 and cooperating link 24, is disengaged from the contact jaws 16, with a straight-line movement, from its closed position to the "out" position indicated by the dotted lines in the drawing.

By the use of the blade 18, instead of the usual link and short contact member heretofore employed, we materially decrease the length of the shunt 27, thus rendering the shunt more rigid and avoiding danger of making random contacts.

The movement of the blade 18 in a straight line, as referred to above, is made possible through the link 24 cooperating with the movable insulator 19, and it can be seen that, when the insulator 19 moves either toward or away from the contact jaws, the link 24, by reason of being pivotally mounted on the terminal member 14 and pivotally connected to the left end of the switch blade 18, cooperates with the insulator 19 to impart to the blade 18 a substantially longitudinal mo-

tion, as contrasted with the rotary movement more usual in knife-blade switches.

While we have described and illustrated only one embodiment of our invention, it will be apparent to those skilled in the art that certain changes, modifications, substitutions, additions and omissions may be made in the mechanism without departing from the spirit and scope of the appended claims.

We claim as our invention:

1. A switch mechanism including contact jaws, a switch blade, having a slot therein, a pivotally mounted insulator for actuating and supporting the blade having a projection thereon associating with the slot for engaging a wall of the slot for initially forcing the blade in a radial direction with respect to the axis of rotation of the insulator when the insulator is first moved to open the switch.

2. A switch mechanism including contact jaws, a switch blade having a slot therein, a movable insulator for actuating and supporting the blade having a projection thereon associating with the slot for engaging a wall of the slot and camming the blade with respect to the jaws when the insulator is moved to open the switch.

3. A switch mechanism including contact jaws, a switch blade associated therewith, a fixed insulator, a movable insulator for actuating the blade pivotally mounted between the said jaws and insulator, a link pivotally connecting the fixed insulator and the said blade for controlling the movement of the blade, and a driving connection between the movable insulator and the said blade for imparting a relatively short bodily movement to the blade with respect to the movable insulator during a relatively long initial travel of the movable insulator toward the open position and for positively driving the blade with the movable insulator after it has traveled a predetermined distance.

In testimony whereof, we have hereunto subscribed our names this 30th day of March, 1927.

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