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DISCONNECTING SWITCH

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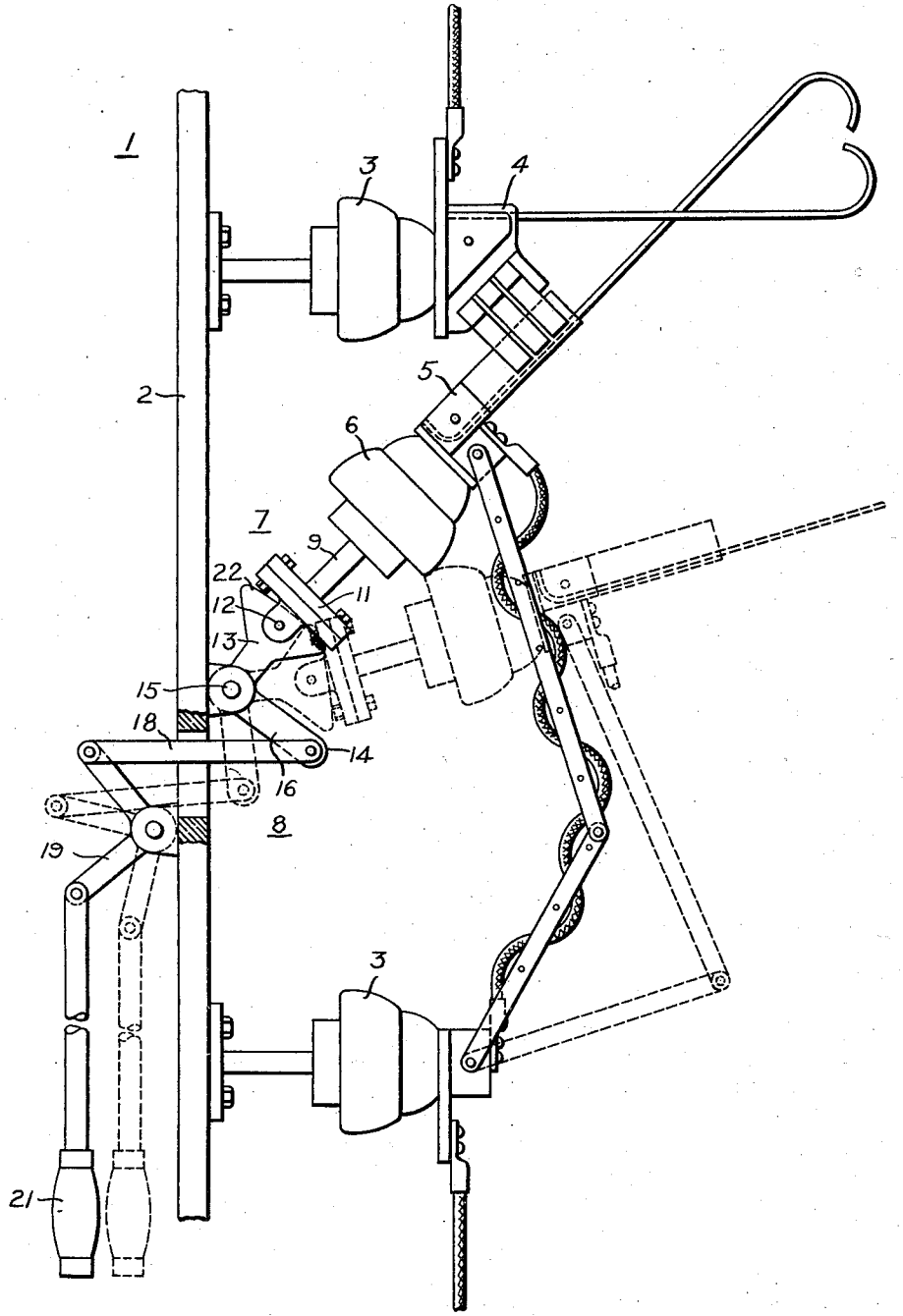

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UNITED STATES PATENT OFFICE

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DISCONNECTING SWITCH

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My invention relates to electrical transmission apparatus, and particularly to disconnecting switches.

One object of my invention is to provide a disconnecting switch for out-of-door use that shall be capable of breaking a coating of ice when the movement of separation between the contact members begins.

Another object of my invention is to provide a supporting and actuating mechanism for out-of-door disconnecting switches that shall impart an initial movement to the switch blade for the purpose of breaking a coating of ice.

In disconnecting switches for out-of-door use, trouble is frequently experienced by reason of the contact jaws freezing together and, when it is desired to separate them, such force must be applied thereto as may break the porcelain insulators that support the moving contact member.

I propose to avoid this difficulty by providing such lost-motion connection in the operating mechanism that the moving contact member is given a slight wiping movement across the stationary contact member for the purpose of cracking such a coating of ice before the contact members start to separate.

The accompanying drawing is a view, partially in elevation and partially in section, of a disconnecting switch embodying my invention.

My invention comprises a disconnecting switch 1 comprising the usual base 2, terminal members 3, one of which supports a stationary contact member 4, and a movable contact member 5 that is mounted on an insulator 6 connected, through a lost-motion connection 7, to an operating mechanism 8.

The terminal members 3, stationary contact member 4 and movable contact member or switch blade 5 may be of any preferred type. The switch blade 5 is mounted on the insulator 6 that, in turn, is connected, by a support 9, to a flange 11. The flange 11 is pivotally supported by a pintle 12 upon an arm 13 of a bell crank 14. The bell crank 14 is mounted on a shaft 15 secured to the base 2. The other end 16 of the bellcrank 14 is connected to the actuating mechanism 8 which comprises a link 18 extending through the base 2 and a second bell crank 19 to which is attached an operating handle 21.

The lost-motion connection 7 comprises the flange 11, the pintle 12 and the crank arm 13. The latter has an elongated and curved outer surface that bears against the under surface of the flange 11 so that there is a certain amount of turning movement about the pintle 12 before the surface 22 engages the flange 11, after which the two members move as a unit.

To operate the disconnecting switch, handle 21 is pulled downwardly, which movement is transmitted through the lever system 8 to turn the bell crank 14 in a clock-wise direction. The initial turning movement of the crank arm 13 produces a relative turning movement between it and the flange 11 about the pintle 12. This movement causes the switch blade 5 to turn relatively to the stationary contact member 4 but not to depart therefrom.

The foregoing movement of the switch blade 5 is sufficient to break any coating, or mantle, of ice that may enclose it and the stationary contact member 4, since ice is relatively weak when placed in tension. A further turning movement of the bell crank 14 causes the surface 22 of the crank arm 13 to firmly engage the undersurface of flange 11, thereby preventing further turning movement about the pintle 12. Thereafter, the switch blade 5 is moved away from the stationary contact member 4 in the arc of a circle about the shaft 15, in a manner well-known in the art.

Accordingly, I have provided a disconnecting switch in which a lost-motion connection is provided between the supporting insulator for the switch blade and the actuating mechanism in order that the switch blade may be given a slight wiping or turning movement relative to the stationary contact member before the contact members definitely start to separate.

It is to be understood that various changes in the arrangement and details of the component parts of my invention may be made within the scope of the appended claims.

I claim as my invention:

1. In a disconnecting switch, a pair of spaced terminal members, a movable contact member for completing the circuit between the terminal members, operating means for the movable contact member comprising a system of levers and an insulator supporting the movable contact member and having a lost-motion connection to one of the said levers.

2. In a disconnecting switch, a pair of spaced terminal members, a movable contact member for completing the circuit between the terminal members, operating means for the contact member comprising a system of levers and an insulator supporting the contact member and pivotally mounted on one of the said levers.

3. In a disconnecting switch, a pair of spaced terminal members, a movable contact member for completing the circuit between the terminal members, operating means for the contact member comprising a system of levers, an insulator supporting the contact member and pivotally mounted on one of the said levers, and means for limiting the pivotal movement of the insulator.

4. A movable switch arm for a disconnecting switch comprising a supporting shaft, a crank connected thereto, actuating means connected to one arm of the crank, an insulator having a lost-motion connection to the other arm of the crank, and a contact member supported by the insulator.

5. A movable switch arm for a disconnecting switch comprising a supporting shaft, means for actuating the shaft, a contact member, a supporting insulator for the contact member, and a link for supporting the insulator in such a manner as to permit angular movement therebetween and mounted on the shaft to permit angular movement thereabout.

6. A movable switch arm for a disconnecting switch comprising a supporting shaft, means for actuating the shaft, a contact member, a supporting insulator for the contact member, and means for supporting the insulator adapted to permit angular movement therebetween and angular movement about the shaft.

7. A movable switch arm for a disconnecting switch comprising a supporting shaft, a crank connected thereto, actuating means connected to one arm of the shaft, another arm of the crank terminating in a curved surface, an insulator pivotally mounted on the last named crank arm and having a lost-motion connection relative to the curved surface, and a contact member carried by the insulator.

8. In a disconnecting switch, a pair of spaced terminal members, a movable contact member for completing the circuit between the terminal members, operating means for the movable contact member comprising a system of levers, an insulator for supporting the movable contact member for angular movement with a lever and means joining the insulator to the lever adapted to provide an angular movement to the insulator about the engaged contact before the said angular movement of the insulator with the lever.

9. In a disconnecting switch, a pair of spaced terminal members, a movable contact member for completing the circuit between the terminal members, operating means for the contact member including a pivoted member and an insulator for supporting the contact member on the pivoted member in such a manner as to impart an angular movement to the insulator about the contact member before it is moved angularly with the pivoted member.

10. In a disconnecting switch, a pair of spaced terminal members, a movable contact member for completing the circuit between the terminal members, a bellcrank pivoted on a supporting pin, an insulator for supporting the contact member, means for pivotally mounting the insulator on one leg of the bellcrank and operating means attached to the other leg of the bellcrank adapted to impart an angular movement to the insulator first about the contact member and thereafter about the supporting pin.

In testimony whereof, I have hereunto subscribed my name this 5th day of August, 1926.

ALFRED T. TWISS.