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2,788,403

ELECTRICAL ISOLATING SWITCHES

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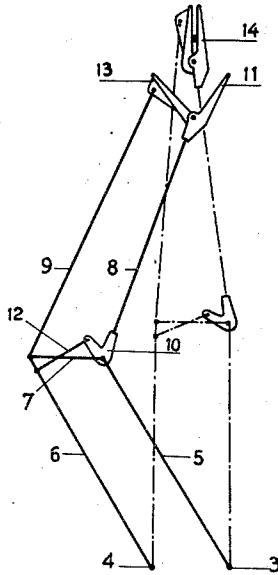


Fig. 1

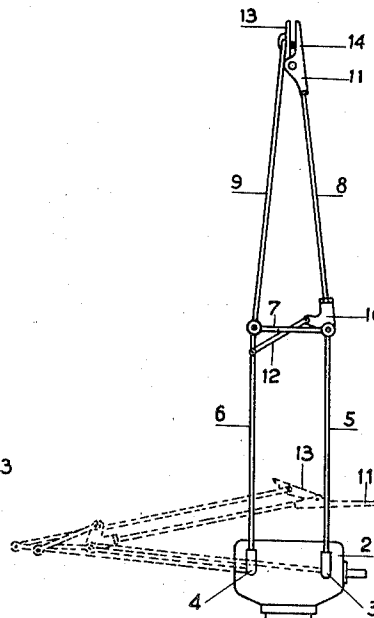


Fig. 2

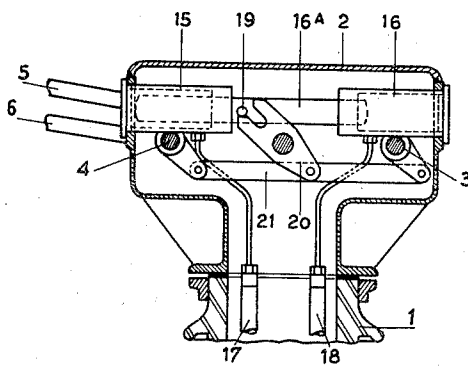


Fig. 3

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ELECTRICAL ISOLATING SWITCHES

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5 Claims. (Cl. 200—48)

This invention relates to improvements in overhead electrical isolating switches with articulated arms. More particularly it relates to switches that reduce the lateral space occupied by this type of apparatus in the isolating or open position, and to an improvement in the operation of the contacts in the closed position.

According to the invention, the kinematic system formed by the articulated arms folds to one side only in relation to the vertical axis of the device. The kinematic system comprises lower arms pivoting on a support and upper arms arranged so as to be displaced substantially in vertical position, a movable contact member having a pair of jaws which, in the raised position of the arms, close upon and engage a stationary contact located above the kinematic system.

The invention is hereinafter described with reference to the accompanying drawings which show a preferred embodiment by way of example. In the drawings:

Fig. 1 is a kinematic diagram of the articulated arms of a switch in accordance with the invention.

Fig. 2 is a side elevation of the switch and

Fig. 3 is an enlarged fragmentary part-sectional view of the driving mechanism, with the arms in folded position and the switch open.

As shown in Fig. 1 schematically and specifically in Fig. 2 the switch is mounted upon a support 1, in the form of a porcelain insulator which may be of the oil-filled type, and carrying on top a metal box 2 which encloses the switch driving mechanism hereinafter described. The box 2 is fitted with two parallel horizontal driving shafts 3 and 4 (Fig. 3), at the outer extremities of which are keyed the substantially parallel pivoting arms 5 and 6. The latter are connected by a cross-link 7 at their free ends. Two upper arms 8, 9 are pivotally connected to pivoting arms 5 and 6. Positioned between arms 5 and 8 is bell-crank lever 10 with arm 5 pivotally connected to it. The bell-crank 10, has two arms one of which is carrying the upper arm 8. The latter terminates at a first jaw 11. The other arm of the bell-crank 10 is connected by a sloping cross-link 12 to arm 6 at a selected point spaced from the cross-link 7. A second jaw 13 is pivotally connected to the first jaw 11 and upper arm 9 is connected to this jaw 13.

The shape of the bell-crank lever 10, the position of the link 12 and the arrangement of the jaw 13 are selected in such a way that during the lowering movement of the arms 5 and 6 towards the open position, represented in dotted lines in Fig. 2, the jaws 11 and 13 open out about their hinge as they descend. When the arms move in the opposite substantially vertical direction, the jaws 11 and 13 close upon a conductor such as 14 with which the isolating switch is to establish contact in the upper closed position, which is indicated in broken lines in Fig. 1.

Fig. 3 shows the mechanism for driving the shafts 3 and 4, which carry the respective pivoting arms 5 and 6. Two cylinders 15 and 16, which co-operate with a common plunger or piston 16A, receive liquid under pres-

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sure by way of insulating pipes 17 and 18. The piston 16A carries a cross-piece 19 adapted to engage a rocker arm or cam 20 which by means of a link 21 actuates in the desired direction the shafts 3 and 4 on which the arms 5 and 6 are mounted.

It will thus be seen that the isolating switch has articulated arms which fold to only one side in relation to the vertical axis of the arrangement, and that in folding the arms are displaced in such a manner that the lateral space occupied in the open position is at a minimum, thus permitting the switch to be used in restricted spaces. Furthermore, positive contact with an overhead conductor is assured when the arms are in a raised position and the switch closed.

It is obvious that the form of embodiment which has been described and illustrated can be modified in various manners within the scope of the appended claims. In particular, the pivoting arms 5 and 6 can be driven hydraulically, or mechanically by means of appropriate insulating linkage. In the latter case, the box 2 can be mounted upon a dry insulator without oil.

What I claim and desire to secure by Letters Patent is:

1. An electrical isolating switch of the type co-operating with a fixed overhead conductor and having a kinematic system of articulated arms adapted to fold to one side only in relation to the vertical axis, said kinematic system comprising an actuating mechanism, two driving shafts, two lower arms carried by said shafts, two upper arms pivotally connected to said lower arms, a pair of contact jaws selectively connected to said upper arms, a cross-link interconnecting the free ends of said lower arms, a bell-crank lever interposed between one of said lower arms and one of said upper arms, and a sloping link between a selected point of the other of said lower arms and said bell-crank lever, one of said jaws is fixed upon the free end of one of said upper arms and the other jaw is pivotally connected to both free ends of said upper arms.

2. An isolating switch according to claim 1, in which the position of said sloping link is selected so as to determine a substantially vertical movement and closure of said contact jaws upon said overhead conductor.

3. An isolating switch in accordance with claim 1, in which said actuating mechanism includes a plurality of shafts rotatably mounted and connected to said arms, and mechanical means to rotate said shafts in unison so as to open and close said switch.

4. An isolating switch according to claim 1, in which the position of said sloping link is selected so as to determine a substantially vertical movement and closure of said contact jaws upon said overhead conductor.

5. An electrical isolating switch comprising: a switch actuating mechanism, two lower spaced arms substantially parallel and pivotally connected to said mechanism, a first cross-link transverse to and connecting said lower arms, a bell-crank pivotally connected to the free end of one of said lower arms and having two crank arms, two upper arms pivotally connected to said lower arms with one of said upper arms being carried by one of said bell-crank arms, a second cross-link connected to the other of said bell-crank arms and being connected to the other lower arm at a selected point spaced from said first cross-link, a first jaw fixed upon the upper arm which is carried by the bell-crank and being so disposed as to form an extension of said upper arm, a second jaw pivotally connected to said first jaw and being pivotally connected to the other upper arm.

References Cited in the file of this patent

UNITED STATES PATENTS

2,748,121

Butz ----- May 29, 1956