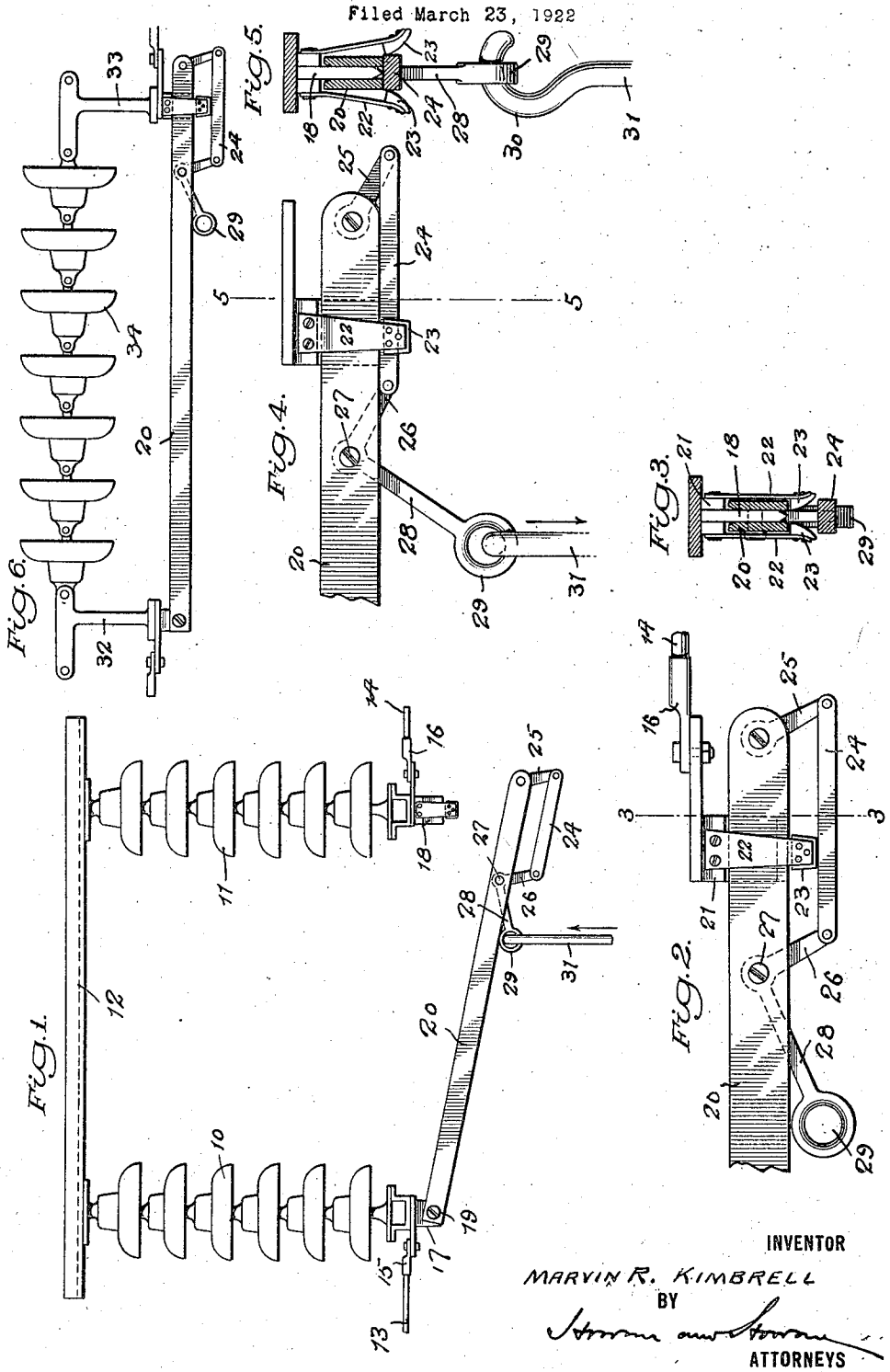
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M. R. KIMBRELL

ELECTRIC SWITCH

Filed March 23, 1922



INVENTOR

MARVIN R. KIMBRELL

BY

ATTORNEYS

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UNITED STATES PATENT OFFICE.

MARVIN R. KIMBRELL, OF CHARLOTTE, NORTH CAROLINA, ASSIGNOR, BY MESNE ASSIGNMENTS, OF ONE-HALF TO MEMCO ENGINEERING & MANUFACTURING CO., INC., OF LONG ISLAND CITY, NEW YORK, A CORPORATION OF NEW YORK.

ELECTRIC SWITCH.

Application filed March 23, 1922. Serial No. 546,002.

To all whom it may concern:

Be it known that I, MARVIN R. KIMBRELL, a citizen of the United States of America, residing at Charlotte, in the county of Mecklenburg and State of North Carolina, have invented certain new and useful Improvements in Electric Switches, of which the following is a specification.

My invention relates to electric switches, and particularly to disconnecting switches for high voltage power lines. The object of my invention is to provide a switch latch and releasing mechanism of improved construction having certain novel characteristics hereinafter described or illustratively embodied in the accompanying drawings, in which—

Fig. 1 is a side elevation of a switch installation in which my invention is embodied in one form and illustrating the position of the parts during the closing operation of the switch;

Fig. 2 is a partial side elevation drawn to a larger scale showing the switch in fully closed position;

Fig. 3 is a section on the line 3—3, Fig. 2;

Fig. 4 is a partial side elevation showing the position of the latch disengaging member at the initiation of the opening movement of the switch;

Fig. 5 is a section on the line 5—5, Fig. 4; and

Fig. 6 is a side elevation of a modified arrangement of the switch in which the switch terminals are connected to the opposite ends of a string of suspension insulators instead of at the ends of two distinct piles of post insulators as illustrated in Fig. 1.

It has heretofore been suggested to provide a latch to retain the blade of a disconnecting switch in closed position. So far as I am aware, however, the latching devices heretofore suggested are dependent for their proper operation upon a more or less exact spacing of the switch terminals with relation to each other. Under service conditions, however, this exact spacing is frequently not maintained, with the result that the latching device itself is inoperative, or the latch-opening device is inoperative, so that either the switch is not securely maintained in closed position, or if maintained in closed position it is not possible to open it by the means intended for that purpose. By the present invention I have provided a latch and latch-opening device of such character that both are operative regardless of variation in spacing between the switch terminals.

Referring to Fig. 1, the switch installation comprises a pair of post insulators 10 and 11 hung from a support 12 of any suitable character. The line wires 13 and 14 are connected by clips 15 and 16 to the switch terminals 17 and 18 respectively. To the terminal 17 is hinged at 19 the switch bar 20, here in the form of a pair of bars which straddle the switch terminal 17 at one end, and the terminal plate 18 toward the opposite end of its length.

Associated with the terminal 18 are spacing blocks 21, to the outer faces of which are secured spring plates 22, which carry at their lower ends beveled latching dogs 23. When the switch is closed, the bars 20 of the switch blade engage the beveled faces of the dogs 23, spreading the latches and permitting the blades to straddle and engage the switch terminal 18, as clearly shown in Fig. 3. When the switch is fully closed the dogs are retracted by their spring arms 22 to engaging position beneath the lower edges of the switch bar, thus holding the latter against escape from switch-closing position.

The latch-opening device comprises a spreader bar 24 connected at one end by a link 25 to the end of the switch bar, and by one arm 26 of the bell crank lever pivoted at 27 to the switch bar at a point spaced from the end of the latter, and having a second arm 28 terminating in an eye 29 to receive the hook end 30 (Fig. 5) of a switch-opening pole 31. The spreader bar 24 is

of a width substantially corresponding to the width of the switch bar 20, and in the closed position of the switch, underlies the latch dogs 23. When the switch is to be opened, the hook 30 of the pole 31 is inserted in the eye 29 of the bell crank lever 26—28. As the pole is drawn downward to open the switch, its initial downward movement swings the bell crank lever on its pivot 27, forcing the spreader bar 24 upward between the latching dogs 23 and moving the latter in opposite directions out of obstructing position beneath the lower edge of the switch bar (see Fig. 5). The switch bar is now free to move downward, and a further downward pull on the pole 31 effects the opening of the switch. To close the switch the hook of the pole 31 is again inserted in the eye 29 of the bell crank lever, pressing the arm 28 upward and thus positively shifting the spreader bar 24 away from the switch bar 20, so that when the switch bar is shoved fully home into engagement with the switch terminal 18, the latching dogs 23 are free to snap under the switch blade to lock it in closed position. The spacer blocks 21 serve as stops which limit the upward movement of the blade to an extent sufficient to bring the spreader 24 into engagement with the latching dogs.

It is obvious that a variation in the spacing of the switch terminals 17 and 18 under various conditions of strain on the line wires 13 and 14, incident to the loading of the latter with sleet, snow or heavy wind, does not affect either the engagement of the latching dogs 23 with the switch blade, or the effectiveness of the spreader bar 24. The only result of such variation in spacing is a difference in position of the terminal 18 with respect to the free end of the switch blade. The length of the blade 20, and of the spreader bar 24 may be made sufficient to cover any possible variations of spacing which may occur within the limits of the mechanical strains which the insulators 10 and 11 are capable of withstanding. Moreover, the construction is such that it automatically takes care of possible inaccuracies in the connection between insulator units, and of the mounting of the insulators on the support 12, as well as a variation in the mounting of the switch terminals on the posts.

In Fig. 6 I have shown the switch mounted on terminal fittings 32 and 33 at opposite ends of the strain insulator 34. In other respects the switch and latching device are the same as that just described. While I have shown the present invention applied to a switch bar of the double blade type, it is obvious that the idea is equally applicable to a switch in which the bars of a single blade type are adapted to be engaged between a pair of terminal clips. Modifications of structure to effect this are within the skill of any one familiar with the art.

It may be pointed out, furthermore, that as an incident to the parallel ruler arrangement of the spreader 24 with relation to the switch bar 20, the effort required to spread the latches 23 is uniform, regardless of the longitudinal spacing of the contact 18 and latches 23 from the pivot axis 27 of the bell and crank at the moment the switch is opened. In this respect the arrangement has a marked advantage over a simple lever construction, in which one arm of the lever is used to open the latches —since, in the latter construction, the greater the distance from the lever pivot to the latches, the greater the effort required to spread the latches.

I claim—

1. An electric switch having a movable blade, latching means engaging the blade to hold it in circuit closing position, and a latch-freeing member mounted on the blade and having a parallel ruler motion with respect thereto.

2. An electric switch having a movable blade, latching means engaging the blade to hold it in circuit closing position, and a latch-freeing member mounted on the blade and having a parallel ruler motion with respect thereto, together with an operating lever pivotally connected to said blade and latch-freeing member.

3. An electric switch comprising a pair of switch terminals subject to variation in spacing, a switch blade pivoted to one of said terminals and movable into engagement with the other terminal, latching means for holding the switch blade in closed switch position, lever means carried by the switch blade and operative to free the latching device at variable spacing of the switch terminals, said lever means including a spreader bar having a parallel ruler motion with respect to the switch blade.

4. An electric switch having a blade pivoted at one end and movable at its opposite end to open and closed circuit position, latching means engaging the free end of said bar to hold it in closed circuit position, in combination with a latch-freeing member mounted at the free end of said bar and comprising a spreader having a parallel ruler motion with respect to the bar, together with a bell crank lever pivoted to the bar and having one arm pivotally connected to the spreader.

5. An electric switch having a blade pivoted at one end and movable at its opposite end to open and closed circuit position, latching means engaging the free end of said bar to hold it in closed circuit position, in combination with a latch-freeing

member mounted at the free end of said bar and comprising a spreader having a parallel ruler motion with respect to the bar, together with a bell crank lever pivoted to the bar and having one arm pivotally connected to the spreader, the other arm of said bell crank having at its free end means for engagement by an operating rod, said free end of the bell crank operating arm having a movement away from the switch bar to render the spreader operative, and a movement toward the bar to render the spreader inoperative.

In testimony whereof I have signed my name to this specification.

MARVIN R. KIMBRELL.