

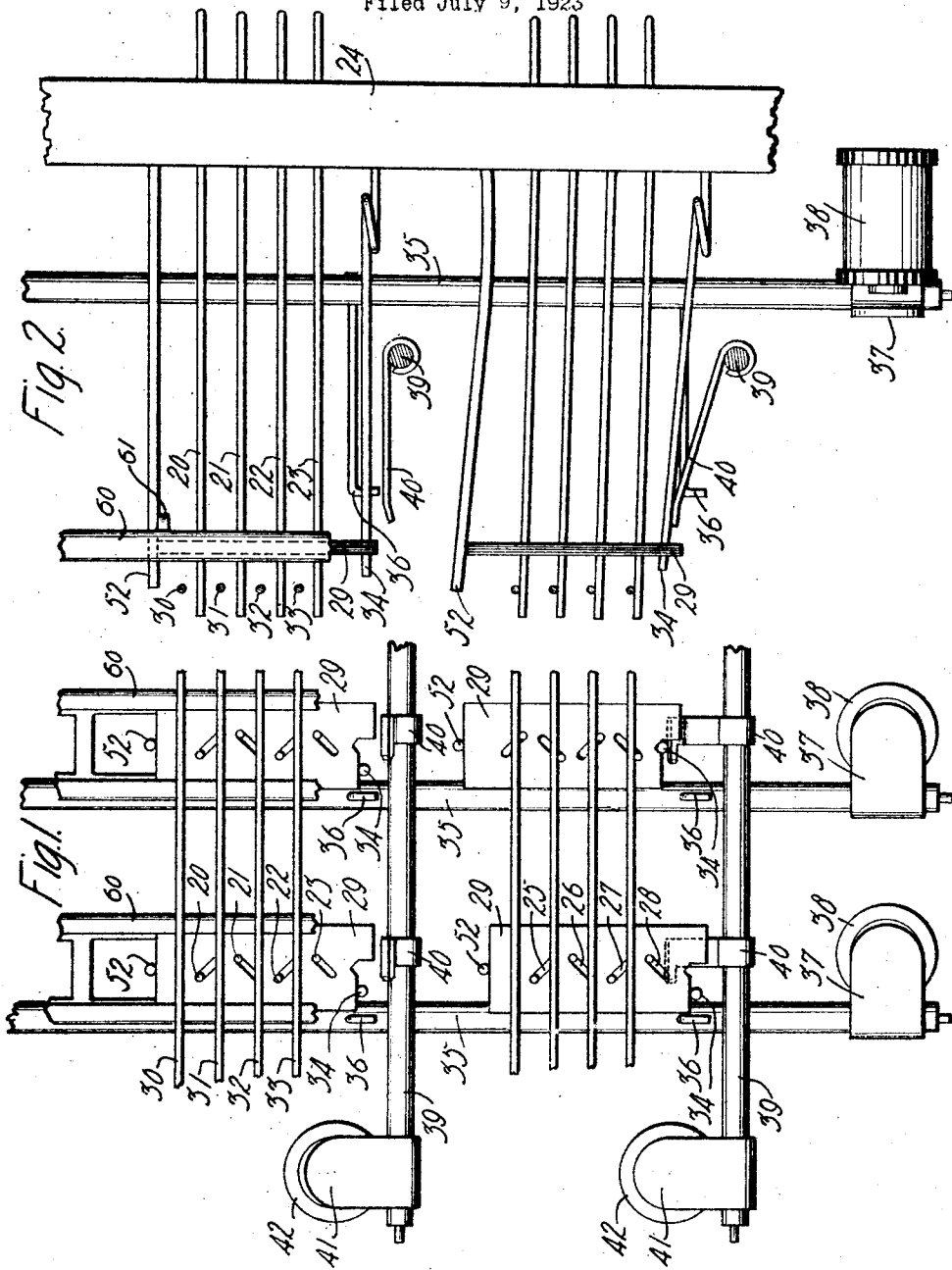
Aug. 25, 1925.

M. B. KERR

1,551,033

AUTOMATIC SWITCH

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Inventor:
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MARK B. KERR, OF ROSEBANK, NEW YORK, ASSIGNOR TO WESTERN ELECTRIC COMPANY, INCORPORATED, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

AUTOMATIC SWITCH.

Application filed July 9, 1923. Serial No. 650,265.

To all whom it may concern:

Be it known that I, MARK B. KERR, a citizen of the United States of America, residing at Rosebank, in the county of Richmond and State of New York, have invented certain new and useful Improvements in Automatic Switches, of which the following is a full, clear, concise, and exact description.

This invention relates to automatic switching apparatus and more particularly to the switches of the type known as coordinate switches adapted for establishing connections in an automatic or semi-automatic telephone exchange system.

The object of the invention is to provide a switching device of the type referred to above, in which certain sets of active contacts are moved selectively into engageable relation with sets of associated grid wires in a simple and positive manner and wherein the number of operating parts is reduced to a minimum.

A feature of the invention resides in mounting the card lifting fingers on stationary supports together with the provision of selecting bars having camming members for moving the lifting fingers served thereby collectively into operable relation with respectively associated operating arms.

Another feature is the provision of means whereby the free end portions of the lifting fingers are adapted to be moved in a plurality of different directions for selectively moving their associated active contacts into engagement with associated passive contacts through the movement of cooperating bars therefor.

Another feature is the provision of means for moving the selected card lifting finger out of engageable relation with its respectively associated operating arm wherein any subsequent movement of the selecting bar is ineffective to disturb the connections already established.

Other features and advantages will appear from the following description, in which Fig. 1 is a partial front assembly view of said switch showing one set of active contacts in engagement with its associated grid wires. Fig. 2 is a right side view thereof.

Similar reference characters refer to similar parts throughout the several views.

The switch structure shown in Fig. 1 generally consists of a plurality of sets of active contacts arranged in coordinate rows on in-

sulating supports 24, one of which is shown in Fig. 2. Each set of active contacts generally consists of a plurality of bare wires 20, 21, 22 and 23 which are fixedly arranged in their respectively associated insulating supports 24. These supports are disposed in parallel relation to each other and are secured at both ends to the switch frame (not shown). The structure may be of any desired width and height to accommodate as many vertical rows of active contact sets and as many sets per row as may be required. The active contact wires 20, 21, 22 and 23 extend laterally from both sides of supports 24, one end being adapted to be normally connected to incoming wire conductors (not shown) and the other end extending through oblique apertures 25, 26, 27 and 28 in an operating card 29 in juxtaposition with associated grid wires 30, 31, 32 and 33, disposed coordinately to their associated active contacts 20, 21, 22 and 23, and held securely at each end in a frame (not shown).

The operating cards 29 of each vertical row are slidably arranged in a suitable guiding member 60 provided with stops adapted to hold the retracting springs 52 and their associated operating cards 29 in adjusted position with reference to their associated active contacts 20, 21, 22, 23, etc. For each set of active contacts 20, 21, 22 and 23, there is associated a resilient operating finger 34, which is secured in the insulating support 24, and the free ends of which extend in operable relation with their respectively associated operating cards 29.

For each vertical row of active contacts there is provided a vertically disposed rotatable bar 35, each provided with a plurality of laterally extending arms 36, each associated with an operating finger 34. On one end portion of each bar 35 there is securely arranged an armature 37 adapted to rotate its associated bar 35 and the arms 36 carried thereby in response to the energization of an electromagnet 38. For each horizontal row of active contacts there is provided a horizontally disposed rotatable bar 39, on which the operating arms 40 are secured. Each arm 40 is associated with a card 29 and an operating finger 34. It is to be noted that normally the arm 40 is free to move alongside of its associated operating finger 34 without engaging it as shown in the lower left hand example in Fig. 1.

On one end portion of bar 39 there is secured an armature 41 adapted to rotate its associated bar and the operating arms 40 carried thereby in response to each energization of electromagnet 42. When the bar 35 is moved from normal to operated position, the operating arms 36 carried thereby move their associated operating fingers 34 collectively into operative engagement with their operating arms 40, whereby a movement of operating bar 39 is effective to move the card located at the intersecting point of the particular bar 35 and the particular bar 39. The active contacts served thereby are moved into contacting engagement with their associated grid wires. The operating finger 34 is thereupon held out of operable relation with member 36 by virtue of the camming action of the card 29 and the bar 35 may be returned to normal position to participate in the establishment of other coexisting connections without disturbing the connection already established. The bar 39 together with operating arms 40 carried thereby remain in operated position throughout the duration of the connection. Upon the termination of the connection, magnet 42 is deenergized and bar 39 rotates to normal position whereupon the finger 34 releases the card 29 and the switching device is returned to normal.

This invention is an improvement of the type of switch disclosed in Patent No. 1,515,735, granted to Charles L. Goodrum et al. on November 18, 1924.

What is claimed is:

1. In a coordinate switch structure, the combination of active and passive contact sets, an operating card for each set of said active contacts, means for operating said cards comprising a plurality of resilient members, stationary supports for said members, rotatable bars for moving said members in operable relation with a plurality of said cards collectively, and other bars for moving said members into engagement with said plurality of cards to cause the cooperation of said active and passive contacts.

2. In a coordinate switch structure, the combination of sets of active contacts arranged in a row, an insulating support therefor, sets of passive contacts associated with said sets of active contacts, a selecting member for each of the first mentioned sets arranged on said support and adapted to be flexed in coordinate directions, a movable bar for operatively engaging said members collectively, and means for operating said members individually to cause the inter-engagement of a set of active and passive contacts.

3. In a switching structure, the combination of sets of active contacts, insulating supports therefor, sets of passive contacts associated with said active contacts, a resilient

member for each set of said active contacts arranged securely on said supports, means for collectively moving a plurality of said members, a rotatable bar for each set of said passive contacts, and means carried by said bar for operatively engaging said plurality of said members while held in actuated position for engaging said active and passive contacts.

4. In a coordinate switch structure, passive contacts, active contacts associated therewith, insulating supports for said active contacts, selecting members arranged on said supports and adapted for horizontal and vertical flexure, a bar, operating arms carried by said bar for moving said members vertically but normally out of operable relation therewith, another bar and means carried by the second mentioned bar for moving said members horizontally wherein a movement of the first mentioned bar is capable of interengaging said active and passive contacts.

5. In a switching device, the combination of sets of active and passive contacts, an upright support for each row of said active contacts, a loosely mounted operating card supported on each of said sets of active contacts, a resilient lifting finger for each set of active contacts arranged in said support and adapted to be moved in a horizontal and a vertical direction sequentially, a pair of rotatable bars for selectively operating said active contacts, cams attached to one of said bars, operating members arranged on the other, a magnet for operating the first mentioned bar for moving said fingers horizontally in operable relation with said operating cards and said members collectively, and a magnet for operating the second mentioned bar for moving one of said fingers vertically to cause an interengagement of said active and passive contacts selectively.

6. In a switching structure, sets of active contacts, insulating supports therefor, an operating card loosely mounted on each of said sets, sets of passive contacts associated with said sets of active contacts, a mechanism for operating said active contacts consisting of coordinately disposed bars, resilient members fixedly arranged on said supports and adapted to be moved in a plurality of directions sequentially, said members having their free end portions movable collectively through their engagement with one of said bars to position themselves in operable relation with said operating cards, and individually through the movement of another bar for moving one of said operating cards to effect an interengagement of said active and passive contacts.

7. In a switching device, sets of normally disengaged active and passive contacts, a stationary support, an operating mechanism

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therefor consisting of lifting fingers secured to said support and movable operating cards associated with said active contacts, selective and operating bars associated with
5 said fingers, camming members carried by the selecting bar for moving the free end portions of said fingers in operative relation with said operating cards collectively,
10 and operating arms carried by the operating bar for moving said fingers selectively for engaging said contacts, said operating arms in conjunction with the movable operating cards being adapted to hold said fingers out of the path of said members wherein a subsequent movement of the selecting bars is ineffective to disturb a connection already established. 15

In witness whereof I hereunto subscribe my name this 26th day of June, A. D., 1923.

MARK B. KERR.