Jan. 20, 1925.

A. H. ADAMS

1,523,383

SELECTOR

Filed May 5, 1922

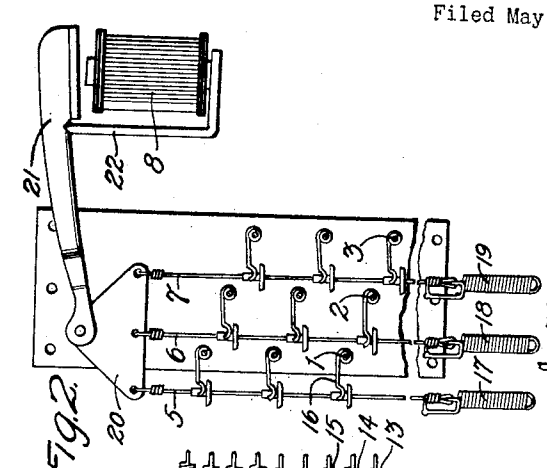


Fig. 2.

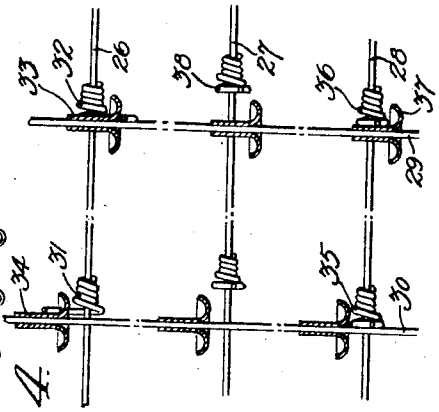


Fig. 4.

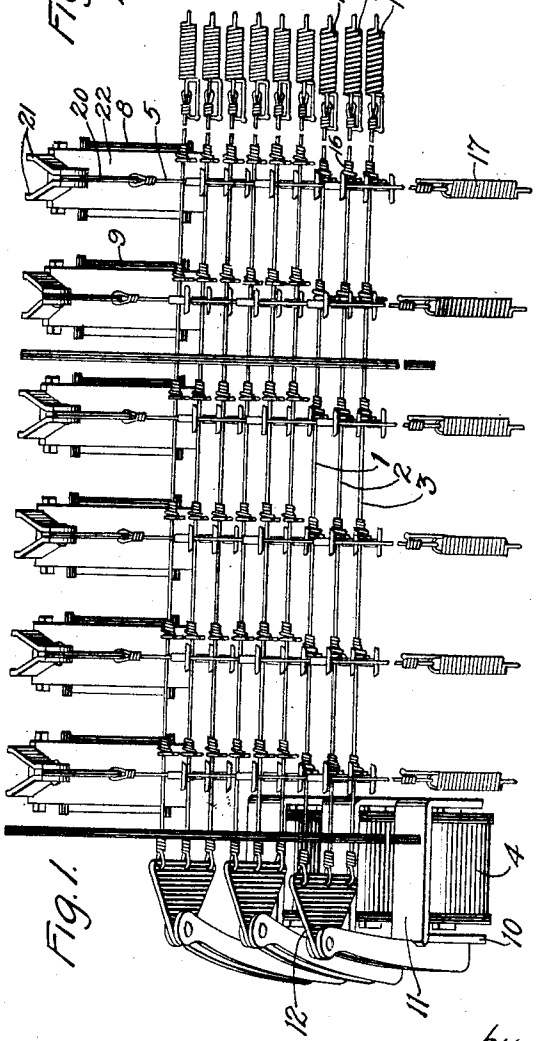


Fig. 1.

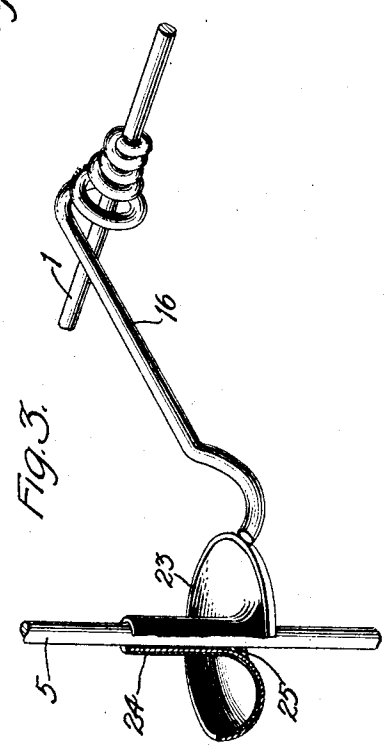


Fig. 3.

Inventor
Arthur H. Adams
by W. E. Beatty. Att'y

Patented Jan. 20, 1925. 1,523,383

UNITED STATES PATENT OFFICE.

ARTHUR H. ADAMS, OF LAKEVILLE, CONNECTICUT, ASSIGNOR TO WESTERN ELECTRIC COMPANY, INCORPORATED, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

SELECTOR.

Application filed May 5, 1922. Serial No. 558,802.

To all whom it may concern:

Be it known that I, ARTHUR H. ADAMS, a citizen of the United States, residing at Lakeville, in the county of Litchfield, State of Connecticut, have invented certain new and useful Improvements in Selectors, of which the following is a full, clear, concise, and exact description.

This invention relates to selectors for use in telephone systems. It has for its object the provision of a simple, rugged, efficient and easily maintained switch of the coordinate type.

The structure which embodies the present invention comprises a plurality of sets of longitudinally movable bare wire conductors coordinately arranged, the conductors of each set having contact devices attached thereto at each point of intersection with the wires of the other set, the contact devices at any point of intersection being brought into engagement by the conjoint operation in a predetermined order of two sets of conductors.

In the drawings, Fig. 1 is a side view of the essential elements of a selector; Fig. 2 is an end view of the same partly in section; Fig. 3 is a detail showing the formation of the contact devices, and Fig. 4 is a diagrammatic representation illustrating the manner in which connections between conductors of different coordinate sets are made.

This switch follows closely in its operation the method of operation set forth and described in the patent to J. N. Reynolds, No. 14,236, reissued December 26, 1916. In that patent the element known as the trunk bar is operated first and thereafter the element known as the line bar is operated. Connection between the contacts of the operated trunk bar and line bar is made, whereupon the trunk bar is released to normal position and the connection is maintained through the continued operation of the line bar.

In the present structure the three conductors 1, 2 and 3 controlled by the magnet 4 may be considered a line bar and the conductors 5, 6 and 7 controlled by the magnet 8 may be considered a trunk bar. Six trunk bar magnets are shown, in Fig. 1 of which the fifth, here numbered 9, is shown in its operated position. If while magnet 9 is operated magnet 4 becomes operated, then connection will be established between conductors 1 and 5, 2 and 6 and 3 and 7, respectively, and in the manner set forth in the Reynolds patent hereinbefore referred to, the magnet 9 will become deenergized and as long as magnet 4 remains energized the connection will be maintained.

The elements of the line bar comprising essentially conductors 1, 2 and 3, include also an armature 10 controlled by magnet 4 pivoted on the frame 11 and controlling a triangular piece of insulating material 12. Attached to this piece of insulating material 12 are the three conductors 1, 2 and 3 which are stressed by springs 15, 14 and 13, respectively. At each intersection of the line bar with a trunk bar a contact device 16, shown in detail in Fig. 3, is provided. This contact device comprises essentially a resilient spring wire secured to the conductor 1 by being first loosely wrapped thereabout and then tightly wrapped thereabout.

The trunk bar, comprising essentially the conductors 5, 6 and 7, includes also three springs 17, 18 and 19 for stressing the conductors 5, 6 and 7, respectively, and a triangular shaped piece of insulating material 20 attached to an armature 21 controlled by the magnet 8 and pivoted on the frame 22 as shown in Fig. 2. Each of the conductors 5 has threaded on it, at intervals corresponding with the intersection with line bars, cup-shaped contact pieces such as 23 shown in detail in Fig. 3. This contact piece consists of a long shank which at one end flares into a concave annular portion and is coated on its upper side with insulating material 24. The contact piece may be secured to the conductor 5 in any desired manner either by soldering or by crimping. As shown in Fig. 5 a layer of solder 25 secures the contact piece 23 to the conductor 5. The end of spring contact 16 is of such a shape as to be adapted to engage the flared portion of a contact piece either on its upper or lower surface

Fig. 4 is a detailed diagrammatic drawing illustrating the manner in which the contact devices operate. There are shown three line bar conductors 26, 27 and 28 and two trunk bar conductors 29 and 30. The line bar conductor 27 is shown in normal position and the line bar conductors 26 and 28

are shown in their operated positions. Trunk bar conductor 29 is shown in its normal position and trunk bar 30 is shown in its operated position. According to this view conductor 29 has been first operated. Thereafter 26 has been operated and 29 has been returned to normal and hence a connection between conductor 26 and conductor 29 has been established. This is shown by the position of the resilient spring 32 which is hooked under the contact piece 33. Also according to this view a connection between conductor 28 and conductor 30 is in the process of establishment. Thus, conductor 30 has been moved upwardly. Since the line bar conductor 26 had previously been operated the resilient spring 31 rested against the insulated portion of the contact piece 34 and upon the upward movement of the trunk bar conductor 30 the bent end of the resilient spring 31 has been caught in the bell shaped portion of the contact piece 34. Due to the coating of insulation no connection is made between conductor 26 and conductor 30. On the other hand, now that conductor 30 has been moved, conductor 28 is moved toward the left and a connection is established between conductors 28 and 30 by the resilient spring 35 actually touching the conductor 30. The resilient spring 36 also attached to conductor 28 is moved over into contact with contact piece 37, but no connection is established at this point due to the coat of insulating material on the shank of the contact piece 37. The next operation to take place will be the return of conductor 30 to its normal position, whereupon the resilient spring 31 will assume the position of the spring 36 and the resilient spring 35 will assume the position of the spring 32.

When connection between a trunk bar conductor and a line bar conductor is no longer desired, the line bar conductor is allowed to resume its normal position, such as is indicated by conductor 27. In this case such resilient spring contact devices as are in the position of spring 32 will ride over the under side of the contact pieces with which they are engaged and will assume the position of the resilient spring 38.

What is claimed is:

1. A selector comprising a plurality of sets of longitudinally movable bare wire conductors coordinately arranged, cup-shaped contact devices and cooperating resilient springs secured to said conductors at each point of intersection of said conductors, and means for bringing said devices into engagement with said springs by moving a plurality of said sets of conductors.

2. A selector comprising a plurality of sets of longitudinally movable bare wire conductors coordinately arranged, contact devices comprising cup-shaped members insulated on one side and uninsulated on the other side and resilient springs secured to said conductors at each point of intersection of said conductors, and means for bringing said devices into engagement by moving a set of conductors carrying cup-shaped members and a set of conductors carrying resilient spring contact devices.

3. A selector comprising a plurality of sets of movable bare wire conductors coordinately arranged, contact devices secured to each conductor at each point of intersection of said conductors, certain of said contact devices having an insulated and an uninsulated portion, other of said contact devices having a bent portion, and means in one condition for bringing said contact devices into engagement on an insulated portion and in another condition on an uninsulated portion.

4. A selector of the cross-bar type in which the bar elements comprise sets of longitudinally movable bare wires having contact pieces secured thereto, certain of these contact devices having a flared portion.

5. A selector of the cross-bar type in which the bar elements comprise sets of longitudinally movable bare wires, certain sets having flared contact devices and other sets having spring contact devices arranged to cooperate in one condition with said flared contact devices on their concave surfaces and in another condition on their convex surfaces.

6. A selector of the cross-bar type in which the bar elements have contact devices secured thereto, certain of these contact devices having an insulated and an uninsulated portion, other contact devices arranged in one condition to cooperate with said first mentioned contact devices on their insulated portion and in another condition on their uninsulated portion.

In witness whereof, I hereunto subscribe my name this 2nd day of May A. D., 1922.

ARTHUR H. ADAMS.