

June 27, 1944.

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2,352,352

SELECTOR SWITCH

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FIG. 1

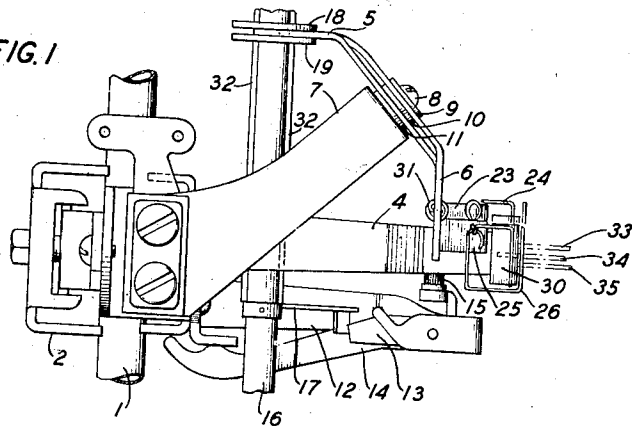


FIG. 3

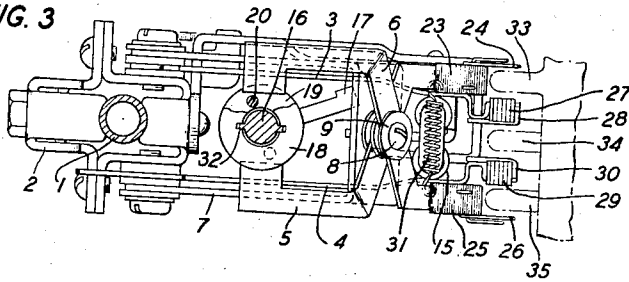


FIG. 4

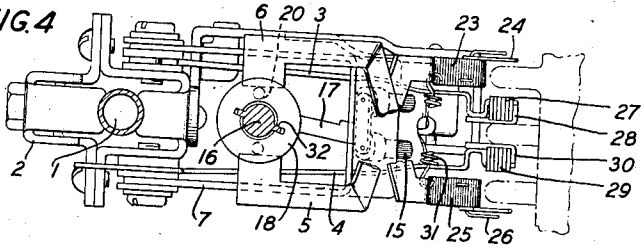


FIG. 2

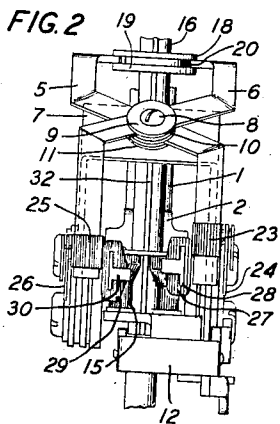
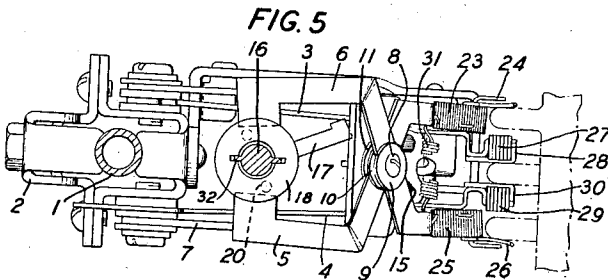


FIG. 5



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SELECTOR SWITCH

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4 Claims. (Cl. 179—27.53)

This invention relates to selector switches for establishing connections in dial switching telephone systems, and has for its object to provide an improved brush set for use in panel type switches.

Panel type switches, in general, comprise large flat terminal banks or panels over the face of which brush sets are moved by means of common brush rods. These brush sets are normally inactive and are selected for operation by means of a trip rod. According to the usual practice when a panel brush set has been tripped, all of the brushes make contact with the corresponding terminal sets as the switch is advanced into the desired position. Because of the wear resulting from the movement of the brushes over the bank terminals only base metal has been used for the strips and terminals. As a consequence, the edges of the terminals become rough and collect the particles of metal worn off, as well as dust from the atmosphere, so that the resistance in the talking circuits completed thereover may vary greatly, interfering with the quality of speech transmitted.

In accordance with the present invention, the use of noble metal contacts on the brushes carrying the talking circuit is permitted by the provision of means for holding such brushes out of engagement with the associated bank terminals whenever the brush set is in motion.

To this end the talking circuit brushes which are held out of engagement with the associated bank terminals under the control of the sleeve brushes while the brush carriage is normal, are also held out of contact under the control of the tripping rod while selections are being made.

More specifically, the talking circuit brushes are provided with rearwardly extending projections which engage a cam. This cam, in turn, rides on the trip rod and is held from rotation by keying ribs and slots. The brushes are urged together by a spring and normally are supported by the sleeve brushes which are held out of engagement with the sleeve terminals by a roller cam member. When the brush carriage is to be moved upward, the trip rod is rotated moving the trip finger into position to trip the cam member. This motion of the trip rod also moves the trip rod into position to hold the talking circuit brushes after the sleeve brushes have been tripped. When selections have been completed the trip rod is restored permitting the talking circuit brushes to make contact with the selected terminals. At the end of conversation, the trip rod is again rotated to hold the talking circuit brushes until the brush carriage reaches normal.

For a clearer understanding of the invention, reference may be had to the following description taken in connection with the accompanying drawing, in which:

Fig. 1 is a side elevation of the brush carriage as it would be in normal position;

Fig. 2 is a front view of the brush carriage in normal position;

Fig. 3 is a plan view of the brush carriage in normal position;

Fig. 4 is a plan view of the brush carriage with sleeve brushes tripped for making selections; and

Fig. 5 is a plan view of the brush carriage as it would appear during conversation.

Reference may be made to United States Patent 1,123,696, granted January 5, 1915 to E. B. Craft et al. for a disclosure of a selector switch and particularly of the trip rod and its functions as heretofore employed.

The individual brush set is mounted on a brush carriage 2 which grasps brush rod 1 so as to move therewith. The brush set comprises four brushes, a tip brush 24, a ring brush 26 and two sleeve brushes 28 and 30. The sleeve brushes 28 and 30 are carried by blocks of insulation 27 and 29 mounted at the ends of springs 3 and 4, respectively, which are insulatedly secured to the brush carriage 2, in the usual manner. The springs 3 and 4 tend to urge brushes 28 and 30 toward one another.

The tip and ring brushes 24 and 26 are shown as rectangular loops of wire composed of noble metal supported in blocks of insulation 23 and 25. The supporting members 5 and 6 for the tip and ring brushes 24 and 26 are metal strips, each strip made up of two lateral sections connected by a diagonal section, the lateral sections being bent at angles to the diagonal sections. The diagonal sections of the two mounting strips form an X when the strips are superimposed. A U-shaped bracket 7 is mounted on the brush carriage 2 so as to make an angle with the brush rod 1 and on the base of the U the mounting strips 5 and 6 are pivotally secured by screw 8 and washers 9, 10 and 11. With the members 5 and 6 so secured, the blocks of insulation 23 and 25 are in position to rest against the sleeve brush springs 3 and 4 and are held against them by means of spiral spring 31 which is fastened to members 5 and 6.

Mounted below springs 3 and 4 is a rigid arm 12 having the form of the letter J. Across the loop of the J is pivotally mounted the brush controlling lever which has a long arm 14, a short arm 13 and an upwardly extending portion carrying two insulating roller cams 15. When the brush controlling lever is in its normal position as shown in Figs. 1 to 3, the rollers 15 press against the inner surface of springs 3 and 4 at a point where they are bent toward one another, holding the sleeve brushes out of engagement with the associated terminals such as terminal 34. When the lever is "tripped," as shown in Figs. 4 and 5, the rollers 15 are moved toward the

brush rod, and the springs 3 and 4 press brushes 28 and 30 against the sleeve terminals.

The trip rod 16 which controls the brush controlling lever is rotatably secured in the switch frame and has secured thereto by a suitable spring and sleeve, a trip finger 17. There is a similar trip finger for each brush set and these fingers are arranged so that when the brush rod 1 has been moved a number of steps corresponding to the position on the rod of the brush set to be used, the trip finger 17 will occupy the vertical position shown in Fig. 1 with relation to the short arm 13 of the tripping cam. Horizontally all of the trip fingers will be in the position of finger 17 in Fig. 3.

When the trip rod 16 is rotated the depending portion of finger 17 catches on arm 13 but all other fingers like finger 17 move into the position shown in Fig. 4. When the brush rod is moved upwardly for the next selection, arm 13 is pressed downwardly by finger 17, tripping the sleeve brushes and sliding over the end of finger 17 which now moves into alignment with the other fingers (Fig. 4).

On the trip rod 16 is mounted a cam member formed of two discs 18 and 19 which are joined by cam studs 20. A pair of ribs 32 on trip rod 16 enter keyways in the discs 18 and 19 so that the discs rotate with the trip rod. The external ends of mounting strips 5 and 6 for the tip and ring brushes have right angle projections which enter the slot between discs 18 and 19. Because of studs 20 the slot between discs 18 and 19 varies in depth and when the trip rod 16 is rotated to trip the sleeve brushes 28 and 30 into operative position, the studs 20 are moved around into position against the projections on strips 5 and 6 and hold the brushes 24 and 26 out of contact with the tip and ring terminals. This is illustrated in Fig. 4.

When the wanted outgoing circuit has been selected, the trip rod is restored. The trip finger 17 moves back to its normal position as do discs 18 and 19. When studs 20 move out of engagement with the projections on mounting strips 5 and 6, spring 31 draws brushes 24 and 26 together and into engagement with the tip and ring terminals, such as terminals 19 and 21 opposite which they have been positioned. The positions of the brushes and the trip rod with the trip finger and discs are shown in Fig. 5.

When the brush set is to be returned to normal the trip rod is again rotated to hold the tip and ring brushes away from the associated rows of terminals and avoid snagging the brushes while the brush set is in motion.

When the brush set reaches its normal position, the long arm 14 of the brush tripping mechanism is acted on by a normal plate (not shown) thereby forcing the rollers 15 between springs 3 and 4, lifting the sleeve brushes 28 and 30 from the sleeve terminal and holding the tip and ring brushes 24 and 26 in their out of contact position after the trip rod 16 is restored.

While the tip and ring brushes 24 and 26 have been shown as rectangular loops of wire, they may take any other form by which the contact is made with a gently wiping action. Likewise the form of the slotted disc may differ from that shown without departing from the conception of the invention.

What is claimed is:

1. In an automatic telephone switch of the panel type, a brush support, a brush set mounted

on said support, said brush set having an inner pair of spring contact members and an outer pair of spring contact members, a brush controlling device normally holding said spring contact members separated in an inoperative position, said device being positioned between said inner pair of spring contact members, a brush tripping device, and a locking cam keyed to said tripping device, said tripping device being rotatable during a preliminary movement of said support to release said inner pair of spring contact members and to position said cam between said outer spring members and being restorable to release said outer pair of spring contact members.

2. In an automatic telephone switch of the panel type, a brush support, a brush set mounted on said support, said brush set having an inner pair of spring contact members and an outer pair of spring contact members, a brush controlling device normally holding said spring contact members separated in an inoperative position, said device being positioned between said inner pair of spring contact members, a brush tripping device, and a locking cam keyed to said tripping device, said tripping device being rotatable during a preliminary movement of said support to release said inner pair of spring contact members and to position said cam between said outer spring members and being restorable to release said outer pair of spring contact members without affecting said inner pair of spring contact members.

3. In an automatic telephone switch of the panel type, a brush support, a brush set mounted on said support, said brush set having an inner pair of spring contact members and an outer pair of spring contact members, a brush controlling device normally holding said spring contact members separated in an inoperative position, said device being positioned between said inner pair of spring contact members, a brush tripping device, and a locking cam keyed to said tripping device, said tripping device being rotatable during a preliminary movement of said support to simultaneously release said inner pair of spring contact members and to position said cam between said outer spring members and being restorable to release said outer pair of spring contact members and subsequently reoperable to position said cam between said outer spring members without affecting said inner pair of spring contact members.

4. In an automatic telephone switch of the panel type, a brush support, a brush set mounted on said support, said brush set having an inner pair of spring contact members and an outer pair of spring contact members having flexible contacts of noble metal, a brush controlling device normally holding said spring contact members separated in an inoperative position, said device being positioned between said inner pair of spring contact members, a brush tripping device, and a pair of discs joined by a pair of studs to form a slotted cam keyed to said tripping device, projections on said outer pair of spring contact members entering said cam slot, said tripping device being rotatable during a preliminary movement of said support to release said inner pair of spring contact members and to engage said studs against said projections and being restorable to release said outer pair of spring contact members.