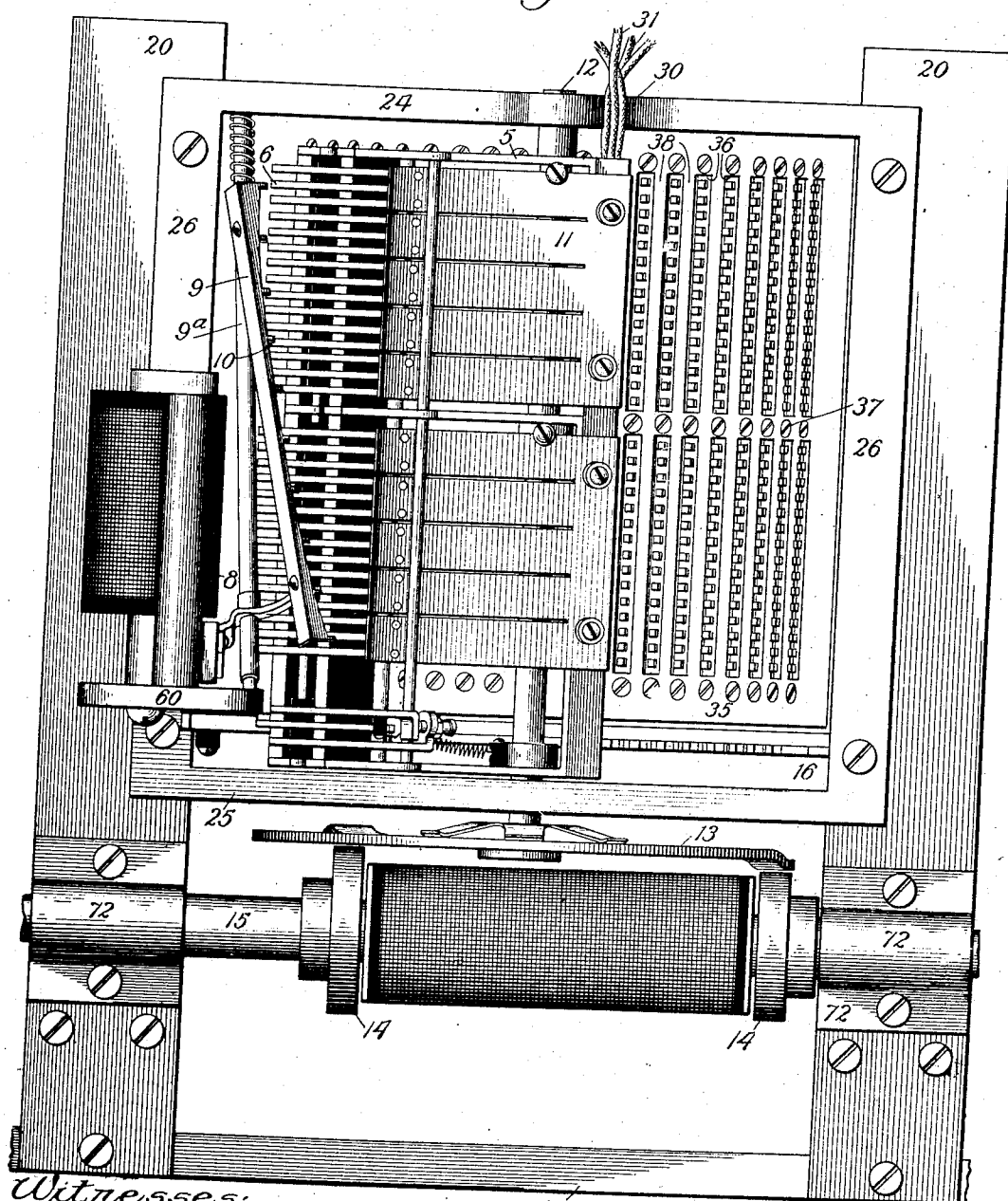


1,097,867.

Patented May 26, 1914.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses:

G. M. Campbell

Irving MacDonald

Inventor:

Frank R. Mc Berty

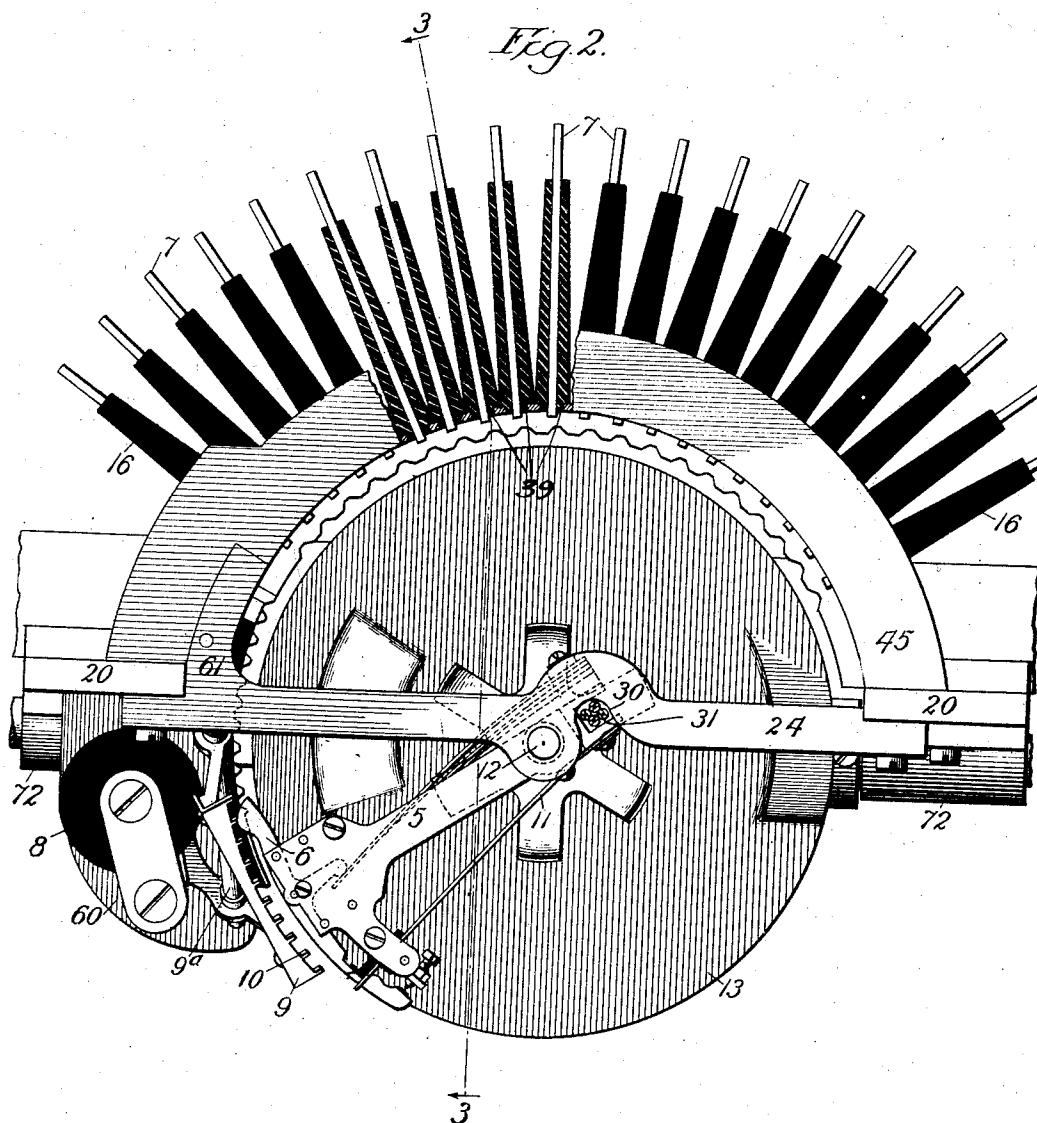
By A. Channer
Att'y

F. R. McBERTY.
 SELECTOR SWITCH FOR AUTOMATIC TELEPHONE EXCHANGES.
 APPLICATION FILED FEB. 26, 1910.

1,097,867.

Patented May 26, 1914.

3 SHEETS—SHEET 2.



Witnesses:
 H. M. Campbell
 Irwing MacDonald

Inventor:
 Frank R. McBerty.
 By L. Channer
 Atty.

F. R. McBERTY.
 SELECTOR SWITCH FOR AUTOMATIC TELEPHONE EXCHANGES.
 APPLICATION FILED FEB. 26, 1910.

1,097,867.

Patented May 26, 1914.

3 SHEETS-SHEET 3.

Fig 4.

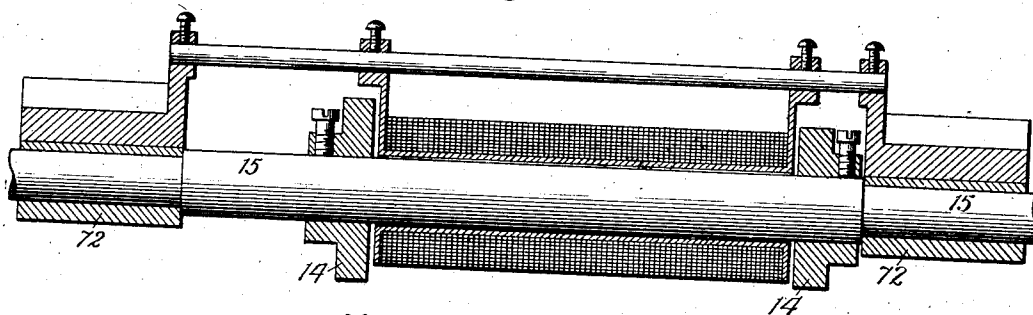


Fig 3.

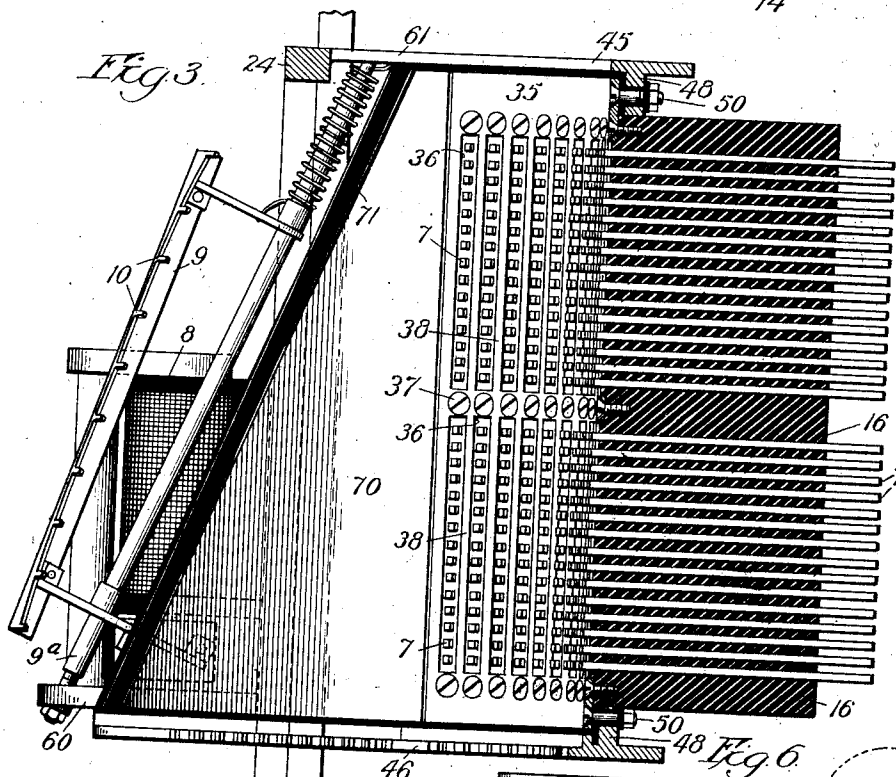


Fig 5.

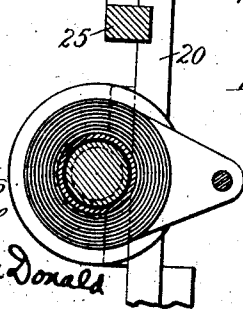
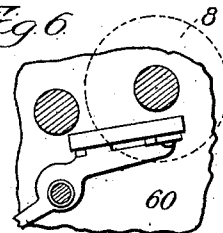


Fig 6.



Witnesses
 A. M. Campbell
 Irving MacDonald

Inventor
 Frank R. McBerty
 By J. C.anner
 Atty.

UNITED STATES PATENT OFFICE.

FRANK R. McBERTY, OF NEW ROCHELLE, NEW YORK, ASSIGNOR TO WESTERN
ELECTRIC COMPANY, OF NEW YORK, N. Y., A CORPORATION OF ILLINOIS.

SELECTOR-SWITCH FOR AUTOMATIC TELEPHONE-EXCHANGES.

1,097,867.

Specification of Letters Patent.

Patented May 26, 1914.

Application filed February 26, 1910. Serial No. 546,135.

To all whom it may concern:

Be it known that I, FRANK R. McBERTY, citizen of the United States, residing at New Rochelle, in the county of Westchester and State of New York, have invented a certain new and useful Improvement in Selector-Switches for Automatic Telephone-Exchanges, of which the following is a full, clear, concise, and exact description.

My invention relates to automatic telephone selectors of the type wherein movable brushes connected either directly or through suitable connecting means with telephone lines, are adapted to traverse stationary terminals connected either with trunk or telephone lines.

It contemplates in general an improved mounting for the operating parts of the selector switch whereon such parts may be easily assembled and will be easily accessible for adjustment or replacement.

One feature of my invention provides for the assembling of the brush-carrying member and related parts in such a manner that they may be removed separately or as a unit from the main frame.

Another feature of my invention involves certain structural features in such a mounting, whereby in the movement of the brush carrying member leading in wires attached to a movable part thereof are allowed a wide range of movement in order that they will not be injured in the movement of said movable part.

My invention also involves as one of its features a novel mounting for the stationary terminals adapted to retain them in contact relation to said brushes, said mounting embracing generally a slotted or perforated plate and insulating blocks carrying said terminals and mounted upon said plate with the inner ends of said terminals projecting through for engagement with said brushes.

In the drawings—Figure 1 is a view in front elevation of the selector embodying my invention; Fig. 2 is a plan view of the selector with a part broken away; Fig. 3 is a vertical sectional view taken upon line 3—3 of Fig. 2 with parts removed; Fig. 4 is a detail sectional view of a power magnet used in connection with this selector; Fig. 5 is a detail view in side elevation of a trip magnet used in connection with this selector; and Fig. 6 is a fragmentary detail sectional view taken upon line 6—6 of Fig. 5.

Like reference numerals designate like parts throughout the specification and drawings.

The movable switch carriage 5 is provided with a number of multiple sets of contacts or brushes 6, 6 arranged to traverse corresponding rows of contact members forming circuit terminals 7, 7. The brushes are normally out of contact with the stationary terminals, but are adapted to be selectively released to engage said terminals by means of a release magnet 8, said release magnet controlling a tripping device 9. Said tripping device is pivotally mounted upon a diagonally arranged shaft 9^a and provided with a plurality of fingers 10, 10 adapted to separately release latch members 11 which normally engage the separate sets of brushes to retain them in inoperative position.

The brushes 6, 6 are adapted to be rotated into engagement with the contacts or terminals 7, 7 and for this purpose the brush carrier 5 is mounted upon a vertically arranged rotating shaft 12, upon the lower end of which is mounted a disk 13 of magnetic material; said disk being adapted to be engaged and rotated by magnetic rollers 14, 14 mounted upon a horizontally arranged shaft 15, the construction being the same as that shown and described in my U. S. Letters Patent No. 922,802 of May 25, 1909. The contact members or terminals 7, 7 are secured in vertical rows in hard rubber blocks or terminal mountings 16, 16 which blocks are secured to the switch frame concentric with the shaft 12 and in the manner hereinafter set forth.

The frame upon which the various operating parts of the switch are mounted embraces features of construction as follows: 20, 20 designate vertical main frame members which are connected at their lower ends by a crossbar 21, said crossbar being adapted to be secured to a suitable base. In practice these side frame members 20, 20 will be extended to support a plurality of the selectors. Removably mounted upon said side frame members 20, 20 is an integral rectangular frame comprising upper and lower horizontal frame bars 24 and 25 and side frame bars 26, 26, said side frame bars being secured to the main frame members by machine screws or other suitable means. Said upper and lower frame bars 24 and 25

are apertured at their central longitudinal portion to receive and rotatively support the vertical shaft 12. As shown the upper frame bar 25 is provided near its central portion, adjacent to the upper end of the shaft 12, with an off-set or recessed portion 30 which forms a gooseneck therein, said gooseneck being adapted to receive a cable 31 containing a number of wires which are connected to various of the springs on the brush carriage. Inasmuch as the brush carriage is adapted to rotate through an angle of approximately one hundred and eighty degrees it is necessary that the adjacent portion of the cable have a movement of approximately the same degree and this particular arrangement of the frame member 24 will permit the cable to follow the movement of the carriage thus preventing the rubbing of the conductors over sharp edges to the detriment of the insulation and entirely eliminating any exterior pressure which might tend to loosen the connections of the conductors with the springs.

In the specific construction of terminal mounting shown there is employed a curved segmental plate 35, the radius of curvature of which is slightly greater than the arc of the circle described by the brushes 6, 6. As shown said plate is mounted concentrically with the shaft 12 and is provided with an upper and lower set of rectangular openings 36, the openings of each set being arranged equal distances apart around the periphery of said plate and having their major dimensions parallel to the axis of rotation of said brushes or at right angles to the planes of movement of said brushes. The openings of the two sets are separated by means of a horizontal strip 37, while the separate ones of each set are separated by means of bars 38. Each of the insulating blocks 16, 16 is preferably tapered transversely of its length and is provided on one margin with a reduced portion 39 which fits within the slot 36, with the shoulder adjacent to said reduced portion 39 engaging the separating bars 38. The provision of these bars in the plate 35 serves to reinforce the surface of the same and at the same time furnishes a rigid abutment for the insulating blocks, said abutment being adapted to prevent the lateral movement of the blocks due to the wiping movement of the brushes over the terminals, and otherwise retain them in a permanently adjusted radial relation. Moreover the bars 38 being located between the adjacent vertical rows of terminals provide a uniform metallic wearing surface for the brushes to drag over in the operation of the selector which keep the brushes well polished on their ends which engage the terminals, thus insuring good electrical contacts between the brushes and terminals and uniform wear on all of

the working parts. The insulating blocks 16, 16 are rigidly secured to the plate 35 by machine screws or other suitable means. The tapering of said insulating blocks lightens the structure, provides sufficient space between the outer ends thereof whereby any particular one may be easily removed without disturbing the adjacent ones, and also provides sufficient space to accommodate the cables carrying the conductors attached to the terminals.

The curved segmental terminal plate 35 is mounted between upper and lower curved segmental bars 45 and 46, which bars are removably secured to the main frame bars 20, 20, in a rigid relation thereto, preferably by machine screws. Each of the segmental bars is provided near its inner margin with a projecting flange 48, the flanges on the two members being directed inwardly or toward each other and adapted to support the terminal mounting plate 35 which is secured to the inner faces thereof by means of machine screws or bolts 50, 50. In order to preserve the circuit connections during the operation of the selector it is necessary that the segmental terminal plate 35 be insulated from the remainder of the frame and this is done by interposing a layer of insulating material between the adjacent faces of said segmental plate and projecting flanges and also between the end margins of said plate and the adjacent bearing surfaces. The bolts securing the terminal block plate to the flanges 48 are preferably surrounded by insulating bushings.

A projecting arm 60 secured to one side frame member 26 of the integral rectangular frame supports the tripping magnet 9 and also the lower end of the diagonally arranged shaft 9^a, the upper end of which shaft is supported in an inwardly projecting member 61 formed integrally with the upper horizontal frame bar 24. In this way the brush carriage and its shaft, the tripping magnet and the parts controlled thereby may be removed intact with the removal of said rectangular frame.

70 designates a triangular shaped plate secured to the selector frame at the advance edge of the terminal mounting, said plate being insulated from the frame and adapted to complete a local circuit through the active ones of the brushes and a controlling switch (not shown). An insulating strip 71 secured to said plate 70 serves to return the brushes to their normal or inoperative position at the completion of the switch operation.

The horizontal shaft 15 is supported in journals 72, 72 secured to the main frame members below said rectangular frame.

The frame constructed in accordance with my invention not only affords a mounting for the selector parts, which is as compact

as possible for the efficient operation of the apparatus, but also provides an easy means of adjustment for the parts and permits their easy removal, or the easy removal of the separate parts without interfering with the adjustment of the remaining parts. Moreover such a frame is easily constructed, is neat in appearance and can be easily assembled.

10 Having described my invention, I claim:—

1. In a selector switch the combination with a movable brush carriage and flexible conductors leading into and connected with the brushes on said carriage, of frame members between which said brush carriage is supported, one of said frame members being recessed to permit said conductors to follow freely the movement of said brush carriage.

2. In a selector switch the combination with a rotatable brush carriage, a shaft therefor and flexible conductors leading to and connected with the brushes of said carriage, of horizontal frame members in which the ends of said shaft are journaled, one of said members in the path of movement of said flexible conductors being provided adjacent to one end of said shaft with a goose-necked portion to receive said conductors and allow a wide range of movement thereof.

3. In a selector switch in combination, a frame, contact terminals, insulating blocks in which said terminals are secured, and a perforated plate carried by said frame upon which said blocks are mounted with the ends of said terminals projecting there-through.

4. In a selector switch the combination with movable contact brushes, of contact terminals arranged in rows, insulating blocks in each of which a row of terminals is mounted, and a frame plate upon which said insulating blocks are mounted, said plate having openings through which the ends of said terminals project in position to be engaged by said movable brushes.

5. In a selector switch in combination a frame, contact terminals, insulating blocks in which said terminals are carried, each of said blocks being provided on one margin with a reduced portion, a mounting plate secured to said frame and provided with

openings adapted to receive said reduced portions of said blocks, and means rigidly securing said blocks to said plate.

6. In a selector switch in combination a frame, contact terminals, insulating blocks in which said contact terminals are mounted in a straight row, each of said blocks being provided with a reduced portion, a mounting plate for said blocks, said plate being secured to said frame and provided with a plurality of longitudinally arranged slots separated by bars, said slots being adapted to receive the reduced portions of said blocks with the portion of said blocks adjacent to said reduced portion bearing against said separating bars.

7. In a selector switch the combination with main frame members and a bank of contact terminals supported thereby, of a supplementary framework, switch operating parts carried thereby embracing a rotatable brush carriage having driving means carried by said main frame, said supplementary framework with its supported parts being mounted upon said main frame and removable therefrom as a unit.

8. In a selector switch, main frame members, a bank of stationary contact terminals arranged in rows, a terminal block for supporting each row of terminals, and a plate having slots in which said blocks are respectively mounted, said plate being movably secured to said main frame.

9. In a selector switch the combination with movable contact brushes, of contact terminals, insulating blocks in which such terminals are mounted, and a metal mounting plate for said blocks provided with a plurality of slots having their major dimension extending parallel to the axis of rotation of said brushes and adapted to receive said blocks with the terminals projecting therethrough, said slots being separated by bars over which said brushes wipe in the operation of said switch.

In witness whereof, I hereunto subscribe my name this 25th day of February A. D., 1910.

FRANK R. McBERTY.

Witnesses:

IRVING MACDONALD,
MORGAN WASHBURN, Jr.