

March 24, 1925.

1,531,016

H. T. MARTIN ET AL
ELECTRICAL SWITCHING DEVICE

Filed Dec. 6, 1920

Fig. 1

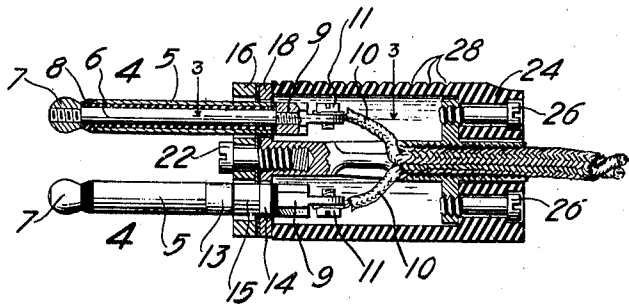


Fig. 2

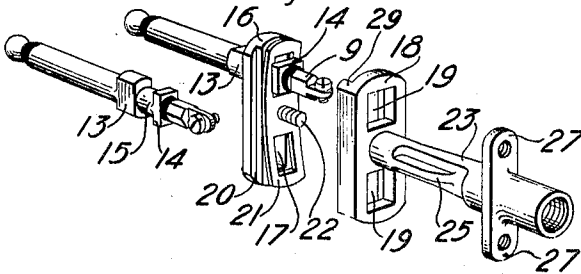
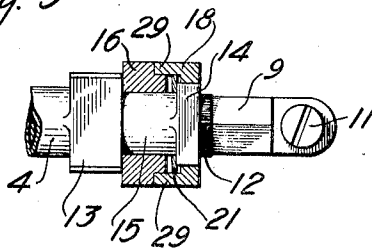


Fig. 3



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UNITED STATES PATENT OFFICE.

HAROLD T. MARTIN, OF NEW YORK, N. Y., AND PAUL NEILL, OF EAST ORANGE, NEW JERSEY, ASSIGNORS TO WESTERN ELECTRIC COMPANY, INCORPORATED, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

ELECTRICAL SWITCHING DEVICE.

Application filed December 6, 1920. Serial No. 428,542.

To all whom it may concern:

Be it known that we, HAROLD T. MARTIN and PAUL NEILL, citizens of the United States, residing at New York, in the county of New York and State of New York, and at East Orange, in the county of Essex, State of New Jersey, respectively, have invented certain new and useful Improvements in Electrical Switching Devices, of which the following is a full, clear, concise, and exact description.

This invention relates in general to electrical switching devices, and more particularly, to plug switches comprising a plurality of contact members mounted on a single base or handle, so as to be inserted simultaneously and by a single operation into their respective sockets.

Such plugs are used extensively in telephone switchboards and are well-known in that connection. In order that good electrical connection may be made between the plug contacts and their corresponding contacts, it is necessary that each individual plug finger fit snugly into its socket. This requirement necessitates either that the sockets and plug fingers be very accurately spaced, or that the spacing of the plug fingers be automatically adjustable. The latter method of overcoming the difficulty has been found most practical and cheapest.

The object of this invention is, therefore, to provide a structure for a plug of the type described which is durable, simple and inexpensive to manufacture.

These objects are accomplished by the invention in its preferred form by providing a supporting plate with rectangular apertures into which the plug fingers are inserted. At the inserted end of the plug is a shoulder of the same shape as and slightly smaller than the aperture which upon turning the plug finger 90 degrees prevents its withdrawal. Another plate with a square aperture is fitted over the rectangular shoulder to prevent further turning of the plug finger while allowing it to slide back and forth to a limited extent. This structure also provides a convenient means for taking the plug apart to replace broken or defective parts. Other objects and advantages of the invention will become evident from the detailed description.

The invention is shown in its preferred

form in the drawing in which Fig. 1 is a sectional view of the structure; Fig. 2 is a view indicating the method of assembling the plug parts; and Fig. 3 is a sectional view showing the means employed to hold the plug fingers against rotation. In the various figures similar parts are designated by similar reference characters.

A pair of plug fingers 4, 4, are composed of an outer conductive shell 5, and a central conductive rod 6, on the end of which a tip contact piece 7 is screwed. The outer shell 5 and the rod 6 are insulated from each other by a cylinder of insulating material 8. At the end opposite the tip 7, is screwed a lug 9 to which suitable cord conductors 10 are adapted to be connected, the customary method of so connecting being by means of a small screw 11 under the head of which the conductor is placed. For the purpose of further insulating the rod 6 from the outer shell 5, an insulating washer 12 is placed on the rod 6 under the lug 9.

The plug finger 4 is provided with a shoulder 13 with a flat bearing surface. A shoulder 14 is also provided which is rectangular in cross-section. The shortest dimension of this rectangle is made substantially the same as the diameter of the slightly reduced shank 15. The other dimension of the rectangle is substantially greater than the diameter of the shank 15.

A supporting plate 16, for the plug fingers 4, 4, is provided with rectangular apertures 17 cut in the face of the plate so that the longer sides, if produced, coincide. The rectangular apertures 17 are of such size that the shoulder 14 will slide there-through with very slight clearance. The thickness of plate 16 is somewhat less than the distance between shoulder 13 and shoulder 14 so that upon insertion into the aperture 17 the finger 4 is free to revolve but cannot be withdrawn except when in such position that the shoulder 14 registers with aperture 17. Also, by virtue of the form of the aperture 17, the fingers 4 may be moved toward and away from each other to a limited extent.

When inserted in the supporting plate 16, the fingers 4 are held against rotation by a locking plate member 18, with apertures 19 which register with the shorter sides of the shoulders 14 but do not interfere with the

sidewise motion of the fingers 4. The forwardly projecting sides 29 of the plate 18 fit into grooves 20 cut at the edges of the plate 16 and leave a narrow space between the two plates. Into this space is inserted a bent spring member 21 provided with apertures similar to those of plate 16. The purpose of spring 21 is to keep the shoulders 13 resiliently held against the plate 16. A further purpose of spring 21 is to provide a good electrical conducting means between the outer shells 5 of the fingers 4, 4, since it is desired that the contact members (not shown), with which the shells 5 contact, be directly bridged together by the insertion of the plug fingers into their sockets.

The locking plate 18, spring 21 and plate 16 are held together as a unit by means of a screw 22 which threads into the locking plate 18.

Integral with the locking plate 18 is a stem 23 at right angles therewith. Stem 23 is hollow, opening at its free end and toward its middle portion to permit the introduction of conductors 10 and their distribution within the plug shell 24 to the terminal lugs 9. The stem 23 is reinforced by a rib 25 to give requisite strength to the structure.

The plug shell 24 of insulating material forms the rear and sides of the whole and is held in place by screws 26 passing through the rear of the shell into lateral projections 27 formed integrally with the stem 23. Corrugations 28 in one side of the shell 24 indicate to the user the position in which the plug should be inserted into its socket.

The inventors do not desire to be understood as limiting their invention to the particular plug described, since, from an understanding of the disclosure, a variety of modifications thereof will readily occur to those skilled in the art without radical departure from the spirit of the invention as set forth in the claims.

What is claimed is:

1. An electrical switch plug, comprising, a plurality of contact finger members, each having a contact engaging end, and a support engaging end; a supporting plate provided with rectangular apertures into which the support engaging ends of said contact members are adapted to be loosely inserted; resilient releasable means to hold the ends of said contact members in engagement with said plate while permitting limited sliding motion of said contact members toward and away from each other, and means to prevent rotation of the contact finger members during such motion.

2. An electrical switch plug comprising, a supporting plate provided with a plurality of similar apertures, a contact finger member for each such aperture, a pair of spaced shoulder projections on each contact

member, one of which shoulders is adapted to pass through the corresponding said aperture in said supporting plate upon turning of said member relative to said plate, and releasable means to prevent such turning after insertion.

3. An electrical switch plug comprising a supporting plate provided with a plurality of polygonal apertures, a contact finger member adapted to be supported in each such aperture, each such member having a round portion within the aperture and a polygonal shoulder similar to and slightly smaller than said aperture, and releasable means to prevent said polygonal shoulder from registering with said aperture.

4. An electrical switch plug comprising a supporting plate provided with a plurality of apertures, a contact finger member for each aperture, the walls of each aperture permitting the insertion therein of a contact finger member only when the member is in an abnormal position and means to hold said member against rotation while within the aperture while allowing a limited degree of motion of the members toward and away from each other.

5. An electrical switch plug comprising a supporting plate member having a pair of rectangular apertures; a contact finger member corresponding to each such aperture and provided with a shoulder to bear against said plate, a cylindrical shank to fit within said aperture, and a rectangular shoulder projection of dimensions slightly less than the corresponding dimensions of said aperture; and a second plate member having a square aperture for each said contact member and adapted to cooperate with the first said plate and the rectangular shoulder of each said contact member to prevent turning thereof while allowing a limiting sliding motion of the contact members toward and away from each other.

6. In a plug, a metallic T-shaped supporting member, the stem of which provides a conduit for wiring and the head of which is apertured to receive finger members, and means for yieldably holding said finger members in said apertures, said apertures being so shaped as to prevent turning of said members.

7. An electrical switch plug comprising a supporting plate provided with an aperture, a contact finger member for said aperture, a pair of spaced shoulder projections on said contact member, one of which shoulders is adapted to pass through said aperture in said supporting plate upon turning said member relative to said plate, and releasable means to prevent such turning after insertion.

8. In an electrical switch plug, a contact finger member provided with spaced rectangular shouldered portions, a plate mem-

ber loosely engaging the finger member between the shouldered portions, and resilient means also inserted between the shouldered portions maintaining one of the shouldered portions in engagement with said plate member.

9. In an electrical switch plug, a contact finger member provided with spaced rectangular shouldered portions, a plate member loosely engaging the finger member intermediate the shouldered portions, means engaging one of the shouldered portions to prevent the rotation of said contact, and means to maintain the other shouldered portion in engagement with said plate member.

10. In an electrical switch plug, a pair of contact finger members each provided with a pair of rectangular shouldered portions, a supporting plate loosely engaging the finger members intermediate the shouldered portions, and means cooperating with the supporting plate and one of the shouldered portions to maintain the other shouldered portion in engagement with the supporting plate.

In witness whereof, we hereunto subscribe our names this 24th day of November A. D. 1920.

HAROLD T. MARTIN.
PAUL NEILL.