July 5, 1932. P. V. WELCH 1,865,600

MULTISWITCH COUPLING

Filed Sept. 9, 1931

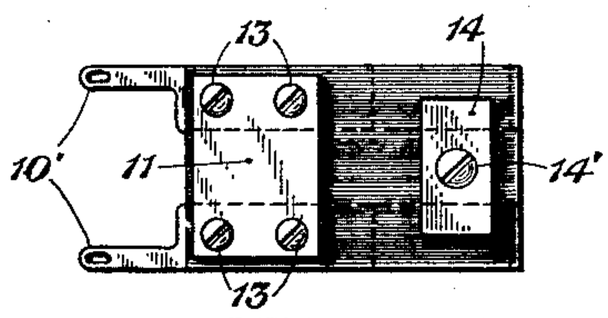

Fig. 1

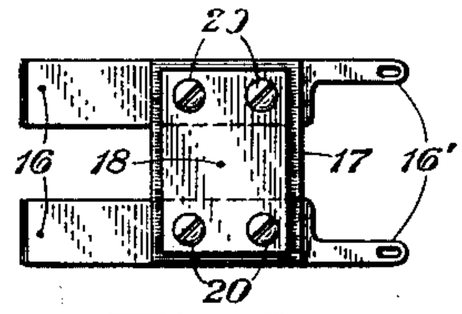

Fig. 3

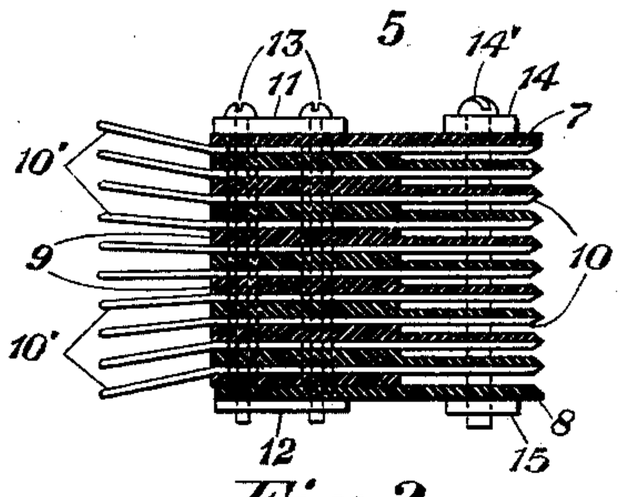

Fig. 2

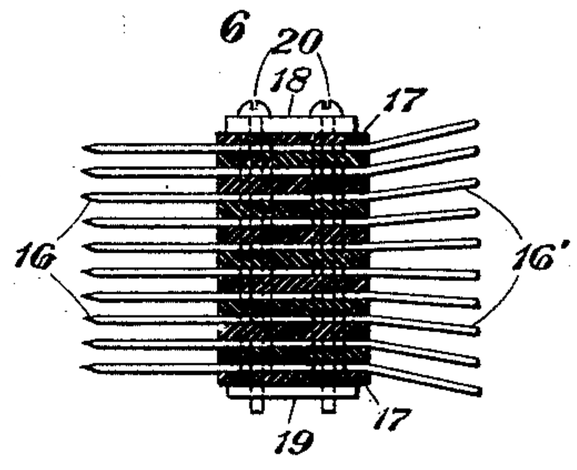

Fig. 4

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UNITED STATES PATENT OFFICE

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MULTISWITCH COUPLING

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This invention relates to couplings, and more particularly to multi-switch couplings for interconnecting outgoing and incoming ends of electrical conductors.

In shop-wired unit mountings of telephone equipment, after all the apparatus of a particular circuit is assembled, wired together and mounted on a suitable plate, it is common practice to terminate the outgoing and incoming wires to the circuits on a strip of terminals on the same mounting. With this arrangement it is necessary in installing the unit to solder the incoming and outgoing wires to the terminal strip. In some cases, as with switch mountings used in the step-by-step telephone system, the soldering work is sometimes avoided by the use of multi-contact plugs and jacks. The relatively heavy pressure required to provide reliable electrical contact between these members, however, necessitates the use of large spring members, and, consequently, requires the use of a comparatively large space for the complete assembly.

It is an object of this invention to provide a device for interconnecting the ends of incoming and outgoing conductors together by reliable contact pressure and eliminate the time-consuming operations required in performing this work by soldering or the like.

A further object is to provide a device of this character which will effectively connect the conductors together and require only a minimum space.

These and further objects will be apparent from the following description when considered in connection with the accompanying drawing, in which one embodiment of the invention is illustrated.

Referring to the drawing, Figure 1 is a plan view of one element or jack member of the improved arrangement; Fig. 2 is a side elevation in section of Fig. 1; Fig. 3 is a plan view of the other element or plug member; and Fig. 4 is a side elevation in section of Fig. 3.

In the drawing in which the improved coupling is illustrated, the reference 5 is applied to what may be termed the jack element, and the character 6 to the plug element. The element 5 is provided with top and bottom plates 7 and 8, which are of substantially rectangular formation and may be made of hard rubber or other material which will afford suitable insulation. A plurality of blocks 9 which may be of insulation similar to the plates 7 and 8 are arranged in layers to form a bank and positioned betwen the plates 7 and 8. These blocks are arranged in pairs and an intervening space is provided between each pair. A contact member 10 is positioned between each pair of the blocks of insulation 9, and the springs and blocks are held together by upper and lower clamping plates 11 and 12. The plates are suitably interconnected in clamping relation by means of bolts 13, having bushings, and these bolts and bushings extend through apertures in the blocks and contact members. The contact members 10 project from the rear of the blocks of insulation and terminate in lugs 10′ which form terminals to which electrical conductors may be attached. The forward portions of the blocks 9 are cut away outwardly from approximately their central portions to provide horizontal spaces between the contact members and the next lower block of insulation. These spaces provide for the accommodation of the extended ends of the contact members 16 which project from the face of the element of plug 6. The co-terminating extremities of each spring 9 and its associated cut-away block portion 10 may be chambered, as shown, to facilitate the entrance of the contact member 16 of the plug 6. The upper pair of contact members extend forwardly along the bottom faces of the plates 7 and the companion or lower pairs of the contact members are positioned against the bottom faces of the successive blocks of insulation 9. A pair of yokes 14 and 15 engage with the top and bottom plates 7 and 8, respectively, and these yokes are connected by a bolt 14′. The bolt 14′ is positioned in the space between each pair of insulated blocks 9 and each pair of springs 10 when tightened, is adapted to apply pressure to the elements as will presently appear.

In the plug element 6, the contact members 16, just referred to, are arranged in pairs, similarly to the contact members 10 in the

jack 5 with which they are adapted to make contact. The contact members 16 are positioned at their approximate centers between blocks of insulation 17 and the rear extremities of the contact members project beyond said blocks and form lugs 16′ to which electrical conductors may be attached. The contact members and their intermediate insulation blocks 17 are held together between yokes 18 and 19 and clamping action is provided by means of bushed bolts 20 which hold these elements together.

The horizontal spaces in the jack element 5 are of sufficient length to permit the introduction therein of the contact members 16 of the plug element 6. Thus, when the members 16 of the plug 6 are inserted in the spaces between the contact members and insulation blocks of the jack element 5, a substantial area of contact is provided. When the contacts are in this position, the clamping of the bolt 14′ in the jack element provides such pressure as to give rigid electrical connection between the contact members of the jack and the plug and a coupling is thus provided between the outgoing and incoming conductors which may be connected to the jack and plug elements.

What is claimed is:

1. A switch coupling comprising two members, one member including a plurality of blocks of insulation with contact members mounted and clamped between the blocks, and the other member including a plurality of blocks of insulation with a plurality of layers or contact members each layer being alternately mounted and clamped between each of the blocks and the blocks of insulation projecting over and covering the active ends of the contact members on one side while leaving the other side of each contact member unprotected so that the coupling may be effected by inserting the contact member of the first member between the contact member and the insulation surfaces of the second member.

2. A switch coupling comprising two members, one member including a plurality of blocks of insulation with contact members mounted and clamped between the blocks, and the other member including a plurality of blocks of insulation with a plurality of layers of contact members each layer being alternately mounted and clamped between each of the blocks and the blocks of insulation projecting over and covering the active ends of the contact members on one side while leaving the other side of each contact member unprotected so that the coupling may be effected by inserting the contact members of the first member between the contact members and the insulation surfaces of the second member, and means to clamp the contact members of both members together when thus inserted.

3. A switch coupling comprising two members, one member including a plurality of blocks of insulation with contact members mounted in parallel pairs and clamped between the blocks, and the other member including a plurality of blocks of insulation with a plurality of layers of contact members arranged in parallel pairs, each layer being alternately positioned with respect to each of the blocks and with a space intervening between the contact members of each pair, the blocks of insulation projecting over and covering the active ends of the pairs of contact members on one side while leaving the other side of each contact member unprotected so that the coupling may be effected by inserting the contact members of the first member between the contact members and the insulation surfaces of the second member.

4. A switch coupling comprising two members, one member including a plurality of blocks of insulation with contact members mounted in parallel pairs and clamped between the blocks, and the other member including a plurality of blocks of insulation with a plurality of layers of contact members arranged in parallel pairs, each layer being alternately positioned with respect to each of the blocks and with a space intervening between the contact members of each pair, the blocks of insulation projecting over and covering the active ends of the pairs of contact members on one side while leaving the other side of each contact member unprotected so that the coupling may be effected by inserting the contact members of the first member between the contact members and the insulation surfaces of the second member, and means to clamp the contact members of both members together when thus inserted, said clamping means extending through the spaces between two contact members of each pair.

In testimony whereof, I have signed my name to this specification this 8th day of September, 1931.

PAUL V. WELCH.