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2,444,037

MOUNTING AND CONNECTING APPARATUS

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FIG. 4

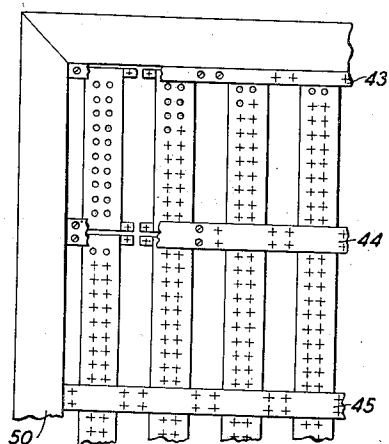


FIG. 1

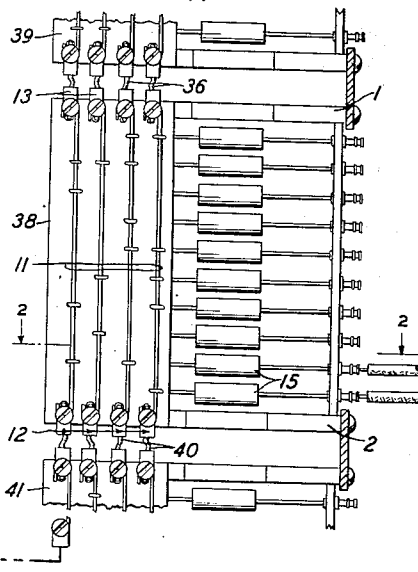


FIG. 2

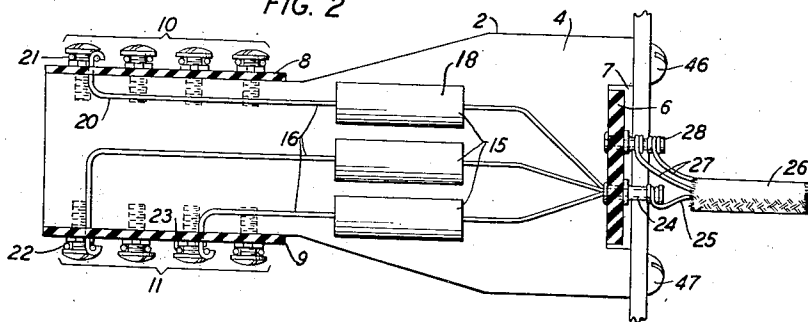
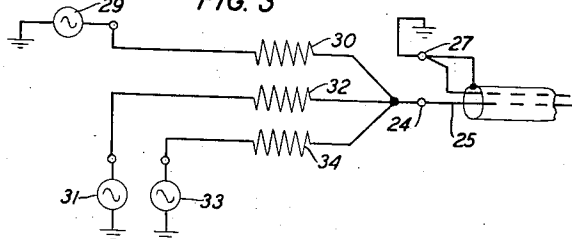


FIG. 3



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MOUNTING AND CONNECTING APPARATUS

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3 Claims. (Cl. 175-298)

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This invention relates to mounting and connecting means and particularly to frame structures and arrangements therein for distributing current supply connections in telephone systems.

An object is to simplify and improve such structures and arrangements for the easy accessibility and convenience of mounting and interconnecting current supply conductors and associated units.

Heretofore various types of junction boxes, terminal fuse boxes and frames have been used for interconnecting a plurality of incoming and outgoing conductors or cables in combinations by means of terminal mounting straps and bus-bars.

It is a feature of the applicant's invention to provide an arrangement whereby conductors incoming from a plurality of current supply sources may be connected through resistance or condenser impedance pads in different combinations to outgoing conductors. The invention may be carried out by arranging a frame structure with a plurality of bus-bars connected to the incoming conductors and to which resistance or condenser pads may be tapped in various groups. These pads are arranged inside the frame structure in corresponding groups with the pads in each group connected together to individual conductors outgoing from the frame structure. Arrangements of this kind may be employed in telephone systems where various combinations of alternating currents of different frequencies are required to be combined through resistance pads to supply corresponding signal codes. For example in laboratories where code signals comprising different combinations of frequencies are constantly used, it is convenient and useful to be able to quickly select such codes by establishing connections to these outgoing conductors arranged in this orderly manner. So also in actual telephone installations in telephone exchanges it is of considerable advantage to have structural units according to this invention that may be prefabricated and permanently installed singly or in groups in space saving formations and from which code connections may be quickly selected and permanent connections made for use as ringing signal sources or for other supervisory and identifying signals.

The invention has been illustrated in the accompanying drawings in which:

Fig. 1 shows a side view of a preferred form of the applicant's invention;

Fig. 2 is a cross-section taken on line 2-2 of Fig. 1;

Fig. 3 discloses a typical circuit connection and combination of resistance pads; and

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Fig. 4 discloses an arrangement of a plurality of said frame structures with their associated connections arranged in a frame.

Referring now to the drawings, a single frame structure consists of a top plate 1 and a bottom plate 2 which are enlarged at the front end as shown at 4 in Fig. 2. At this end the plates are connected by means of an upright cross member 6 secured in openings such as 7 in these enlarged portions 4 of the top and bottom plates 1 and 2. The opposite narrower ends of the plates 1 and 2 are connected together by plates 8 and 9 arranged in parallel relation at opposing sides of said ends as shown particularly in Fig. 2. It should be noted that the top and bottom plates are of considerable thicker material than the plates 6, 8 and 9 and all of the plates are preferably made from insulation material such as a composition or fiber substance. On the outer surface of the plates 8 and 9 are mounted bus-bars, four in number, on each plate such as the group 10 on plate 8 and group 11 on plate 9. The bus-bars may consist of thin bands or wires connected at each end to terminals such as 12 at the bottom of the frame and 13 at the top of the frame. Between the plates 1 and 2 may be mounted various combinations of groups of resistance pads such as the group 15 shown in Fig. 2 and in layers as shown in Fig. 1. These various groups may be connected by means of straps or wires such as the group 16 to individual bus-bars by extending through openings in the plates 8 and 9 and soldered to the bus-bars 10 and 11 in various combinations. For example as shown in Fig. 2 where there is provided three resistance pads, the pad 18 is connected by means of a strap 20 to the bus-bar 21. Similarly the other two resistance pads in this group 15 are connected respectively to bus-bars 22 and 23. The opposite ends of these three resistance pads 15 are then connected together by having their outgoing straps or wires threaded through a common tubular terminal punching 24 on the plate 6 to which in turn a common shielded conductor 25 is soldered. The shielding 26 of each conductor 25 may be grounded through a conductor 27 to the companion terminal punching such as 28 for punching 24. All of the punchings 28 may be connected together with a strap to ground. In other words, each group of resistance pads are connected to various combinations of bus-bars at one end and to a common conductor at the other end through a terminal with the associated shielding grounded. Fig. 3 discloses the circuit connections for such a combination of three resistance pads. It should

be understood that the number of resistance pads in the different groups may be varied depending on what combinations are desired. The terminals for the bus-bars may be connected directly to various individual sources of alternating current as shown in Fig. 3 where one source 29 is connected through one bus-bar T, the resistance pad 30, source 31 through another bus-bar to pad 32 and source 33 through a closed bus-bar to pad 34. These pads are connected at their opposite ends to the common conductor 25.

In telephone systems it may be desirable to mount a number of these mounting units with their associated connections in groups in a common frame, for example, as shown in Fig. 1 different units may be connected on top of each other by straps such as 36 between the unit 38 and the unit above partly shown and indicated with the numeral 39, while straps such as 40 may be connected below the bus-bars of unit 38 and the partially disclosed unit identified by the numeral 41. These units may be arranged in horizontal and vertical rows and connected to cross plates such as 43, 44 and 45 and others by screws such as 46 and 47 as shown, for example, connecting cross plate 43 with the bottom member 2 shown in Fig. 2. These plates 43, 44 and 45 and others may be connected in any suitable manner to the frame 50. It is also evident that the sources of current may be connected to the bus-bars by cables (not shown) but strapped to frame 50 as desired. The outgoing conductors 25, etc., may be similarly arranged. A common arrangement would be to have all the bus-bars on all the units connected together to corresponding current sources through a common cable.

By this arrangement of units it is evident that various combinations of alternating current sources may be strapped through impedance pads arranged in groups to individual conductors for the supplying of combinations of different frequencies to produce corresponding signal codes as employed for various purposes in telephone systems. While the impedance pads disclosed are resistances, it will be understood that they may be capacitances or combinations of resistance and capacitance.

What is claimed is:

1. A connecting unit comprising a frame having two opposite end plates and three mounting plates connecting said end plates, pairs of terminals mounted on a first and a second of said three mounting plates, the terminals of each pair mounted at opposite ends of said plates, a bus-bar connected between each pair of terminals, said bus-bars extending in a direction perpendicular to the end plates across the associated mounting plates, parallel layers of impedance units mounted on top of each other between the end plates, the number of impedance units in each layer being no greater than the number of bus-bars, a conductor connecting each impedance unit to a corresponding bus-bar and threaded through an aperture in the mounting plate on which said

bus-bar is mounted, conductors connecting the impedance units in each layer together, and a conductor threaded through a corresponding aperture in the third mounting plate and connected to the conductors of a corresponding layer of impedance units.

2. A mounting unit for variously combining different frequency carrying incoming conductors through resistance pads to individual outgoing conductors comprising a top plate, a bottom plate, two spaced parallel mounting plates connecting said top and bottom plates and an end mounting plate connecting said top and bottom plates and located some distance away from and at a right angle to said parallel plates, bus-bars mounted in parallel relation on the outside surfaces of said parallel plates, a terminal connected to each bus-bar and mounted on the corresponding parallel plates, an incoming conductor connected to each terminal and adapted to be energized by a frequency of electrical current different from others of said incoming conductors, resistance pads arranged in different combinations in layers between said top and bottom plates and between said parallel plates and said right angle plate, conductors connecting said pads in each layer in various combinations to said bus-bars and extending through apertures in the associated parallel plates, conductors connecting the opposite ends of the pads in each layer together, and single outgoing conductors each extending through an individual aperture of said right angle plate and connected to a corresponding group of said connected opposite ends of a layer.

3. A mounting mechanism comprising a top and a bottom plate, two parallel mounted plates connecting said top and bottom plates and an end plate connecting said top and bottom plates and located at a right angle to and some distance away from said parallel plates, bus-bars and terminals therefor mounted in parallel relation on the outside surfaces of said parallel plates, a conductor connected to each terminal and adapted to be connected to separate sources of current, resistance units arranged in various combinations and located between the parallel plates and the end plates, each of said resistance units having one end connected through a separate aperture in a corresponding parallel plate to a particular bus-bar, and opposite ends in each combination of resistance units connected together and threaded through an individual aperture in the end plate.

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