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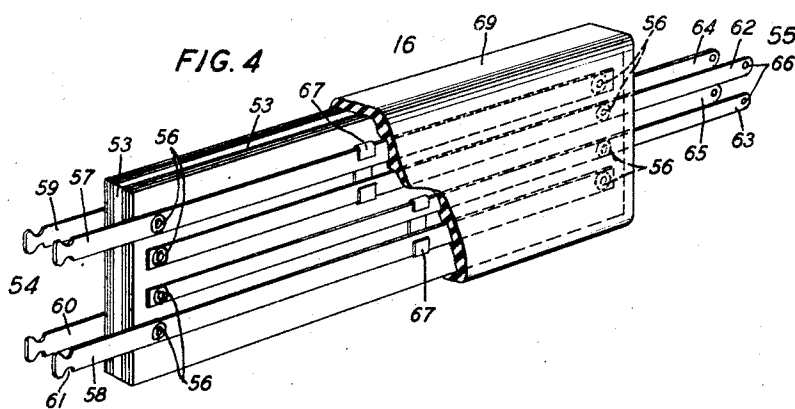
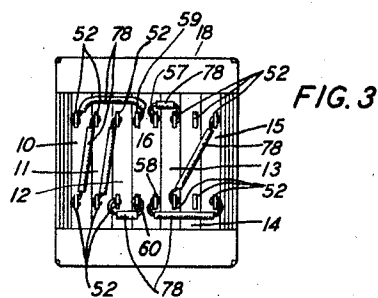
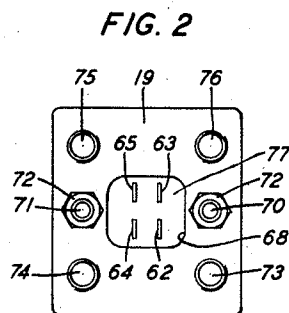
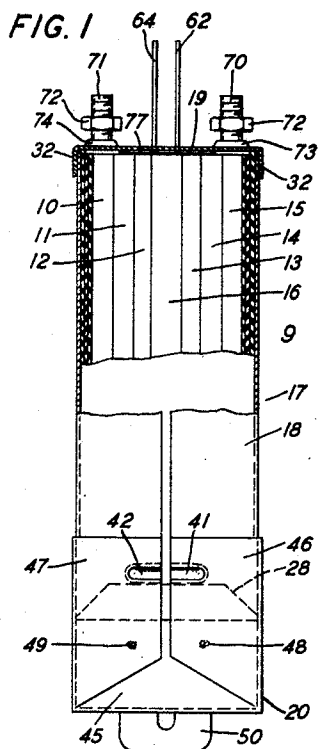
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2,303,958

ELECTRICAL RESISTANCE PAD DEVICE

Filed Sept. 24, 1941

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

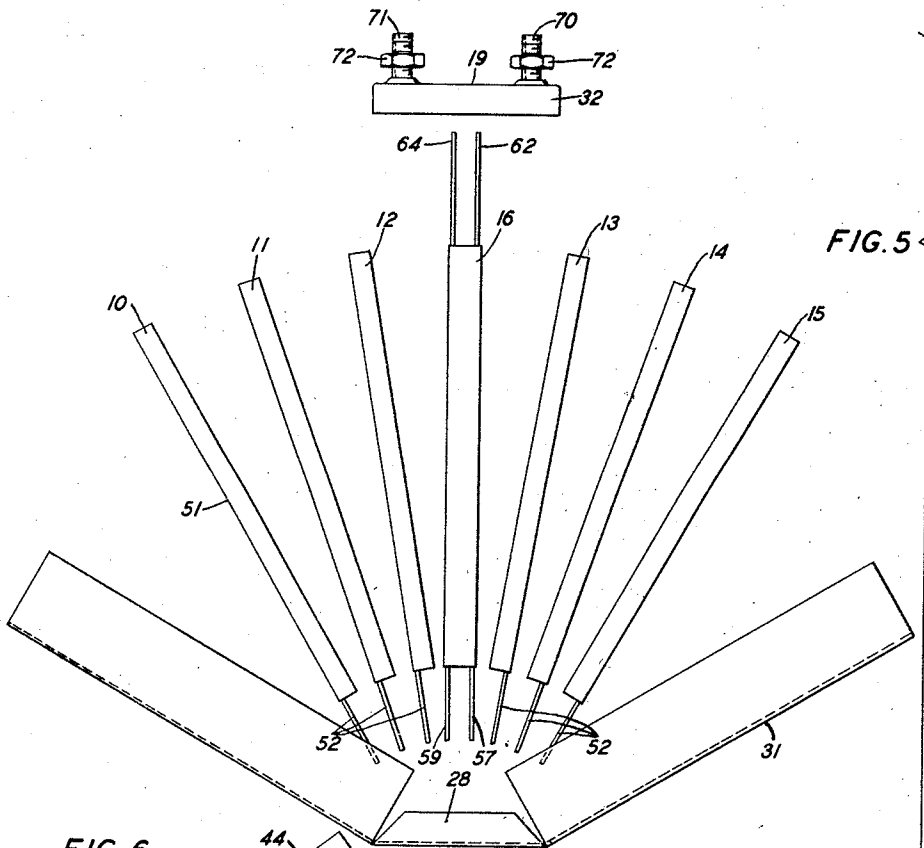


FIG. 5

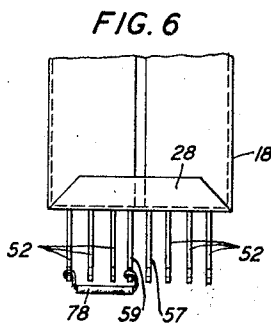


FIG. 6

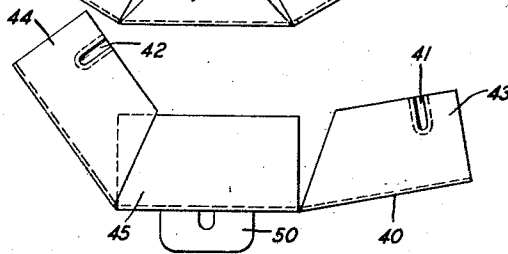


FIG. 7

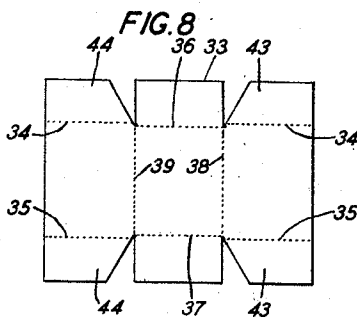
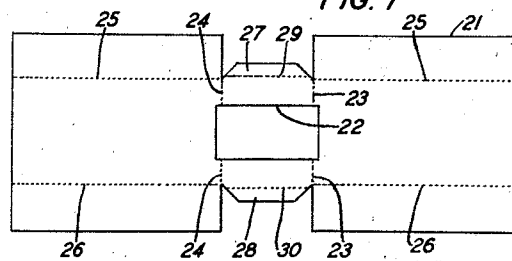


FIG. 8



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ELECTRICAL RESISTANCE PAD DEVICE

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3 Claims. (Cl. 201—63)

This invention relates to electrical resistance devices and more particularly to resistance devices in which a plurality of resistance elements are arranged and connected to form a resistance pad.

The object of the invention is to provide improvements in the structure of resistance devices commonly known as resistance pads.

A feature of the invention resides in a connector block.

Another feature resides in a casing structure.

Other features reside in the particular form and arrangement of the parts in combination.

In the drawings,

Fig. 1 is a front elevational view, partly in section, of the resistance device;

Fig. 2 is a top view of the device;

Fig. 3 is a lower end view of the device shown in Fig. 1 but minus the cover on the lower end of the casing;

Fig. 4 is a view in perspective of the connector block and with a portion of the outer covering broken away to show interior portions of the structure;

Fig. 5 is an exploded view of the parts shown in Fig. 1;

Fig. 6 is a view of a lower portion of the casing minus the lower cover and with terminals of the resistance elements and of the terminal block projecting below the lower end of the casing. A strap connection is shown electrically connecting two of the terminals;

Fig. 7 is a top plan view of a blank from which the body of the casing is formed; and

Fig. 8 is a top plan view of a blank from which the lower cover is formed.

In such cases where resistance pads are required in an electrical system it is common practice to select and assemble a plurality of resistance elements and to electrically connect the resistance elements to form the required resistance pads. The resistance elements may be of various forms and values. Some of the resistance elements employed and particularly in electrical communication systems are known as flat type resistances. These resistances are usually separately mounted on a supporting frame and in order to connect them to form the required resistance pad conductor wires are connected to the terminals of the resistances to form strap connections between the various resistance elements. A relatively large number of strap connections are often required to interconnect the resistance elements and to connect the resistance elements to suitable terminals so that the resistance elements

will be combined to form the required resistance pad. The strap connections and the wires leading to the terminals are rather loosely arranged and present an untidy appearance. The wiring operations are costly and somewhat confusing.

The present invention provides a neat and compact resistance pad. The resistance elements are enclosed in a casing particularly adapted to hold them together as a unit and which may be mounted on a suitable support. A connector block is provided in the unit to facilitate interconnecting the resistance elements and to reduce the number of wires required in making the interconnections. The terminals of the resistance elements and certain terminals of the connector block and the wires forming the interconnections are enclosed in and protected by a removable lower cover of the casing structure.

Fig. 1 shows a resistance pad unit 9 embodying the invention and comprising a plurality of flat type resistance elements 10, 11, 12, 13, 14 and 15, the connector block 16 and the casing 17.

The casing 17 is made in the form of a rectangular can comprising the body 18, an apertured top cover 19 and a removable lower cover 20. The parts of the casing 17 are made of sheet material suitable for fabrication into a substantially rigid protective casing for the resistance elements and the connector block. For the purpose of simplifying the description of them and not in the sense of limiting the invention to the use of such material, it will be assumed that they are made of sheet metal of the type commonly used in making can type containers. The body 18 is made from a cut-out blank 21 of the sheet material as shown in Fig. 7. The blank 21 is apertured at 22 and is upwardly folded along the dotted lines 23 and 24 and upwardly along the dotted lines 25 and 26. The flaps 27 and 28 are folded upwardly along the respective dotted lines 29 and 30. When the blank 21 is folded along the lines mentioned it will be in the form of the partly formed body 31 shown in Fig. 5. Further folding along the dotted lines 23, 24, 25 and 26 will bring the partly formed body 31 to the form of the body 18 shown in Figs. 1 and 6. The front wall of the casing is formed by two parallelly arranged half sections which are partly overlapped by the folded up flap 28. The back wall is of similar construction. After the body 18 has been formed in the manner described, the resistance elements 10, 11, 12, 13, 14 and 15 and the connector block 16 are inserted in the body 18. The top cover 19 is then applied to the body 18. The top cover 19 has a downwardly turned

edge flange 32 to encompass the upper end of the body 18 and is welded or otherwise fastened along the edge flange 32 to the upper end of the body 18.

The lower cover 20 is formed from a suitably cut-out blank 33 shown in Fig. 8. The blank 33 is folded upwardly along the dotted lines 34 and 35 and upwardly along the dotted lines 36 and 37. It is also folded upwardly along the dotted lines 38 and 39 to form the partly completed lower cover 40 shown in Fig. 5. Inwardly extending embossings 41 and 42 are formed in the walls 43 and 44 of the part 40 shown in Fig. 5. Further folding along the dotted lines 34, 35, 36, 37, 38 and 39 will bring the partly completed lower cover 40 shown in Fig. 5 to the form of the lower cover 20 shown in Fig. 1. In its completed form the front wall of the cover 20 is co-operatively formed by the wall 45 and the two walls 46 and 47, the walls 46 and 47 overlapping a portion of the wall 45 and being spot-welded or otherwise secured to the wall 45 at the points 48 and 49. The back wall of the lower cover 20 is formed in the same manner as the front wall. It will be seen by looking at Fig. 1 that the wall 45 is about half the height of the lower cover 20 and abuts against the lower end of the body 18 when the cover 20 is applied to the body 18. The inwardly directed embossings 41 and 42 extend over the upper edge of the flap 28 to hold the lower cover 20 from accidental dislodgement from the body 18. A U-shaped handle 50 is secured to the lower end of the lower cover 20 to facilitate handling the lower cover 20. When the lower cover 20 is being applied or removed the walls 46 and 47 will be flexed sufficiently in the region of the embossings 41 and 42 to allow passing of the embossings 41 and 42 over the upper edge of the flaps 27 and 28.

The resistances 10, 11, 12, 13, 14 and 15 are flat type resistances comprising a rectangular body portion 51 and terminals 52 and are inserted in the body 18 of the casing 17 so that the terminals 52 extend through the aperture 22 in the lower end of the body 18, as shown in Fig. 6. It will be understood that the resistances comprise in each case a resistance element enclosed in the insulating body portion 51 and that the terminals 52 of each resistance are electrically connected to the resistance element.

The connector block 16 as shown in Fig. 4 comprises a laminated rectangular block 53 of insulating material equipped with two sets of terminals 54 and 55. The terminals in each set 54 and 55 are relatively long flat strips of conducting material and are secured to the block 53 by means of eyelets or rivets 56 which project through apertures provided in the terminals and into the block 53. The terminals are arranged in parallel spaced relation and have end portions extending longitudinally outward of the block 53. The set 54 is shown as comprising four terminals 57, 58, 59 and 60, the projecting end portions of which are notched at 61 to facilitate the connecting of wires thereto. The set 55 is also shown as comprising four terminals 62, 63, 64 and 65 with the projecting end portions apertured at 66 to facilitate the connecting of circuit wires thereto. The terminals 57 and 58 are rather widely spaced apart on one face of the block 53 and the terminals 59 and 60 are likewise spaced apart on the opposite face of the block 53. The terminals 62 and 63 are located between the terminals 57 and 58 and extend in parallel spaced relation therewith. The terminals 64 and 65 are located between the terminals 59 and 60 and ex-

tend in parallel spaced relation therewith. Each terminal in the set is electrically connected by means of a conducting strap 67 to an adjacent terminal in the other set at some convenient point along the structure of the connector block 16. It will be seen that the projecting ends of the terminals in the set 55 are in more closely grouped formation than the projecting ends of the terminals in the set 54 and as shown in Figs. 1 and 2 project upwardly through an aperture 68 in the top cover 19. The terminals 62, 63, 64 and 65 therefore project outwardly of the casing structure and may be used as exterior terminals of the resistance pad. A covering 69 of insulating material is provided on the connector block 16 to cover all but the projecting end portions of the terminals mounted on the block.

Supported on the top cover 19 and projecting upwardly therefrom are spaced studs 70 and 71 equipped with nuts 72 so that the resistance pad unit may be supported on a supporting frame or rack, not shown. Spaced embossings 73, 74, 75 and 76 are formed on the upper surface of the top cover 19 to bear against the supporting frame or rack above-mentioned. An apertured insulating strip 77 is provided as a closure for the aperture 68 in the top cover 19 and to assist in maintaining the projecting ends of the terminals 62, 63, 64 and 65 in required spaced relation.

The terminals 57, 58, 59 and 60 of the connector block 16 and the terminals 52 on the resistances 10, 11, 12, 13, 14 and 15 project through the aperture 22 in the casing 18 and below the lower end of the casing 18 as shown in Fig. 6. These terminals may be selectively and electrically connected by means of strap conductors 78 to form various desired combinations of the resistance elements and to bring the resistances into electrical connection with the terminals on the terminal block 16. The strap conductors 78 may comprise insulated wires or other conductors suitable for the purpose and may be arranged so that they serve as connecting means between one or more of the resistance devices and the connector block. In Fig. 3 which shows one of the many possible arrangements of the strap conductors the resistances 10, 11 and 12 are connected in series by means of strap conductors 78 and are electrically connected by means of strap conductors 78 to the terminals 59 and 60 of the connector block 16. Since the terminals 59 and 60 are electrically connected by means of conducting straps 67 the outside terminals for this combination of resistances will be the terminals 64 and 65 projecting through the top cover 19. Again as shown in Fig. 3, resistances 13 and 15 are electrically connected by means of strap conductors 78 and other strap conductors 78 are provided to electrically connect this combination of resistances to the terminals 57 and 58 of the connector block 16. In this case the outside terminals for this combination are the terminals 62 and 63 of the connector block 16. It is obvious that various combinations of resistances may be made by suitably connecting the terminals thereof by means of the strap conductors 78 and that the connector block 16 facilitates the combining of the resistances to form a required resistance pad unit.

The lower cover 20 when placed in the position shown in Fig. 1 serves in cooperation with the lower end of the casing 18 and with the lower ends of the resistances enclosed in the casing as a housing for the terminals 52 of the resist-

ances, the terminals 57, 53, 59 and 60 of the connector block 16 and the various strap conductors 78 employed in making the required electrical connections. The engagement of the upper ends of the walls 45 with the bottom of the casing 18 prevents too far thrusting of the lower cover 20 on the casing 18. Since the inwardly extending embossings 41 and 42 snap over and engage the upper edges of the flap portions 27 and 28 of the casing 18 accidental dislodgment of the lower cover 20 from the casing 18 is prevented.

What is claimed is:

1. In an electrical resistance pad device comprising a plurality of resistance elements stacked together in combination, a tubular casing holding said resistance elements in stacked condition, an end cover closing one end of said casing and extending below the lower end of said casing to form in cooperation with said casing and the lower ends of said resistance elements a lower compartment, an apertured top on said casing, spaced mounting studs on said top providing means for mounting said casing on a support, a connector block disposed between two of said resistance elements, a set of terminal strips secured to said connector block and having end portions extending into said lower compartment, said end portions being electrically connected to said resistance elements, a second set of terminal strips secured to said connector block and having end portions projecting through said top and conducting straps electrically connecting terminal strips in the first set to terminal strips in said second set.

2. In an electrical resistance pad device comprising a plurality of flat type resistance elements in combination, a connector block, an apertured can type casing holding said resistance elements and said connector block in stacked condition, an apertured top cover on said casing, means supported on said top cover to mount said casing on a support, a set of long strip terminals supported on said connector block and having end portions projecting outwardly through said top cover, a second set of long strip terminals supported on said connector block and electrically connected to the first-mentioned set

of terminals and extending downwardly through the lower end of said casing, terminals on said resistance elements extending downwardly through the lower end of said casing, conductors electrically connecting said second set of terminals to the terminals of said resistance elements, a removable lower cover on said casing enclosing said second set of terminals and the terminals of said resistance elements and means on said casing and on said lower cover to prevent accidental dislodgment of said lower cover from said casing.

3. In an electrical resistance pad device comprising a plurality of flat type resistances in combination, a connector block of the same general form as said resistances, an apertured can type casing enclosing and holding said resistances and said connector block in stacked condition, an apertured top cover secured to the upper end of said casing, means on said top cover for mounting said casing on a support, two sets of long strip terminals supported in spaced relation on said terminal block, one of said sets having end portions extending through said top cover, the other set having downwardly projecting end portions extending through the lower end of said casing, conducting straps supported on said connector block and electrically connecting said sets of terminals, terminals on said resistances extending through the lower end of said casing and in spaced relation with the downwardly projecting end portions of one of said sets of long strip terminals, conductors electrically connecting the terminals of said resistances to the set of terminals having the downwardly projecting end portions, flap portions on the lower end of said casing, a lower cover removably supported on the lower end of said casing and serving in cooperation with the lower end of said casing as an enclosure for the projecting ends of one of said sets of terminals, the terminals of said resistances and said conductors, and embossings on said lower cover adapted to snap over and frictionally engage the flap portions on said casing to prevent accidental dislodgment of said lower cover from said casing.

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