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ELECTRIC TERMINAL MOUNTING

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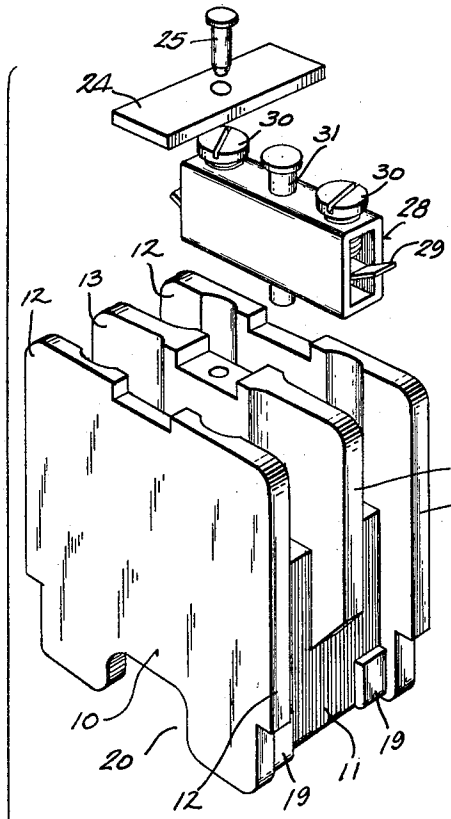


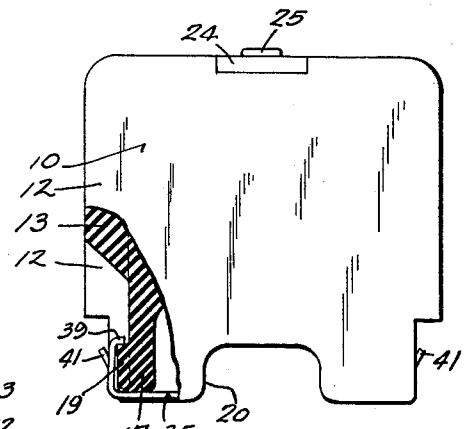




Fig. 2

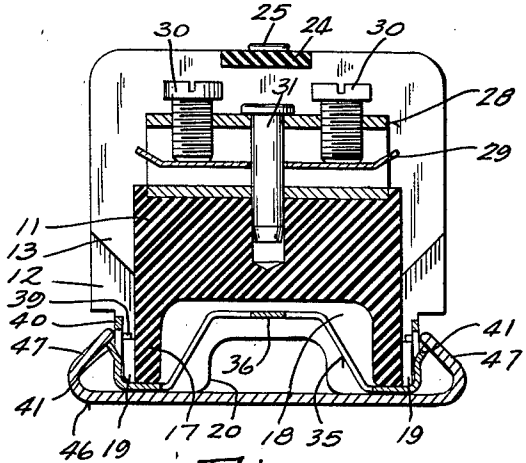
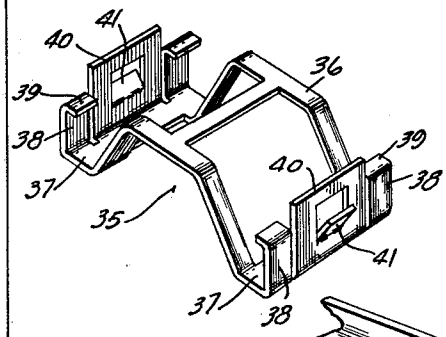



Fig. 3



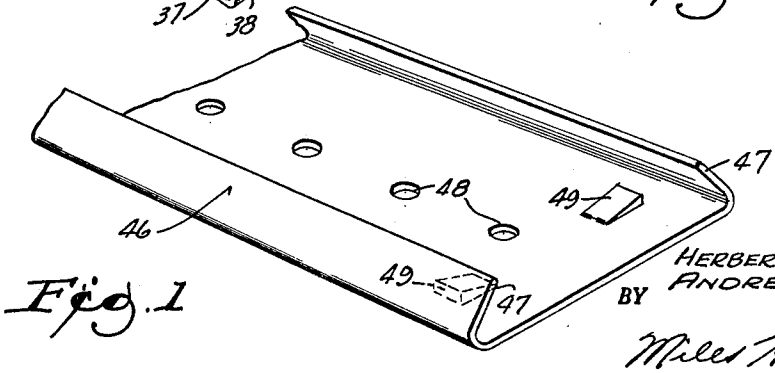




Fig. 1

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# ELECTRIC TERMINAL MOUNTING

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This invention relates to improvements in built-up electrical terminal structures, including terminal block units of sizes receiving different numbers of terminal post sets.

Generally the present electric terminal structure comprises a channel to be mounted on a switch board panel or the like as a base and into which a spring member locks while retaining a block of insulating material which provides a number of sets of electrical terminals to form a block unit. The terminals themselves are either the known screw or tube type dependent on current rating for the terminal. A number of block units are mounted in one channel depending on the number of sets of terminals required. Where the number of sets of terminals may vary, a channel is used of such length as to accommodate the maximum number of block units and the channel may be filled with block units or may contain only the number of block units presently required. A block unit may be placed in or removed from a channel without disturbance of other units inasmuch as the spring is so related to the block as to flex for insertion or removal of the block unit from the channel at right angles to the longitudinal axis of the block. To retain such flexure possibility, the spring is seated only on some block surfaces and is spaced from all other block surfaces so that the major portions of the spring are held in spaced relation to the block and to the channel.

The structure is illustrated in the drawings in which;

FIG. 1 is an "exploded" perspective view showing a marking plate, a terminal set, a block, a spring and a fragment of one form of channel,

FIG. 2 is an elevation with a fragment in cross-section, of the block with a spring and other parts seated thereon, and

FIG. 3 is a cross-section through an assembled terminal block.

Referring specifically to the drawings, **10** generally designates a block of insulating material which comprises a relatively massive body **11** on which are formed two side extension **12** and a center extension **13**, the extensions defining slot-like spaces in which the metallic tube or screw terminal posts are mounted. It will be noted that the center extension **13** is generally double the thickness of the side extensions but the end edges thereof are partially cut away to receive and place an electric conductor about a terminal post, the side extensions **12** being also cut out for such conductor placement. When the block is placed adjacent another block the total thickness of the adjacent side extensions are equal to the thickness of the center extension which is calculated to provide a sufficient insulating barrier between two sets of terminals. The ends of block body **11** are formed with a foot-like part **17** coacting with side extensions **12** in defining a space **18** for receiving the spring. Each foot part **17** is formed with two pads **19** inside of and extending laterally from the side extensions **12**. The side extensions **12** are notched at **20** but extend slightly farther from the block body than the pads **19** and also extend below the foot parts **17** so that the side extensions actually seat in the channel.

Notches in the upper end of the block parts **12** and **13** accommodate a strip **24** for receiving markings for each set of terminals, the strips being removably held in place by a pin **25** pressed into the center extension **13**. The strips **24** extend for less than the full thickness of the side extensions **12**, thus permitting placing of a number of



strips end to end to form a substantially continuous marking surface over all of the block units. Each of the block slots defined by the block extensions **12**, **13** receives a terminal structure shown as being a conductive tube **28** containing a pressure strip **29** on which electrical conductors are to be pressed by screws **30**. Each terminal structure **28—30** is held in place in its block slot by a pin **31** extending through such structure for pressing into the block body **11**.

A spring generally designated **35** is shaped to receive the parts **17** of the block body **11** with a midportion **36** of the spring extending into space **18** in the block. It will be noted that the spring portion **36** is reduced to relatively narrow strips to permit relatively high flexibility thereof and is spaced from adjacent surfaces of the block body **11**. Each end portion **37** of the spring has parts **38** turned up and parts **39** turned over to engage over block pads **19**. By reference to FIGS. 2 and 3, it will be seen that spring portions **38** do not bear on the block parts **17** and **19** except for the upper surfaces of the pads **19** and the lower surfaces of the feet **17**, the bearing of such spring parts **39** on a surface of pads **19** causing the block to be tightly gripped by the spring under the resilient action of the spring mid-portion **36**. An ear **40** extends between each pair of spring parts **38**, **39** and is set slightly inwardly of such parts. The ear has a prong **41** struck therefrom and extending outwardly from the assembled block and spring and the ears **40** and prongs **41** are each relatively large masses of metal so as to be only stiffly resilient.

A metallic mounting channel **46** preferably of stiffly resilient material, is formed of a width to receive an assembled block and spring transversely of the channel with the prongs **41** engaging under channel sides **47** which are bent toward the channel centerline. The channel has holes **48** for attachment to a base and is of a length to receive whatever combination of blocks with different numbers of "slots," is desired. Pairs of lugs **49** may be struck up from the bottom of the channel a sufficient height to prevent accidental movement of a terminal block endwise out of a channel due to vibration or other forces. Obviously holes **48** adjacent the ends of the channel may be used to attach clips or other means bearing on the sides of the end block units to lock the block units in place. However, we have found that the resilience of the springs and channel parts is easily so related as to prevent endwise movement of the block units under even more severe conditions than are usual in use of such devices.

In assembly of the block and spring, the spring midportion **36** is flexed to open the spring end portions **38—39** outwardly. The block **10** is then placed in the spring with the pads **19** on one block foot under the spring parts **39** at one end of the spring. Release of the spring then brings the other end thereof up to snap the other pair of spring parts **39** over the other pair of pads **19**. Pressure on the block unit **10** at right angles to the length of the channel **46** now flexes the spring **35—41** about its bearings on pads **19** so that prongs **41** slip past the edge of the channel sides **47** and engage the undersurfaces of such sides. Such engagement is obtained with relatively little force and without the use of tools of any kind. However when the block unit is to be disengaged from the channel, it is necessary to insert a bar-like tool between the end of an ear **40** and a channel side **47** and to flex the spring ears **40** until prongs **41** disengage from channel sides **47**. Both the engaging and the disengaging movements are at right angle to the channel length and strictly transversely of the channel.

It will be seen that a terminal block may be inserted at any point along a channel and between the blocks already mounted in the channel, without coming into the channel from an end thereof. Any intermediate terminal block

may also be removed without removal of other blocks. No special tools are required to place or remove a terminal block, a screwdriver of suitable size being adequate for the purpose. There is no limit to the length of channel and the number of terminal blocks which may be used in one mounting. As many channel mounting screws may be used as desired and such screws are covered by but do not interfere with the terminal block themselves. The full length of the channel may be used or a channel may be used with space for future terminal blocks. Each "snap-in" operation mounts a terminal block in a single operation.

We claim:

1. In a built-up electric terminal structure, a block of insulation having a slot for receiving the terminal and having feet at the block ends for defining a space within the block, a spring having relatively stiff end portions extending along the block ends and engageable with surfaces thereof for assembly with the block, the spring end portions severally having a prong struck therefrom and extending away from the block ends, the spring having a mid-portion of relatively narrow strips for easy flexing and shaped for arching into the space in the blocks, and a channel for mounting on a base and for receiving the block-spring assembly therein, the channel having inwardly sloping sides extending adjacent the block ends and engageable by the ends of the spring prongs, the spring end portions extending above the channel side edges for pressing thereon to release a prong from the channel for withdrawal of the block spring from the channel.

2. The structure of claim 1 in which the block ends have pads extending therefrom toward the channel sides and the block has extensions projecting beyond the block ends and the bottom on the block feet for providing a space for the spring between the block and channel.

3. The structure of claim 1 in which the spring end portions severally have pairs of parts engaging individually on one surface of a block end pad and have the prong struck from between said pair of parts for providing an aperture for engagement of a tool for pressing the prong away from the channel side.

**References Cited** in the file of this patent

UNITED STATES PATENTS

1,936,963 Dutzmann ---------- Nov. 28, 1933

FOREIGN PATENTS

286,990 Switzerland ---------- Nov. 15, 1952