Sept. 8, 1959 S. M. GOFFSTEIN 2,903,661

CORE AND COIL ASSEMBLY MOUNTING FRAME

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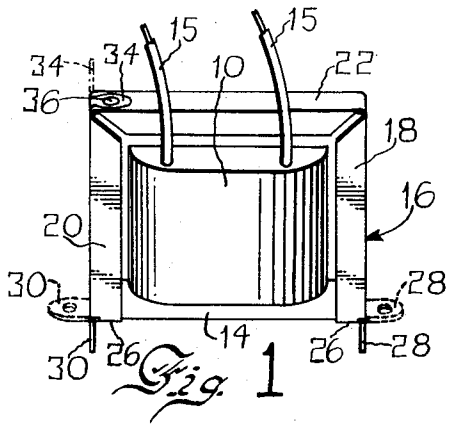


Fig. 1

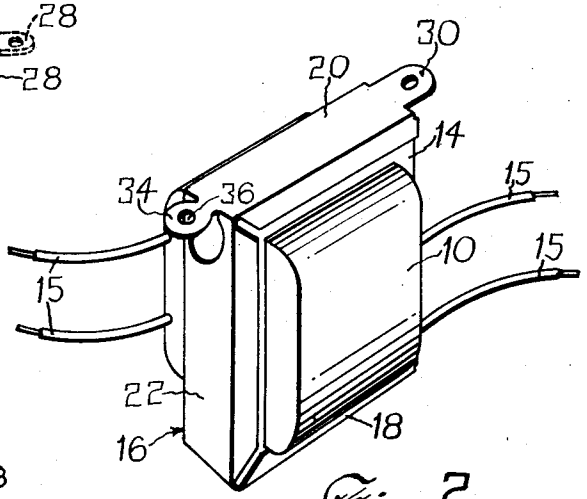


Fig. 2

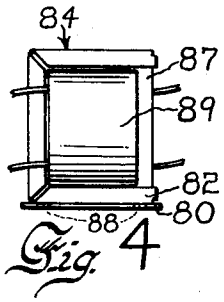


Fig. 4

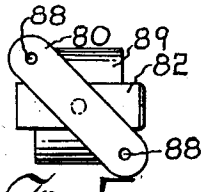


Fig. 5

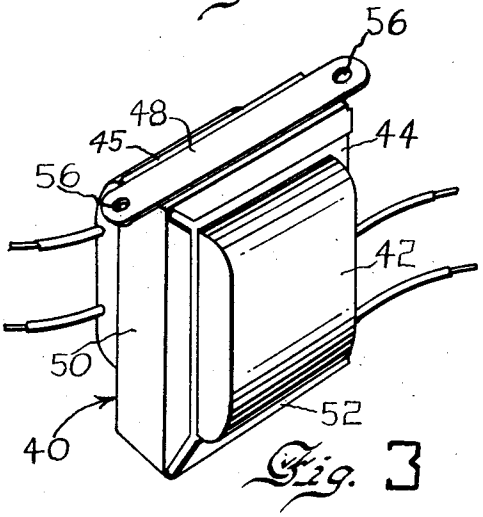


Fig. 3

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CORE AND COIL ASSEMBLY MOUNTING FRAME

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4 Claims. (Cl. 336—65)

This invention relates to a mounting frame having mounting tabs or feet and a method of producing the mounting tabs or feet. This invention relates more particularly to an electrical apparatus provided with a mounting frame. The invention relates more particularly to an electrical apparatus which is mounted on a panel or control board or the like. The invention relates still more particularly to a transformer, choke, coil, reactor, or any electrical device provided with a frame member adapted to be mounted on a panel or board or the like. However, the invention is not so limited in that the structure and method disclosed herein may be applied to numerous types of devices and apparatus.

In the art of transformers, chokes, reactors, coils, and the like, a mounting frame member comprising channel members is usually provided for attaching the apparatus to a panel or board or the like. The frame member customarily is provided with a pair of parallel channel shaped legs and a channel shaped cross member normal to the legs and attaching the legs one to the other at one end thereof. It is customary to have mounting feet or tabs extending from the ends of the legs opposite the cross member. These mounting feet or tabs may extend in alignment with the legs or may be formed at right angles to the legs for mounting of the frame upon a panel, board, or the like.

The core usually has a rectangular configuration with a central portion of the core extending through the coil. The frame member partially encompasses the core as the core is disposed within the frame. The frame member is of such size that the core slidably moves into the channel members forming the frame and fits somewhat snugly therein.

In some installations it is desirable to mount the core so that the longitudinal axis thereof is vertical when the panel upon which the core is mounted is horizontal. In such installations the central axis of the coil usually extends horizontal and the connector leads extending from the coil are disposed substantially horizontal. In other installations it is desired to mount the core so that the longitudinal axis thereof is parallel to the board or panel upon which the core is mounted.

It has therefore been customary to provide two types of mounting frames. One type of mounting frame has the leg portions thereof shorter than the cross member which attaches the two legs one to the other. This type of mounting frame retains the core and coil assembly for mounting with the longitudinal axis of the core horizontal when the panel upon which the assembly is mounted is horizontal and is referred to in the trade as a horizontal mounting frame. The other type of mounting frame has the two legs thereof longer than the cross member which attaches the two legs one to the other. This type of frame retains the core and coil assembly for mounting with the longitudinal axis of the core vertical and is referred to in the trade as a vertical frame.

Thus, when it has been desired to provide a core and coil for vertical mounting, a vertical frame has been selected into which the core is disposed. Likewise, when it has been desired to provide a core and coil for horizontal mounting, a horizontal frame has been selected into which the core is disposed. The core is then secured within the frame by any suitable means, such as by integral prongs at the ends of the legs which prongs may be bent over the core to retain the core within the frame.

It has been found that a horizontal type of mounting frame is highly preferable over a vertical type of mounting frame. When a core having butted portions is disposed within a vertical type of mounting frame, several keepers or retainers must be employed between the core and the frame in order to properly retain portions of the core within the frame. Such keeper members or retainers reduce the amount of space available for the core material and thus such keepers or retainers are objectionable. Thus, the horizontal type of frame member provides an apparatus with better electrical design and is preferable over the vertical type of mounting frame member.

In a horizontal type of channel, pressure of the bent-over prongs against the core firmly clamps portions of the core in their proper relative positions within the frame. Thus, the pressure of the prongs maintains the desired air gap between portions of the core. In the vertical type of channel, the pressure of the bent-over prongs does not directly assist in maintaining a proper air gap between portions of the core.

Furthermore, in the assembly of a core in a conventional type of frame member, the legs of the frame may be somewhat distorted, thus changing the spacing between mounting feet or tabs. This is objectionable due to the fact that accurate mounting dimensions must be maintained in order that the frame members may be mounted upon a pre-selected mounting panel.

It may be desirable in regard to production time and costs to be able to eliminate the necessity of providing more than one type of mounting frame.

Thus, it is an object of this invention to provide a mounting frame member which has the desirable characteristics of a horizontal frame member and which may be used for either vertical or horizontal mounting.

It is another object of this invention to provide a method of producing a horizontal type of frame member so that the frame member may be used for vertical mounting.

Another object of this invention is to provide a method of producing a horizontal type of mounting frame member for use as a vertical mounting frame.

Another object of the invention is to provide means for mounting a frame by which mounting dimensions are accurately maintained regardless of any distortion of the frame which may occur.

Another object of this invention is to provide means for mounting a core and coil frame member in any de-

sired manner of orientation and with the core axis in any desired angular position with respect to a mounting panel to which the frame member is attached.

Another object of this invention is to provide means for attaching a mounting frame to a panel in spaced relation therefrom so that other components and/or conductors may be disposed between the panel and the mounting frame.

Other objects and advantages reside in the construction of parts, the combination thereof, the method of manufacture, and the mode of operation, as will become more apparent from the following description.

In the drawing:

Figure 1 is a perspective view showing a horizontal type of mounting frame member of this invention which may be used for vertical mounting as well as horizontal mounting. A core and coil assembly is shown within the frame member.

Figure 2 is a perspective view, taken from another angle, showing the core and coil assembly of Figure 1 with the mounting frame member adapted for vertical mounting.

Figure 3 is a perspective view showing a core and coil assembly with a preferred modification of a mounting frame of this invention, the mounting strip thereof being parallel to the frame.

Figure 4 is a side elevational view of a mounting frame assembly of the type shown in Figure 3 with the mounting strip thereof disposed at an angle with respect to the frame.

Figure 5 is a bottom view of the structure shown in Figure 4.

Referring to the drawing in detail, Figure 1 shows a core and coil assembly including a coil **10** and a core **14**. The coil **10** has connection leads **15**. Encompassing a portion of the core **14** is a frame **16**. The frame **16** has channel shaped legs **18** and **20** with a channel shaped cross member **22** joining the legs **18** and **20** at one end thereof. The core **14** is retained within the frame **16** by any suitable means such as by bent-over prongs **26**, integral with the frame **16**. Extending from the leg **18** is a mounting foot or tab **28**. Extending from the leg **20** is a mounting foot or tab **30**.

The mounting feet or tabs **28** and **30** may be bent normal to the legs **18** and **20**, as shown in dotted lines in Figure 1, for horizontal mounting of the frame **16** upon a panel or board.

In order that the mounting frame **16** may serve to mount the assembly shown in Figure 1 in a vertical position as well as horizontal, a portion **34** of the cross member **22** adjacent the leg **20** is partially severed. The portion **34** has an aperture **36** provided therein by any suitable means. The portion **34** remains integrally attached to the leg **20**. Thus the portion **34** of the cross member **22** may be bent outwardly to extend in alignment with the leg **20** to form a mounting foot **34** cooperable with the foot **30** for vertical mounting of the frame **16**.

Thus, as shown in Figure 2, the mounting frame **16** is attachable for vertical mounting of the core **14** and the coil **10**. In the vertical mounting of the assembly, as shown in Figure 2, the mounting feet **30** and **34** are attached to a panel or board by means of screws or the like which are inserted through the apertures in the mounting feet **30** and **34**.

It is to be understood that in forming a mounting foot or tab to cooperate with the mounting tab **30** for vertical disposition of the frame **16**, a portion of the leg **20**, rather than the cross member **22**, may be partially severed and bent outwardly to form a mounting tab.

Figure 3 shows a preferred modification in the provision of mounting tabs upon a horizontal type of mounting frame **40** which has a coil **42** and a core **44**. Attached to a leg **45** of the frame **40** axially therewith is an elongate mounting strip or plate **48**. The frame **40** also has a cross member **50** joining the leg **45** of the frame **40** to a leg **52** of the frame **40**. In the provision of mounting tabs for attachment of the frame **40** to a panel, the ends of the strip or plate **48** are provided with apertures **56** through which suitable screws or the like may be inserted for attachment of the strip **48** to a mounting panel. Thus, the horizontal type of frame member **40** may be vertically attached to a panel or board.

Figures 4 and 5 show the modification of the type of mounting means disclosed by Figure 3. However, in Figures 4 and 5 a mounting strip **80**, similar to the mounting strip **48** is attached to a leg **82** of a frame **84** in angular relation thereto. Adjacent each end of the mounting strip **80** is an aperture **88** through which screws or bolts or the like may be inserted to secure the frame **84** to a panel. Retained by the frame **84** are a core **87** and a coil **89**.

The structure of this invention as shown in Figures 3, 4, and 5 provides means by which a mounting frame may be attached to a mounting panel in any desired orientation. Furthermore, the mounting strips or plates, such as the strips or plates **48** and **80**, may be of any suitable dimension so that mounting holes may be provided in a mounting panel of any desired size and in any desired spaced relationship regardless of the dimensions of the mounting frame.

Furthermore, in regard to the invention as shown in Figures 3, 4, and 5, mounting dimensions may be accurately maintained regardless of any distortion which may occur in the mounting frame.

It is to be understood that the mounting strip or plate such as the strips or plates **48** and **80**, shown in Figures 3, 4, and 5 may be attached in any angular manner to the frame members. Furthermore, the strips or plates may be attached to either the legs or the cross member of the mounting frame so that the axis of the core may extend in any desired angular relationship with respect to a mounting panel.

Thus, it is understood that the method of this invention provides means by which a horizontal type of frame member may be used in the vertical mounting of an electrical apparatus. Thus, all of the desirable features of a horizontal type of frame member are obtained in a vertical type of mounting. Furthermore, if desired, the same frame member may be used for either a vertical type of mounting or a horizontal type of mounting, thus eliminating the necessity of providing both a horizontal and a vertical type of frame member.

Furthermore, this invention provides a mounting frame which may be disposed in any angular position or in any desired orientation with respect to a supporting panel. This invention also provides a mounting frame which may be mounted in any desired spaced relationship from a supporting panel.

Although the preferred embodiment of the device has been described, it will be understood that within the purview of this invention various changes may be made in the form, details, proportion and arrangement of parts, the combination thereof and mode of operation, which generally stated consist in a device capable of carrying out the objects set forth, as disclosed and defined in the appended claims.

Having thus described my invention, I claim:

1. Support structure comprising a mounting frame, a core and coil assembly carried and surrounded by the frame, the frame being adapted for vertical mounting upon a panel as well as horizontal mounting thereupon, the frame having a pair of legs, a cross member attaching the legs one to the other at one end thereof, the cross member being longer than either of the legs, the coil having an axis parallel to the legs, a mounting tab extending from at least one of the legs at the end thereof opposite the cross member, a mounting tab extending from said one of the legs from a position adjacent the cross member, the mounting frame thus being attachable to a panel with the axis of the coil parallel to the panel.

2. Support structure according to claim 1 in which the

last said mounting tab is a cut and bent out portion of the leg from which it extends.

3. Support structure according to claim 1 in which the last said mounting tab is a cut and bent out portion of the cross member.

4. Support structure comprising a mounting frame, a core and coil assembly carried and surrounded by the frame, the frame being adapted for vertical mounting upon a panel as well as horizontal mounting thereupon, the frame having a pair of legs, a cross member attaching the legs one to the other at one end thereof, the cross member being longer than either of the legs, the coil having an axis parallel to the legs, an elongate strip

attached to one of the legs, the strip having end portions extending from said leg to which it is attached, each of the end portions forming a mounting tab so that the mounting frame can be attached to a panel with the axis of the coil parallel to the panel.

References Cited in the file of this patent

UNITED STATES PATENTS

1,156,885	Caine	Oct. 19, 1915
1,524,591	Starr	Jan. 27, 1925
2,494,350	Mittermaier	Jan. 10, 1950
2,627,385	Tinnerman	Feb. 3, 1953
2,703,662	Mayer	Mar. 8, 1955