Nov. 6, 1962 C. E. SLOOP 3,062,495

TRANSFORMER MOUNTING

Filed Oct. 13, 1958 2 Sheets-Sheet 1

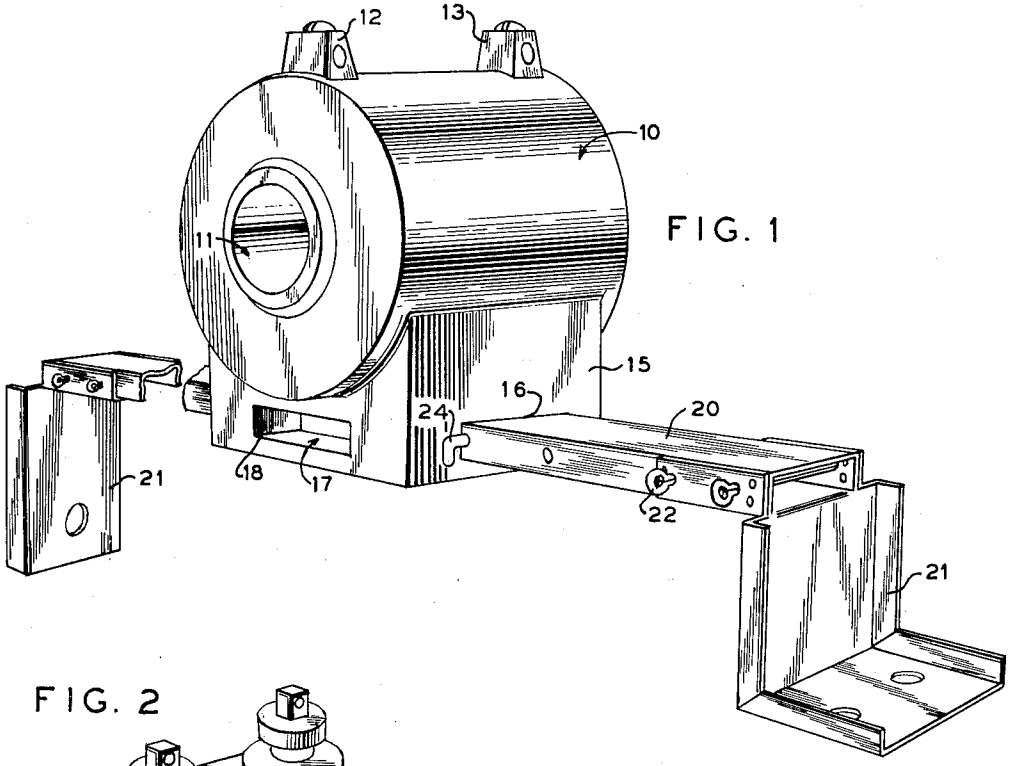
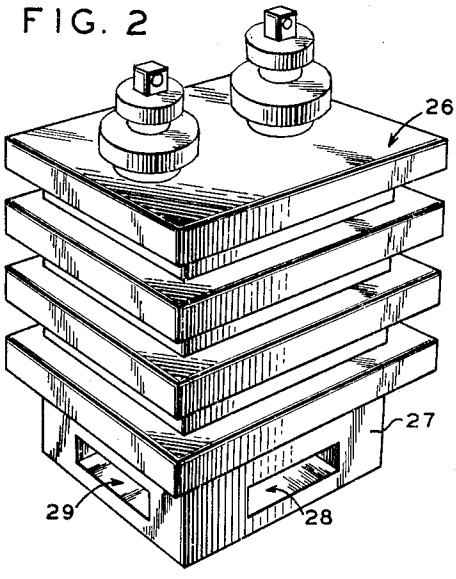


FIG. 1

FIG. 2



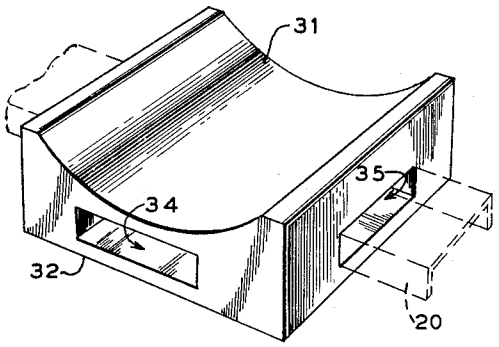


FIG. 3

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TRANSFORMER MOUNTING

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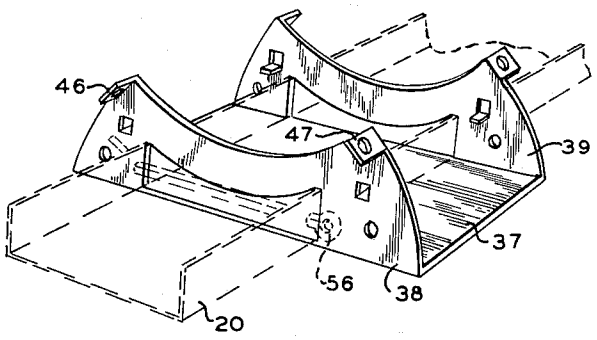


FIG. 4

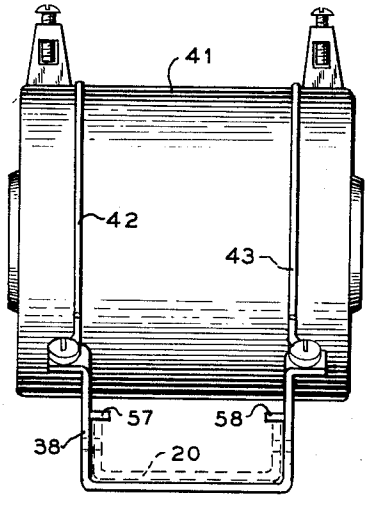


FIG. 5

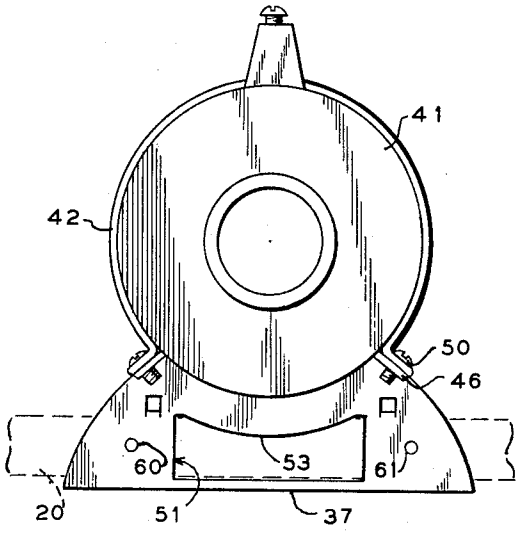


FIG. 6

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TRANSFORMER MOUNTING

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12 Claims. (Cl. 248—205)

This invention relates to a transformer mounting, and more particularly concerns a base for mounting current and potential instrument transformers used in the metering of electrical circuits from 120 to 15,000 volts.

For many years the outer covering of such transformers has been of metal with metal base plates attached thereto by screws, bolts or welding so as to provide for mounting by securing the base plates, to a foreign support. Permanent or detachable feet have also been associated with such base plates so as to give a choice of two sides from which the mounting may be accomplished. In all instances, however, the effect has been that of a flat base between the transformer and its foreign support. Transformer mounting bases of this type have been provided with holes through the outside edges thereof to receive the required bolts or screws for securement to the support. When necessary to rotate the transformer 90° on its support, however, it has been found that new bolt holes are needed in the support, where the transformer body length and width are not the same.

In recent years the outer covering for many of such transformers has been formed of polymerized material, such as rubber or plastic. Base plates have been attached to such transformers in various ways such as by wire hoops, by individual threaded expansion-type metal inserts in or under the outer covering so as to take mounting screws from the base plate, by having a plate with threaded holes in or under the outer covering which also takes mounting screws from the base plate, or by flange type mounting feet being anchored in or under the outer covering.

There are two major objections to the metal expansion inserts and metal plates imbedded in or under such polymerized outer covering material. First, high breakage results in that many of such inserts pull out over a period of time due to mechanical fatigue or because of rough handling or mounting. Second, the presence of metal inserts or plates imbedded in or under the outer covering decreases the electrical breakdown rating from the transformer coil to the insert or plate and from the insert or plate to the base, with the result that a great many such transformers fail to pass rigid high voltage acceptance tests or otherwise fail in use because of such insulation defects.

Although the prior art method of securing a base to a transformer by hoops and bands does not meet with the insulation breakdown and breakage objections above noted, such method has not met with wide acceptance in the industry because of the greater manufacturing expenses and field installation time involved.

Transformer mounting arrangements known to the prior art have also suffered from the drawback that they have not readily permitted a quarter rotation of the transformer as is often required when setting up the transformers for metering either in delta or Y configurations to obtain proper readings, as is well understood by those skilled in the art. In most cases, reorientating a transformer on its supporting bracket has been tedious and time consuming and not readily permitted in the inaccessible locations where such brackets must often be mounted.

The transformer base of the present invention is adapted to be mounted on the bracket shown and described in detail in my copending application Serial No. 766,937, filed on an even date herewith, which is of the general type of bracket shown and described in my U.S. Patent

No. 2,841,772, issued July 1, 1958. Such brackets are adapted for securement to wire spool racks which may be mounted on poles, mast arms, metal and wood structures, framework on building walls, wall surfaces, and in indoor and outdoor cabinets. The working position of such transformers may be standing vertical with base at bottom, or hanging vertical with base at top, projecting horizontally with base at a wall, or at other angles depending on the most convenient mounting of their foreign support and as required by the circuit with which they may be associated.

One of the objects of this invention is to overcome these and many other problems known to the prior art by the provision of a transformer mounting arrangement in which the transformer base is formed with a plurality of mounting windows for complementary registration with a bracket or channel member that is adapted to pass through one of such windows so as to permit selective orientation and positioning of the transformer on the bracket.

Another object of this invention is to provide a new and improved transformer mounting arrangement in which a transformer base is formed of the same or similar type of polymerized material as the outer covering of the transformer so that such base may be formed either integrally with the transformer or separately therefrom but readily bonded thereto by adhesive.

A further object of this invention is to provide a new and improved base attachment for metering transformers which may be readily secured by adhesive bonding to transformers of either cylindrical or rectangular configuration.

Still another object of this invention is to provide a new and improved transformer mounting arrangement which is simple yet rugged in construction, and which readily lends itself to the demands of economic manufacture and installation.

Many of the advantages, features and objects of the invention will become apparent from consideration of the following specification taken in conjunction with the accompanying drawings in which like designators refer to the same or similar parts throughout, and in which:

FIG. 1 is a perspective view of a cylindrical instrument transformer having a mounting base according to the invention formed integrally therewith and secured to a suitable mounting bracket.

FIG. 2 is a perspective view showing a high voltage instrument transformer of rectangular configuration having a mounting base according to the present invention formed integrally therewith.

FIG. 3 is a perspective view of a mounting base attachment according to the present invention which may be utilized with transformers of either cylindrical or rectangular configuration.

FIG. 4 is a perspective showing another type of mounting base according to the invention.

FIG. 5 is an end elevation showing the mounting base of FIG. 4 secured to a cylindrical transformer by hoops.

FIG. 6 is a side elevation of the transformer mounting arrangement shown in FIG. 5.

Referring now more particularly to the drawings, that form of the invention shown in FIG. 1 includes a generally conventional metering transformer **10** of cylindrical configuration having a conductor window **11** formed coaxially therein for reception of a current carrying conductor that functions as a one-turn primary winding. As is well understood by those skilled in the art, a secondary winding is attached internally to secondary terminals **12** and **13** for external connection to a suitable measuring device.

The outer insulation or coverage of such conventional

transformers has recently been made of plastics or polymerized material, such as Butidiene, or resin. According to the invention, such material is not only utilized to provide an insulation or outer covering but also to form an enlarged mounting base **15** of generally rectangular configuration, such mounting base being more particularly characterized by rectangular passages or windows **16** and **17** therethrough disposed at right angles with respect to each other. It is to be noted that such windows are coplanar and in spaced parallel relation to the plane of the bottom of the mounting base, the arrangement being such that the windows intersect centrally within the mounting base, thereby defining corner columns **18** between the upper and lower portions of the base.

The above described transformer having a base according to the present invention is adapted to be slidably positioned on a foreign support or bracket, preferably of the type described in detail in my copending application Serial No. 766,937, filed on an even date herewith. Such bracket may be more particularly characterized by a central elongate channel body **20** having feet **21** at both ends thereof which are readily detachable by removal of cotter pins **22** so as to permit slidable reception of transformers thereon. When utilized in such manner, the transformer is adapted to be secured on the bracket by cotter pins or wires, as at **24**. Selection of orientation of the transformer is determined by both the available mounting for the bracket and the circuit being metered, so that depending on whether the circuit is in Y or delta configuration and the position of mounting of the bracket itself, it might be desirable to mount the conductor window of each transformer either transverse to or parallel to the length of the bracket. It will be readily apparent, then, that the mounting base of the present invention not only provides for selective positioning of the base along the bracket, but, in addition, provides for selective orientation of the transformer with respect to the bracket so as to meet all foreseeable mounting requirements.

Referring more particularly to FIG. 2, therein is shown a generally conventional potential type metering transformer **26** but having the outer covering thereof extending downwardly to form a base **27** having passages or windows **28** and **29** therethrough disposed at right angles to each other, similar to the arrangement of FIG. 1.

FIG. 3 shows a mounting base attachment of polymerized material which is adapted to be adhesively bonded to a conventional transformer having a coating of suitable polymerized material. The top of the mounting base is formed with a concave surface or cradle **31** for bonding to cylindrical type transformers, and a flat bottom **32** for bonding to tranformers of rectangular configuration. Formed through the base attachment are mounting windows or passages **34** and **35** disposed at right angles to each other for selective reception therethrough of a mounting bracket of the type illustrated in FIG. 1. It is to be noted that both the outer covering of the transformer and mounting base attachment are of materials that adhesive will set up to permanently, such being well known in the art and readily available. It will, of course, also be recognized that the base attachment above described may be applied in the transformer factory, at the utility warehouse or in the field prior to installation, such application being in negligible time and without the aid of special training. As a result, inventories may be reduced both by the manufacturer and the utility, since the decision for adding the base attachement need not be made until the installation needs are known rather than at the time of sale, as is highly desirable because of the many types of metering installations in use at the present time.

It is also of interest to note that the above described attachement affords considerable economy in construction. Manufacturers are, for the first time, freed of the necessity of designing special transformers to provide for attachment of particular types and sizes of flat bases since no provision need be made in the transformer body itself for attaching the base of the present invention thereto by such mechanical fastening means as screws or bolts.

Referring now particularly to FIGS. 4, 5 and 6, that form of the invention shown therein includes a metal base of generally U-shaped configuration having a flat intermediate portion **37** and upturned side wall portions **38** and **39**, respectively. The upper edge of each side wall is of such curvature as to form a cradle for complementary registration with the peripheral wall of cylindrical transformer **41**. Securement of the transformer body to the mounting base is provided for by hoops or bands **42** and **43** which are each adapted to pass about the body of the transformer and to be secured to opposite ends of each side wall, the arrangement being such that ears **46** and **47**, formed on each side wall adjacent the terminal edge of each cradle, are apertured to receive therethrough band tightening screws **50**. Each side wall is further former with a window **51** having a botton terminating at the upper side of the intermediate portion **37** and a top **53** formed with a curvature commensurate to that of the upper cradle edge of the side wall but spaced downwardly therefrom.

The confronting windows **51** of side walls **38** and **39**, respectively, are of such dimension as to receive therethrough an upwardly opening channel-like bracket **20** of the type shown in FIG. 1, for positioning of the mounting base with transformer attached thereto, the arrangement being such that the mounting base is retained on the bracket as by cotter pins **56** passing therethrough on both sides of the base.

As shown in FIGS. 5 and 6, the mounting base also provides for positioning on the channel member at right angles from that position shown in FIG. 4. For this purpose, inwardly bent spaced fingers **57** and **58** are formed on each side wall, the arrangement being such that the channel member is adapted to be retained within the general area defined by the bottom or intermediate portion of the mounting base and the fingers extending inwardly from each side wall. Each side wall is formed with spaced apertures **60** and **61** for reception of cotter pins or wires therethrough to secure the base to the channel member.

In utilizing the mounting base of the present invention with the knock-down bracket shown, it will be noted that after the bracket is secured in position, the intermediate channel member **20** may be released from either the upper or lower foot by pulling out cotter pins or wires **24**, thereby permitting transformers to be slid onto such channel member. After positioning the desired number of transformers on the channel with proper spacing and orientation, intermediate channel member **20** may again be placed in the free foot member and the cotter pins or wires returned to their position, thereby completing the installation. Alternatively, of course, the transformers may all be positioned on the bracket prior to mounting of the feet thereof on the spool bolt of a secondary wire rack or other support means.

From the foregoing it will be apparent that I have provided a new and improved transformer mounting which is well adapted to fulfill the aforestated objects of the invention. Moreover, whereas the invention has been described with respect to embodiments which give satisfactory results, it will be understood by those skilled in the art to which the invention most nearly appertains that additional embodiments and modifications thereof may be resorted to without departure from the spirit or scope of the invention as defined by the appended claims.

I claim:

1. In an instrument transformer, a transformer body, a mounting base formed integrally with said body, said mounting base having a plurality of non-circular hollow windows therethrough closed on all sides and open on its ends.

2. In an instrument transformer, a transformer body, a mounting base on said body, said base having first and

second non-circular windows therethrough, said first window being angularly related to said second window with respect to the line of sight therethrough.

3. In an instrument transformer, a mounting base extending therefrom and formed of the same material as the outer covering of the transformer, said base portion having first and second rectangular windows therethrough, said first window being disposed at right angles with respect to said second window, said windows being closed on all sides and open at their ends, said windows criss-crossing each other in the same plane.

4. A base attachment for an instrument transformer comprising a body having a top portion of concave configuration and a bottom portion substantially flat, said body having between said top and bottom portions a plurality of coplanar non-circular windows extending therethrough spaced from the plane of said bottom portion and being in the same plane with each other, said windows being closed on all sides and open at their ends.

5. A base attachment for an instrument transformer comprising a body having a top portion of concave configuration and a bottom portion substantially flat, said body having between said top and bottom portions first and second coplanar non-circular windows extending therethrough spaced from the plane of said bottom portion, said first window being angularly related with respect to said second window.

6. A base attachment for an instrument transformer comprising a U-shaped member having a base portion and a pair of side wall portions, each of said side wall portions having an upper edge of equal concavity, said side walls being further formed with a window for reception of a support member therethrough, each of said side walls being further formed with a pair of spaced inwardly extending lugs so as to define a support member passage therebetween with said base portion.

7. In combination, a transformer base having a plurality of non-circular windows therethrough angularly related with respect to the line of sight therethrough for selectively receiving a support member, together with an elongate support member removably positioned in one of said windows and adapted to be removably positioned into the other of said windows.

8. Apparatus as set forth in claim 7 including a pair of feet releasably secured to said elongate support member.

9. In combination, a transformer for metering electrical service, a base on said transformer, said base having a pair of windows therethrough disposed at right angles to each other with respect to line of sight therethrough, a bracket for mounting on the spool bolt of a secondary wire rack, said bracket having an elongate central member and terminal feet releasably secured thereto, said feet adapted to be mounted on said spool bolt, said central member adapted for selective registration with one of said pair of windows of said base, and means for retaining said base in position on said central member.

10. The combination with a transformer of the type having an outer surface of a mounting base, an elongated non-circular support member, said mounting base being of generally rectangular configuration having outer parallel surfaces and a flat bottom surface, said mounting base having an upper surface conforming to the shape of the outer surface of said transformer, and means for securing said transformer within said upper surface of said mounting base, there being provided a first window extending through said mounting base, said first window being entirely within said base parallel to and above said bottom,

there being provided a second window through said mounting base and coplanar with said first window, said second window being entirely within said base parallel to and above said bottom, said first window and said second window being at right angles to each other, each window being non-circular to receive said elongated support member therethrough, said support member removably passing entirely through one of said windows, said mounting base being adapted to be removed from said support member and remounted thereon with said support member projecting entirely through the other window.

11. The combination with a transformer of the type having a cylindrical outer surface of a mounting base, an elongated support member, said mounting base being of generally rectangular configuration having outer parallel surfaces and a flat bottom surface, said mounting base having a concaved upper surface conforming to the cylindrical outer surface of said transformer, and means for securing said transformer within said upper surface of said mounting base, there being provided a first window extending through said mounting base, said first window being parallel to and above said bottom, there being provided a second window through said mounting base and coplanar with said first window, said second window being parallel to and above said bottom, said first window and said second window being at right angles to each other, each window being so shaped as to receive said elongated support member therethrough, said support member removably passing entirely through one of said windows, said mounting base being so adapted to be removed from said support member and remounted thereon with said support member projecting entirely through the other window.

12. The combination with a transformer of the type having a cylindrical outer surface of a mounting base, an elongated rectangular support member, said mounting base being of generally rectangular configuration having outer parallel surfaces and a flat bottom surface, said mounting base having a concaved upper surface conforming to the cylindrical outer surface of said transformer, and means for securing said transformer within said upper surface of said mounting base, there being provided a first window extending through said mounting base, said first window being parallel to and above said bottom, there being provided a second window through said mounting base and coplanar with said first window, said second window being parallel to and above said bottom, said first window and said second window being at right angles to each other, each window being substantially the same cross-section as said support member to receive said elongated support member by one end projecting therethrough, said support member removably passing entirely through one of said windows, said mounting base being adapted to be removed from said support member and remounted thereon with said support member projecting entirely through the other window.

References Cited in the file of this patent

UNITED STATES PATENTS

448,550	Scott	Mar. 17, 1891
1,105,284	McMurtie	July 28, 1914
1,783,749	Roehl	Dec. 2, 1930
2,050,510	Thoms	Aug. 11, 1936
2,085,434	Loftis	June 29, 1937
2,841,772	Sloop	July 1, 1958
2,849,027	Tetyak	Aug. 26, 1958

FOREIGN PATENTS

935,780	France	Feb. 9, 1948