ABSTRACT OF THE DISCLOSURE

A transformer enclosure for pad mounted transformer having a main housing, a cover member interlocking with a flange on the main housing and a front panel which anchors to the housing. A locking member is provided on the housing and complementary locking means are provided on the front panel and cover such that when the parts are assembled, they may be securely locked in the assembled or closed position by a single locking means.

Background of the invention

As is well known to those skilled in the transformer art, in recent years the underground distribution system of power, has become increasingly popular particularly for residential developments. In general, this demand has arisen because the underground distribution systems eliminate the overhead wires, poles and the like, which are considered unsightly in these newer developments. In order to provide for adequate underground distribution, it is necessary either to bury the transformers in vaults or else to mount the transformer directly at ground level. As the art has developed the ground level mounted transformers have been termed “pad-mounted” transformers.

In many types of pad mounted transformers, a large rectangular housing or enclosure is provided which is mounted on a concrete pad. A transformer is contained within the enclosure, sometimes in its own tank or else in a portion of the enclosure specifically built to hold the transformer. Further, high and low voltage sections are provided in another portion of the enclosure. Usually all of the wiring to and from the pad mounted enclosure is carried underground entering the enclosure from prepared openings in the concrete pad. With the wires entering the pad from underground, it is desirable to have a connecting compartment within the enclosure for making the various connections to and from the transformer. Further, since it is necessary to make various connection changes and to perform repairs and maintenance during the use of the transformer, it is desirable that ready access be provided to the connection compartment of the transformer enclosure. In the prior art such access has been provided by means of hinged doors on the front of the enclosure, which will provide immediate access to the connection compartment, but not to the transformer itself. In order to prevent unauthorized entry into the connection section of the transformer enclosure, various types of blocking means have been provided for the doors of the enclosure. It has also been suggested that compartments be provided directly connected to a transformer tank to provide the desired connection compartment. Various types of locking means have been proposed, most of them requiring the use of hinged doors with locks on such doors.

In many residential areas the large enclosures which have been used in pad mounted transformers have been considered undesirable because of the extra cost of such enclosures and their large and bulky appearances. Therefore, it has been found desirable to devise a small compact enclosure for use in residential areas to make the pad mounted transformer as inconspicuous as possible. Further, it is necessary to provide adequate locking means for such enclosures to prevent unauthorized entry into the connection compartment where contact with dangerous high voltages could be made. However, as will be understood, it is also desirable that authorized entry be readily obtained for maintenance and repairs as necessary. Due to the small size of these compact enclosures, it is also considered desirable to provide a removable cover to allow easier inspection and maintenance of the transformer connections. Further, it is considered desirable that the enclosure be as inexpensive and simple as possible in keeping with the requirement for adequate security of the enclosure.

It is therefore one object of this invention to provide a novel transformer enclosure with interlocking means to enable a single lock to secure the enclosure.

A further object of this invention is to provide a simple, inexpensive transformer enclosure comprising three interlocking portions which may be secured by a single locking device.

Summary

In carrying out this invention in one form, a transformer enclosure is provided comprising a housing member, a removable cover member and a removable front panel member. The housing members is mounted on a cement pad and is provided with a flange member which will interlock with a mating flange on the removable cover member. Anchor means are provided on the housing, which receive mating anchor means on the front panel. Interlocking means are provided on the housing, the cover and the front panel such that the three portions may be locked by a single locking device to form a secure transformer enclosure.

The invention which is sought to be protected will be particularly pointed out and distinctly claimed in the claims appended hereto. However, it is believed that this invention and the manner in which its various objects and advantages are obtained as well as other objects and advantages thereof will be more fully understood by reference to the following detailed description of preferred embodiments thereof, especially when considered in the light of the accompanying drawings.

Brief description of the drawings

FIGURE 1 is a perspective view of a preferred form of transformer enclosure according to one form of this invention;

FIGURE 2 is an exploded perspective view of the transformer enclosure of FIGURE 1 showing the construction and operation thereof;

FIGURE 3 is a sectional side view of the transformer enclosure of FIGURE 1 showing the interlocking of the various portions with a transformer mounted within the enclosure;

FIGURE 4 is a partial sectional side view of a modified form of the transformer enclosure of this invention;
FIGURE 5 is a partial sectional side view of the modification shown in FIGURE 4 showing the opening of the interlocking parts;

FIGURE 6 is a partial sectional side view of another modified form of the transformer enclosure of this invention;

FIGURE 7 is a partial sectional side view of the modification shown in FIGURE 6 showing the opening of the interlocking parts; and

FIGURE 8 is a partial sectional side view of a further modification of the transformer enclosure of this invention.

Description of preferred embodiments

Reference will now be made to the drawings in which like numerals will be used to indicate like parts throughout the various views thereof. Referring first to FIGURES 1, 2, and 3, there is shown the present preferred embodiment of the transformer enclosure of this invention. FIGURE 1 shows a perspective view of the transformer enclosure 10 comprising a main housing unit 12, a removable cover member 14, and a removable front panel 16. The three sections or units of the transformer enclosure 10, interlock so that they are more fully described and are securely locked in the closed position by a single locking device such as padlock 18. As shown in FIGURE 1 the transformer enclosure 10 is mounted on a concrete pad 20 in the conventional manner.

FIGURE 2 is an exploded perspective view of the units of the transformer enclosure 10. As is shown in FIGURE 2, the main housing 12 is preferably a three-sided member divided into a transformer compartment 22 and an electrical connection compartment 24 by a divider 26. The relation of the compartments 22 and 24 and the divider 26 is clearly shown in FIGURE 3 of the drawing. The divider 26 is preferably a metal member which is welded or otherwise secured in place on the sides of the main housing 12 in the manner indicated in the drawing. As will be understood, in a pad mounted transformer enclosure, the bushings for the high and low voltage connections (not shown) are brought to the divider 26 so that all necessary connections may be made by providing access to the electrical connection compartment 24. Since the connections form no part of this invention, they are not shown.

The main housing 12 is provided with an external flange 28 at the rear thereof which may also extend along both sides, if desired. A locking member is also provided on the rear housing, preferably in the form of a metal flange 30 which is welded or otherwise secured to the sides of the housing 12 at the front as is shown. Locking flange 30 is provided with the holes 32 and a hasp member 34. The main housing 12 also has a pair of anchors 36 which are preferably metal members welded to the inside of the sides of housing 12 in the manner shown.

Cover 14 is provided with a downwardly extending and interlocked flange 38 at the rear thereof, as best seen in FIGURE 3. As is apparent from FIGURE 3, the flange 38 on cover 14 will interlock with flange 28 on the housing 12. Cover 14 also has a down turned flange 40 which is welded to the front portion of cover 14 as shown. The flange 40 is provided with a pair of holes 42 which mate with holes 32 in the locking flange 30 when cover 14 is mounted in place on housing 12. Flange 40 is also provided with a slot 44 which slides about hasp 34 on the locking flange 30.

The removable front panel 16 has a pair of anchor members 46 welded to the lower inside portion of panel 16 as shown. These anchors 46 interlock with anchors 36 on housing 12 as best seen in FIGURE 3. Panel 16 also has a pair of metal dowel members 48 which interlock in the holes 32 of the locking flange 30 and the holes 42 on cover flange 40. A slot 50 is also provided which receives the hasp 34 when the front panel is in place on the housing 12.

From the above description and in consideration of FIGURE 3 it will be apparent the manner in which the transformer enclosure 10 of this invention is assembled and interlocks to provide a novel transformer enclosure which may be securely fastened in a closed position by a single locking device. The housing 12 is mounted on a concrete pad 20 in any desired manner, as is well known in the art. After a transformer such as, for example, transformer 52 of FIGURE 3, is placed in the transformer compartment 22, and the connections (not shown) have been made to divider 26, the cover 14 is placed on housing 12 with the flange 38 on cover 14 interlocking with flange 28 on housing 12. The cover flange 40 will overlie the locking flange 30 with the holes 42 in registry with the holes 32 and slot 44 around hasp 34. The front panel 16 is then mounted with anchors 46 interlocking with the anchors 36 on the housing. The panel 16 may then be pivoted about the anchors 46 and 36 against the housing 12. The dowels 48 will enter holes 42 and 32 while hasp 34 will slide through the slot 50. With the front panel 16 in place, cover 14 is securely locked to housing 12 by means of dowels 48 through holes 42 and 32. The front panel is securely fastened to the housing by means of the cover 14 and the holes 32 at the base of the hasp 34 are through slot 50. With a single lock in the hasp 34, the entire assembly is securely locked in its closed position, as is shown in FIGURE 3. However, as will be apparent, if it is desired to obtain access to the electrical connection compartment 24, it is only necessary for an authorized person to remove lock 18 and then remove front panel 16 to provide ready access to the connection compartment 24. Of course, it will be understood that, while the enclosure 10 has been shown with a transformer compartment 22, and in FIGURE 3, with transformer 52 mounted in such compartment, it is well known to manufacture transformer enclosures in which the compartment 22 includes a transformer, and the sides of the compartment are the actual tank of the transformer. In this manner the enclosure of this invention may still be utilized, however, it would not be necessary to use a separate transformer 52 as it shown in FIGURE 3.

FIGURES 4 thru 8 of the drawings show modifications of the enclosure of this invention using different types of securing means. In these modifications the cover member is placed on the enclosure after the front panel is in place, so it is necessary to at least lift the cover as is shown particularly in FIGURES 5 and 7 to provide removal of the front panel.

Referring now to FIGURES 4 and 5 of the drawing, a modification is shown in which the cover member 14a is provided with a hasp 54 on a down turned forward flange 56, the hasp 54 mating with the hasp 34 on the anchor 30 of the main housing 12. In this modification, the front cover 16a is provided with a slot 50 but no dowels are used. As is apparent from FIGURE 5 the front panel 16a is first mounted, preferably on anchors as is shown in FIGURES 2 and 3 and then pivoted with hasp 34 sliding through the slot 50. Then, the cover member 14a is mounted over the housing 12 with the flanges 28 and 30 interlocking in the same manner as earlier discussed, with reference to FIGS. 2 and 3. Then the downturn flange at the front of cover member 14a overlies the front panel 16a, and hasp 54 mates with hasp 34 such that the single lock 18 may be interfit with the two hasps 34 and 54 to securely lock the transformer enclosure in the closed position as shown in FIGURE 4.

FIGURES 6 and 7 show a further modification in which the cover 14a is still provided with the downturn flange 56 and the hasp member 54. However, in this modification the locking flange 30a of the housing 12a is provided with openings such as for example, holes 33 of FIGURE 2 to receive the dowels 48a of the front panel 16a. Front panel 16a has a hasp 58 which interlocks with the hasp 56 such that a single locking device such as padlock 18 may be interfit with the two hasps to securely lock the
enclosure as shown in FIG. 6. As will be apparent, the flanges 38 on the cover and 28 on the housing still interlock at the rear to securely hold the cover 14a to the housing 12.

In FIGURE 8 there is shown a further modification in which a transformer tank 52a is used as the rear wall portion of the main housing and is provided with side panels for example in the manner disclosed, application Ser. No. 354,076, now Patent No. 3,315,023 filed Mar. 23, 1964, for "Transformer Housing and Locking Means Therefor," in the name of John N. Davis and assigned to the same assignee as this invention. The transformer tank is provided with a flange 28a similar to the flange 28 of the housing 12 of FIGS. 1 thru 3. The cover member 14a has the downturn and inwardly extending rear flange 38 which interlocks with the flange 28a on transformer tank 52a. A locking flange 30b is provided, secured to the cover of transformer tank 52a or to the side walls of the housing, and extends forwardly and provided with a hasp 34b as shown. As in FIG. 4, the removable front panel 16 is provided with the slot 50 for reception of the hasp 34b. Cover member 14a is provided with the front downturn flange 56 and the hasp 54. The hasp 54 mates with hasp 34b such that a single locking device may lock the enclosure in closed position as shown in FIGURE 8.

It will be noted that in all of the above described modifications that the cover member 14 or 14a is readily removable after the locking device has been detached. This provides easier access to compartment 24 and readily allows any connection therein to be observed while standing. In the modifications shown in FIGURES 5–8, the front flange 56 of cover member 14a extends well over the locking device, protecting such device from the weather.

From the above description of the present preferred embodiment and the modifications thereof it will be apparent that this invention provides a simple, inexpensive transformer enclosure which may be readily assembled and which utilizes only a single locking device for locking the transformer enclosure in its closed position. Further it is apparent that by removal of the single locking device ready access may be provided to the connection compartment by authorized personnel, as is desired for making changes in the electrical connections to the transformer. Of course, it will be apparent to those skilled in the art, that changes may be made in various constructional details without departing from the spirit and scope of the invention, particularly as it is set forth in the appended claims.

What is claimed as new and which it is desired to secure by Letters Patent of the United States is:

1. A transformer enclosure for pad mounted transformers comprising, in combination
   (a) a main housing having two side walls, a back wall, and an open front,
   (1) an outwardly extending flange on at least the top of said back wall
   (b) a cover member including a downwardly and inwardly projecting flange for interlocking with said flange on said main housing
   (c) and a front panel,
   (1) anchor means on said front panel interlocking with anchor means on the side walls of said housing,
   (2) interlocking means on said front panel cooperating with interlocking means on said main housing and said cover to lock said enclosure with a single lock.

2. A transformer enclosure as claimed in claim 1 in which a locking bar is provided across the open front of said main housing, said locking bar having said interlocking means cooperating with said front panel and said cover member.

3. A transformer enclosure as claimed in claim 2 in which said cover member has an inner flange which overlies said locking bar of said main housing.

4. A transformer enclosure as claimed in claim 3 in which the interlocking means on said front panel comprise dowel means which fit into holes in said locking bar of said housing and said inner flange of said cover member.

5. A transformer enclosure as claimed in claim 1 in which said back wall of said main housing is a transformer tank.

References Cited

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LARAMIE E. ASKIN, Primary Examiner.

T. J. KOZMA, Assistant Examiner.