Jan. 23, 1962 M. E. HILL 3,018,017

RETAINER FOR TRANSFORMER CASING COVER

Filed Jan. 12, 1959

Fig. 1.

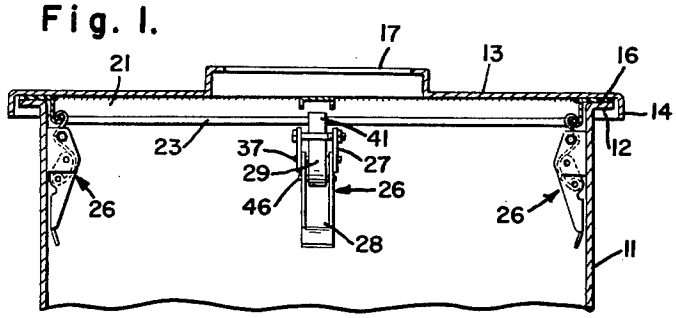


Fig. 2.

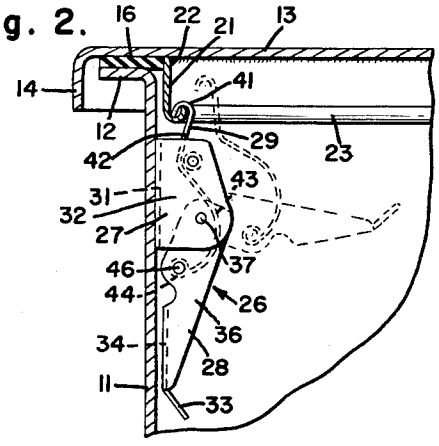


Fig. 3.

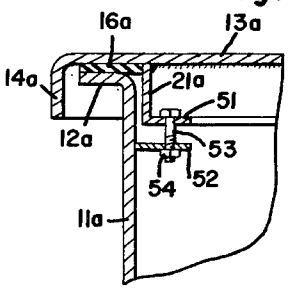


Fig. 4.

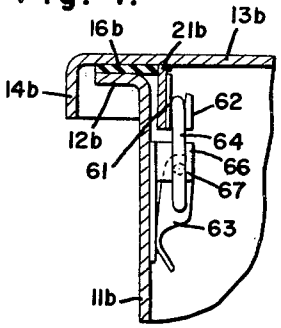
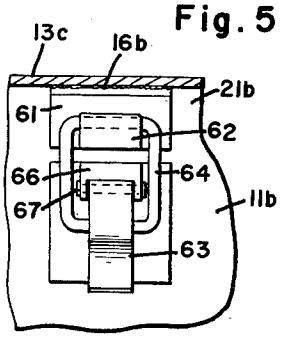


Fig. 5.



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United States Patent Office 3,018,017
Patented Jan. 23, 1962

3,018,017

RETAINER FOR TRANSFORMER CASING COVER

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Filed Jan. 12, 1959, Ser. No. 786,220
2 Claims. (Cl. 220—55)

This invention relates to a new and improved retainer means for a transformer casing cover. A conventional transformer requires an open end casing or tank in which the transformer and the oil or other fluid is contained, and a cover for the tank with a gasket to seal the cover to the casing. The present invention relates to an improved means for clamping the cover in place.

An important feature and advantage of the present invention is the fact that the means whereby the cover is retained in place is disposed entirely inside the casing and hence does not interfere with placement of the transformer in any desired location or constitute a danger of snagging a person or object.

One of the features of the invention is the fact that the retainer means in the casing cooperates with a downwardly extending sleeve or ring welded to the under side of the cover. The use of such a sleeve has a number of advantages. One principal advantage is the fact that it serves as a stiffener for the cover. Another advantage of the sleeve is the fact that it cooperates with the down-turned rim of the cover to retain the sealing gasket in place.

Still another feature of the invention is the fact that exact placement of the cover on the transformer in order to establish connection with the retainer means is not necessary and hence rapid installation of the cover is facilitated.

Another feature of the invention is the convenience with which the retainer means may be engaged as compared with conventional methods of attachment.

Other objects of the present invention will become apparent upon reading the following specification and referring to the accompanying drawings in which similar characters of reference represent corresponding parts in each of the several views.

In the drawings:

FIG. 1 is a fragmentary vertical, sectional view through the cover and upper portion of a casing.

FIG. 2 is an enlarged fragmentary sectional view showing the retainer means in locked position in solid lines, and in unlocked position in dotted lines.

FIG. 3 is a view similar to FIG. 2 of a modification.

FIGS. 4 and 5 are fragmentary sectional and elevational views of still another modification.

A conventional transformer is contained in an open-top cylindrical metal casing or tank **11** having a peripheral outward projecting annular flange **12**. A cover **13** fits over the flange **12** and has a downward turned rim **14** which fits over and below the flange **12**. An annular cork or fibrous gasket **16** is located inside the rim **14** and generally over the flange **12**. Conventionally, covers **13** are formed with hand holes **17** for access through the cover to the interior of the casing **11** in order to make adjustments of the transformer, to check the level of the oil therein, or for various other purposes. The hand hole **17** is employed in the present invention to provide access to the cover retainer means.

In the form of the invention shown in FIGS. 1 and 2, the cover **13** is provided with a depending sleeve **21** or ring, fastened to the underside of the cover **13** by means of a weld **22** or other convenient means and formed at its lower edge with an inwardly upturned lip **23**. The ring **21** cooperates with the rim **14** to serve as a retainer for the gasket **16**, locating it properly in position and retaining it against accidental dislodgment. It also stiffens cover **13**.

A plurality of toggle latches **26** is employed to engage with the lip **23** to retain the cover **13** in place. In the modification illustrated in FIG. 1, four toggles **26** are employed. The number of latches required varies depending upon the size of the transformer casing and various other considerations, but it will be understood that fewer latches are necessary than the number of conventional retainers currently employed. The latch **26** illustrated in FIGS. 1 and 2 consists of a stationary support **27**, a hinged lever **28** and a spring clamp **29**. Stationary support **27** is U-shaped in cross-section, having a central connecting portion **31** which is welded or otherwise secured to the inner surface of tank wall **11** and a pair of parallel side arms **32** perpendicular to connecting portion **31** and spaced apart a short distance. The hinged lever **28** has a finger grip **33** at its outer end which is bent upward from the connecting portion **34** and has a pair of parallel sides **36** perpendicular to connecting portion **34** and fitting inside the lower portion of side arms **32**. A hinge pin **37** pivotally connects the hinge lever **28** to the stationary support **27**.

Clamp spring **29** is of an irregular shape as best shown in FIG. 2, having at its upper end an outwardly downwardly turned hook **41** which engages over and locks with lip **23** when the latch is closed. Below hook portion **41** the spring **29** has a downward stretch **42** and is then bent outwardly in an arcuate portion **43** which curves around hinge pin **37** and terminates in an eye **44** by which the spring is secured to the hinged lever **26** by means of anchor pin **46**.

Thus, in order to secure the cover **13** in place, the cover **13** is placed over flange **12** with gasket **16** fitting on top of the flange **12**. The latches **26** are open (dotted line position as viewed in FIG. 2) at the time of installation. If by accident the toggles should be initially in closed position, by reason of the curvature of the lower edge of the lip **23** and of the hook portion **41**, the toggles are sprung open. It will be noted that the exact positioning of the cover **13** relative to the casing **11** is immaterial. Thereupon the user reaches through the hand hole **17** inside the casing **11** and pushes the finger grip **33** downwardly to the solid line position of FIG. 2 which causes the hook **41** of spring **29** to lock with lip **23**. Each of the latches **26** is locked in a similar manner and thereby the cover **13** is retained in place. When necessary it is easily unlocked merely by reaching through the hand hole **17** and lifting the hinged lever **28** to the dotted line position.

The modification of FIG. 3 is similar in many respects to that of FIGS. 1 and 2. Similar reference numerals are employed followed by the subscript *a* for the corresponding parts. The depending ring **21***a* is formed with an inwardly horizontally directed flange **51**. Welded at various locations on the inside of casing **11***a* are horizontal lugs **52**. Lugs **52** and flange **51** are apertured to receive bolts **53** held in place by nuts **54**. The number of bolts **53** required varies depending upon the size of the casing.

The form of the invention shown in FIGS. 4 and 5 is likewise similar and corresponding reference numerals followed by the subscript *b* are employed. Depending lugs **61** are fastened to ring **21***b* depending from the underside of cover **13***b* and carry hooks **62**. Suitcase type latches **63** are fastened to the inside of casing **11***b*. Latches **63** have wire loops **64** which engage over the hooks **62**. Latches **63** are pivotally connected to stationary members **66** by pins **67** and stationary members **66** are welded to casing **11***b*.

Although the foregoing invention has been described in some detail by way of illustration and example for

purposes of clarity of understanding, it is understood that certain changes and modifications may be practiced within the spirit of the invention and scope of the appended claims.

I claim:

1. In combination, an open top transformer casing, an apertured cover for said casing having a depending rim overhanging the top of said casing, a continuous, cylindrical sleeve depending from the underside of said cover interiorly of said casing, said sleeve having an inturned curled lip, and a plurality of toggle latches spaced around the inside of said casing adjacent the top thereof, each said toggle latch comprising a stationary support fixed to said casing, a lever pivoted to said support, and a latch spring pivotally mounted on said lever, said spring being formed with a hook to hook over said lip when said lever is depressed.

2. In a transformer casing assembly, an open top tank, an apertured cover having a peripheral rim overhanging and resting upon the top of said tank, a cylindrical, short sleeve permanently secured to the underside of said cover

and extending continuously around the inside of the upper end of said tank, said sleeve having an inwardly turned curled lip, and a plurality of latches each fixed to the inside of the upper end of said tank and spaced around the inside of said tank, each said latch having an operative and an inoperative position, each said latch having a hook to hook over said lip when said latch is in operative position and being disengageable from said lip when said latch is in operative position to permit lifting of said cover from said tank, said latches being manually operable through said aperture.

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