March 14, 1933. W. E. McCLINTOCK 1,901,760

CLAMPING DEVICE

Filed Oct. 14, 1931

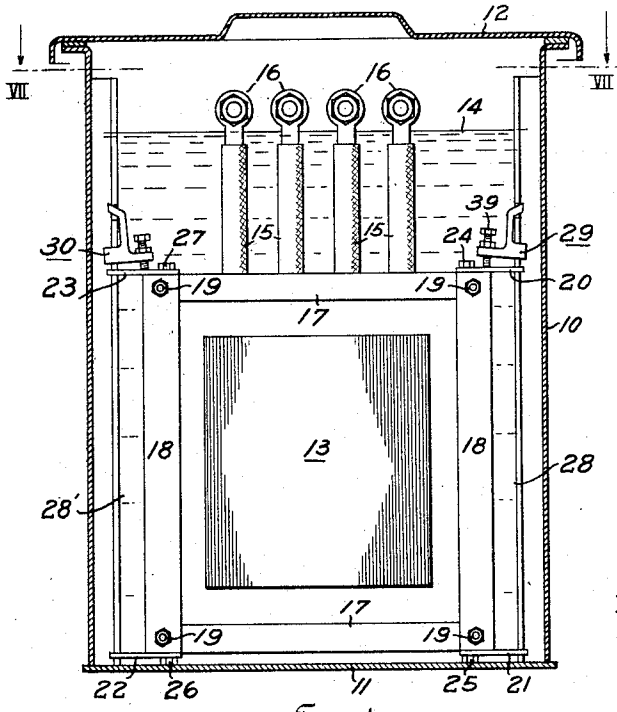


Fig. 1

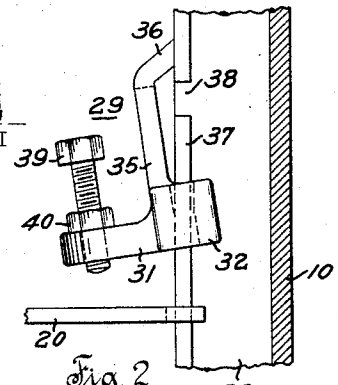


Fig. 2

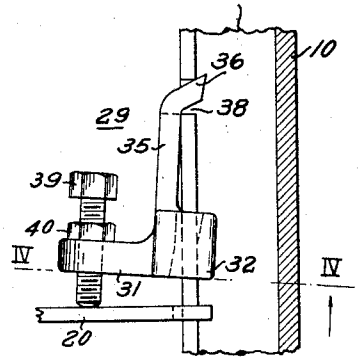


Fig. 3

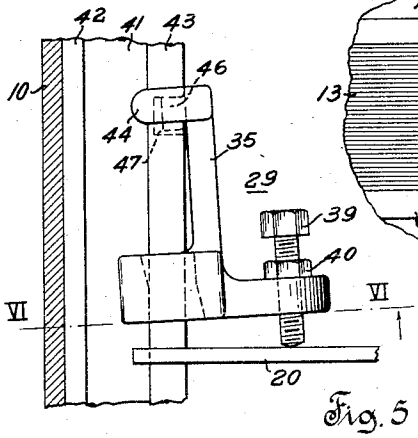


Fig. 5

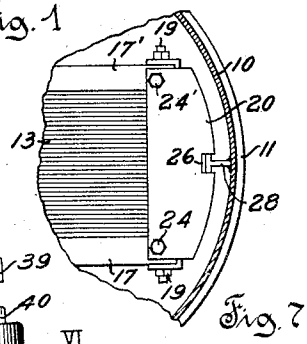


Fig. 7

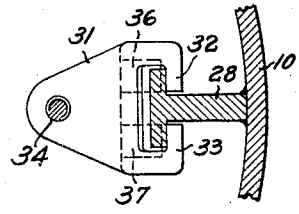


Fig. 4

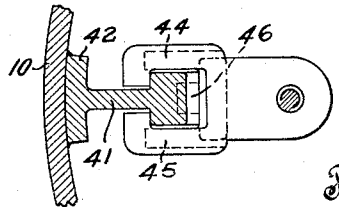


Fig. 6

Inventor
W. E. McClintock
by G. P. Dewey
Attorney

Patented Mar. 14, 1933 1,901,760

UNITED STATES PATENT OFFICE

WILLIAM ELMER McCLINTOCK, OF BELLEVUE, PENNSYLVANIA, ASSIGNOR TO ALLIS-CHALMERS MANUFACTURING COMPANY, OF MILWAUKEE, WISCONSIN, A CORPORATION OF DELAWARE

CLAMPING DEVICE

Application filed October 14, 1931. Serial No. 568,695.

This invention relates in general to clamping devices, and more particularly to devices for clamping reactors, transformers and the like in place in casings.

The problem which applicant has solved is best understood by reference to the transformer art wherein it has been usual practice to hold transformer coil and core assemblies in place within casings by various devices, such as clamping screws extending through the casing near the base thereof, raised portions on the bottom of the tank, resilient members mounted on the core and adapted to engage the side walls of the casing, lugs welded to the casing walls, and wedges of various kinds.

It is an object of this invention to provide an improved device for retaining transformers and the like in casings.

It is a further object of this invention to provide a clamping device which also serves to guide the transformer coil and core assembly relative to the casing during assembly and disassembly thereof.

It is a further object of this invention to provide a simple clamping member which is adapted to engage with a guide rail.

These and other objects and advantages are attained by this invention, various novel features of which will be apparent from the description of the drawing herein, and will be more particularly pointed out in the claims.

Various illustrative examples of the application of this invention are shown in the accompanying drawing, in which:

Figure 1 is a side view of a transformer with its casing broken away to show an embodiment of the invention;

Figure 2 is an enlarged side view of the clamping device shown in Figure 1 during assembly thereof;

Figure 3 shows the clamping device of Figure 2 in its final clamping position;

Figure 4 is a section view taken on the line IV—IV of Figure 3;

Figure 5 is a side view of a modified form of clamping device embodying this invention;

Figure 6 is a section view taken along line VI—VI of Figure 5; and

Figure 7 is a view of the transformer shown in Figure 1 taken on line VII—VII of Figure 1 and with the cover and clamping element removed.

The transformer shown in Figure 1 is provided with a casing having side walls 10, a bottom member 11 welded thereto, and a cover member 12 adapted to be clamped on the side walls. A transformer coil and core assembly 13 is immersed in insulating liquid 14 and is provided with conductor cables 15 which are connected to bushing terminal members 16 of any suitable type. The core of the coil and core assembly 13 is clamped by means of horizontal angle irons 17 and vertical angle irons 18 which are held in place by means of bolts 19. A plurality of guide members 20, 21, 22, and 23, are attached to the angle irons by means of bolts, 24, 25, 26, and 27, respectively. A pair of upright guide rail 28 and 28′ are welded to the side walls 10 of the transformer casing at diametrically opposite points.

The manner in which groove 26 of guide member 20 cooperates with guide rail 28 is more clearly shown in Figure 7, noting that in some instances it is desirable to weld guide member 20 to the horizontal angle irons 17 and 17′, instead of using bolts 24 and 24′. While the drawing shows two pairs of guide members 20, 23 and 21, 22, it is to be understood that in actual practice an upper and a lower crosspiece having grooves in each end thereof is also used in lieu thereof. In assembling the transformer the coil and core assembly is lowered into the transformer tank in such a manner that the guide members 20, 21, 22, and 23, slide upon guide rails 28 and 28′. The drawing shows that the weight of the coil and core assembly is transmitted by the heads of bolts 25 and 26 to the tank bottom 11, but it is to be understood that any suitable and well known supporting means may be used instead. The coil and core assembly is held in place in the transformer tank by means of clamping elements 29 and 30, which will be described more in detail hereafter.

Referring now to Figures 2, 3, and 4, it is to be noted that the T-rail member 28 has a flange member 37 which is provided with a pair of slots 38 formed in both edges of the flange 37. A clamping element, generally indicated at 29, comprises a body portion 31 having a pair of arms 32 and 33 which define a T-shaped slot. Clamping element 29 also has an arm portion 35 provided with a pair of finger members 36 and 37 which are adapted to engage said pair of slots 38 in the flange portion 37. The body portion 31 is also provided with a threaded hole 34 adapted to receive a machine screw 39 which is locked in adjusted position relative thereto by means of nut 40. The inner surfaces of the T-shaped slot in body portion 31 are so formed as to readily permit the clamping device to slide upon guide rail 28.

After the coil and core assembly have been lowered into the tank as above described, the clamping elements 29 and 30 are slid down on the rails 28 and 28′ as shown in Figure 2 until the finger 36 and 37 are opposite the slots 38. The fingers 36 and 37 are next moved into the respective slots 38 as shown in Figure 3, then clamping screw 38 is screwed down into engagement with guide plate 20 until sufficient pressure is exerted thereupon to firmly hold the coil and core assembly within the transformer tank. Locknut 40 is then tightened to prevent loosening of the clamping device.

Referring now to Figures 5 and 6, it is to be noted that the guide rail 41 in this form of invention comprises a channel member of substantially I-section having flanges 42 and 43. Flange 42 is welded to the side wall 10, and flange 43 is provided with a hole 47 drilled or otherwise formed therein. The clamping device 29 differs from the clamping device shown in Figures 2, 3, and 4, in that a button or pin member 46 is utilized to project into hole 47 rather than a pair of finger members. This clamping device, however, is provided with a pair of finger members 44 and 45 which extend around flange 43 and serve as guide members. The operation of this embodiment of the invention is substantially the same as that above described.

It is thus seen that a simple rugged and easily made device has been devised which is capable of preventing lateral and longitudinal movement of a transformer coil and core assembly, reactance or the like in a casing.

It is to be understood that the disclosure herein described is merely illustrative of the invention and is not to be taken in a limiting sense, changes in the form of the guide rails, clamping member, and guide members, and the arrangement of parts being permissible so long as within the spirit of the invention and the scope of the claims which follow.

It is claimed and desired to secure by Letters Patent:

1. In combination, a casing having a side wall, a pair of stationary flanged bars arranged in parallel spaced relation within said casing and attached to said side wall, a removable device having a plurality of guide members slidably cooperating with said flanged bars, and locking means engaging said flanged bars for preventing the removal of said device from said casing.

2. In combination, a tank, a pair of upright stationary rail members mounted within said tank, a device having a plurality of guide members cooperating with said rail members to prevent lateral movement of said device within said tank, and means attached to said rail members for preventing upward movement of said device relative to said rail members.

3. In a combination, a tank having vertical side walls, a pair of rails attached to said side walls and each having a head portion, a pair of clamps each having arms slidably embracing said head portions and having at least one projecting portion, each of said head portions having at least one cut away portion adapted to receive said projecting portion, an electrical device having a plurality of guide members slidable over said rails to prevent lateral movement of said device, and means for urging said projecting portion into engagement with said head portion so as to lock said electrical device in place in said tank.

4. In combination, a tank, a pair of channel members attached to said tank and each having a flange, clamping members each having arms embracing one of said flanges and each having a detent portion, each of said channel members also having a cut away portion adapted to receive said detent portions, a plurality of guide members cooperating with each of said flanges, and means carried by said clamping members for biasing said guide member away from said cut away portions.

5. In combination, a transformer casing, a plurality of upright flanged members attached to said casing, a transformer assembly having a plurality of guide members cooperating with said flanged members for sliding said assembly into said casing, said member having slots therein, a plurality of clamping devices slidable on said flanged members for locking said assembly in place in said casing, said clamping devices having fingers projecting into said slots.

6. In combination, a transformer casing, a plurality of upright flanged members attached to said casing, a transformer assembly having a plurality of guide members cooperating with said flanged members for sliding said assembly into said casing, each of said members having a recess

therein, a plurality of clamping devices slidable on said flanged members for preventing longitudinal movement of said assembly relative to said casing, said clamping devices each having a pin portion projecting into said recess.

7. Means for holding a transformer coil and core assembly in a tank which comprises in combination, a vertical guide member attached to said tank, a guide plate attached to said core and having a groove cooperating with said guide member, and means slidable on said guide member for exerting a clamping force on said guide plate.

8. Means for holding a transformer coil and core assembly in place in a tank which comprises in combination, an upright rail member having a base portion attached to an inner wall of said tank, a guide member attached to said transformer core and adapted to slide vertically on said rail, and a clamp adapted to slide on said rail and provided with means for clamping said clamp to said rail and for exerting a force on said guide member.

In testimony whereof, the signature of the inventor is affixed hereto.

WILLIAM ELMER McCLINTOCK.