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R. E. APPLGATE

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MEANS FOR HANDLING ELECTRICAL EQUIPMENT AND THE LIKE

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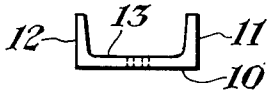


Fig. 1a.

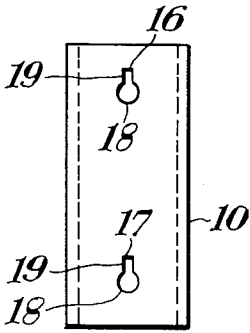


Fig. 1b.

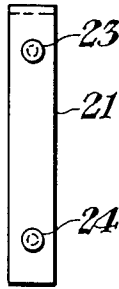


Fig. 2b.

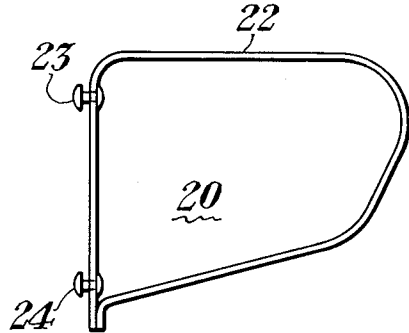


Fig. 2a.

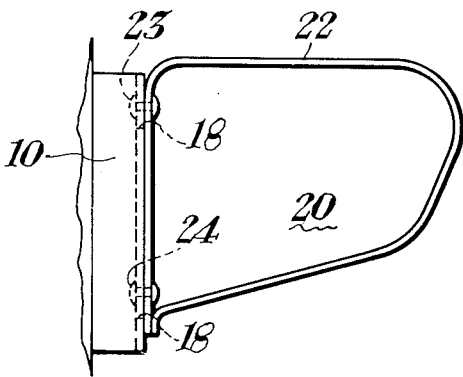


Fig. 3.

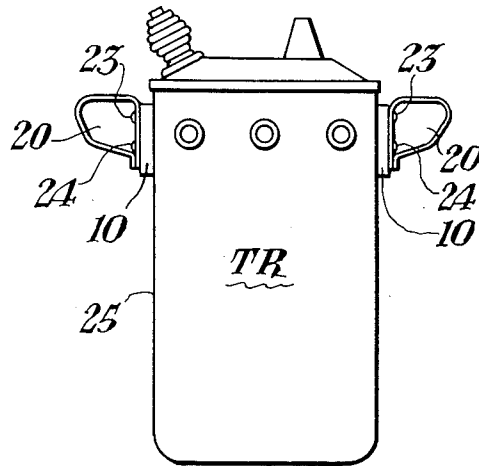


Fig. 5.

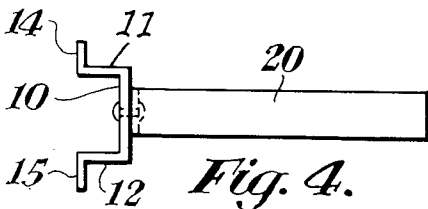


Fig. 4.

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MEANS FOR HANDLING ELECTRICAL EQUIPMENT AND THE LIKE

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2 Claims. (Cl. 16—114)

My invention relates to means for handling electrical equipments and the like, and more particularly to means that can be readily applied to an equipment or device, such as a transformer, for example, for handling the device at a storeroom or yard, and from a truck to a location at which it is to be installed. Also, it enables the device to be safely handled when it is taken out of service and returned to a storeroom.

It is the general practice for the manufacturers of electrical equipments to crate the smaller transformers and similar units for shipment from the factory to the purchaser. Such crating makes it relatively easy to handle and move the units with safety. However, the purchaser, who is usually a power distribution company, must uncrate the devices at their storeroom or yard in order for each device to be stenciled with the purchaser's name, its size and an identifying location number. Once uncrated, the handling of these devices about the storeroom, into trucks and at the outlying locations of installation, without mechanical injury to the device and physical injury to the workmen, becomes a problem.

Furthermore, many of the locations at which such devices are installed are inaccessible to a truck and the device must be carried from the truck to the location by the workmen. The terrain not infrequently includes a steep hillside or a swamp or is covered with brush, and the difficulty of carrying a device is greatly increased. In rural electric distribution systems, rough ground and inaccessibility of a location at which electric units are mounted on a pole is the rule rather than an exception.

Heretofore, the manner by which transformers and similar equipments have been handled and carried after being uncrated has been for the workmen to take hold of terminal bushings or any place they can get a hand hold because handles are not provided. This manner of handling and carrying the equipments frequently results in the breaking of a bushing or damage to a seal and vapor lock, and the inside mechanism is open to damage by moisture. Hence, repairs to the unit are required at once or soon after it has been in service. Furthermore, the awkward manner in which the workmen can take hold of a unit results in many injuries to their feet, hands and backs. Not infrequently such injuries to a workman cause a serious loss of time and a corresponding financial loss for the company.

Again, lightning arresters are attached generally to a transformer before it is taken to the location at which it is installed and the chances of damage to this complete unit in the handling and carrying of it by the workmen are greatly increased, and the financial loss to the company due to breakage may be a relatively large item.

The need for a safe and satisfactory arrangement for handling and carrying uncrated equipments of the type here contemplated has confronted electric power companies for a long time and various arrangements have been tried. During my many years in the operation and maintenance of an electric power distribution system, I have experienced much difficulty in the handling of un-

crated units, and as far as I am aware there has been no satisfactory solution of the problem prior to my invention.

Consequently, a primary object of my invention is the provision of novel and improved means for handling electrical equipments and the like.

Another object of my invention is the provision of novel handling and carrying means which can be applied readily to a device of the type here involved by a purchaser after it has been removed from its shipping crate.

Again, an object of my invention is the provision of means that can be applied to a device to enable workmen to handle the device at a storage yard and to carry it from a truck to a point of installation with relatively little danger of damage to the device.

Still another object of my invention is the provision of improved means which can be applied to an electrical unit or the like to enable workmen to carry the unit even over rough ground to a point of installation inaccessible to a truck with little danger of injury to a workman.

Another object of the invention is the provision of equipment handling means of the type here contemplated which is relatively inexpensive both in its structure and in the application thereof.

Again, an object of my invention is the provision of handling and carrying means having detachable handles and a company has to provide only a few handles for its entire system.

Another object of my invention is the provision of handling means which can be used as a sling in hoisting a device up onto a pole or platform and in lowering it from the pole.

Other objects of my invention as well as advantages and features of novelty thereof will be apparent from the following description taken in connection with the accompanying drawings.

I shall describe a preferred form of structure embodying my invention, and shall then point out the novel features thereof in claims.

In the accompanying drawings, Figs. 1a and 1b are top and front views, respectively, showing a holder to be secured to an outer case or housing of a device which is to be handled and carried.

Figs. 2a and 2b are side and end views, respectively, showing a handle that is detachably associated with the holder of Figs. 1a and 1b.

Fig. 3 is a side view showing the handle of Figs. 2a and 2b attached to the holder of Figs. 1a and 1b.

Fig. 4 is a top view showing the handle attached to the holder, the holder being a slight modification of that shown in Figs. 1a and 1b, and which modification I may use.

Fig. 5 is a pictorial view illustrating two holders and handles of the invention secured to a transformer for handling and carrying it.

In each of the several view like reference characters are used to designate similar parts.

Although in the drawings the structure embodying my invention is shown applied to a transformer, it is to be understood that the structure is not limited to a transformer in its application but it is equally adaptable to other electrical devices, such as circuit breakers and capacitors, and also to devices other than electrical equipments.

There are many places the structure embodying my invention would be useful and I contemplate these various uses.

Referring to the drawings, the reference character 10 of Figs. 1a and 1b designates a holder for the handling means. This holder 10 is a relatively short strip of any material suitable of being secured to the outer surface or

case or housing of a device or equipment. For example, when the device is provided with a steel outer case or tank, the holder 10 may be a strip of steel channel or channel iron. The dimensions of the strip are not critical and would be preselected according to the size and weight of the device with which the handling means are to be used. For example, for a medium size transformer, the holder 10 may be a strip of the order of five inches in length of a channel having a depth of the order of three inches, flanges one inch wide and a web one-fourth inch thick.

In the example cited above, the holder 10 would be secured to the case by welding flanges 11 and 12 of the channel to the case. This welding places the web 13 spaced away from the case the width of the flanges 11 and 12. That is, there is a clear space between web 13 and the case of the device.

While welding is a preferred manner of securing the holder 10 to the case when used with a steel outer case or tank of a transformer, oil circuit breaker or capacitor or the like, it is clear the holder 10 may be secured to a case or housing as by tap screws. At times the flanges of the channel of the holder may be formed with a lip to aid in securing the holder. In Fig. 4, the flanges 11 and 12 of a channel strip provided for holder 10 are shown with lips 14 and 15, respectively, for aiding in securing to a surface of a device.

At least two holders 10 are provided and the two holders would be secured to the case of the device on opposite sides. That is, the two holders would be located substantially 180 degrees apart. In other words, the two holders are diametrically opposite each other. Furthermore, the holders preferably are disposed in a vertical position, that is, the center line of the channel web 13 is vertical with the device sitting on its base. Again, the two holders would be secured on the case at approximately the same height above the base. Obviously, more than two holders may be provided and arranged in any convenient manner on the outer surfaces of the device to be handled.

Each holder 10 is provided with two eyes or slots 16 and 17 in the channel web 13 spaced apart a preselected distance. Preferably, the eyes 16 and 17 are on the center line of the channel web 13. The spacing of the eyes 16 and 17 may be, for example, three inches when the channel strip is five inches in length, but other spacing can be used.

The two eyes 16 and 17 are alike in shape and each has a circular bottom portion 18 and a rectangular upper portion 19 which has parallel edges spaced less than the diameter of the circular bottom portion 18. Although the eyes 16 and 17 are shown alike and placed on the same vertical line of the channel web 13, the two eyes may be different in shape and arranged in the web in a pattern different from that shown, the essential feature being that each eye or slot has a preselected shape and size and they have a preselected spacing with respect to each other.

Looking at Figs. 2a and 2b, the reference character 20 designates a handle, which may be, for example, formed from a strip of sheet steel or other suitable material. The handle 20 includes a face 21 and a hand grip or gripping portion 22. The strip is bent for the hand grip 22 to extend from the upper end of face 21 at substantially right angles. Preferably, the free end of the portion 22 is looped in a more or less circular manner for the two ends of the strip to abut and be welded together. The face 21 is of a length at least equal to the length of the holder 10.

The straight part of the hand grip 22 is of a length to enable a workman to take hold, that is, it has a length of the order of four to six inches. The strip of metal for handle 20 is of any suitable width and as best shown in Fig. 2b, the handle is of a width of the order of two inches. The handle strip is of a thickness to afford am-

ple stiffness. The edges of the hand grip portion 22 would be rounded off as by filing so that it can be grasped by a workman without injury to his hand.

Two bolt members 23 and 24 are secured in the face 21 of handle 20, and, as here shown, these members are round headed bolts, the shanks of which are secured in the face by insertion through holes and the inner ends of the bolts welded or riveted to the face. The bolts 23 and 24 extend from the face for the heads thereof to be spaced from the face a distance a little greater than the thickness of the web of the channel of holder 10. The two bolts 23 and 24 are mounted on the same vertical line and spaced apart a distance equal to the spacing of eyes 16 and 17 of the holder. Again, the heads of bolts 23 and 24 are of a diameter slightly less than the diameter of the circular portions 18 of the eyes 16 and 17 and of a thickness less than the width of the holder flanges 11 and 12. Furthermore, the shanks of bolts 23 and 24 are of a diameter slightly less than the spacing of the edges of the rectangular portions 19 of eyes 16 and 17. It follows that handle 20 can be attached to holder 10 by inserting the heads of bolts 23 and 24 through the circular portions of eyes 16 and 17 of the holder, and then raising the handle with the shank of the bolts to engage the upper portions 19 of the eyes of the holder. In this raised position, the handle is firmly locked to the holder by the bolt heads engaging the inner surface of the web 13. Conversely, handle 20 can be detached from holder 10 by lowering the handle until the bolt heads mate with the circular portions of eyes 16 and 17.

Side and top views of handle 20 attached to holder 10 are disclosed in Figs. 3 and 4, respectively. Two handles 20 are provided one for each two holders 10 mounted on opposite sides of the device. Thus two workmen, one taking hold of each of the two handles, can pick up and carry the device with the device between them. When the device is relatively heavy, the additional holders and handles are provided.

Fig. 5 illustrates the structure used with a transformer TR having a metal case or tank 25. Two holders 10 are welded to case 25 at points approximately 180 degrees apart a selected distance from the top of the case, the locations of holders 10 being selected to clear terminal bushings and other elements of the transformer. With a pair of handles 20 attached to the holders in the manner previously explained, workmen can safely move and carry the transformer TR with little danger of damage to the transformer or injury to a workman. When the transformer has been moved and installed, the handles can be detached leaving the holders in place, the holders not interfering in any way with its operation. Obviously, the handles 20 can be used as slings by which the transformer can be elevated to supports or platforms on a pole. Again, the handles can be attached to the holders for lowering the transformer from its position on a pole and carrying to a truck when it is taken out of service and returned to a storage yard.

While eyes 16 and 17 of holder 10 and bolts 23 and 24 of handle 20 are mounted on the same vertical lines and the eyes 16 and 17 are alike in shape, it is clear that other patterns and spacing can be used, the essential requirement being that the bolts of the handle mate with the eyes of the holder.

In view of the foregoing description, it is clear that the handling means embodying my invention has advantages that it can be readily applied to a device which has been uncrated and thereby enable workmen to move the device about a storeroom into and out of a truck and at installation locations with the chances of damage to the device or injury to a workman reduced to a minimum. Also, it can be used as a sling in raising the device up to a pole support or platform.

Again, it can be manufactured at a very low cost, and the handles being detachable, only a relatively few handles are needed for an entire system. The holders can be

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welded or otherwise secured to the case of a device at the storeroom or in the field. Obviously, these holders can be provided by a manufacturer if desired.

In practicing my invention, I have found it fills a great need in moving uncrated electrical equipments around the storage yard, loading them on trucks and unloading and handling them at the places of installation.

As stated hereinbefore, although the greatest need for handling means embodying my invention is in its use in handling electrical equipments of power distribution systems, there are many other places it may be useful. While only a preferred form of structure embodying the invention is shown and described, the structure may be varied within the scope of the appended claims without departing from the spirit and scope of the invention.

Having thus described my invention, what I claim is:

1. In means for handling an electrical equipment having a single wall metallic outer case for housing electrical apparatus with insulated terminals with weather seals secured in the wall of the case and which equipment is uncrated by purchaser for marking and then handled uncrated at storeroom and at a field installation point, there being no means for taking hold of the case, the combination comprising, a pair of holders each a strip of a steel channel, each said channel with flanges which are welded to the case after the equipment is uncrated and each said holder with the flanges of the channel welded to the equipment case with the web of the channel spaced from the case the width of the flanges, each said holder with the center line of the channel web vertical and the two holders mounted substantially 180 degrees apart on the case and at points on the case selected for the holders to clear the insulated terminals and weather seals, each said holder with two handle eyes in the channel web one above the other a preselected distance, each said handle eye with a circular bottom portion and an upper rectangular portion with vertical edges a preselected distance apart, two metallic handles, each said handle with a face and a hand gripping portion which extends from one end of the face at substantially right angles, a pair of round headed bolts secured in the face of each handle and spaced for the bolts to mate with the spacing of said handle eyes of said holders, each said bolt extending from the face opposite the hand gripping portion with a length of bolt shank slightly greater than the thickness of the channel webs of said holders, each said bolt head of a diameter slightly less than the diameter of said circular portion of said handle eyes, and each said bolt shank of a diameter slightly less than the distance between the edges of said upper portions of said handle eyes.

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2. An equipment handling means comprising in combination with an electrical equipment having a single wall steel housing case in which terminal bushings with weather seals are secured and which equipment is crated for safe handling during shipment from a manufacturer to a purchaser and is uncrated by purchaser for marking and handled uncrated at storeroom and field installation point, there being no means for taking hold of the case, two steel channel strips of a size preselected according to the size of the equipment, each said channel strip provided with flanges along its lengthwise edges which are welded to the case after the equipment is uncrated and each said channel strip with its flanges welded to the equipment case with the channel web standing away from the case the width of the flanges, said two channel strips secured on the case substantially 180 degrees apart and at substantially the same height above the equipment base, said two channel strips spaced for the strips to clear all terminal bushings and weather seals, each said channel strip with two eyes in the channel web, the two eyes of a strip spaced a preselected distance apart in the center line of the web, each said eye with a receiving portion of a preselected shape and a locking portion having parallel edges a preselected distance apart, two sheet metal strips, each said sheet metal strip with a face portion and a hand gripping portion extending from one end of the face portion, each said face portion with two bolt members secured to extend from the face opposite said hand gripping portion, said bolt members spaced to mate with the spacing of said eyes and extending from the face a distance slightly less than the width of said channel strip flanges, each said bolt member with a head and a shank which mate with the receiving portion and the locking portion respectively of said channel strip eyes, whereby said two sheet metal strips can be interchangeably attached and detached with said two channel strips.

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