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CIRCUIT BREAKER TANK LIFTER

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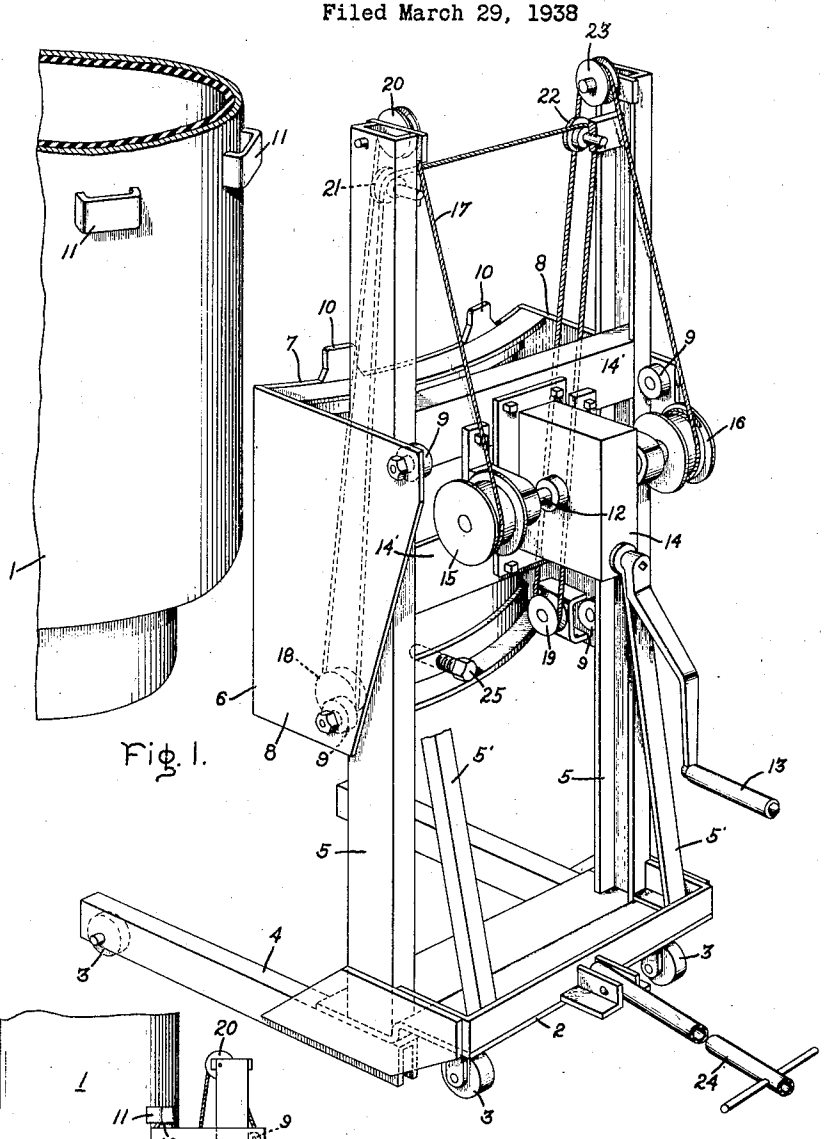


Fig. 1.

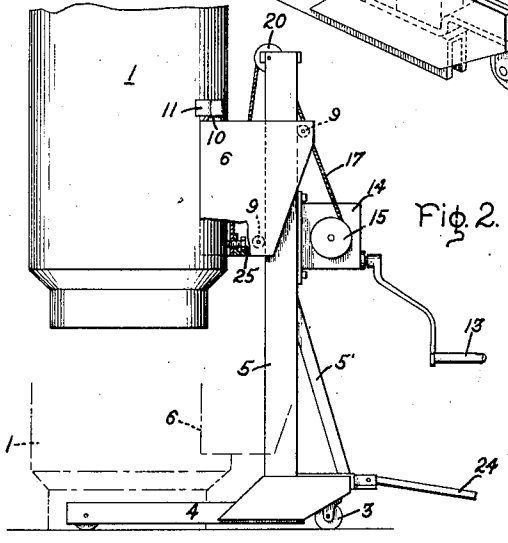


Fig. 2.

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CIRCUIT BREAKER TANK LIFTER

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2 Claims. (Cl. 187—11)

My invention relates to circuit breaker tank lifters, and more particularly to tank lifters of the truck type for raising and lowering tanks of large capacity oil circuit breakers.

It is customary in inspecting and servicing oil circuit breakers to detach the oil-containing tank from the dome or cover structure, which supports the mechanism and contact structure, after which the tank is lowered by suitable means. In some cases where the circuit breakers are mounted in an elevated frame structure, the lowering and lifting mechanism is permanently incorporated in the framework itself. This arrangement is practical only in certain types of large installations, such as outdoor stations. Also, transferable specially designed mechanisms have been made for each tank diameter. However, since a special lifting mechanism is suitable for a tank of but one diameter, appreciable equipment expense necessarily results where a considerable number of tank sizes are used in a station.

The principal object of my invention is the provision of improved transferable tank-lifting means that has universal application to circuit breaker tanks of varying diameters.

My invention will be more fully set forth in the following description referring to the accompanying drawing, and the features of novelty which characterize my invention will be pointed out with particularity in the claims annexed to and forming a part of this specification.

Referring to the drawing, Fig. 1 is a perspective view partly in section of an oil circuit breaker tank and transferable lifting mechanism therefor embodying the present invention, and Fig. 2 is an elevational view partly in section showing the application of the lifting mechanism to the tank.

Fig. 1 illustrates an oil circuit breaker tank 1 of well-known construction. The coacting cover or dome structure is not illustrated in the interest of clearness since this part of the circuit breaker structure forms no part of the present invention. The tank-lifting mechanism for lowering and raising the tank 1 is of the transfer truck type and comprises a supporting framework generally indicated at 2 that is mounted on rollers 3. The framework 2 can be suitably formed of structural steel shapes, such as angle and channel sections, joined together to form a U-shaped base 4 which supports a pair of vertical uprights 5. The uprights 5, shown formed as channels, are suitably braced as at 5' with respect to the base structure 4.

A carrier structure 6, formed by a plate member 7 that is concave in shape corresponding to the general curvature of a breaker tank is guided for vertical reciprocal movement on the uprights 5. To this end the plate 7 is provided with lateral flanges 8 having guide rollers at 9 for coacting with the side flanges of the uprights as illustrated.

For the purpose of detachably supporting the tank 1, the carrier plate 7 is provided at its upper edge with a pair of vertically offset lugs 10 for coacting with a pair of correspondingly positioned lugs 11 welded to the tank 1. The lugs 10 on the carrier member are spaced a predetermined distance, the positions of the lugs corresponding to suitable points of support for a comparatively wide range of tank sizes. The corresponding tank lugs 11 are welded to the tank in the same space or pitch relation regardless of the tank diameter. It will therefore be apparent that the tank-lifting means above described has application to a large number of tank sizes since the relative positioning of the conventional dome attaching lugs heretofore used in combination with certain types of tank lifters is immaterial in the present case.

The carrier 7 can be raised or lowered along the uprights 5 by any suitable gear or tackle mechanism, the drawing illustrating by way of example a pulley device having a main drive shaft 12 that can be manually driven, for example, at 13, through a gear box 14 that is secured to a transverse frame member 14' interconnecting the uprights 5. The pulley shaft has secured thereto a pair of cable drums 15 and 16 to which the opposite ends of the cable 17 are connected respectively. The points of pulley application to the carrier are at the lower inner edges of the flanges 8 at 18 and 19 respectively. The cable 17 may be arranged with respect to the pulleys in any suitable manner, the present arrangement starting from the cable drum 15 including a guide pulley 20 mounted at the upper end of the adjacent upright 5, carrier pulley 18, guide pulley 21 mounted in the upper part of the same upright and a corresponding pulley 22 in the opposite upright, carrier pulley 19, guide pulley 23, and the other cable drum 16.

The above arrangement can be manually operated through suitable gear reduction means at 14 to raise and lower heavy steel tanks partly filled with circuit breaker oil.

Referring more particularly to Fig. 2 which illustrates the mechanism in use, the truck is first rolled beneath the circuit breaker tank, as by manual operation at 24. The carrier 6 is lowered

until the lugs 10 are beneath the corresponding lugs 11 and in vertical alinement therewith, so that the concave plate 7 is in juxtaposition to the side wall of the breaker tank. For the purpose of maintaining the heavy breaker tank in substantially vertical position, an adjusting bolt 25 can be mounted at the lower edge of the plate 7 for abutting the lower part of the tank as illustrated by Fig. 2.

In the position above described, the carrier 6 is raised by the lifting mechanism above described so that the tank is substantially supported by the carrier. The dome bolts can then be unloosened after which the tank is free to descend when the carrier is lowered to the floor between the sides of the U-shape base 4 as indicated in the dotted line position shown in Fig. 2. Raising of the tank to its operative position is carried out in the same manner.

In view of the fact that the tank-lifting device above illustrated is transferable and applicable to any tank having lugs or equivalent holding means spaced a predetermined pitch distance on the side walls of the breaker tank, a single lifting mechanism such as illustrated can be used for practically all oil circuit breakers in a station. The lugs 11 can obviously be located on the side walls of the tank so that they do not interfere in any way with the normal assembly of the tank and dome and operation of the oil circuit breaker.

It should be understood that my invention is not limited to specific details of construction and arrangement thereof herein illustrated, and that changes and modifications may occur to one skilled in the art without departing from the spirit of my invention.

What I claim as new and desire to secure by Letters Patent of the United States, is:

1. A tank lifter for an oil circuit breaker tank having a pair of projecting supporting lugs spaced a predetermined pitch distance on one side of the outer wall of said tank, said pitch distance being fixed and independent of the diameter of said tank, comprising vertically positioned frame structure, a carrier guided for vertical reciprocal movement on said structure, said carrier including a vertically positioned plate having supporting lugs adapted to be positioned in vertical alinement with said tank lugs, and means carried by said vertical frame for moving said plate and supporting means into detachable connection with said tank lugs whereby the weight of said tank is solely supported by said lugs for vertical movement therewith.

2. A tank lifter for an oil circuit breaker tank having a pair of projecting supporting lugs spaced a predetermined pitch distance on one side of the outer wall of said tank near the top thereof, said pitch distance being fixed and independent of the diameter of said tank, comprising a vertically positioned frame, a carrier guided for vertical movement on said frame, said carrier including a vertically positioned plate arranged to be in juxtaposition thereto in the supporting position, said plate having a pair of supporting lugs spaced said predetermined pitch distance and adapted to connect with said tank lugs for bodily supporting said tank from the upper part of said plate, tackle mechanism mounted on said truck for raising and lowering said carrier, and adjusting means disposed at the lower part of said plate arranged to abut said tank for holding the same substantially parallel to said plate in vertical position.

CARL THUMIM.