This invention relates to tanks for electrical transformers or the like and, in particular, to a cover and seal construction for tanks designed to accommodate transformers of various sizes.

Transformer tanks as heretofore constructed have been provided with various types of covers and securing means therefor. In one form, the cover is a flat plate extending beyond the side wall of the tank and bolted to a flange projecting outwardly therefrom. A gasket is usually placed between the bolt flange and cover but the material of which gaskets are usually made deteriorates after several years and requires replacement to maintain a gas-tight seal. In order to avoid this difficulty, it has been proposed to weld the cover to the tank flange. This is objectionable, however, because the weld has to be chipped off in order to obtain access to the interior, which is a difficult operation and also entails the danger that chips of the weld will fall into the tank where they are apt to cause damage to the transformer windings. A further objection to the welded cover as heretofore proposed is that a weld at the joint between surfaces in flatwise abutting engagement may readily break under the pressure existing in transformer tanks which may, sometimes, be as high as 10 lbs. per square inch or even higher. This pressure causes flexing of the cover which in turn results in cracking of the weld.

We have invented a novel tank cover and seal construction which overcomes the aforementioned objections and provides an air-tight closure which can readily be opened in case of necessity. In a preferred embodiment, we provide a flange on the tank spaced below the upper edge thereof and extending outwardly from the side wall. A sealing strip is welded to this flange and the overhanging edge of the cover. We may also provide means independent of the sealing strip for securing the cover to the tank wall such as studs on the cover cooperating with lugs on the wall or pins inserted through the wall and lugs depending therefrom the cover.

A complete understanding of the invention may be obtained from the following detailed description which refers to the accompanying drawings. In the drawings,

Figure 1 is a vertical section through a transformer tank having the invention incorporated therein;

Figure 2 is a portion of Figure 1 to enlarged scale; and

Figures 3, 4 and 5 are views similar to Figure 2 showing modifications.

Referring in detail to the drawings, a transformer tank 10 comprises a bottom 11, a side wall 12 and a cover 13. The bottom 11 is welded to the side wall 12 which may be of any desired shape in horizontal section, i.e., circular, rectangular or elliptical. The cover 13 is simply a flat or domed plate adapted to lie on the upper edge of the side wall. The edge of the cover projects outwardly beyond the side wall at all points as indicated at 13a. The interior of the tank is adapted to accommodate a transformer of any desired size and a cooling bath of oil therefor.

An outwardly extending flange 14 is welded to the side wall 12 a short distance below the upper edge thereof. The flange is in the form of a continuous ring cut from plate. The cover 13 may have downwardly extending studs 15 welded to the lower surface thereof in circumferentially spaced relation. Lugs 16 having holes there through to accommodate the studs 15 are welded to the side wall 12 between the flange 14 and the upper edge of the wall. Any suitable number of studs and lugs may be employed, depending on the total pressure which may be developed on the cover. Instead of separate lugs 16, we may use a continuous ring having holes spaced there around. With this construction, the plate 13, when properly positioned on the tank with the studs extending through the holes in the lugs, may be firmly secured thereon by turning up nuts on the studs and tightening them by means of a wrench. The studs and lugs may be omitted, however, where the internal pressure is not likely to be great, as in the case of small transformers.

Figure 5 shows such a construction in which a narrow sealing strip 17a closes the space between the edge 13a and the flange 14. A sealing strip 17 extends around the cover 13 and flange 14 and is welded thereto, thereby closing and sealing the joint between the cover and tank. The joint between the ends of the strip 17 is welded, preferably in such manner as to leave a tongue projecting from one end, whereby the strip may be removed by rolling in the manner of the tearing strip of a key-opening can. The welds between the strip and the cover and flange are broken progressively as the sealing strip is rolled up. The nuts or the studs 15 are thus exposed for removal. In this way, access to the interior of the tank may easily be had when desired. At the same time, there is no danger that fragments of the weld metal will get into the tank, since the sealing strip is entirely removed before the cover is taken off. If the studs 15 are used, furthermore, the welds are not stressed by...
the internal pressure tending to lift the cover from the tanks. The studs 15 and lugs 16 alone withstand such pressure. A further advantage of the invention is that it presents a neat, trim appearance. In fact, the construction provides a seal which is permanent for all practical purposes yet may easily be opened in case of need.

Figure 3 shows a modified construction in which lugs 18 of inverted U-shape are welded to the cover 13. The cover is secured to the tank 1 by pins 19 passing through alined holes in the lugs and tank wall. As shown in the drawing, one branch of each lug is disposed on the inside of the tank wall and the other on the outside when the cover is in position. While the drawings show the tank wall notched to accommodate the bases of the lugs 18, this is not necessary since the lugs may simply rest on the upper edge of the wall. The sealing strip 17 is applied in the manner already described and functions exactly the same in the case of the modified construction as in that shown in Figure 1.

Figure 4 illustrates a further modification generally similar to that of Figure 3 except that lugs 20 are welded to the cover 13. These lugs are simply flat pieces of plate extending downward from the cover on the outside of the tank wall.

It will be understood that in the modifications of Figures 3 and 4, the pins 19 have to be withdrawn after the sealing strip is removed. It will be noted that the pins cannot be accidentally displaced since engagement of the heads with the sealing strip 17 prevents sufficient outward movement of the pins to release the locking relation of their shanks with the lugs and tank wall.

It will be apparent from the foregoing that the invention is characterized by numerous advantages over seal constructions for transformer tanks known heretofore. In the first place, a permanent seal between the cover and tank is obtained without the use of gaskets. In the second place, the seal may be easily removed if it becomes necessary to get into the tank. Finally, the tank cover is held in place by means independent of the seal so that there is little or no stress on the latter under normal conditions. A new sealing strip may easily be welded on after one has been removed.

Although I have illustrated and described but a preferred embodiment of the invention with modifications, it will be understood that changes in the details of the construction disclosed may be made without departing from the spirit of the invention or the scope of the appended claims.

We claim:

1. A seal construction for transformer tanks or the like, comprising in combination, a container having an open top and a lateral wall with an upper edge bounding said open top, a removably attached cover closing said opening, said cover having a generally continuous periphery extending to the exterior of said wall below said upper edge, a removable cover adapted to close said open top of said container, said cover projecting outwardly beyond said upper edge and extending continuously around the same in spaced relation to said opening, and a generally continuous annular flange rigidly attached to the underside of said cover and to said container between said cover and said container for securing said cover to said container, and a continuous sealing strip removably welded along its respective edges to the respective projecting and extending portions of said cover and said flange, whereby said sealing strip renders gastight the closure between said cover and said container while said disengagable means take up stresses between said container and said cover.

2. A cover seal construction for transformer tanks or the like, comprising in combination, a container having an opening and a wall generally normal to the plane of said opening, a generally annular flange fixed to the exterior of said wall in spaced relation to and below said opening, a removable cover for said opening, said cover having a generally continuous periphery extending beyond said wall when in closure position in spaced relation to the periphery of said flange, depending stud members fixed in generally circumferential manner to the underside of said cover beyond said wall when said cover is in closure position, registering lug members fixed to the exterior of said wall between said flange and said opening, said lug members being adapted to be engaged by said studs when said cover is in closure position to secure said cover to said container, and a continuous sealing strip removably welded along its respective edges to the respective peripheries of said flange and said cover, whereby when said container is closed by said cover, said stud and lug members resist internal pressures in said closed container and said sealing strip makes said closed container gastight.

3. A cover seal construction for transformer tanks or the like, comprising in combination, a container having an opening and a wall generally normal to the plane of said opening, a generally annular flange fixed to the exterior of said wall in spaced relation to said opening, a removable cover for said opening having a periphery extending beyond said opening in spaced relation to the periphery of said flange, securing members fixed to said cover and extending generally toward said flange, securing members and said container having adjacent and registering members therein when said cover is in closure position relative to said opening, pins adapted to be pushed into engagement with said registering members when said cover is in closure position to lock said cover in place, and a sealing strip removably and continuously welded along its respective edges to the respective peripheries of said flange and said cover, whereby when said container is closed by said cover said pins resist internal pressures in said closed container and said sealing strip makes the closed container gastight.

4. A cover seal construction for transformer tanks or the like, comprising in combination, a container having an opening and a wall ending in said opening, a generally annular flange fixed to the exterior of said wall in spaced relation to said opening, a removable cover for said opening having a periphery extending beyond said opening in spaced relation to the periphery of said flange, securing members fixed to said cover and extending generally toward said flange, securing members and said container having adjacent and registering members therein when said cover is in closure position relative to said opening, pins adapted to be pushed into engagement with said registering members when said cover is in closure position to lock said cover in place, and a sealing strip removably and continuously welded along its respective edges to the respective peripheries of said flange and said cover, whereby when said container is closed by said cover said pins resist internal pressures in said closed container and said sealing strip makes the closed container gastight.

5. A cover seal construction for transformer tanks or the like, comprising in combination, a container having an opening and a wall ending in said opening, a generally annular flange fixed to the exterior of said wall in spaced rela-
tion to said opening, a removable cover for said opening having a periphery extending beyond said opening in spaced relation to the periphery of said flange, securing members fixed to said cover and extending generally toward said flange, said securing members and said container having adjacent and laterally extending registering holes in registry when said cover is in closure position relative to said opening, pins adapted to be pushed into engagement with said registering holes when said cover is in said closure position to lock said cover in place, and a sealing strip removably and continuously welded along its respective edges to the respective peripheries of said flange in said cover, said sealing strip being spaced from said pins at a distance sufficient to prevent their disengage-

ment from said holes when said sealing strip is in place.

SAMUEL HORELICK.
ROBERT C. SEFTON.

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