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ELECTRICAL APPARATUS

Filed July 16, 1957

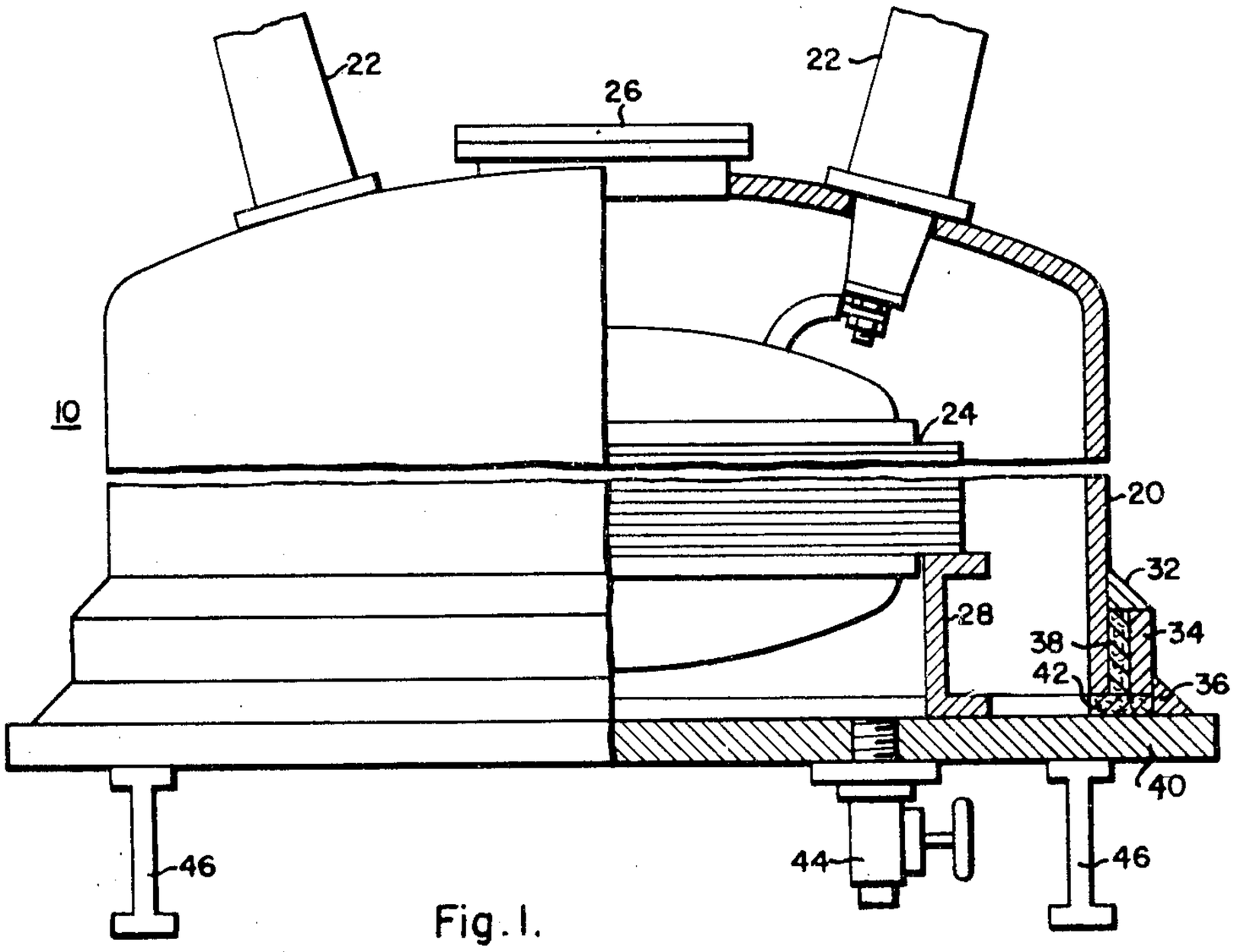


Fig. 1.

Fig. 2.

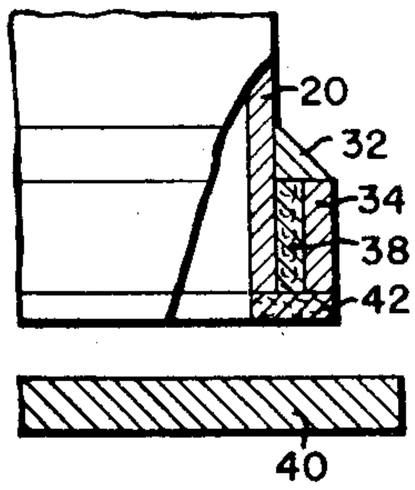


Fig. 3.

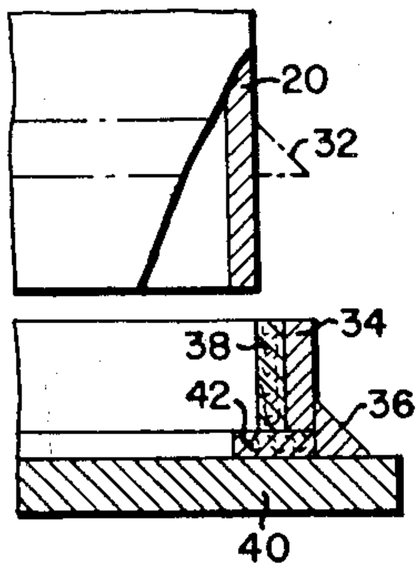
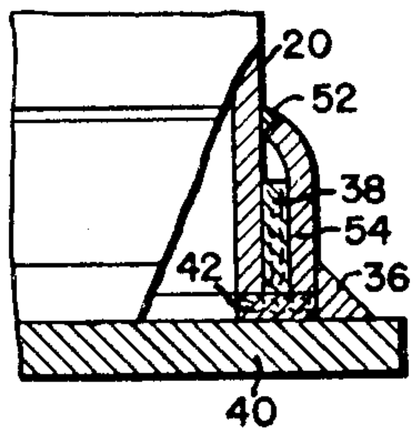


Fig. 4.



WITNESSES

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ELECTRICAL APPARATUS

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7 Claims. (Cl. 220—67)

This invention relates to tanks for electrical apparatus and more particularly to the joining together of the side wall and end members of such tanks.

A problem arises in the opening of the tank of certain types of liquid-filled transformers. Such transformers include those having a welded joint between the side wall of the tank and the end member of the tank at the bottom of the transformer. A fire hazard is present whenever the joint is opened by removing the weld by burning. This fire hazard exists even though most of the insulating liquid is drained from the tank by opening a drain valve since it is practically impossible to completely empty the tank of all insulating liquid. It is therefore desirable to provide a welded joint for transformers of the above type which would substantially eliminate the fire hazard which is present whenever a tank on a transformer of the above type is opened by burning means.

An object of this invention is to provide a new and improved electrical apparatus.

Another object of this invention is to provide a new and improved joint in a tank for electrical apparatus such that the fire hazard will be substantially eliminated when the joint is opened.

Other objects of the invention will, in part, be obvious and will, in part, appear hereinafter.

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description taken in connection with the accompanying drawing, in which:

Figure 1 is a view partly in elevation and partly in section showing a liquid insulated transformer within a tank;

Fig. 2 is a fragmentary view illustrating how the joint shown in Fig. 1 is made;

Fig. 3 is a fragmentary view illustrating how the joint shown in Fig. 1 is opened; and

Fig. 4 is a fragmentary view of a second embodiment of the joint shown in Fig. 1.

Referring now to the drawing and Fig. 1 in particular, a transformer tank **10** is shown in which is mounted a transformer core and coil assembly **24** which would be immersed in an insulating liquid. On the top of the transformer tank **10** may be mounted the bushings **22** for accommodating the connection of the transformer windings to a power circuit in a well-known manner. A man hole **26** may also be provided on the top of the transformer tank **10**. The core and coil assembly **24** may be supported by the bottom end frame **28**. The tank **10** includes a side wall portion **20** and an end member **40** which is supported in this instance by the channel iron **46**. A drain valve **44** is provided so that the insulating liquid inside the transformer tank **10** may be removed from the tank **10**. The joint between the side wall portion **20** and the end member **40** of the tank **10** comprises a metallic band **34** disposed to follow the periphery of the side wall **20** adjacent to the end member **40**, non-inflammable material **38** disposed between

the side wall **20** and the band **34**, non-inflammable material **42** disposed between the side wall **20** and the end member **40**, a first weld **32** joining the band **34** to the side wall **20**, and a second weld **36** joining the band **34** to the end member **40**. The non-inflammable materials **38** and **42** would preferably be asbestos.

Referring to Fig. 2, the first step in making the joint between the side wall **20** and the end member **40** is illustrated. The band **34** is formed around the periphery of the side wall **20** adjacent to the end member **40** with a quantity of non-inflammable material **38** disposed between the band **34** and the side wall **20**. The first weld **32** is then made joining the band **34** to the side wall **20**. The non-inflammable material **42** is then cemented or secured to the side wall **20** and the band **34**, which is attached thereto. The side wall **20** and the band **34** are next lowered onto the end member as shown in Fig. 1. Referring to Fig. 1, the second weld **36** is then made joining the band **34** to the end member **40**. The latter method of making the joint between the side wall **20** and the end member **40** would be employed in the manufacture of the tank **10** before the insulating liquid had been put into the transformer tank **10**. Therefore, there would be no fire hazard in making the joint between the side wall **20** and the end member **40** in the manner just described.

Referring to Fig. 3, there is illustrated the method by which the joint between the side wall **20** and the end member **40** shown in Fig. 1 is opened after the transformer tank **10** has been placed in service. It is assumed that the insulating liquid has been drained from the transformer tank **10** by opening the drain valve **44**. As previously stated, a fire hazard would still exist in opening a conventional welded joint on a transformer tank because of the residue of oil remaining in the transformer tank **10** even after most of the insulating liquid has been removed by opening the drain valve **44**. The first step in opening the joint between the side wall **20** and the end member **40** is to remove the weld **32** by burning. The burning flame cannot reach any residue of insulating oil inside the transformer tank **10** because of the non-inflammable materials **38** and **42** which form part of the joint between the side wall **20** and the end member **40**. To ensure complete separation of the side wall **20** and the band **34**, a small part of the band **34** at the top of the band may also be removed when removing the weld **32**. The side wall **20** may then be raised away from the end member **40** and the band **34**, as shown in Fig. 3. After opening the joint between the side wall **20** and the end member **40** by the method just described, any irregularities on the side wall **20** adjacent to the end member **40** and on the inside of the band **34** should be removed by grinding. When making a new joint between the side **20** and the end member **40** after the joint has been opened as illustrated in Fig. 3, the first step is to lower the side wall **20** inside the band **34**, the original non-inflammable material **38** having been removed and therefore not interfering with the lowering of the side wall **20**. The space between the side wall **20** and the band **34** should next be filled with the non-inflammable material **38**. The final step in reclosing the joint between the side wall **20** and the end member **40** is to replace the weld **32**, as shown in Fig. 1.

Referring to Fig. 4, a joint between the side wall **20** and the end member **40** is illustrated, which may be substituted for the joint shown in Fig. 1. The joint shown in Fig. 4 differs from the joint shown in Fig. 1 in that a band **54** is bent inward toward the side wall **20** at the top of the band **54**. A weld **52** then joins the band **54** to the side wall **20**. The joint shown in Fig. 4 allows greater clearance between the side wall **20** and the portion of the band **54** adjacent to the non-in-

flammable material 38 without allowing any of the weld 52 to fall into the space between the band 54 and the side wall 20. The non-inflammable materials 38 and 42 would be provided in a similar manner to that shown in the joint illustrated in Fig. 1.

It is to be understood that there need be no separation between the band 34 and the end member 40 in a joint embodying the teachings of this invention. It is also to be understood that the non-inflammable materials 38 and 42 may take any of various forms available, such as tape or rope.

The apparatus embodying the teachings of this invention has the advantage that a joint incorporating this invention can be opened by removing a single weld while the fire hazard normally present is substantially eliminated.

Since numerous changes may be made in the above-described apparatus and different embodiments of the invention may be made without departing from the spirit thereof, it is intended that all the matter contained in the foregoing description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

I claim as my invention:

1. In a tank structure, the combination comprising a side wall member, an end member, a band member disposed about the periphery of said side wall member, non-inflammable material disposed between said side wall member and said band member and between said side wall member and said end member, and means for securing said members together.

2. In a tank structure, the combination comprising a side wall member, an end member, a band member disposed about the periphery of said side wall member, non-inflammable material disposed between said side wall member and said band member and between said side wall member and said end member, and welds securing said members together.

3. In a tank structure having a side wall portion and an end member, a band disposed about the outside periphery of said side wall adjacent to said end member,

non-inflammable material disposed between said side wall and said band and between said side wall and said end member, and welds joining said band to said side wall and to said end member.

4. In a tank structure, the combination comprising a side wall member, an end member, a band member disposed about the periphery of said side wall member, asbestos disposed between said side wall member and said band member and between said side wall member and said end member, and welds securing said members together.

5. In a tank structure having a side wall portion and an end member, a band disposed about the outside periphery of said side wall and spaced apart from said side wall and said end member, non-inflammable material disposed between said side wall and said band, a first weld joining said band and said side wall, and a second weld joining said band and said end member.

6. In a tank structure having a side wall portion and an end member, a band disposed about the outside periphery of said side wall and spaced apart from said side wall and said end member, asbestos disposed between said side wall and said band and between said side wall and said end member, a first weld joining said band and said side wall, and a second weld joining said band and said end member.

7. In a tank for electrical apparatus, a side wall portion, an end member, a band disposed about the outside periphery of said side wall adjacent to said end member, a first layer of non-inflammable material disposed between said band and said side wall, a first welded seam joining said band to said side wall, a second layer of non-inflammable material disposed between said side wall and said end member, and a second welded seam joining said band to said end member.

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