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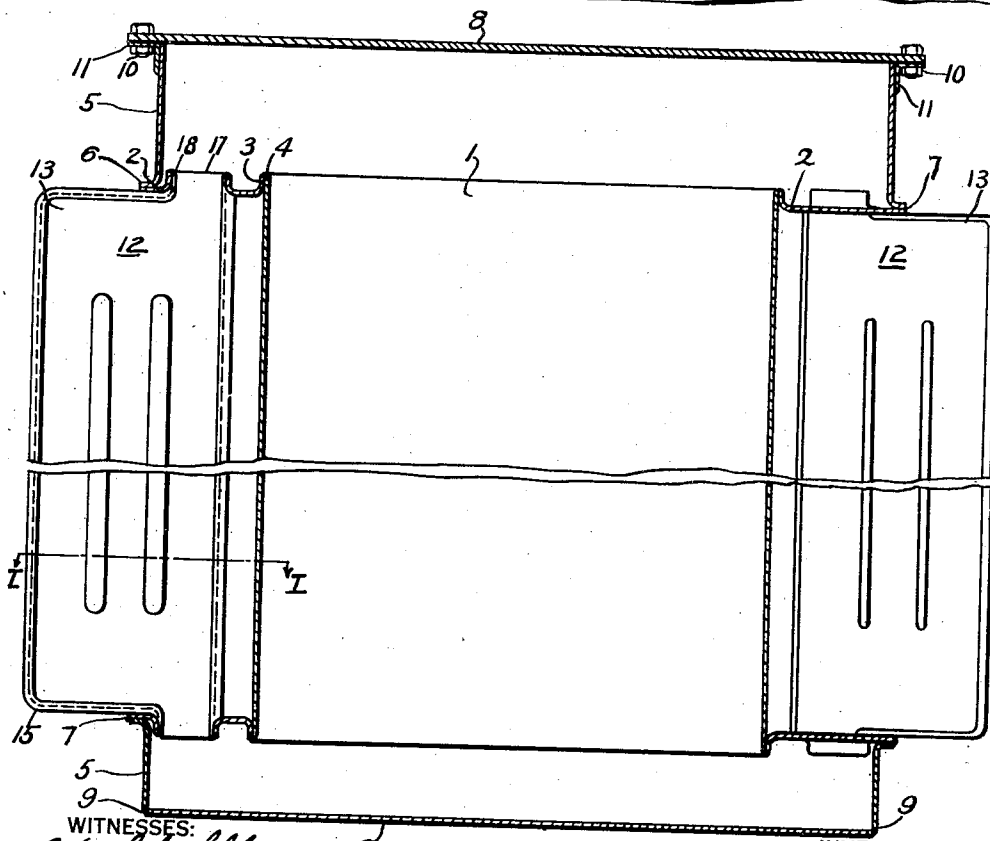
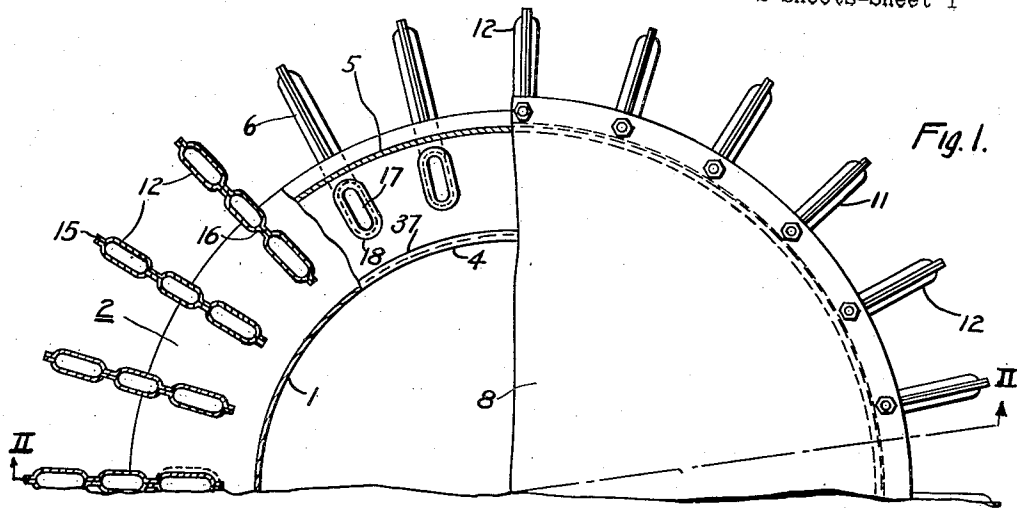
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W. M. DANN ET AL.

TRANSFORMER TANK

Filed Dec. 30, 1920

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WITNESSES:

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Fig. 2.

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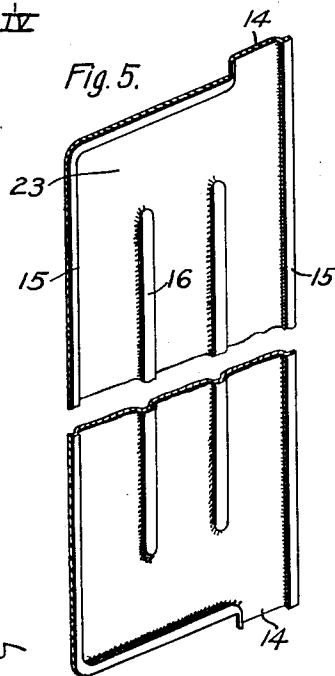
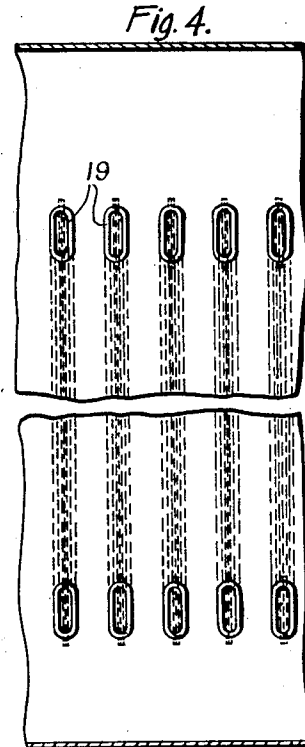
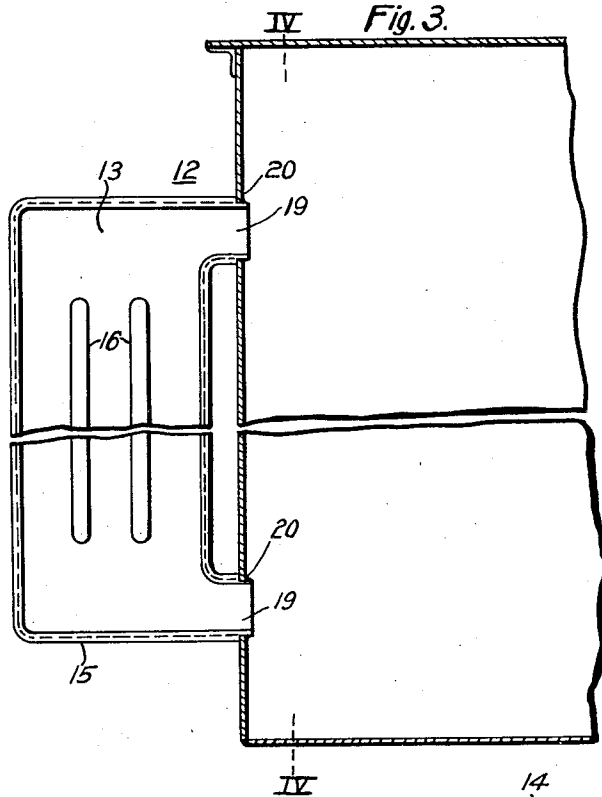
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WITNESSES:

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UNITED STATES PATENT OFFICE.

WALTER M. DANN AND ALBERT T. CHADWICK, OF WILKINSBURG, PENNSYLVANIA,
ASSIGNORS TO WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, A COR-
PORATION OF PENNSYLVANIA.

TRANSFORMER TANK.

Application filed December 30, 1920. Serial No. 434,019.

To all whom it may concern:

Be it known that we, WALTER M. DANN, a citizen of the United States, and a resident of Wilkinsburg, in the county of Allegheny and State of Pennsylvania, and ALBERT T. CHADWICK, a subject of the King of Great Britain, and a resident of Wilkinsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Transformer Tanks, of which the following is a specification.

Our invention relates to radiators and it has particular relation to radiators adapted to be employed in connection with transformer-cooling systems.

One of the objects of our invention is to provide a device, of the character described, having a relatively large radiating surface and so constructed as to insure an efficient dissipation of heat from the medium circulated therein.

Another object of our invention is to provide a transformer tank, having a plurality of radiators mounted thereon, that shall be of strong and rigid construction and one that may be handled, when filled with oil, without warping or straining the seams and joints thereof.

A further object is to provide a transformer tank, having co-acting radiator elements so constructed that the header members, heretofore generally employed, may be dispensed with, thus considerably simplifying the structure and minimizing the time and labor necessary to assemble the same.

Heretofore, in structures of this general character, radiators have been arranged radially about the periphery of a transformer tank in relatively exposed positions and unbraced, as against lateral displacement. The only supporting means for the individual radiator elements, in such structures, were the couplings or joints which formed the means of communication with the transformer tank.

It has been observed that, when a transformer tank of this type was handled in transportation, and, particularly, a large transformer tank containing a large quantity of oil, great care was necessarily exercised to prevent the weight of the same from straining the various connections between the tank and the radiators. Furthermore, in such structures, wherein the radiators were

not laterally braced, the radiators frequently became displaced or bent and often to the extent of developing leaks.

In accordance with our invention, we provide a transformer tank having the upper and lower portions thereof of greater diameters than the main portion of the tank and extending outwardly therefrom. A plurality of radiators are mounted between the outwardly extending portions of the tank and communicate therewith.

In the accompanying drawings,

Fig. 1 is a fragmentary view, partly in plan view and partly in horizontal step section, of a transformer tank having a plurality of radiators mounted thereon and constructed in accordance with our invention.

Fig. 2 is a vertical sectional view on line II—II of Fig. 1, illustrating one of the radiator elements in elevation and one in vertical longitudinal section.

Fig. 3 is a fragmentary vertical sectional view of a transformer tank having a radiator mounted thereon in accordance with a modified form of our invention.

Fig. 4 is a fragmentary sectional view on line IV—IV of Fig. 3, illustrating the method of securing the individual units to the side of a transformer.

Fig. 5 is a perspective view of one of the side members or walls of a radiator unit.

Referring to the drawings, a transformer tank is formed with a main body portion 1, preferably in the form of a sheet-metal cylinder having welded seams.

Plates or discs 2, provided with relatively large central apertures having annular flanges 3, are secured to the body portion 1 at the upper and lower extremities thereof and with the flanges 3 engaging the cylindrical wall of the body portion. The edges of the flanges 3 and the walls of the tank 1 are disposed in alinement with each other and are preferably welded together, as indicated at 4. Cylindrical walls 5, of substantially the same diameter as the plates 2 and formed with outwardly extending horizontal flanges 6, are mounted upon the plates 2 and are preferably welded thereto, as at 7.

Plates or discs 8 are secured to the upper and lower walls 5 and completely close the tank. The lower plate 8 may also be secured to the circular wall 5 by means of welding,

as indicated at 9. The upper plate 8, however, is removably secured to the wall 5, preferably by means of bolts 10 and annular angle member 11 arranged adjacent to the upper edge of the wall 5.

By means of this construction, a transformer tank may be formed with a main body portion having outwardly extending or overhanging head portions which communicate directly with the main portion of the tank and which practically constitute a continuation thereof.

A plurality of radiator elements 12 are arranged around the periphery of the central portion 1 of the tank and between the outwardly extending head portions thereof. Each of the respective radiators 12 preferably comprises side members or walls 13, suitably pressed or formed from sheet-metal blanks. (Fig. 5.) The members 13 are preferably formed with extensions 14 at the opposite ends thereof and with an outwardly projecting flange 15 extending around the edges of the same. The members 13 may be provided with a plurality of grooves or longitudinal depressions 16 adapted to reinforce or stiffen the respective members and to direct the flow of the cooling medium therethrough.

When two members, so formed, are arranged in position in side-by-side relation, the respective flanges 15 abut and may be welded, or otherwise suitably secured, together. The complementary extensions 14 then form tubular projections adapted to project within apertures 17 in the horizontal plates 2. The apertures 17 are preferably formed with vertically extending flanges 18 to which the edges of the projections 14 may be welded.

In Figs. 3 and 4, we have shown a modified form of our invention wherein a radiator unit is formed with a tubular extension 19 adapted to project directly into the side wall of a transformer tank and welded thereto, as indicated at 20.

According to our invention, the radiators are protected and braced laterally by the overhanging portions of the tank, which also performs the same functions as the separate header members heretofore employed. A free and unobstructed circulation of a cooling medium is thereby obtained through the tank, and the various radiator elements are both strengthened and protected against displacement. Air may circulate freely between the portions of the radiator units that project beyond the peripheries of the enlarged portions of the tank. The radiators are cooled by vertical currents of air that flow therebetween.

We claim as our invention:

1. A cooling system for electrical apparatus comprising a receptacle having enlargements at each of the ends thereof, and a

plurality of relatively flat cooling elements disposed between said enlargements and communicating therewith, said elements extending radially from said receptacle and beyond said enlargements.

2. A cooling system for electrical apparatus comprising a receptacle having enlargements at each of the ends thereof, a plurality of cooling elements disposed between said enlargements and communicating at one side thereof with said enlargements, the other sides of said elements extending outwardly from said receptacle beyond the peripheries of said enlargements.

3. A cooling system for electrical apparatus comprising a receptacle having enlargements at each of the ends thereof, a plurality of cooling elements disposed between said enlargements and communicating therewith, said elements comprising a plurality of relatively wide complementary members of dish-shape secured together and having longitudinally extending tubular extensions for connection to said enlargements, said elements projecting beyond the peripheries of said enlargements.

4. A cooling system for electrical apparatus comprising a tank having enlargements at each of the ends thereof, a plurality of cooling elements disposed between said enlargements and communicating therewith by means of vertically-extending projections, said elements comprising a plurality of relatively wide and flat complementary members, said elements extending radially outwardly beyond said enlargements whereby they are cooled by vertical currents of air.

5. A cooling system comprising a receptacle having enlargements at each of the ends thereof, a plurality of cooling elements disposed between said enlargements and communicating therewith, said elements comprising a plurality of complementary members of dish-shape having extensions at each end thereof and adapted to be secured together to form a relatively flat envelope having tubular extensions adapted to communicate with said enlargements, said elements having portions extending beyond said enlargements whereby air may circulate freely therebetween.

6. A cooling system comprising a receptacle having enlargements at each of the ends thereof, a plurality of cooling elements disposed between said enlargements and communicating therewith, said elements comprising a plurality of relatively flat envelopes having tubular extensions adjacent to one side thereof and adapted to form communication between said envelope and the enlargements of said receptacle, said envelopes extending radially from said receptacle beyond the peripheries of said enlargements.

7. A cooling system comprising a receptacle having enlargements at each of the

ends thereof, said enlargements having a plurality of oppositely disposed apertures provided with annular flanges, a plurality of relatively flat cooling elements disposed between said enlargements and provided with tubular extensions adjacent to one side thereof and projecting into said apertures and being welded to the flanges disposed there-

about, the other sides of said elements extending beyond the peripheries of said enlargements. 10

In testimony whereof, we have hereunto subscribed our names this 16th day of December, 1920.

WALTER M. DANN.

ALBERT T. CHADWICK.