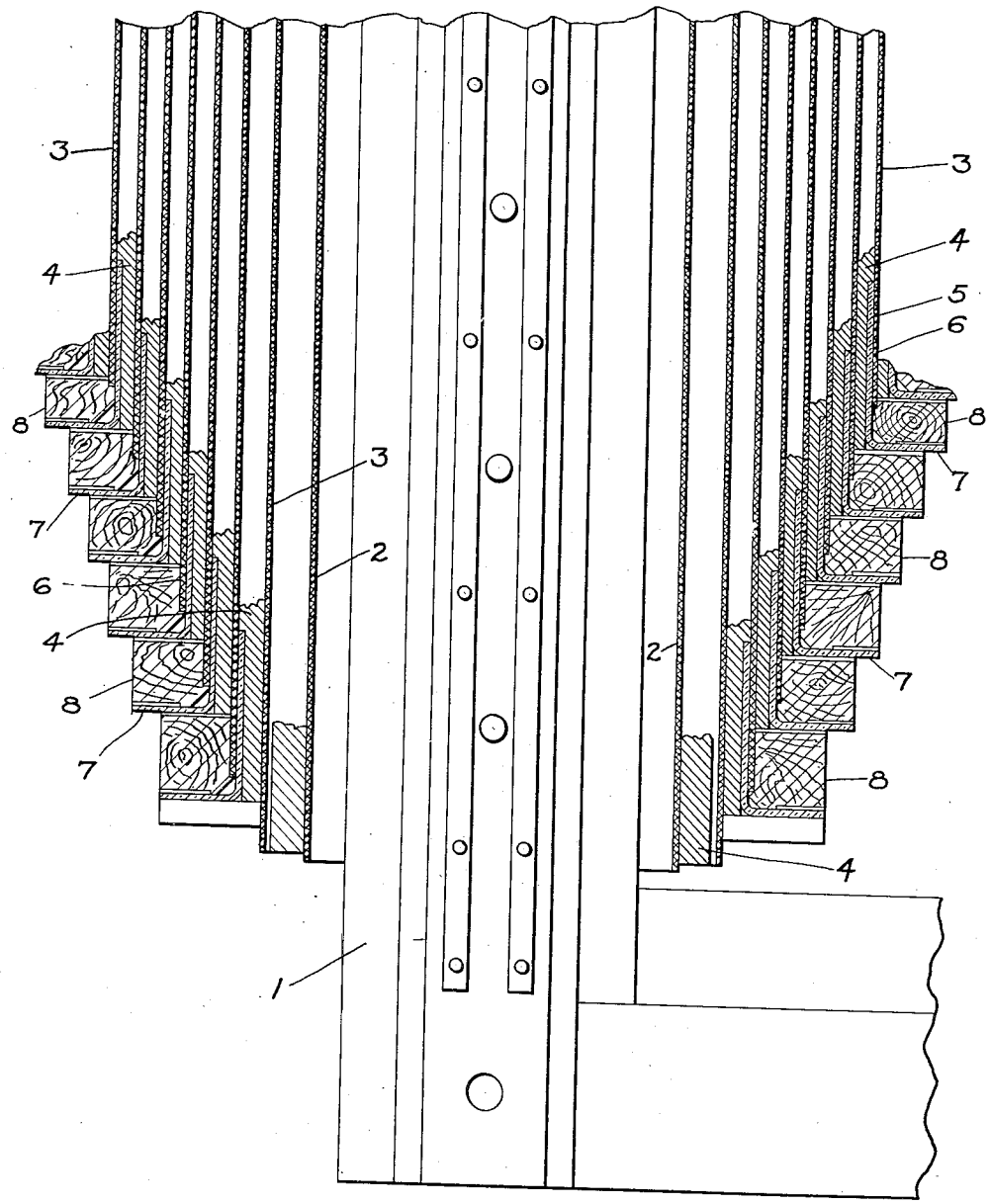
March 15, 1927. 1,621,039

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ANGLE RING FOR TRANSFORMERS

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Fig. 1.



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Fig. 2.

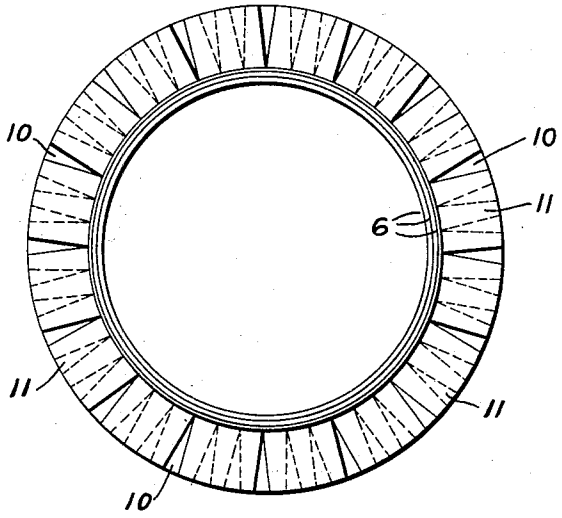


Fig. 3.

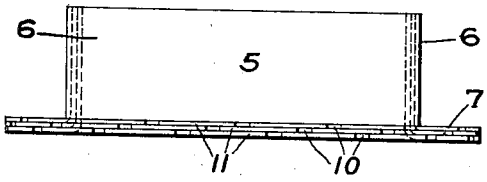


Fig. 4.

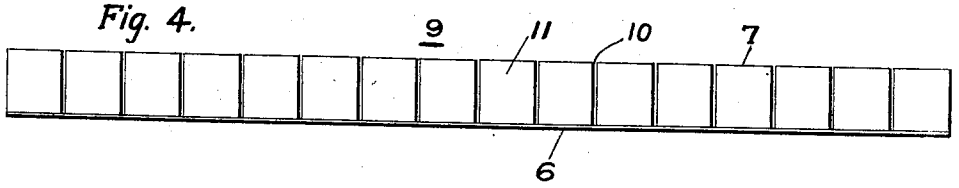
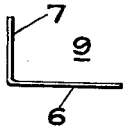


Fig. 5.



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UNITED STATES PATENT OFFICE.

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ANGLE RING FOR TRANSFORMERS.

Application filed January 14, 1921. Serial No. 437,131.

My invention relates to transformers and it has particular relation to coil-spacing and insulating members therefor.

Heretofore, it has been customary, in the manufacture of certain types of transformers, to concentrically arrange the primary and secondary coil members upon the core elements and to space them from each other by means of annular spacing members. These members were pressed into the desired shape from previously formed blanks by means of relatively expensive dies of different sizes, according to the sizes of the spacing members required. Moreover, spacing members of this particular form and adaptation consisted of continuous annular members of various sizes which required great skill to properly position them between the coils.

One of the objects of my invention is to provide a spacing strip member of the character described and of suitable form to be cut into the desired lengths and wrapped around a coil and secured in place in any preferred manner, thus dispensing with the expensive dies and machinery heretofore utilized for this purpose.

Another object of my invention is to provide a spacing member of the character described consisting of a plurality of layers of fibrous material, thus increasing the durability and the insulating properties thereof.

In the accompanying drawings,

Figure 1 is a fragmentary, vertical, longitudinal, sectional view of a transformer core having a plurality of primary and secondary coils concentrically mounted thereon and spaced by means of spacing members constructed in accordance with my invention.

Fig. 2 is a plan view of a spacing member illustrated in Fig. 1.

Fig. 3 is a side elevation of the spacing member illustrated in Fig. 2.

Fig. 4 is a plan view of one of the layers of a spacing member before the same has been assembled and bent.

Fig. 5 is an end view of the member shown in Fig. 4.

Referring to the drawings, a portion of a core-type transformer is illustrated as comprising a core member 1 having a plurality of cylindrical primary and secondary coils 2 and 3, respectively, concentrically mounted thereon. The coils 3 so decrease outwardly in overall length that the extremities thereof are disposed in stepped relation with each other.

Spacing strips 4 are so vertically arranged between the respective coils as to maintain them in proper spaced relation and, at the same time, permitting free and undisturbed circulation of a cooling medium therebetween. The respective coils are insulated from each other at their extremities by means of annular angle members 5 arranged in superposed relation with respect to each other.

A flange 6 of each of the members 5 extends vertically between the coils 3, and the horizontal flanges 7 of the members 5 extend outwardly therefrom. This arrangement not only increases the creepage distance between the extremities of the coils but constitutes a support for the next adjacent coil. Spacing and insulating blocks 8 may be disposed between the outwardly extending flanges 7 of the adjacent members, if desired.

Referring particularly to Figs. 2, 3, 4 and 5, the members 5 are preferably formed of a plurality of strips 9 of fibrous material of angular cross-section, one flange of which is provided with a plurality of spaced slits 10, to form a plurality of tongue members 11. A plurality of strips so formed are arranged in superposed relation with the tongue members of one strip spanning the slits of the next adjacent strip. The respective layers may be arranged, one at a time, between the coils, as the structure is assembled.

A member so formed is bent around a coil and may be maintained in place by means of twine or tape until the next coil is positioned over it. When the member 5 is bent around a coil, the slits 10 permit the horizontal flange to expand and the tongue portions of the next adjacent strip to lap over the spaces formed thereby, thus forming a continuous and unbroken horizontal flange.

The extremities of the member 5, resulting from the arrangement of the component layers, are in staggered relation and are therefore adapted to overlap each other when the member is bent into position. The

joints or spaces between the elements of one layer are covered by the elements of adjacent layers.

According to my invention, the spacing members may be quickly and easily assembled in a transformer by unskilled labor and at a relatively small cost, and, at the same time, insure a very accurate fit.

It will be apparent that spacing members constructed in accordance with my invention may be manufactured in any desired lengths, portions of which may be cut therefrom according to the circumference of the coil upon which it is to be assembled.

While I have shown my invention as applied to a transformer, it will be understood that it is applicable to all structures in which it is desired to employ an insulating member in the form of a flexible strip which is adapted to be cut into the desired lengths and wrapped around the part to be insulated.

I claim as my invention:

1. A spacing member for transformer coils comprising a plurality of superposed layers of insulating material, the extremities of certain of said layers extending beyond the extremities of the adjacent layers and having slits therein whereby said member is adapted to be bent into substantially annular form with the elements formed by the slits in the extremities of said layers arranged in staggered relation whereby the joints between elements in one layer are covered by the elements of an adjacent layer.

2. The combination with a pair of concentrically disposed windings, of a spacing member therefor comprising flexible strips having a plurality of flange elements secured along one edge, said strips being bent into a plurality of layers that are disposed between the windings with the flange elements extending outwardly between the edges of the windings with the flange elements of the several layers in staggered relation.

3. The combination with a pair of concentrically disposed windings, of a spacing member therefor comprising a flexible strip having a plurality of flange elements secured along one edge, said strip being bent into an annular shape and disposed between the windings with the flange elements extending outwardly at an angle to the axis of the windings between the edges of the windings.

4. The combination with a pair of concentrically disposed cylindrical windings, of a spacing member therefor comprising flexible strips having a plurality of flange elements secured along one edge, said strips being bent into a plurality of layers that are disposed between the windings with the flange elements extending outwardly between the edges of the windings with the flange elements of the several layers in staggered relation.

In testimony whereof, I have hereunto subscribed my name this 5th day of January, 1921.

ARTHUR W. THOMPSON.