

Jan. 30, 1945.

J. J. WELDON

2,368,505

SPACER FOR ELECTRICAL WINDINGS

Filed May 5, 1942

Fig. 1.

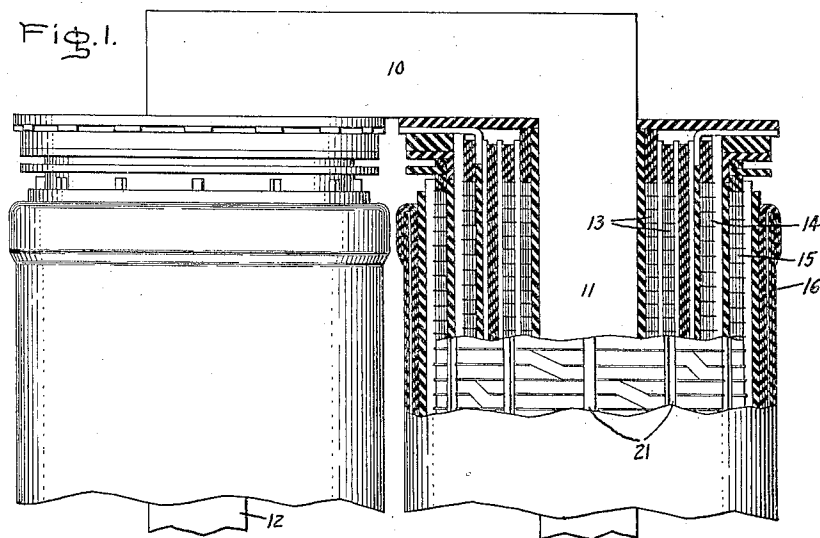


Fig. 3.

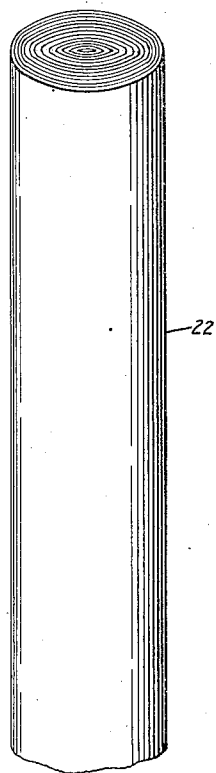


Fig. 4.

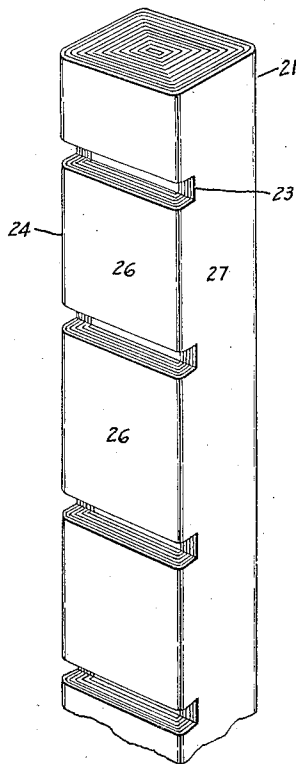
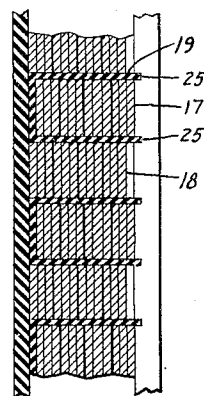


Fig. 2.



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UNITED STATES PATENT OFFICE

2,368,505

SPACER FOR ELECTRICAL WINDINGS

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Application May 5, 1942, Serial No. 441,781

3 Claims. (Cl. 174-138)

My invention relates to spacers for electrical windings, and although not limited thereto it has particular application to spacers between multiconcentric windings of transformers.

An object of my invention is to provide an improved spacer which may be employed between electrical windings.

Another object of my invention is to provide an improved spacer construction for spacing multiconcentric windings of a transformer.

Further objects and advantages of my invention will become apparent from 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.

In the drawing, Fig. 1 is a side elevation in partial section of a core and coils of a transformer which may be provided with my improved spacer; Fig. 2 is a sectional side elevation of a portion of the winding of the transformer illustrated in Fig. 1, and Figs. 3 and 4 are perspective views of my improved spacer construction during separate steps of manufacture.

In the arrangements illustrated in the drawing I have provided an improved spacer construction which is adapted to be placed between multiconcentric windings. The spacer is an improvement over the spacer described and claimed in a copending application S. N. 441,782, Paluev, filed concurrently herewith, which is also assigned to the same assignee as this present invention. My spacer includes a rolled strip of suitable material, such as pressboard, which is formed into a rectangular cross section and which has notches provided along one side thereof for cooperatively fitting into the outer edges of flanged collars which are employed with the winding construction described and claimed in the above-mentioned Paluev application.

Referring more particularly to Fig. 1 of the drawing, I have illustrated a portion of a transformer including a core 10 having winding legs 11 and 12. Each of the winding legs is surrounded by low voltage winding 13 and a high voltage winding having concentric windings 14 and 15. An electromagnetic shield 16 of any suitable type surrounds the high voltage winding. As is described and claimed in the above-mentioned Paluev application, the high voltage winding includes a plurality of axially disposed disk coils 17 and 18, see Fig. 2, the coil 17 being wound from the inside out in a channel collar 19, and the winding 18 being wound from the

inside out and then reshuffled until the turns progress from the outside in.

In order to provide an arrangement for spacing multiconcentric windings such as those having the construction of the type illustrated, I provide a plurality of spacers 21 which may be peripherally disposed in any suitable manner around the outer surface of the windings 14 and 15. The spacer 21 is formed from a rolled strip of suitable material, such as cellulosic material, in order to form a round member 22 having a spiraled laminated cross section as is illustrated in Fig. 3. The cellulosic material may be of any suitable type such as pressboard and I have found that the material may be rolled tightly together when wet. The member 22 is then formed in a suitable manner, such as by molding into a suitable shape, such as a substantially rectangular cross section or having a plurality of sides to form a spacer as illustrated in Fig. 4. Notches 23 are then cut in a face 24 thereof at suitable distances so that they may receive extending portions or ends 25 of the adjacent portions of the channel collar 19. In this manner a relatively integral and tight multiconcentric winding construction is provided.

With the spacer being formed of rolled stripped material, the portions 25 between the grooves will be held in place by integral portions at the side 27. Such a construction substantially minimizes the possibility of loose ends or the portions 26 of the laminations from being sloughed off during manufacture, or during the life of the transformer. Any particles of material which become loosened from the spacer may clog the ducts formed by the spacer and clog a pump which may be employed to force the fluid through the ducts. Also disintegration of the spacers may cause movement thereof with resulting movement of the windings. Thus, a greatly improved spacer structure is formed over that which would be present provided a conventional lamination spacer were provided with grooves cut in one face.

Although I have shown and described a particular embodiment of my invention, I do not desire to be limited to the particular embodiment described, and I intend in the appended claims to cover all modifications which do not depart from the spirit and scope of my invention.

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

1. An insulating spacer for separating windings of electrical apparatus including a rolled strip of cellulosic material formed into a sub-

stantially rectangular cross section, said spacer having spaced notches in an outer surface thereof on one side for receiving a structural portion of the adjacent winding, the material between said notches on said side being integrally connected with the material forming the remaining sides so as to minimize the possibility of the material between said notches from becoming loosened during operation of the apparatus.

2. A spacer for separating windings of electrical apparatus including a rolled strip of insulating material formed into a member having a plurality of sides, said spacer having spaced notches in an outer surface thereof on one side for receiving a structural portion of the adjacent winding, the material between said notches on said side being integrally connected with the

material forming the remaining sides so as to minimize the possibility of the material between said notches from becoming loosened during operation of the apparatus.

5 3. A spacer for separating windings of electrical apparatus including a rolled strip of laminated insulating material having a plurality of outer sides, said spacer having a plurality of spaced notches in a surface thereof on one side for receiving extending structural portions of the adjacent winding, the material between said notches on said side being integrally connected with the material forming the remaining sides so as to minimize the possibility of the material between said notches from becoming loosened during operation of the apparatus.

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