July 7, 1931. C. H. THORDARSON 1,813,716

INSULATING AND SUPPORTING WASHERS FOR ELECTRICAL BINDING POSTS

Filed Feb. 24, 1930

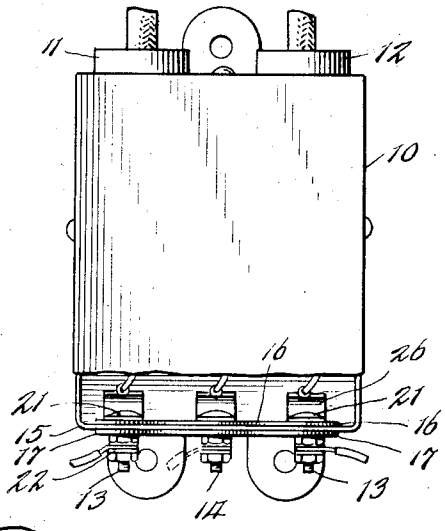


Fig. 1.

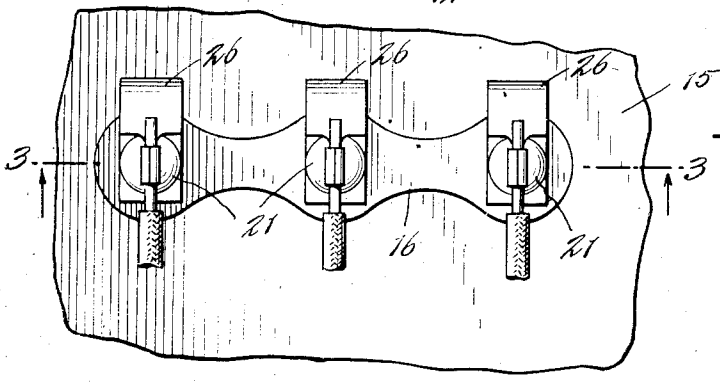


Fig. 2.

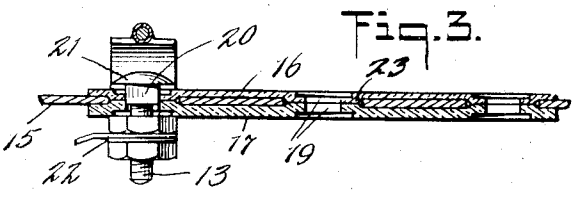


Fig. 3.

Fig. 4.

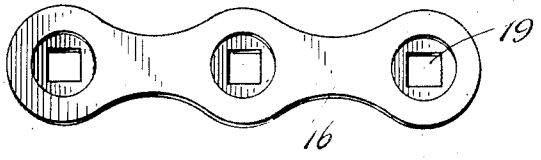


Fig. 5.



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UNITED STATES PATENT OFFICE

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INSULATING AND SUPPORTING WASHERS FOR ELECTRICAL BINDING POSTS

Application filed February 24, 1930. Serial No. 430,844.

This invention relates to improvements in means for supporting insulating electrical posts and like conducting elements from the metal wall of a casing for an electrical device at outlet openings through which said binding posts extend, and refers also to a novel arrangement of gang washers for insulating and supporting a plurality of such binding posts, and to a novel washer for such use.

The invention consists in the combination and arrangement of the parts shown in the drawings and described in the specification, and is pointed out in the appended claims.

The invention is herein shown as adapted to a casing for containing a transformer of that type wherein the secondary is provided with a number of taps or terminals, and in such construction three or more of such binding posts are employed. The invention is capable, however, of adaptation to a lesser number of binding posts.

In the drawings:

Figure 1 is a plan view of a transformer casing, partially broken away, to show the adaptation of my invention thereto;

Fig. 2 is an inside view of the casing wall and the inside washer and associated parts;

Fig. 3 is a horizontal section on the line 3—3 of Fig. 2;

Fig. 4 is a perspective view of one of the gang washers; and

Fig. 5 is a fragmentary longitudinal section of one of the washers.

As shown in the drawings, 10 designates the casing of a transformer; 11, 12 the insulating bushings through which the conductors of the primary circuit are led into the casing, and 13, 13, 14 designate binding posts which extend through openings in the metal wall 15 of the casing for connection with internal and external conductors. 16, 17 designate inner and outer gang washers which are applied, respectively to the inner and outer faces of the casing wall 15, through which the binding posts extend. Said washers are made of any suitable insulating material, such as fibre, and are substantially thicker than the pierced wall 15 of the casing.

Each of said washers comprises an elongated strip of insulating material which is formed with a plurality of openings 19 for the passage of the binding posts 13, 14, the openings 19 of the inner and outer washers registering with each other and with the outlet openings in the casing wall 15. The openings for one or both of the gang washers are rectangular or made otherwise non-circular, to receive the inner squared or non-circular shanks 20 of the binding posts just inside the heads 21 thereof, which heads lie inside and engage the inner face of the inner washer 16, so as to thereby afford a non-rotative connection between said binding posts and both the gang washers. The outer ends of said binding posts are threaded and extend beyond the outer gang washer 17 to receive nuts 22 by which to clamp the washers firmly against the inner and outer faces of the casing wall 15; and between said nuts are clamped the external conductors in a known way.

The said inner gang washer 16 is provided around its openings 19 with hollow bosses 23 (Fig. 3) of a length to extend flush with or slightly beyond the outer face of the casing wall 15. The outer gang washer 17 is formed on its inner side around the openings 19 therein with like bosses 23 that are aligned with and abut against the bosses of the inner washer. The said bosses and resultant shallow recesses of the inner and outer washers can be formed by a suitable stamping or embossing operation by the same dies which cut and form the washers and form the openings therein. By reason of the fact that the said bosses of the inner and outer gang washers are aligned and abut against each other at said openings in the casing wall, pressure applied through the clamping nuts 22 serve to somewhat deform said boss ends, thus intimately pressing them together and closely filling or lining the openings in the casing wall to afford good insulation between the binding posts and the metal casing wall at said binding post openings. The said abutting bosses also serve to center the binding posts in said openings and thus further insure efficient

insulation between the binding posts and casing wall. Furthermore, the substantial thickness of the inner and outer washers provides firm supports for the binding posts in the casing wall when the washers are clamped against the casing wall between the heads and nuts of said binding posts, thereby providing means for rigidly holding the binding posts in place. The construction described also provides an interlocking connection between the washers and the perforated casing wall which prevents transverse and longitudinal displacement of the washers, thus insuring maintaining centralization of the binding posts in said casing wall openings.

An advantage of the gang washer described, in addition to those mentioned, lies in the facility by which the washers may be assembled on the casing wall and the binding posts assembled to clamp the washers in place, due to the one piece structure of the washers. Moreover, the openings of the casing wall and the bosses are equidistantly spaced, so that the washers may be readily assembled on the wall without regard to the endwise disposition of the washers, as will be evident. The structure also has the effect of materially stiffening the casing wall and of producing a very rigid and elongated support for the binding posts, in addition to the insulating properties of said washers.

The lead wires from the secondary may be connected to the binding posts 13, 14 through the medium of U-shaped clips 26, the forward arms of which are apertured to interlockingly fit over the squared shanks of said posts between the heads thereof and the inner washer, and the rear members of which are formed for electrical attachment with said leads. The forward members of the U-shaped clips thus formed and arranged with respect to the headed ends of the binding posts insure that the said terminals will be firmly clamped between said heads and the inner gang washer.

It will be understood that the insulating and supporting means for the binding posts described may be employed for other uses than that shown and specifically described, and further, that the structural details are capable of some variations within the spirit and scope of the invention, as defined in the appended claims. For instance, the insulation at one side of the wall, preferably the inner side, can in some instance be made of individual perforated pieces instead of an integral one-piece member, as shown.

I claim as my invention:

1. The combination with a perforated metallic member, of insulating and binding post supporting gang washers fitted to the opposite sides of said member and having spaced openings and provided therearound at adjacent sides of the washers with bosses that abut at the member perforations, each of said washers being composed of a mechanically stiff flat strip of insulating material, binding posts extending through said washer openings and bosses and said member perforations, and clamping means associated with said posts and acting on the washers to force the abutting bosses together.

2. The combination with a perforated metallic member, of mechanically strong stiff insulating and binding post supporting gang washers fitted to the opposite sides of said member and having longitudinally spaced openings and provided therearound at adjacent sides of the washers with bosses that endwise abut at the member perforations, binding posts extending through said washer openings and bosses and said member openings, and clamping means associated with said posts and acting on the washers to force the abutting bosses together.

3. The combination with a perforated metallic member, of insulating and binding post supporting gang washers fitted to the opposite sides of said member and having longitudinally spaced openings and provided therearound at adjacent sides of the washers with bosses that abut at the member perforations, each washer consisting of a flat stiff mechanically strong strip, headed binding posts extending through the bosses and the perforations of said member, and clamping nuts threaded on said posts.

In testimony whereof I have hereunto set my hand on this 18th day of February A. D., 1930.

CHESTER H. THORDARSON.