

[72] Inventor **Ralph B. Stetson**
Durham, N.H.
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 [73] Assignee **General Electric Company**

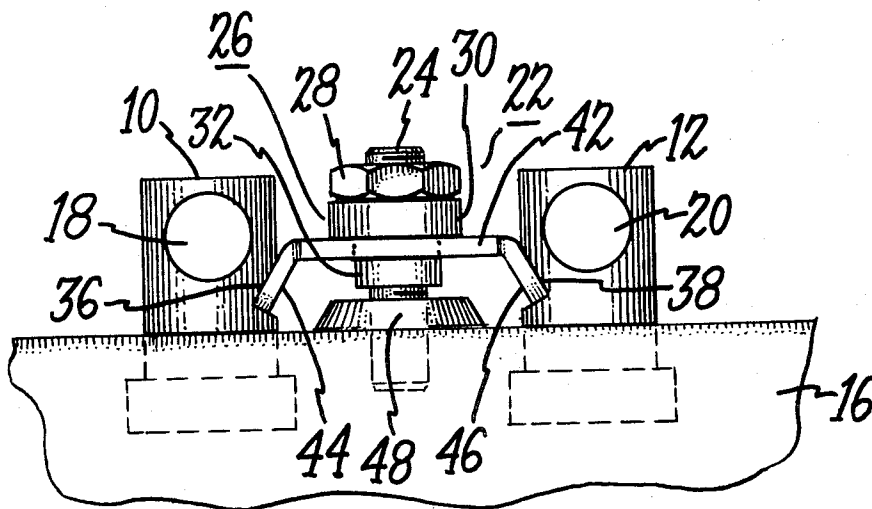
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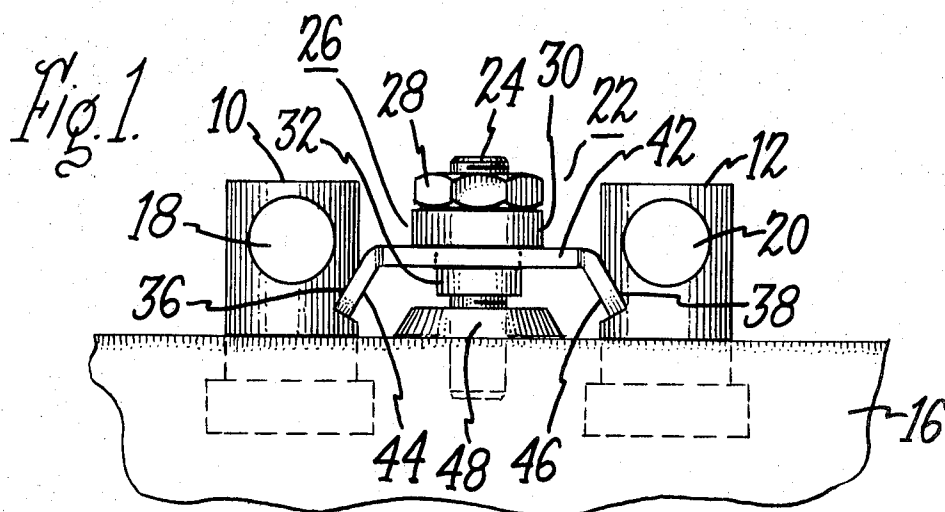
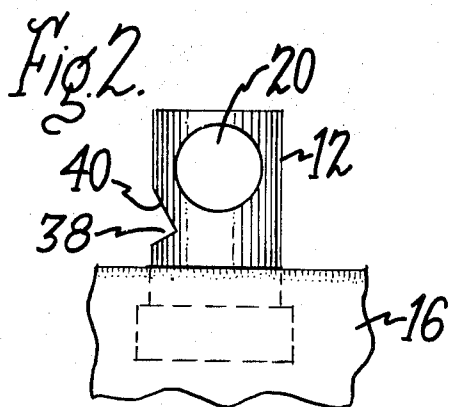
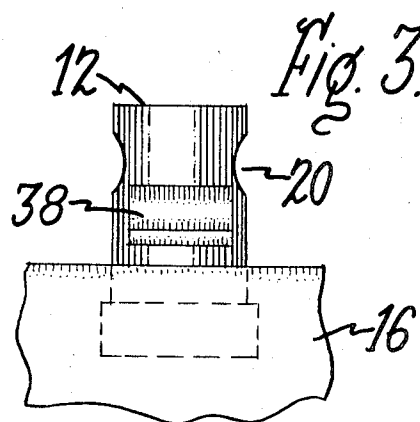
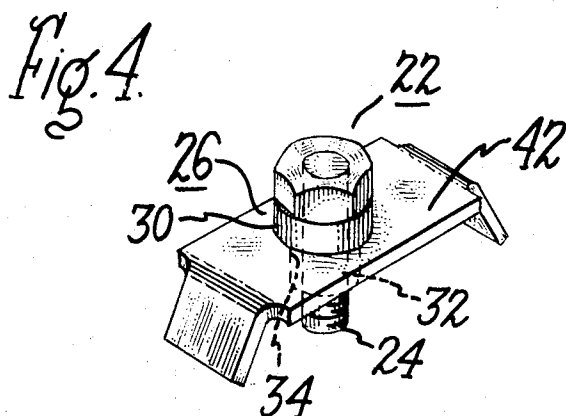
Primary Examiner—Thomas J. Kozma
Attorneys—Francis X. Doyle, Vale P. Myles, Frank L.
 Neuhauser, Oscar B. Waddell and Joseph B. Forman

[54] **SECONDARY TERMINAL AND SHORTING
 DEVICE**
 3 Claims, 4 Drawing Figs.

[52] U.S. Cl..... 336/107,
 200/166, 339/19, 339/222
 [51] Int. Cl..... H01f 27/04
 [50] Field of Search..... 336/105,
 107; 339/19, 222; 200/158, 166, 155, 168

ABSTRACT: The secondary terminals of a current transformer are provided with a cutout section which provides a flat contact surface on each terminal. A short circuit member has a pair of depending angular legs having faces which are parallel to the flat contact surfaces of the secondary terminals. This provides a large contact area with good electrical contact between the secondary terminals and the shorting device.





Inventor,
Ralph B. Stetson,
by Francis X. Doyle
His Attorney.

SECONDARY TERMINAL AND SHORTING DEVICE

BACKGROUND OF THE INVENTION

This invention relates to the shorting of secondary terminals of current transformers and more particularly to a shorting device making direct contact with a large area of the secondary terminals.

In the transformer art and in particular in the field of instrument current transformers, dangerous electrical potentials may be developed across the secondaries of such transformers when they are energized if no load is connected to the secondary circuit. For this reason, it is normal practice to provide some type of shorting device to short circuit the secondary terminal. In many present-day shorting devices additional contacts are usually provided on the secondary terminals and the shorting device makes contact with these members connected to the secondary terminals. See for example U.S. Pat. No. 3,208,021. This leads to additional parts and also the insertion of other members between the terminals and the shorting device which increases the resistance as well as areas subject to wear in the shorting device. It is considered desirable to provide a direct contact between terminals with a large area of contact.

It is, therefore, one object of this invention to provide a simple, direct contact, shorting means for secondary terminals of an instrument transformer.

A further object of this invention is to provide a shorting means between secondary terminals which provides large surfaces in direct contact between each of the secondary terminals and the shorting device.

SUMMARY OF THE INVENTION

In carrying out this invention in one form, a flat contact surface is cut in each secondary terminal. A shorting device is pivotally mounted between the terminals and is provided with a pair of depending legs having faces which are parallel to the flat contact surfaces of the secondary terminals. The shorting device may be rotated from a shorting position, with the legs in direct electrical contact with the flat contact surfaces, to a nonshorting position.

The invention desired to be protected will be particularly pointed out and distinctly claimed in the claims appended hereto. However, it is believed that this invention and the manner in which its various objects and advantages are obtained as well as other objects and advantages thereof will be better understood from the following detailed description of a preferred embodiment particularly when considered in the light of the accompanying drawing.

BRIEF DESCRIPTION OF DRAWING

FIG. 1 is a partial plan view of the secondary terminal of a current transformer showing the preferred form of secondary terminal shorting means according to the invention;

FIG. 2 is a side view of one of the secondary terminals in FIG. 1;

FIG. 3 is a front view of the secondary terminal of FIG. 2, and

FIG. 4 is a perspective view of a preferred form of shorting device used in the preferred embodiment of this invention.

DESCRIPTION OF PREFERRED EMBODIMENT

Reference will now be made to the drawing in which like numerals are used to indicate like parts throughout the various views thereof for a more complete understanding of the preferred embodiment of the shorting means of this invention. FIG. 1 shows a plan view of a pair of post-type secondary terminals 10 and 12 upstanding from the surface 14 of a current-type instrument transformer 16, which is only partially shown.

As will be understood, the terminals 10 and 12 are connected to the secondary winding (not shown) of the transformer 16 and are provided with openings 18 and 20 for the reception of secondary leads (not shown). In the manner of post-type terminals, a screw member is usually inserted into the secondary terminals 10 and 12 through the top thereof and makes contact with the leads mounted in holes 18 and 20, firmly securing the leads to secondary terminals 10 and 12.

A shorting device 22 is provided, rotatably mounted on a stud member 24. Stud 24 is fixed in the surface 14 of the transformer 16 and is spaced between the secondary terminals 10 and 12, as is shown. The stud member 24 is usually a metal member and is threaded. A spacer 26 is provided to hold the shorting device 22 on stud 24 while a nut 28 is threaded on the stud 24 to firmly position the shorting device 22 in the desired position. As can be more clearly seen from FIG. 4, the spacer 26 has a large diameter upper portion 30 which rests on shorting device 22 and a smaller diameter portion 32 which extends through an opening 34 in shorting device 22. In the preferred form of the invention, the spacer 26 is of a plastic insulating material to insulate the shorting device 22 from the stud 24.

As is more clearly shown in FIGS. 2 and 3, each of terminals 10 and 12 is provided with a cutout portion 36 and 38, respectively. As will be understood, terminals 10 and 12 are round posts and will not provide good contact with the shorting device 22. Therefore, cutout portions 36 and 38 are provided. The cutout portions are sloped angularly away from the stud 24 in the preferred form, to provide a flat contact surface 40 best shown in FIG. 2.

The shorting device 22, as shown in FIGS. 1 and 4, is a substantially U-shaped member having a bight portion 42 containing the opening 34. The ends 44 and 46 are bent downwardly, as shown, at the same angle as the flat contact surface 40 on terminals 10 and 12. This provides flat faces parallel to the flat contact surface 40 of the cutout portions 36 and 38, as is clearly shown in FIG. 1 of the drawing. Thus, as will be apparent, when shorting device 22 is turned into contact with terminals 10 and 12 as is shown in FIG. 1 the legs or ends 44 and 46 will make good electrical contact with the flat contact surface 40 of terminals 10 and 12.

Of course, as will be understood, shorting device 22 may be held in the nonshorting position at right angles to the position shown in FIG. 1 by a detent 48 on the surface 14. The nut 28 may be tightened on stud 24 to hold the shorting device in either of the two desired positions, that is, the shorting position shown in FIG. 1 and the nonshorting position in contact with detent 48.

While there has been shown and described the present preferred embodiment of this invention, it will be obvious to those skilled in this art that various changes may be made without departing from the spirit and scope of the invention.

I claim:

1. A shorting means for the secondary of an instrument transformer comprising: a pair of secondary terminals spaced on the surface of an instrument transformer; a cutout in each of said pair of secondary terminals on the portion of said terminals facing each other providing a flat contact surface on each said terminal; a stud mounted on the transformer surface midway between said terminals; a shorting device rotatably mounted on said stud and provided with a pair of depending leg portions, each said leg portion having a face parallel to the flat contact surface of said terminals.

2. A shorting means as claimed in claim 1 in which each said cutout provides an angular contact surface and said depending leg portions are bent downwardly at the same angle.

3. A shorting means as claimed in claim 1 in which said shorting device has an insulating spacer extending through a hole in said shorting device and surrounding said stud.