Sept. 3, 1968 L. G. C. TEURLINGS 3,400,362

FRACTURE RESISTANT CONNECTING POST

Filed March 14, 1967

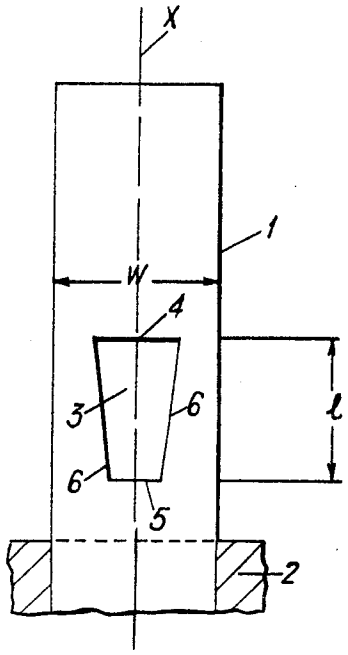


Fig. 1.

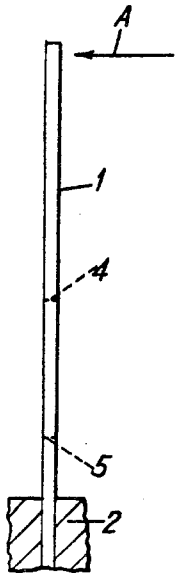


Fig. 2.

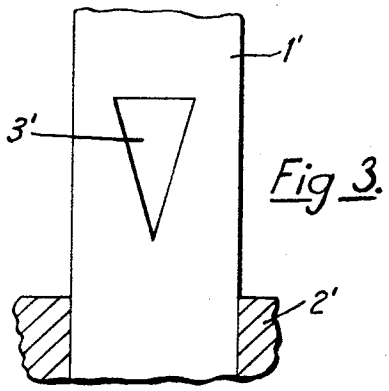


Fig 3.

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# FRACTURE RESISTANT CONNECTING POST

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## ABSTRACT OF THE DISCLOSURE

A flat sheet metal post securable in a mounting member which is provided with an aperture proximate the end securable in the mounting member to equalize the bending stress under the action of a bending force over the length of the apertured portion of the post and the bending stress is greater than such bending stress at any cross section of the remainder of the post.

Cantilever, flat sheet metal posts are commonly employed for example as connecting posts for the attachment of electrical wire, for example by soldering, the posts projecting from a base formed by an insulating block in which the posts are embedded. Since each post may project a considerable distance, for example half an inch from the block, it is readily susceptible to being accidentally bent in a direction at right angles to its plane. It has been found that these posts are susceptible to fracture if bent as cantilevers towards the block and then bent back to their original perpendicular positions a given number of times. The susceptibility of the posts to fracture, results from the fact that since the posts act as levers under the action of the bending forces, the bending forces are greatest at the lines of entry of the posts into the block, this being the case both when a post is bent from its perpendicular position relative to the block and when it is bent back again. The post is accordingly work-hardened along the line of entry in both bending directions so that it snaps off. The susceptibility of the posts to fracture is enhanced when the posts have been stamped from a rolled metal sheet transversely of the rolling direction.

An object of the invention is to provide a thin metal post capable of withstanding bending stresses and equalizing the bending stresses over a length thereof.

Another object of the invention is the provision of a thin metal post having an aperture therein to equalize bending stresses applied to the post over the length of the apertured portion of the post.

A further object of the invention is to provide an apertured post with the aperture located proximate an end securable in a mounting member to improve the resistance of the post to fracture and especially if the post is cut out perpendicularly to the rolling direction of the sheet of metal from which it is formed.

An additional object of the invention is the provision of a thin metal post having an aperture therein between a longitudinal center of the post and a base in which the post is secured and the post is dimensioned so that the cross-sectional area of the post over the length of the aperture in the direction of the longitudinal axis of the post increases towards the base concomitantly with the mechanical advantage afforded by the post.

Other objects and attainments of the present invention will become apparent to those skilled in the art upon a reading of the following detailed description when taken in conjunction with the drawings in which there is shown and described an illustrative embodiment of the invention; it is to be understood, however, that this embodiment is not intended to be exhaustive nor limiting of the invention but is given for purposes of illustration in order that others



skilled in the art may fully understand the invention and the principles thereof and the manner of applying it in practical use so that they may modify it in various forms, each as may be best suited to the conditions of a particular use.

The invention as a preferred embodiment provides a sheet metal, flat, cantilever post extending from a base, the post having a through aperture disposed between the longitudinal center of the post and the base and being dimensioned so that the cross-sectional area of the post over the length of the aperture in the direction of the longitudinal axis of the post increases towards the base concomitantly with the mechanical advantage afforded by the post in respect of a force applied to the post on the opposite side of the aperture to the base and tending to bend the post in a direction at right angles to its plane; whereby the bending stress under the action of the bending force is equal over the length of the apertured portion of the post and greater than such bending stress at any cross section of the remainder of the post.

The aperture in the post is preferably trapezoidal with the parallel edges of the aperture extending perpendicularly to the longitudinal axis of the post and the smaller end of the trapezium being directed towards the base. The aperture may otherwise be triangular with the apex of the triangle directed towards the base and the base of the triangle perpendicular to the longitudinal axis of the post.

For a better understanding of the invention reference will now be made by way of example to the accompanying drawings, in which:

FIGURE 1 is an enlarged elevational view drawn to scale, showing a sheet metal post extending from an insulating block which is shown in fragmentary form;

FIGURE 2 is an end view of FIGURE 1; and

FIGURE 3 is a view similar to FIGURE 1 which illustrates an embodiment.

A post **1** made of rolled sheet metal is fixed in a block **2** of insulating material and has a trapezoidal aperture **3**, disposed between the base **2** and the longitudinal center of the post **1**. The parallel edges **4** and **5** of the apertures **3** extend perpendicularly to the longitudinal axis X of the post, the shorter one, **5**, of the two edges, being nearest the block **2**. The relationships between the dimensions of the post and those of the aperture **3** and the position of the aperture **3** in the post are such that the cross section of the apertured portion of the post **1**, i.e. over the length *l*, decreases concomitantly with the mechanical advantage afforded by the post as a cantilever in respect of a bending force applied in the direction of the arrow A in FIGURE 2, i.e. a force tending to bend the post **1** from its perpendicular position with respect to the block **2** towards the upper (as seen in FIGURES 1 and 2) surface of the block **2**, whereby the bending stress under the action of the bending force is equal over the length of the apertured portion of the post and greater than the bending stress in any other cross section of the post. The post will thus bend arbitrarily about any line along the length *l* under the action of the bending force since the bending stress along the length *l* will be equal throughout the length *l*. Let it be assumed that the post **1** is first bent leftwardly (as seen in FIGURE 2) under the action of the bending force indicated by arrow A. The radius about which the post **1** is bent is large in view of the equal bending stress of the post over the length *l*. The post can now be bent back to its original perpendicular position relative to the block **2**. If the post is thereafter bent rightwardly (as seen in FIGURE 2) it will bend about the same abovementioned large radius. Thus, each time the post is bent it bends about the same large radius through the length *l*. It has been found that the post can be bent backwards and forwards six or seven times without fracturing.

In view of the improved resistance to fracture of the post, the post may be cut out perpendicularly to the rolling direction of the sheet metal from which it is formed.

Instead of being trapezoidal, the aperture 3' in the post 1' may be triangular with the base of the triangle extending perpendicularly to the longitudinal axis X of the post and the apex of the triangle being directed towards the base 2' as illustrated in FIGURE 3. Other configurations of the aperture may, of course, be realized.

It will, therefore, be appreciated that the aforementioned and other desirable objects have been achieved; however, it should be emphasized that the particular embodiment of the invention, which is shown and described herein, is intended as merely illustrative and not as restrictive of the invention.

The invention is claimed in accordance with the following:

1. A base and a sheet metal, flat, cantilever member extending from the base comprising a post having a through aperture disposed between a longitudinal center of the post and the base, said aperture having sides converging towards each other in a direction towards said base with the width of the aperture closest to said base being not more than four-fifths of the width of the aperture farthest away from the base, said post being dimensioned so that a cross-sectional area of the post over the length of the aperture in the direction of a longitudinal axis of the post increases towards the base concomitantly with the mechanical advantage afforded by the post in respect of a force applied to the post on the opposite side of the aperture to the base and tending to bend the post in a direction at right angles to its plane; whereby the bending stress under the action of the bending force is equal over the length of the apertured portion of the post and greater than such bending stress at any cross section of the remainder of the post.

2. A post according to claim 1 in which the aperture is trapezoidal with parallel edges of the aperture extending perpendicularly to the longitudinal axis of the post and a shorter one of these edges lying nearest the base.

3. A post according to claim 1, in which the aperture is triangular with a base of the triangle extending perpendicularly to the longitudinal axis of the post and an apex thereof being directed towards the base.

4. An electrical connection post comprising a thin metallic member having one end for securing in a mounting member so that said member can extend outwardly therefrom for receiving an electrical connection thereon, said member having an aperture therein between a longitudinal center of said post and said one end, said aperture having sides converging towards each other in a direction towards the one end with the width of the aperture closest to said one end being not more than four-fifths of the width of the aperture farthest away from said one end and being dimensioned, thereby providing a cross-sectional area of said member over the length of said aperture in the direction of a longitudinal axis of said member, said cross-sectional area increasing towards said one end to provide an increased mechanical advantage to equalize bending stresses under the action of bending forces over the length of the apertured section of said member and to be greater than the bending stresses at any cross section of the remainder of said member.



5. An electrical connection post according to claim 4 wherein said aperture has a trapezoidal configuration.

6. An electrical connection post according to claim 4 wherein said aperture has a triangular configuration.

7. An electrical connection post comprising a thin metallic member having one end for securing in a mounting member so that said member can extend outwardly therefrom for receiving an electrical connection thereon, said member having a section provided with an aperture therein between a longitudinal center of said member and said one end, said aperture having a configuration decreasing in cross section in a direction towards said one end with the width of the aperture closest to said one end being not more than four-fifths of the width of the aperture farthest away from said one end to provide an increased mechanical advantage to equalize bending stresses under the action of bending forces over the length of the apertured section and to be greater than the bending stresses at any cross section of the remainder of said member.

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