March 26, 1940. G. H. DEAN 2,195,327

STRUCTURAL COLUMN

Filed Feb. 2, 1939

Fig. 1

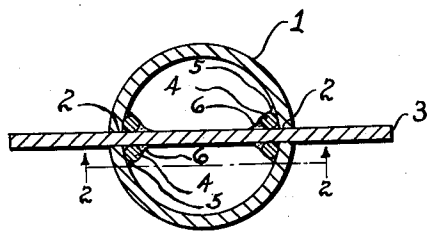


Fig. 3

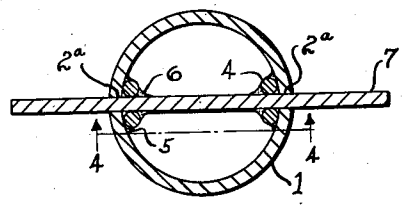


Fig. 2

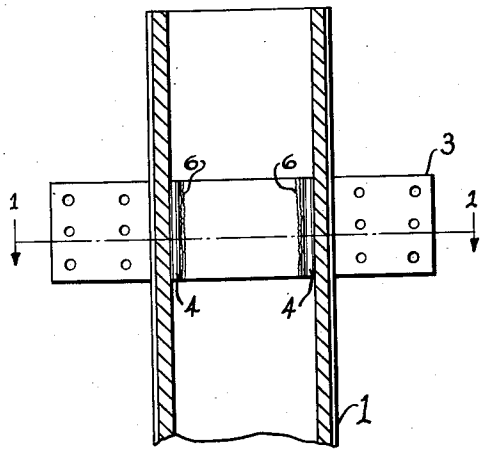


Fig. 4

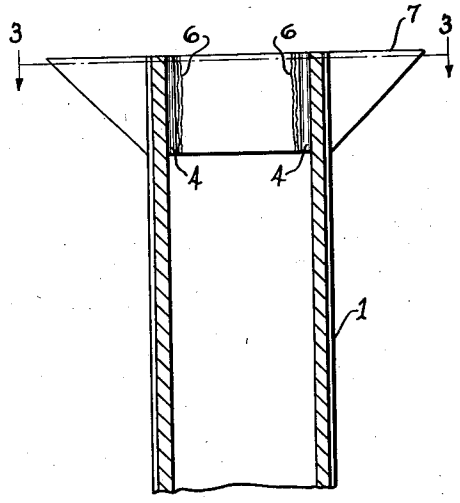


Fig. 5

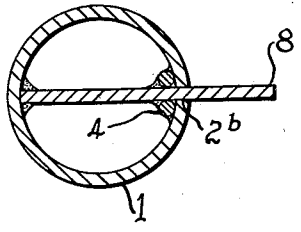
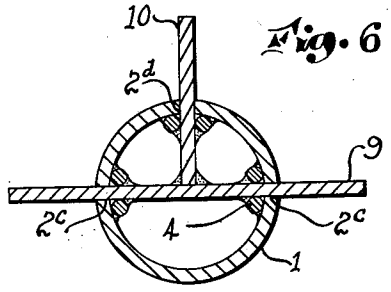


Fig. 6



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STRUCTURAL COLUMN

George H. Dean, Norwood, R. I.

Application February 2, 1939, Serial No. 254,202

1 Claim. (Cl. 189—42)

This invention relates to a structural column and more particularly to such a column having one or more supporting plates secured thereto.

Columns made by filling metal casings with concrete have been used for years as structural supports. It has also been customary to attach vertical supporting plates of one form or another to these casings to help support top plates, beams or girders, especially where a load may be imposed somewhat eccentrically upon the column. The present practice is to cut away a part of the casing to form a slot therethrough into which the aforesaid vertical supporting plates can be inserted. This slotting of the casing is generally recognized as of weakening effect in that it actually removes a part of the metal. And where the slots are formed at the very end of the casing not only is the end weakened by the aforesaid removal of the metal but the remaining separated portions of the column are quite likely to spread apart under the continued stress of the load. To prevent this, various devices have been provided to encircle the split or slotted ends and thereby prevent the spreading of the sections. Another expedient adopted for the same purpose, as disclosed in the Lally Patent 1,539,580 of May 28, 1925, and in the Peterson Patent 1,604,931 of October 26, 1926, is to weld the edges of the slots to the supporting plate inserted therein but this at best only permits a limited fillet or rim weld to be made.

It is among the objects of my present improvements to provide within a casing a true fillet member which is separately welded both to the casing and to the supporting plate near the edge of a slot. This arrangement is adaptable to brackets for supporting top or crown plates, and to tie plates. It not only provides a secure fastening between the casing and the supporting plate but reinforces each of them and particularly compensates for the weakening effect in the casing due to a slot therein.

In the preferred arrangement a round rod is placed in both internal corners formed at the vertical edges of a slot by the casing wall and the supporting plate, and welded to both the casing and the plate. The added fillet members and welding material effectively lock the supporting plate against any longitudinal or crosswise shifting and the horizontal surface added by these members and the welding material enable more of the load to be imposed directly upon a greater area of concrete and thus reduce the shearing strain at the metal-to-metal contact of the plate and casing wall at the bottom of the slot. Another advantage which follows from fastening the plate and casing together only within the casing is that any beam attached to the supporting plate can be placed immediately adjacent the external surface of the casing, thus not only avoiding undesirable spacing but permitting the edge of the beam to bear directly against the column and thus avoiding racking. This close positioning of the beam against the casing also causes the load carried by the beam to be imposed nearer to the vertical axis of the column.

The best mode in which I have contemplated applying the principles of my invention is shown in the accompanying drawing but this is to be taken as merely illustrative because it is intended that the patent shall cover by suitable expression in the appended claim whatever features of patentable novelty exist in the invention disclosed.

In the accompanying drawing:

Figure 1 is a plan in section, as on line 1—1 of Figure 2, of a casing provided with a tie plate in accordance with my improvements;

Figure 2 is a vertical section as on line 2—2 of Figure 1;

Figure 3 is a top view in section as on line 3—3 of Figure 4 of a casing provided with a bracket and embodying my invention;

Figure 4 is a vertical section as on line 4—4 of Figure 3;

Figure 5 is a horizontal section showing how a bracket or tie plate which extends on only one side of the casing may be secured in accordance with my invention; and

Figure 6 is another horizontal section showing how one bracket or tie plate may extend on opposite sides of a casing and another bracket or tie plate may extend therefrom on a third side.

Referring to the drawing and more particularly to Figures 1 and 2, a metal casing 1 is provided with diagonally opposed vertical slots 2 in its wall. A tie plate 3 is inserted in these slots so as to extend on opposite sides of the casing. At each inner corner, a fillet member 4 is separately welded to the inner surface of the casing wall and to the tie plate as indicated at 5 and 6. The fillet member may be a bar of rectangular cross-section, but I prefer to use a piece of round bar stock as shown.

There are advantages gained in using the round bar stock. As compared to a square or rectangular bar of corresponding size, the round bar gives a greater surface for welding on both the casing and the supporting plate as well as on itself. It also enables the welding material to be applied to the casing wall a little closer to

the slot and thus enhances the reinforcing effect on the casing wall.

In Figures 3 and 4 the same arrangement of fillet members and welds are shown applied to a bracket 7 inserted in slots 2a cut at the end of a casing.

Figure 5 shows my improved fastening when a supporting plate 8, which may of course be either a bracket or tie plate, is to extend on only one side of the casing. This plate is inserted through a vertical slot 2b in the casing and butted against the inner opposite surface of the casing to which it may be directly welded. The fillet members 4 are inserted and welded adjacent the slot to the casing and to the supporting plate as previously described.

In Figure 6 I have illustrated the application of my invention to a supporting plate 9 (which again may be a tie plate as shown in Figures 1 and 2 or a bracket as shown in Figures 3 and 4) which extends on opposite sides of a casing through diagonally opposed slots 2c, and another supporting plate 10 which extends through a third slot 2d. This latter plate is butted against the supporting plate 9 and welded directly thereto. Fillet members 4 are welded to both plates and the casing as hereinbefore described.

By use of fillet members as disclosed herein, not only is a supporting plate firmly secured to the casing against any longitudinal movement in the direction of the axis of the plate, but the casing wall itself is reinforced at each vertical side of a slot. Such reinforcement prevents any spreading of the casing, especially where the slots are cut at its upper end as shown in Figures 3 and 4. The result is a simple but exceedingly efficient arrangement of casing and supporting plates.

I claim:

A structural column comprising a tubular metal casing adapted to stand upright and having a vertical slot cut therein; a metal supporting plate extending from outside said casing through said slot with its bottom edge resting on the bottom of said slot; a piece of round metal rod, of length approximately equal to the vertical extent of said supporting plate, positioned inside the casing in the vertical corner formed by the said plate and the casing adjacent one edge of said slot; the said rod having vertical line contact with the inside surfaces of said plate and said casing; a fillet weld between said rod and said plate; and another fillet weld between said rod and the casing; the said welds extending throughout the vertical length of said rod and being of such thickness and shape as to form with the rod a substantially flat continuous surface between said plate and said casing.

GEORGE H. DEAN.