May 5, 1942. D. M. DE CANIO 2,281,833

FORM WALL TIE

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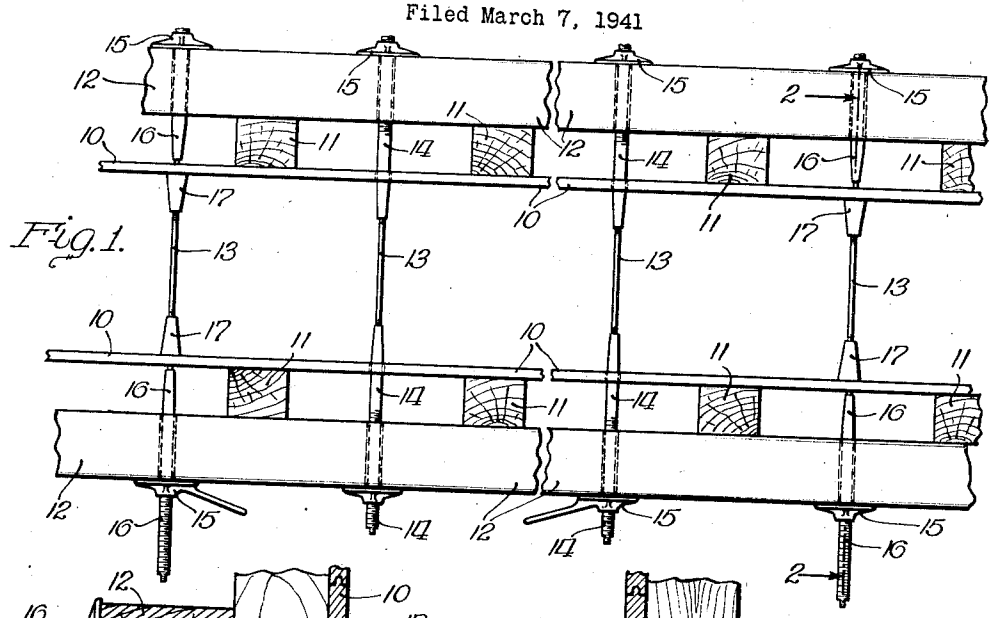


Fig. 1.

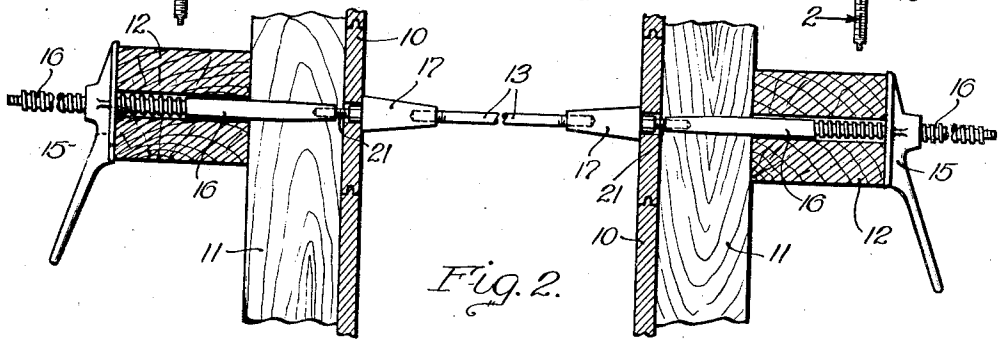


Fig. 2.

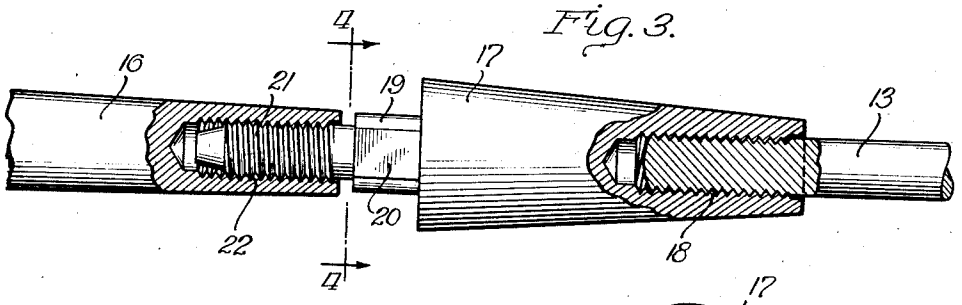


Fig. 3.

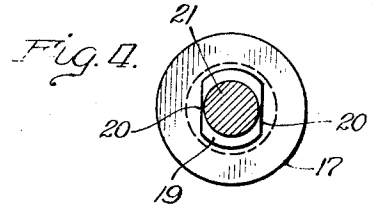


Fig. 4.

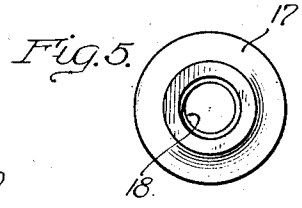


Fig. 5.

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FORM WALL TIE

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3 Claims. (Cl. 25—131)

This invention relates to ties for bonding together the side walls of concrete forms.

In constructions where the wall forms are relatively short, ties which prevent outward bulging or expansion of the walls alone are used. On the other hand, where the form walls are of considerable length, it is necessary to employ ties which not only prevent the walls from bulging outwardly, but also space the walls against bulging inwardly. In long wall constructions, it is common practice to use for the most part tie-rods not equipped with spacers, and to insert at intervals tie-rods equipped with spacers.

A standard construction of tie-rod not employing spacers is illustrated in patent to Dietrich, No. 1,925,689, Sept. 5, 1933, wherein the tie member is made up of a central element called the "tie-rod," having threaded ends, and a pair of so-called "stud-rods" having threaded sockets in their inner ends which screw onto the threaded ends of the tie-rod, and threaded outer portions which extend through the form walls and the stringers and walers that brace the form walls externally, and receive nuts bearing against the outer sides of the walers.

A standard form of tie member, equipped with spacers to prevent inward collapse of the form walls, is disclosed in patent to McCarty, No. 915,995, March 23, 1909, which comprises the central tie-rod having threaded ends, a pair of conical spacers, each having a threaded socket in its inner end to receive the threaded end of the tie-rod, and also a threaded socket in its outer end to receive the externally threaded inner end of a stud-rod.

In the structure employing no spacers, typically represented by the Dietrich patent, aforesaid, it is necessary that the stud-rods be of at least ¾" stock, in order to provide adequate threaded sockets at their inner ends to receive the threaded ends of the tie-rod. On the other hand, in the structure employing spacers, typically represented by the McCarty patent, aforesaid, the stud-rods may be, and commonly are, made of ⅝" stock. Hence, in a job employing both types of tie-rods, it has heretofore been necessary to provide stud-rods of different thicknesses and different structures.

An important object of the present invention has been to provide an improved structure of spacer, by the use of which identical stud-rods and identical tie-rods can be employed on the job with both the more numerous tie elements not employing spacers and the less numerous tie elements employing spacers. A further object of the invention has been to provide an improved structure of form wall tie that will save metal by permitting re-use of the elements to a greater extent than has heretofore been possible. My present improvement provides a novel structure of spacer which affords a wrench-hold, by which, when the walls have been taken down, a wrench may be applied and the spacer unscrewed from the tie-rod and removed for re-use.

An illustrative embodiment of the invention is shown in the accompanying drawing, in which—

Fig. 1 is a top plan view, broken off at its ends, and broken out between its ends, of a relatively long form wall employing tie elements not equipped with spacers, and other tie elements having my improved spacers.

Fig. 2 is an enlarged vertical section taken on the line 2—2 of Fig. 1.

Fig. 3 is a side elevation, partly in longitudinal section, of my improved spacer, also showing the same engaged with the threaded end of the tie-rod and the tapped end of the stud-rod.

Fig. 4 is a transverse section taken on the line 4—4 of Fig. 3.

Fig. 5 is an end view of the cone spacer, as seen from its smaller end.

Referring to the drawing, 10 designates the usual plank walls of the form that are externally supported by vertical stringers 11 and horizontal walers 12.

A greater number of the tie elements are of the type having no spacers, and consist simply of central tie-rods 13 formed with threaded ends, and stud-rods 14 that extend through holes in the form walls 10, between adjacent stringers 11, and through holes in the walers 12; the outer end portions of the stud-rods being threaded to receive clamp nuts 15, and their inner ends having threaded sockets that engage with the threaded ends of the tie-rod, all as disclosed in the aforesaid Dietrich patent.

The structure of the tie element which embodies an important novel feature of my present invention is more fully shown in Figs. 2, 3, 4 and 5. This comprises the central tie-rod 13, which is identical with the tie-rods 13 shown in the central portion of Fig. 1, a pair of stud-rods 16, and a cone spacer 17 located between and connecting each end of the tie-rod with the proximate end of the stud-rod 16. The structural features of this spacer are best shown in Figs. 3, 4, and 5, from which it will be seen that the small end of the cone has a tapped socket 18 that receives the threaded end of the tie-rod, while its wide end, that bears on the inner side

of the form wall, has an integral shank 19 that is formed with opposed flat sides 20, which shank occupies a hole in the form wall 10, and constitutes a wrench-hold. Integral and continuous with the shank 19 is an externally threaded coaxial stem 21 that screws into a tapped socket 22 in the meeting end of the stud-rod 16. The externally threaded stem 21 is of the same diameter and thread pitch as the externally threaded end of the tie-rod 13, and the tapped socket 22 is of the same diameter and thread pitch as the tapped socket 18; so that, where the cone spacer is not required, the threaded end of the tie-rod 13 can be screwed directly into socket 22 of the stud-rod, as is shown in the two inner tie-rod structures in Fig. 1.

The outer end portions of the stud-rod 16 are threaded, as in the case of the stud-rods 14, and equipped with similar clamp nuts 15.

By reason of this construction, the stud-rods and tie-rods of all the tie elements, both those having spacers and those without spacers, may be made structurally identical, thus substantially reducing costs of manufacture.

When the walers, stringers and form walls have been removed, by applying a wrench to the shank 20 of the spacers, the latter can be unscrewed from the tie-rods for re-use in a subsequent job, leaving only the tie-rods 13 imbedded in the concrete; the holes in the wall left by the spacers being plugged with concrete. This feature also substantially reduces the cost of the equipment.

I claim:

1. A device for maintaining the walls of a concrete wall form against both outward and inward bulging, comprising a central tie-rod, a pair of spacer blocks having a screw-threaded connection to the respective ends of said tie-rods and adapted to bear on the inner sides of the form walls, the ends of said blocks in contact with the form walls having each a shank adapted to occupy a hole in a form wall and formed with a wrench-hold, stud-rods having a screw-threaded connection to the respective shanks identical with the screw-threaded connection of said tie-rod to said spacer blocks, and clamps engaged with the outer ends of said stud-rods.

2. A device for maintaining the walls of a concrete wall form against both outward and inward bulging, comprising a central tie-rod having threaded ends, a pair of spacer blocks each having in its inner end a tapped socket engaged by an end of said tie-rod and at its other end adapted to bear on the inner side of a form wall, said other end having an integral shank adapted to occupy a hole in said form wall and formed with a wrench-hold, a threaded stem integral and continuous with said shank and identical in diameter and thread pitch with the threaded ends of said tie-rod, stud-rods formed with tapped sockets in their inner ends identical in diameter and thread pitch with the tapped sockets of said spacer blocks engaged with said threaded stems, and clamps engaged with the outer ends of said stud-rods.

3. A device for maintaining the walls of a concrete wall form against both outward and inward bulging, comprising a central tie-rod having threaded ends, a pair of spacer cones each having in its narrow end a tapped socket engaged by an end of said tie-rod and at its broad end adapted to bear on the inner side of a form wall, said broad end having an integral shank adapted to occupy a hole in said form wall and formed with opposed flattened sides creating a wrench-hold, a threaded stem integral and continuous axially with said shank and identical in diameter and thread pitch with the threaded ends of said tie-rod, stud-rods formed with tapped sockets in their inner ends identical in diameter and thread pitch with the tapped sockets of said spacer blocks engaged with said threaded stems and with threaded outer end portions, and clamp nuts on said threaded outer end portions.

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