March 17, 1936. L. J. SAROSDY 2,034,638

TIE AND SPACER FOR WALL FORMS

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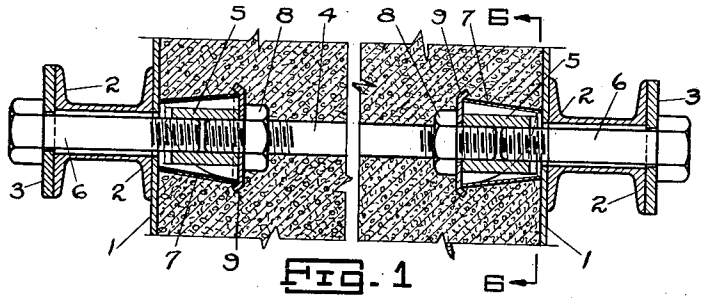


FIG. 1

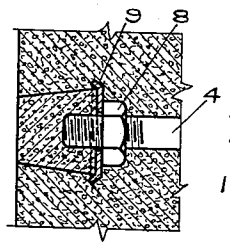


FIG. 2

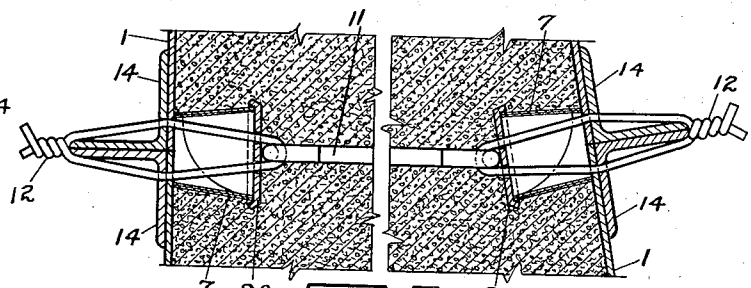


FIG. 3

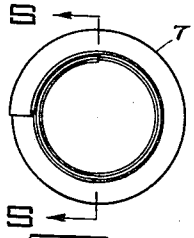


FIG. 4

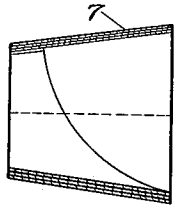


FIG. 5

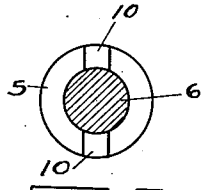


FIG. 6

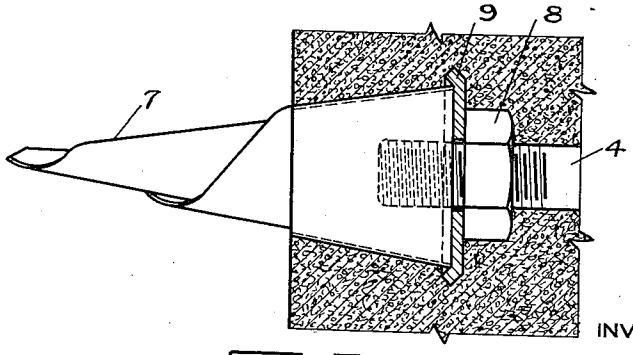


FIG. 7

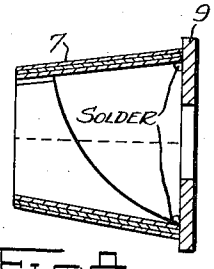


FIG. 8.

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TIE AND SPACER FOR WALL FORMS

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6 Claims. (Cl. 25—131)

The invention pertains to wall ties as used in connecting the opposing walls of forms and particularly to the form wall spacing members mounted on the tie rods and serving to space the walls of a form a predetermined distance as the fluid concrete is being placed in the form.

In the casting of monolithic wall structures the customary procedure is to erect a pair of wall molds suitably braced against distortion and connected at a plurality of points intermediate the upper and lower edges by ties. These ties extend between the wall molds and continue through suitable openings in the wall molds where they are connected to convenient points on the exterior of the wall molds and serve to prevent separation of the wall molds. In order to prevent the collapse of the wall molds towards each other during the pouring of the concrete, it is customary practice to mount on the ties suitable spacing members which engage the inner face of the mold walls and have their inner portions in engagement with shoulders or other stop means on the ties so as to maintain the form walls in fixed spaced relation.

After the fluid concrete has set and the wall molds removed, these spacing members are removed from the wall and in so doing openings are left in the finished wall, the ends of the tie rods are cut off, and the openings filled with grouting to present a smooth surface. As the concrete forming the wall has already hardened before the aforementioned grouting is inserted, a good bond between the grouting and the concrete forming the wall is rarely obtained. This results in the grouting eventually falling out of the openings in the wall and presenting an unsightly appearance.

An object of the invention is to provide a novel form of tie and spacer for use with forms in erecting concrete structures.

Another object of the invention is to provide a form tie with a readily removable form wall spacing member.

A further object of the invention is to provide a novel form of spacing member for use in form ties as aforesaid which, when removed, leaves an opening shaped to prevent displacement of the grout plugs.

Referring now to the drawing illustrating the invention, Fig. 1 shows a portion of a wall form filled with concrete and provided with the tie and spacer of the invention; Fig. 2 shows a section through a portion of the wall at one of the openings after the spacer has been removed and the opening filled with grouting; Fig. 3 is a section through a portion of a wall mold showing a modification of the invention; Fig. 4 is an end view of the spacer; Fig. 5 is a section taken on the lines 5—5 of Fig. 4; Fig. 6 is taken on the lines 6—6 of Fig. 1 showing an end view of the rod coupling; Fig. 7 is a section through the wall at the spacer with the form removed and showing the manner of collapsing the spacer in removing from the wall.

Referring now in detail to the drawing and to the form of the invention as shown in Fig. 1; reference character 1 indicates the oppositely disposed wall forms provided with horizontally disposed walers 2 with the tie rod extending through the form walls and walers and connected to a suitable member 3 mounted on the walers 2.

The form tie preferably comprises an intermediate rod 4 having threaded end portions, couplings 5 mounted on each end of the rod, and end rods 6 mounted in the couplings 5. As shown in Fig. 1, the end rods 5 are in the form of bolts of sufficient length to extend between the walers 2, form wall 1 and within the coupling 5 so that as the head of the bolt is turned the threaded end portion engages with the coupling 5 completing the tie and the head of the bolt abutting against the member 3 on the walers 2 prevents spreading of the walls of the form.

To prevent the form walls from collapsing inwardly, spacer or abutment members 7 are mounted on the rods 4 having one end against the inner face of the wall of the form and the other end against a stop or shoulder 8 of the rod 4.

In order to provide for an adjustable spacing of the walls of the form it is preferable to extend the threads at the ends of the rod 4 inwardly of the rod and mount a nut on the rod 4 adjacent each end thereof to function as a stop 8. As the spacer 7 is preferably made hollow a suitable plate or washer 9 is mounted on the rod 4 outwardly of the shoulder 8 and serves to close the inner end of the member 7. As shown in Fig. 1, the ends of the member 9 are flanged to prevent shifting of the spacer 7. The adjustment in spacing of the walls 1 is readily accomplished by suitably placing the stop 8 and locking the plate 9 against the stop with the coupling 5.

The abutment member 7 is of general cone-shape or may be described as a frustum of a hollow cone and is formed of a preferably flat strip of pliable metal wound upon itself with the ends of the strip disposed on the outer and inner walls of the cone. The spacer 7 is disposed with the small end adjacent the form wall and the

large end against the washer 9. In this position it will be observed that the spacer encloses the coupling 5 and protects it from the concrete placed between the walls of the form.

After the concrete in the form has set, the ends 6 of the tie are removed from the coupling 5 and the form removed from the wall. The coupling 5 may then be removed by the insertion of a suitable tool into the slots 10 provided for that purpose and the coupling backed off from the rod 4. By reaching within the spacer and grasping the inner free end of the strip by means of the fingers or a suitable tool, the end of the strip may be pulled outwardly, rotating it slightly if necessary, and the spacer 7 will be collapsed and thus readily removed from the wall as shown in Fig. 7 of the drawing. Thus the only parts remaining in the wall are the rod 4, nut 8 and washer 9.

The opening in the wall has its outer edges smaller in diameter than the inner edges as shown in Fig. 2 of the drawing. Obviously then, when a plug of grouting is inserted in the hole as shown in Fig. 2 of the drawing, it is not necessary to form a bond between the grouting and the concrete of the wall to retain the grouting within the opening. After the grouting has hardened it will be impossible, due to its shape, for the plug to fall out of the wall.

Referring now to Fig. 3 of the drawing wherein is shown a modification of the invention, the portion 11 of the tie rod remaining in the concrete is formed of a metal rod or bar having a hooked end portion. In this case no adjustment is provided and rods of different length are required for different spacing of the walls. The spacer 7 has its inner end closed by the washer plate 9a having openings therein through which a tie wire 12 is threaded and engaging the hook on the end of the rod 11. The tie wires 12 are then passed through the form walls and around the horizontal walers 14 where they are twisted to retain them in place as shown in Fig. 3 of the drawing. After the concrete is set, the tie wires 12 are cut, the forms removed and the spacer 7 collapsed. The ends of the tie wires 12 are then trimmed before filling the opening with grout as previously described.

In some cases, particularly on lighter wall construction, the washer or plate 9 may be formed without the flanged edge portion, the spacer 7 placed thereon and a few drops of solder suitably disposed will retain the spacer 7 in position on the plate 9 and yet not be sufficiently rigid to prevent breaking the seal formed by the solder when collapsing the spacer 7.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent is:

1. The combination in a tie and spacer for wall forms of a pair of frusto-conical spacers, the smaller ends thereof adapted to engage the opposite inner faces of a wall form, an apertured closure member for the inner end of each spacer, a rigid bar abutting the closure members, and a flexible end member secured to each end of the bar and extending through the closure apertures to engage the outer face of the adjacent form walls.

2. In a tie and spacer for wall forms, in combination, a pair of hollow frusto-conical spacers disposed with the walls thereof diverging inwardly, an apertured end closure for the inner and larger end of each spacer, a substantially rigid tie portion disposed between the spacers and extending through said apertures, an adjustable abutment on the tie rod adjacent each end closure piece, an internal threaded sleeve member disposed within each spacer and mounted upon the projecting end of the tie rod, said sleeve and abutment at each end of the tie rod embracing the adjacent end closure and a tie rod end member engaging within the said sleeve and including means for connecting with an adjacent wall form.

3. In a wall form tie and spacer, in combination, an intermediate tie rod having threaded end portions, a hollow open-ended frusto-conical spacer, formed of a flat sheet wound upon itself, mounted on each end of the tie rod, an apertured end closure member for the inner and larger end of each spacer, said closure member releasably engaging the end of the spacer, internal threaded members engaging the opposite ends of the tie rod and on opposite sides of each closure member to position same upon the tie rod, and end pieces adapted to engage the outer face of the form walls, said end pieces having threaded inner ends engaging the internal threaded member within the spacer to complete the wall tie.

4. In a tie and spacer for wall forms in combination, a pair of spacer members, each comprising a flexible sheet of suitable material wound upon itself to form a hollow open-ended frustum of a cone, an apertured member closing the larger end of each spacer member, a substantially rigid member disposed between said spacer members, abutments on said rigid member engaging said closure members and means extending through said apertures of the closure members and associated with said rigid member completing the tie.

5. In a tie and spacer for wall forms in combination, a pair of open-ended spacer members having a sloping side wall, an apertured closure for the larger end of each spacer member, and a tie member comprising a substantially rigid intermediate portion including abutments for said closure of each spacer and end portions extending through the apertures of the said closures.

6. A tie and spacer as defined in claim 5, having a spacer formed of a flexible sheet wound into frusto-conical form and secured to its closure so as to be readily detachable therefrom and collapsed from the finished wall by pulling the inner end of the sheet outwardly.

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