June 19, 1956 E. C. HALLOCK 2,750,648

TIE ROD SYSTEM FOR MOLDS FOR CONCRETE COLUMNS, WALLS, AND THE LIKE

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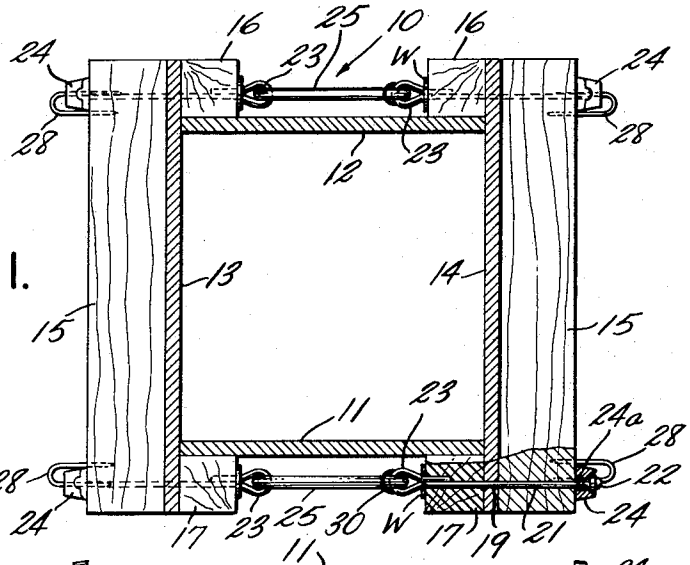


FIG. 1.

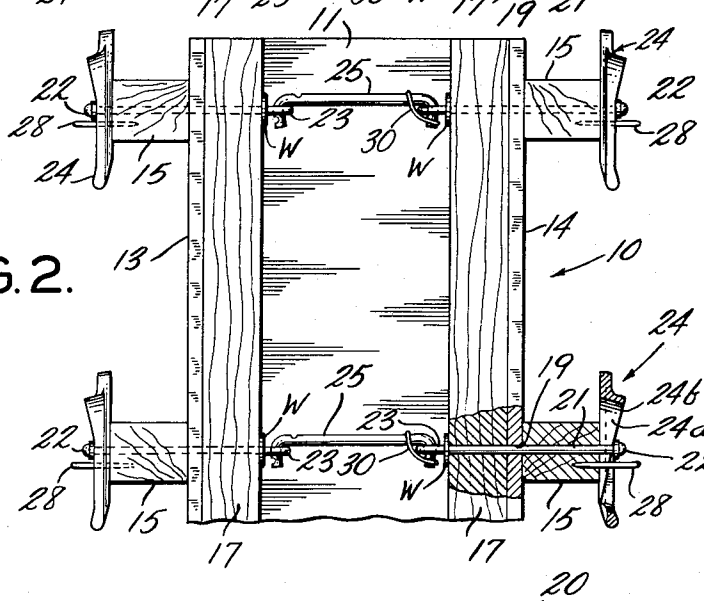


FIG. 2.

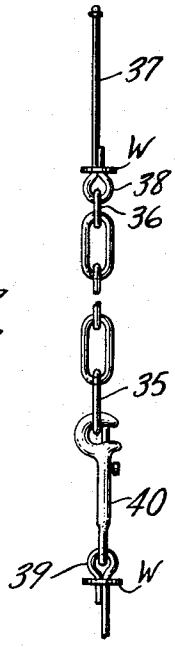


FIG. 6.

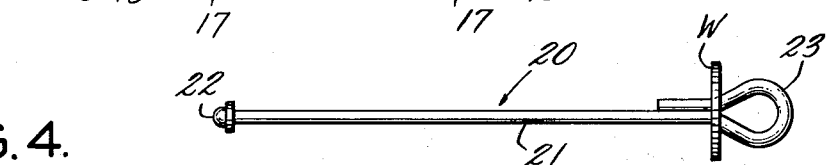


FIG. 4.

FIG. 3.

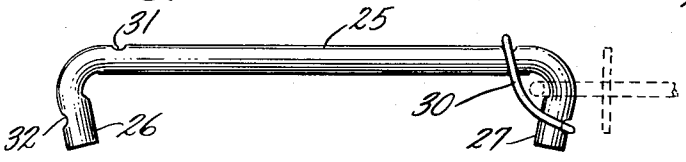




FIG. 5.

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TIE ROD SYSTEM FOR MOLDS FOR CONCRETE COLUMNS, WALLS, AND THE LIKE

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4 Claims. (Cl. 25—131)

This invention relates to the manufacture of concrete columns and the like and it relates, more particularly, to an improved form for molding concrete columns and the like and to tie members for holding the form in assembled relation.

In the pouring of concrete columns, walls, blocks and the like, it is customary to use wooden forms which may be held in assembled relation by means of nails, ties, clamps and the like. The ties usually are in the forms of rods which have threaded portions for receiving a tightening turn buckle and enlarged ends to engage the outside of the form or receive wedging elements by means of which the sections of the forms can be releasably drawn together. Some of the tie rods are provided with weakened sections to enable them to be broken to facilitate the removal of the form from the hardened concrete.

A major disadvantage of the prior tie members is that the parts are not connected in any way when the forms are taken down and, as a result, it is common to lose the wedges, tie bars, clamps and the like. In large scale operations the loss of hardware of this type may run into many thousands of dollars. Present column forming methods involve high labor costs in that insertion or removal of clamps or ties is required each time a column form is erected or stripped.

Many of the prior concrete forms are of such nature that they are dangerous to assemble and disassemble on buildings because the clamps or ties are not readily accessible from the interior sides of the forms. Such forms leave considerable to be desired.

The present invention overcomes the disadvantages of the prior concrete forms and the ties or clamps therefor by providing an easily assembled form which is held together by means of a novel tie assembly. The parts making up each tie assembly can be connected to each other and to the sections of the form so that they cannot be lost therefrom and may also be arranged so that they are readily accessible from any side of the form to enable the form to be assembled or disassembled even at the edges of high buildings without endangering the safety of the workers.

The tie assembly also has the advantage of being collapsible so that it moves back against the form sides when not erected to facilitate movement of forms or lifting them from floor to floor.

For a better understanding of the present invention, reference may be had to the accompanying drawing, in which:

Fig. 1 is an end view of a form embodying the present invention for making concrete columns;

Fig. 2 is a view in side elevation of a portion of the form;

Fig. 3 is a view in elevation of an eye-bar used in holding the form in assembled condition;

Fig. 4 is a view in elevation of a C-bar used in holding the form assembled;

Fig. 5 is a plan view of a spring clip for detachably connecting a C-bar to an eye-bar; and

Fig. 6 is a modified tie assembly utilizing a chain in the place of the C-bar.

It will be understood that forms for molding concrete may be of various sizes and shapes and that they may be used for making concrete columns, wall sections or the like. To illustrate the present invention, Figs. 1 and 2 disclose a form 10 for making concrete columns and the invention will be described with reference to such a form although it should not be considered as limited thereto. The form 10 shown in Figs. 1 and 2, includes a pair of elongated side panels or boards 11 and 12 which may be formed of plywood or the like and are of appropriate width, length and thickness. The side panels 11 and 12 engage edgewise against the faces of a pair of front and back panels 13 and 14 also formed of plywood and of somewhat greater width than the panels 11 and 12. The panels 13 and 14 are reinforced by means of a plurality of parallel wooden cleats 15 which extend across the panels 13 and 14 and are spaced apart vertically on the panels, as shown in Fig. 2. The panels 13 and 14 are also reinforced by means of the cleats 16 and 17. The cleats 16 and 17 are nailed or otherwise secured to the inner faces of the panels 13 and 14 and extend lengthwise of the panels at their outer edges. The edge portions of the side panels 11 and 12 bear against the cleats 16 and 17 and are supported by them substantially perpendicular to the panels 13 and 14. The form 10 thus is made up of the four panels 11, 12, 13 and 14, which can be separated or assembled as may be required.

To facilitate the assembly and disassembly of the form 10, I have provided a novel type of tie assembly. As best shown in Figs. 1 and 3, the front and back panels 13 and 14 may be provided with a series of holes 19 at each edge which are drilled through the longitudinal cleats 16 and 17 and the back cleats 15 to receive the eye-bars 20. Each eye-bar 20 has a rod-like shank 21 provided with an enlarged head 22 at one end and an eye or a loop 23 at its opposite end. The eye 23 may be formed by bending the end of the shank 21 and welding the free end of the rod to the shank 21. The shanks 21 of the eye-bars pass through the holes 19 in the front and back panels and are provided with washers W at their front end to prevent the eyes 23 from gouging into the cleat 16 or 17. The washer W also is used for locking the form sides 13 or 14 into a single unit when the forms are demounted. When the column form is taken down, the wedge 24 is driven up so that the washer W is tight against cleats 16 and 17. This makes for easier handling and improved form life. The washer W is loose when the form is erected and the assembly is placed in tension. The opposite end 22 of each eye-bar 20 is engaged by a malleable cast iron wedge 24 of conventional type, such as the wedge manufactured and sold by the Richmond Screw Anchor Co., Inc. These wedges have a slot 24*a* extending lengthwise thereof to receive the shank 21 of an eye-bar 20 and an inclined ramp portion 24*b* against which the head 22 of the eye-bar 20 bears. Thus, by moving the wedge 24 endwise so that the head 22 moves up along the ramp portion 24*b*, the eye-bars can be moved apart and the assembly placed in tension, as viewed in Fig. 2.

Cooperating with the eye-bars are C-bars 25, best shown in Figs. 2 and 4. The C-bars 25 are formed of steel rod or bar stock and have laterally bent, converging ends 26 and 27 which are adapted to engage in the eyes or loops 23 of the eye-bars mounted in the front and back panels 13 and 14. As shown in Fig. 2, if the wedges 24 are driven downwardly when the C-bars 25 are connected with the eye-bars 20 in the panels 13 and 14, the panels

13 and 14 will be drawn up tightly against the edges of the side panels 11 and 12 and the form will be held rigidly in assembled relation. The converging ends of the C-bars 25 hold them in engagement with the eye-bars 20.

Inasmuch as the forms described above are intended to be taken down and reassembled many times, it has been found that loss of parts can be reduced to a minimum by securing the parts of the tie assembly to the parts of the form. The wedges 24 may be secured to the cleats 15 by driving a special staple 28 through the slot in each wedge 24 and into the cleat. The staple 28 should be positioned so that the wedge 24 cannot be moved far enough to release the eye-bar 20 connected with it. Thus, the special staple acts as a wedge retainer. It is desirable also to connect each C-bar 25 to one of the eye-bars 20 to prevent loss of the C-bars. This can be accomplished by means of a figure 8-shaped spring clip 30, shown in Figs. 2 and 5. The spring clip 30 is designed so that it can be slipped over the end of a C-bar 25, the end of the C-bar is then inserted in the eye 23 of an eye-bar 20 and the free end of the clip 30 is then snapped over the free end of the arm of the C-bar so that the clip spans the eye 23 as shown in Fig. 2. In order to hold the spring clip 30 firmly on the C-bar, the ends and shank of the C-bar may be provided with notches 31 and 32 in which the loops of the clip 30 engage.

With the form in assembled relation, as shown in Figs. 1 and 2, disassembly can be accomplished very easily by driving the wedge 24 at one or both sides of the form upwardly to loosen the eye-bars 20 and thereby permit the free end of each C-bar 25 to be unhooked from its corresponding eye 23. When all of the C-bars have been unhooked, the sides of the form may be separated and may be transported to another place for reassembly. Reassembly is accomplished by reversing the operation, that is, by placing the sides of the form in the proper relation, hooking the free ends of the C-bars 25 in the eyes 23 of the corresponding eye-bars 20 and then driving the wedges 24 downwardly to draw the front and back sides of the form together.

Inasmuch as the wedges 24 are permanently connected with the form by the staples or wedge retainers, and the C-bars 25 are connected to corresponding eye-bars 20 by the clip 30, none of the parts are lost and very substantial savings are achieved because of this fact. Moreover, inasmuch as all of the parts are attached to the forms and only require hooking together, the assembly of the form is greatly facilitated.

A chain 35 formed of butt-welded links may be used instead of the C-bar 25 for connecting the sides of the form, as shown in Fig. 6. The link 36 at one end of the chain may be permanently joined with the eye 38 of one eye-bar 37. The cooperative eye-bar 39 has a heavy snap latch or hook 40 thereon to engage any of the links of the chain 35 which is attached to the other side of the form. The chain 35 and hook 40 serve the same purpose as the C-bar and are, of course, attached to the form and cannot be lost readily. Moreover, the hook and chain connection is adjustable as to length because the hook can engage any of the links along the length of the chain.

It will be understood that the forms may be made in various sizes and cross-sectional shapes, as may be required, and that the C-bars or connecting chains, for example, may be made in a number of different lengths, depending upon the width of the form which they are required to span.

The strength of the C-bars, the chains and the eye-bars, that is, the thickness of the material and the strength of the materials from which they are made, may be varied according to the requirements.

Accordingly, the form of the invention described herein should be considered as illustrative and not as limiting the scope of the following claims.

I claim:

1. A connecting assembly for concrete forms and the like comprising at least one eye-bar member having an elongated shank, a loop-like eye at one end and an enlarged head at the other, a link having a rod-like body and laterally bent ends, one of said ends engaging in the eye of one eye-bar member and the other end being adapted to engage an eye of another eye-bar member, and a spring clip detachably engaging said body and one end of said link and spanning the eye of an eye-bar to retain said link on said eye-bar.

2. The connecting assembly set forth in claim 1 in which said spring clip is substantially 8-shaped and has loops to engage around the body and one end of said link and extend diagonally between said one end and said body.

3. A demountable form for forming concrete columns and the like, comprising separate front and back panels, side panels interposed between said front and back panels and forming therewith a hollow box-like form, eye-bar members extending through the front and back panels adjacent opposite edges thereof and each having an eye on its inner end, an elongated rod-like body and an enlarged head at its outer end, links having laterally bent ends engaging in the eyes of opposed eye-bar members and connecting them to hold said front and back panels against the edges of said side panels, removable clips mounted on at least one end of each link and detachably securing it to one of said eye-bar members, wedge members engaging the outer ends of said eye-bar members and slidable endwise to pull the eye-bar members endwise and press said front and back panels against the edges of said side panels, and means detachably and slidably securing said wedge members to said front and back panels.

4. The form set forth in claim 3, in which each clip is substantially figure 8-shaped and has loops extending around the body of the eye-bar member and one laterally bent end thereof, said clip extending diagonally between said one end and said body to span a portion of the eye of said eye-bar member.

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