March 17, 1942. J. L. BOETTNER 2,276,458

WALL SPACER FOR CONCRETE FORMS

Filed May 31, 1940

Fig. 1

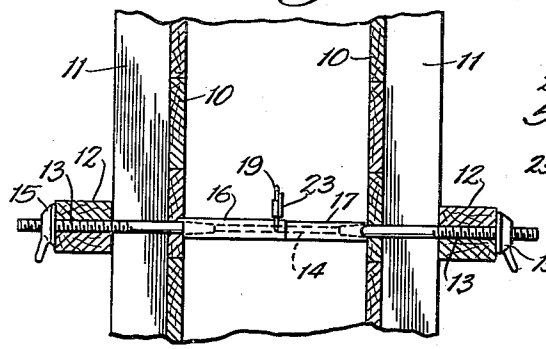


Fig. 4

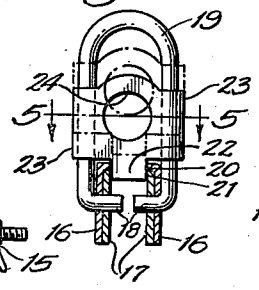


Fig. 5

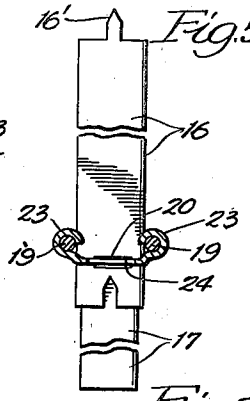


Fig. 2

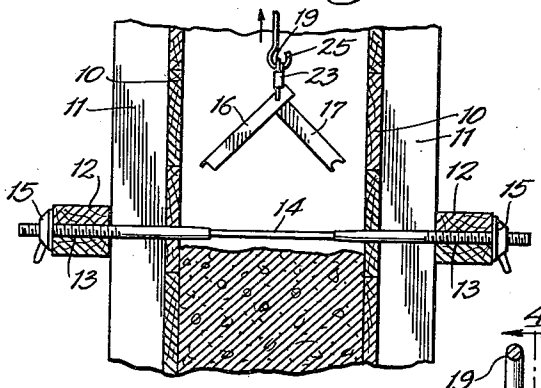


Fig. 7

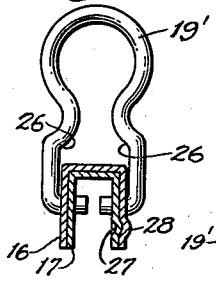


Fig. 8

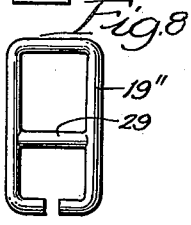


Fig. 6

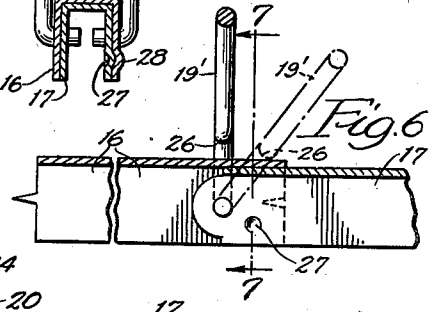


Fig. 3

Fig. 9

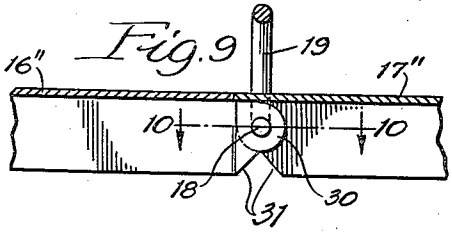
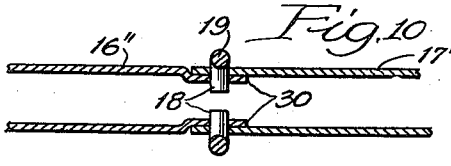


Fig. 10



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2,276,458

WALL SPACER FOR CONCRETE FORMS

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Application May 31, 1940, Serial No. 338,024

6 Claims. (Cl. 248—351)

This invention pertains to the art of concrete forms, and has reference more particularly to a class of devices known in the trade as "spreaders," which are employed, usually in association with tie rod devices, for maintaining the side walls of the form in true relative position or spacing during the pouring of the concrete. The tie rods bond the forms against spreading, and the spacers oppose inward movement of the forms toward each other. In some cases, the spacers are structurally combined with the tie rods, so that the combined structure performs both functions. Such combined tie rods and spacers are, however, somewhat complicated and expensive, and when the form is taken down a considerable part of the combined structure is necessarily left embedded in the concrete.

An important object of the present invention has been to provide a collapsible form spacer that can be wholly removed while the concrete is being placed and later reused, thus avoiding considerable waste of material. Another object has been to provide an improved form spacer which will maintain the forms in proper spaced positions as the wall is built up, and which will require a lesser number of spacers for the erection of a wall than has heretofore been necessary.

Still other objects and attendant advantages of the invention will be apparent to persons skilled in the art from the following detailed description of practical embodiments of the invention shown in the accompanying drawing, in which—

Fig. 1 is a vertical section through a fragment of a form, showing in elevation one of my improved spacers in operative position in which it is preferably associated with a tie rod structure.

Fig. 2 is a view similar to Fig. 1, but showing the spacer collapsed and raised preliminary to its removal from the form.

Fig. 3 is a longitudinal vertical section, on an enlarged scale, of the spacer in fully expanded position and its lifting bail and lock.

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

Fig. 5 is a horizontal section looking downwardly on the line 5—5 of Fig. 4.

Fig. 6 is a view similar to Fig. 3, but showing a modified form of bail and also means for frictionally maintaining the spacer in expanded position.

Fig. 7 is a vertical section taken on the line 7—7 of Fig. 6.

Fig. 8 is an elevation of another form of bail that may be used.

Fig. 9 is a fragmentary longitudinal section, similar to Fig. 3, showing a modified structure of spacer employing a pair of channel bar struts of equal sizes.

Fig. 10 is a horizontal section taken on the line 10—10 of Fig. 9.

Referring to the form of the invention illustrated in Figs. 1 to 5 inclusive, 10 designates the usual plank walls of the form that are flanked externally by the customary risers 11 and wales 12. The side walls of the form are bonded against spreading by tie rod structures, each of which, in the instance shown, comprises a pair of stud rods 13 extending through the wales 12 between adjacent risers 11 and through the walls 10 and formed on their inner ends with internally threaded sockets which receive the threaded ends of an intermediate tie rod 14. The outer portions of the stud rods 13 are threaded to receive nuts 15 that are turned up against the outer sides of the wales 12 to put the tie rod structure under tension. This is an old and known tie rod structure, and no claim thereto is made herein.

Describing now the preferred form of the spacer or spreader forming the subject-matter of this invention, 16 and 17 designate a pair of struts, preferably of channel bar form, the strut 17 being sufficiently narrower than the strut 16 to permit one end thereof to be entered a short distance into the adjacent end of the other. Registering holes are formed in the lapped ends of the struts to receive a pivot; and this pivot may conveniently consist of the inwardly bent lower ends 18 (Fig. 4) of the side limbs of a wire bail 19. In the transverse limbs of the channel bars 16 and 17 are formed holes 20 and 21 (Fig. 3) which, when the strut members 16 and 17 are both horizontal, register with each other and receive a locking tongue 22 formed on the lower end of a slide 23 mounted on the bail 19. The slide 23 has a central hole 24 adapted to be engaged by a depending hook 25 (Fig. 2), which hook, as it rises, first lifts the slide and retracts the lock 22, and then, through engagement with the bail 19, raises the spacer from its expanded position shown in Fig. 1 to a collapsed or idle position shown in Fig. 2, preliminary to the application of the spacer at a point higher up in the form.

The two limbs 16 and 17 of the spacer are formed on their free ends with prongs such as 16' and 17' which engage with, and bite into the

form walls 10 when the spacer is expanded to working position, as shown in Fig. 1.

Since the main function of the spacer is to oppose undue narrowing of the form by excessive tightening of the tie rods, the spacer is preferably but not necessarily closely associated with the tie rod, although it may be more or less spaced from the latter. Where the struts 16 and 17 are of channel beam structure, as shown, the spacer, when in working position, can overlie and straddle the tie rod 14, as shown in Fig. 1, in which position it most effectively prevents undue drawing together of the side walls of the form when tensioning the tie rods.

In Figs. 6 and 7 I show a slightly modified form of bail 19', the side limbs of which are bowed inwardly to form shoulders 26 that, through contact with the upper corners of the struts 16 or 17, when the hook 25 is released from the bail, limit the down swing of the latter to the inclined position shown by dotted lines in Fig. 6, so that the bail is readily picked up by the hook 25 when the spacer is to be collapsed and raised. In Figs. 6 and 7 I have also illustrated another form of lock for securing the struts 16 and 17 in fully expanded position; this locking means taking the form of a lateral protuberance 27 in a side wall of the inner strut 17 that, in the fully expanded position of the struts, interfits with a correspondingly shaped depression 28 in the corresponding side wall of the outer strut member 16, thus frictionally locking the two struts in fully expanded position, but permitting collapse when the spacer is raised as shown in Fig. 2.

Fig. 8 shows a further modification 19'' of the bail wherein the two side limbs are connected by a cross bar 29, which is welded or otherwise applied after the bail has been engaged with the struts.

Figs. 9 and 10 illustrate a slight modification of the spacer structure, wherein the strut members 16'' and 17'' consist of channel bars of equal widths; and the overlap of their adjacent pivoted ends is obtained by inwardly offsetting the end portions 30 of the side limbs of one bar, such as 16'', and inserting them into the end of the other bar 17''. This construction presents a small economy in the cost of manufacture, since both strut members can be cut from a single length of channel bar. To permit the collapsing of the strut members, the lower corners of the overlapping sides of the channels 16'' and 17'' are cut away as shown at 31 in Fig. 9.

Fig. 2 shows the concrete built up in the form to approximately the height of the tie rod 14. At this point the hook 25 is then lowered to engage the bail and then raise to elevate the collapsed spacer. The hook 25 is then disengaged, and the spacer is raised in a new position. As shown in Fig. 1 this operation is repeated as fast as the wall builds up. By this construction the spacer is not left embedded in the wall, but may be reused indefinitely for the erection of succeeding walls; this obviously effecting a very substantial reduction in the cost of the form equipment.

Variations in the details of structure and arrangement of parts may be made within the purview and scope of the invention as defined in the appended claims.

I claim:

1. A form wall spacer comprising a pair of struts disposed in endwise alinment with their adjacent ends connected by a pivot joint, the combined lengths of said connected struts equalling the internal width of the form, a bail connected to said pivot joint for raising and collapsing said spacer, and an automatic lock for securing the two struts in fully expanded position against collapse on either side of the pivot joint.

2. An embodiment of the subject-matter defined in claim 1, wherein the automatic lock includes a member slidably mounted on the bail and operative to automatically lock the two struts against any pivotal movement when they have reached fully expanded position.

4. A form wall spacer comprising a pair of struts disposed in endwise alinement with their adjacent ends overlapped, a pivot connecting said overlapped ends, the combined lengths of said connected struts equalling the internal width of the form, and said overlapped ends having holes registering with each other in the fully expanded position of said struts, a bail connected to said pivot for raising and collapsing said spacer, a hook for liftingly engaging said bail, and a slide mounted on said bail formed with a tongue on its lower end adapted to enter said holes and thereby lock said struts in fully expanded position.

5. An embodiment of the subject-matter defined in claim 4, wherein the slide is formed with a hole adapted to be engaged by the hook to unlock said struts prior to the lifting of the bail by the hook.

6. An embodiment of the subject-matter defined in claim 4, wherein the struts consist of inverted channel bars, and the registering holes in the overlapped ends are formed in the transverse limbs of said channel bars.

JOSEPH L. BOETTNER.

CERTIFICATE OF CORRECTION.

Patent No. 2,276,458. March 17, 1942.

JOSEPH L. BOETTNER.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, second column, line 2, for "raise" read --raised--; line 17, claim 1, for "alinment" read --alinement--; line 30, after the word and period "position." insert the following as claim 3 -

> 3. An embodiment of the subject-matter defined in claim 1, wherein the struts consist of inverted channel bars of equal width, and the sides of the lapping end of one bar are inwardly offset to enter the adjacent end of the other bar.

and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 12th day of May, A. D. 1942.

Henry Van Arsdale,
Acting Commissioner of Patents.

(Seal)