United States Patent [19]

Verhey

[11] **3,792,831**

[45] **Feb. 19, 1974**

[54] **SCAFFOLD-WALER BRACKET**

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[22] Filed: **May 4, 1972**

[21] Appl. No.: **250,308**

[52] **U.S. Cl.** ..... **249/219 W**
[51] **Int. Cl.** **E04g 17/14**
[58] **Field of Search** .....249/219 W; 425/213; 248/205 R

[56] **References Cited**

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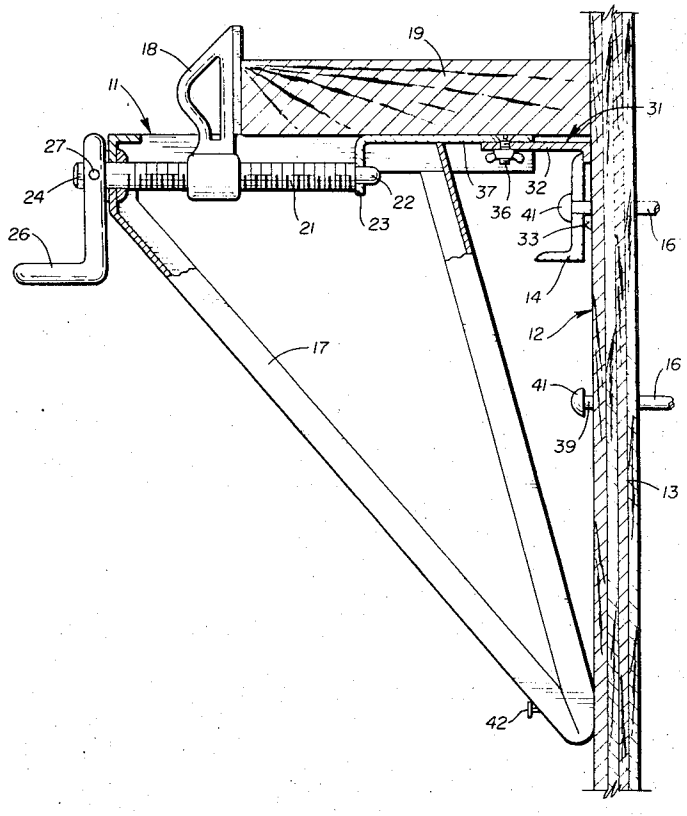
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Primary Examiner—Robert D. Baldwin
Attorney, Agent, or Firm—C. B. Messenger

[57] **ABSTRACT**

A bracket for use with concrete forming systems to support work scaffolding or form aligning and strengthening walers. A support frame having a lower end for contact with form elements extends upwardly and outwardly to provide clearance for form reinforcing bars and to provide support for a movable clamping element. An attachment is provided for engaging the reinforcing bars, form tie elements or a first waler of the form system to hold the support frame as adjustment of the clamping element moves the scaffold staging pieces horizontally into secure engagement with the forms thereby additionally providing a reinforcing and aligning waler. A screw may be used for powering movement of the clamping element.

5 Claims, 10 Drawing Figures



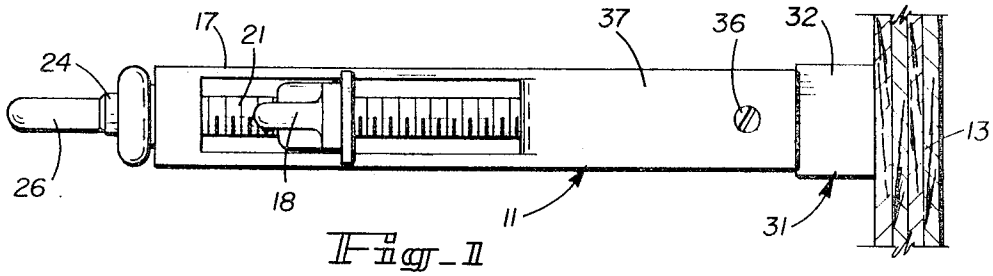


Fig_1

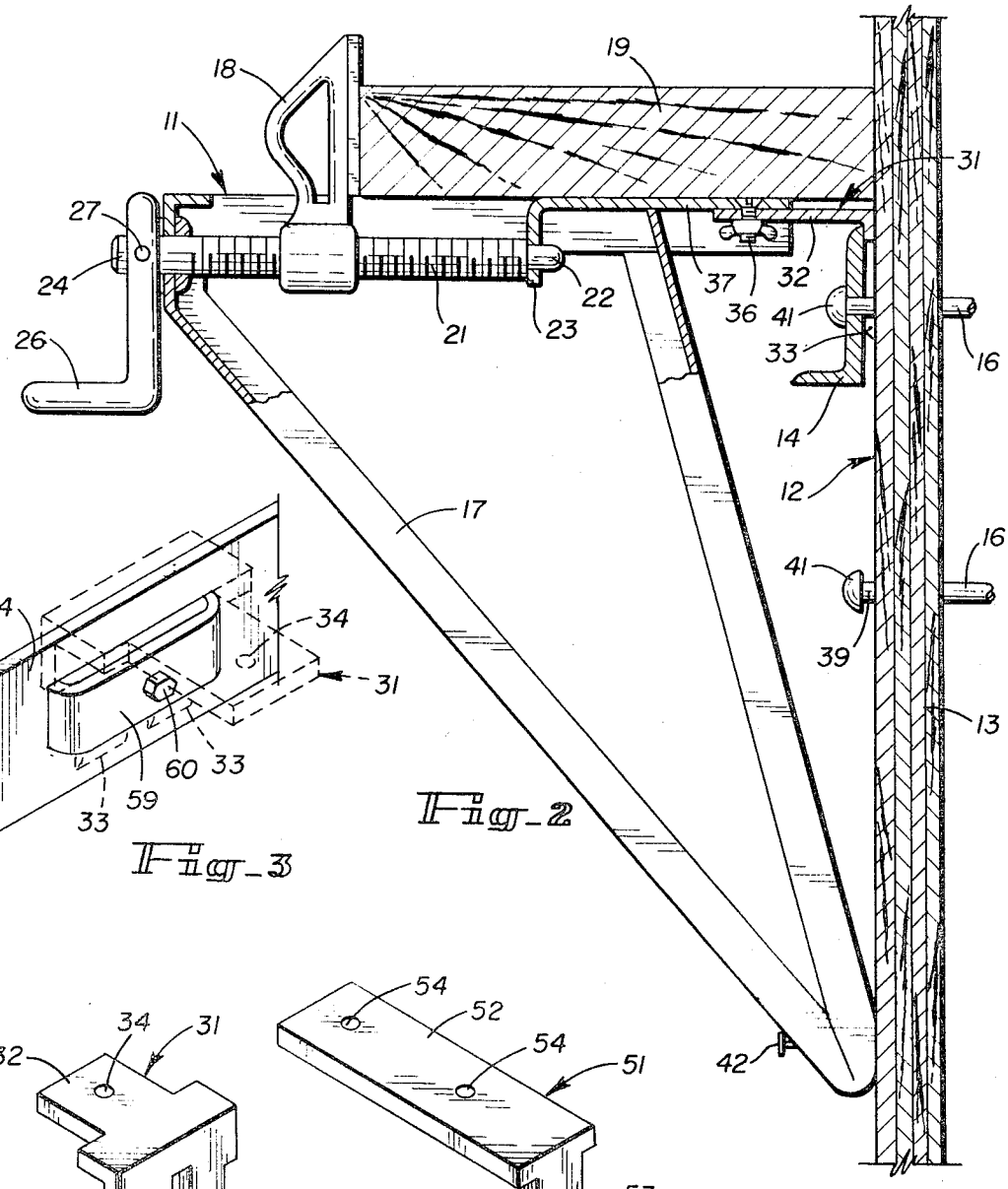


Fig_2

Fig_3

Fig_4

Fig_5

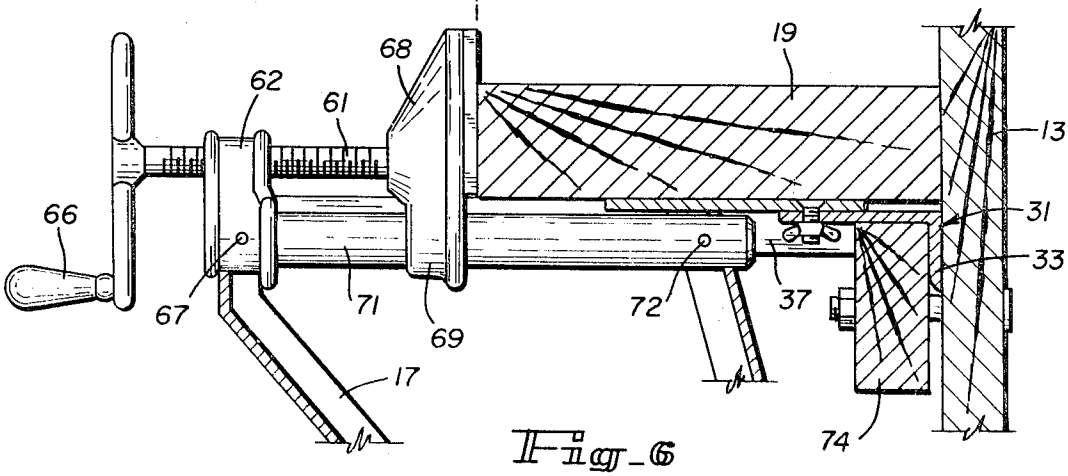


Fig_6

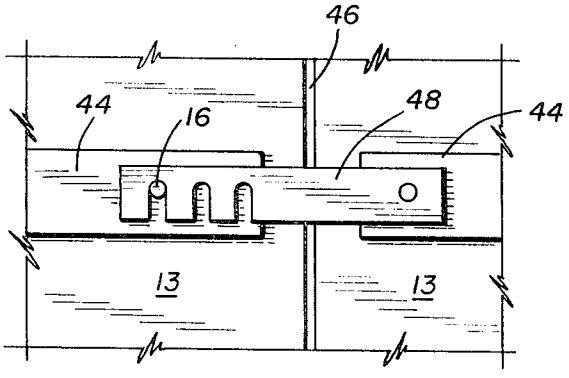


Fig_7

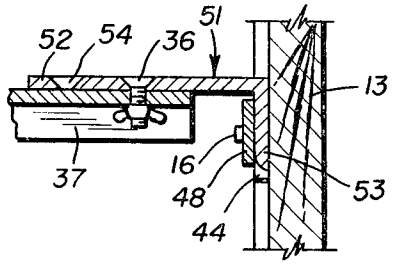


Fig_8

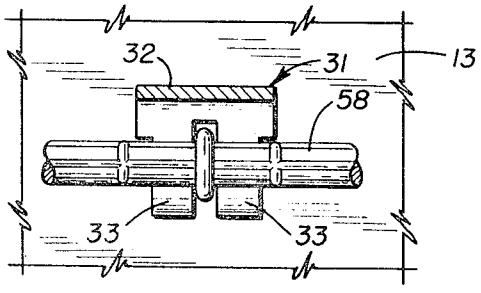


Fig_9

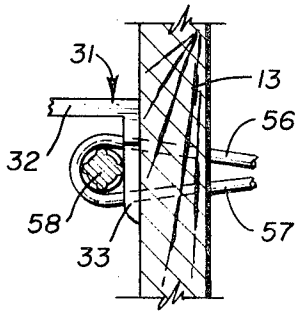


Fig_10

SCAFFOLD-WALER BRACKET

BACKGROUND OF THE INVENTION

In connection with the pouring of concrete walls and similar structures, many different panel type forms are now being used. The present systems usually provide a panel form element that may be of plywood and that may or may not be reinforced at its edges. Form ties of wire or rod are extended between opposed form boards or panels to hold the forms in desired position. Many form systems provide locking bars that are disposed horizontally on the form panels for interengagement one with the other to provide at least preliminary alignment of the forms as they are being erected. In order to assure accurate wall alignment, it is desirable in many instances to provide a continuous horizontally disposed waler on at least one of the opposed form walls. Further, since the walls may be of considerable height, it is often desirable to provide staging components so that workmen may more conveniently introduce concrete into the upwardly opening void. An object of the present invention is to satisfy both the staging and alignment waler requirements of form systems through provision of a support bracket that may be engaged with the present panel forms or the form ties used therewith.

SUMMARY OF THE INVENTION

In keeping with the stated objective, the present invention provides a support bracket for engagement with existing types of panel forms or at least with the form ties used in connection therewith. A support frame extends outwardly from the form panels to provide support for a clamping element that may be adjustably positioned. The frame or elements attached thereto is engaged directly with the reinforcing bars, walers or form ties used in different forming systems. Mechanical advantage means on the frame are then used to move a clamping element against scaffold staging components that may be of dimension lumber materials thereby moving the staging components into secure engagement with the panel forms. A working scaffold is thus provided, but the panel forms are at the same time brought into alignment with the scaffold staging components. The staging components, accordingly, become reinforcing and aligning walers for the form system.

Separate attachments are provided to adapt a standard type of bracket for use with various existing forming systems. Accordingly, the combined scaffold and waler advantages of the present invention may be utilized with most all of the extensively used forming systems now in existence.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a top plan view of the first embodiment of the invention,

FIG. 2 is a side elevation of the embodiment shown in FIG. 1,

FIG. 3 is a perspective illustration showing a receptacle or pocket adapted to receive an attachment for said bracket,

FIG. 4 is a perspective view showing a first attachment clip of a type suited for use with the type of receptacle shown in FIG. 3,

FIG. 5 shows a further type of attachment clip,

FIG. 6 is a partial side elevation showing an alternate embodiment of the invention,

FIG. 7 is a front elevation illustrating a form lock for one type of form panels,

FIG. 8 is a side elevation showing an attachment clip engaged to the form lock of FIG. 7,

FIG. 9 is a front elevation showing engagement of a forked type of attachment clip on a panel form system using wire ties, and

FIG. 10 is a side elevation of the embodiment illustrated in FIG. 9 showing an attachment clip engaged behind a longitudinally extending reinforcing bar as used in connection with the form system of FIG. 9.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Preferred embodiments of the invention are shown in the accompanying drawings. In a first embodiment as shown in FIGS. 1 and 2, a scaffold-waler bracket 11 is shown engaged to elements of panel type concrete forms 12. The panel forms illustrated provide form boards 13 for disposition in upright side-by-side arrangement. With this type of form a plurality of waler bars 14 are generally positioned at spaced horizontal intervals to course longitudinally along the face of the form boards 13. Usually the walers or bars, such as the element 14, or similar members are interrupted at the edges of each separate form board and a locking device is then provided for holding adjacent form panels together. The locking devices either serve simply to hold the form boards in adjacent position, or alternately the form locks can additionally engage form tie elements 16 that extend from a first set of forms through the void space that is to be filled with concrete and thence through the opposed form boards of an opposed set of forms.

In different forming systems twisted type wire ties, taper ties, or threaded ties and she bolts may be used. For most forming systems the longitudinal support provided by the segmented or interrupted waler elements 14 is inadequate to assure proper alignment of the forms as necessary to attain a straight concrete wall. For this reason others have previously provided different systems for attaching supplementary walers to the forms after they have been erected and before a wall is to be poured. Satisfactory walers are often provided through use of dimension lumber materials or through use of auxiliary metal channel or angle sections. Where it is necessary to provide even additional support, strongback elements are disposed vertically to interconnect a plurality of walers.

Many walls that are to be poured through use of present types of panel form systems may be eight to ten feet high. Under such circumstances it has often been necessary for the contractors to erect scaffolding along the forms so that concrete can be moved into place for completion of the wall and to facilitate forming, finishing or other similar operations. Accordingly, many panel form systems now provide scaffold brackets that may be attached to the forms for the support of elevated staging. An objective of the present invention is to provide a support and attaching system of suitable durability and utility to efficiently satisfy both the waler support and scaffold requirements of forming operations. In keeping with such objective, the present inventor provides a scaffold-waler bracket of the type shown herein.

In the first embodiment of the invention shown in FIGS. 1 and 2, the scaffold-waler bracket 11 has a support frame 17 made preferably of channel section to support the movable clamp element 18 that is to be brought into engagement with a timber piece 19 (or a plurality of such pieces) disposed in side-by-side relationship. The clamp 18 is moved by mechanical advantage means that is in this preferred embodiment of the invention a lead screw 21. Lead screw 21 has an inner end 22 that pivots in a receptacle 23 provided by the frame 17, while an outer end 24 is rotated by an operator handle 26 that may be joined to the lead screw 21 by a through pin 27 or other similar attaching device. Obviously, as the handle is rotated the clamp element 18 will be moved toward or away from engagement with the timber piece 19. In use the entire scaffold-waler bracket 11 is engaged to secure elements of the forming system. Usually the particular form ties being used will be strong elements of the total forming system. Accordingly, it is desirable to attach the bracket in some way to such ties or at least to a form element that is directly supported by the ties.

In order to adapt the present bracket for use with the various types of form ties or forming system, the present invention provides a bracket construction that is adapted to receive various adaptor attachments. The adapter attachment 31 used for the installation shown in FIGS. 1 and 2 is similar to that shown in FIG. 4. This attachment has a bar segment 32 and bifurcated tines 33. Bar segment 32 provides an opening 34 so that an attaching bolt 36 may be passed there-through and through a similar opening provided in an extension component 37 of the frame 17. The depending tines 33 can then be positioned behind the angle waler 14 as shown with the tines 33 preferably straddling a through tie 16. Alternately the space 38 between adjacent tines 33 can provide a receptacle for the shaft 39 of a tie 16 while the button head 41 thereof is prevented from passage through such opening. With this alternate arrangement wherein the forked attachment 31 is engaged directly about the button 41 of a rod type tie 16, the bracket 11 can be positioned at any elevation on the form system. Its positioning is not then dependent upon the predetermined positioning of the longitudinal reinforcing bars or walers provided by the form system.

Once the bracket 11 is attached to the form system through use of any of the various attachments that might be provided, the operator handle 26 is rotated to bring the clamp 18 into secure engagement against the outer edge of a timber piece 19. An inner edge of the timber will at the same time be moved into contact with the form boards 13 or with other elements of the form system. When a plurality of scaffold-waler brackets are used in spaced positions along the length of the wall, the engagement of all such bracket clamps 18 will bring the wall into alignment with the timber pieces. The timber pieces 19, accordingly, become form supporting walers that add considerable strength to the form system while assuring the better alignment thereof. In addition to providing an aligning waler, the timber pieces 19 are used as a staging or scaffold upon which workmen can walk when the wall is being poured or during operations in preparation therefor. Since the alignment of a single wall of the form system will usually be adequate to assure adequate alignment of the entire wall, a relative limited number of scaffold-waler brackets will be required to assure correct installation of the wall.

For convenience of useage and in order to provide satisfactory on-the-job utility, the brackets 11 should be capable of receiving timber pieces 19 that may be of up to 12-inch dimension. Similarly the brackets should be adaptable for use with waler components of 4, 6, 8 or 10 inch dimension. To accommodate such a wide range of sizes the tongue or bar segment components of the attachments used may be of extended or shortened length. The adaptor attachment 51 shown in FIG. 5 has a tongue 52 of extended length providing a plurality of openings 54 along the length thereof. This type of attachment may be positioned above the extension component 37 of the frame 17 as illustrated in FIG. 8 to facilitate the adjustable positioning thereof. In order to prevent lateral or longitudinal swinging movement of the bracket frame 17, holes (not shown) may be provided through the lower extremity thereof for the reception of a nail 42 that can be selectively driven into the form boards 13. Usually such nail support will not be required, since adequate security is provided by the engaged adapter attachments being used with the scaffold-waler brackets.

Drawings illustrating the use of other adapter attachments are shown in FIGS. 7–10. In FIGS. 7 and 8 the attachment 51 of FIG. 4 is used. This attachment is provided for forming systems where the waler bars 44 of the form system are interrupted at positions adjacent the edges 46 of the form boards 13. This arrangement leaves a gap between the ends of adjacent waler bars 44 and a resulting space behind the form lock 48 when it is in the engaged position about through tie 16. For this type of installation the prong 53 of attachment 51 may be positioned behind the form lock 48. Forces exerted by the prong 53 are transmitted by the form lock 48 to the adjacent waler bars 44 and the through tie 16.

The adapter attachment 31 shown in FIG. 4 may be used in connection with use of the present scaffold-waler brackets on forming systems that use wire ties. For these systems, as shown in FIGS. 9 and 10, a loop 57 of a wire tie 56 extends about a reinforcing bar 58. The forked tines 33 are placed in straddle position over the loop 57 of the tie and behind the reinforcing bar 58 to provide a secure engagement for the scaffold bracket.

This same type of attachment 31 can also be used in connection with a separate forming system where a punched out pocket 59 is provided in the surface of a waler bar 44 as shown in FIG. 3. The pocket 59 has a bolt 60 disposed through the center thereof, and the tines 33 are engaged in the pocket and about the through bolt 60 to provide a secure and strong attachment for the scaffold bracket.

An alternate arrangement for the lead screw and clamp components is shown in FIG. 6. In this embodiment of the invention the lead screw 61 is in inverted position, and it extends through a threaded anchor 62 to engage the moving clamp 68. The lower end 69 of the moving clamp 68 has an opening therethrough for engagement about a guide component 71 so that the clamp will move reciprocally therealong when the screw 61 is rotated by operation of the handle 66. For this embodiment of the invention the same type of frame support and frame extension may be provided. The threaded anchor 62 and the guide component 71 may be attached to the frame by through pins 67 and

72. As in the previous embodiment, frame extension 37 is adapted to receive the separate types of adapter attachments 31, 51, or other. As an alternate arrangement, such adapter attachments could be joined directly to the guide component 71.

For the illustrated embodiment shown in FIG. 6 where a first form waler 74 is provided by a wood piece, the tines 33 of attachment 31 or the prong 53 of attachment 51 could be extended into engaged position behind the waler 74 to provide the desired support for the bracket unit. The operation and utility of this modified bracket unit is similar to that previously described. When used with other typical panel form systems, the tines 33 of the attachment 31 may be engaged directly behind the buttonhead 41 of a rod type tie 16, or the space 38 between adjacent tines 33 can be of a correct size to engage a notched segment in a tie of otherwise constant cross-section.

For all embodiments of the invention it is desirable that the clamp elements 18 or 68 be of sufficient height to engage at least two scaffolding or timber pieces 19 when such pieces are in stacked arrangement one above the other. This lapped configuration makes it possible to use lumber that is of standard length to make up a continuous waler reinforcement. It is unnecessary to cut any lumber when the bracket provides for overlapping engagement. Where the lapping is extended for at least the width between two brackets, the alignment of the waler and, accordingly, the straightness of the poured wall is assured.

I claim:

1. A scaffold-waler support bracket for use with staging elements and/or walers in connection with concrete wall forming systems utilizing panel form components held in place by form ties comprising a support frame for said bracket positioned adjacent a form tie and having a leg extending downwardly therefrom for engagement with elements of the form system, a clamp element supported by said frame for adjusting movement toward and away from the panels of said form system, a staging support element on said bracket in position intermediate said clamp element and elements of said form system whereby adjusting movements of said clamp element may exert lateral pressure against staging elements disposed on said staging support for holding said staging elements in operative personnel support positions against said forms whereby the staging is further operative as a waler for the alignment and support of said forms, thread means operative thereof, a bearing support in combination with said thread means and operative therewith for moving said clamp element to adjusted positions, and alternate attachment means for selective use with said support bracket combination, said attachment means having a prong disposed in angular position with respect to the plane of said staging support for engagement with elements of said form system to hold said bracket in elevated position on said forms and for resisting forces exerted by said clamp element.

2. The scaffold-waler support bracket as set forth in claim 1 wherein said attachment means provides bifurcated tines for engagement with form system components.

3. The scaffold-waler support bracket as set forth in claim 1 and further comprising adjustment means for cooperative use with said attachment means whereby the attachment means may be moved to multiple positions of use.

4. The scaffold-waler support bracket as set forth in claim 1 wherein said clamp element is threaded for engagement with said thread means.

5. The scaffold-waler support bracket as set forth in claim 1 wherein the bearing support for said thread means is an anchor element providing internal threads for engagement with said thread means to power movement of said clamp.

* * * * *

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,792,831 Dated Feb. 19, 1974

Inventor(s) Myron B. Verhey

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

In the claims:

Claim 1, column 6, line 10, after "operative" insert

-- with said clamp element for the powered adjusting movement -- .

Signed and sealed this 2nd day of July 1974.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents

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USCOMM-DC 60376-P69
* U.S. GOVERNMENT PRINTING OFFICE : 1969 O—366-334