

April 4, 1961

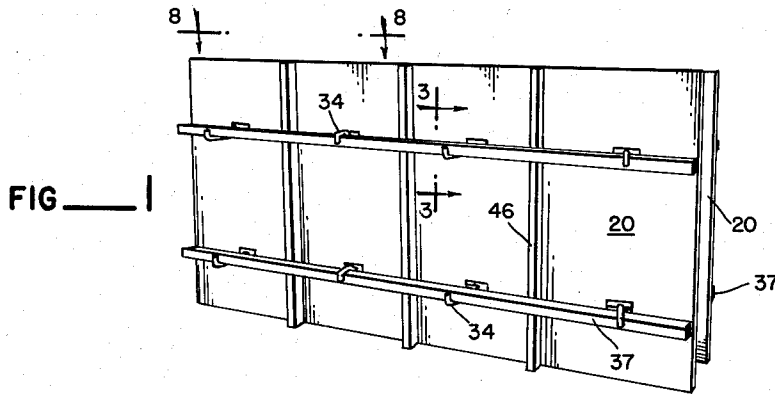
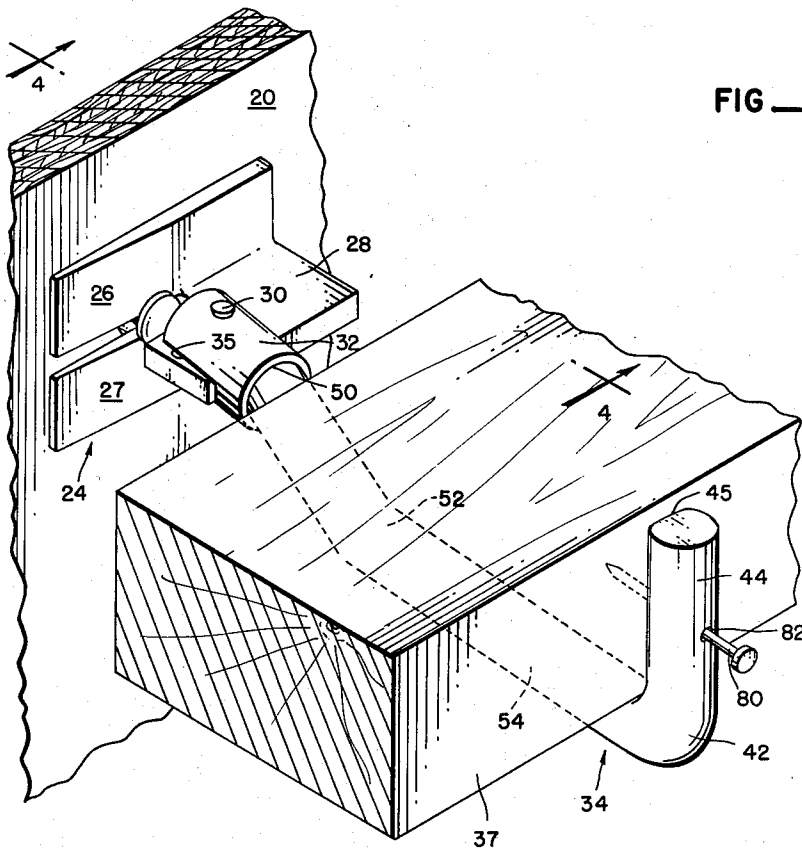
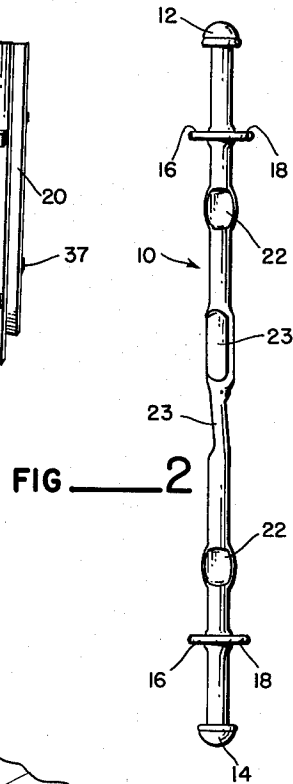
F. M. BUXTON

2,977,659

MEANS FOR SECURING CONCRETE WALL FORMS IN POSITION

Filed Sept. 16, 1958

3 Sheets-Sheet 1



FRANK M. BUXTON
INVENTOR.

BY
Smith & Tuck

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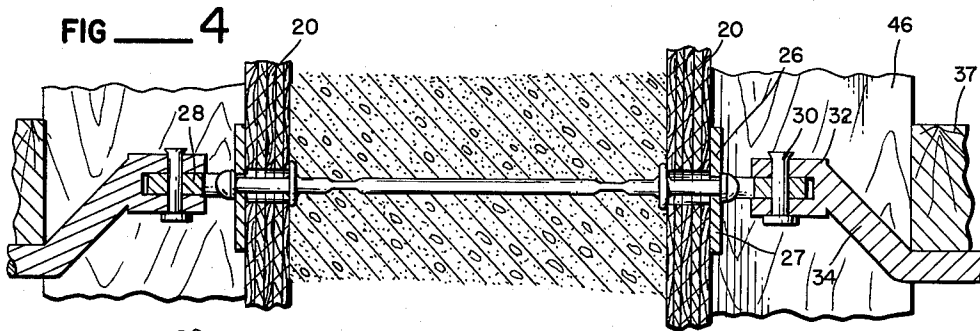
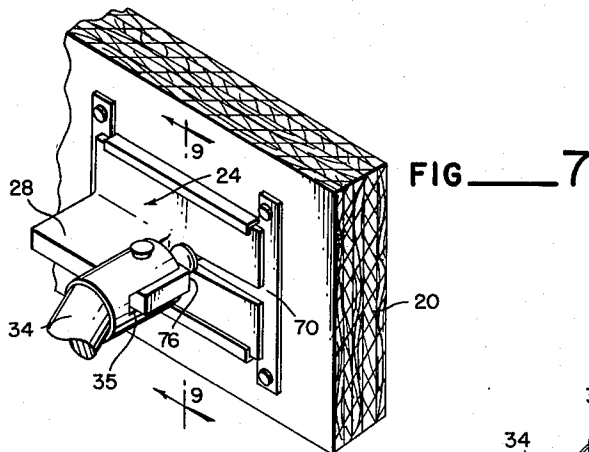
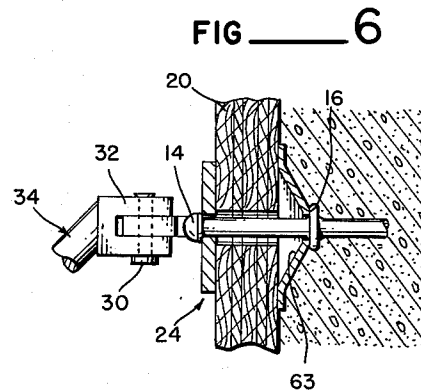
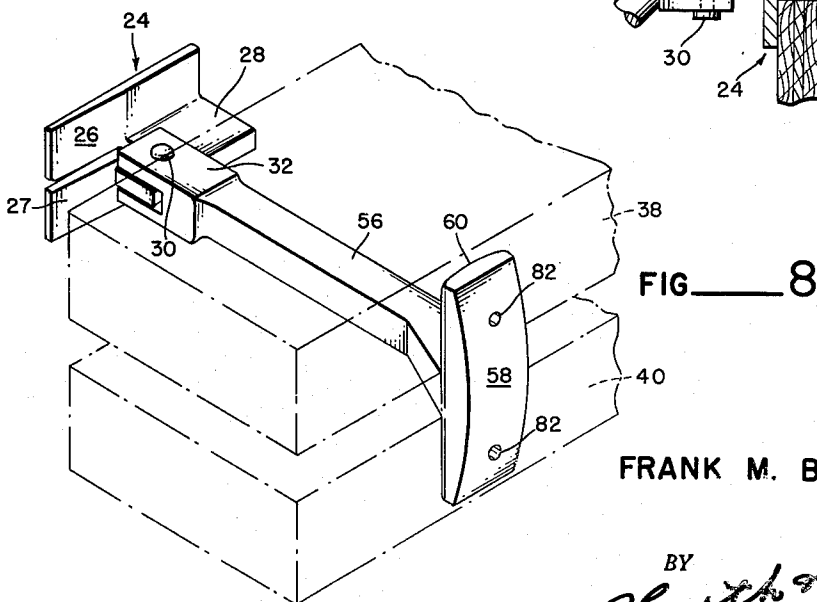
F. M. BUXTON

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MEANS FOR SECURING CONCRETE WALL FORMS IN POSITION

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3 Sheets-Sheet 2



FRANK M. BUXTON
INVENTOR.

BY
Smith & Tuck

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F. M. BUXTON

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3 Sheets-Sheet 3

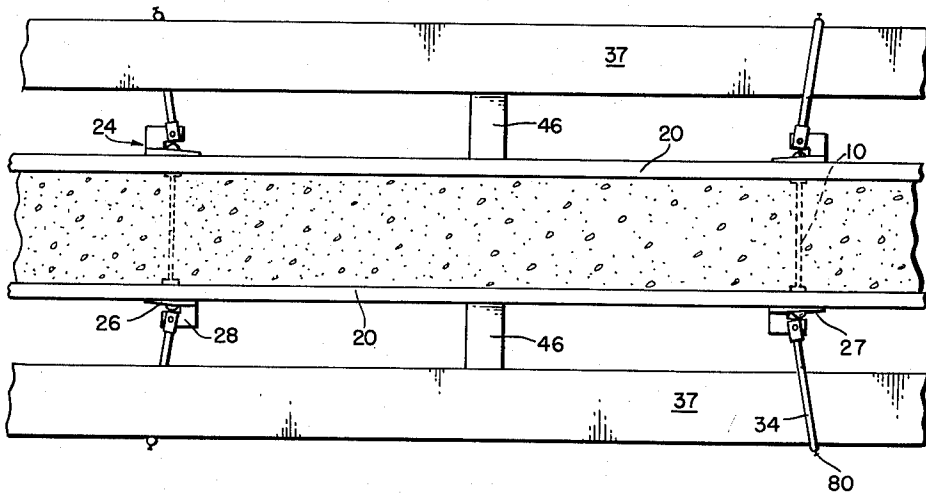


FIG 5

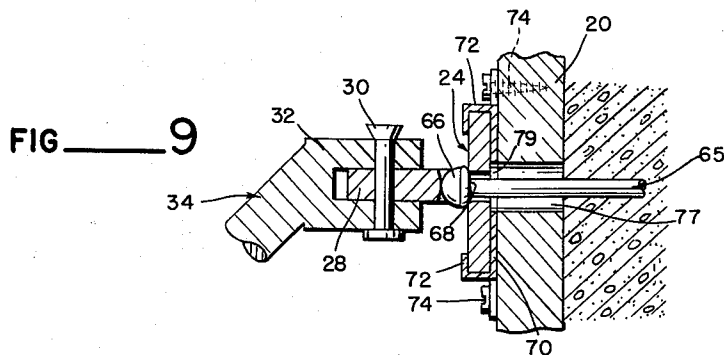


FIG 9

FRANK M. BUXTON
INVENTOR.

BY
Smith & Tuck

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2,977,659

MEANS FOR SECURING CONCRETE WALL FORMS IN POSITION

Frank M. Buxton, Seattle, Wash.
(Rte. 1, Box 243, Okanogan, Wash.)

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5 Claims. (Cl. 25—131)

This present invention relates to the general art of means for securing the walls of concrete forms in place and more particularly to tie rods of simplified form and the associated mechanical means employed for anchoring them firmly in position on preferably plywood form material and further, to have the same means secure the vertical studding and the horizontal waler members in fixed position during their period of use without resorting to nailing or permanently securing the same together.

The keen competition between contractors building concrete structures has made it very desirable to develop concrete form tie materials which will hold the forms securely in place during their period of use and which, further, can be put in place very quickly with a minimum of labor. Many devices have been studied and those observed have shown complicated, expensive structures so that the amortization of brackets and other gear employed adds materially to the cost of the building of concrete forms. Many of these arrangements also so disfigure the plywood panels, that are currently in general use in such work, as to seriously reduce the amount that can be salvaged from one job for use on another. Plywood of adequate thickness for this purpose, having at least one smooth face, is expensive material and unless it can be largely salvaged for re-use the gains incidental to the use of plywood can soon be dissipated in the purchase of new materials. My present tie rods and the materials employed to secure them in place are believed to overcome any disadvantages of the equipment used in the past.

The principal object of my invention therefore is to provide tie rods of a minimum length and of simplified construction and to use these in conjunction with special brackets which can be put in place very quickly with a minimum of labor.

A further object of this present invention is to provide a pivoted bracket member so arranged as to support the horizontally disposed walers and to force them into tight engagement with the vertical studding, backing up the plywood form walls so that the entire structure can be clamped in place rather than nailed in place.

A further object of my present invention is to provide a tie rod having a button type head at each end together with means for securing the plywood walls in fixed spaced relationship to said heads by means associated therewith so as to insure an exact spacing of the interior sides of the plywood forms and insure that the resulting walls will be of uniform and exact dimension.

A further object of my invention is to provide a bracket arrangement that may be used to engage a waler on its upper or lower surfaces so that by alternatively positioning the brackets, the walers can be secured very firmly in position.

A further object of my invention is to provide the main supporting member of my bracket assembly with a vertical pivot so that the pivoted member may be driven sideways in a horizontal plane and wedge the wales tightly against the studding of a wall, and to achieve this clamping action very simply and easily.

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Further objects, advantages and capabilities will be apparent from the description and disclosure in the drawings, or may be comprehended or are inherent in the device.

In the drawings:

Figure 1 is a perspective view illustrating one of the simpler wall forms used in concrete wall construction and illustrating the use of my equipment.

Figure 2 is a longitudinal view of one type of tie rod found to be very convenient for use with certain of my equipment.

Figure 3 is a perspective view, on enlarged scale, showing the structure of the clamp bracket means employed in Figure 1.

Figure 4 is a fragmentary vertical cross sectional view through a concrete wall form and showing my equipment in use with certain parts broken away to more fully illustrate the functional parts of the same.

Figure 5 is a top plan view of a concrete wall showing the concrete in place and illustrating studding and waler arrangements and how these two members including the wall material are clamped in operational position.

Figure 6 is a fragmentary vertical sectional view showing my equipment employed in association with a deeply belled washer.

Figure 7 is a perspective view illustrating a modified form of tie rod and engaging means therefor.

Figure 8 illustrates a modified form of the pivoted clamp member as used in my equipment modified so that the head of the bracket can secure two spaced walers in place.

Figure 9 is a vertical cross sectional view taken along the line 9—9 of Figure 7.

Referring to the drawings, throughout which like reference numerals indicate like parts 10 designates generally one preferred form of tie rod for use with my equipment. This tie rod is made of a high grade steel wire having a high tensile strength and is provided at each end with an up-set button head as 12 and 14. These are preferably cold formed in order to retain the high tensile strength of the material. In the form in Figure 2 spacing washers 16 are provided. These are so positioned that the outer faces as 18 will provide exact spacing for the inner faces of the plywood facing sheets 20 currently in general use in concrete form construction. The rod stock intermediate washer 16 is preferably deformed as at 22 and 23 so as to hold the body of the rod fixed within the concrete when set and thus facilitate breaking the ends of the rod when a suitable wrench is applied thereto after the rods have served their purpose and it is desirable to strip the forms from the finished wall. The rods normally break within the bore of washer 16 owing to the fact that the washers are swedged in place by material from the rod and thus normally provide a point of minimum strength. If it is desirable to have the washer left in place or definitely not to have it in place then annular scoring may be resorted to to insure breakage at the point desired.

The use of rods of the type shown in Figure 2 will probably be best understood from a study of Figure 4 where it will be observed that the interior faces of the concrete forms as 20 are spaced apart by washers 16. The plywood members are forced against washers 16 by a bifurcated wedge 24 having a bearing surface and an opposite outer face and the two spaced wedge portions 26 and 27. Wedge member 24 has the general form of a T bar and thus is provided with the outwardly extending web portion 28 which is disposed centrally of and at right angles to the general plane of wedge portions 26 and 27. Web 28 provides an anchor for the through pivot pin 30 and gives stability to the slotted end 32 of bracket member 34. The slotted end is normally up-set

or formed by other means so as to have additional strength to compensate for the material lost in slot 35, it being desirable that web member 28 and end portion 32 be generously proportioned so as to give stiffness to bracket member 34 in order that it can in turn support considerable weight. The wedge member is driven transversely of rod 10 until washers 16 are in snug engagement with the plywood wall face materials 20. This spaces the walls apart and also gives a firm anchorage for bracket members 34.

Bracket members 34 may be made after the showing of Figure 3 or 8 depending upon whether they are to be used with a single waler 37 or dual walers as 38 and 40. In the first case a simple bend is made at 42 to provide a vertical portion 44 which usually is parallel to pin 30 so that this portion may be driven sideways to tighten the walers in clamping relationship against the studding 46. In this form additional bends are made at 50 and 52 so that the support portion of member 34 as 54 will be horizontal in use and thus most effectively support the waler members.

In the modified form shown in Figure 8 wedge member 24 is made identically with that illustrated in Figure 3 but the modified supporting bar 56 of the bracket member is preferably straight with the head portion 58 having upward and downward T portions provided with the vertical inner face which is preferably formed as a slight curve shown at 60 so that as the head 58 is driven sideways to tighten the walers as 38 and 40 a firm bearing will be provided in the various successive positions. In the single vertical portion 44, the waler engaging surface is preferably similarly rounded as indicated at 45.

Figure 6 shows a modified construction in that a dished washer 63 is employed outside of the flange-like washers 16 so that a flat conical recess will be provided in the face of the concrete wall and thus facilitate plastering over the same to provide with the feathering edges a convenient means for completely hiding the opening.

Figures 7 and 9 illustrate a minor modification of my equipment in which a simplified tie rod 65 is employed which has up-set heads 66 only one on each end and these heads are provided with flat inner faces 68 which are accurately spaced apart, there being no swedged on washers as 16 or other flange arrangements. The usual wedge member 24 is employed but in this instance the wedge is slidably positioned within retaining means 70 which has overlapping flanges as 72 which overlay the wedge member 24 and holds it in position. Retaining means 70 is secured to the plywood member 20 by a plurality of screws 74. This arrangement has the overall result of holding the web portion 28 in fixed spaced relationship from the plywood face material 20. The inner face 76 of the slot formed between a portion of web 28 and the plane of wedges 26 and 27 is arranged to snugly engage the outer surface of the button head 66 of modified tie rod 65. Except for the substitution of guideway 70 for the washer 16 the arrangement still follows the teachings of Figure 4 in that two assemblies such as shown in Figure 9 are employed, one at each end of tie rod 65. It will be apparent, it is believed, that when there are no flanges or washers 16 on the tie rods, stripping the forms is simplified in that by the withdrawal of wedge member 24 and the other associated parts secured to it, the plywood facings as 20 can be stripped from the wall without any interference from heads 66 which will be free to pass through holes 77 in the plywood panels. This arrangement is also very convenient for assembling the forms prior to pouring the concrete as the plywood panels can be put in place and then the tie rods passed through the two panels. This is in counter distinction to the form shown in Figure 4 in which the tie rods must, of necessity, be inserted from the inside of each of the plywood facing panels 20 due to the fact that washers 16, if they are to serve their intended purpose, must be appreciably larger than hole 77. This

sequential operation of introducing the tie rod ends through the plywood panels from the inside of the wall is sometimes inconvenient and especially it is so when the walls are high. The bracket members as 34 or 56 are identical in all forms of this invention as illustrated and described and the same tightening procedure is employed and once the bracket members are in position they may be secured as by nails 80 passing through suitable openings 82 in the vertical members 44 or in head 53.

Having thus disclosed the invention, I claim:

1. Means for securing concrete wall forms in position, comprising: a wall form having two spaced apart form walls made of plywood sheets with smooth interior faces; vertically disposed studding on the outer faces of said form walls and horizontal walers disposed on the outer edges of said studding to provide alignment therefor; a metal tie rod disposed to pass perpendicularly through the said two spaced apart form wall sheets and having a button-head on each end thereof; two wedge members, providing two spaced apart wedge portions, positioned one on each of the opposite ends of the said tie rod and between said button-heads and the outer face of said wall form; said wedge members having a web extending outwardly from, and at right angles to the center line of said wedge member and slotted over the space between said wedge portions to a point adjacent the thicker end of said wedge portions; a bracket member for positioning a waler member used in concrete wall forms; said bracket member pivotably secured by a vertically disposed pivot pin, to the web of said wedge member and having a support portion for engaging the horizontal underside of a waler and an end portion disposed parallel to the axis of said pivot pin, adapting said bracket member to engage the vertical edge of a waler.

2. Means for securing concrete wall forms in position, comprising: a wall form having two spaced apart form walls made of plywood sheets; vertically disposed studding on the outer faces of said form walls and horizontal walers disposed on the outer edges of said studding to support and provide alignment therefor; a metal tie rod disposed to pass perpendicularly through the said two spaced apart form wall face sheets and having a head on each end thereof; spacing means on said rod and disposed to engage the inner faces of the form walls and space them apart; wedge members slotted to provide two spaced apart wedge portions adapted for positioning on opposite ends of said tie rod and between said heads and the outside surface of the sheets of each of the wall forms; said wedge member having a longitudinally extending centrally disposed web extending outwardly from, and at right angles to said wedge member and slotted over the space between said portions to permit the head of a tie rod to be positioned at the thicker end of said wedge portions; a bracket member for securing studding and waler members used in supporting said concrete wall forms; a vertical pivot for said bracket member, parallel to the plane of the wall forms, secured to said web of the wedge member, said bracket having a horizontally disposed support portion for engaging the side of a waler and an end portion disposed parallel to the axis of the pivot for said bracket member and adapted to engage the edge of a waler supported by the bracket, and said bracket adapted to vary the pressure applied to a supported waler as it is moved along the outer surface of said waler.

3. Means for securing concrete wall forms composed of facing material, vertical studding and horizontal walers in position, comprising: a wall form having two spaced apart form walls made of plywood facing sheets; a metal tie rod disposed to pass perpendicularly through the facing sheets of said two spaced apart form walls and having a button-head having flat bearing surfaces on each end thereof; a slotted wedge member on each end of said tie rod, each wedge member providing two spaced apart wedge portions positioned on opposite sides of said tie rod and between one of said button-heads and the outer

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face of a sheet of a wall from; retaining means for said wedge members, used on each end of said tie rod, fixedly secured to the outer surface of the form face sheets and adapted to slidably position said wedge member; said wedge member having a web extending outwardly from, and at right angles to the plane of said wedge member and having an open ended slot over the space between said wedge portions to a point substantially at the thicker end of said wedge portions; said slot having an inner face adapted to engage the outer end surface of said tie rod head and to coact with said wedge portions to fixedly secure said button-head and thus provide means to space the inner surfaces of the form face sheets apart and thus determine the thickness of the concrete wall; a bracket member secured to said web of the wedge member by a vertical pivot pin; said bracket having a horizontally disposed support portion for engaging the side of a waler and an end portion for engaging the edge of the said waler disposed parallel to the axis of pivot for said bracket member and said end portion movable along the outer edge of the supported waler to vary the pressure applied to said waler.

4. The subject matter of claim 1 in which said bracket member has its pivot pin positioned substantially in alignment with the longitudinal axis of said tie rod and has a bifurcated, enlarged end pierced with vertically aligned openings for said pivot pin and a downwardly bent portion connected to said support portion adapted to so position said support portion that a waler resting on the same, in its position of use, will be vertically centered on said tie rod axis; said end portion of said bracket being

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upwardly directed and disposed to have a line of contact extending entirely across the outer edge of said waler and said end portion adapted to be driven along said waler pivoting said bracket on said pivot pin, until said bracket is tight and in its adjusted position and pointed means on said end portion for locking said bracket in its using position.

5. The subject matter of claim 1 in which said wedge member, comprises: a rectangular planar bearing surface adapted to snugly engage the outer surface of one of said wall facing sheets with its longest dimension horizontally disposed and having an opposite outer face, said wedge-shaped portions being parallel and extending for substantially one-half the length of said wedge member; the longitudinal axis of said wedge portions being horizontally disposed when in use, said web being centrally positioned and extending longitudinally from said outer face for substantially one-half of the length of the wedge and providing an anchor for said pivot pin.

References Cited in the file of this patent

UNITED STATES PATENTS

1,552,912	Colt	Sept. 8, 1925
1,689,151	Mercer et al.	Oct. 23, 1928
2,001,052	Colt	May 14, 1935
2,273,198	Hillberg	Feb. 17, 1942
2,307,274	Jenkins	Jan. 5, 1943
2,358,975	Hillberg	Sept. 26, 1944
2,572,366	McGaugh	Oct. 23, 1951
2,763,048	Sullivan	Sept. 18, 1956
2,902,744	Patterson et al.	Sept. 8, 1959