

Feb. 22, 1955

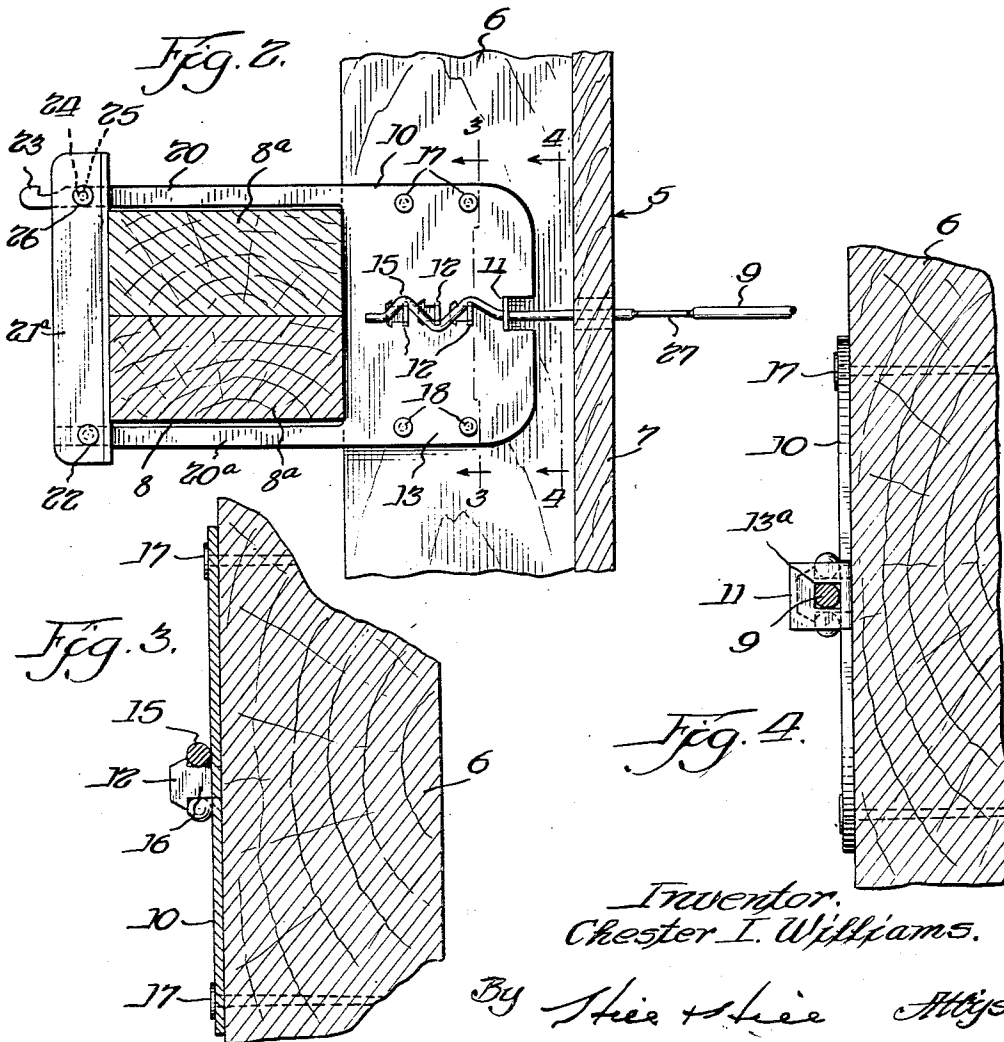
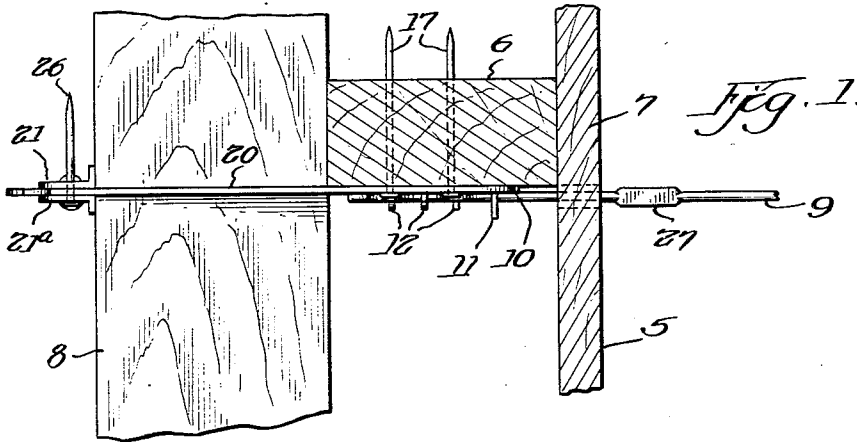
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2,702,420

COMBINED FORM TIE AND WATER SUPPORT

Filed Nov. 19, 1948

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

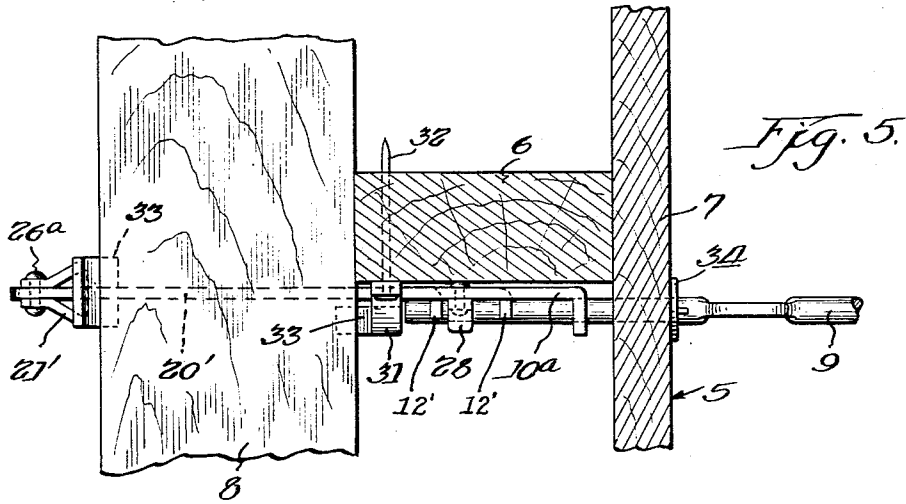


Fig. 5.

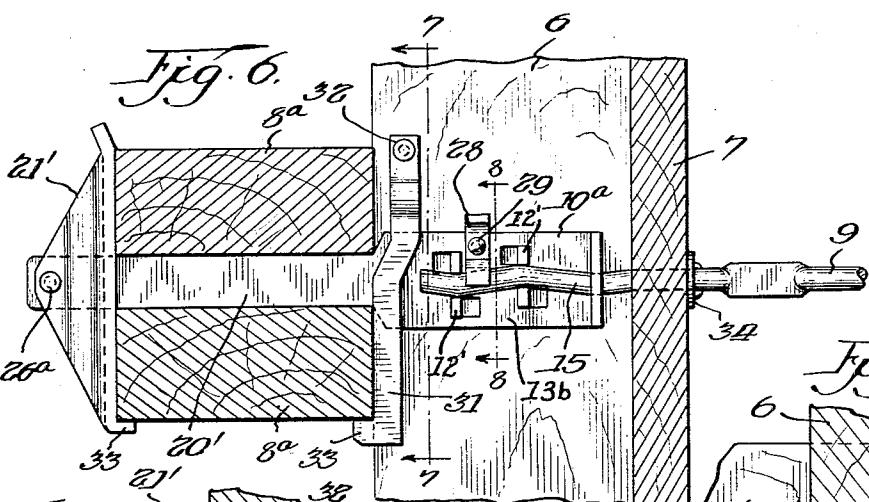


Fig. 6.

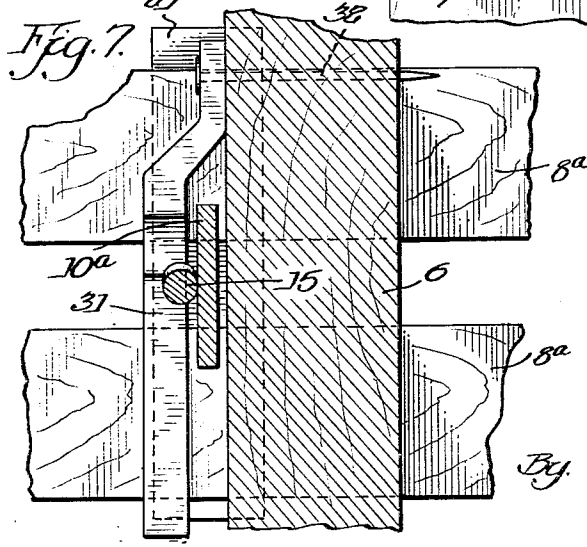


Fig. 7.

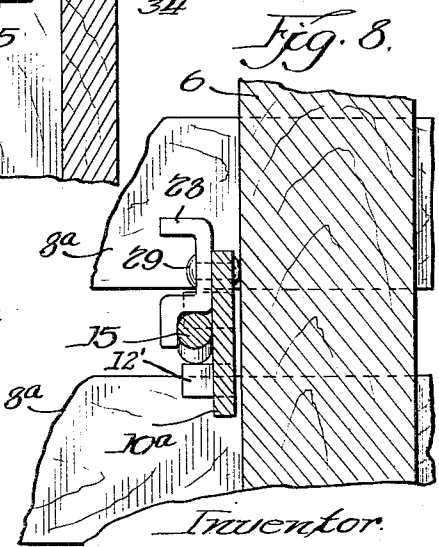


Fig. 8.

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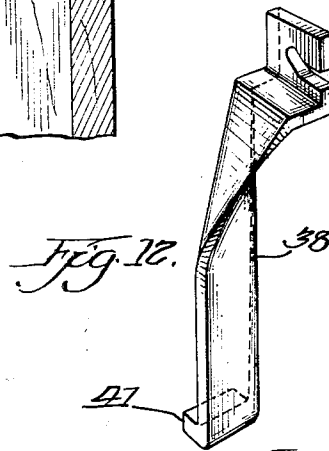
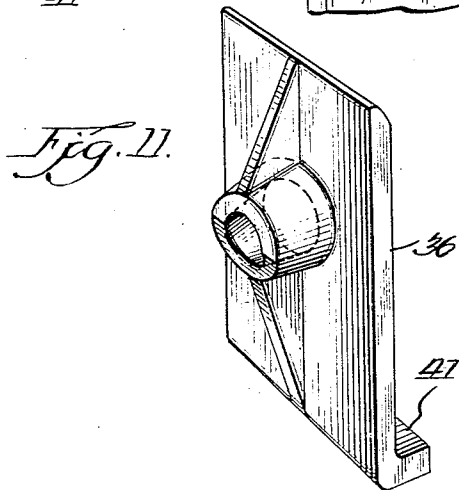
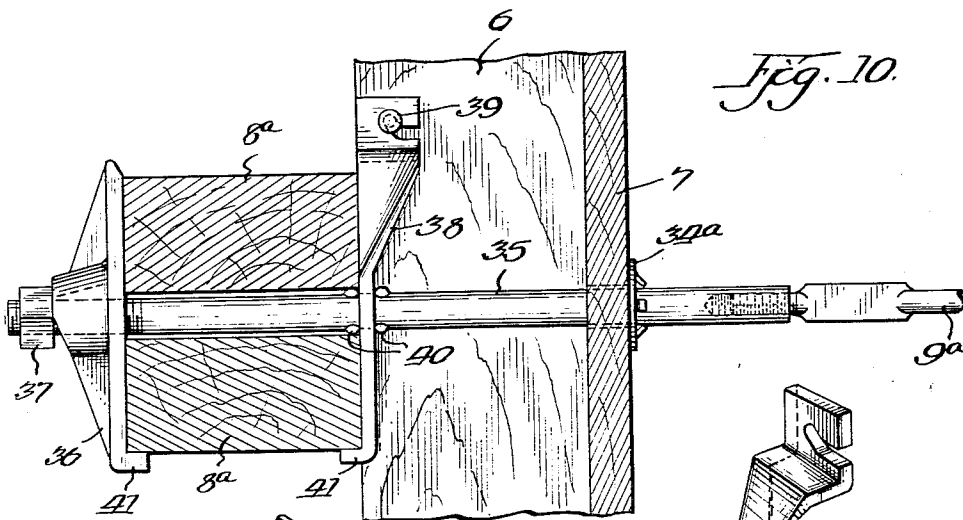
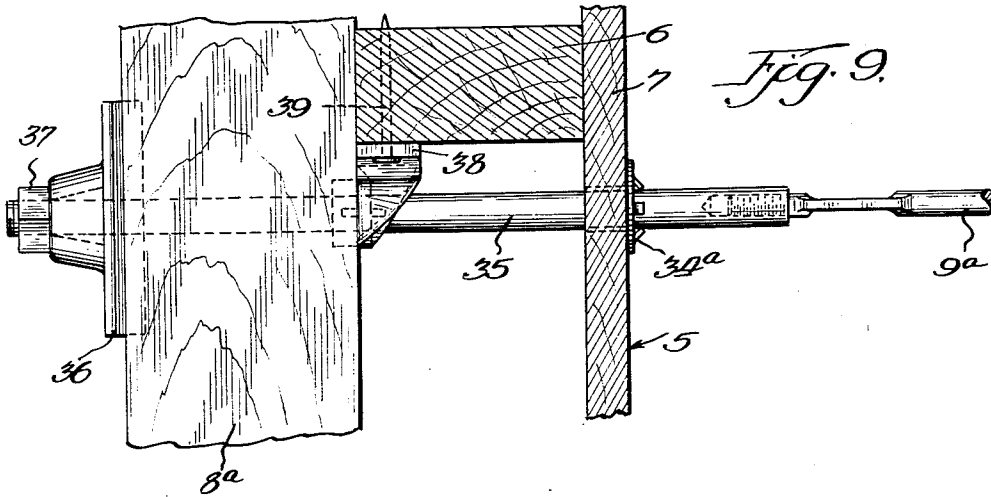
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COMBINED FORM TIE AND WALER SUPPORT

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3 Sheets-Sheet 3



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2,702,420

COMBINED FORM TIE AND WALER SUPPORT

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Application November 19, 1948, Serial No. 61,030

9 Claims. (Cl. 25—131)

This invention relates to a combined form tie and waler support for use with concrete forms in which concrete is poured to form foundations, walls and the like. Concrete forms are ordinarily composed of sheathing, nailed or otherwise secured to studs in connection with walers which are held tightly against the studs. In pouring each wall section two spaced forms are used, each one defining a face of the wall or the like, and tie rods are provided between the two forms. Ordinarily cleets or other supports are secured to the studs for supporting the walers, and ordinarily the tie rods extend to the outer faces of the walers and are provided with nuts or the like for tightening up the tie rods. Forms for an entire wall may be erected as usual.

One of the objects of the present invention is to provide a combined form tie and waler support by which the forms are properly spaced apart, and the walers held against the studs of the forms.

Another object is to lessen the cost of manufacture of devices of this character, and to provide a device which may be readily secured in place and removed therefrom.

With these and other objects and advantages in view, this invention consists in the several novel features hereinafter fully set forth and more particularly defined in the appended claims.

The invention is clearly illustrated in the drawings accompanying this specification in which:

Fig. 1 is a horizontal view, partly in section, through a concrete form and showing in plan a combined form tie and waler support embodying the preferred form of the invention.

Fig. 2 is a view partly in side elevation and partly in vertical cross section of the parts seen in Fig. 1.

Fig. 3 is an enlarged detail vertical cross section taken on the line 3—3 of Fig. 2.

Fig. 4 is an enlarged detail vertical cross section taken on the line 4—4 of Fig. 2.

Fig. 5 is a view partly in horizontal section, partly in plan of a concrete form showing in plan a modified form of the invention applied thereto.

Fig. 6 is a view partly in side elevation and partly in vertical cross section of the parts seen in Fig. 5.

Fig. 7 is an enlarged vertical cross section taken on the line 7—7 of Fig. 6.

Fig. 8 is an enlarged vertical cross section taken on the line 8—8 of Fig. 6.

Fig. 9 is a view partly in plan and partly in horizontal section of a concrete form showing in plan a second modified form of the invention applied thereto.

Fig. 10 is a view partly in side elevation, and partly in vertical cross section of the parts seen in Fig. 9.

Fig. 11 is a perspective view of a clamp plate forming part of the modified form shown in Figs. 9 to 12. And

Fig. 12 is a respective view of a certain hanger bar associated with the form of the invention illustrated in Figs. 9 to 12 inclusive.

Referring to said drawings and first to Figs. 1 to 4 inclusive, the reference character 5 designates a section of a concrete form ordinarily composed of a plurality of studs one of which is seen at 6 to which sheathing 7 is secured by nails or the like as is customary. Two such forms are used in pouring a section of a wall or the like, one of each side with the sheathing of each form facing the other. A waler is seen at 8 and may comprise two 2 x 4's, 8a or other timbers, or the walers may each comprise a single piece of timber. The tie rod element of the device is seen at 9 and extends through holes in the sheathing of both forms and together with the waler supports, connect and space apart the two forms. The waler

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supporting element of the device is seen at 10 and one is fastened to the tie rod at each end thereof. The fastening means between the tie rod and waler supports may take several forms, but the one illustrated in Figs. 1 to 4 is simple and comparatively inexpensive, and is produced by punch press operation. As shown, several tongues 11, 12 are struck up from the body portion 13 of the waler support and are bent to stand at right angle to the body portion. The tongue 11 is formed with a hole 13a there-through, and the tongues 12 may be T-shaped as shown. The construction of the tongues 11 and 12 provide means for preventing transverse movement of the tie rod and axial movement of the tie rod.

Each end of the tie rod is warped, offset or undulating as at 15, and each offset, warped or undulating end of each tie rod is inserted through the hole in the tongue 11 and wrapped about the shanks 16 of the tongues 12. Practice has shown that this form of connection between the tie rod and waler supports is very effective, and serves to space the forms apart. The waler supports may be temporarily secured to the studs as by nails 17 or the like which are driven through nail holes 18 in the waler support and into the stud. With the waler supports secured to the studs and connected by a tie rod the forms are properly spaced apart and cannot separate from each other. The tie rod and waler supports tie the forms in spaced relation.

The waler supports are constructed and arranged to hold the waler tightly against the studs and various forms of connections between the waler and waler supports may be had. As shown in Figs. 1 to 4 the waler support has a loop which surrounds the waler and as shown is formed with two parallel arms 20, 20a that project from one end of the body portion and said arms are spaced apart to receive a waler between them. The arms 20, 20a are of a length to extend somewhat beyond the outer side of the waler, and in use these outer ends of the arms are connected by one or more cross bars 21, 21a here shown as comprising angle shaped bars, one disposed at each side of the arms 20, 20a. The cross bars 21, 21a are connected to the arms 20, 20a by suitable means, and as here shown are pivotally connected at one end to the arm 20a as by a rivet 22 or the like which extends through both bars 21, 21a and the arm 20a. The other arm 20 is formed with means whereby the bars may be forced tightly against the waler. This arm as shown is formed with a lateral projection 23 such as a hook which may be engaged by a claw of a claw hammer, and by it the bars may be pressed back tightly against the outer face of the waler. Holes 24, 25 are formed in the cross bars 21, 21a and arm 20 respectively which are brought into register when the cross bars have been swung back tightly against the waler, and a nail 26 or the like such as a cotter pin is driven through the holes 24, 25 to connect the crossbars to the arm.

The tie rod may be flattened as at 27, at places adjacent the forms, whereby to weaken the tie rod at these places. This provides breaking points whereby the offset, warped or undulating ends of the tie rod may be broken off after the forms have been taken down.

In the modified form of the invention illustrated in Figs. 5 to 8 inclusive, the tie rod 9 is secured to the waler supporting elements 10a having a body portion 13a as in the preferred form shown in the Figs. 1 to 4, and a latch 28 pivoted to the waler supporting element as by a rivet 29 may be employed to positively lock the warped end of the tie rod to the waler supporting element. The pivoted latch 28 provides means for preventing transverse movement of the tie rod. Outwardly extending tongues 12' formed from the body portion 13a, provide means for preventing axial movement of the tie rod.

The waler supporting element is formed with an extended portion 20¹ which extends between two timbers 8a, that compose the waler. On the end of the extended portion 20¹ is a clamping member 21¹ which is secured to the extended portion 20¹ as by a rivet or the like 26a which extends through the clamping member 21¹, and the extended portion 20¹ of the waler supporting element. A waler hanger bar 31 is fastened to the stud 6 as by a nail or the like 32. Both the hanger 31 and the clamping member 21¹ may be formed with intumed ledges

33 upon which the lower timber 8a may rest. The upper timber 8a rests upon the top of the extended portion 20¹. To hold the sheathing 7 against the stud 6, a stud lock or washer 34 may be employed on the tie-rod.

In the modified form of the invention illustrated, in Figs. 9 to 12 inclusive, the rod 9a is threadedly secured in a she-bolt 35 which extends through the sheathing 7 along side the stud 6 and extends between the two timbers 8a which serve as a waler. On the outer end of the she-bolt is a clamping plate 36 which is pressed against the waler by a nut 37 on the end of the she-bolt 35. A waler hanger 38 is nailed to the stud as at 39 and is secured to the she-bolt as by staking or knurling the latter as at 40 on both sides of the hanger bar 38. Both the bar 38 and the clamp plate 36 are formed with inturred flanges 41 which support the waler until the clamp plate is drawn tightly against it as by screwing up the nut 37.

To hold the sheathing 7 against the stud 6, stud lock or washer 34a may be secured upon the she-bolt so as to bear against the sheathing.

In either modified form the lower end of the clamping member is swung outward to permit the lower timber 8a to be inserted between the clamping plate and stud, after which the clamping plate is swung into upright position permitting the upper timber to be placed between the clamping plate and stud.

It is understood that the parts described are duplicated on the opposite side of the concrete wall to be poured. Therefore, it is believed that a description of one will suffice for both.

Having thus described my invention, it is obvious that various immaterial modifications may be made in the same without departing from the spirit of my invention; hence, I do not wish to be understood as limiting myself to the exact form, construction, arrangement and combination of parts herein shown and described or uses mentioned.

What I claim as new and desire to secure by Letters Patent is:

1. A combined form tie and waler support comprising a tie rod formed with undulating ends, a waler support having a body portion formed with outstanding tongues which are engaged by the undulating end of the tie rod, and said waler support having two spaced arms which extend from the body portion of the waler support and straddle the waler, and a cross bar connecting the outer ends of said arms to form a loop surrounding the waler.

2. A combined form tie and waler support comprising a tie rod formed with undulating ends, a waler support having a body portion formed with outstanding tongues which are engaged by the undulating end of the tie rod and said waler support having two spaced arms which extend from the body portion of the waler support and straddle the waler, a cross bar pivotally connected at one end to one arm and means for securing together the other end of the cross bar and other arm.

3. In a device of the kind described, a waler engageable member having a horizontally extending portion adapted to be positioned adjacent to and extending transversely across a waler, means associated with said member adapted to engage the outer side edge of such a waler and exert pressure thereon, and a tie rod, one end of which is provided with undulating portions thereon, a plurality of projections extending outwardly from said member, said undulating portions being engageable with said projections and co-operable therewith to detachably connect said tie rod to said member and prevent axial movement of the tie rod relative to the member, and means associated with said member for restricting transverse movement of said rod relative to said member.

4. In a device of the kind described, a waler engageable member having a horizontally extending portion adapted to be positioned adjacent to and extending transversely across a waler, means associated with said member adapted to engage the outer side edge of such a waler and exert pressure thereon, and a tie rod, one end of which is provided with undulating portions thereon, a plurality of projections extending outwardly from said member, said undulating portions being engageable with said projections and co-operable therewith to detachably connect said tie rod to said member and prevent axial movement of the tie rod relative to the member, and a latch element movably mounted on said member and adapted to engage said rod end for restricting transverse movement of the latter relative to said member.

5. In a device of the kind described, a waler engage-

able member having a horizontally extending portion adapted to be positioned between and extending transversely across a pair of adjacent walers, a clamping element pivotally mounted on the outer end of said member adapted to engage the outer side edges of such walers and exert pressure thereon, and a tie rod, one end of which is provided with undulating portions thereon, a plurality of projections extending outwardly from said member, said undulating portions being engageable with said projections and co-operable therewith to detachably connect said tie rod to said member and prevent axial movement of the tie rod relative to the member, a latch element pivotally mounted on said member and adapted to engage said rod end for restricting transverse movement of the latter relative to said member, and an L-shaped hanger bar adapted to be secured to a stud positioned adjacent said walers, with a portion of said hanger bar underlying the lower waler.

6. In a device of the kind described, a waler engageable member having a horizontally extending portion adapted to be positioned adjacent to and extending transversely across a waler, a clamping element carried by the outer end of said member adapted to engage the outer side edge of such a waler and exert pressure thereon, and a tie rod, one end of which is provided with undulating portions thereon, a plurality of projections extending outwardly from said member, said undulating portions being engageable with said projections and co-operable therewith to detachably connect said tie rod to said member and prevent axial movement of the tie rod relative to the member, a latch element pivotally mounted on said member and adapted to engage said rod end for restricting transverse movement of the latter relative to said member, and an L-shaped hanger bar adapted to be secured to a stud positioned adjacent said waler, with a portion of said hanger bar underlying the waler.

7. A tie rod for a concrete form structure having a plurality of undulating bends adjacent an end thereof and means on a portion of the form structure engageable with said plurality of bends for preventing axial movement of such rod relative to such form structure.

8. A combined form tie and waler support comprising a tie rod formed with an undulating end, a waler support having a body portion formed with outstanding tongues which are engaged by an undulating end of the tie rod, and said waler support having an extended portion which extends from the body portion of the waler support and transverse to the waler, and a cross bar operatively connected to said extended portion and adapted to engage the waler.

9. A combined form tie and waler support for a form construction including studding, form ties and walers, said combined form tie and waler support comprising a tie rod formed with an undulating end, a waler support adapted to be affixed to the studding and having a body portion formed with outstanding tongues which are engaged by an undulating end of the tie rod and said waler support having an extended portion which extends from the body portion of the waler support and transverse to the waler, a cross bar pivotally connected to said extended portion and adapted to engage the waler, whereby the waler and tie rod are supported from the studding by the waler support.

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