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WALER BRACKET FOR CONCRETE FORMS

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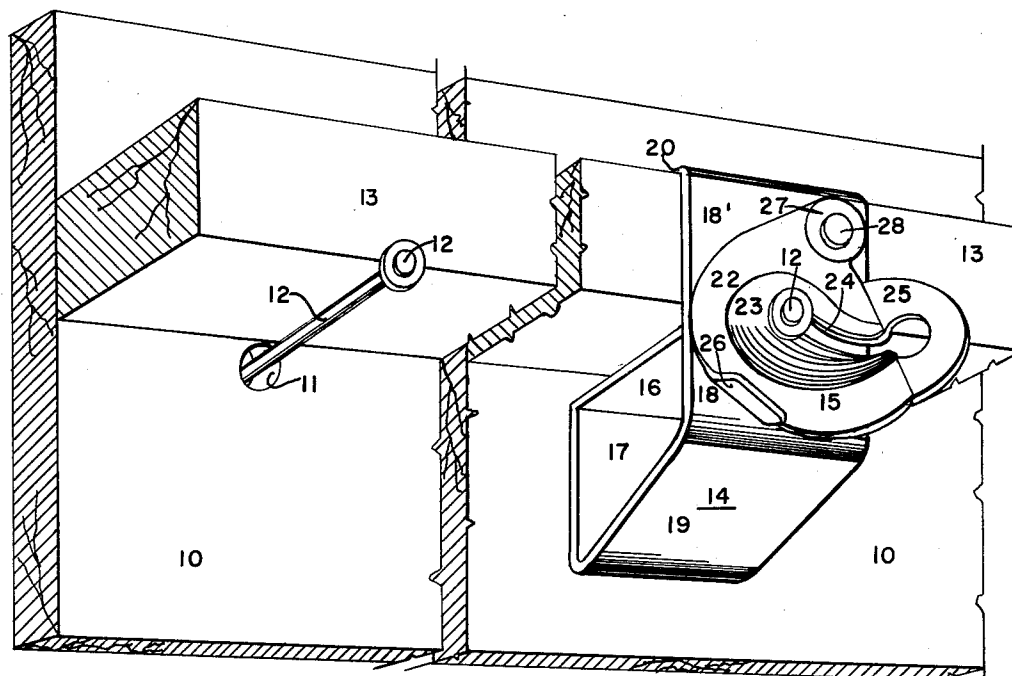


Fig. 1

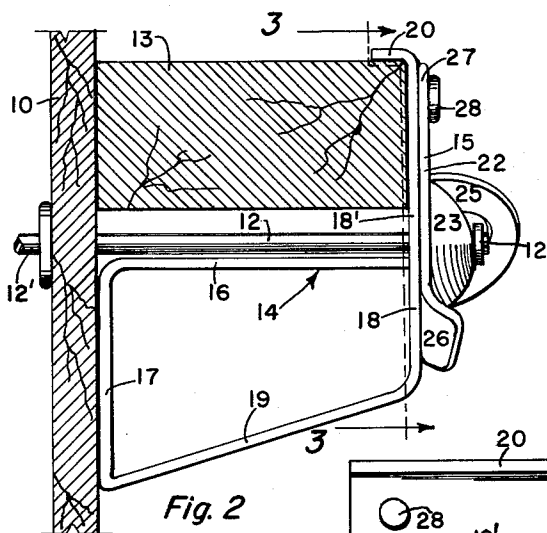


Fig. 2

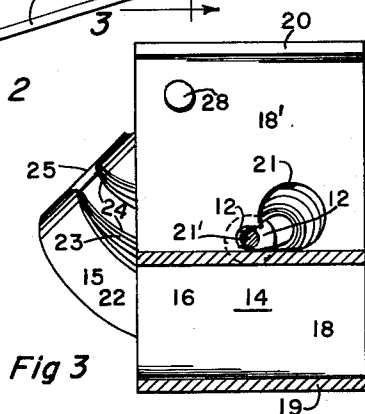


Fig. 3

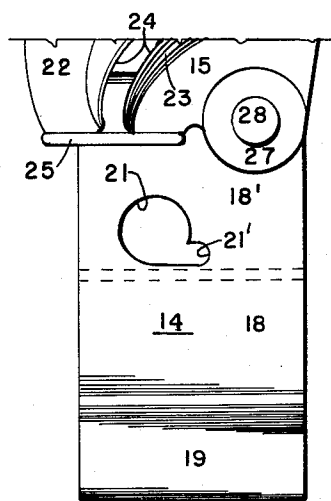


Fig. 4

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WALER BRACKET FOR CONCRETE FORMS

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5 Claims. (Cl. 248—205)

As a development from and a specific use adaptation of the disclosures of United States Patent No. 2,967,689, dated January 10, 1961, this invention relates to clamp brackets useful in the erection and operative organization of forms adapted to receive and shape concrete in permanent position, and has as an object to provide a distinctive such bracket of utility and practical merit.

A further object of the invention is to provide a novel and improved waler bracket for concrete forms that is applicable to clamping coaction with and release from the panel, waler, and tie-rod components of conventional concrete forms assembled in operative correlation for subsequent consolidation thereby.

A further object of the invention is to provide a novel and improved waler bracket for concrete forms that is employable in association with and to consolidate preformed combinations of panel and waler components functioning in conjunction with tie-rods as major sections of form structures resulting from practice of the technique known as "gang-forming."

A further object of the invention is to provide a novel and improved waler bracket for concrete forms that is individually and independently applicable to and separable from intended clamping coaction with pre-assembled operative correlations of panel, waler, and tie-rod components through simple manipulations attended by no disturbance of the component arrangement.

A further object of the invention is to provide a novel and improved waler bracket for concrete forms that is expedient of economical production in a range of preferred sizes, that is effective in cooperation with and to apply the wedging action of structurally-diverse detent supplements, that is rugged and durable for long practical life in repetitious use, that felicitously resolves a complication peculiar to "gang-forming" practice, and that is efficient in attainment of the ends for which designed.

With the foregoing and other objects in view, my invention consists in the construction, arrangement, and operative combination of features and elements as hereinafter set forth, pointed out in the appended claims, and illustrated by the accompanying drawing, in which—

FIGURE 1 is a fragmentary, isometric view of operatively interrelated panel, waler, and tie-rod components exemplifying a form wall section amenable to coaction with and as consolidated by a typical bracket embodiment of the present invention, an intermediate length portion of elements comprised in the view being broken away to conserve space.

FIGURE 2 is a section transversely of the representation according to FIGURE 1 taken immediately to the left of the bracket feature shown in said latter view.

FIGURE 3 is a detail sectional view of the bracket according to the preceding views taken substantially on the indicated line 3—3 of FIGURE 2.

FIGURE 4 is an outer end view of the bracket according to the preceding views separate and apart from operative disposition and with the associated wedging detent but partially shown in an elevated adjustment thereon.

It is wide-spread conventional practice to organize concrete forms as spacedly-parallel walls of marginally-abutting panels upstanding from a base and spaced apart by a succession of shouldered tie-rods perpendicularly therethrough in extension of their headed end portions outwardly beyond the walls, to reinforce and align the panels

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of each wall by means of walers engaged transversely thereof superjacent the outer end extensions of the tie-rods, and to securely consolidate the form wall organization through the influence of wedging detents entered between and applied to separate the head terminations of the tie-rods and proximate outer edge areas of the walers. Suited to facilitate the practice of form erection accomplished as just discussed through assembly and operative correlation at the site of initially-separate panel, waler, and tie-rod components, various waler brackets, such as that disclosed in the above-noted patent, have been and are available in arrangements adapted through loose attachment of the bracket to the headed end extension of a tie-rod exterior of the wall to receive, seat and support a waler subsequently applied to an aligned succession of the brackets, and have proved to be eminently satisfactory for organization and consolidation of such arrangements. However, an advanced technique of form erection, termed "gang-forming," promotive of efficiency and economy in many such operations has introduced certain variations of component assembly which hamper intended use and largely nullify the practical advantages realized by the waler brackets hitherto known, and the instant invention hence is directed to the provision of a novel and improved such facility applicable to develop the functions and attain the purposes of the known brackets in application to and cooperation with the form components as associated in the practice of "gang-forming."

Characteristic of the "gang-forming" technique is the preassembly of panels and walers in multiple to constitute form wall sections of extensive area having a patterned array of holes spaced and aligned for customary predetermined accommodation of tie-rod end extensions contiguous to and along like sides of waler components fixedly traversing, and uniting, the panel components in spaced, parallel relation, and subsequent conjunctive correlation of said sections in and as a form wall exteriorly presenting the waler components in a horizontal disposition immediately above and in overhanging relation with tie-rod end extensions projected through and from said holes. As so constituted, it is quite infeasible to operatively associate the known types of waler brackets with the "gang-formed" wall because of the lack of a uniform clearance between the rod end extension and the superjacent waler sufficient to accommodate passage of the rod end through both end webs of the bracket with attendant reception of the bracket top plate between the rod and waler, and it is to the relief of such infeasibility that the improvements of the present invention are directed.

As exemplified by FIGURES 1 and 2, a form wall resulting from practice of the "gang-forming" technique presents as conditioned for ultimate form consolidation coplanar, upright panel components 10 formed with a horizontally-aligned succession of holes 11 through which are received the projecting end extensions 12 of conventional tie-rods 12' and waler components 13 fixed in spaced, parallel relation to horizontally traverse the said panels along and immediately above each horizontal succession of the holes 11 and associated rod ends 12, in and to which arrangement of components it is the function of the waler bracket to releasably apply a force efficiently acting with customary clamping effect between and to separate the head terminating the tie-rod extension 12 and the adjacent edge margin of the waler 13 for consolidation of the form assembly in reaction to tensing of the rod extension.

Designated generally by the numeral 14, the waler bracket of the present invention is, save for its associated wedging detent 15, a rigid unit of suitable material, such as sheet metal, formed in broad analogy with the disclosure of the patent above noted and in any appropriate or desired manner to provide a laterally-open, angular loop

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characterized by a flat portion 16 having a length slightly less than the width of the waler 13 wherewith the bracket is to be associated, an inner flat end portion 17 fixedly depending perpendicularly from one end of the portion 16, an outer flat end portion 18 fixed perpendicularly to and across the other end of the portion 16 in spaced parallelism with the portion 17 to project as a flange 18' above the portion 16 a distance no less, and preferably exceeding, the combined thickness of the waler 13 engageable thereby and the diameter of the rod extension 12 subjacent the waler and to extend below the portion a distance less than the corresponding dimension of the portion 17, said angular loop being completed and closed by an inclined bottom member 19 fixed to span as a brace between lower margins of the portions 17 and 18 in a consequent outward convergence with the portion 16. Distinguishing from any known previous waler bracket disclosure, the margin of the flange 18' remote from the portion 16 is intumed spacedly over the proximate end of said portion 14 as a lip 20 parallel thereto disposed and adapted to engage over the upper outer corner of the waler 13 in the use application of the bracket thereto, as is clearly shown by FIGURE 2. Further distinctively adapting the bracket 14 to its intended use and purpose, an aperture 21 is formed in a size to loosely pass the head terminal of the tie-rod end extension 12 in and through the flange 18' adjacent the conjunction of the latter with the upper face of the portion 16 substantially tangent at one side with the longitudinal median line of the flange and a notch 21' tangent to the arc of said aperture 21 adjacent the portion 16 in a size to receive and embrace the rod extension 12 is offset laterally of the flange 18' and across the said longitudinal median line thereof in fully open communication with the associated aperture, whereby, as shown in FIGURE 3, a rod extension 12 head-entered through the aperture 21 to overlie the loop portion 16 may be received in and positioned with retention against undue play by said notch 21'. Thus distinctively conformed and proportioned in any appropriate width of its elements 16, 17, 18, 18' and 19 desirably less than the length of the portion 16, the bracket 14 is qualified for convenient application to intended operative coaction with the panel, waler, and tie-rod components of form walls erected in conformity with "gang-forming" techniques, since, as should be adequately apparent, to the association of said components appearing at the left in FIGURE 1 the bracket 14 may be conveniently and expeditiously applied with its portion 17 coplanarly opposed to the panel 10 and its portion 16 directly and closely underlying the rod extension 12 through simple manipulations directed to effect passage of the terminal head of the rod extension through the aperture 21 of the flange 18', hooking of the lip 20 over the upper outer corner of the related waler 13, and slight lateral shift of the so-engaged bracket each as will serve to seat the rod extension in the notch 21'; in which mounted relation with the form wall components the flange 18' of the bracket 14 closely overlies the outer edge of the waler 13 in a spacing inwardly of the rod extension 12 from the terminal head thereof adequate to accommodate the wedging detent 15, or the functional equivalent, when and as entered with separating effect therebetween.

Obviously, any form and style of wedging detent effective to crowd the bracket 14 inwardly of the rod extension 12 in reaction to detent coaction with the terminal head of the extension may be utilized to effectuate the form-consolidating functions of the bracket, the pivotally-related such feature illustrated and identified by the numeral 15 being the functional equivalent and structural approximation of that disclosed in the above-noted patent. Preferred for reasons unnecessary of elaboration herein, the detent 15 is, as represented, a flat, rigid plate 22 generally of arcuately-triangular outline formed with an arcuate cuneal boss 23 divergent from one edge margin of the plate, a throat 24 arcuately longitudinal of said boss from

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a closed end coincident with maximum boss divergence from the plate and to an open end at the plate margin wherewith the boss is convergent, a lug 25 apertured to pass the terminal head of the rod extension 12 integrally and angularly outstanding marginally of the plate in bridging relation with the open end of said throat, a striker 26 offset angularly from the plate margin in a spacing from said lug, and an apertured ear 27 connectible with a fastener 28 near an upper corner of the flange 18' whereby to mount the plate 22 in overlying contact with the portion 18 and flange 18' for free oscillation about the axis of the fastener 28 such as to track the throat 24 across the aperture 21 and to registration of the closed end of the throat with the notch 21'. As so comprised and associated with the bracket 14, the detent 15 may be swung, as in FIGURE 4, to full clearing relation with the aperture 21 to accommodate passage of the rod extension head therethrough as the bracket is applied to its use position, whereafter gravity-induced swing of the detent on its pivotal axis serves to pass the rod head through the aperture of the lug 25 and engage the adjacent rod extension length within the throat 24 as the cuneal boss margins of the throat are brought to bear with wedging effect against said head for a reaction augmented by impacts applied to the striker 26 promotive of the desired form-consolidating interclamping of the form wall components subject to the influence of the bracket.

Organized as shown and described the improved bracket of the present invention is expediently serviceable as a complement to "gang-forming" practices, is facile of application to and removal from its practical use associations, is repetitiously employable with important conservation of labor time and materials, and felicitously resolves a complication peculiar to the practice of "gang-forming."

Since changes, variations, and modifications in the form, construction, and arrangement of the elements shown and described may be had without departing from the spirit of my invention, I wish to be understood as being limited solely by the scope of the appended claims, rather than by any details of the illustrative showing and foregoing description.

I claim as my invention:

1. A waler bracket applicable to the consolidation of concrete forms having wall areas exteriorly traversed by walers contiguous to terminally-headed tie-rod extensions transverse thereof in projection outwardly therebeyond, said bracket comprising a rigid base portion slightly less in length than the waler dimension perpendicular to the wall fixedly yoking corresponding margins of spacedly-parallel flat end portions perpendicularly offset in the same direction at the ends thereof, a flange integrally coplanar with one of said end portions extending thence in a direction opposite to that of the end portion offset, a lip intumed from the free end of said flange in parallel, overhanging relation with the proximate end of said base portion and at a spacing therefrom at least equal to the combined tie-rod extension diameter and the waler dimension radial of said extension, said flange being formed with an aperture sized to loosely pass the terminal head of the tie-rod extension substantially tangent to the base portion at the conjunction of the latter with the flange, and a wedging detent shiftably related with the coplanar outer face surfaces of said flange and the associated end portion for intrusion in embracing relation with a rod extension entered through the aperture of the flange between and to separate the bracket and the terminal head of said extension.

2. The organization according to claim 1, wherein the aperture formed in the flange is substantially tangent to the longitudinal median line of the flange as well as to the base portion and communicates with a supplemental notch tangentially offset therefrom across said longitudinal median line thereof and adjacent the base portion

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adapted to conformably receive a rod extension entered through the aperture.

3. The organization according to claim 1, wherein said lip is adapted to clip over an upper salient corner of a waler in partial support of the bracket as engaged with a rod extension received through the aperture formed in the flange, said aperture is disposed substantially tangent to the longitudinal median line of the flange as well as to the base portion and communicates with a supplemental notch tangentially offset therefrom across said longitudinal median line thereof and adjacent the base portion adapted to conformably receive the rod extension entered through the aperture, and said detent coacts with the bracket and associated rod extension to seat the latter within said notch as an incident of detent manipulations promotive of wedging effect.

4. In a waler bracket for concrete forms having a rigid base portion slightly less in length than the projection outward from a form wall of the waler wherewith it is designed to coact, spacedly-parallel, flat end portions perpendicularly offset in the same direction from the ends of the base portion, and a flange integrally coplanar with one of said end portions extending thence in a direction opposite to that of the end portion offset, means conditioning said bracket for consolidating coaction with forms having wall areas exteriorly traversed by walers contiguous to terminally-headed tie-rod extensions transverse thereof in extension outwardly therebeyond, said means comprising a length of flange extension away from the base portion at least equal to the combined tie-rod extension diameter and the waler dimension radial of said extension, a lip inturned from the free end of said flange in parallel, overhanging relation with the proximate end of the base portion, an aperture sized to loosely pass the terminal head of the tie-rod extension formed in and through said flange substantially tangent to the base portion at the conjunction of the latter with the flange, and a wedging detent shiftably related with the coplanar outer face surfaces of said flange and the associated end portion for intrusion in embracing relation with a rod extension entered through the aperture of the flange between and to separate the bracket end and the terminal head of the extension.

5. In a waler bracket for concrete forms having a rigid base portion slightly less in length than the pro-

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jection outward from a form wall of the waler wherewith it is designed to coact, spacedly-parallel, flat end portions perpendicularly offset in the same direction from the ends of said base portion, and a flange integrally coplanar with one of said end portions extending thence in a direction opposite to that of the end portion offset, means conditioning said bracket for consolidating coaction with forms having wall areas exteriorly traversed by walers contiguous to terminally-headed tie-rod extensions transverse thereof in extension outwardly therebeyond, said means comprising a length of flange extension away from the base portion at least equal to the combined tie-rod extension diameter and the waler dimension radial of said extension, a lip inturned from the free end of said flange in parallel, overhanging relation with the proximate end of the base portion for clip engagement with and over an upper salient corner of a waler, an aperture sized to loosely pass the terminal head of a tie-rod extension formed in and through said flange substantially tangent to the base portion at the conjunction of the latter with the flange, whereby to accommodate a tie-rod extension in outward projection from a bracket lip-clipped to the contiguous waler, a supplemental notch formed in communication with and as a tangential offset from said aperture across the longitudinal median line of the flange and adjacent the base portion for conformable reception of a rod extension entered through the aperture, whereby to positively position and retain against undue play a rod extension embraced by the notch, and a wedging detent shiftably related with the coplanar outer face surfaces of said flange and the associated end portion for intrusion in embracing relation with a rod extension entered through the aperture of the flange between and to separate the bracket and the terminal head of the rod, manipulations of said detent promotive of wedging action serving to seat the so-embraced rod extension in the notch supplement of the aperture.

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CLAUDE A. LE ROY, *Primary Examiner*.