May 22, 1962 J. E. IBECK 3,035,322

CLAMP AS FOR CLAMPING BEAM FORMS AND THE LIKE IN END TO END RELATION

Original Filed Sept. 25, 1956 2 Sheets-Sheet 1

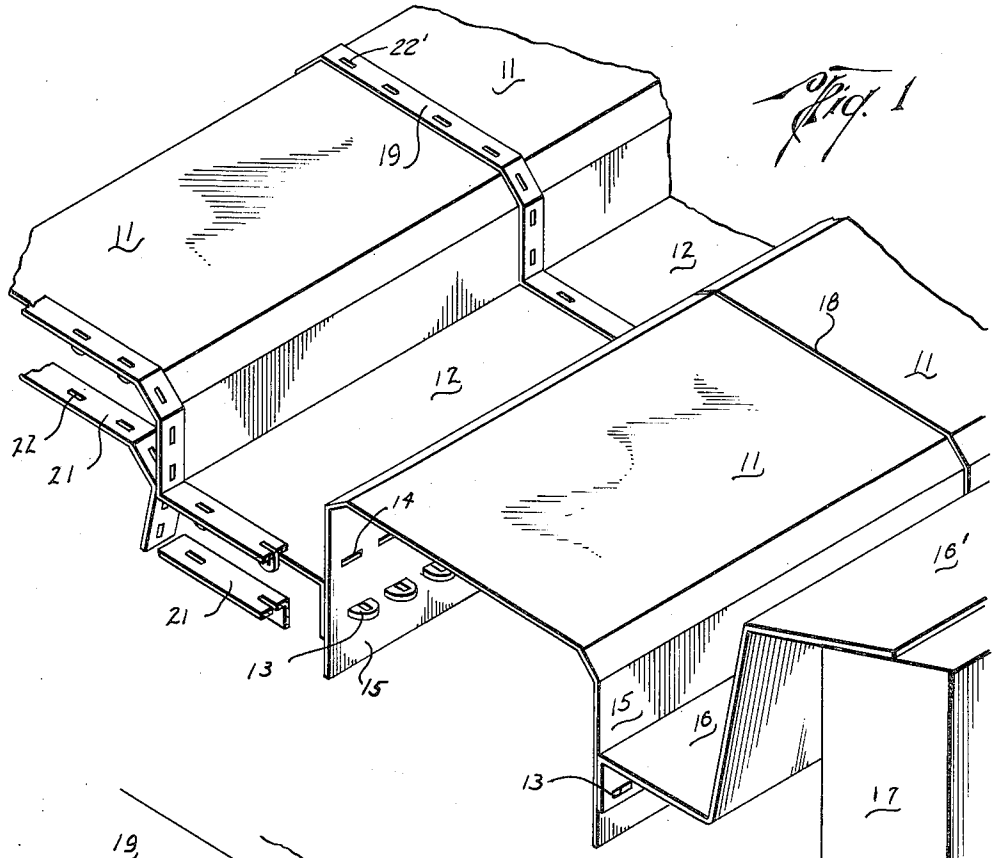


Fig. 1

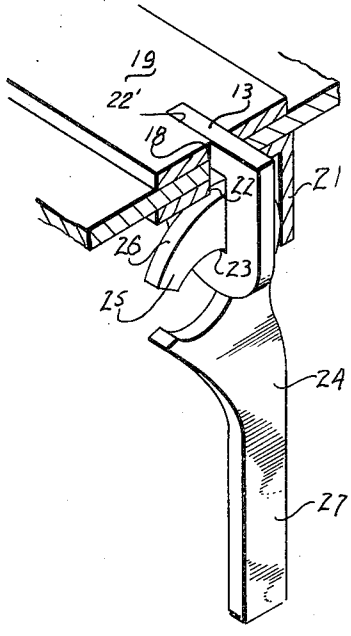


Fig. 2

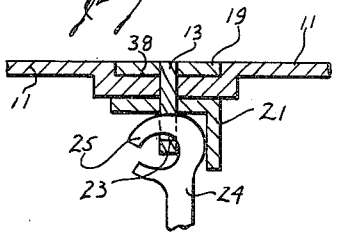


Fig. 7

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CLAMP AS FOR CLAMPING BEAM FORMS AND THE LIKE IN END TO END RELATION

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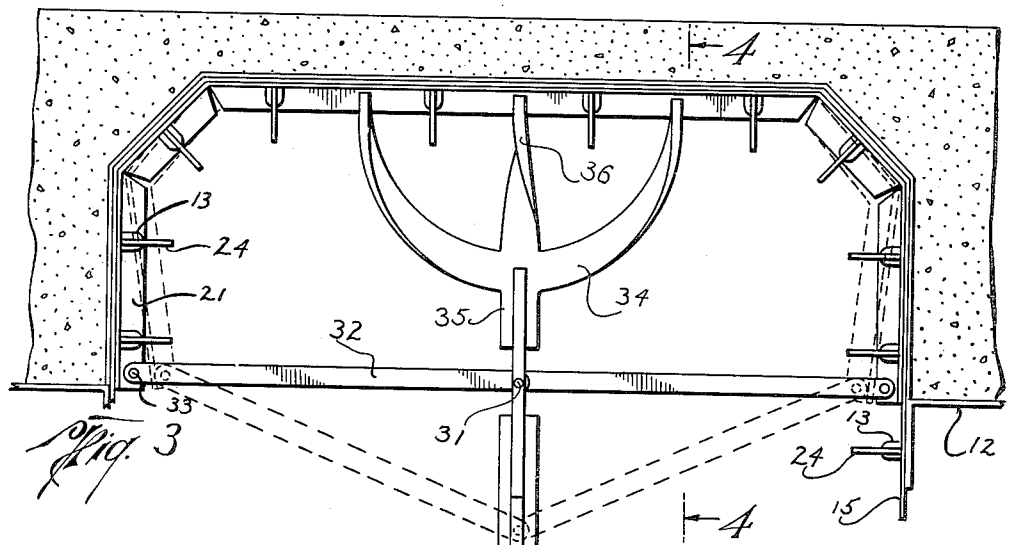


Fig. 3

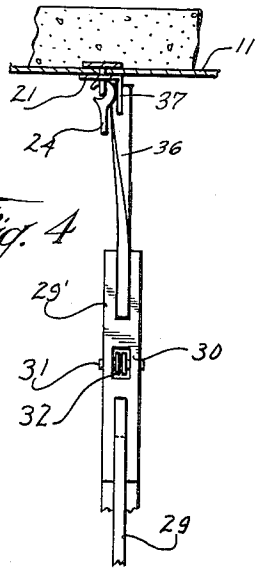


Fig. 4

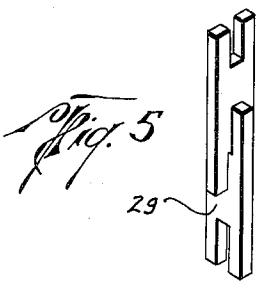


Fig. 5

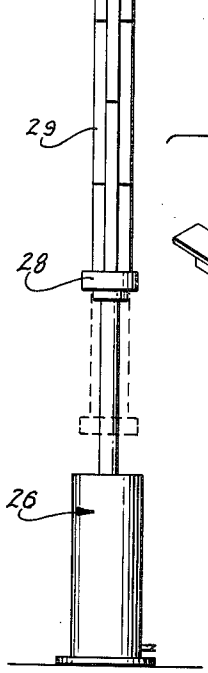
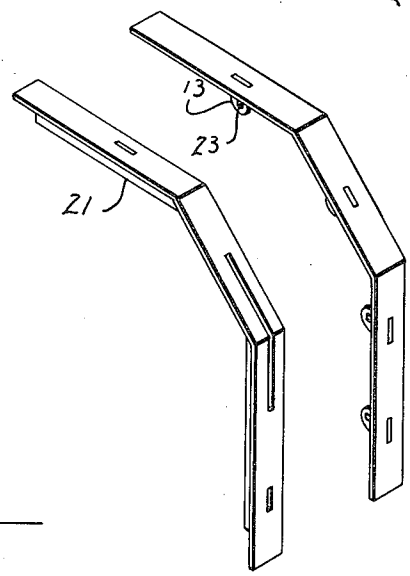


Fig. 6



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CLAMP AS FOR CLAMPING BEAM FORMS AND THE LIKE IN END TO END RELATION

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Continuation of application Ser. No. 611,947, Sept. 25, 1956. This application Jan. 26, 1959, Ser. No. 788,861
2 Claims. (Cl. 25—131.5)

This invention relates to a clamp as for easily clamping beam form sections, plates, and the like in longitudinally extending, co-axially spaced apart, end to end relation, this application being a continuation application of my co-pending application Serial No. 611,947, filed September 25, 1956, now abandoned, for Form Clamp and Jack and Method of Use, the invention permitting beam forms to be easily adjusted as to depth and easily jack supported from below, and the jacks and the clamps supported thereby being easily released after the concrete used for the beams is poured.

It is a particular and primary object of this invention to provide clamp means as for easily clamping beam form sections in end-to-end connection.

It is another object of this invention to provide a clamp for a beam form construction which is easily adjustable as to depth, easily jack supported from below, and easily removed after the beams are poured.

It is also an object of this invention to provide a clamp for a beam form construction which does not leave the imprint of the end-to-end beam form section connection on the poured beams.

Other and further objects will be apparent when the specification herein is considered in connection with the drawings in which:

FIG. 1 is a perspective view of a beam form section connection construction as embodied by this invention;

FIG. 2 is a perspective view, part in section, showing the clamp latching construction of this invention applied in latching beam form sections in end-to-end connection;

FIG. 3 is an elevational view of a jack-supported beam section construction and the jack therefor as taken along line 3—3 of FIG. 1 with the clamp structure at such station removed;

FIG. 4 is a sectional elevation taken along line 4—4 of FIG. 3;

FIG. 5 is a perspective view of detail parts of jack post construction;

FIG. 6 is a perspective view of clamp part construction; and

FIG. 7 is a sectional elevation of a modification of beam section construction whereby the clamp imprint is not left in the poured beam.

Referring in particular to the drawings, FIG. 1 shows parallel extending beam sections 11 which are connected by a beam section 12, each beam section being of inverted U cross-section, and the lower beam section 12 connecting the two beam sections 11 by means of lugs 13 thereon which extend through slots 14 in the sides 15 of the beam sections 11 and through which latch connection is made as will be hereinbelow described. Also, there is provided an outermost beam section 16 having a lower part of Z cross-section with a horizontal flange 16' extending from the upper leg thereof to rest on an upright outer support, as a wall 17, and connection is made therefrom to the outermost beam section side 15 by means of lugs 13 also latched as will be hereinbelow described.

Spaces 18 are provided between the adjacent ends of the beam sections 11, 11 and 12, 12 and top strap or clamp members 19 overlap these spaces 18 and have spaced apart slots 22' therein into which lugs 13 are press fitted to extend therebelow. Lower clamp or angle members 21 are positionable below the adjacent beam

section ends to under extend the spaces 18 and such have longitudinally spaced apart slots 22 therein coextensive with and directly below the slots 22' to receive therethrough the lugs 13 which extend first through the slots 22' and then through the spaces 18 before extending through the slots 22. Obviously the structure requiring that the lugs 13 must be press fitted rather than simply fitted resides in the relative widths of the slots 22', spaces 18, and slots 22 and the thickness of the lugs 13, it being well known in the trade of mechanical tolerances that a member to be press fitted may be no less than, or even minutely greater in dimension than the space in the receiving member in to which the member to be press fitted is to be forced with resulting tightest frictional engagement to be obtained.

The angle members 21 are positioned and latched as best shown in FIG. 2, vertical slots 23 being provided in the lugs 13 and latch cams 24 being provided which have arcuate heads 25 having outer eccentric or cam surfaces 26 which bear upwardly against the under sides of the upper legs of the angle members 21 when the handles 27 of the cams 24 are rotated to slide their heads 25 into latching position. A similar latch cam 24 is employed to latch the outermost beam sections 11 to the beam sections 16, and to latch the beam sections 11 to the beam sections 12, as set forth hereinabove.

When the beam section construction is thus latched, and supported from below, as hereinbelow described, concrete is ready to be poured thereupon, and in this respect it is pointed out that the space between the wall 17 and the beam section 16 may or may not be provided as shown, such space being provided if a structural member may later be contemplated to occupy such space or otherwise the vertical leg of the section 16 may abut the wall 17.

Support for the load of poured beam sections may be provided by conventional jacks 26, as shown in FIG. 3 which are provided with actuation means 27 to lift a piston or jack head 28, either by conventional hydraulic lift means, or by mechanical means, as a jack screw. The upper part of the jack is of a composite construction to gain flexibility, and as shown an H-shaped link 29 is rigidly connected to the jack head 28 and thereabove other links 29 are installed one upon the other as indicated in FIG. 5. The uppermost line 29' is modified as shown in FIG. 4, and has a recess 30 therein to receive therethrough a pivot pin 31 to serve as a pivot for the inner ends of spreader rods 32 which have their other and outer ends pivoted on pivots 33 carried by the lowermost parts of the angle members 21 on opposite sides of the jack 26.

Above the top link 29 a three-pronged support or reinforcing member 34 is provided, the base or leg 35 thereof being slotted to be received in the slot in the top of the link 29' and the top of each prong or arm 36 being twisted through 180° and slotted at 37 in the top to receive therein the lower leg of the angle 21, as best shown in FIG. 4.

The angle members 21 are shaped to the configuration of the beam structure to be poured and thus in conformity with the beam sections 11. Thus, with the beam sections 11 and 12 in position and firmly latched in place by the latch cams 24, as they engage the lugs 13 and the angle members 21, and with the jacks 26 in elevated position to force the spreader rods 32 to full extension and the prongs 36 into full angle member engagement, a quickly installed and positive support structure is provided to receive and support concrete beams 37 of the full desired length of a building, the height of the outermost or sideward beam section forms 16 determining the depth of concrete to be poured.

This invention solves a very important problem in

heavy building construction and permits the easy handling of beam section forms since they may be provided in shorter length and easily latched together thereby obviating the heretofore unwieldy and awkward handling of much longer lengths of such forms requiring jacks and supports of the heaviest capacity, together with expensively heavy material handling equipment, as heavy cranes.

The case of disassembly is also obvious it only being necessary to remove the latching cams 24 and lower the jacks, for the whole beam section form structure to be in position to recede out of beam structure engagement, and if sticking occurs, this can be remedied by lightly tapping the forms and then the clamp members 19.

In order to provide a structure in which the indentation of the clamp members 19 may not be left in the beam structure, the ends of the beam forms 11 and 12 may be offset at 38 for the width of the clamp member 19 whereby the top thereof is flush with the top surfaces of the adjacent beam forms 11. Thus, when the concrete is poured the removal of the beam forms 11, 12, along with the clamp members 19 may be easily accomplished.

Broadly, this invention provides a rapidly operated, easily handled, positively operable clamp for beam forms, plates and the like extending in end to end relation, and the disclosure hereinabove may be modified to include variations of the clamp hereinabove described and shown in the drawings, as long as such modification may fall within the broad spirit of the invention and within the scope of the appended claims.

What is claimed is:

1. A clamp as for clamping together longitudinally extending, co-axially spaced apart plates as form sections and the like when said plates are positioned to have aligned upper and lower flat surfaces, said clamp comprising a top strap with a longitudinal axis extending transversely across said plates and overlapping the spacing therebetween, said strap having slots therein longitudinally extending and longitudinally spaced apart positionable over said spacing when said strap overlaps said plates, an angle structure under member with a lower leg extending vertically and with an upper leg to underextend said plates and said spacing and with the lower leg extending downwardly at right angles from one side of said upper leg, said upper leg having slots therein longitudinally extending and of the length of said top strap slots and correspondingly longitudinally spaced apart positionable under said spacing and said top strap slots, latch lugs to extend through said slots and being in transverse cross-section of substantially the length of said slots and of width to be press fitted with force to fit in tight frictional engagement therewith, through said spacing, and through said upper leg slots, and therebelow, each lug having a longitudinally extending slot therein spaced below the top of the lug, a latch cam for each lug including a longitudinally extending handle and an arcuate cam portion extending from an end of said handle and terminating in an end of transverse measurement to permit insertion with clearance through said lug slot below the top thereof, said arcuate cam portion providing a concave surface maintaining contact with said latch lug when said latch cam is rotated following end insertion and providing a convex surface with relation to said under member to contact upwardly with said upper leg and sidewardly with said vertical leg to establish tighter and tighter contact as said latch cam is rotated to a position with its handle extending downwardly and releasably latching said top strap and said under member to clamp said co-axially spaced apart plates.

2. A clamp as for clamping together longitudinally extending, co-axially spaced apart plates as form sections and the like when said plates are positioned to have aligned upper and lower flat surfaces, said clamp comprising a slotted top strap with a longitudinal axis extending transversely across said plates and overlapping the spacing therebetween with said slots positionable over said spacing when said strap overlaps said plates, an angle structure under member with a lower leg extending vertically and with a slotted upper leg to under extend said plates and said spacing and with the lower leg extending downwardly at right angles from one side of said upper leg, said upper leg slots being correspondingly longitudinally spaced apart and positionable under said spacing and said top strap slots, latch lugs to extend through said slots and being in transverse cross-section of substantially the length of said slots and of width to be press fitted with force to fit in tight frictional engagement therewith, through said spacing, and through said upper leg slots, and therebelow, each lug having a longitudinally extending slot therein spaced below the top of the lug, a latch cam for each lug including a longitudinally extending handle and an arcuate cam portion extending from an end of said handle and terminating in an end of transverse measurement to permit insertion with clearance through said lug slot below the top thereof, said arcuate cam portion providing a concave surface maintaining contact with said latch lug when said latch cam is rotated following end insertion and providing a convex surface with relation to said under member to contact upwardly with said upper leg and sidewardly with said vertical leg to establish tighter and tighter contact as said latch cam is rotated to a position with its handle extending downwardly and releasably latching said top strap and said under member to clamp said co-axially spaced apart plates.

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