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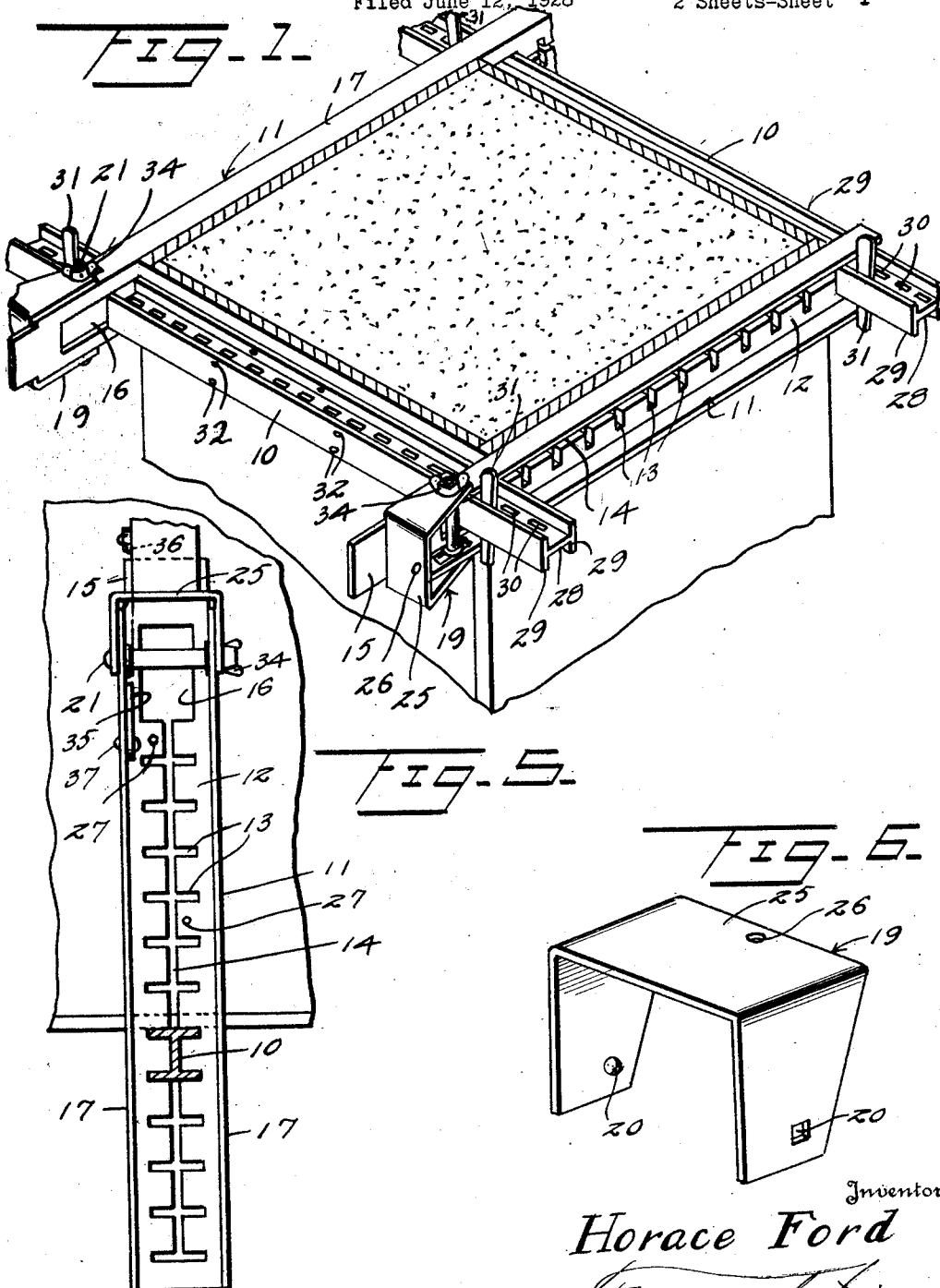
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CONCRETE FORM CLAMP

Filed June 12, 1928

2 Sheets-Sheet 1



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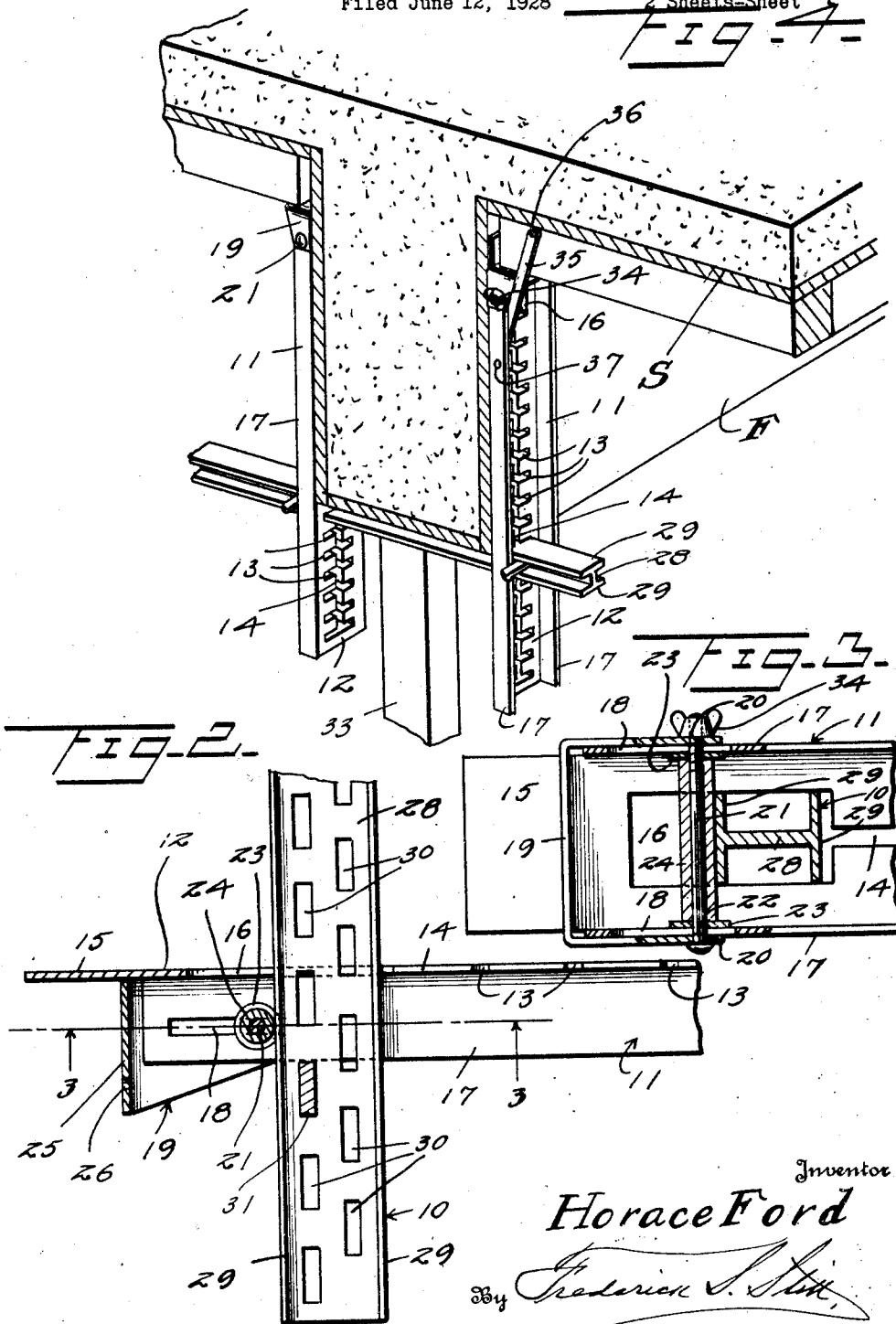
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2 Sheets-Sheet 2



UNITED STATES PATENT OFFICE.

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CONCRETE-FORM CLAMP.

Application filed June 12, 1928. Serial No. 284 737.

This invention relates to concrete form clamps and more particularly to a clamping structure of general use in the formation of beams, columns and pilasters, and has for an important object thereof the improvement of the structure shown in my co-pending application, Serial No. 248,475, filed January 21, 1928, for Concrete form clamps.

More specifically, it is an object of the present invention to improve the structure of the form clamp shown in the application above identified as to the construction of the side members employed therein, so as to enable these side members to be adjusted to compensate for variations in thickness of materials employed or to enable the same to be employed in the construction of odd-sized forms without the use of wedges, blocking or similar expedients.

A further and more specific object of the invention is to provide in a device of this character a construction providing a seat for a supported beam which is adjustable to various positions to compensate for variations in thickness of the material or a variation of the mold form a standard size.

A further object of the invention is to provide in a construction of this character an adjustable beam support, which further provides an adjustment for the end members of the mold, permitting compensation for variations in thickness of the material or size of the mold.

A still further object of the invention is to provide supports for slab mold beams in combination with a beam clamp which is of such character that the slab mold beams need not be accurately cut and may, as a matter of fact, be of less length than the actual distance between the side frames of the beam molds or boxes and at the same time the beam molds and the beams of the slab mold will be securely and firmly held against displacement or dislodgement.

A still further object of the invention is to provide a construction of this character which may be very readily and cheaply embodied in the structure employed in my co-pending application above identified.

These and other objects I attain by the construction shown in the accompanying drawings, wherein for the purpose of illustration is shown a preferred embodiment of my invention and wherein:—

Figure 1 is a perspective view showing mold clamps constructed in accordance with my invention in use to secure a column mold;

Figure 2 is a horizontal sectional view through the engaged portions of end and side members of the clamp when employed in this capacity;

Figure 3 is a section on the line 3—3 of Figure 2;

Figure 4 is a perspective view of the clamp in use for securing coacting elements of beam and slab molds;

Figure 5 is a vertical sectional view showing an elevation of the side member;

Figure 6 is a perspective view of the chair.

Referring now more particularly to the drawings, the clamp comprises elements 10 and 11 which, for the purpose of convenience, may be termed end and side members. The side members comprise channel iron beams which are provided in the web thereof with a plurality of uniformly longitudinally spaced transversely extending slots 13 connected to one another by a centrally disposed longitudinally extending slot 14. At one end, the beam has its flanges cut-away to permit projection of the web, as indicated at 15, and adjacent this end and inwardly of the ends of the flanges, the web is formed with an opening 16 of the same width as the transverse slots 13 and of a length approximating the distance between three of said slots. The flanges 17 of the channel member are provided adjacent the cut-away portions with longitudinally extending slots 18 which are of a length approximately equal to one-half the length of the opening 16 and have their upper ends substantially co-incident therewith.

A chair 19 is provided comprising a U-shaped bracket having in the arms thereof aligned openings 20, one of which is squared. A carriage bolt 21 is inserted through the openings 20 having the squared portion 22 of its shank engaged in the squared opening of the chair 19 whose legs abut the outer faces of the flanges 17 and is further extended through the slots of the flanges in the second opening 20 of the chair. At the inner faces of the flanges 17, washers 23 are mounted upon the bolt and between these washers, a tubular spacer 24 surrounds the bolt. The chair seat 25 has an opening 26 formed therein for the passage of a securing

element and the web 12 of the channel is provided with perforations 27 for the same purpose.

The end members 10 preferably comprise 5 H beams, the webs 28 of which may fit in the slots 14 and the flanges 29 of which are spaced apart a distance such that they may engage in adjacent slots 13 of the channel web 12. The webs are provided adjacent 10 each end thereof with parallel rows of longitudinally extending wedge slots 30, the slots of each row being staggered with relation to the slots of the adjacent row and each of said slots being adapted to receive a 15 tapered wedge key 31. Each flange 29 is formed with perforations 32 for the passage of securing elements, these openings 32 being so spaced that securing elements may be simultaneously directed through a plurality 20 thereof to engage in the upper end of a supporting beam 33 when the device is employed in the formation of a beam.

In employing the device as a column mold, 25 an end member 10 is secured against one side of the mold and two side members engaged therewith by passing the side members over the ends of the end member with the flanges and web of the end member extending through slots 13 and 14 of the side 30 members and slipping the keys 31 in position to engage the side members and prevent their separation from the end members. The second end member is then passed through the openings 16 of the side members 35 and adjusted by shifting the bolts 21 until the end member is firmly clamped against the wall with which it is associated. The bolts are then tightened by means of wing nuts 34. The wedge keys may be then inserted in the end member and all of the 40 wedge keys fully tightened so that the form will be securely held in position. If desired, securing elements may be directed through the openings 27 and 32 of all of the elements 45 of the complete clamp.

It will be observed that by the adjustment afforded by the bolt 21 operating in the slots 18, a closer adjustment may be obtained than would otherwise be possible. For 50 example, if the mold was of standard dimensions but the material employed of improper size, this adjustment will remove any possible necessity for wedges employed between the side and end members and the 55 frame to take up play. As the standard end member employed preferably consists of a two inch H-beam, it will be obvious that there is otherwise only a two inch adjustment to the clamp. If the column is, therefore, an off size, requiring an intermediate 60 inch adjustment, this may be taken care of by the adjustment of the bolt 21.

In employing the device in the formation of a beam, an end member is secured to a 65 support 33 by passing securing elements

through the openings 32 into the end of the beam. The side members are then slipped over opposite ends of the end member with their channels outwardly disposed and secured by keys 31. These side members 70 may be secured to the mold frame F by securing elements extending through the openings 27, if desired. The mold beams supporting the floor slab S are then seated at their ends upon the chair and may be 75 secured thereto by directing securing elements through the openings 26. The beam, after being secured, is then adjusted to the proper level by loosening the bolt 18 and shifting the same vertically until the proper 80 level is reached or this adjustment may be made before the beam is seated upon the chair. As set forth in my prior application, the construction of a pilaster is simply the construction of a beam which is vertically 85 instead of horizontally disposed and the attendant arrangement is identical with that set forth.

For convenience in bracing the beam of the floor slab S, I preferably pivot to the 90 inner face of one flange of the side member adjacent the upper end thereof a brace 35, the free end of which is perforated, as at 36, for the passage of a securing element. 95 This brace, after the beam has been seated in position, is swung about its pivot 37 until it engages against the outer edge of the chair seat 25 before the securing element is inserted through the opening 36 to engage the beam. It will be obvious that since this 100 brace is connected directly to the side member, longitudinal movement of the beam with respect to the side member will be absolutely prevented as well as vertical movement of the beam with respect to this 105 side member. Under these circumstances, it will be obvious that the sides of the box or mold of the beam form cannot shift and there will be no necessity for cross-bracing the mold. This is a decided advantage, in 110 that after these molds are set up, reinforcing iron or steel must be placed in position therein and these cross braces interfere considerably with this installation. It is 115 a further advantage in that it permits use of a beam considerably shorter than the actual distance between the portions 15 of the side members. It will often occur that one panel or slab will be one or two inches longer than similar panels or slabs and with 120 the ordinary structure, it is necessary that separate beams be provided for use therewith and in all cases, there is a slight variation, necessitating cutting of the beam. All of these may be eliminated with the use 125 of a structure such as that just described.

It will be obvious that a device of this character greatly facilitates the operation of setting up the mold and is capable of use in a great many more situations than those il- 130

lustrated. I accordingly do not limit myself either to the specific structure or use of the device as hereinbefore set forth except as hereinafter claimed.

6. I claim:—

1. A concrete form clamp including side and end members for engagement with sides and at least one end of a concrete form, said clamp including end and side members, the end members being of a cross section including a web and a perpendicularly related flange, the side members comprising bars each having a plurality of longitudinally spaced transversely extending slots for the selective passage of the flange of an associated end member, a longitudinally extending slot communicating with all of said transverse slots and adapted for the reception of the web of the end member, each side member having in one end an opening of the same width as the flange of the end members and of greater depth than the end member, and means adjustable upon the side member for engagement with the outer face of an end member directed through said opening.

2. A concrete form clamp including side and end members for engagement with sides and at least one end of a concrete form, said clamp including end and side members, the end members being of a cross section including a web and a perpendicularly related flange, the flange being connected to the web at its center, the side members comprising bars each having a plurality of longitudinally spaced transversely extending slots for the selective passage of the flange of an associated end member, a longitudinally extending slot communicating centrally with all of said transverse slots and adapted for the reception of the web of the end member, each side member having in one end an opening of the same width as the flange of the end members and of greater depth than the end member, and means adjustable upon the side member for engagement with the outer face of an end member directed through said opening.

3. A concrete form clamp including side and end members for engagement with sides and at least one end of a concrete form, said clamp including end and side members, the end members being of a cross section including a web and a perpendicularly related flange, the side members comprising bars each having a plurality of longitudinally spaced transversely extending slots for the selective passage of the flange of an associated end member, a longitudinally extending slot communicating with all of said transverse slots and adapted for the reception of the web of the end member, each side member having in one end an opening of the same width as the flange of the end members and of greater depth than the end member, means adjustable upon the side mem-

ber for engagement with the outer face of an end member directed through said opening, the web of the end member having adjacent each end thereof spaced parallel rows of longitudinally extending openings, the openings of each row being staggered with relation to the openings of the other row and webs engageable in said openings and adapted to engage one face of an associated side member.

4. A concrete form clamp including an end member H-shaped in cross section and channel iron side members, the webs of the channel iron side members having at one end longitudinally spaced transversely extending slots for the passage of the flanges of the H and a longitudinally extending slot connecting adjacent transverse slots for the reception of the web of the H, the opposite ends of the side members having openings of greater depth than the H and of the same width thereas, and means adjustable upon the side members for engaging the outer face of an end member engaged therein.

5. A concrete form clamp including an end member H-shaped in cross section and channel iron side members, the webs of the channel iron side members having at one end longitudinally spaced transversely extending slots for the passage of the flanges of the H and a longitudinally extending slot connecting adjacent transverse slots for the reception of the web of the H, the opposite ends of the side members having openings of greater depth than the H and of the same width thereas, the flanges of the side members at said ends being longitudinally slotted for the passage of a bolt, said bolt being adapted to engage the outer face of a second end member extended through said openings.

6. A concrete form clamp including an end member H-shaped in cross section and channel iron side members, the webs of the channel iron side members having at one end longitudinally spaced transversely extending slots for the passage of the flanges of the H, a longitudinally extending slot connecting adjacent transverse slots for the reception of the web of the H, the opposite ends of the side members having openings of greater depth than the H and of the same width thereas, the flanges of the side members at said ends being longitudinally slotted for the passage of a bolt, said bolt being adapted to engage the outer face of a second end member extended through said openings, and a chair secured to said bolt and adjustable therewith.

7. A concrete form clamp including side and end members for engagement with sides and at least one end of a concrete form, said clamp including end and side members, the end members being of a cross section including a web and a perpendicularly related flange, the side members comprising bars

each having a plurality of longitudinally spaced transversely extending slots for the selective passage of the flange of an associated end member, a longitudinally extending slot communicating with all of said transverse slots adapted for the reception of the web of the end member, and means at corresponding ends of the side members affording transversely extending seats projecting outwardly from the side member, and adjustable longitudinally of the side members.

8. A concrete form clamp including side and end members for engagement with sides and at least one end of a concrete form, said clamp including end and side members, the end members being of a cross section including a web and a perpendicularly related flange, the side members comprising bars each having a plurality of longitudinally spaced transversely extending slots for the selective passage of the flange of an associated end member, a longitudinally extending slot communicating with all of said transverse slots adapted for the reception of the web of the end member, means at corresponding ends of the side members affording transversely extending seats projecting outwardly from the side member for the reception of the end of a beam and a brace pivoted to the side member and swingable about the pivot thereof to engage the outer edge of the associated seat and adapted to be secured to a beam disposed upon said seat.

9. A concrete form clamp including an end member and side members having perforations at one end through which the end member may be directed and in which the end

member fits, means for securing the side members in adjusted positions upon the end member, chairs upon the opposite ends of the side members and adjustable longitudinally of the side members and adapted to receive the ends of beams, and braces pivoted to said side members and swingable to simultaneously engage the chair and the beam supported thereby, said braces being adapted to be secured to the beam and when secured thereto preventing relative movement of the beam and side member.

10. A concrete form clamp including end and side members, the side members having openings for the passage of the end members at one end which fit the end members and at the opposite end openings for the passage of the end members permitting adjustment of the end members longitudinally of the side members, and a member adjustable longitudinally of each side member for engaging an end member directed through the last named opening thereof.

11. A concrete form clamp including end and side members, the side members having openings for the passage of the end members at one end which fit the end members and at the opposite end openings for the passage of the end members permitting adjustment of the end members longitudinally of the side members, a member adjustable longitudinally of each side member for engaging an end member directed through the last named opening thereof, and a beam chair carried by the longitudinally adjustable member of each side member.

In testimony whereof I affix my signature.

HORACE FORD.