July 15, 1952 A. E. TROIEL 2,602,983

WALL OPENING FORM

Filed Sept. 30, 1947 2 SHEETS—SHEET 1

Fig. 1.

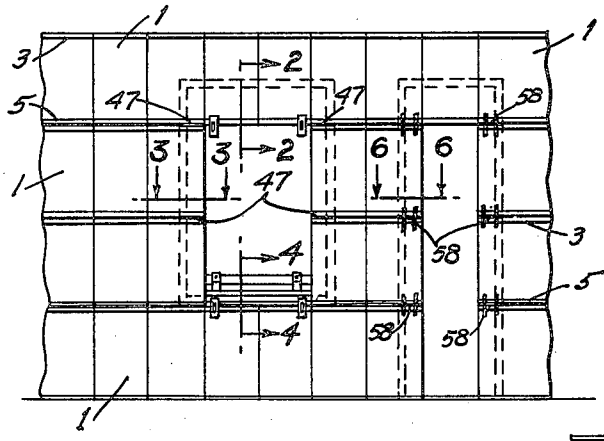
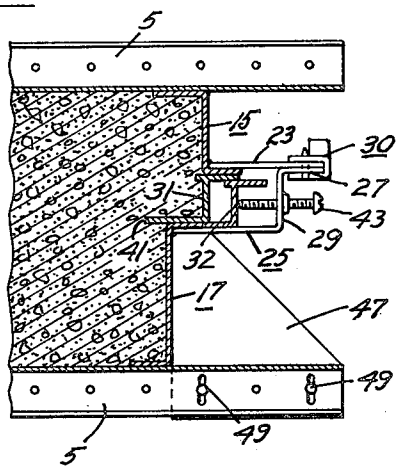


Fig. 3.



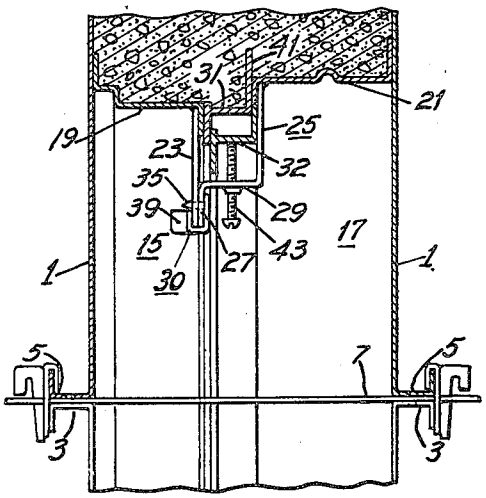


Fig. 2.

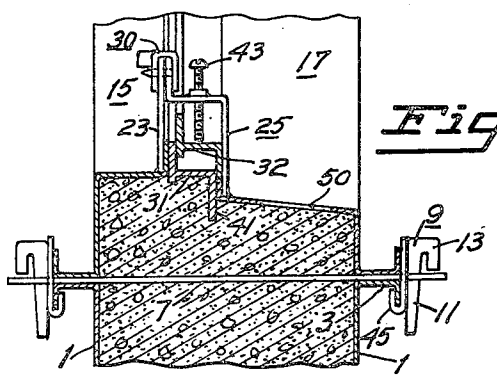


Fig. 4.

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WALL OPENING FORM

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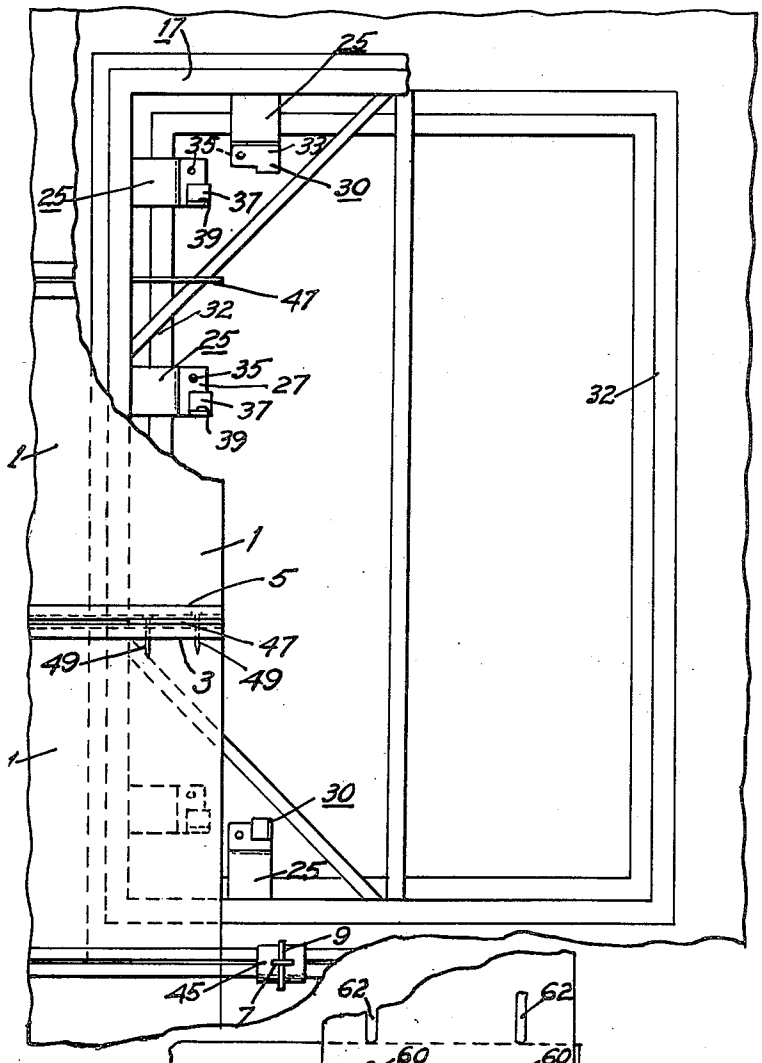


Fig. 5.

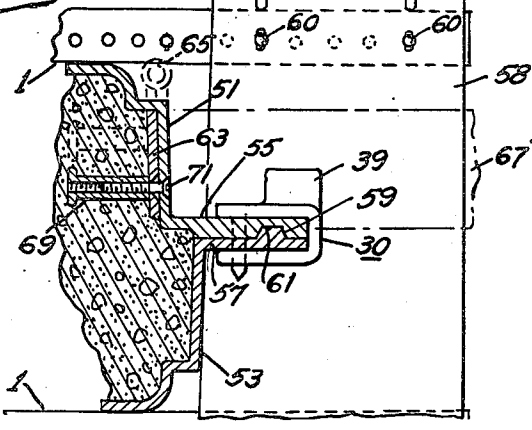


Fig. 6.

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Patented July 15, 1952

2,602,983

UNITED STATES PATENT OFFICE

2,602,983

WALL OPENING FORM

Arthur E. Troiel, Berkeley, Calif.

Application September 30, 1947, Serial No. 777,064

6 Claims. (Cl. 25—131)

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My invention relates to wall forms, and more particularly to forms for wall openings such as windows and doors, in walls cast with concrete or the like.

Among the objects of my invention are:

(1) To provide a novel and improved wall opening form for use in pouring of concrete walls;

(2) To provide a novel and improved form for determining window and door openings in a cast wall of concrete or the like;

(3) To provide a novel and improved form for casting a wall of concrete or the like with the window sash in place;

(4) To provide a novel and improved form for forming door openings in a cast wall, with hinge-anchoring means embedded therein.

Additional objects of my invention will be brought out in the following description of a preferred embodiment of the same, taken in conjunction with the accompanying drawings wherein—

Figure 1 is a front elevational view of a wall form including the wall opening forms of the present invention;

Figure 2 is a view in section taken in the plane 2—2 of Figure 1;

Figure 3 is a view in section taken in the plane 3—3 of Figure 1;

Figure 4 is a view in section taken in the plane 4—4 of Figure 1;

Figure 5 is a fragmentary front elevational view of a window opening form installed in a wall form;

Figure 6 is a view in section taken in the plane 6—6 of Figure 1.

The present invention is pertinent to the wall form constituting the subject matter of my patent for "Form for Plastic Structural Work," No. 2,017,553 of October 15, 1935.

Such wall form, basically, comprises a plurality of sheet steel panels 1, having their top and bottom edges each bent to an L-shaped flange 3 and 5, respectively, with perforations in such flange at intervals of the order of an inch or so. In setting up a form utilizing such panels, the lowermost opposing panels are first placed in position, back to back in spaced relationship determined by the desired thickness of wall to be cast. Tie members 7 are then laid across the tops of these panels and the second row of panels then set upon the tie members in the planes of the lower panels.

Such tie members each consist of a strap-shaped piece of metal having perforations therein for alignment with the perforations in the channels of the panels so that a bent nail or pin

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may be inserted to prevent movement of the tie members with respect to the panels. The tie members are of sufficient length to extend beyond the flanges of the panels and are provided at their exposed ends with slots to receive anchoring wedges 9.

Such anchoring wedges consist of a flat piece of metal having a wedge-shaped elongated prong 11 terminating at its upper end in a hook 13. In applying an anchoring wedge in the assembling of the wall form of my aforementioned patent, the long prong is inserted through the slot of a tie member with the hook end of the anchoring wedge embracing the upturned edge of the bottom channel of the upper panel with which the anchoring wedge is associated.

The wall opening forms of the present invention have been designed primarily for installation in the above type of wall form.

The window frame form comprises an inside frame 15 and an outside frame 17, the inside frame including an inside edge-shaping section 19, while the outside edge frame includes an outside edge-shaping section 21.

At similarly spaced points about each frame and projecting inwardly thereof are flange means in the form of flange plates 23, 25, each welded to its associated frame. Those, 23, on the inside frame are preferably planar while those, 25, on the outside frame are each formed with an offset 27 and an offsetting wall 29 whereby when the frames are assembled with the flange plates abutting, the inner and outer edge-shaping sections will be spaced from each other sufficiently to receive a window supporting frame 31 with window panels 32 already installed therein.

The abutting flange plates have aligned perforations for use in locking the two frames together to constitute the form.

For locking the frames together, I may utilize a locking means 30 of my aforementioned patent, which involves a device including a flat plate 33 provided with a pin 35 extending laterally therefrom, such plate having an extension 37 bent around parallel to the plate proper. This bent-over extension carries an integral lateral tab 39 to serve as an operating handle.

In employing such locking means, the pin is first inserted through aligned perforations of abutting flange plates and then pivoted thereon to embrace the abutting flange plates between the plate and the bent-over extension of the locking means.

Prior to assembling and locking such frames to

constitute the window form, the window supporting frame 31 which is preferably of metal with the window panels 32 suitably hinged therein, is placed between the frames, the window supporting frame having an outside border flange 41 extending into the mold, to be embedded in the concrete when poured, while the thickness of the window supporting frame is sufficient to substantially close the opening between said frames along the inner edges thereof.

Inasmuch as one window supporting frame may vary slightly in dimensions from other similar frames and must be properly and symmetrically centered with respect to the form, to assure proper installation, I provide at spaced points in the offsetting walls 29 of the flange plates of the outside frame, adjusting screws 43 whereby the vertical and lateral position of the window supporting frame and its associated window panels, may be quickly adjusted and fixed and thereafter held rigidly in position during the pouring and setting of the concrete.

Upon removal of the form, the window supporting frame will be firmly anchored in the wall structure.

In building up the wall form to include the above-described window frame form, the window frame form is set in position upon previously installed wall panels, with one or more tie members extending to the front and rear of the window frame form adjacent the lower or sill end thereof. To anchor the sill end to the adjacent wall form panels on which the window frame form rests, I provide a hook 45 formed by bending over an end of the strip of metal, and in the stem of the hook, a slotted opening is formed to permit of passage of a tie member therethrough.

Such hook, where used, engages the downturned edge of the supporting panel, and the tie member is passed through the slotted opening, following which, an anchor wedge is driven into the opening in the protruding end of the tie member, with the back edge of the wedge against the hook. With one or more of these anchoring means at each side of the window frame form, the frame becomes firmly anchored along its lower end.

In building the wall form from this point up, the wall form panels are caused to overlap the vertical sides of the window frame form but preferably do not extend across the window frame opening. In order to anchor the window frame form to these overlapping wall form panels, there is welded to each vertical member of the outside frame, horizontally projecting plates 47 coinciding in elevation with the seams between the vertically-positioned wall form panels, such projecting plates being thus adapted to fit between such panels. These plates are perforated, such that selected perforations can coincide with those in the panel channels, and by passing a large nail or pin 49 through such aligned openings, substantial anchoring of the window frame form to these wall form panels is realized.

Toward the upper end of the window frame form, the row of panels is extended across the form to either side thereof. Hooks 45 are hung from the lower channels of these panels and carry tie members which pass through the opening of the frame form. Anchoring wedges through the ends of the tie members complete the anchoring of the form at its upper end.

From the above-described manner of mounting the window frame form in the wall form, a very rigid and strong tie-in is realized, sufficient to withstand the expanding stresses developed in the pouring of the concrete into the form.

An opening 50 in the sill portion of the window frame form permits visual access to the interior of the form for inspection purposes, particularly during pouring of the concrete.

The door forms are basically similar to the window frame forms described above but of somewhat simpler design, in that no problem is involved comparable to that of casting into the wall, of a window supporting frame.

The door forms, therefore, may comprise merely two frames, namely, an inside frame 51 and an outside frame 53, with integral matching flanges 55 and 57, respectively, which are similarly perforated at spaced points to permit of locking the two frames together through the use of such locking means as has previously been described. A bead 59 along one flange and a complementary groove 61 along the other provide an interlock to preclude escape of concrete between the flanges during pouring and thereby facilitating the application of a finishing coat after the form is removed, if a finishing coat is to be applied.

The door form is anchored to the wall form in a manner similar to that described in connection with the installation of the window frame form, but in lieu of utilizing integral horizontal plates corresponding to the plates 47 of the window frame form, I prefer to utilize independent plates 58 of a length sufficient to overhang the parallel spaced wall form panels when placed thereon. A central edge notch permits the plate to straddle the matching flanges 55 and 57 and in such position, the plate is held against sidewise displacement by a pair of nails 60 which are dropped through holes in the plate, such holes being spaced to match holes in the panel channels.

The overhanging ends of each plate have slots 62 to receive anchoring wedges 9 to clamp the parallel spaced wall form panels against separation under the lateral pressures developed when the form is poured.

Following the pouring of the form and the subsequent removal of the door form frames, a wall opening for the installation of a door, will be available, having a pleasingly contoured edge or rim, and suitable door jam, all molded of concrete.

At the hinge locations in the inside frame, there is affixed against the inner surface, a form plate 63 comparable in area to a hinge plate of a conventional door hinge. Such affixed plate will form a recess in the jam of the door opening, sufficient to receive one plate of the hinge 65 on which a door 67 is to be hung. The edges of this form plate are slightly beveled to facilitate removal from the concrete, when the door frame form is removed.

In order that such door hinges may be strongly anchored to the door jam, I provide internally threaded tubular anchoring means 69 to be embedded in the door jam at points corresponding to the screw holes in the hinge. These anchoring means are held in proper position against the form plate 63 by machine screws 71 extending through the form plate and threadedly engaging such anchoring means.

Upon removal of these screws following the pouring of the form and the setting of the concrete, the door form frames may be removed, leaving the hinge-anchoring means effectively embedded in the door jam. Thereafter it becomes a simple matter to bolt a hinge thereto and hang a door.

From the above description of my invention in its preferred form, it will become apparent that the same fulfills all the objects of my invention as previously recited, and while I have disclosed the illustrated embodiment of my invention in considerable detail, the same may be subject to alteration or modification without departing from the fundamental principles of my invention. I, accordingly, do not desire to be limited in my protection to such specific details, except as may be necessitated by the appended claims.

I claim:

1. A wall opening form for a concrete or the like wall form, comprising an inside frame of cross-sectional shape determining the inside edge of such wall opening, an outside frame of cross-sectional shape determining the outside edge of such wall opening, and means for removably locking such frames together about the inner periphery thereof, said means involving flanges extending inwardly from said frames with corresponding flanges in contact with each other, and a plurality of locking means embracing said flanges and holding them in such contact with each other.

2. A wall opening form for a concrete or the like wall form, comprising an inside frame of cross-sectional shape determining the inside edge of such wall opening, an outside frame of cross-sectional shape determining the outside edge of such wall opening, and means for removably locking such frames together about the inner periphery thereof, said means involving flanges extending inwardly from said frames, said flanges having aligned perforations therethrough, and a plurality of locking means embracing said flanges and having supporting pins through such aligned openings.

3. A wall opening form for a concrete or the like wall form, comprising an inside frame of cross-sectional shape determining the inside edge of such wall opening; and outside frame of cross-sectional shape determining the outer edge of such wall opening; means for removably locking such frames together about the inner periphery thereof, said means involving flange means extending inwardly from said frames with corresponding flanges in contact withe each other, the flange means of at least one of said frames including offsets and associated offsetting walls to provide separation between said frames when the flange means thereof are in abutment; and means for adjustably supporting a window supporting frame in the space between said frames.

4. A wall opening form for a concrete or the like wall form, comprising an inside frame of cross-sectional shape determining the inside edge of such wall opening; an outside frame of cross-sectional shape determining the outer edge of such wall opening; means for removably locking such frames together about the inner periphery thereof, said means involving flange means extending inwardly from said frames, the flange means of at least one of said frames including offsets and associated offsetting walls to provide separation between said frames when the flange means thereof are in abutment; and means including a plurality of screws threaded through said offsetting walls for adjustably supporting a window supporting frame in the space between said flange means, said window supporting frame being of a thickness sufficient to substantially close the opening between said frames along the inner edges thereof.

5. A wall opening form for a concrete or the like wall form, comprising an inside frame of cross-sectional shape determining the inside edge of such wall opening; an outside frame of cross-sectional shape determining the outer edge of such wall opening; means for removably locking such frames together about the inner periphery thereof, said means involving flange means extending inwardly from said frames with corresponding flanges in contact with each other, the flange means of at least one of said frames including offsets and associated offsetting walls about the frame to provide separation between said frames when the flange means thereof are in abutment; and means adjustably supporting a window supporting frame in the space between said flange means, said window supporting frame being of a thickness sufficient to substantially close the opening between said frames along the inner edges thereof and having an anchor flange extending into the space between said frames.

6. A wall opening form for a concrete or the like wall form, comprising an inside frame of cross-sectional shape determining the inside edge of such wall opening; an outside frame of cross-sectional shape determining the outer edge of such wall opening; means for removably locking such frames together about the inner peripheries thereof, said means involving a flange means extending inwardly from said frames with corresponding flanges in contact with each other, the flange means of at least one of said frames including off-sets and associated off-setting walls to provide separation between said frames when the flange means thereof are in abutment; and means for adjustably supporting a window supporting frame in the space between said frames, said means including a plurality of adjustable screws mounted on and passing through said offsets at spaced locations around the inner peripheries of said frames.

ARTHUR E. TROIEL.

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The following references are of record in the file of this patent:

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