March 12, 1929. C. R. LEAGUE 1,704,898

CONCRETE FORM SYSTEM

Filed Feb. 26, 1927 4 Sheets-Sheet 1

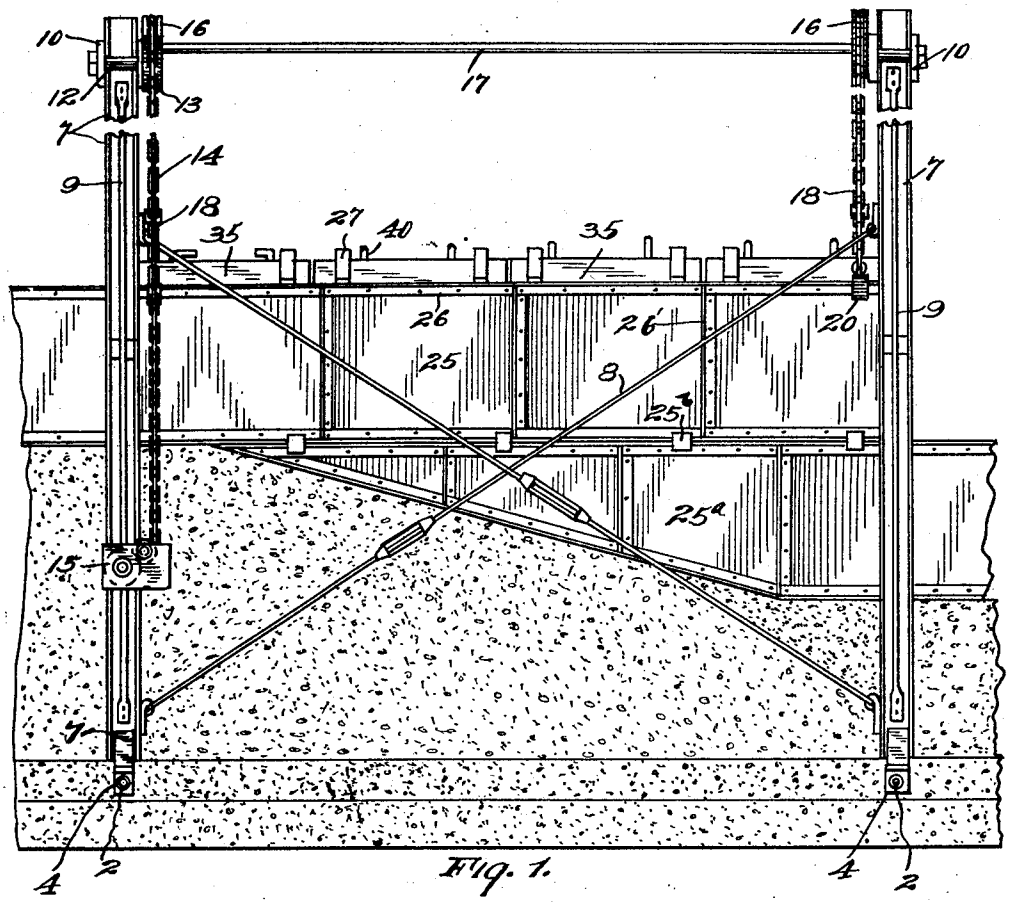


Fig. 1.

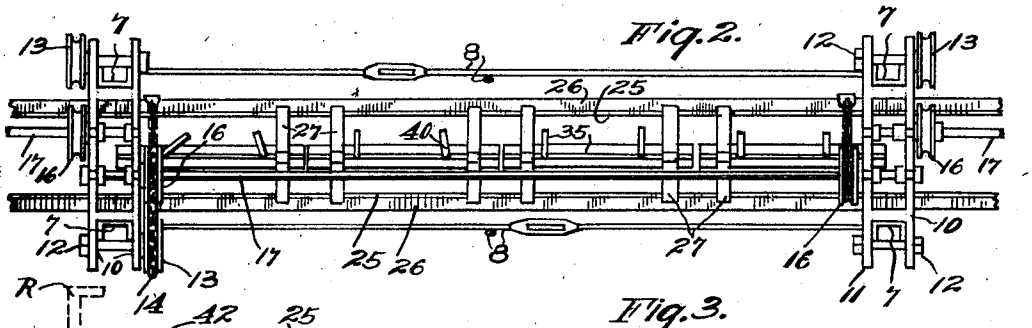


Fig. 2.

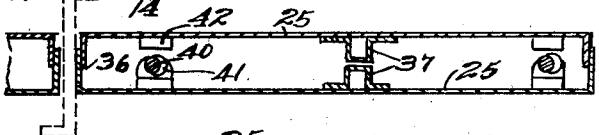


Fig. 3.

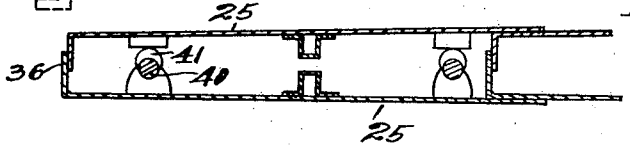


Fig. 4.

INVENTOR;
C. R. League,
BY R. E. Maynard
ATTORNEY.

March 12, 1929. C. R. LEAGUE 1,704,898

CONCRETE FORM SYSTEM

Filed Feb. 26, 1927 4 Sheets-Sheet 2

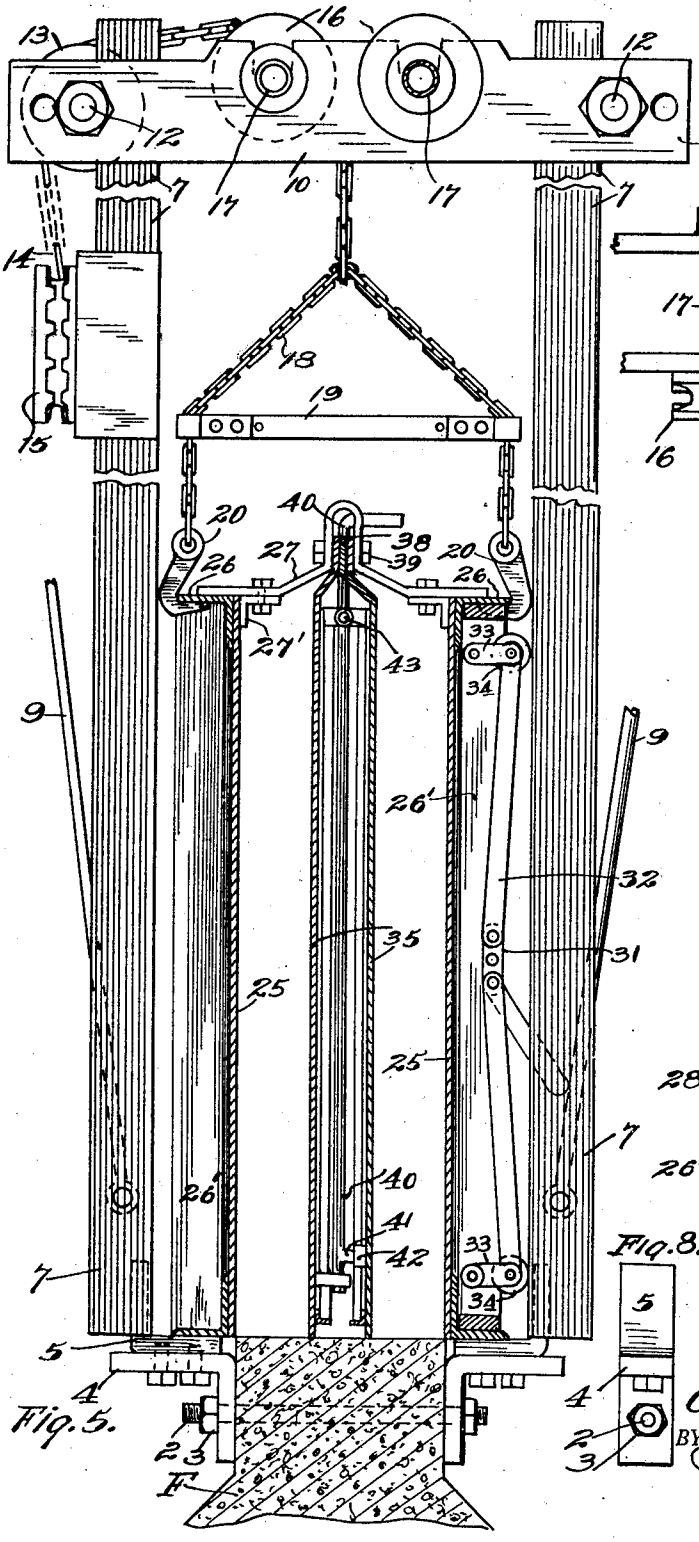
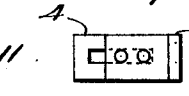


Fig. 5.

Fig. 8A.



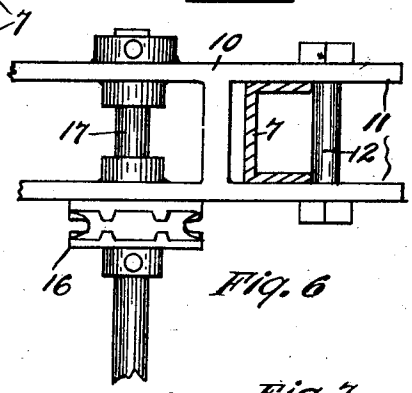


Fig. 6

Fig. 7.

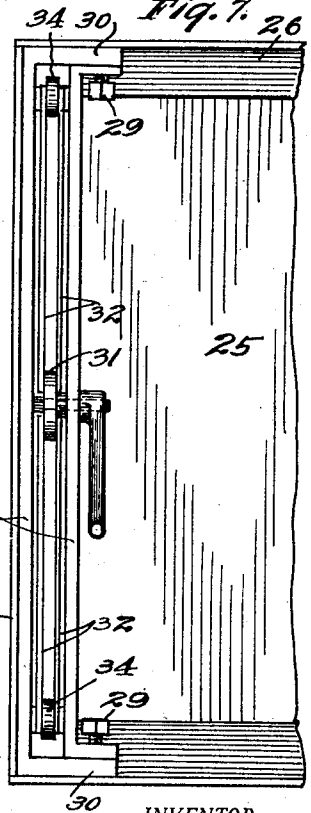


Fig. 8.

INVENTOR;
C. R. League;
BY F. E. Maynard,
ATTORNEY.

March 12, 1929. C. R. LEAGUE 1,704,898

CONCRETE FORM SYSTEM

Filed Feb. 26, 1927 4 Sheets-Sheet 3

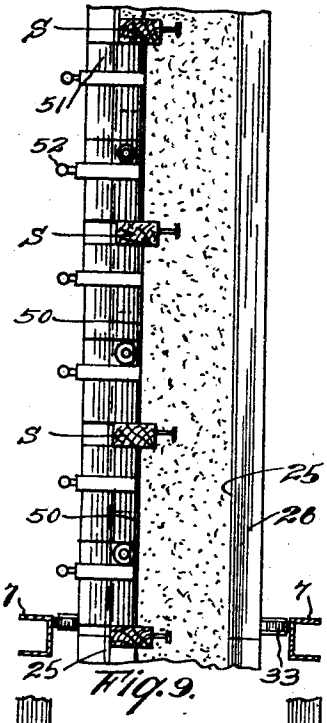


Fig. 9.

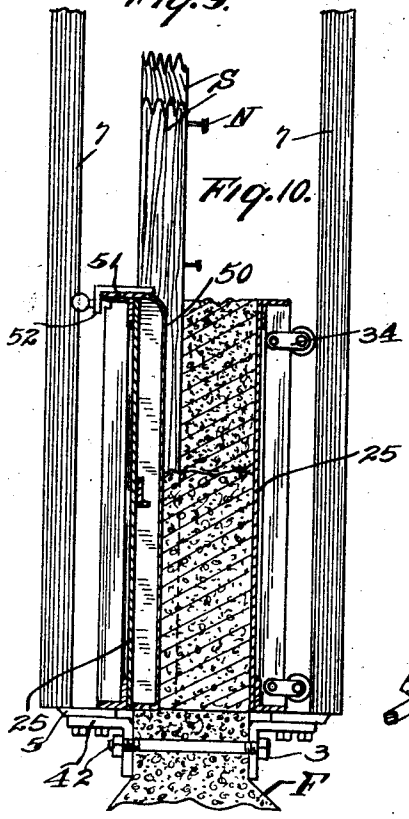


Fig. 10.

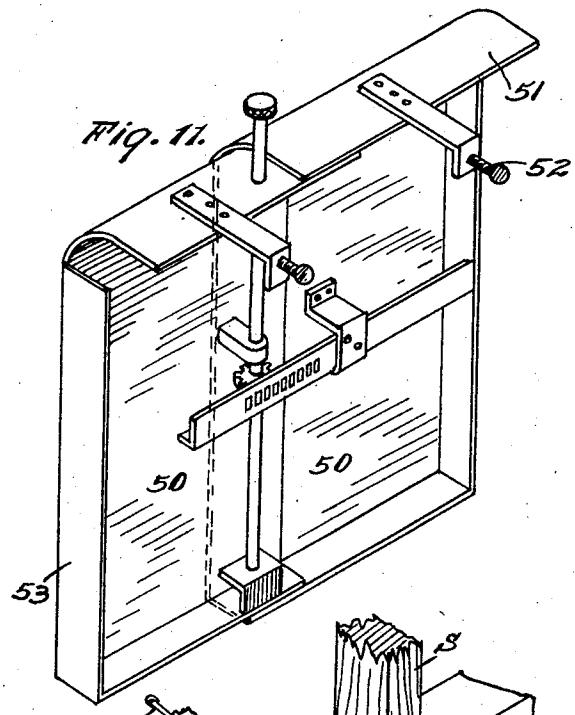


Fig. 11.

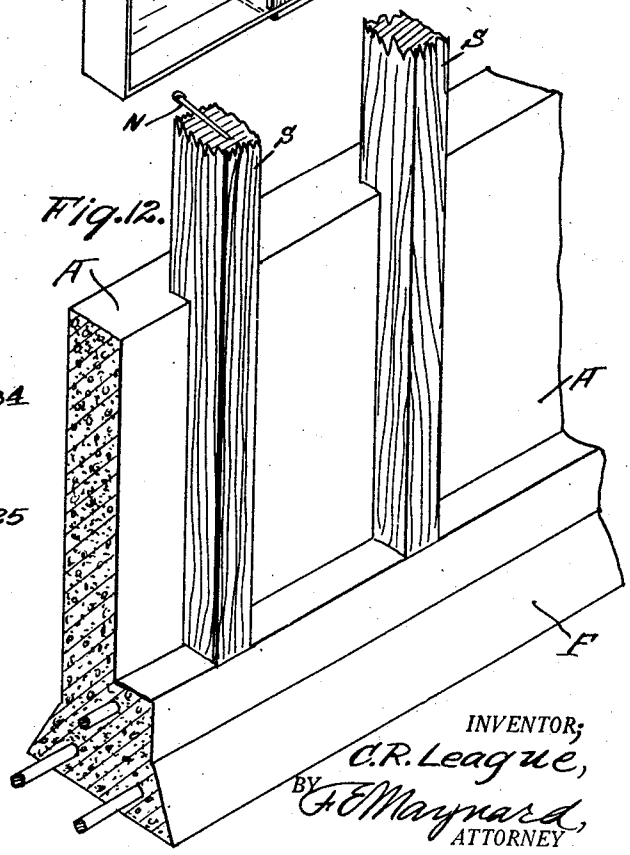


Fig. 12.

INVENTOR;
C. R. League,
BY
G. E. Maynard,
ATTORNEY

March 12, 1929. C. R. LEAGUE 1,704,898

CONCRETE FORM SYSTEM

Filed Feb. 26, 1927 4 Sheets-Sheet 4

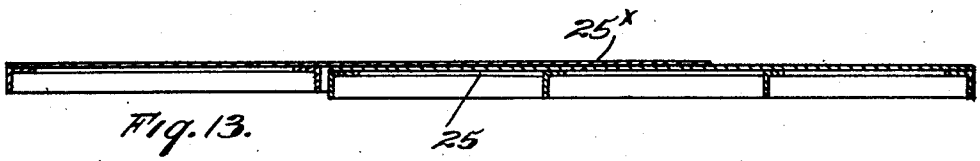


Fig. 13.

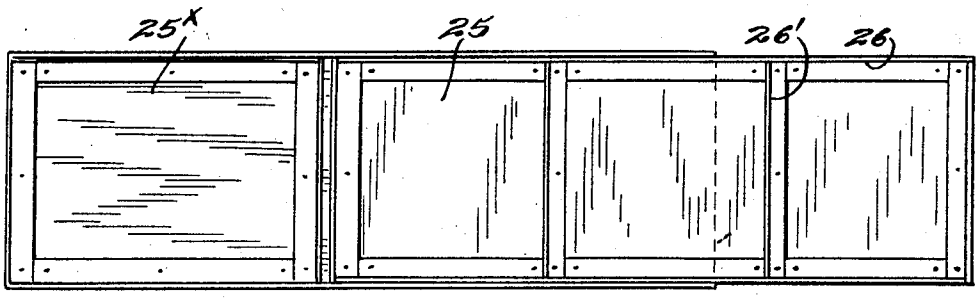


Fig. 14.

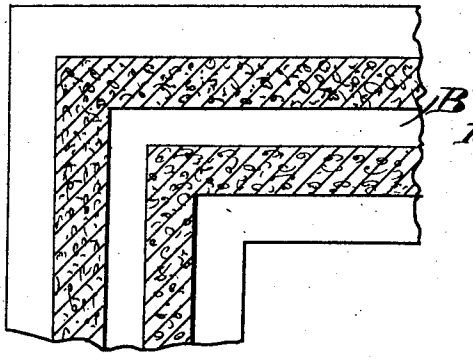


Fig. 15.

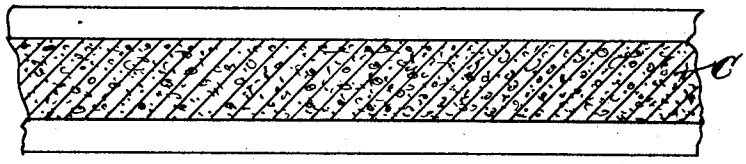


Fig. 16.

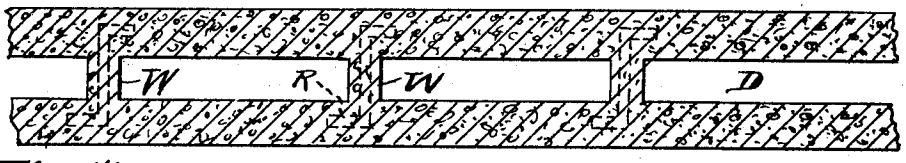


Fig. 17.

INVENTOR;
C. R. League,
BY
F. E. Maynard
ATTORNEY.

Patented Mar. 12, 1929. 1,704,898

UNITED STATES PATENT OFFICE.

CHARLES R. LEAGUE, OF LOS ANGELES, CALIFORNIA.

CONCRETE-FORM SYSTEM.

Application filed February 26, 1927. Serial No. 171,231.

This invention relates to wall structures and to apparatus for facilitating the building of the same.

An object of the invention is to provide a bodily portable form system employing a set of standards for staying mutual, adjustable steel forms, and to provide means on the standards for effecting a vertical adjustment of units of the forms as the wall body is built up by poured plastic material.

A further object is to provide a form system by the use of which several types of wall bodies may be readily erected, and also enabling the production of walls of diverse thicknesses.

Additional objects, advantages and features will be made manifest in the following specification of the herewith illustrated embodiment of the invention; it being understood that modifications, variations and adaptations may be resorted to within the spirit, scope and principle of the invention as it is hereinafter more directly claimed.

Figure 1 is a side elevation of the apparatus in use.

Figure 2 is a plan of the apparatus of Fig. 1.

Figure 3 is a horizontal section of the mold cores arranged for forming cross-reinforced hollow wall.

Figure 4 shows form cores arranged to produce a continuous wall cavity.

Figure 5 is a vertical cross-section of the apparatus as employed to form a hollow wall, parts being broken to indicate indefinite length.

Figure 6 is a top plan of a part of a crown block.

Figure 7 is a detail of an end portion of one panel unit and showing its releasing toggle.

Figure 8 is a face view of a column stirrup.

Figure 8[a] is a plan of the stirrup.

Figure 9 is a plan of the apparatus set for erecting an embedded-stud wall.

Figure 10 is a section of the apparatus of Fig. 9.

Figure 11 is a perspective of a mask panel.

Figure 12 is a perspective of a fragment of an embedded-stud wall.

Figures 13 and 14 are a section and an elevation of an extensible mold panel.

Figure 15 is a horizontal section of a fragment of a cast wall having a continuous chamber between inner and outer bodies.

Figure 16 is a horizontal section of a solid cast wall, and

Figure 17 is a plan of a cross-webbed wall.

My present invention is designed to be useful in the casting of several types of wall bodies A, B, C, and D illustrated in Figs. 12, 15, 16 and 17 and the method of casting such walls will be made clear in the following exposition of the apparatus.

Assuming that a wall is to be cast upon a set foundation F this is provided at suitable points with stout dead-bolts 2 on the projected ends of which are securely clamped, under nuts 3, angle brackets 4 having adjustably secured on their top flanges, upturned horns 5.

Mounted on and positioned by these horns is an outer and an inner series of standards 7 of any desired height as determined by the height of the proposed wall. The standards may be of steel angle or channel iron stock and when stood on the horns 5 are in a given spaced position from each other transversely of the foundation. Contiguous pairs of the standards, along the wall, are trussed up by diagonal ties 8 and each standard has an up and down truss 9.

Transversely opposite pairs of the standards are solidly secured by top crown-blocks 10 having open-end cheeks 11 embracing the standards and being clinched thereon by bolts 12, at any desired height. Certain of the bolts 12 have loose wheels 13, Fig. 1, to each receive a respective haul chain 14 passing up from its winch 15 which is mounted at arm height on its standard 7. Each chain 14 extends into its sprocket 16 which is secured on a counter shaft 17 whose ends are mounted in adjacent blocks 10. Each block supports two shafts 17; these being laterally offset so that the haul chains pass down centrally between the shaft line and hitch onto bails 18 having longitudinally adjustable spreaders 19 to regulate the distance of hooks 20 on the ends of the bails. The apparatus, just described, constitutes a readily erectable, mold supporting frame and mold adjusting means including the hooks 20.

The mold means includes an outer series and an inner series of panel units of desired sizes and shapes determined by proposed wall styles and dimensions. Each panel includes a steel face plate 25 having outside stiffening borders 26 and bracing bars 26′, of suitable

shape. These panels 25 are stood on the brackets 4—5 in spaced relation and the top flanges of the borders 26 are grappled by the tackle hooks 20, by which the panels 25 are lifted evenly from one stage to the next by rotation of the respective counter shaft 17 as the wall filling proceeds.

The tops of the panels are firmly spaced apart by spreaders or saddles 27 having adjustable lugs 27′ setting against the panels.

Means are provided to buttress the panels against outward pressure and also to relieve the panels from the cast wall when this has sufficiently set. This means includes a vertical jack frame 28, Fig. 7, having set screws 29, in top and bottom lugs 30, to bind against the panel flanges 26 and removably hold the frames in place. In the frame 28 is a toggle lever 31 having links 32 extending to top and bottom thrust levers 33 which may have rollers 34 to bear out against the adjacent faces of the near standards 7. After the form has been filled and the cement has set then the levers 31 are thrown so as to release the rollers 34 and loosen the panels for elevation by the tackle 18.

Figure 5 shows the system with an interior core device utilized when a hollow wall is to be cast. This core includes opposite, spaced plates 35 whose vertical edges have overlapping lips 36, Fig. 3, but when desired only one end may be lipped as in Fig. 4 as when forming a continuously hollow wall B, Fig. 15. The plates have intermediate reinforcements 37 and their upper edges are overseamed at 38 and connected by bolts 39 to the saddles 27. The plates 35 are relatively collapsible to facilitate extraction from the cast wall. A cam shaft 40 is journalled on one plate and its cam 41 is turnable to jam against a block 42 on the opposite plate. The plates may be pivotally connected at 43.

If it is desired to form a solid body wall C, Fig. 16, the core devices are omitted and the plastic material then fills the form from panel to panel.

When it is desired to build a cross-webbed wall D, Fig. 17, the cores 35 are spaced endwise a distance determined by the desired web W, and reinforcing bars R may be laid between the core ends.

In Figs. 9 to 12 inclusive, there is shown a very practical wall, and means and method for its creation. In this system the standards 7 are set up as above described and the panels 25 are arranged in position therebetween as stated. Wood studs S are now spaced along on the foundation F at the desired pitch on centers. False panels 50 are set in place along one series of the mold panels and their ends are closed up tight against the contiguous studs S, which protrude inwardly from the panels 50 so as to be embedded in the cast material. Thus, one side of the mold is a continuous panel face of units 25 and the other is made partly by the false panels 50 and partly by the protruding studs S. The studs may have nails N extending inwardly to bind in the plastic fill and to support reinforcing rods or wires if desired.

The tops of the false-panels 50 have outturned rims 51 with clamp hooks 52 to bind on the panel flanges 26, and the outer faces of the members 50 have stiffening flanges 53 which also serve as stops to bear against the set panels 25. After the first course of plastic material has set somewhat the studs become fixed and the movable panels are lifted by the tackle to the next stage along the studs.

The panels 25 may be of uniform course level along a wall or, as in Fig. 1, the panels may be stepped vertically. In such case an irregular or triangle panel 25^a is attached by clips 25^b to the next higher panel thus forming a step from an upper course to one below along the wall.

From the above it will be seen that I have provided knockdown, portable wall-mold apparatus which can be compactly stacked for transportation from job to job, for repeated set up and use for wall casting; provision being made for adjustment of the elements for casting walls of different thicknesses and different types.

In Figs. 13 and 14 there is shown applied to a mold unit 25 over which is an adjustable or telescopic section 25^x whose face panel slides over the face of the unit 25 to vary the effective length of the combined parts as may be desired according to wall requirements.

What is claimed is:

1. A wall casting system including side panels to form a mold, demountable standards to support the panels when set up, crown-blocks cross connecting opposite standards, counter-shafts extending from one block to the next, and hoist tackle connected to said shafts and grappling the mold panels.

2. A wall casting system including side panels to form a mold, standards to support the set up panels, crown-blocks having shafts reaching between respective pairs of blocks and provided with panel lifting tackle, and winches attached to given standards for respective shafts.

3. A wall molding apparatus including opposed sets of standards, adjustable base supports on which the standards rest, overhead tackle blocks cross-connecting paired standards, tackle shafts extending from one block to the next, and mold forming means disposed between the sets of standards and tackle connecting the said shafts and said means.

4. A wall mold including an overhead crossing member having slotted ends, standards mounted in the slots and adjustably secured by said member, and side panel units supported between and by said standards.

5. A wall mold including overhead cross-

ing members, standards adjustably secured at the tops by said members, side panel units disposed and supported between and by said standards, cross saddles spacing said units, and a collapsible central core means attached to the saddles and being liftable thereby with the side units.

6. A wall mold including laterally spaced and adjustable wall panels, standards buttressing the panels, inside false-panels secured in end spaced position along one set of panels, and wood studs inset in the spaces between the ends of the false panels and protruding inwardly therefrom so as to be partly embedded in the cast wall.

7. A wall mold including side wall panels, means to support the panels upright, wood studs stood in the mold space, and side-wall false panels setting endwise against the sides of the studs and from which the latter protrude inward.

8. A wall mold apparatus including a set of wall studs, spaced sets of mold panels and means to support the panels, one set of the panels alining with the stud set with its panels abutting endwise against the stud sides and exposing portions of the studs so that they will be embedded in the cast body.

9. The method of erecting a cast wall which includes setting up mold panel sets in spaced opposition, spacing the near ends of the panels of one set, and standing studs in the spaces at the spaced ends so as to protrude into the chamber of the mold, and casting plastic material into the mold to embed the exposed portions of the studs.

CHARLES R. LEAGUE.