May 20, 1924. 1,494,538

O. L. GENT

CONCRETE MOLD

Filed Jan. 5, 1923 3 Sheets-Sheet 1

Fig. 1.

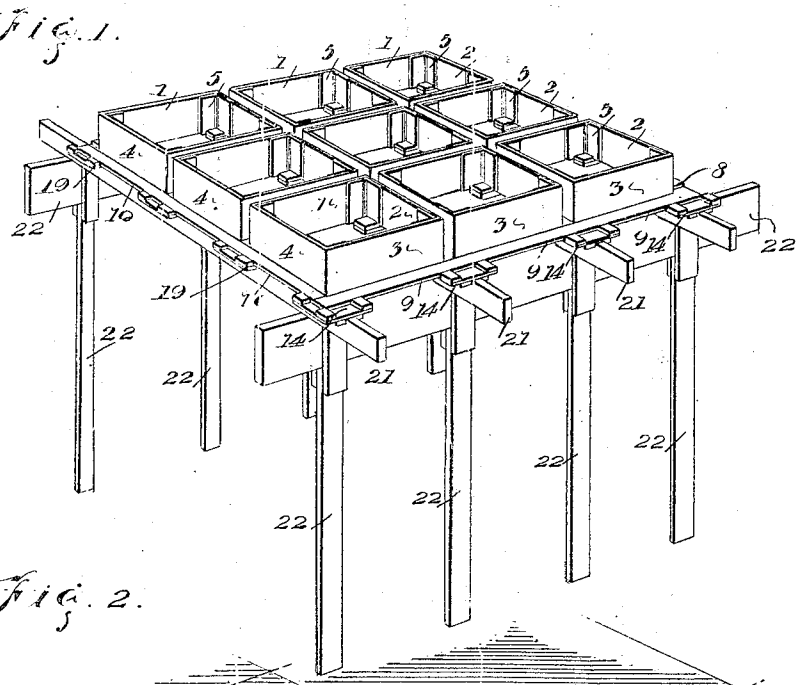


Fig. 2.

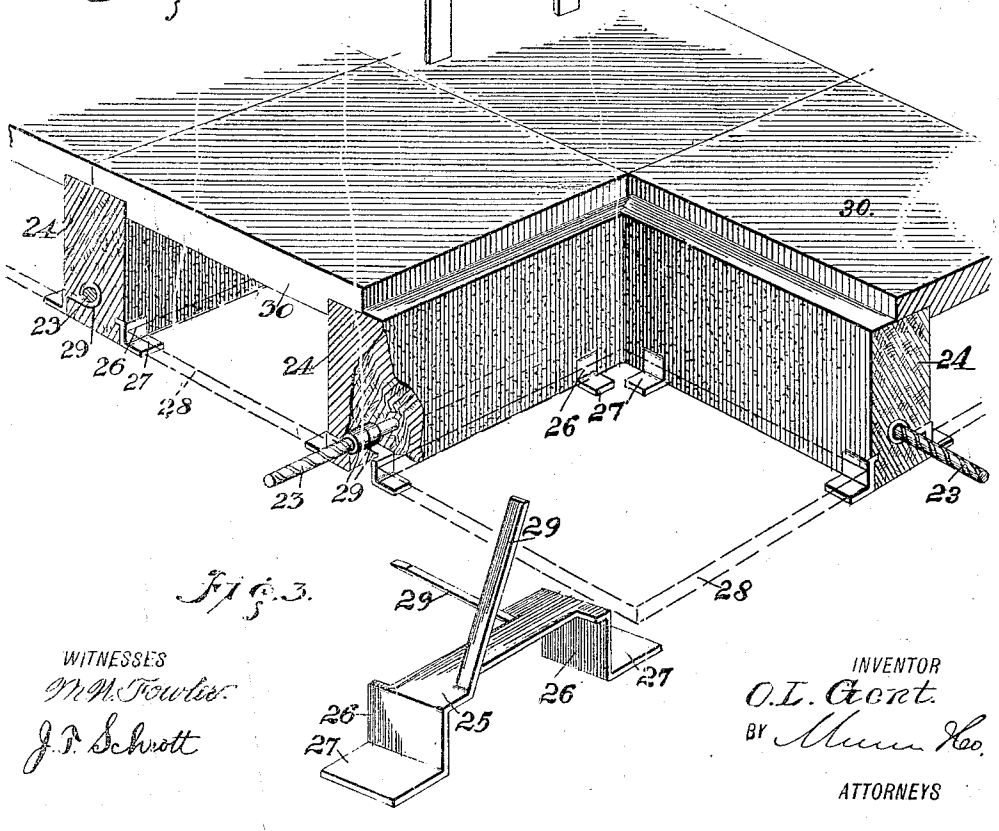


Fig. 3.

WITNESSES

M. M. Fowler

J. F. Schrott

INVENTOR

O. L. Gent.

BY Munn & Co.

ATTORNEYS

May 20, 1924. 1,494,538

O. L. GENT

CONCRETE MOLD

Filed Jan 5, 1923 3 Sheets-Sheet 2

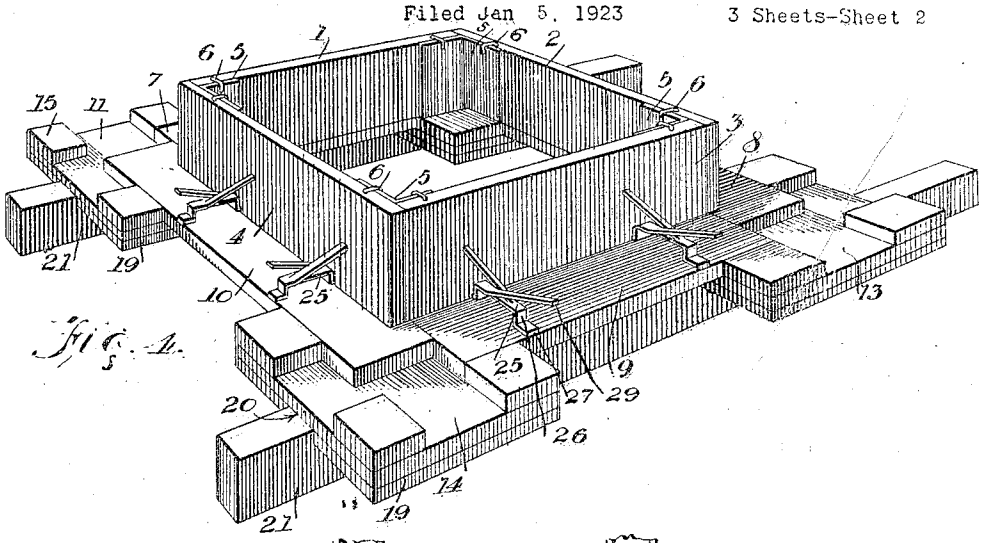


Fig. 4.

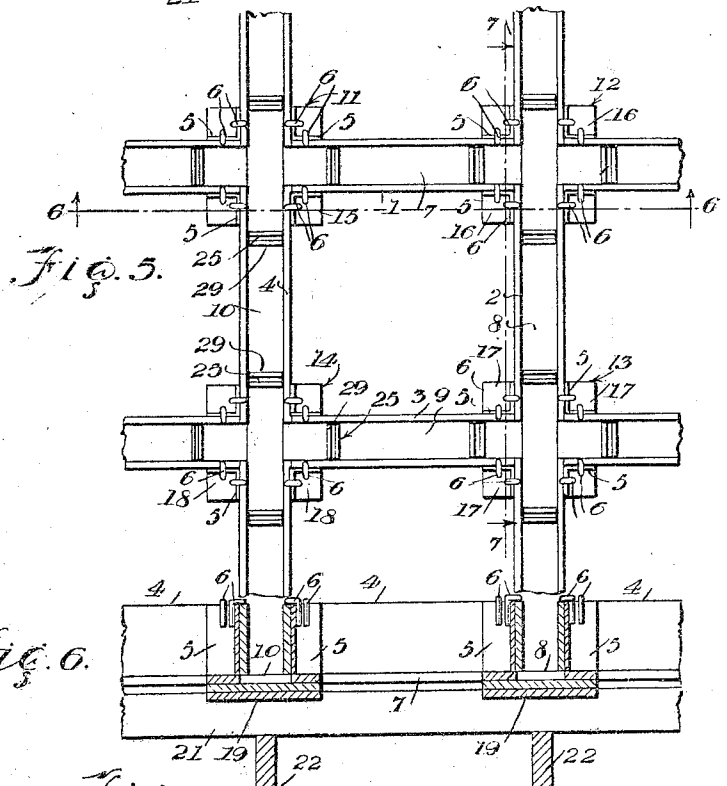


Fig. 5.

Fig. 6.

Fig. 7.

WITNESSES

M. W. Fowler

J. F. Schrott

INVENTOR

O. L. Gent.

BY Munn & Co.

ATTORNEYS

May 20, 1924. 1,494,538

O. L. GENT

CONCRETE MOLD

Filed Jan. 5. 1923 3 Sheets-Sheet 3

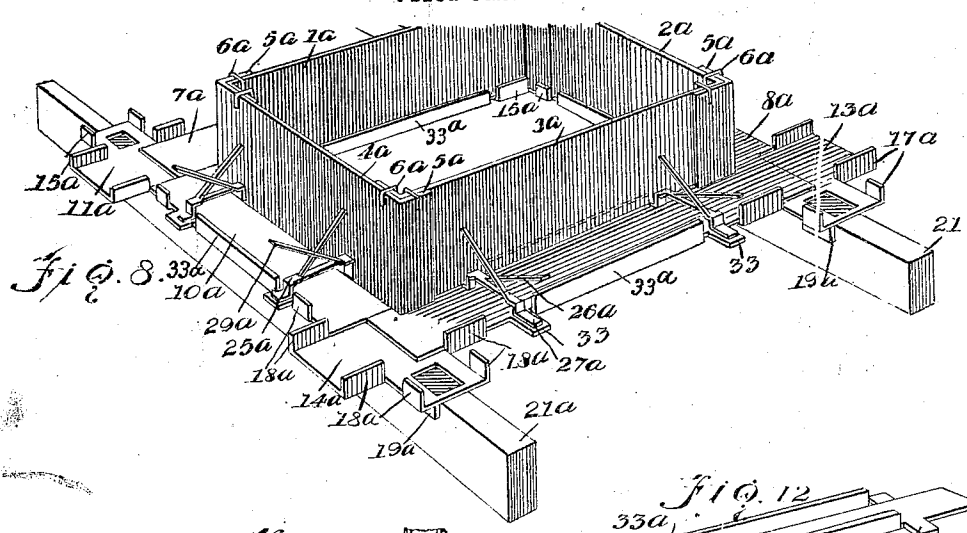


Fig. 8.

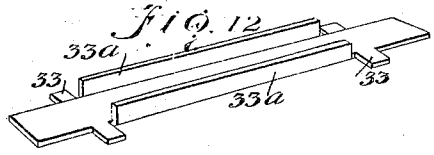


Fig. 12.

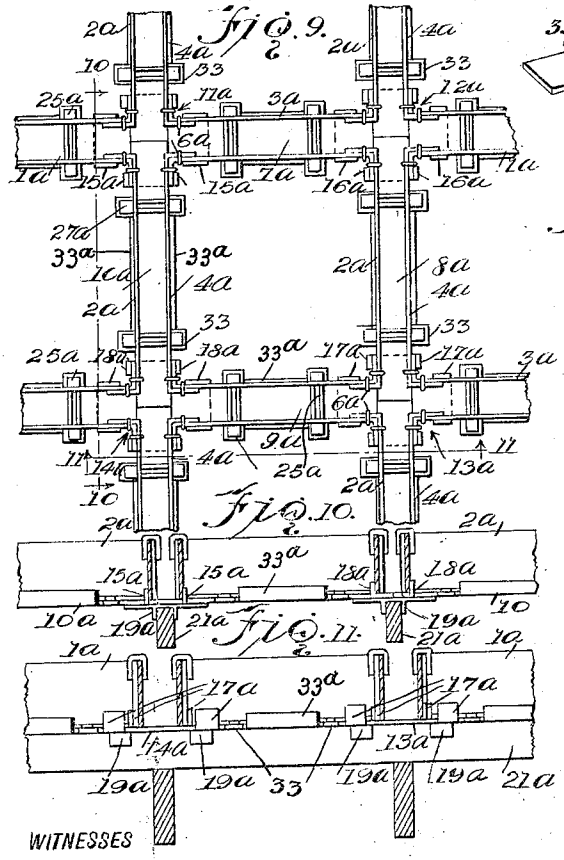


Fig. 9.

Fig. 10.

Fig. 11.

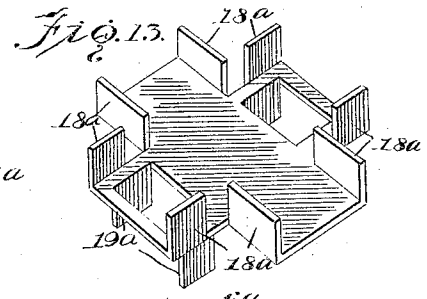


Fig. 13.

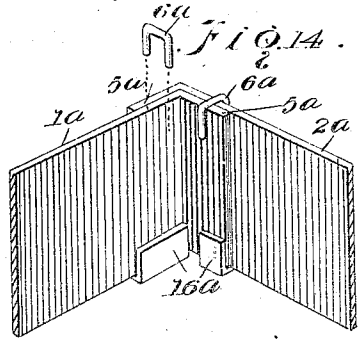


Fig. 14.

WITNESSES

M. W. Fowler.

J. F. Schutt

INVENTOR

O. L. Gent.

BY Munn & Co.

ATTORNEYS

Patented May 20, 1924. 1,494,538

UNITED STATES PATENT OFFICE.

OSCAR LAWRENCE GENT, OF TULSA, OKLAHOMA.

CONCRETE MOLD.

Application filed January 5, 1923. Serial No. 610,884.

To all whom it may concern:

Be it known that I, OSCAR LAWRENCE GENT, a citizen of the United States, and a resident of Tulsa, in the county of Tulsa and State of Oklahoma, have invented certain new and useful Improvements in Concrete Molds, of which the following is a specification.

My invention relates to improvements in molds and it consists of the constructions, combinations, and mode of operation herein described and claimed.

An object of the invention is to provide a collapsible sectional mold to be used in the construction of reinforced concrete joists for floor slabs.

A further object of the invention is to provide a mold for the purpose described which is capable of being made in different sizes so that various arrangements of joists can be carried out.

Other objects and advantages will appear in the following specification, reference being had to the accompanying drawings, in which:—

Fig. 1 is a perspective view illustrating a number of the sectional molds assembled preparatory to constructing concrete joists,

Fig. 2 is a detail perspective view, parts being in section, illustrating the concrete joists upon completion, showing how the slabs of concrete and plaster-board are laid in position to make a hollow floor construction,

Fig. 3 is a detail perspective view of one of the metal clips by which the reinforcing rods are held in place and which later serve as supports for the plaster-board,

Fig. 4 is a detail perspective view of one of the molds,

Fig. 5 is a detail plan view of a portion of the sectional mold construction in Fig. 1,

Fig. 6 is a section on the line 6—6 of Fig. 5,

Fig. 7 is a section on the line 7—7 of Fig. 5,

Fig. 8 is a detail perspective view, on the order of Fig. 4, illustrating a modification in accordance with which the mold is made of sheet metal instead of wood as in Fig. 4.

Fig. 9 is a detail plan view of the sheet metal mold construction, corresponding with Fig. 5,

Fig. 10 is a section on the line 10—10 of Fig. 9,

Fig. 11 is a section on the line 11—11 of Fig. 9,

Fig. 12 is a detail perspective view of one of the bottom plates,

Fig. 13 is a detail perspective view of one of the corner plates, and

Fig. 14 is a detail perspective view showing how the corners of the side plates are held together.

The form of the invention in Figs. 1 to 7 illustrates a concrete mold in which most of the parts are made of wood. It consists of side plates 1, 2, 3 and 4 which, in the present instance, form a square. The corners where these side plates join, are braced by sheet metal angle pieces 5 and the latter are held in place by means 6.

The retaining means 6 may in practice consist of nothing more than nails driven into the wooden sides and hammered over to hold the angle pieces 5 in place. The wooden sides are put in position on edge on bottom plates 7, 8, 9 and 10, these in turn being laid across the spaces between corner plates 11, 12, 13 and 14.

These corner plates have projections 15, 16, 17 and 18 in each of the four corners defining cross passages in which the ends of the aforesaid bottom plates 7, etc., are laid. The projections 15, etc. in the present instance, are nothing more than blocks of wood of suitable size.

Underneath of the corner plates 11 etc. are downward projections 19. These differ from the projections 15 etc., by extending all the way across opposite sides of the bottom surface, in short, being arranged and intended to define passages 20 in which the supporting wooden joists 21 fit. The obvious purpose of both the projections 15 etc. and 19 is to provide means for preventing the bottom plates 7, 8, 9 and 10 and the wooden joists 21 from slipping out of position.

As it is the purpose of the concrete mold

to form concrete floor joists, it is necessary to support the wooden joists 21 with suitable shoring 22 (Fig. 1) which remains in place until the concrete joists have set. The plates 7, 8, 9 and 10 may be of any desired length, this depending on the distance between centers of the concrete joists, but when the plates are prepared for a particular class of work, they should be of uniform length. In this connection it is to be observed that the opposing plates 7 and 9 are shorter than the opposing plates 8 and 10, the former pair matching the distance between the projections 17 and 18 on the corner plates 13 and 14 nearest the observer in Fig. 4, while the other pair extend from center to center of the aforesaid plates 7 and 9. Other plates (in companion mold boxes) corresponding to the plates 7 and 9, should be of equal length and so should corresponding plates 8 and 10. However, it seems quite obvious that this arrangement can be varied, the ultimate purpose in providing the plates 7, etc. at all being to form a bottom of the joist mold.

Reinforcing rods 23 (Fig. 2) are used to provide the necessary strength for the concrete joists 24. Clips 25 are provided for the purpose of holding the reinforcing rods in position before and during the pouring of the concrete. These clips are preferably made of galvanized iron but may be made of any other suitable material.

The ends of the clips 25 are bent down and out to respectively form shoulders 26 and pads 27. The side plates 1, 2, 3 and 4 are set in position against the shoulders 26 and upon the pads 27 so that after the mold plates are removed (Fig. 2) only the shoulders 26 and pads 27 show on the outside of the concrete work. The pads serve the useful purpose of attaching means for plaster-boards 28 and in order to fasten the plaster-boards, any acceptable expedient may be adopted.

Strips 29 are cut and bent up from the upper part of each metal clip 25. These are bent up so as to cross at a place substantially in the center of the joist channel (between the side and bottom plates). The reinforcing rods 23 are laid in the place where the strips cross, and the strips are then twisted around the reinforcing rod (Fig. 2) to hold the latter firmly in position. The concrete is intended to flow down and around the metal clip and hold it in place as part of the concrete joist. Floor slabs 30 are laid in place on top of the concrete joist structure, and when the plaster-boards 28 are fixed in position a hollow floor construction results.

Attention is directed to Fig. 1. This shows in part only what a complete set of molds for a concrete joist construction will look like. It also illustrates the use of long plates 31 and 32 which might be called binder plates inasmuch as they are used to hold the outermost mold side plates in place. These may be used in place of the shorter plates 7 etc. around the boundary of the mold formation, and so far as the purpose of the binder plates 31 and 32 is concerned, it is the same as that of the aforesaid shorter plates.

The modification in Figs. 8 to 14 involves elements which serve the purpose of corresponding elements in the form of the mold shown in Figs. 1 to 7, the difference being that now sheet metal is made use of instead of wood. Parts which correspond with parts in the first modification bear similar reference numerals but also exponent letters so as to distinguish the modifications.

In Fig. 8, the side plates 1^a, 2^a, 3^a and 4^a are held together in the corners by angle pieces 5^a which are bent up from adjacent side plates, and staples 6^a which fit over the edges, as shown. These side plates rest upon bottom plates 7^a, 8^a, 9^a and 10^a the ends of which rest upon corner plates 11^a, 12^a, 13^a and 14^a. The corner plates have upward projections 15^a, 16^a, 17^a and 18^a respectively for the purpose of providing passages in which the ends of the aforesaid plates fit. The corner plates also have downward projections 19^a which provide passages for the reception of wooden joists 21^a, corresponding with the wooden joists 21 in Figs. 1 and 4.

As clearly shown in Fig. 8, the various projections described consist of appropriately stamped portions of the corner plates which are bent either up or down, as the case may be, to provide passages either on top or underneath for the bottom plates and the joists respectively. The bottom plates are arranged in long and short pairs so as to carry out a scheme of laying the bottom plates very much on the order of the scheme of laying the wooden bottom plates in Fig. 4. The minor distinction of the metallic bottom plate 10^a (for example) being longer than the wooden bottom plate 10 in Fig. 4 is to be observed, but as the ultimate purpose of the bottom plates is to provide a tight bottom for the concrete joist form, the manner of arranging the bottom plates is not of prime importance.

In assembling the side plates 1^a, etc., upon the bottom plates 7^a etc., use is made of the upstanding projections 15^a, 16^a, 17^a and 18^a to abut the exposed inner surfaces of the side plates and fix the positions thereof in respect to the bottom plates. Reinforcing rods are made use of as before, and these reinforcing rods rest upon metal clips 25^a having shoulders 26^a and pads 27^a. The shoulders rest against the insides of the side plates and, as in the case in Fig. 4, form

spaces to maintain a uniform width of the molding space in which the concrete joist is to be formed. The clips have strips 29^a to be wrapped around the reinforcing rods and hold the latter in place.

The bottom plates 7^a etc. have lateral extensions 33 upon which the pads 27^a rest. The shoulders 26^a are disposed at a place in from the edges of the bottom plates sufficiently far to leave room for the insertion of the side plates 1^a etc. between such shoulders and side flanges 33^a on the bottom plates as is suggested by the relative positioning of the shoulder 26^a and flange 33^a in Fig. 8. This arrangement provides a close joint at the bottom through which none of the plastic material can escape, the side plates being raised from the bottom plates only the distance of the thickness of the pads 27^a. This is also the case in Fig. 4. The flanges 33^a furnish braces which keep the side plates from slipping outward in respect to the bottom plates.

The advantages

may be briefly outlined. After having erected a system of molds for the construction of concrete joists, the side plates 1, 2, 3 and 4 in the wooden construction in Figs. 1 and 4, or the side plates 1^a, 2^a, 3^a and 4^a in metallic construction in Fig. 8, may be removed after the concrete has sufficiently set, so as to more fully expose it to the drying action of the surrounding air. The bottom plates and shoring necessarily remain in place until the joists have completely set. The ability to remove the side plates, so as to expose the concrete joists to the air, is considered quite an advantage.

The provision of the metallic clips 25 adds another advantage. These not only hold the reinforcing rods in place prior to and during the pouring of the concrete, but also provide pads by means of which plaster-boards, metallic ceilings, etc., may quite readily be fastened in place underneath the concrete joists.

The molds are easily erected, are fire-resistive (especially in the case of the modification in Figs. 8 to 14), require a minimum amount of shoring and are strong enough to be used in heavy concrete construction. The mold parts can be used again and again and are not required to be discarded as is often the case where concrete constructions are erected. The fact that the molds are collapsible and re-usable makes the mold system less expensive to use for the reasons that the molds can be erected in less time than ordinarily and can be taken down with less labor.

While the construction and arrangement of the improved concrete molds as herein described and claimed, is that of a generally preferred form, obviously modifications and changes may be made without departing from the spirit of the invention or the scope of the claims.

I claim:—

1. A mold comprising a bottom plate, corner plates upon which the ends of the bottom plates are supported, means on the corner plates to form passages to receive said ends, side plates to be placed on the bottom plate to define the mold space, and means situated in said mold space to be abutted by said side plates to space them apart.

2. A mold comprising a bottom plate, corner plates having means providing passages in which the ends of the bottom plate rest, means underneath of the corner plates providing passages for supporting structure, side forming plates to be positioned upon the bottom plate to define a molding space, and means to support the side plates in position during the pouring of the plastic material but permitting removal of the side plates without removing the bottom plate or supporting structure after said material has sufficiently set to permit access of the air thereto.

3. A mold for concrete joists comprising bottom plates laid at angles to each other, corner plates having means defining passages into which the ends of the bottom plates are laid, side plates stood on edge on the bottom plates to define joist molding spaces over the bottom plates, means in engagement with the corner plates to support the mold, and means to temporarily hold the side plates together but permit removal thereof as a part of the mold without removing the bottom plates or the supporting structure.

4. A mold for concrete joists comprising bottom plates laid at angles to each other, corner plates having upward projections defining passages to receive the ends of said plates, and hold them in position, downward projections from said corner plates providing passages, a supporting structure including joists to occupy said last passages and be held in place by said projections, side plates stood on edge on the bottom plates, means situated in the molding space defined by said side plates and bottom plates including shoulders to be abutted by the side plates, also including means to hold reinforcing elements in said spaces, and means at the places where said side plates join temporarily holding them together to enable removal of said side plates without removing the supporting structure or bottom plates to permit access of the air to the concrete joists to facilitate hardening.

5. A mold for concrete joists comprising corner plates having projections arranged to define cross passages, bottom plates laid between corner plates, resting thereupon

and occupying parts of said passages, side plates stood on edge upon the bottom plates to define molding passages in which said joists are formed, and means situated at the places where the side plates meet to temporarily hold them together and permit removal of the side plates without disturbing the other structure.

6. Apparatus of the character described comprising a plurality of bottom plates, corner plates having upstanding means defining passages in which the ends of the bottom plates rest for support said ends all being in contact to furnish a continuous surface, clips having shoulders terminating in pads upon which they stand on the bottom plates, side plates stood on edge on the pads in contact with the shoulders to insure uniformity in the molding spaces, means including in said clips providing supports for reinforcing elements, and temporarily fastening means for the side plates situated at the adjoining ends thereof.

7. Apparatus of the character described comprising a plurality of corner plates distributed over an area according to a predetermined order, means upstanding on the corner plates providing crossed passages, bottom plates having the ends resting in said passages and abutting in such a way that the top surface of the bottom plates is continuous, all of the corner plates being occupied excepting the ones at the outside of said area, side plates stood upon the bottom plates to define a system of crossed molding spaces, means to brace and temporarily hold the ends of said side plates, and long bottom plates laid in the aligning passages of the outermost corner plates to bound the outermost side plates and hold all together.

OSCAR LAWRENCE GENT.