

April 15, 1924.

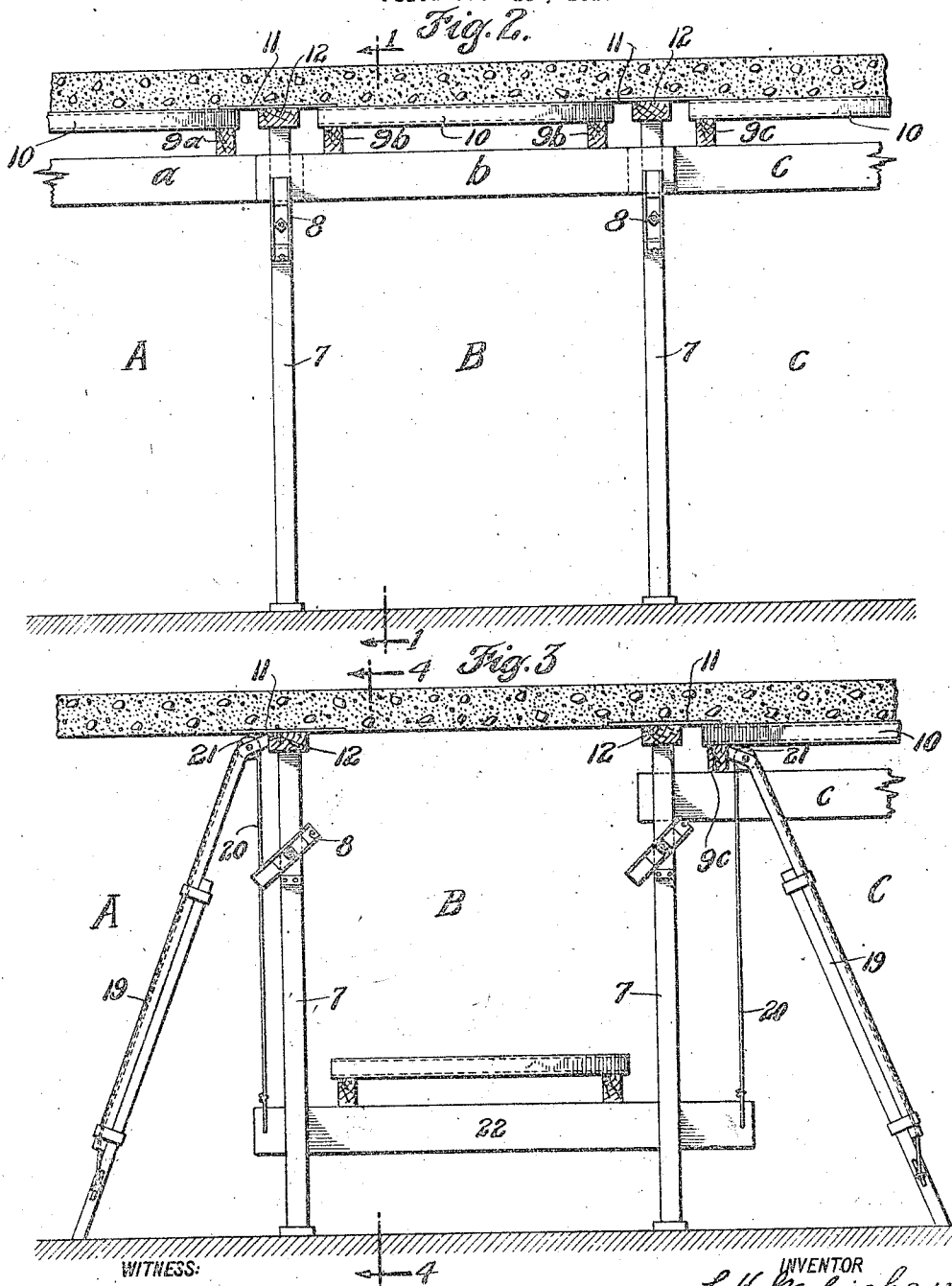
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L. H. GARLINGHOUSE

FLOOR MOLD FORM

Filed Oct. 13, 1919

5 Sheets-Sheet 2



WITNESS:

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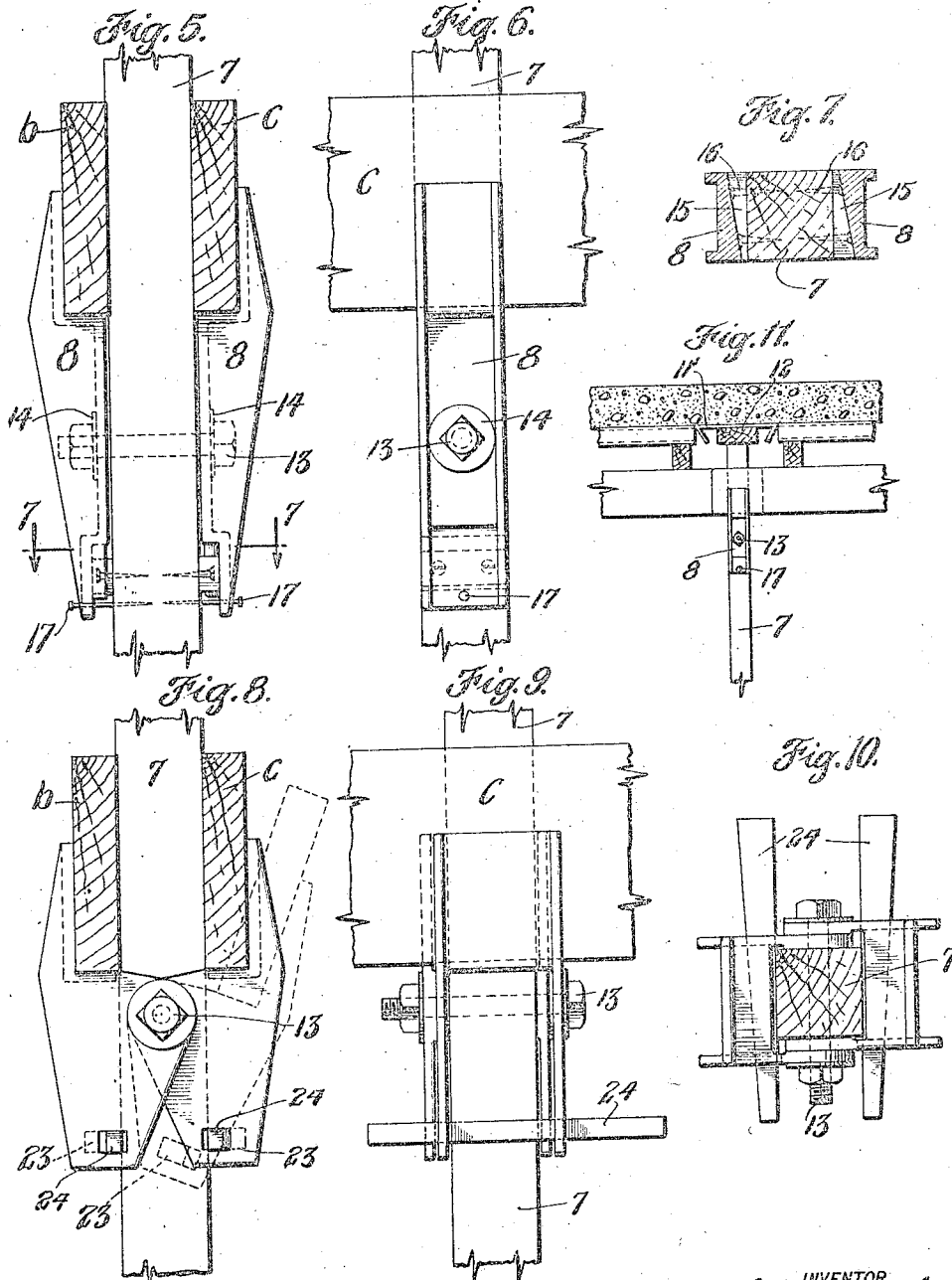
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FLOOR MOLD FORM

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5 Sheets-Sheet 4



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L. H. GARLINGHOUSE

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FLOOR MOLD FORM

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5 Sheets-Sheet 5

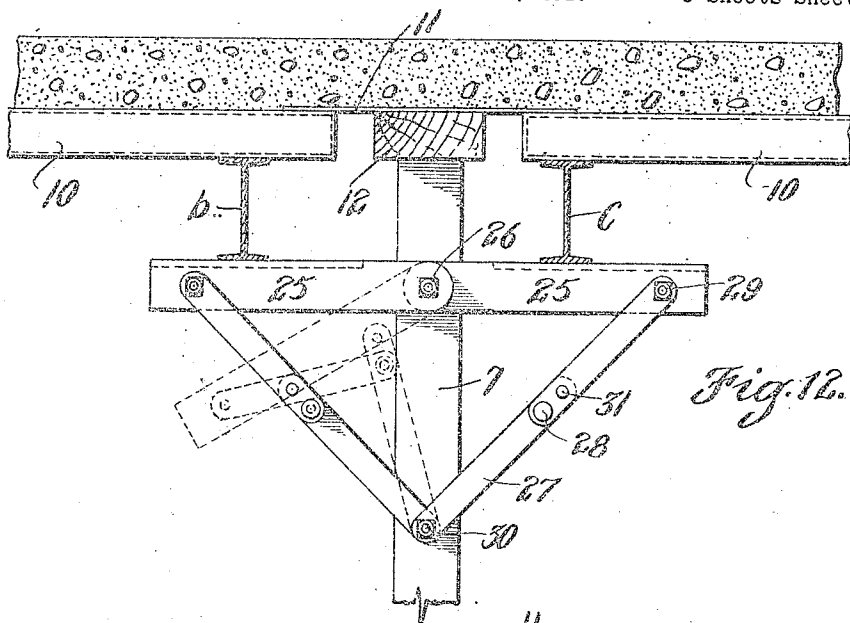


Fig. 12.

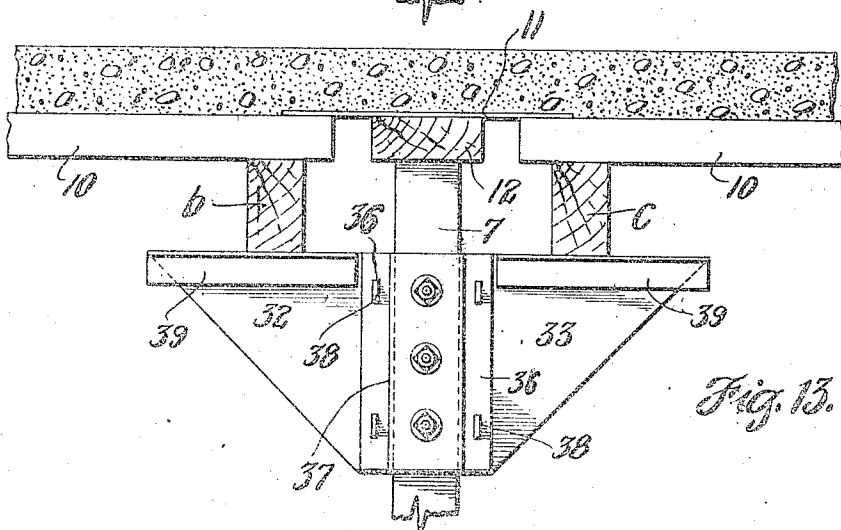


Fig. 13.

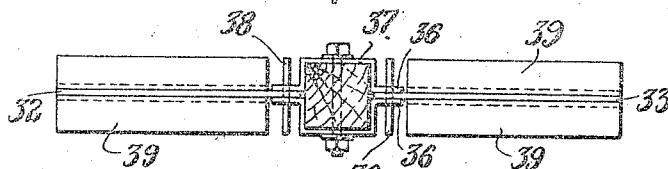


Fig. 14.

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UNITED STATES PATENT OFFICE.

LESLIE H. GARLINGHOUSE, OF ASPINWALL, PENNSYLVANIA, ASSIGNOR TO BLAW-KNOX COMPANY, A CORPORATION OF NEW JERSEY.

FLOOR-MOLD FORM.

Application filed October 12, 1918. Serial No. 330,343.

To all whom it may concern:

Be it known that I, LESLIE H. GARLINGHOUSE, a citizen of the United States, residing at Aspinwall, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful improvements in Floor-Mold Forms, of which the following is a specification.

This invention relates to mold forms for making floors and ceilings or the like from plastic material such as concrete, and is particularly useful in connection with operations on a large scale, one of the primary objects of the invention being the provision of improved apparatus whereby such operations may be carried out expeditiously, economically, and with a minimum initial plant investment.

One of the more specific objects of my invention resides in the provision of improved mold form apparatus, the major portion of which may be quickly and easily taken down within a comparatively short period of time after the concrete has been poured, and the units of which may be readily shifted and repositioned for progressive operations, remaining portions of the mold apparatus being left in position to support the concrete until the latter has set thoroughly.

Still another object of my invention resides in means for supporting a plurality of mold units in such manner that one or more units may be readily taken down without interference with adjacent units.

In general my invention contemplates the provision of improved features of construction, to be hereinafter more fully pointed out, to facilitate the attainment of the foregoing ends.

The above, together with such other objects as may hereinafter appear, or are incident to my invention, I obtain by means of a construction which I have illustrated in preferred form in the accompanying drawings, wherein—

Figure 1 is a longitudinal section taken on the line 1--1 of Figure 2, illustrating the application of my invention to the construction of a flat slab floor, for example; Figure 2 is a cross section taken on the line 2--2 of Figure 1; Figure 3 is a view similar to Figure 2 showing the take down apparatus in position and indicating the manner in which the mold units are lowered; Figure 4 is a section taken on the line 4--4 of Figure 3;

Figures 5 and 6 are end and side elevations respectively of a detail of my invention drawn on an enlarged scale; Figure 7 is a section taken on the line 7--7 of Figure 5; Figures 8, 9 and 10 are views illustrating a modification of the structure shown in Figures 5, 6 and 7; Figure 11 is a section illustrating a modification of the means employed for filling the gap between adjacent mold units; Figure 12 is a side elevation of a collapsible shoring head suitable for use in carrying out my invention; Figure 13 is a side elevation of shore head, the same being a modification of the structure shown in Figure 12; Figure 14 is a plan view of the head shown in Figure 13; and Figures 15, 16 and 17 are views illustrating still another modification of my invention.

In carrying out my invention as applied to the construction of a flat slab floor, I provide a plurality of rows of shores 7 or similar supporting false work members, the shores being suitably spaced apart for the proper support of the load, and dividing the mold structure into bays A, B, C, etc. In the construction shown in Figures 1 to 6 inclusive, each shore 7 is provided on opposite sides, adjacent the upper end thereof with a supporting bracket 8, the construction of which will hereinafter be pointed out. Rows of ledgers *a*, *b*, *c*, etc., are detachably carried on the brackets 8, the ledgers *b* for example being carried by the brackets on one side of the rows of shores forming the bay B, the ledgers *c* having one end carried on the bracket of the right hand shore on the opposite side and the other end by the corresponding bracket, on the proper shore of the next row of shores, and similarly with the ledgers *a*. This will be clearly seen from inspection of Figures 1 and 2. Stated in other words the rows of ledgers for the respective bays are carried on the brackets on one side of the shores forming the bays respectively. The rows of ledgers are therefore independent of one another.

Extending longitudinally of the bays and carried by their respective rows of ledgers, are a plurality of stringers 9^a, 9^b, 9^c, etc. A plurality of panels 10, individually extending transversely of the bay, are mounted on each pair of stringers, being secured thereto in any preferred manner. The pairs of stringers and their panels constitute mold units, the length of which may be varied in

accordance with the facilities available for handling the same. In Figure 1, I have shown the units as comprising eight panels with stringers of the necessary length. It will be understood that more than one unit may be utilized in a bay, this being made possible, for example, by overlapping the ends of adjacent sets of stringers as shown in Figure 1, but not securing the end panel which will be supported by the stringers of either unit while the other unit is being taken down.

The gaps between the sides of adjacent units are closed by stretchers or filler pieces 11, preferably in the form of sheet metal plates, the ends of which overlap the ends of the panels of adjacent units. The stretchers are supported at intervals intermediate the units by the supporting or stringer members 12 carried on the tops of the shores 7.

Referring now to Figures 1 and 5 to 7 inclusive it will be seen that the pair of brackets 8 carried by each shore 7 are apertured to receive common holding bolts 13 passing through bolt holes in the shores. Washers 14 are provided under the heads of the bolts 13 and their respective nuts to permit the brackets 8 to be readily turned about the bolts as an axis of rotation. The jaw portions of the brackets serve to tightly clamp and jam the ledger members against the shoring when the brackets are rotated to vertical position, by reason of the engagement of the lower end of the brackets with the wedge members 15, which are preferably secured to the shores by such means as the screws 16. The lower ends of the brackets are provided with inclined surfaces cooperating with the wedge members to drive the lower ends of the brackets outwardly from the shores which in turn imparts an inward movement to the upper ends of the shores, as will be clear from inspection of Figure 7. The brackets 8 are held in ledger clamping position by temporary means such as the nails 17. It will be seen from the construction just described that whenever it is desired to remove one or all of the ledgers for a unit, this may be readily accomplished by taking out the nails 17 and swinging the brackets to the position shown, for example in Figure 3.

With the parts assembled in the position shown in Figures 1 and 2, (preferably with units set up for an entire floor at once), the concrete is poured. After it has set a comparatively short period of time, the mold units may be taken down, the concrete being sufficiently supported by the stretchers 11 and stringers 12 which are left in position. The manner of taking down the units will now be described.

Assuming that the unit or units of bay A have been taken down, and the unit or units of bay B are to be taken down, pair of

take-down members such as the extension ladders 19 are set up, the upper ends of which are rested against the stringers 12 at one side of the bay and against the stringers 9^a at the other side of the bay. Each ladder is provided with a cable 20 passing over a pulley 21 and the pairs of ladders are arranged in opposition so that the ends of the cables may be secured to a pair of temporary ledger members 22. These temporary ledger members are elevated and brought into position beneath the stringers 9^b, occupying a position such as indicated in dotted lines in Figure 1. The brackets holding the ledgers 6 are loosened and turned to the position indicated in Figure 3 which permits the removal of the ledgers 6, and the mold unit now rests solely upon the pair of temporary ledgers 22. The unit may now be lowered by easing off on the cables and the lowering may be continued until the temporary ledgers rest upon the ground, after which the unit may be picked up and transferred to a new point for setting up, or the unit may be lowered onto a truck such as is diagrammatically indicated in dotted lines in Figure 4 at D and shifted to a new point of use. It will also be seen that the units may be assembled on the ground and elevated initially in a very simple manner and that a unit when taken down may be elevated and supported at a new point of use, the ledgers placed in position and clamped. The work may be therefore carried out expeditiously, economically and progressively with a minimum amount of equipment.

Referring now to Figures 8, 9 and 10, I have therein shown a modification of the brackets for supporting the ledgers. The brackets in this case are provided with slots 23, adapted to receive the wedges 24 which when driven home tightly serve to spread the lower ends of the brackets away from the shoring, forcing the upper ends thereof toward the shoring to clamp the ledgers.

In Figure 11 I have shown a modified arrangement of filler or stretcher member 11' which is adapted to lie flush with the top surfaces of the panels 10. The stretcher members in this case are supported as before.

Instead of employing separate brackets for supporting the respective ledgers I may use a head for the shoring, such head comprising a pair of arms or cross pieces 25, each pivoted at its inner end to the shore by means of a bolt 26. The arms or cross pieces are supported by foldable braces 27, each comprising a pair of members pivoted together as at 28, the end of one member being pivoted to the end of a cross piece by a bolt 29 and the ends of the other members being pivoted to the shore by a common pivot bolt 30. The braces are provided with lock pins 31 which permit the braces to be collapsed

as shown in Figure 12 but keep the braces from reverse collapsing movement. The ledgers, which in this figure consist of I beams, are supported on the respective cross pieces. In dropping the respective units the cross piece is lowered by collapsing the brace arm as indicated, the operation in other respects being the same as that described.

10 In Figures 13 and 14 instead of providing a two part folding head, the head of the shore consists of two brackets 32 and 33, adapted to be inserted between the flanges 36 of two straps or yoke members 37 adapted to embrace the shore as shown in Figure 14. The brackets and the flanges are apertured and wedges are driven into the apertures securely fastening the brackets to the shore. Each bracket has secured to the top thereof, on opposite faces, a pair of angles 39 to form a seat for the stringers, which in this instance are wooden. In taking down a unit, the proper brackets are removed by knocking out the wedges 38 after which the operation is as before described.

15 Referring now to Figures 15 to 17 it will be seen that I have illustrated a modified form of bracket consisting of a pair of side plates 45 having hooks 46 and secured together by a single U-shaped strap 47, the base of which extends above the top edges of the plates. The brackets are hooked over a bolt 48 with which each shore is provided and they are held in ledger supporting position by means of keys or wedges 49 in the manner hereinbefore set forth.

Each bracket is provided at the top with a transverse plate or bar 50 which not only strengthens the bracket but serves as a seat for the ledger. This bar or plate is so located with reference to the center of the hooks that when a bracket is swung 90° to the position shown in Figure 17, the bar will engage the side of the shore and support the bracket with the strap 47 extending at right angles to the shore. The projecting portion of the strap will then serve to support a ledger.

It will be observed that this form of bracket may be hung from either side of a shore which makes its use advantageous when the floor units are broad enough to cover more than one bay with ledgers of suitable length, or in any other arrangement in which it is unnecessary to provide all the shores with more than one bracket. I am thus enabled to cut down the number of brackets required for permanent plant.

By making the brackets slightly wider than the posts, and by using bolts of sufficient length, I am enabled to support a pair of brackets from each bolt.

One of the important advantages of my improvements is that standard lengths of stringers and ledgers may be used and cut-

ting to length is eliminated and, therefore, the amount of permanent plant is reduced, as are the losses incident to cutting. The time and labor which would otherwise be involved in sorting stringers and ledgers is also eliminated.

I claim:

1. A mold form apparatus for concrete floors and the like comprising in combination a mold section, false work, ledger members removably carried on the false work and adapted to support the mold section, and a take down mechanism for taking down the mold section together with temporary ledger members to support the mold section to permit the removal of the first mentioned ledgers.

2. A mold form apparatus for concrete floors and the like comprising in combination a mold section, means adapted to support said section, false work for removably supporting said mold section supporting means, and means temporarily supporting the mold section to permit of the removal of said mold section supporting means.

3. A mold form apparatus for concrete floors and the like comprising in combination a mold section, false work, means releasably carried by the false work for supporting the mold section, and take down mechanism adapted to engage and support the mold section to permit of the removal of the releasable supported means and to lower the mold section.

4. A mold form apparatus for concrete floors and the like comprising in combination a mold section, false work, a support for the mold section, and brackets on the false work adapted to releasably support the said support, together with means adapted to temporarily support the mold section.

5. A mold form apparatus for concrete floors and the like comprising in combination false work, a pair of ledgers releasably supported from the false work, stringer means resting on the ledgers, and mold means on the stringer means together with means adapted to temporarily support the stringer means to permit of the removal of the ledgers.

6. A mold form apparatus for concrete floors and the like comprising in combination false work arranged in bays, a mold section for each bay, and means extending crosswise of the bays for supporting said mold sections from common false work independently whereby the sections may be independently taken down.

7. A mold form apparatus for concrete floors and the like comprising in combination a plurality of rows of shoring, a mold section for each bay formed thereby, and separate means for supporting mold sections in the respective bays extending across adjacent bays and supported independently of

one another on common shoring, said means being releasable to permit the independent taking down of the mold sections.

8. A mold form apparatus for concrete floors and the like comprising in combination a plurality of rows of shoring, a mold section for each bay formed thereby, ledger members extending across adjacent bays independently supported on common shoring, and stringer means carried on respective ledgers for supporting the mold sections.

9. A mold form apparatus for concrete floors and the like comprising in combination false work, a plurality of mold sections, and means whereby the mold sections are supported independently of one another on the false work to permit the taking down of the same substantially independently, together with take-down mechanism for taking down the sections.

10. A mold form apparatus for concrete floors and the like comprising in combination a plurality of rows of shoring, a mold section for each bay formed thereby, ledger members extending between adjacent rows and independently supported thereby, and stringer means carried on the ledgers for the respective bays for supporting the mold sections, together with take-down mechanism for taking down the sections.

11. A mold form apparatus for concrete floors and the like comprising in combination a plurality of mold sections spaced apart, filler means closing the gaps between sections, shoring or false work sup-

porting the filler means, and means for supporting the respective mold sections releasably carried by the shoring, together with take-down mechanism for taking down the mold sections.

12. A mold form apparatus for concrete floors and the like comprising in combination spaced false work, a mold section located intermediate the spaced portions of the false work, means releasably supporting the mold section from the false work, and take-down mechanism exterior of said space for lowering the mold section.

13. Mold form apparatus for concrete floors and the like comprising in combination a plurality of rows of shoring, a mold section for each bay formed thereby, separate ledgers extending across the respective bays for supporting the mold sections, and bracket means on the shoring for separately and releasably supporting the several ledgers, so that the mold sections in the respective bays may be taken down independently of one another.

14. A shore comprising in combination a center support, a pair of flanged plates secured thereto, the flanges of which are spaced apart, a bracket member adapted to be inserted in the space between flanges, and means for keying said bracket member to the flanges.

In testimony whereof I have hereunto signed my name.

LESLIE H. GARLINGHOUSE.