H. K. CARPENTER.

CONCRETE MOLD.

APPLICATION FILED MAY 20, 1920.

1,363,391. **Patented Dec. 28, 1920.**

Fig. 1

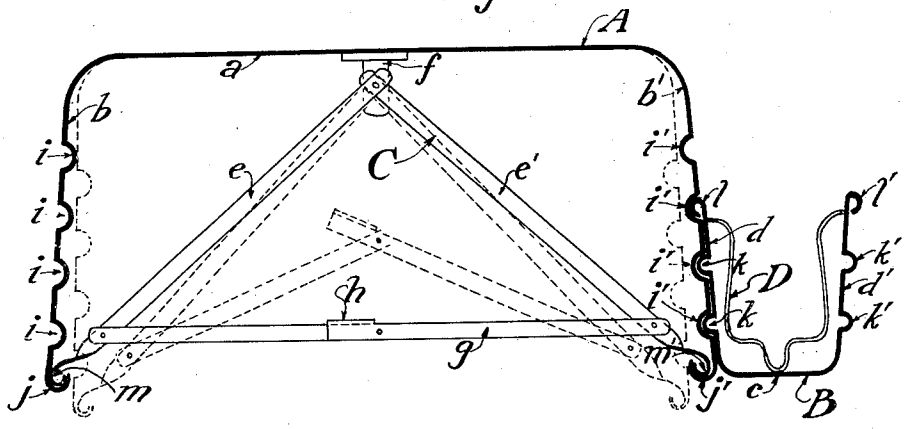


Fig. 2

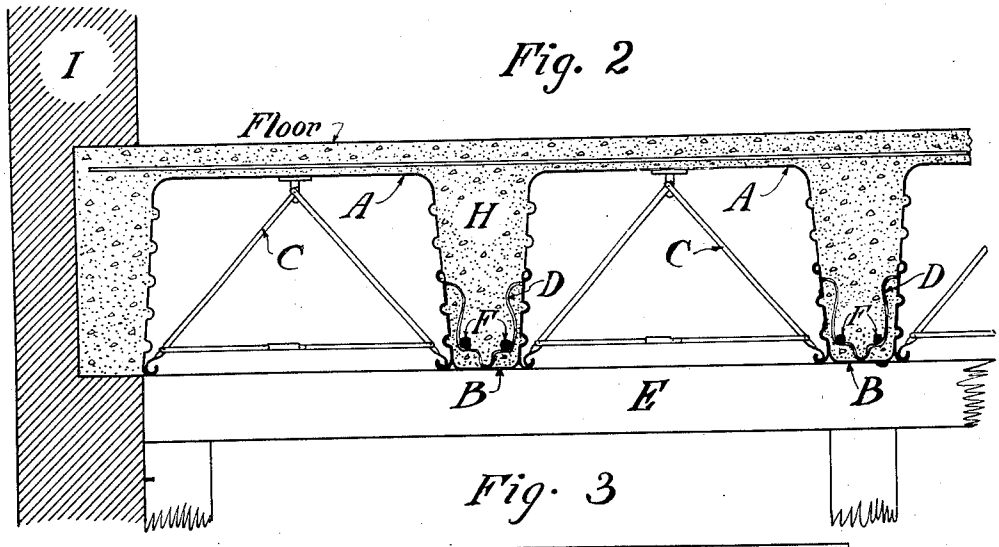
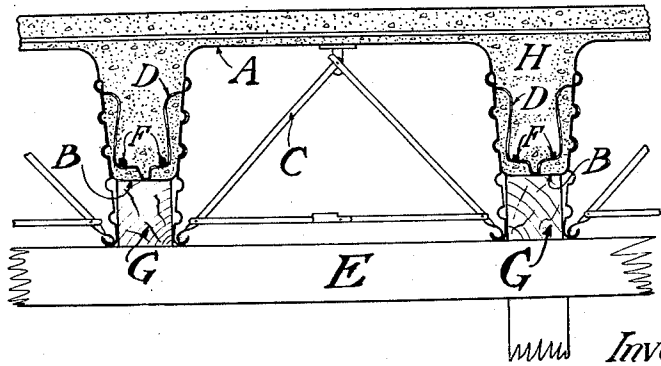


Fig. 3



Witnesses

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CONCRETE-MOLD.

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To all whom it may concern:

Be it known that I, HARRY K. CARPENTER, a citizen of the United States, residing at Clarksburg, in the county of Harrison and State of West Virginia, have invented certain new and useful Improvements in Concrete-Molds, of which the following is a specification.

My invention relates to forms or molds for concrete construction and more specifically to devices of this character which are adapted for the construction of concrete floors and the supporting beams associated therewith.

Its objects are to provide a device of this character which will be cheap to manufacture, light in weight, simple in operation, and free from troublesome bolts, clamps, and complicated interlocking means.

A further object is to provide a device of this character which will reduce the cost of concrete construction by diminishing the time and labor required. This is accomplished by the ease and rapidity with which the invention may be erected, adjusted, and removed.

Another object is to provide a device of the character described which may be conveniently adjusted to permit the construction of beams of a variety of depths. Other objects of the invention will become apparent upon a more complete disclosure thereof.

For a better understanding of my invention reference is had to the accompanying drawings in which similar letters indicate corresponding parts throughout the several views in which—

Figure 1 is a transverse sectional view of one unit; Fig. 2 is a transverse sectional view of a portion of concrete floor illustrating the use of a series of units and the method of temporarily supporting the same for the placing of the concrete; and Fig. 3 is a similar view illustrating the employment of the adjustable feature.

Referring now to the figures of the drawings, A represents an elongated metallic form adapted to support a floor-slab and to provide a mold for one side of each of two beams. This member is also denoted by the subsequent references to "floor-slab support." The letter B indicates an elongated metallic form which corresponds in length to A and is adapted to complete a beam mold by connecting one of the depending sides of a floor-slab support A to the adjacent depending side of another floor-slab support. This member is also denoted by the subsequent references to "beam support." The letter C indicates a collapsible brace adapted to support the plate *a* of the floor-slab support A and to support and control the movement of the depending flexible sides *b* and *b'* of the said support A. The letter D indicates a movable brace adapted to support the upturned flexible sides *d* and *d'* of the beam supporting form B. This brace, which is retained within the finished concrete beam, is of a shape which permits it to support the reinforcing rods F, illustrated in Figs. 2 and 3, which are employed in the construction of the beams. The sides *b* and *b'* of the form A are provided with the longitudinally extending corrugations or grooves *i* and *i'* respectively. The lower edges of the sides *b* and *b'* are formed into the longitudinally extending channels *j* and *j'* respectively. The sides *d* and *d'* of the form B are provided with the longitudinally extending corrugations or grooves *k* and *k'* respectively and terminate, at their upper edge, in the longitudinally extending rolled edges *l* and *l'* respectively. The grooves *i* and *i'* are equally spaced with respect to one another and the spacing of the rolled edges *l* and *l'* and the grooves *k* and *k'* respectively correspond to the spacing of the grooves *i* and *i'*. The rolled edge *l* and the grooves *k* are adapted to engage the grooves *i'* and the rolled edge *l'* and the grooves *k'* are adapted to engage the grooves *i*. The brace C consists of the hinged arm *g* and the pivoted arms *e* and *e'*. The arm *g* is attached at one end to the arm *e* and at the other end to the arm *e'* while the arms *e* and *e'* are pivoted at their upper ends to the plate *f* which bears upon the under side of *a* and prevents sagging of same under the weight of the concrete. The letters *m* and *m'* indicate the rounded lower ends of the arms *e* and *e'* which are confined within the channels *j* and *j'* respectively when the form A is in use. When the forms are not in use, the braces are removed to facilitate transportation and storage. The hinged arm *g* is movable upwardly but is limited in its downward movement by the flange *h*

which is formed on one menber of the arm g. It will be readily apparent that an upward movement of the arm g will impart a downward movement to the arms e and e' which, in turn, imparts an inward movement to the sides b and b' of the form A. The inward movement of the sides b and b' is sufficient to permit them to clear the sides d' and d respectively of the form B and thereby renders the forms readily removable whereas a downward movement of the arm g will impart an upward movement to the arms e and e' resulting in an outward movement of the sides d' and d respectively causing the rolled edge l and the corrugations k and the rolled edge l' and the corrugations k' to enter the corrugations i' and i respectively.. The operation of the brace C is clearly shown in Fig. 1. Obviously, the corrugations in the sides b and b' are concave when the corrugations in the sides d and d' are convex and vice versa.

The operation of my invention is as follows:

Suitable temporary supports are erected of timber as shown at E in Figs. 2 and 3 upon which are placed the required number of forms B in their relative positions. The desired number of braces D are placed within the beam supporting forms B either before or after the same have been placed upon the support E and the required number of A forms, equipped with a suitable number of collapsible braces C, are then placed in position—one A form between each two B forms. The arms g of the braces C are then lowered effecting the engagement of the corrugations in the sides of the A forms with the corrugations in the adjacent sides of the B forms and resulting in a rigid whole well adapted for the purposes intended. Figs. 1 and 2 illustrate the relative positions of the forms A and B when the depth of the beams are to correspond to the depth of the sides of the form A. However, the beam depth can be readily increased by lowering the B forms with respect to the A forms and can also be decreased by raising the B forms with respect to the A forms. Fig. 3 illustrates the latter condition and shows the manner of supporting the beam molds by the addition of the blocks G to the temporary support E. The corrugations in the sides of the A forms and the rolled edges of and corrugations in the sides of the B forms are so spaced that a variety of beam depths may be secured by the use of one set of forms. The forms may be either of a length to meet the requirements of a particular type of building or may be extensible to accommodate beams of a variety of spans. In the latter case, the meeting edges of the forms may be secured together in any suitable manner.

Having thus described my invention, the structural elements of which are susceptible to modifications which fall within the scope of the appended claims, what I claim and desire to secure by Letters Patent is:

1. In a device of the character described, the combination of a plurality of flexible metal forms, engagement means integral with the sides of the forms, and clamping members operatively associated with the said sides to operate the engagement means.

2. In a device of the character described, the combination of a plurality of flexible metal forms, supporting members for the sides thereof, and supporting means integral with the sides adapted for mutual engagement responsive to the operation of alternate supporting members.

3. In a sheet-metal form for concrete construction, the combination of a plurality of corrugated members with detachable means for sustaining the corrugated members in operative contact.

4. In a sheet-metal form for concrete construction, the combination of a plurality of corrugated members with a plurality of collapsible braces adapted to control the operation of the sides of alternate corrugated members.

5. In a sheet-metal form for concrete construction, the combination of a plurality of members with depending corrugated sides with a plurality of members with upturned corrugated sides and means to support the said corrugated sides in operative contact.

6. A device of the character described comprising in combination a plurality of metal forms constituting molds for concrete floor-slabs and their supporting beams, supporting means integral with the sides of the forms adapted to permit adjustment of said forms, collapsible braces for connecting said forms in assembled position, and a temporary supporting structure for the whole.

7. A device of the character described comprising in combination a plurality of units consisting of two flexible metal forms provided with grooved sides adapted for mutual engagement and vertically adjustable to regulate the beam depth, removable braces for supporting the grooved sides in operative contact, and temporary means for supporting the assembled units.

8. In a device of the character described, the combination of a plurality of separable metal forms with supporting means integral therewith and adapted to permit the vertical adjustment of the individual forms, collapsible means for connecting the forms in assembled position, and temporary supporting means for the assembled forms.

9. In a metal form member for concrete construction, the combination of a floor-slab mold provided with depending corrugated sides with a beam mold provided with upturned corrugated sides, means to support

the corrugated sides of the beam mold, and means to expand the corrugated sides of the floor-slab mold to cause the nesting of the respective corrugated sides.

10. A metal form member for concrete construction, comprising in combination a mold provided with depending sides terminating in longitudinal channels, a mold provided with upturned sides terminating in longitudinal rolled edges, correspondingly spaced longitudinal grooves in the depending and upturned sides, and collapsible supports adapted to engage the longitudinal channels and expand the depending sides to control their engagement with the upturned sides.

11. A metal form for concrete construction comprising in combination a plurality of floor-slab molds provided with depending corrugated sides, a plurality of beam molds with upturned corrugated sides adapted to coact with the adjacent dependent sides of two floor-slab molds to complete the beam molds, removable braces for supporting the upturned sides, and collapsible braces engaging the depending sides and adapted to expand the said depending sides to cause the engagement of same with the adjacent upturned sides of the beam molds.

12. A metal form for concrete construction comprising in combination a plurality of floor-slab molds formed with depending sides provided with longitudinal grooves, a plurality of beam molds formed with upturned sides provided with longitudinal grooves, the longitudinal edges of the depending sides being formed into channels and the longitudinal edges of the upturned sides being formed into rolled edges, the said grooves and rolled edges of the upturned sides being spaced to correspond with the grooves in the depending sides and adapting the respective sides for vertical adjustment, supports for beam reinforcing rods adapted to brace the upturned sides, and folding braces engaging the longitudinal channels and adapted to support the floor-slabs and to operate the depending sides to cause the engagement of the grooves of the depending sides with the grooves of the adjacent upturned sides and the subsequent release of same.

In testimony whereof I affix my signature.

HARRY K. CARPENTER.