Sept. 7, 1926. 1,599,035

W. E. BAUMBERGER

KNOCKDOWN FORM FOR MOLDING CONCRETE

Filed Nov. 9, 1925 2 Sheets-Sheet 1

Fig. 1.

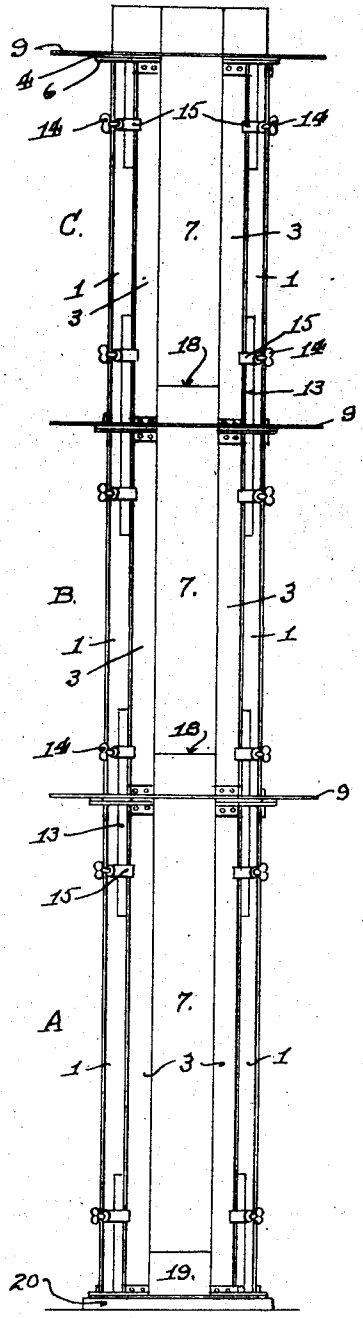


Fig. 2.

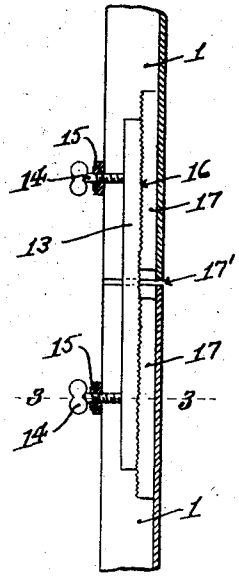
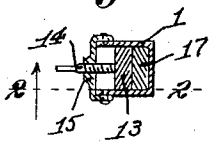


Fig. 3.



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Fig. 4.

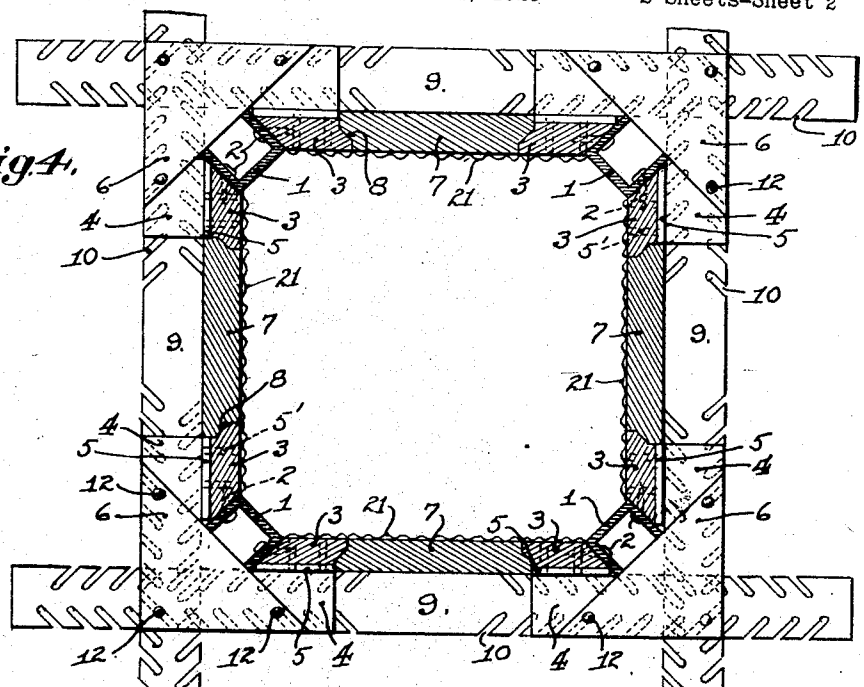


Fig. 5.

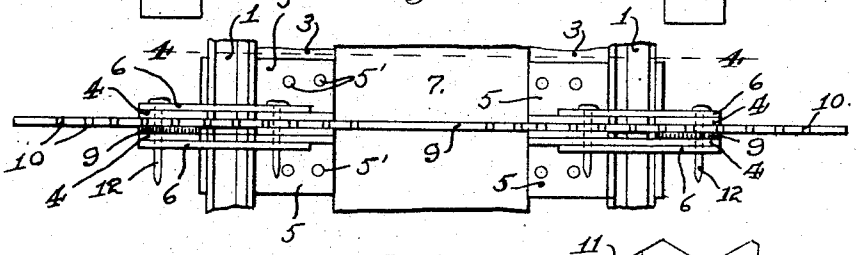


Fig. 6.

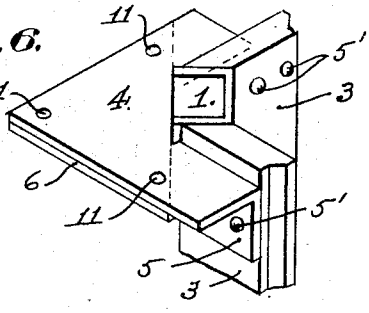
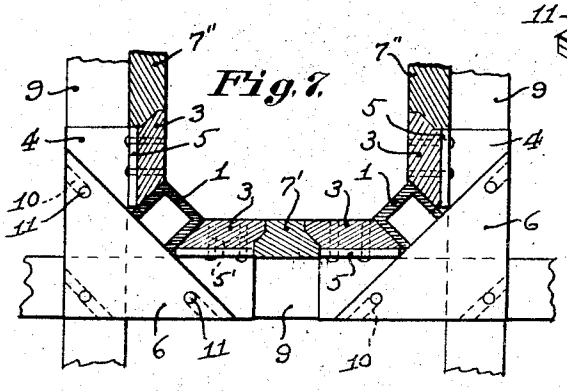


Fig. 7.



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UNITED STATES PATENT OFFICE.

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KNOCKDOWN FORM FOR MOLDING CONCRETE.

Application filed November 9, 1925. Serial No. 67,834.

The present invention relates to knock-down forms for molding concrete, especially for columns, beams, and the like.

The principal object of the invention is to provide a knock-down form which can be used an indefinite number of times. A further object is to provide such a form which is adjustable to different sizes. A still further object is to eliminate, to a large extent, the use of bolts, nuts, or other small special fittings which are easily lost. A still further object is to provide a form of ample strength and rigidity to prevent bulging. Additional objects and advantages of the invention will be apparent from the following specification, which must be read with the understanding that the proportion, arrangement, and form of the several parts may be varied, within the limits of the claims hereto appended, without departing from the spirit of the invention as set forth in said claims. It is also to be understood that the invention, although particularly adaptable for molding columns, beams and the like, may be embodied in forms of other shapes without material change.

With this in view, a preferred embodiment of the invention will now be fully described with reference to the accompanying drawings, wherein:—

Fig. 1 is an elevation of my complete form.

Fig. 2 is a longitudinal section enlarged of one of the corner channel members, showing the splicing member for joining two units together, and is taken on the line 2—2 of Fig. 3.

Fig. 3 is a transverse section taken on the line 3—3 of Fig. 2.

Fig. 4 is a transverse section, enlarged, of the complete form, and is taken on the line 4—4 of Fig. 5.

Fig. 5 is a side elevation of the transverse joint between two adjacent units.

Fig. 6 is a perspective detail of the upper end of one of the corner members.

Fig. 7 is a transverse sectional detail of two corner members and an intervening side member, illustrating the positions of the parts when molding horizontal beams.

My form is preferably constructed in units, which can be joined together, end to end, to make the desired length. Thus, for example, three such units are shown in Fig. 1, designated A, B, and C respectively. All are identical in construction, and are built up of four corner sections with intervening side sections, the transverse dimensions of the form being governed by the width of said side sections.

The corner sections are all identical, and each comprises a longitudinally disposed channel member 1, Figs. 4 to 7, preferably iron or steel, and positioned at an angle of 45 degrees to the sides of the form, as shown. To the sides of this channel member are secured, as by nails 2, longitudinally disposed flat members 3, preferably wood, which complete the corner section of the unit. The edges of the members 3 are cut at an angle of 45 degrees, to abut against the sides of the channel member 1. Obviously, if the cross section of the column to be molded be other than rectangular, as for example hexagonal, the angular dimensions given above would be varied accordingly.

The corner section is further held together and strengthened by gussets, there being preferably one such gusset at each end of the section, and as many in between as may be necessary. The end gussets only are shown in the drawings, however. Each gusset comprises an angularly formed transversely disposed plate member 4, preferably iron or steel, provided with flanges 5 at its end regions, and said flanges are permanently secured to the backs of the flat members 3 by screws, rivets, or bolts indicated at 5′, and a triangular flat plate 6 reinforcing the central bent or angular region of said plate member 4 and secured thereto in any desired manner, not shown. The gussets thus constitute rigid angular reinforcements for the corner sections, holding the members 1 and 3 together in their proper relative positions. Said gussets also provide flanges extending outwardly from the corner sections by which they may be connected together, as will be described hereinafter.

The intervening side sections, which are separable from the corner sections above described, are longitudinally disposed flat members 7, preferably wood, and are fitted to the corner section members 3 by splayed or rabbeted joints 8. Obviously one or more such flat members may be used to make up each side section 7, or, in molding small columns, the side sections may be dispensed with entirely. In molding horizontal beams, the form or unit may consist only of two corner sections, as shown in Fig. 7, with a

bottom member 7', similar to the side members 7 described above, and side members 7'' of any desired height to provide a trough-like form of suitable depth.

The corner sections and the intervening side sections, if the latter be employed, are held together laterally, to form the complete unit by four transverse locking or retaining bars 9, preferably metal. Said locking bars are provided with suitable connecting means which in their best form comprise angularly disposed notches 10 formed in the edges of said bars, the notches at the two end portions of each bar being reversed in direction, as shown. These notches 10 register with apertures 11, Figs. 6 and 7, formed in the gusset members 4 and 6, there being preferably three such apertures in each gusset, so that pins 12, Figs. 4 and 5, may be dropped through to lock the bars 9 and the corner sections together. The side sections 7 are retained in position by the splayed joints 8 and by the bearing of their outer surfaces against the bars 9.

The angular arrangement of the notches 10 in the locking bars 9 makes for ease in assembling the structure, without impairing the effectiveness of the lock, for, the greater the lateral expansive force upon the unit, the more securely are the pins 12 retained in said notches; and by providing a plurality of such notches in each bar, the same bars may be used for units of different dimensions.

When two units are placed end to end, only one set of locking bars need be used at the joint, said bars lying between the gussets of the adjacent units, as shown in Fig. 5, and the pins 12 being passed through both gussets and the intervening bar. Said gussets, pins, and bars thus serve to connect the two units, but as a further connection, and to add rigidity to the joint, I prefer to employ the parts shown in Figs. 1, 2 and 3. These comprise splicing bars 13 lying longitudinally within the channels 1 of the corner members and extending across the joints, and clamping screws 14 adapted to bear against the outer faces of said splicing bars, said screws being mounted in bridges or yokes 15 secured to the open sides of the channel members. As a further precaution I prefer to provide the inner faces of the bars 13 with teeth, as shown at 16, adapted to engage correspondingly toothed blocks 17 secured to said channel members 1. Thus when two or more units are joined together, end to end, both by the pins 12 and by the connecting bars 13, a rigid columnar form is provided.

It will be obvious that the splicing bars 13 may be relied upon exclusively to make a rigid joint between adjacent units, especially in comparatively light work. This construction is indicated in Fig. 1, in which the units B and C are provided with gussets at their upper ends only, their lower ends being held against lateral expansion by being connected, through the agency of the bars 13, with the gussets and transverse locking bars 12 of the upper ends of the sections A and B respectively. The use of the splicing bars 13 also permits the adjacent units to be spaced slightly, as shown at 17' in Fig. 2, if such spacing be desired for any reason. In this case, the bars 13 not only connect the adjacent units, but bear the weight of the upper unit as well. The teeth 16 prevent slipping, and provide for reasonably close adjustment of the space 17'.

As a further means of strengthening the joints between the ends of adjacent units, I may shift the side sections 7 longitudinally with respect to the corner sections, so that the joints between the ends of said side sections are out of line with those of the corner sections, as indicated at 18 in Fig. 1. A short filler piece 19 may be employed at the bottom of each tier of side sections to produce such broken joints. The bottom of the complete form may be secured in any desired manner to a suitable base indicated at 20.

In order to preserve the wooden members 3 and 7 from the deleterious effects of the concrete, I prefer to employ a lining 21, Fig. 4, which may be made of any suitable material, as for example sheet metal, and which may be held in position by any suitable means not shown in the drawings. Such lining may have any desired surface form. For example, I have shown it as corrugated, to produce a rough or corrugated surface upon the concrete for the better adhesion of plaster or other coating subsequently applied.

It is to be noted that my form requires no bolts, screws, or other special small parts capable of being lost easily, with the exception of the pins 12, and for these pins I prefer to use ordinary nails of suitable size. The clamping screws 14 are screwed through the yokes 15, and, if desired, some well known means may be employed for preventing their removal. All other parts are of such a size as to keep them from being easily lost or broken.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent of the United States is:—

1. In a knock-down form for molding concrete, a corner section comprising a longitudinally disposed channel member; flat members secured to the sides of said channel member and having their faces angularly disposed toward each other; and a substantially transverse gusset secured to the backs of said flat members to hold them and said channel member in their relative positions.

2. In a knock-down form for molding concrete, a corner section comprising an ob-

lique longitudinally disposed member; flat members secured to the sides of said oblique member and having their faces angularly disposed toward the face thereof; and a substantially transverse gusset secured to the backs of said flat members to hold them and said oblique member in their relative positions.

3. In a knock-down form for molding concrete, a corner section comprising longitudinal mold members angularly disposed toward each other, and a substantially transverse gusset extending across the backs of said members for holding them together, said gusset comprising an angular member bent at its central region and provided with flanges at its end regions for attachment to said mold members, and a triangular reinforcing plate secured to the bent central region of said angular member.

4. In a knock-down form for molding concrete, a corner section comprising an oblique longitudinally disposed channel member; flat members secured to the sides of said channel member and having their faces angularly disposed with respect to the face thereof; and means for holding said channel member and said flat members in their relative positions.

5. A knock-down form for molding concrete comprising a plurality of cooperating corner sections having substantially transverse apertured flanges projecting from their backs; a plurality of locking bars surrounding said corner sections, said bars having inclined notches in their edges adapted to register with the apertures of said flanges; and connecting pins removably seated in said apertures and notches.

6. A knock-down form for molding concrete comprising a plurality of cooperating corner sections having substantially transverse apertured flanges projecting from their backs; a locking bar extending across the backs of said corner sections and lying adjacent the flanges thereof, said bar having inclined notches in its edge adapted to register with the apertures of said flanges; and connecting pins removably seated in said apertures and notches.

7. A knock-down form for molding concrete comprising a pair of corner sections; gussets secured to the backs of said corner sections for holding them in shape, said gussets forming substantially transverse flanges provided with apertures; a locking bar extending between the gussets of said corner sections for holding them together, said bar having inclined notches formed in its edges; and removable pins adapted to engage said apertures and said notches to connect said bar with said gusset flanges.

8. In a knock-down form for molding concrete columns and the like, a plurality of corner sections each comprising an oblique longitudinally disposed channel member and flat members secured to the sides of and angularly disposed toward said channel member; means for releasably holding said corner sections together; and lining members within the form and positioned to cover the faces of said flat members.

9. In a knock-down form for molding concrete columns and the like, a plurality of corner sections each comprising an oblique longitudinally disposed channel member and flat members secured to the sides of and angularly disposed toward said channel member; means for releasably holding said corner sections together; and lining members provided with corrugated inner faces, positioned within the form and covering said flat members.

10. In a knock down form for molding concrete, a pair of units positioned end to end, each unit comprising longitudinally disposed corner sections and intervening side sections, the joints between the adjacent ends of said side sections of the two units, lying in a different transverse plane from that of the joints between the adjacent ends of said corner sections; means for separably connecting the sections of one unit with those of the other unit; and transversely disposed means for separably connecting the sections of one unit together.

In testimony whereof I have signed my name to this specification.

WALTER E. BAUMBERGER.