

Nov. 13, 1923.

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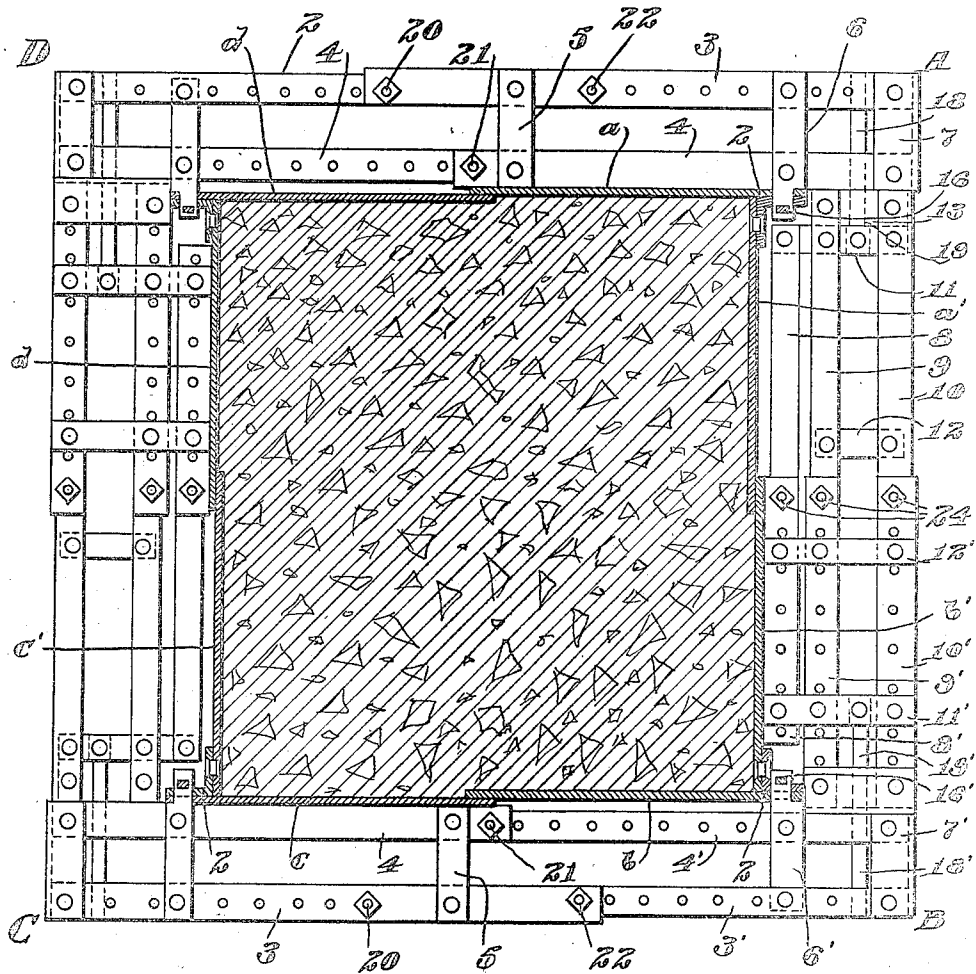
C. F. MOORE

ADJUSTABLE CONCRETE FORM

Filed Oct. 6, 1922

3 Sheets-Sheet 1

Fig. 1.



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Fig. 3.

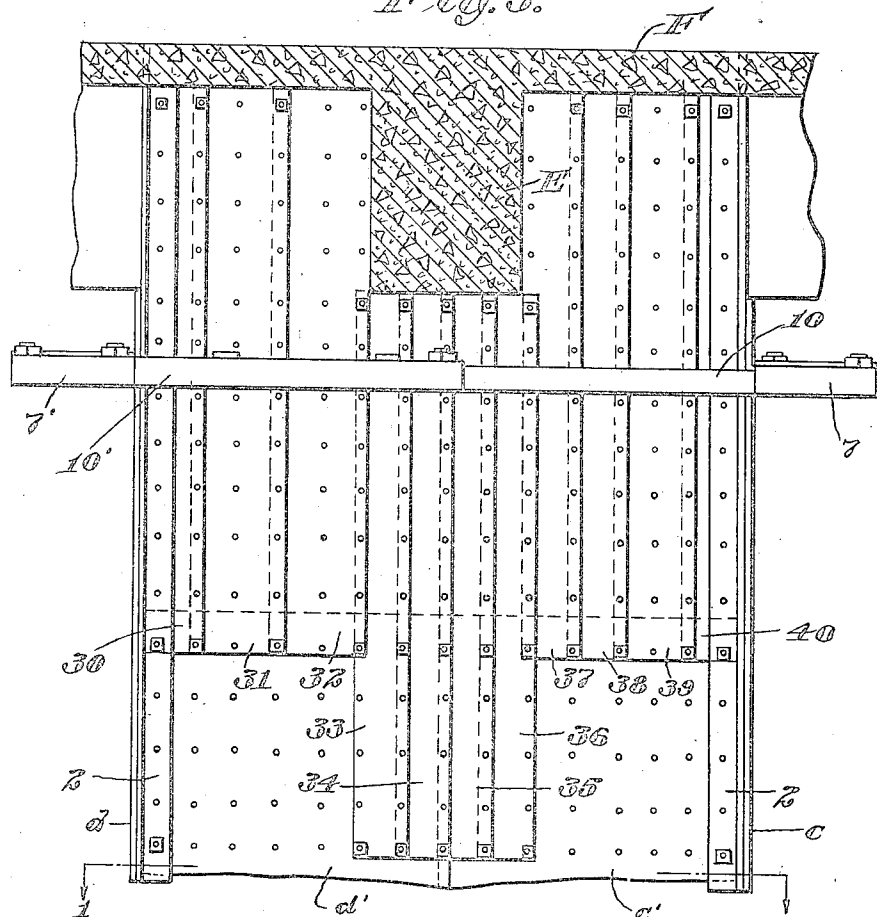
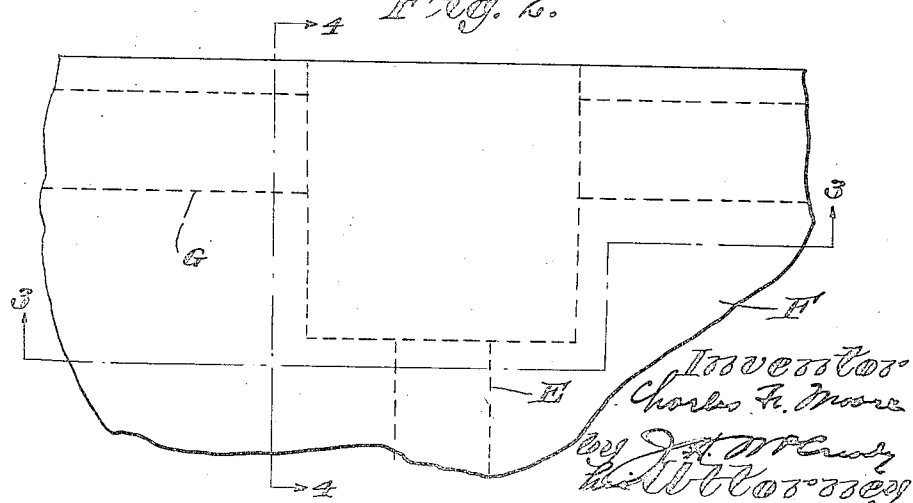


Fig. 2.



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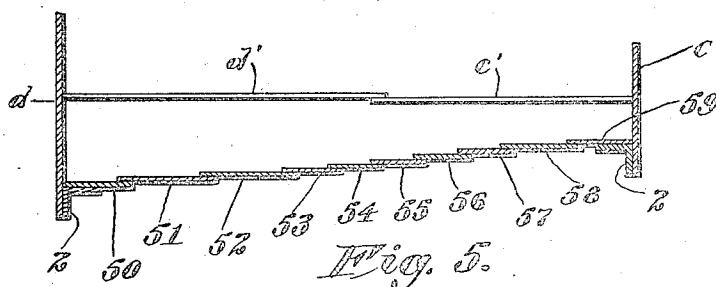
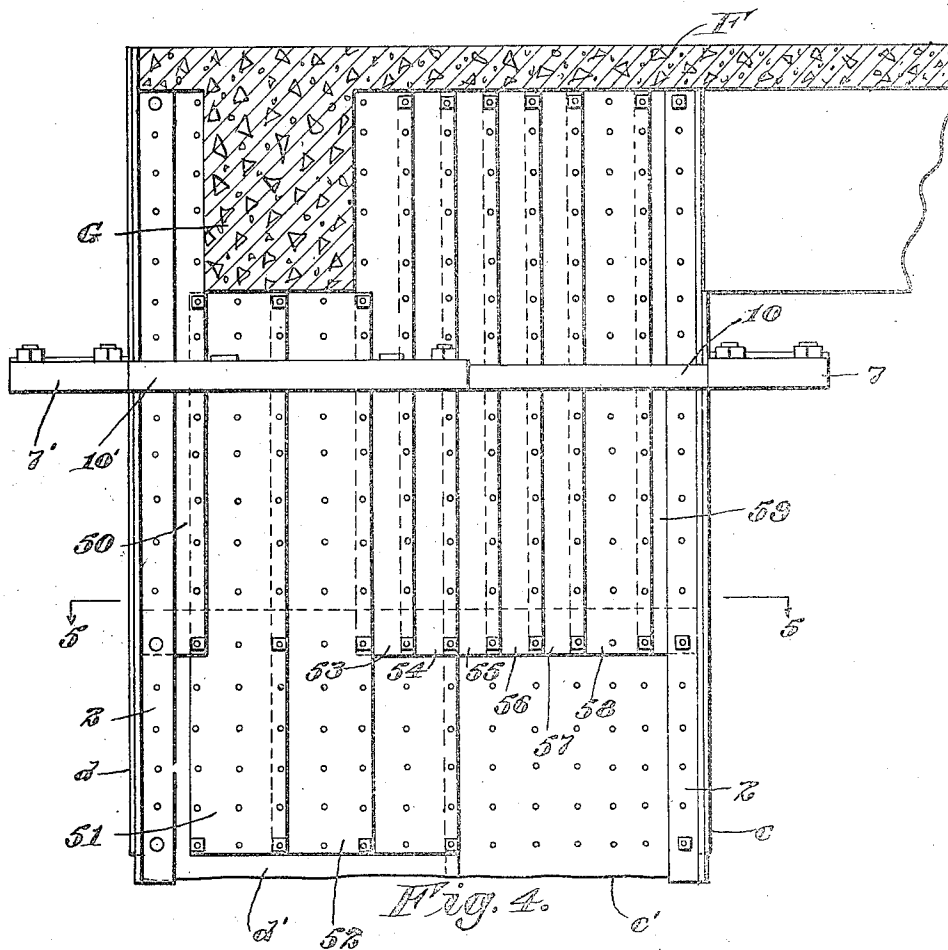
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE.

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ADJUSTABLE CONCRETE FORM.

Application filed October 6, 1922. Serial No. 592,729.

To all whom it may concern:

Be it known that I, CHARLES F. MOORE, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Adjustable Concrete Forms, of which the following is a specification.

This invention relates to forms used to support a concrete column while the concrete is poured, and subsequently during the period required for the concrete to set sufficiently to become self-sustaining. The present invention involves an improvement on the invention described in my copending application Serial No. 411,092, filed September 18, 1920.

In my prior application above identified, I have disclosed a sheet metal form which is adjustable for use in the making of concrete columns of various cross sectional dimensions. It is a common practice, as is well understood by those skilled in this art, to locate a column under a beam or under a junction of two or more beams, and this practice necessitates what is known in this art as "a beam cut" in the upper part of the form which supports the column. That is, the upper part of the form is cut out at each point where it is necessary to accommodate a beam.

The present invention has for its chief object to devise a form which can be adjusted to provide a beam opening or beam cut. The invention also aims to devise a form of this character which can be used in connection with the form disclosed in my application above identified.

The nature of the invention will be readily understood from the following description when read in connection with the accompanying drawings, and the novel features will be particularly pointed out in the appended claims.

In the drawings,

Figure 1 is a horizontal cross sectional view of a concrete column supported in a form of the character shown in my application above designated, the plane of cross section being indicated by the line 1—1, Fig. 3;

Fig. 2 is a plan view of a portion of a floor of a building showing a column and three beams radiating therefrom;

Fig. 3 is a cross sectional view on substantially the line 3—3, Fig. 2, showing the

upper part of a form adjusted to accommodate the beam;

Fig. 4 is a similar cross sectional view on substantially the line 4—4, Fig. 2; and

Fig. 5 is a diagrammatic cross sectional view of the parts at one side of the column, the plane of cross section being indicated by the line 5—5, Fig. 4.

Referring first to Fig. 1, the form there shown comprises four sections arranged in two pairs, the members of each pair being duplicates of the corresponding members of the other pair. Each section supports one corner of the column and the sections are designated at A, B, C and D, respectively. Section A comprises two plates *a* and *a'* which lie at right angles to each other and are secured rigidly together at their adjacent edges by being riveted to an angular strip 2. These two plates define one corner of the column. Each of the other sections includes similar plates secured together in a like manner, the plates of the section B being designated at *b* and *b'*, those of section C at *c* and *c'*, and those of section D at *d* and *d'*, respectively. Each pair of plates defines one corner of the column, and the corresponding plates of similar pairs are supported in overlapping relationship and support the four vertical faces of the column. Each plate preferably consists of sheet metal of suitable thickness. It is contemplated that rolled steel or iron plates, galvanized if desired, will be used and each plate for most purposes need not be over one-sixteenth of an inch in thickness.

For the purpose of supporting these plates in their operative positions, each of the sections above mentioned includes truss-like frame members which are secured together to encircle the plates, and several of these encircling frames are provided on each form, the several frames being spaced apart vertically of the form at the required intervals to give the necessary rigidity to the frame and prevent the plates from buckling.

The frame for the section A comprises two parallel metallic bars 3 and 4 of angular cross section spaced apart but secured rigidly together by cross pieces 5, 6 and 7, and if desired also by diagonal members. The frame part formed by these members lies parallel to the plate *a* and supports this plate. This frame section also includes three other members or bars lying parallel to

the plate a' , these members being designated at 8, 9 and 10, respectively, and the two latter members being of angular cross section. Cross pieces 11, 12 and 13 riveted to these parts secure them in the desired spaced relationship, and the downwardly projecting webs of the angular pieces 4 and 13 are secured together by bolts.

For the purpose of securing this section to the corner plates a and a' , the plate a , and the corner angle piece 2 where these parts project beyond the plate a' , have a hole punched therein to receive a lug or extension 16 of the member 6, and a tapered key or wedge 17 is driven through the slot in this tongue and cooperates with the face of the part 2 to secure this frame section firmly to the plates a and a' .

The corresponding part of the section B includes the same frame members as that of the section A, but these members are reversed and accordingly the parts of this frame section are designated by the same numerals as those used for the corresponding parts of section A except that these numerals are primed. The section C is an exact duplicate of the section A, while the section D is a duplicate of the section B.

The sections are adjustably secured together in a manner which enables them to be set up relatively to each other in various relationships depending upon the desired cross sectional dimensions of the column to be made. For this purpose the angle members 3 and 4 of the section A overlap the corresponding members 3' and 4' of the section D and these members are secured together by bolts 20, 21 and 22 which enter holes formed in these parts. It will be seen that each of the parts 3, 3', 4 and 4' are provided with a series of holes spaced apart at regular intervals so that a great range of adjustment is provided for the sections A and D toward and from each other.

The sections A and B are similarly connected together by bolts 24. That is, the parts 8 and 8', 9 and 9', 10 and 10' overlap and are provided with holes spaced similarly to those in the parts 3, 3' and 4', and the bolts 24 secure these parts together, this construction providing for a variation in the distance between the sections A and B similar to that provided between the sections A and D. The same provision is made for securing the section C to the sections B and D.

The construction so far described is like that shown and described in my copending application above designated, and this construction is utilized to support the greater part of the column. Fig. 2 shows an arrangement which I have devised for providing a beam cut at the upper end of this column. In this arrangement a series of narrow plates, designated by the numerals

30 to 40 inclusive, Fig. 2, are secured to the upper portions of the main plates d' and c' . All of these narrow plates have holes punched in their opposite margins at regular intervals to receive bolts by means of which their overlapping edges are secured together. The main plates d' and c' also are perforated at corresponding intervals so that the narrow plates may be adjusted vertically of the main plates into different positions of longitudinal relationship to each other.

As shown in Fig. 3, the plates 33—34—35 and 36 have been adjusted into lower positions than the other narrow plates, thus forming an opening between the adjacent edges of the plates 32 and 37 to accommodate the beam E which is joined to the floor slab F. The outermost plates 30 and 40 are secured to the opposite angle strips 2—2 in the same manner that the main plates d' and c' are secured thereto.

If the other faces of the column are not intersected by beams they will be supported by plates arranged as shown in Fig. 1, the narrow plates being used only where it is necessary to provide for a beam opening. The upper part of the form preferably is encircled by a truss-like frame exactly like that used to support the form at lower points so that all the plates are rigidly held in their operative positions while the concrete is being poured and subsequently while it sets.

It will be noted that some of the plates, as for instance, 31, 32 and 39, are wider than the other plates of the narrow set. This variation in width enables the workmen to rearrange the plates, as may be desired to make the beam of substantially any desired cross sectional dimensions, and to make it in any part of the upper edge of the support.

Figs. 4 and 5 show a somewhat different arrangement of plates adjusted for the location of the beam G near the left-hand side of the column. This plate arrangement will be obvious from an inspection of Figs. 4 and 5. In both Figs. 3 and 4 it has been assumed for convenience that the narrow plates are used in the upper part of a section constructed like the section at the left-hand side of the column shown in Fig. 1.

It will now be understood that this invention provides a simple construction of sheet metal form which can be adjusted to accommodate beams of substantially any desired dimensions. Since the plates are made of sheet metal they can be manufactured very economically, it being necessary simply to punch or cut them out to the proper size and punch the holes in them. They can be used over and over again, thus obviating the waste of lumber which is inevitable when wooden forms are used, as is now the common commercial practice. Furthermore,

after the form has been taken down the parts can be packed in a small space for shipment or storage.

While I have herein shown and described the best embodiment of my invention of which I am at present aware, it will be appreciated that this embodiment may be modified in many particulars without departing from the spirit or scope of the invention.

Having thus described my invention, what I desire to claim as new is:

1. In an adjustable form for concrete columns, a series of plates forming a support for one vertical face of a column, and means for securing said plates together in overlapping relationship and enabling them to be adjusted to provide in said support a beam opening adjustable in dimensions both vertically and laterally.

2. In an adjustable form for concrete columns, a series of plates forming a support for one vertical face of a column, and means for securing said plates together in overlapping relationship and enabling them to be adjusted to provide a beam opening at any desired location in the upper end of said support.

3. In an adjustable form for concrete columns, a series of plates forming a support for one vertical face of a column, means for securing said plates together in overlapping relationship and enabling them to be adjusted to provide a beam opening in the upper end of said support, additional plates supporting the other faces of the column, and a truss-like frame encircling all of said plates and supporting them in operative relationship to each other.

4. In a form for concrete columns, an adjustable support for one face of a column comprising a series of narrow plates, and means for securing said plates together with their edges overlapping in various positions of relationship longitudinally of each other.

5. In a form for concrete columns, an adjustable support for one face of a column comprising a series of narrow plates, having holes in their marginal portions, and bolts located in certain of said holes and securing the plates together with their edges overlapping, said holes being positioned to enable the plates to be secured in various positions of relationship longitudinally of each other.

6. In a form for concrete columns, an adjustable support for one face of a column

comprising a pair of main plates supporting the lower part of said face, a series of narrower plates supporting the upper portion of said face, and means for securing said plates in their operative positions and enabling the narrow plates to be adjusted to provide a beam opening in the upper part of said support.

7. In a form for concrete columns, an adjustable support for one face of a column comprising a pair of main plates, and a series of narrow plates secured to the upper portions of said main plates, said narrow plates being adjustable vertically of the main plates, whereby the narrow plates may be adjusted to provide a beam opening in the upper end of said support.

8. In an adjustable form for concrete columns, a series of narrow plates forming a support for the upper part of the vertical face of a column, main plates supporting said vertical face below said narrow plates, means whereby said main plates may be adjusted to vary the width of said face, and means for securing said narrow plates to each other and to said main plates and enabling the narrow plates to be adjusted vertically to provide a beam opening in said support.

9. In an adjustable form for concrete columns, a series of narrow plates forming a support for the upper part of the vertical face of a column, a pair of main plates cooperating to support said face below said narrow plates, the margins of said narrow plates being perforated and said main plates being perforated, and bolts securing said narrow plates together and securing them to said main plates, said perforations being spaced to enable the main plates to be adjusted to vary the width of said face and enable said narrow plates to be adjusted vertically of the main plates.

10. In an adjustable form for concrete columns, a series of narrow plates forming a support for the upper part of the vertical face of a column, said plates varying in width, main plates supporting said vertical face below said narrow plates, means whereby said main plates may be adjusted to vary the width of said face, and means for securing said narrow plates to each other and to said main plates and enabling the narrow plates to be adjusted vertically to provide a beam opening in said support.

CHARLES F. MOORE.