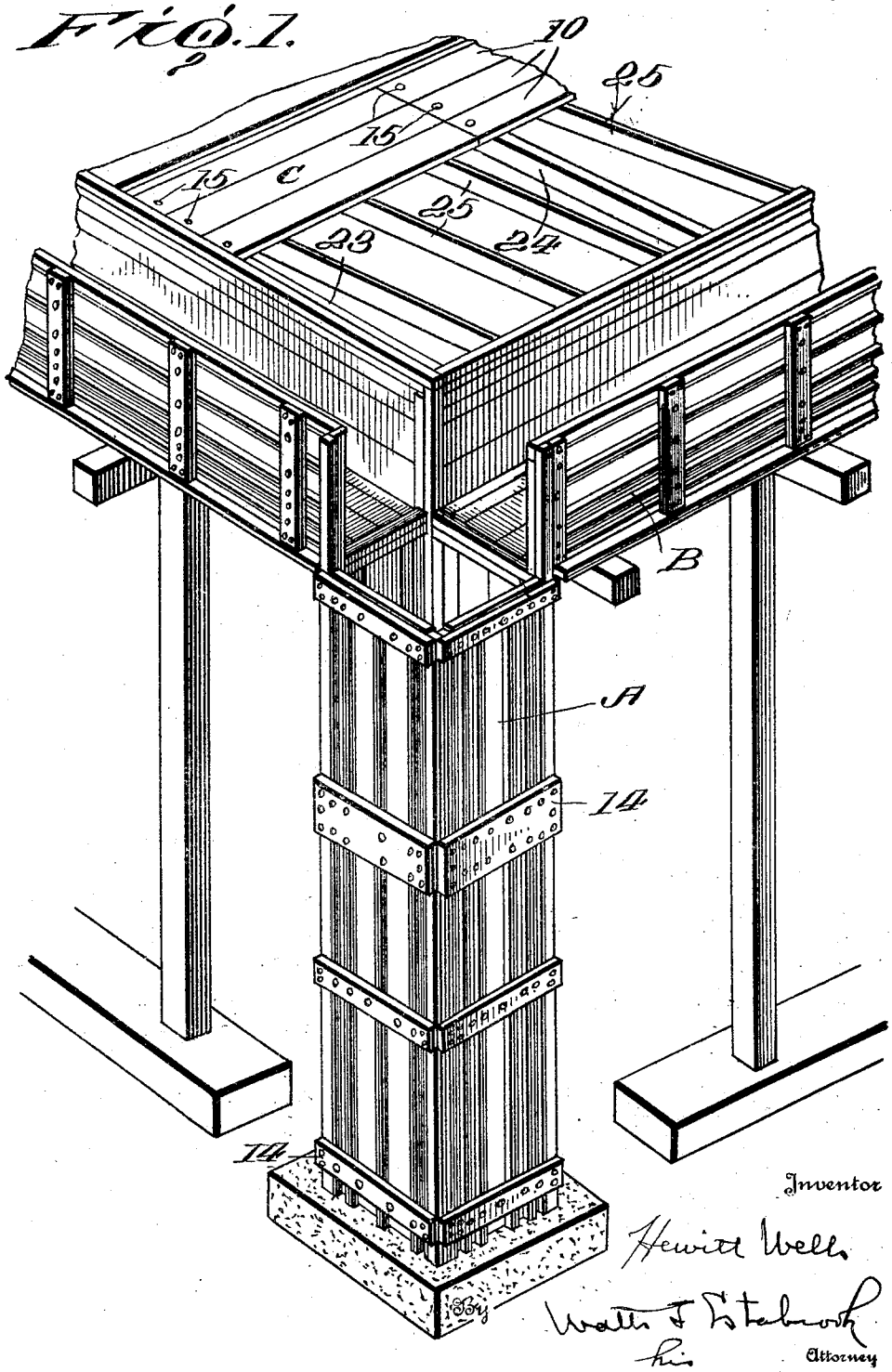
March 16, 1926. **1,577,429**

H. WELLS

FORM FOR CONCRETE CONSTRUCTION

Filed Nov. 2, 1925 4 Sheets-Sheet 1

Fig. 1.



Inventor
Hewitt Wells.
By Walter F. Stebbins
Atty
Attorney

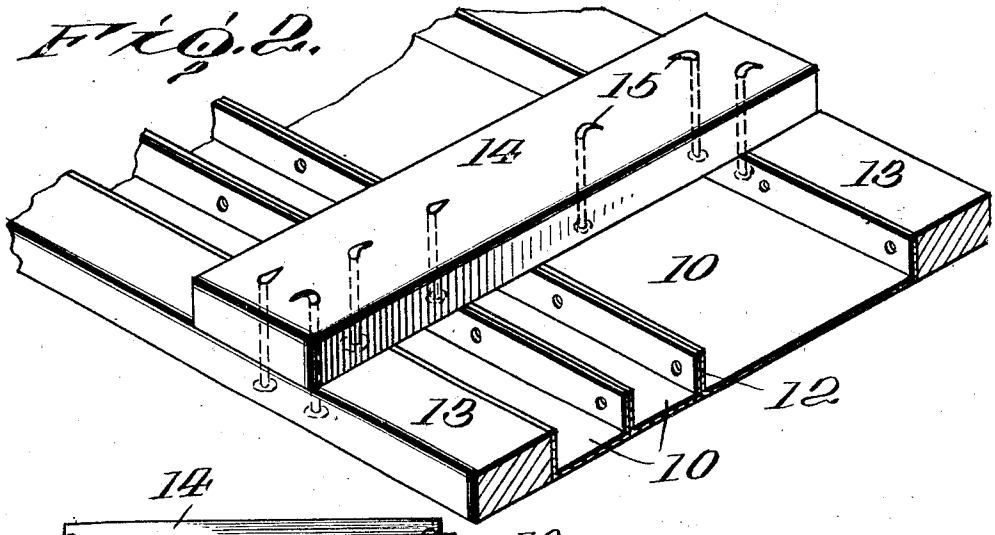
March 16, 1926. 1,577,429

H. WELLS

FORM FOR CONCRETE CONSTRUCTION

Filed Nov. 2, 1925 4 Sheets-Sheet 2

Fig. 2.



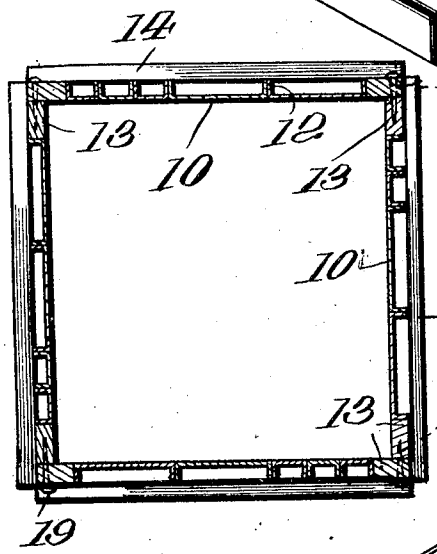


Fig. 3.

Fig. 4.

Inventor

Hewitt Wells

By Walter J. Hotchkiss

Attorney

March 16, 1926. 1,577,429

H. WELLS

FORM FOR CONCRETE CONSTRUCTION

Filed Nov. 2, 1925 4 Sheets-Sheet 3

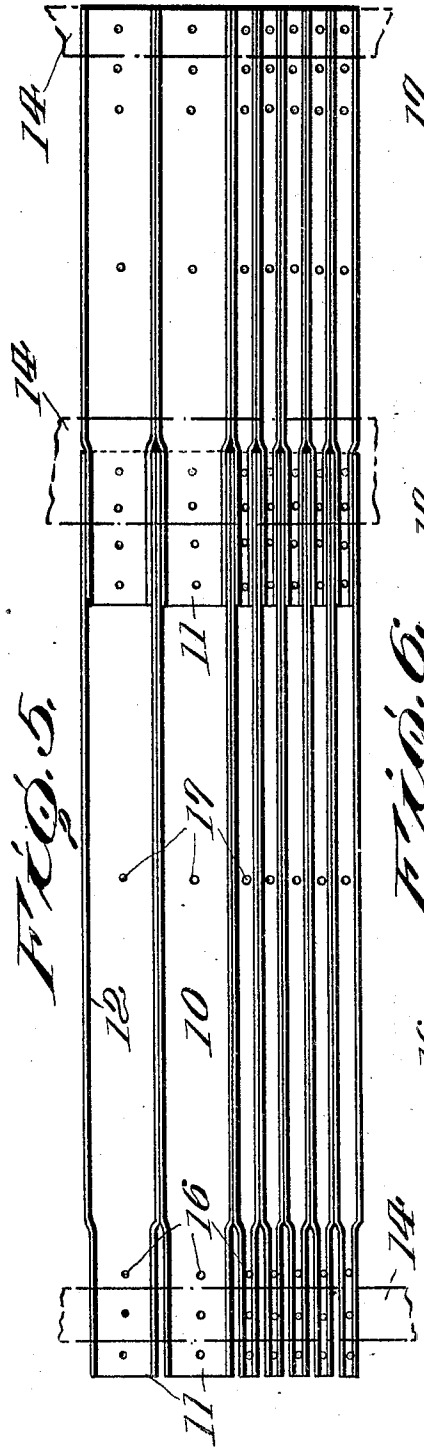


FIG. 5.

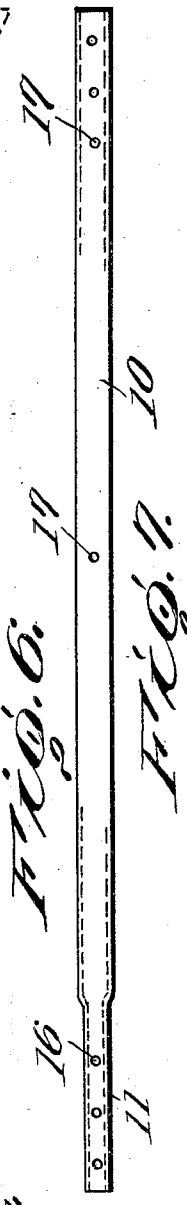


FIG. 6.

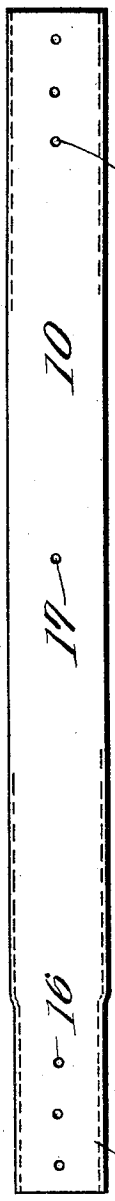


FIG. 7.

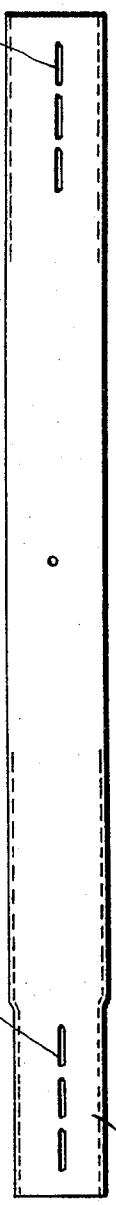


FIG. 8.

Inventor

Henrick Wells

By Watts T. Stalnaker

his

Attorney

March 16, 1926. 1,577,429

H. WELLS

FORM FOR CONCRETE CONSTRUCTION

Filed Nov. 2, 1925 4 Sheets-Sheet 4

FIG. 9.

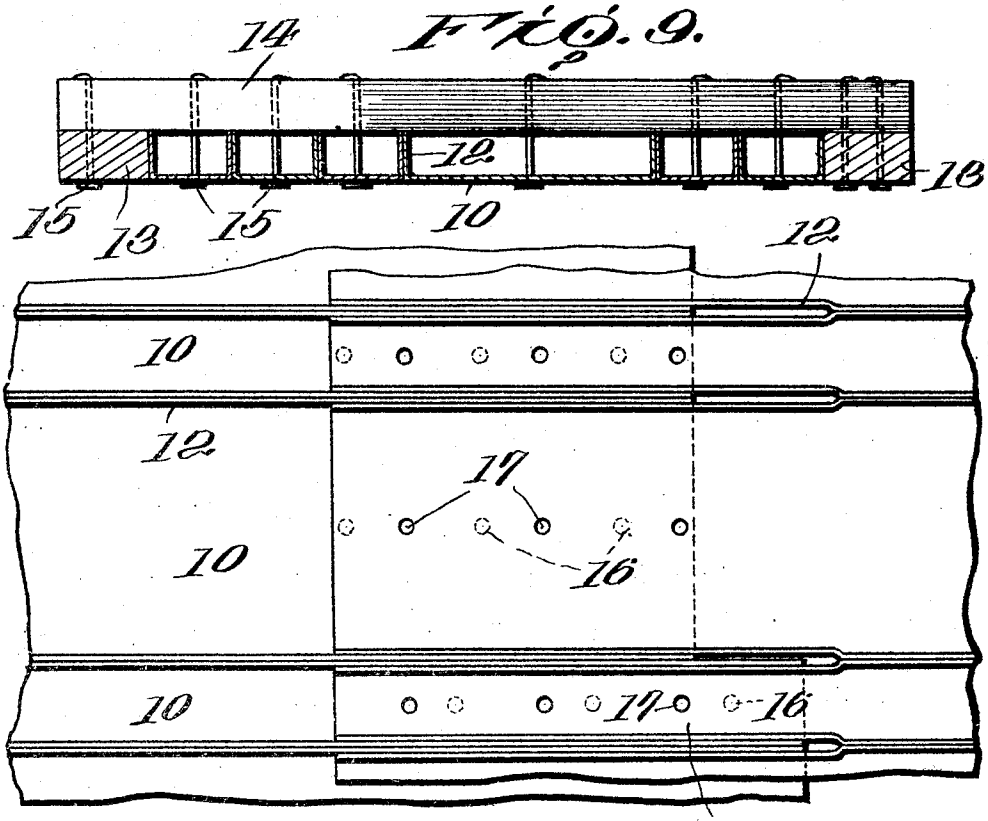


FIG. 10.

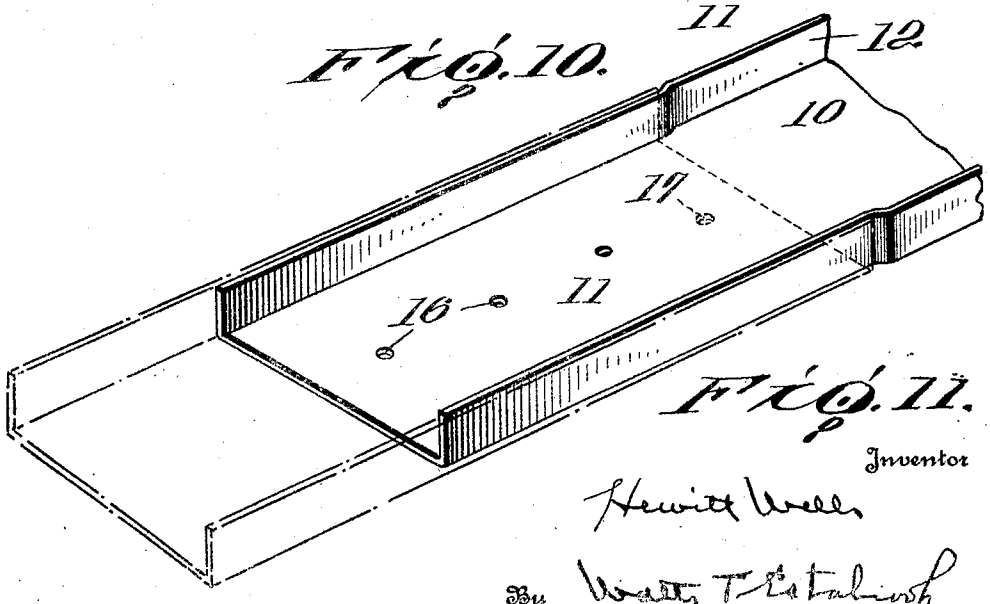


FIG. 11.

Inventor

Hewitt Wells

By Wyatt T. Latanich

Attorney

Patented Mar. 16, 1926. 1,577,429

UNITED STATES PATENT OFFICE.

HEWITT WELLS, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR TO WASHINGTON STEEL FORM COMPANY, OF WASHINGTON, DISTRICT OF COLUMBIA, A CORPORATION OF THE DISTRICT OF COLUMBIA.

FORM FOR CONCRETE CONSTRUCTION.

Application filed November 2, 1925. Serial No. 66,252.

To all whom it may concern:

Be it known that I, HEWITT WELLS, a citizen of the United States, and a resident of Washington, District of Columbia, have invented new and useful Improvements in Forms for Concrete Construction, of which the following is a specification.

This invention relates to an improvement in the design and construction of forms for concrete walls, floors, columns, beams and girders. These forms may be employed in conjunction with each other in the erection of a concrete building wherein the beams and columns would be molded by these forms and the walls and floor system made up of these forms and associated with the columns and beams in the erection of the structure.

The increasing cost of lumber for concrete form work, the high cost of labor in the building and erection, as well as the great waste of material involved, demands some solution of the problem to which this invention applies.

The invention consists in employing pressed steel or hot rolled channel shaped plates of varying widths and lengths and having an end of each channel plate compressed or decreased in depth at one end for the purpose of overlapping or telescoping with adjacent channels in obtaining the desired length of form.

In assembling the form two wooden rails or strips are provided and interposed between these strips are a number of channel shaped plates of different widths to produce a form of a given width and to these plates are connected other plates in overlapping relation to produce the desired length. The rails and plates are mounted upon wooden battens with the flanged edges of the plates resting upon the battens. The rails and plates are then clamped together and nails are driven through the plates and rails into the battens thereby connecting the rails and plates to the battens and producing a composite form. These forms may be made all of the same length and width in erecting a wall, floor, panel or column, or some of them may be made of less width and of shorter lengths, to make allowances for openings and clean out pockets. Also when several of these forms are arranged together to cast the beams or columns they may be built up of various widths and lengths for the purpose of making allowances where beams and columns join and for the purpose of reducing the size of structural members from one floor to another.

The invention consists of certain other novel features of construction and combinations of arrangements of parts which will be hereinafter more fully described and pointed out in the claims.

Figure 1 is a view in perspective illustrating an application of the forms in the construction of columns, beams and floors;

Figure 2 is a perspective view showing the end of a form constructed of two rails and three plates connected together by a batten;

Figure 3 is an end view showing four sides assembled for constructing a column;

Figure 4 is a perspective view in detail showing two overlapping or telescoping channel plates;

Figure 5 is a plan view of a form made with overlapping plates;

Figures 6, 7 and 8 are views of the individual plates;

Figure 9 is an end view of a form constructed of a multiple of widths of plates illustrating the arrangement of these plates to the side rails and battens;

Figure 10 is a front plan view illustrating overlapping relation of the several plates;

Figure 11 is a detail perspective view of two overlapping plates of a modified construction from that shown in Figure 4.

In carrying out this invention the forms are constructed of pressed steel channel shaped plates 10 made preferably in lengths of three, four, five and six feet and two and six inches in width. An end of each plate is compressed inwardly of its length for about twelve inches as at 11 and the body or bottom of the plate may be likewise compressed so that when two plates or sections are telescoped the flanges 12 of the plates of the two sections will be parallel throughout their entire length, Figures 4 and 11.

Figure 6 illustrates one of the channel plates having a reduced end 11, and an arrangement of holes 16 at its reduced end, and holes 17 at the opposite end and near the center or approximately midway of the plate. These holes 16 and 17 may be variously arranged and of any number to

suit the requirements for the purpose of overlapping the ends of two plates and attaching these plates to the battens 14. The plates may be provided with openings or slots 18 as shown in Figures 4 and 8. The downwardly extending flanges 12 of the plates are provided with suitable openings or holes 22 for the purpose of attaching the plates to the side rails 13 should occasion require the fastening of a plate to the side rails.

These plates and side rails 13 are fastened to battens 14 as illustrated in Figures 2 and 9. The battens are preferably four inches wide, but the battens that are employed where the plates overlap are preferably eight inches wide for stiffness and to insure the battens registering with one or more of the holes of the plates so that nails 15 may be driven through the holes and through the battens for fastening the plates at the overlapped ends to the battens. In instances where the holes 16 and 17 of the overlapping ends of the plates do not come into registry due to the length of the form to be constructed a punch is employed to form holes in the underneath plates so that the nails may pass through the plates and into the battens. Instead of a series of closely spaced holes, slots 17 may be employed as illustrated in Figure 8, which would insure registry of the openings of the overlapping ends.

The relation of the plates 10 to each other when assembled in multiple, will bring the flanges 12 in close proximity at the point of overlap and should any open space occur between the plates it will be at the ends of the flanges only as indicated in Figure 10. Where the plates two inches wide on each side of the six inch wide plates are shown having a different overlap illustrates how different overlaps can be made to obtain a desired length of form. The flanges 12 of several of the assembled and overlapped plates when clamped together are brought in close contact and will have their edges tight and parallel throughout the length of the form. When thus nailed to the battens the form will hold its shape and size.

In making a composite form two side rails 13 are employed. These rails are cut to a length for a particular form to be constructed and interposed between these rails are the metal plates 10, the number of plates employed being governed by the width of form to be produced. As illustrated in Figure 2, a form fourteen inches wide is shown made up of two side rails 13 two inches wide, a metal plate 10, six inches wide and two plates each two inches wide. The side rails 13 and plates 10 are connected to a batten 14 by means of nails 15 passing through the rails and battens and through the several plates and battens. The nails are preferably clenched on the outer side of the battens 14 for securely holding the rails and plates in position. It is to be noted that the flanges 12 are in contact with the battens 14 so that the battens form a support for the plates and resist any pressure exerted upon the plates which would force them out of position.

In Figure 9 an end view is shown of a twenty inch wide form composed of the side rails 13 and five two inch plates and one, six inch plate. This arrangement may be varied and instead of three of the two inch plates a six inch wide plate could be substituted.

In making up a form of nine to ten feet in length, the form could be made from plates five feet in length having overlapping ends of twelve inches by selecting two, five feet length plates or a six foot plate and a four foot plate could be used and overlapping them the required number of inches to suit the length of form desired.

In constructing a square column form, the four sides would be assembled as illustrated in Figure 3. As shown the upper and lower forms would be twenty-two inches wide and the remaining two sides would be twenty inches wide while the battens for each form would be twenty-two inches in length. Therefore, in constructing a column say twenty inches square the upper and lower forms might be composed of side rails 13 and two, six inch wide plates 10, and three, two inch wide plates; while the remaining two sides would be made up of side rails and two, six inch wide plates and two, two inch wide plates. When assembled the side forms would be interposed between the upper and lower forms as shown in Figure 3; bringing the rails of the adjacent sections together and fastening them by nails 19.

In the construction of a beam form a similar method is employed as described for columns. The two sides and bottom forms are made as shown in Figure 1.

In reinforced concrete building construction the size of the supporting columns are ordinarily reduced as the floors approach the roof. In such instances it is possible to alter the same forms used on one floor for use on another floor above and without entirely reconstructing the forms or building additional forms for each floor. This is accomplished by taking off one of the side rails and removing one or more of the plates 10 from the form, and then replacing the side rail to the batten. The projecting ends of the battens may then be cut off.

In constructing a column it is often desirable to provide pockets or openings at the bottom of the column box for the purpose of cleaning out the base of the column before the concrete is poured. To provide for this opening at the base two of the plates

may be given a greater overlap than those adjacent, so that they would not extend the full length of the column side. After cleaning out the column this opening may then be closed by inserting a piece of wood and securing it to an adjacent plate or plates by means of nails passing through the openings 22 of the flanges 12. These openings may also be provided at the top of the column forms where the beam forms frame into the column.

Figure 1 illustrates an arrangement that may be employed in the use of these forms in building a column A and beams B and slab forms C. In this method the slab forms C would be supported at its ends upon wooden strips 23 nailed over the battens attached to the exterior surface of the forms comprising one of the sides of the beams B. The overlapped ends of the plates 10 of the form for the floor would be supported by a transverse joist 24. The metal plates 10 would therefore be fastened to the strips 23 and joist 24 by nails 15 passing through the plates and into the strip 23 and joist 24 for holding the forms in place. These forms or plates 10 would be additionally supported between the strips 23 and joist 24 by diagonal braces 25. To remove the slab forms from position after the concrete is poured strips 23 are taken off and joist and braces knocked out and the slab plates 10 comprising the form taken down in turn.

It will be evident from the foregoing that these forms may be variously employed in concrete construction work and the like as they may be made of various widths and lengths to suit the specific requirements of the work.

In assembling the forms of the same or a series of plates of different widths a form may be made of any width required by simply supplying a sufficient number of plates to produce the width of a form desired; and then by adding to these additional plates and overlapping the ends thereof a form may be constructed practically any length required; as the amount of overlap between the adjoining plates would be governed by the length of form needed.

In Figure 11 a modified construction is shown of the overlapping and telescoping ends of two plates 10. This construction is similar to that shown in Figure 4 but the bottom or face of the plates 10 is not compressed and only the sides are compressed sufficiently to premit of the ends entering between the flanges 12 of an adjoining plate.

Having described my invention what I claim as new and desire to secure by Letters Patent is:

1. A form for concrete construction comprising a metal plate having its sides bent downwardly, said plate having the sides thereof at one end extending inwardly for reducing the width of the plate to permit overlapping of the plate with the next adjacent plate.

2. A form for concrete construction comprising a plate having its sides bent downwardly, said plate having the body and sides thereof compressed inwardly for reducing the width of the plate to permit overlapping of the plate with the next adjacent plate.

3. A form for concrete construction comprising a number of pressed steel channel shaped plates, battens extending transversely of the several plates, and means passing through the plates and battens for fastening the plates to the battens and producing a composite form.

4. A form for concrete construction comprising two sets of plates each set consisting of a number of channel shaped plates, the ends of the plates of one set overlapping the plates of the adjoining set for producing an extensible joint, attaching means extending across the several plates at their overlapped ends, and means passing through the plates, and attaching means for connecting them together.

5. A form for concrete construction comprising a number of channel shaped plates of multiple widths, side rails engaging the outermost plates, and battens connected to the side rails for joining the several plates together to produce a composite form.

6. A form for concrete construction comprising a number of channel shaped plates of different widths, side rails engaging the outermost plates, and battens connected to the side rails for joining the several plates together to produce a composite form.

7. A form for concrete construction comprising a number of channel shaped plates, side rails engaging the outermost plates, and battens connected to the side rails and plates for joining the several plates together to produce a composite form.

8. A form for concrete construction comprising sets of plates, each set consisting of a number of plates of multiple widths, an end of the plates of each set being inwardly compressed and telescoping the ends of the adjoining set of plates, side rails engaging the outermost plates of the several sets of plates, battens connected to the side rails for joining the several plates of each set together, and means for connecting the plates to the battens.

9. A form for concrete construction comprising sets of plates, each set consisting of a number of channel shaped plates of multiple widths, an end of the plates of each set being inwardly compressed and telescoping the ends of the adjacent set of plates whereby the sides of the adjoining plates will have continuous contact throughout their length, and battens connected to the plates

for joining the several plates of each set together.

10. A form for concrete construction comprising sets of plates, each set consisting of a number of channel shaped plates of multiple widths, an end of the plates of one set being inwardly compressed and telescoping the ends of the adjoining set of plates, side rails engaging the outermost plates of the several sets of plates, and battens connected to the side rails for joining the several plates of each set together.

11. A form for concrete construction comprising sets of plates, each set consisting of a number of channel shaped plates of multiple widths, an end of the plates each set being inwardly compressed and telescoping the ends of the adjoining set of plates. side rails engaging the outermost plates of the several sets of plates, battens connected to the side rails for joining the several plates of each set together, said plates being provided with openings therethrough, said battens being located in alinement with the openings therein, and means passing through the holes of the plates and into the battens for fastening the plates to the battens.

12. A form for concrete construction comprising sets of plates, each set consisting of a number of plates of multiple widths, an end of the plates of each set overlapping the plates of the adjoining set for producing an extensible joint, said plates being provided with openings, and the openings at the overlapped ends of the plates adapted to be brought into registry, battens arranged over the openings of the plates at the overlapped ends, and means passing through the openings in the plates and engaging the battens for fastening the plates to the battens.

13. A form for concrete construction comprising sets of plates, each set consisting of a number of plates of multiple widths, an end of the plates of each set overlapping the plates of adjoining set for adjusting the length of the form, side rails engaging the outermost plates of the several sets of plates, and battens connected to the side rails and plates for joining the several plates of each set of plates together to produce a composite form.

14. A form for casting concrete columns comprising a number of forms assembled to produce a column mold, each form consisting of a number of channel shaped plates, side rails engaging the outermost plates, and battens connected to the side rails for joining the several plates together to produce a composite form.

15. A form for concrete construction comprising sets of plates, each set consisting of a number of channel shaped plates the ends of the plates of one set overlapping the plates of the adjoining set for producing an extensible joint, and battens extending across the several plates for connecting them together.

HEWITT WELLS.