May 22, 1928. 1,670,338

S. D. BUTTERWORTH

COLUMN FORM

Filed Aug. 19, 1926 4 Sheets-Sheet 1

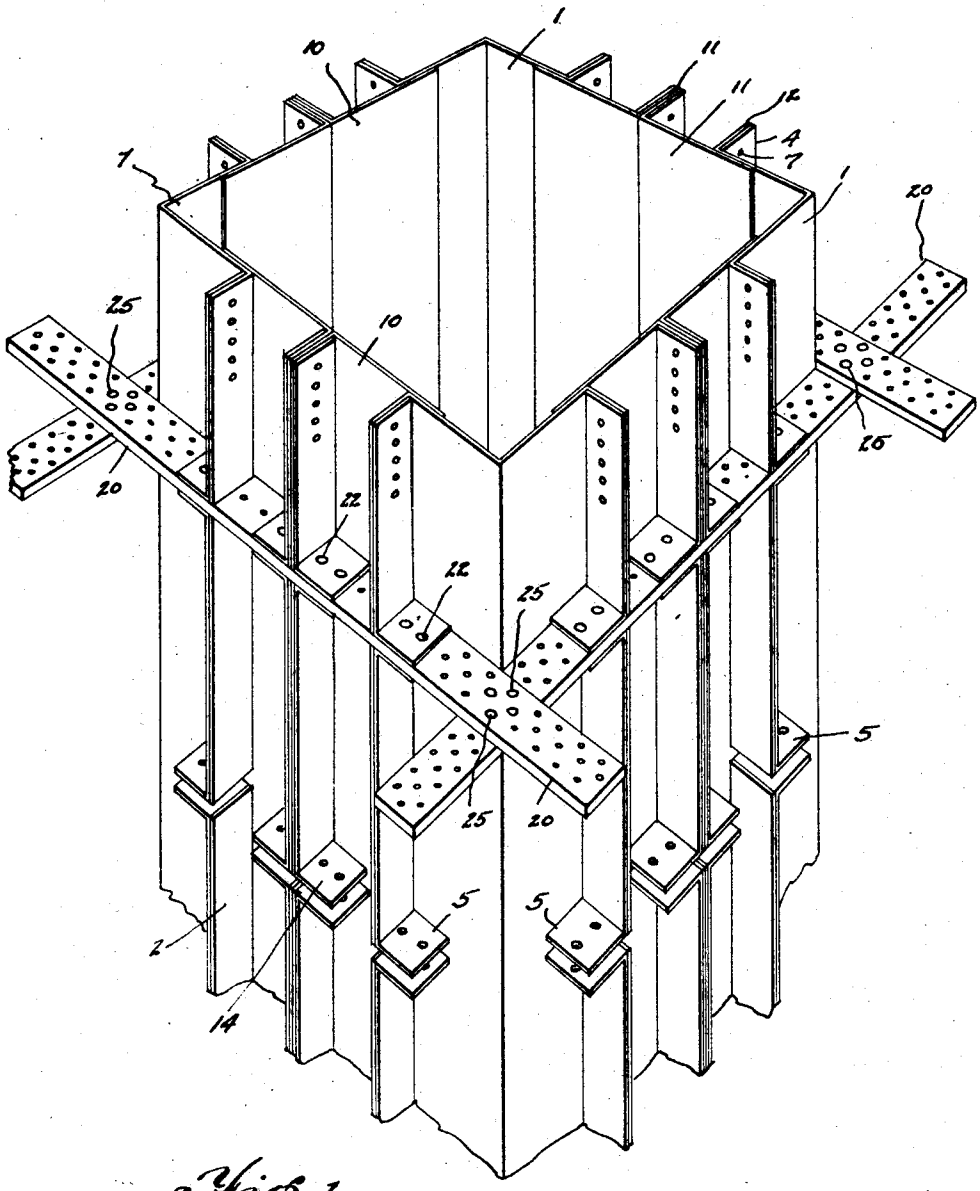


Fig. 1

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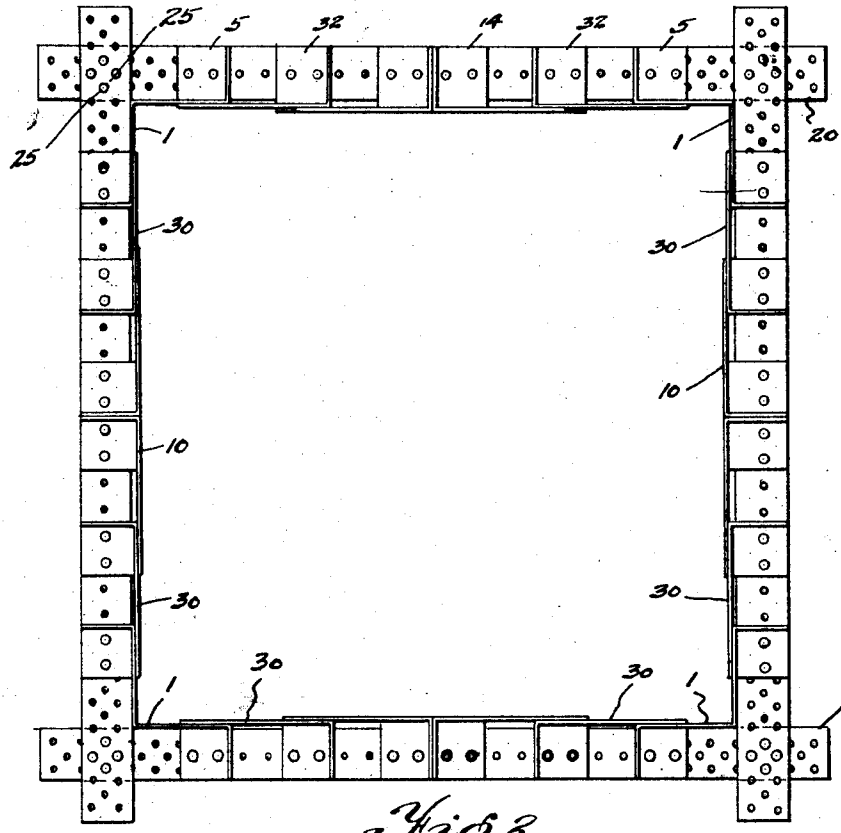


Fig. 2

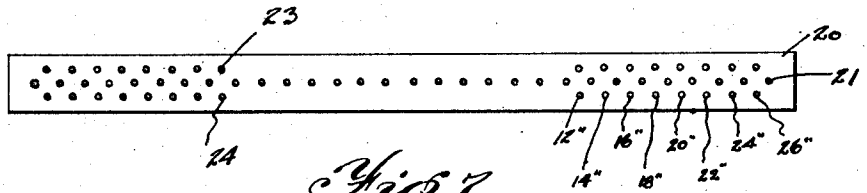


Fig. 7

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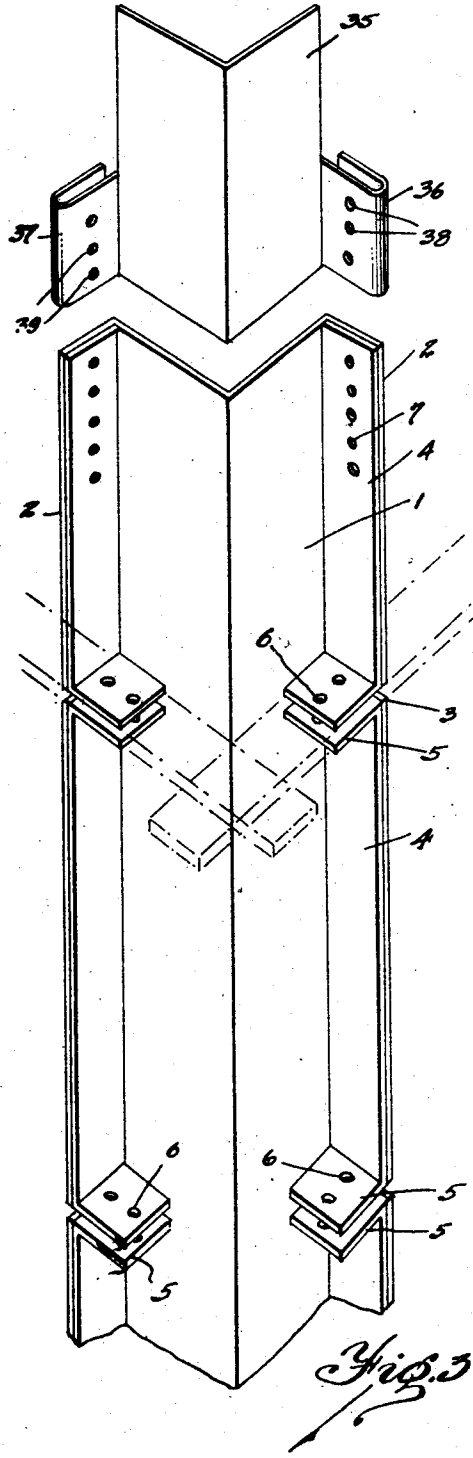


Fig. 3

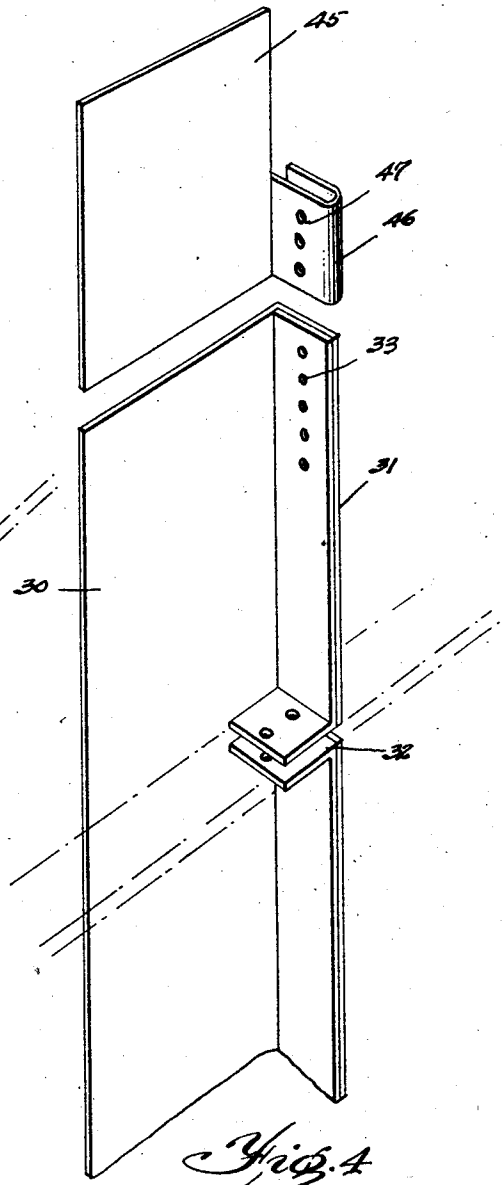


Fig. 4

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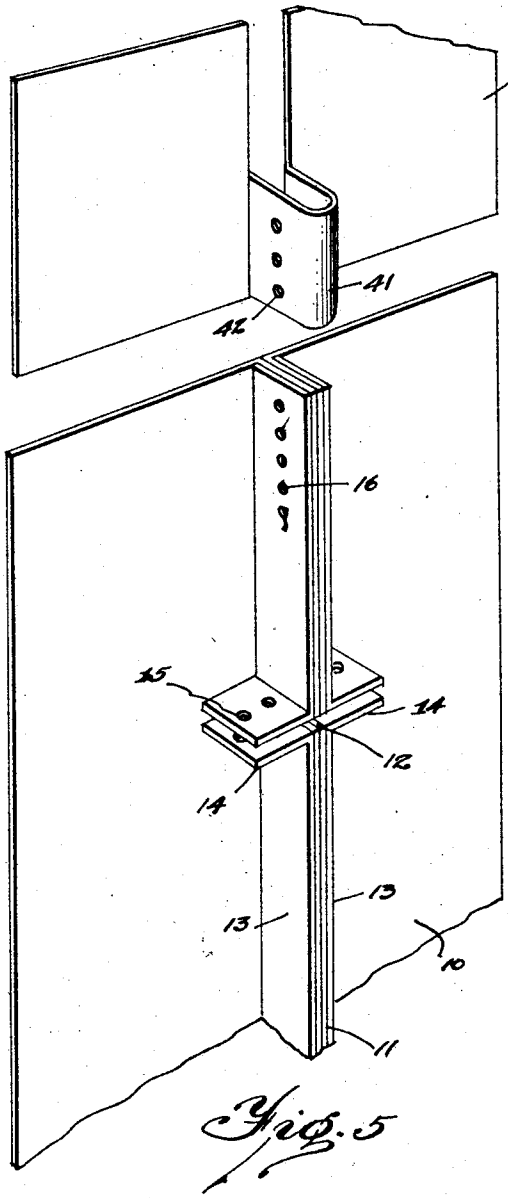


Fig. 5

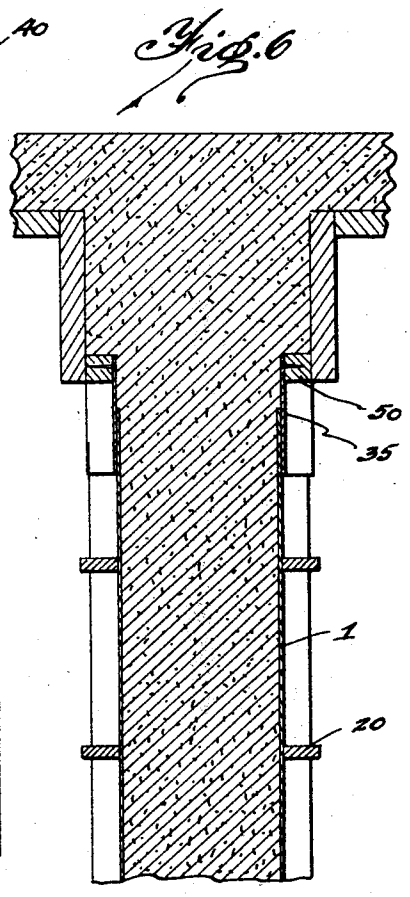


Fig. 6

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UNITED STATES PATENT OFFICE.

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COLUMN FORM.

Application filed August 19, 1926. Serial No. 130,168.

This invention relates to forms for the making of columns of concrete or other similar material, and has to do more particularly with forms which are made of metal.

It has been the practice heretofore to use wooden forms for the making of columns, and there are a number of objections to the wooden form. They are expensive, because much time and labor are required to erect them, and again, new material must be obtained. There is a tendency for wooden forms to curve or bend, and many engineers are exacting in their requirements, in order to insure forms of sufficient strength so that perfect columns will be formed, and it is particularly expensive to make a form which meets these requirements.

It is the aim of this invention to provide a metal form which overcomes the objections to the wooden form. A metal form constructed according to the invention, can be easily and quickly erected, and after a column has been formed it can be disassembled and again erected for forming another column, thus eliminating the necessity of purchasing new material. The form is made up of a minimum number of different parts so that it can be easily assembled, and also, manufactured without great expense. The several parts which go to make up a single form are adjustable so that different sized columns may be made, and columns which are square in cross section or oblong in cross section can be formed.

The form consists of upright members which have a length which is equal to, or substantially equal to, the height of the column to be formed. These members, as mentioned above, are adjustable relative to each other in order to change the size of the form, and they are held in their adjusted position by braces or supports. These braces or supports consist of metallic members which extend around the form at spaced points along its length, and these members are also adjustable, relative to each other, so that they may be adjusted in accordance with the size of column to be formed.

A satisfactory form of the invention is shown in the accompanying drawings wherein:

Fig. 1 is a perspective view of part of a form showing how the upright members are disposed relative to each other and showing how they are held in position by the bracing members which encircle the form.

Fig. 2 is a view showing the form adjusted for making a larger column than that shown in Fig. 1.

Fig. 3 is a perspective view of a corner upright and also showing an end piece for the upright which is adjustable for length.

Fig. 4 is a perspective view of another of the uprights showing its corresponding length adjusting member.

Fig. 5 is a perspective view of still another upright showing its corresponding length adjusting member.

Fig. 6 is a diagrammatic view showing how the form may be used.

Fig. 7 is a plan view of one of the supporting or bracing members.

The form, as shown in Fig. 1, is erected and adjusted for the making of a relatively small, square column. The form is made up of angle uprights 1 (Fig. 3) which are disposed at the corners of the form. Each angle member is provided with a flange 2 at each edge which projects outwardly from the form, and these flanges are cut away at a number of places along their length, as shown at 3. Disposed between each cut away portion of the flange is an additional member 4 which is secured to the flange in any desired manner, as by means of welding or riveting. These members 4 have angular parts 5 adjacent the cut away portion, so that a supporting or bracing member may extend through the cut away portion and between the angular parts. The angular parts are provided with holes 6 whereby they may be secured to the supporting members in a manner as will presently appear. The uppermost member 4 is provided with but one angular part 5, and near the upper end of the upright the flange and the uppermost member 4 are provided with holes 7.

Each side of the form, between the corners, is made up of an upright member 10 (Figs. 1 and 5). This upright member 10 is in the shape of a T, and may be composed of two metal members, each having a flange at one edge, the flanges being secured together, thus forming a common flange 11. This common flange 11 is cut away at spaced points along the length of the upright, as shown at 12, the cut away portions being disposed in the same horizontal planes as the cut away portions 3 of the corner uprights. Similar to the arrangement of the flange on the corner uprights, the common flange 11 is provided with members 13 which have angular parts

14 aligning with the cut away portion 12, and these angular parts are formed with holes 15. The uppermost part of the flange 11 is provided with holes 16. It is satisfactory to provide the flange 11 with angular plates 13 on either side thereof, and to provide the flange 2 of the corner uprights with an angle plate 5 on only one side thereof, although angle plates could be placed on both sides of the flange 2 or on only one side of the flange 11.

The form is erected, as shown in Fig. 1, with angle uprights at each corner, and an upright 10 at each side, disposed so that each lies inside of and overlaps the angle members. The parts are held in position by strap-like braces 20 (Figs. 1 and 7), there being four braces used to encircle the form, and these braces cross near their ends. The braces extend through the cut away portions of the flanges, and between the angular parts adjacent the cut away portions, and each strap is provided with a series of holes 21, located substantially on its center line. A suitable instrument, such as a nail or pin, is inserted through the holes in the angular parts on the flanges, and through the holes in the straps which are aligned therewith, as shown at 22. Each strap 20, near its ends, is provided with a series of holes 23, and a series of holes 24, disposed on opposite sides of the center line of holes, and arranged in staggered relation with respect thereto. The straps cross each other near their ends and, due to the arrangement of holes, they are secured together by four nails or pins 25 which extend through the aligned holes of the two straps. This prevents any twisting or swinging of one strap relative to an adjacent strap.

By reference to Fig. 1 it will be seen that the form may be made smaller by adjusting these straps so that they cross each other nearer their center. This would cause a greater overlapping as between the center member 10 and the upright corner members and, if necessary, the center member 10 can be adjusted in any desired place along the length of the strap by aligning the holes 15 with the desired holes in the strap.

For the purpose of making still larger columns, an additional upright 30 is used (Fig. 4). This upright is provided with a flange 31 which is provided with cut away portions and angle members as shown at 32, similar to the arrangement on the corner uprights and the upright 10. The upper edge of the flange has holes 33. This member is used in the manner shown in Fig. 2, and one of such members may be used or two of such members may be used. They bridge the space between the central member 10 and the corner uprights. These members are secured, as by means of nails or pins, to the straps 20 and, furthermore, they are capable of adjustment, relative to the straps 20.

For practical purposes, each angle member of the corner uprights may be four inches in width, and the center member 10 may be twelve inches in width. With these dimensions, columns may be formed from twelve to eighten inches in thickness by the use only of the corners and the members 10. The width of the upright 30 may be six inches, and when two of these members are used on each side of the form, in the manner shown in Fig. 2, columns from twenty to twenty-six inches can be made.

By reference to Fig. 7, it will be observed that the holes which are arranged in opposite sides of the center line of holes are placed at predetermined points, so that a form of the desired size can be erected without measurement. In other words, if it is desired to erect a form for making a twelve inch column, the innermost holes are used to connect the supporting members where they cross. For the next size column, say fourteen inches, the next hole is used, and so on to the last hole which is an adjustment for a column of twenty-six inches in thickness. Of course, this invention is not to be limited to the dimensions given herein, nor is it to be limited to making columns only of the sizes given, but it is to be understood that these dimensions and sizes are set forth merely for the purpose of clearly describing the manner in which the form is used. Columns are ordinarily made in the sizes mentioned, but of course it is entirely within purview of this invention to make columns of sizes other than those mentioned.

The uprights are to be formed substantially as long as the height of the column which is to be made. For accurate adjustment, however, additional adjusting pieces are provided, and these are adjustably secured to the upper end of each upright. In Fig. 3 an upper adjusting piece 35 for the corner upright is shown. This adjusting piece is angular, and is provided at each edge with channel members 36 and 37 which are provided with holes 38 and 39. This member fits down over the corner upright in overlapping relation, with the flanges fitting into the channels, and is adjustable by suitable alignment of the holes 38 and 39 with the holes 7, whereupon a nail or pin is inserted. The adjusting piece for the upright 10 is shown in Fig. 5. This member consists of plate-like parts 40 which are connected, as shown at 41, by a curved portion provided with holes 42. This member fits down over the upright with the flange in the curved portion 41, and is adjustably secured thereto by means of the holes in the member 41 and in the flange 11. The adjusting piece 45 for the upright 30, as shown in Fig. 4, consists of a plate member also provided

with a channel member 46 having holes 47 which fits over the flange 31 and which is secured adjustably to the member 30 in the same way that the other adjustable members are secured to their respective uprights.

By this arrangement it will be observed that an extremely accurate height adjustment can be made, although there may be cases where the use of these adjusting members will be unnecessary. One way in which the form can be used is diagrammatically shown in Fig. 6. Here the form for the floor and beam above the column is shown, and this form includes a plank 50 which is provided with an opening which is of the shape of the column to be formed. The upper adjusting members 35, 40, and 45, if used, extend within the opening in the plank 50, and may be secured thereto by means of nails. However, it is not necessary to nail the uppermost part of the form to the plank, as the concrete, when poured, tends to expand the form and hold it tightly to the plank. In this figure, it also is made clear how the adjusting members overlap the upper ends of the uprights, and it has already been pointed out how the adjusting member may be moved up and down along the uprights by means of the several holes in the flanges and channel formation of the members.

In the drawings the form has been shown as adjusted for making square columns. It will readily be understood how it can be adjusted for making an oblong column, since all that is required is the proper positioning of the several upright parts with respect to the bases, so that one dimension of the form is greater than the other dimension.

This metal form, in addition to being easily erected and dismantled, is particularly strong and rigid by reason of the several flanges which project outwardly from the form. This insures that there will be no bending or curving of the form with the result that perfect columns are made.

I claim:

1. A form for columns comprising in combination, upright members disposed relative to each other so as to provide a form, one or more of said members being arranged to overlap an adjacent member and being adjustable relative to the said adjacent member to vary the size of the form, and means encircling the form for independently holding each of the members in their adjusted position by a connection with each upright.

2. A form for columns comprising in combination, upright members disposed relative to each other so as to provide a form, one or more of said members being arranged to overlap an adjacent member and being adjustable relative to the said adjacent member to vary the size of the form, and adjustable means encircling the form for holding each of the members in their adjusted position independently of the other uprights by an adjustable connection with each upright, the adjustability of the said means corresponding to the adjustment of the said members.

3. A form for columns comprising in combination, upright members disposed in overlapping relation, the said members being of a height substantially equal to the height of the column to be formed, and an auxiliary member for each upright member, each auxiliary member corresponding to the shape of its respective upright and being adjustably secured to one end thereof.

4. A form for columns comprising in combination, upright members disposed in overlapping relation, the said members being of a height substantially equal to the height of the column to be formed, and an auxiliary member for each upright member, each auxiliary member corresponding to the shape of its respective upright and being adjustably secured to one end thereof, and braces for the form disposed at spaced points along the length of the form.

5. A metal form for columns comprising in combination, upright members of angle formation for the corners of the form, upright members between the corner uprights for forming the sides of the form, the said uprights for forming the sides being disposed so as to overlap the corners, the degree to which the members overlap being variable to vary the size of the form, and means for holding each of the several uprights in position.

6. A metal form for columns comprising in combination, upright members of angle formation for the corners of the form, upright members between the corner uprights for forming the sides of the form, the said uprights for forming the sides being disposed so as to overlap the corners, the degree to which the members overlap being variable to vary the size of the form, and means for holding each of the several uprights in position, said means being adjustable to permit variation of the degree to which the members overlap.

7. A metal form for columns comprising in combination, upright members disposed in overlapping relation to provide a form, a flange on each of the upright members, and supporting means consisting of members arranged to encircle the form, these supporting means being adjustable relative to each other, the flange of each member being adjustably secured to the supporting means.

8. A metal form for columns comprising in combination, upright members disposed in overlapping relation to provide a form, and supporting means disposed at spaced points along the length of the form, these supporting means consisting of strap-like

members arranged to encircle the form, each strap-like member having holes therein whereby the straps may be adjustably secured to each other, and whereby each upright member may be adjustably secured to a strap.

9. A metal form for columns comprising in combination, upright members disposed in overlapping relation to provide a form, supporting means disposed at spaced points along the length of the form, the supporting means consisting of strap-like members arranged to encircle the form, each strap-like member having holes therein whereby the straps may be adjustably secured to each other, and whereby each upright member may be adjustably secured to a strap, the said holes in the supporting members being located at predetermined points so that a form of predetermined size may be made by selective use of the holes.

10. A metal form for columns, comprising upright members disposed in overlapping relation to provide a form, a flange running lengthwise of each of the upright members, said flanges being cut away at spaced points, wing-like members projecting angularly from the flanges at the cut away portions, and straps adapted to be disposed between these wing-like members, means for adjustably securing the wings on each upright member to a strap, and means for adjustably securing the straps to each other.

11. A metal form for columns, comprising upright members disposed in overlapping relation to provide a form, a flange running lengthwise of each of the upright members, said flanges being cut away at spaced points, wing-like members projecting angularly from the flanges at the cut away portions, and straps adapted to be disposed between these wing-like members, the said angular projections and the straps having openings whereby each upright member may be adjustably secured to a strap by means inserted through the openings, said straps being adjustably connected together by means inserted through aligned openings therein.

12. A metal form for columns, comprising in combination upright members disposed in overlapping relation to provide a form, each of the upright members having an outwardly projecting, longitudinally extending flange, some of said upright members being angular in shape and some being flat in shape, and correspondingly shaped members adapted to be secured to one end of each upright to adjust the height of the form, these members being provided with a U-shaped flange within which is received the flange on the corresponding upright, both of said flanges having openings therein for the reception of a securing means.

13. A metal form for columns, comprising in combination upright members disposed in overlapping relation to provide a form, each of the upright members having an outwardly projecting, longitudinally extending flange, some of said upright members being angular in shape and some being flat in shape, and correspondingly shaped members adapted to be secured to one end of each upright to adjust the height of the form, these members being provided with a flange adapted to abut against the flange on the corresponding upright member, the flanges on each upright and on its adjustable member being provided with a plurality of openings for the reception of a securing means whereby the adjusting member may be adjustably mounted on the upright member.

14. A form for columns, comprising in combination angular upright members for forming the corners of the form, these angular upright members having outwardly projecting longitudinally extending flanges, a T-shaped upright member and an L-shaped upright member disposed in overlapping relation and overlapping the angle members for forming each side of the form, means extending through the flanges of the angle members and through one arm of the L-shaped member and the upright portion of the T member for securing the several members together, and adjustable means for securing each upright member to the securing means.

In testimony whereof I affix my signature.

SAMUEL D. BUTTERWORTH.