May 22, 1928. 1,670,339

S. D. BUTTERWORTH

COLUMN FORM

Filed Aug. 19, 1926 4 Sheets-Sheet 1

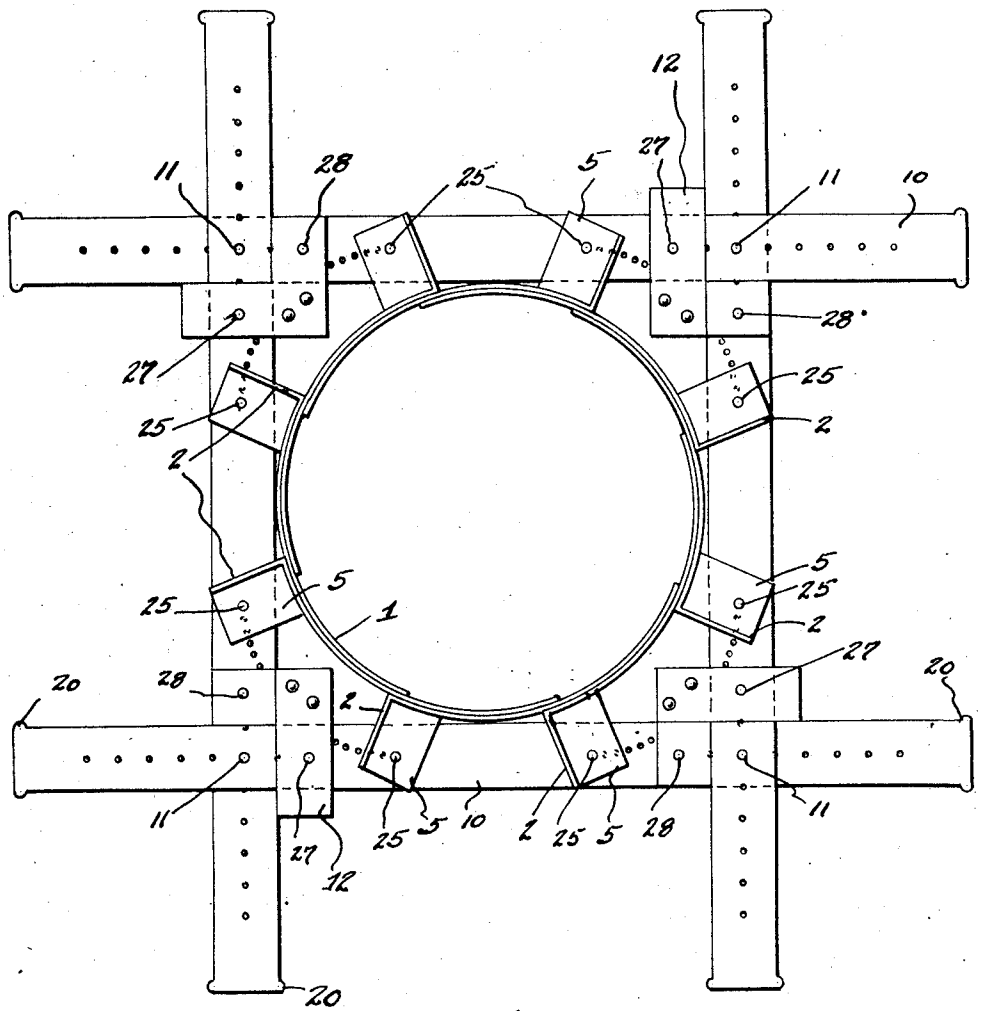


Fig. 1

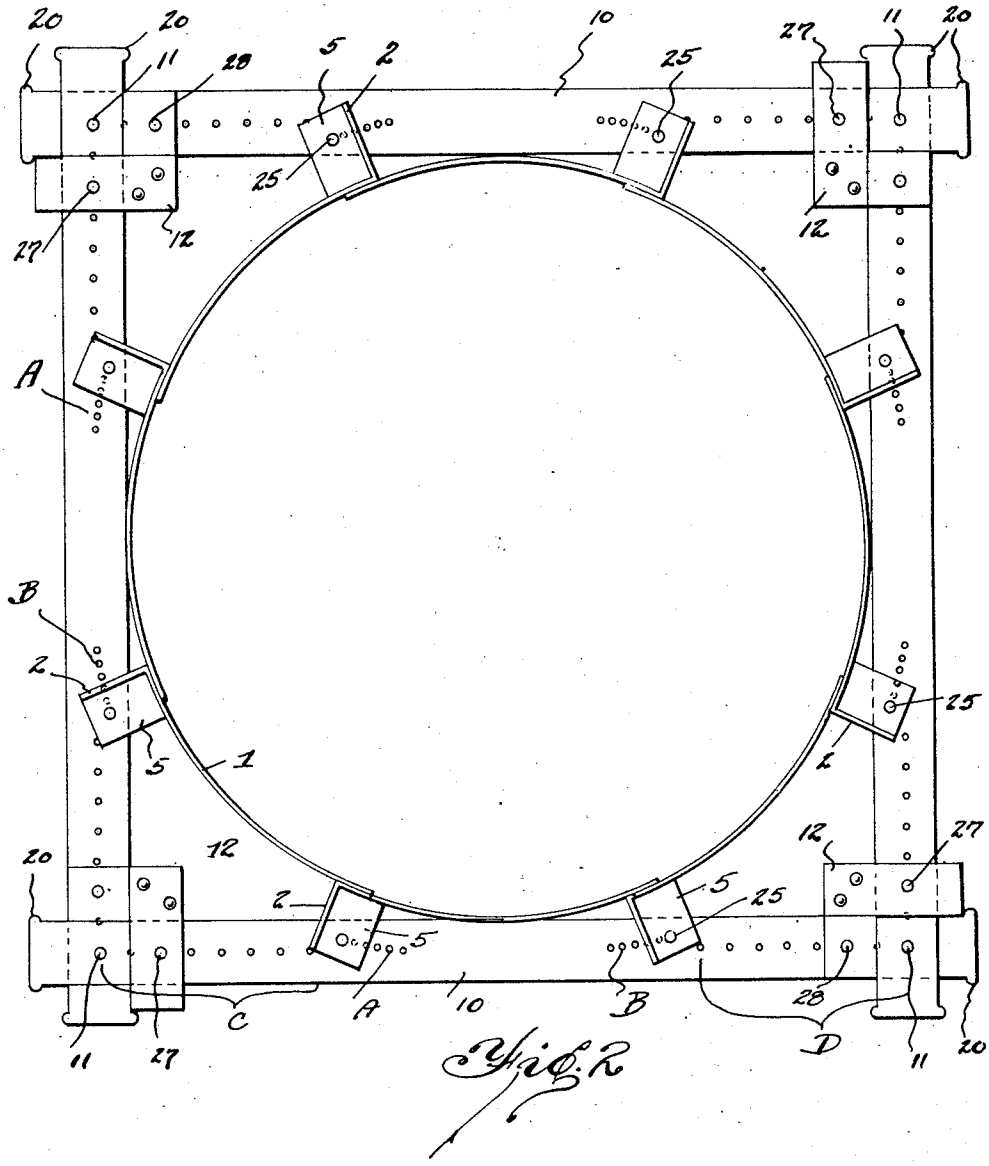
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Fig. 3

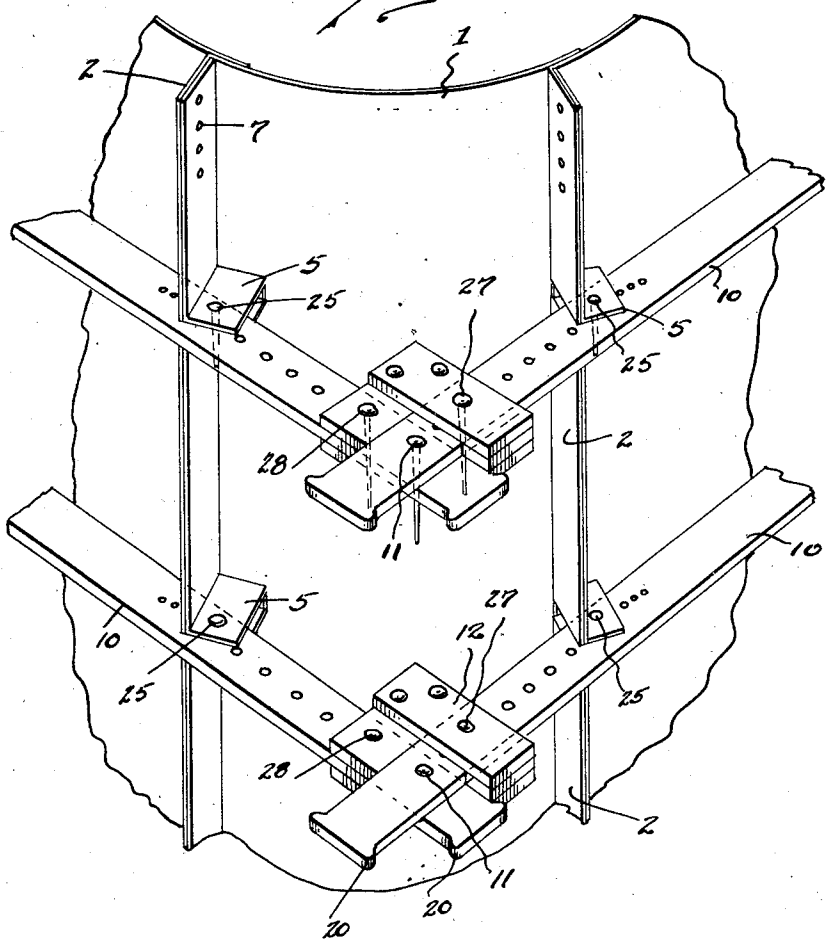
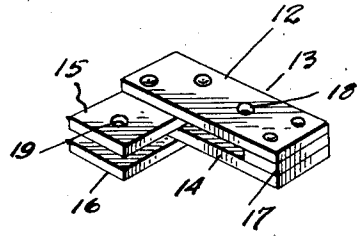


Fig. 4



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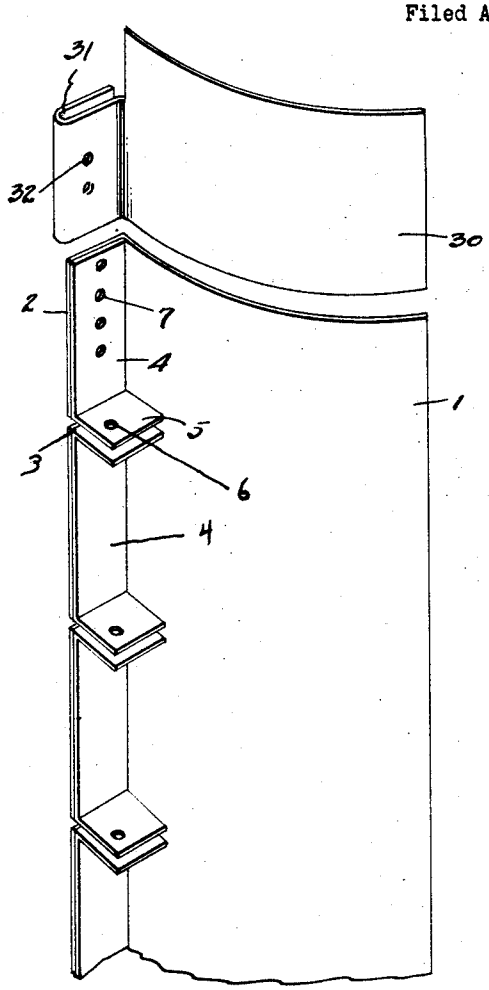


Fig. 5

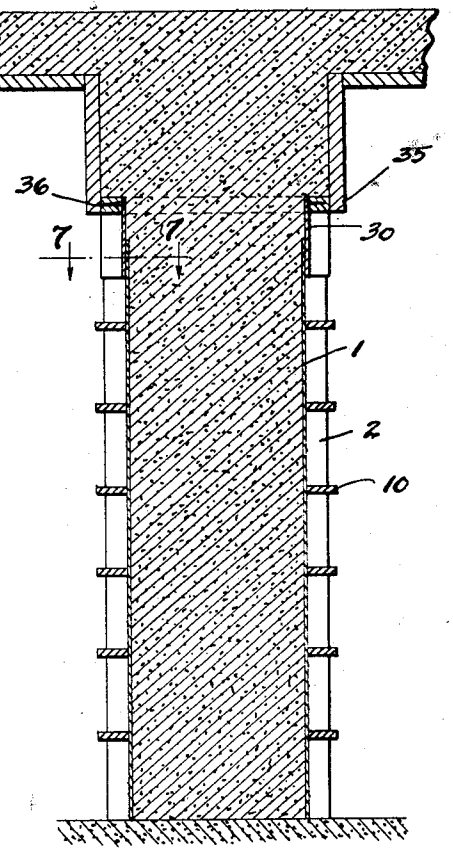
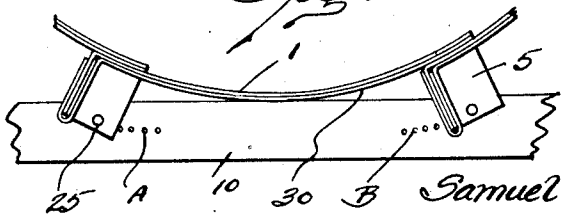


Fig. 6

Fig. 7



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UNITED STATES PATENT OFFICE.

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COLUMN FORM.

Application filed August 19, 1926. Serial No. 130,169.

This invention relates to forms for use in the building of structures where concrete or other similar material is used, and it has to do more particularly with metal forms for round columns.

Heretofore, it has been the practice to use wooden forms for such columns. There are a number of objections to wooden forms among which may be mentioned the expense involved in obtaining new wood for each column, and also the large amount of time and labor which is required in order to erect a wooden form. It has been proposed to make the wood form of uprights having bands around them, but many engineers do not allow the use of such forms as they often bend so that an imperfect column is formed. In order to make a wooden form which is of sufficient rigidity, much time, labor, and material are required.

It is the aim of this invention to provide a metal form which overcomes the objections to the wooden form. A form constructed according to the invention can be easily and quickly erected, and the several pieces which go to make up the form can be used over and over again, thus eliminating the necessity of continually obtaining new material. The form is made up of a minimum number of different parts, so that it can be produced without great expense, and when the parts are in position, sufficient rigidity is obtained to prevent bending, so that perfect columns are formed. After a column is formed, the metal parts can be easily disassembled and transported to another part of the same structure or to a different job, and again erected.

The form consists of a number of arcuate metal members which are disposed in overlapping relation, and these members are held in position by supports or braces. The degree to which the members overlap is determinable, and thus columns of different dimensions may be formed. The arcuate members are equal to, or substantially equal, to the height of the column to be formed, and there is an adjustment provided for accurately determining the height of the form.

In the accompanying drawings:

Fig. 1 is a diagrammatic view showing the form adjusted to a small diameter for forming a small column.

Fig. 2 is a view similar to Fig. 1, showing the form in a larger adjustment for forming a column of large diameter.

Fig. 3 is a perspective view of part of a form showing how the support or brace members are used.

Fig. 4 is a perspective view of a corner member which is used for connecting the ends of the supporting members.

Fig. 5 is a perspective view of part of one of the arcuate members showing an auxiliary arcuate member, and showing the manner in which the auxiliary member is used in order to make an adjustment for height.

Fig. 6 is a sectional view of a column showing the form resting upon a floor or base, and showing how the uppermost portion of the form may be secured to a form for a beam.

Fig. 7 is a sectional view taken on line 7—7 of Fig. 6.

The form consists of a number of arcuate members 1. These members may be provided in different lengths for making columns of different lengths, as for instance, in a building having columns nine feet in height, the arcuate members will be nine feet or substantially nine feet in height.

These arcuate members are arranged in overlapped relation so that a round form is provided for the molding of a column. Eight of such members arranged in overlapping relation is satisfactory, although a larger number, or perhaps a smaller number of arcuate members could be used. Each of these members is provided with a flange 2 which extends along one side thereof (Fig. 5), and this flange is broken along its length, as shown at 3, for the purpose of receiving braces or supports, as will presently be described. Secured to the flanges between the broken places are U-shaped members 4. These members may be secured to the flanges in any desired manner, as by means of welding or riveting, and the members have angle portions 5, each of which is provided with a hole 6. The uppermost member 4 is provided with but one angle member, and a plurality of holes 7 extend through the uppermost portion of the flange and the uppermost member 4.

When the several arcuate members are erected to position, they are held in position by supports or braces which take the form of metal straps 10. There are four metal

straps used to extend around the form and, as shown in Fig. 6, the straps are located at spaced points along the length of the form. The straps are received between the angle members 5, and it is preferable that the arrangement be such that the straps are equidistant from each other.

Each strap is provided with a series of holes A and a series of holes B. These holes are arranged in an arc so that one of the holes aligns with the holes 6 in the flange members, depending upon the adjustment of the form. In the present instance the form is capable of six adjustments for making forms of six different sizes, the smallest adjustment being shown in Fig. 1, and a larger adjustment shown in Fig. 2. For example, in Fig. 1 the form may be fourteen inches in diameter, whereas in Fig. 2 the form may be twenty-four inches in diameter. Thus, the innermost hole of the groups A and B is aligned with the apertures 6 for a fourteen inch column, and the outermost hole is aligned with the apertures for a twenty-four inch column. The intermediate holes are arranged to make columns of intermediate sizes, as for instance, 16″, 18″, 20″ and 22″. These numbers are given because it is customary to make columns in these sizes, although of course, the holes could be arranged to make columns of different sizes from those given. A suitable instrument, such as an ordinary nail, is to be inserted through the aligned holes when the adjustment is made.

The strap members cross near their ends and are secured together so as to prevent a twisting action. For this purpose each strap is provided with a series of holes C and D. These holes are arranged so as to align with each other in accordance with the desired adjustments. In Fig. 2 where the largest adjustment is made, the end holes of the straps align with each other, and a nail or suitable pin, is dropped through the two aligned holes as shown at 11. For the next smaller adjustment, the next adjacent holes are aligned with each other and so on down the line to smallest adjustment, as shown in Fig. 1.

For further strengthening the connection between the supporting members, a corner piece 12, as shown in Fig. 4, can be used. This corner piece 12 consists of members 13 and 14 which straddle one of the straps, and members 15 and 16 which straddle the adjacent strap. Preferably there is one of these corner members permanently secured to each strap, and for this purpose the ends of each strap are enlarged as shown at 20. A spacing element 17 is disposed between the members 13 and 14. Thus, the strap which extends between the members 13 and 14 is prevented from disengagement. The corner piece is provided with apertures 18 and 19 which align with one of the apertures in the series C and D when an adjustment is made.

In erecting the form for a column, say of the smallest diameter, which may be fourteen inches, the arcuate members are overlapped and the strap braces are placed in position. The apertures 6 are aligned with the innermost hole of the series A and B, and a suitable nail or pin 25 is dropped through the aligned holes. Each strap is thus secured to two arcuate members. Then a nail or pin 11 is dropped through the aligned apertures in the ends of the strap members, and after the corner piece 12 has been put into position, nails or pins 27 and 28 are dropped through the aligned apertures in this member and in the strap members. To erect the form for making a column of the next larger size, say sixteen inches, the nails 25 are dropped through the second hole in the series A and B, and the pin 11 is dropped through the next adjacent hole in the series C and D. Thus, it will be observed that no measurement is required, in that it is only necessary, to align the proper holes and then secure the parts together by inserting nails or pins.

The members 1, as above stated, are equal to, or substantially equal to the height of the column to be formed. However, in order to obtain very accurate adjustments, auxiliary arcuate members 30 may be used (Figs. 5 and 7). There is one member 30 for each arcuate member 1, and this member 30 is formed at one end with a channel 31 which is arranged to slide over the end of the flange 2. Both channel members are provided with holes 32, and the desired adjustment is obtained by proper alignment of the holes 32 with the holes 7, whereupon a nail or pin may be inserted.

One manner in which the form may be used is shown in Fig. 6. Here the form is shown as resting upon the floor of a building. The upper end of the form, more specifically the members 30, extend within a circular opening of a plank 35 which forms a part of the form for the beam and floor above. It may be desirable to nail the uppermost end of the form to the plank 35, as shown at 36, although this is not essential, since the tendency of the form is to expand when the concrete is poured, and this would be sufficient to keep the upper end of the form in place.

It will be observed that the metal form of this invention is composed of a minimum number of parts, there being in fact three units, namely, the arcuate members, the supporting strap 10 with its attached corner piece, and the adjustable auxiliary member 30. The form can be quickly and easily erected, and the proper size determined by merely aligning the proper holes and inserting pins or nails. The disassembly of the

form is also easily accomplished, in that the parts can be readily removed from each other by taking out the nails. In case the auxiliary members 30 are nailed into the plank 35, these members can be removed after the long arcuate members 1 are removed and after the plank 35 has been taken down.

The column is rendered particularly strong and rigid by reason of the flange at one edge of each arcuate member. These flanges aid materially in preventing the form from bending with the result that perfect columns are formed. Moreover, the strap braces which extend around the form are securely held together by the corner pieces so as to prevent twisting actions, and this adds to the rigidity of the form.

What I claim is:

1. A metal form for round columns comprising in combination, a plurality of arcuate members disposed in overlapped relation, a flange on one edge of each member, and supporting means extending through the said flanges.

2. A metal form for round columns comprising in combination, a plurality of arcuate members disposed in overlapped relation, a flange on one edge of each member, and supporting means extending through the said flanges, the said flanges being adjustable on the supporting means whereby the amount of overlapping of the said members may be varied.

3. A metal form for round columns comprising in combination, a plurality of arcuate members disposed in overlapped relation, a flange on one edge of each arcuate member which is cut away at spaced points and provided with angle members, supporting means extending through the cut away portion of the flanges, said angle members being adjustably secured to said supporting means.

4. A form for round columns comprising in combination, a plurality of arcuate members arranged to provide a circular form, a plurality of supporting straps extending around the form at a given point, these supporting straps being adjustable relative to each other for columns of different diameters and each arcuate member being connected to a supporting strap, this connection being capable of predetermined adjustment in accordance with the adjustments of the supporting straps.

5. A form for round columns comprising in combination, a plurality of arcuate members arranged in overlapped relation, a flange on each arcuate member, supporting straps extending around the form, each supporting strap having a series of holes adjacent an end whereby it can be adjustably secured to an adjacent supporting strap, and each supporting strap having a second series of holes whereby an arcuate member may be adjustably secured to a strap.

6. A form for round columns comprising in combination, a plurality of arcuate members arranged in overlapped relation, supporting straps extending around the form, each supporting strap having a series of holes adjacent an end whereby it can be adjustably secured to an adjacent supporting strap, and each supporting strap having a second series of holes whereby an arcuate member may be adjustably secured to a strap, the holes in each series being arranged at predetermined points so that a given adjustment provides a form of determined diameter.

7. A form for round columns comprising in combination, a plurality of arcuate members disposed in overlapped relation, a flange on each arcuate member, and an auxiliary arcuate member adjustably secured to the top of said first mentioned arcuate members, these auxiliary arcuate members each having a channel formation adapted to fit over the flange on the first mentioned arcuate member.

8. A form for round columns comprising in combination, a plurality of arcuate members disposed in overlapped relation, a flange on each arcuate member provided with holes near the upper end of the arcuate member, an auxiliary arcuate member provided with a channel formation having holes through each of the channel members, this auxiliary member being adapted to be adjustably secured to the first mentioned arcuate member by means of the said holes.

9. A form for round columns comprising in combination, a plurality of arcuate members disposed in overlapped relation, means for adjusting the degree to which the members overlap to determine the diameter of the form, and auxiliary arcuate members adjustably secured to the top of said first mentioned arcuate members and arranged to be automatically adjusted relative to each other upon adjustment of the overlap of the first mentioned arcuate members.

10. A form for round columns comprising in combination, a plurality of arcuate members arranged in overlapped relation, a flange on one edge of each arcuate member, a plurality of straps extending around the form, these straps having a series of holes whereby they may be adjustably secured to each other by means of a pin or nail extending through the holes, and each strap having a second series of holes whereby the flange of each arcuate member may be adjustably secured thereto.

11. A form for round columns comprising in combination, eight arcuate members arranged in overlapped relation, supports for the form disposed at spaced points along the length thereof, each support con-

sisting of four straps adjustably secured adjacent their ends, and means for adjustably securing two of the said arcuate members to each of the said straps.

12. A form for round columns comprising in combination a plurality of arcuate members arranged in overlapped relation, a plurality of supporting straps extending around the form, these supporting straps being adjustably connected together at predetermined points to determine the size of the form, and an arcuately arranged adjustable connection for connecting one or more of the arcuate members to the strap.

13. A form for round columns comprising in combination a plurality of arcuate members arranged in overlapped relation, means projecting outwardly from one or more of the arcuate members, a plurality of straps extending around the form, these straps having a series of connecting devices whereby they may be adjustably secured to each other to determine the size of the form, the said projection of the one or more arcuate members being adjustably connected to a series of arcuately arranged adjusting devices on the straps.

14. A form for round columns comprising in combination a plurality of arcuate members arranged in overlapped relation, means projecting outwardly from each of the arcuate members, a plurality of straps extending around the form, these straps having a series of connecting devices whereby they may be adjustably secured to each other to determine the size of the form, the said projection of each arcuate member being adjustably connected to a series of arcuately arranged adjusting devices on the straps.

15. A form for round columns comprising in combination a plurality of arcuate members arranged in overlapped relation, means projecting outwardly from each of the arcuate members, a plurality of straps extending around the form, these straps having a series of connecting devices whereby they may be adjustably secured to each other to determine the size of the form, the said projection of each arcuate member being adjustably connected to a series of arcuately arranged adjusting devices on the straps, the connecting devices in each series being positioned at predetermined points whereby the size of the form is automatically effected by utilizing given connecting devices in each series.

In testimony whereof I affix my signature.

SAMUEL D. BUTTERWORTH.