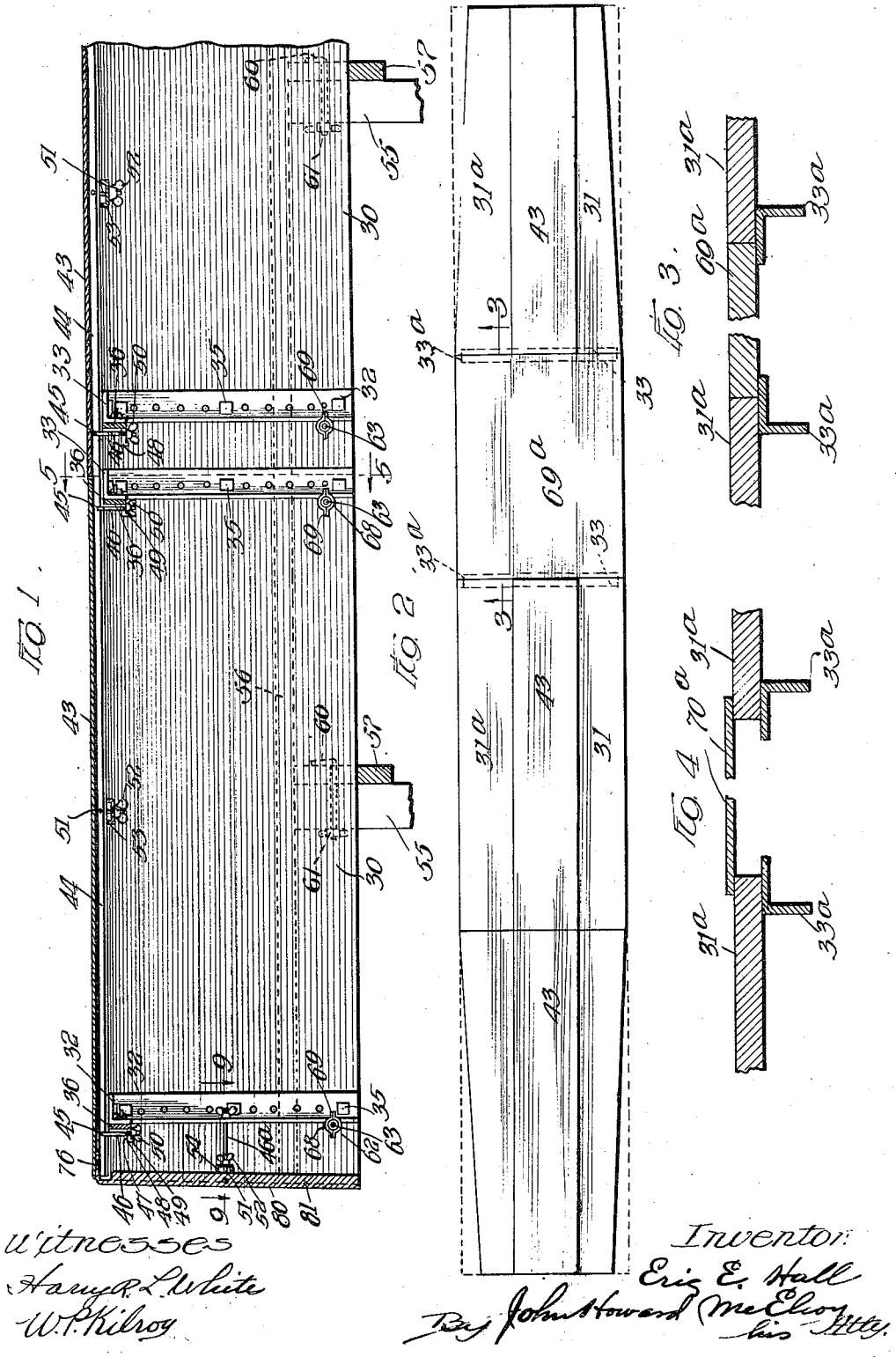
Oct. 16, 1923. 1,470,729

E. E. HALL

FORM FOR CONCRETE WORK

Original Filed May 28, 1919. 4 Sheets-Sheet 1



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Oct. 16, 1923. 1,470,729

E. E. HALL

FORM FOR CONCRETE WORK

Original Filed May 28, 1919. 4 Sheets-Sheet 2

FIG. 5

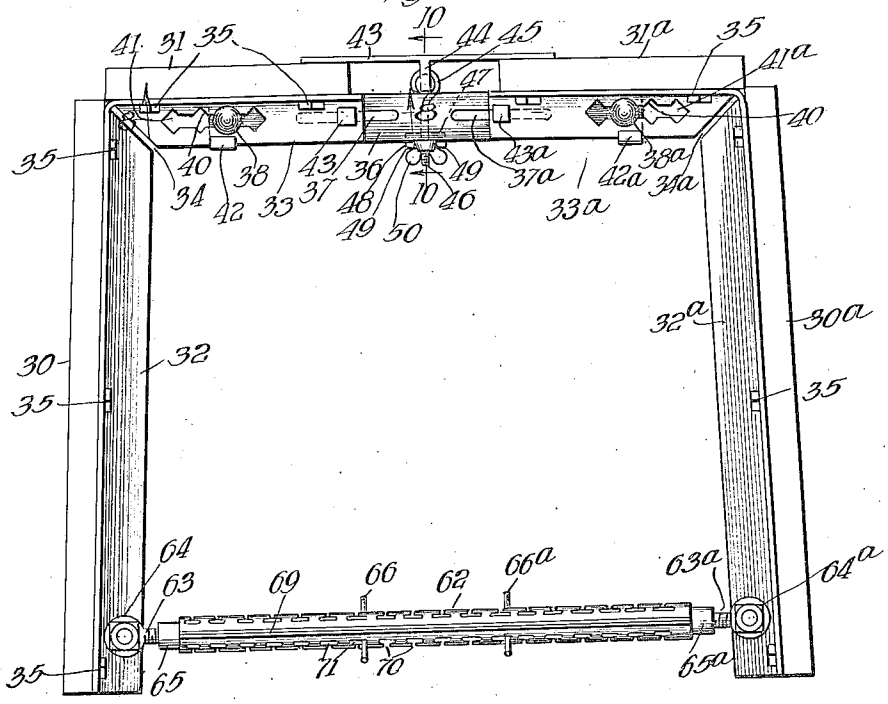


FIG. 6

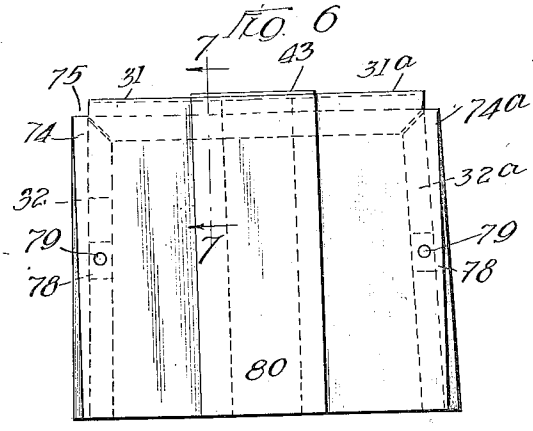


FIG. 7.

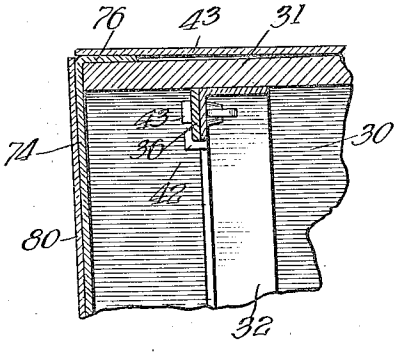
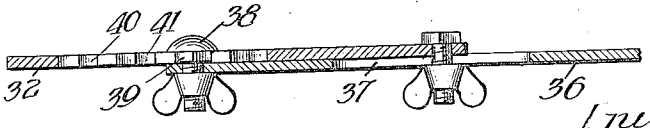


FIG. 8.



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Oct. 16, 1923. 1,470,729

E. E. HALL

FORM FOR CONCRETE WORK

Original Filed May 28, 1919. 4 Sheets-Sheet 3

FIG. 9.

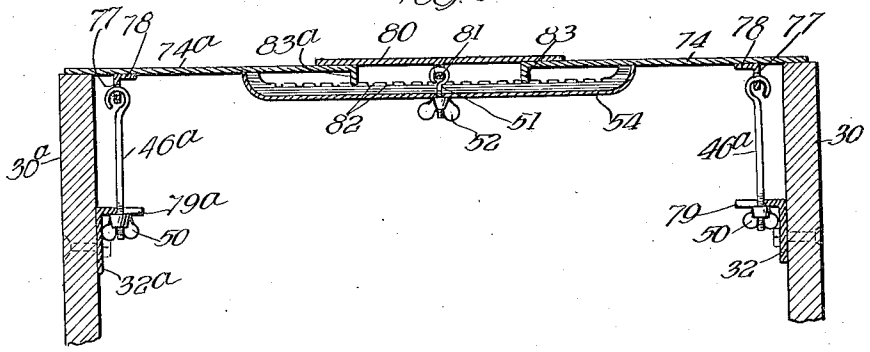


FIG. 10.

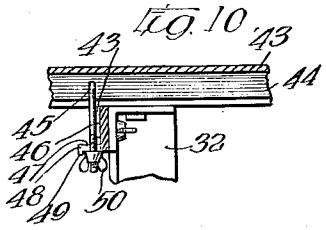


FIG. 12.

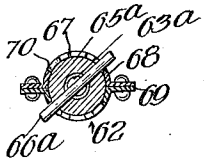


FIG. 13.

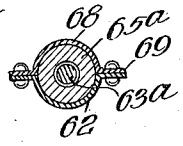


FIG. 11.

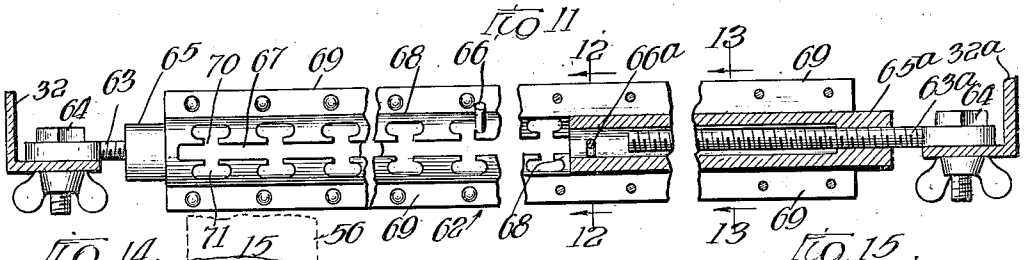


FIG. 14.

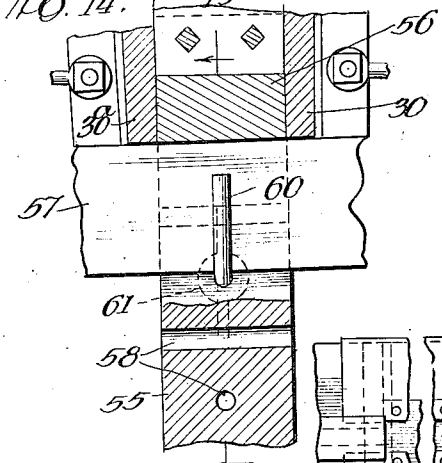


FIG. 15.

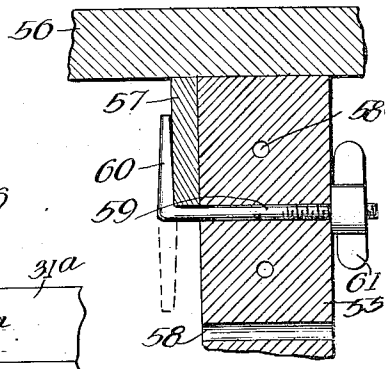
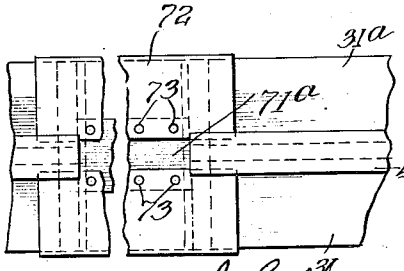


FIG. 16.



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Oct. 16, 1923. 1,470,729

E. E. HALL

FORM FOR CONCRETE WORK

Original Filed May 28, 1919. 4 Sheets-Sheet 4

FIG. 17.

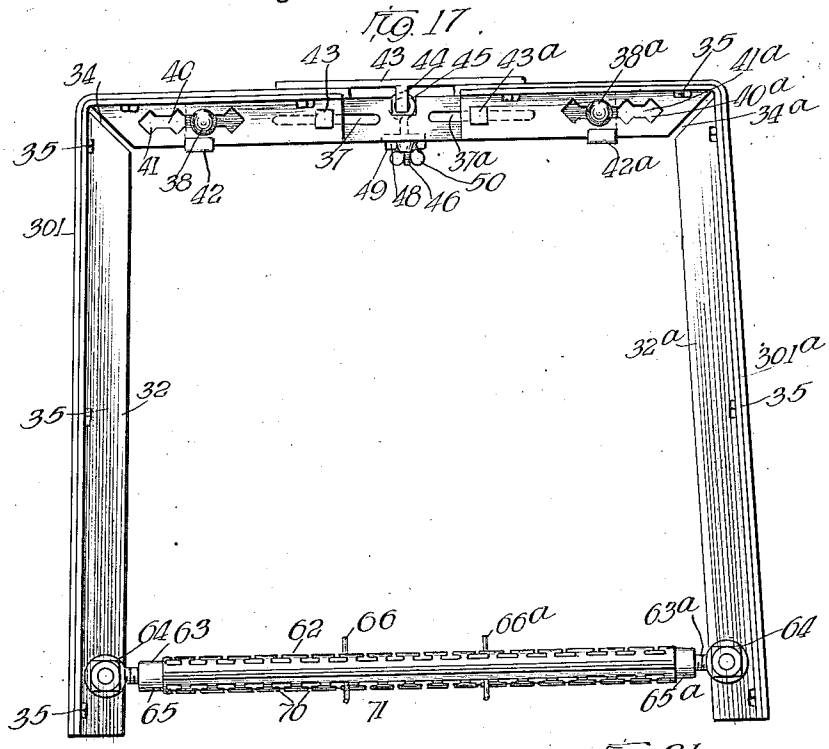


FIG. 18.

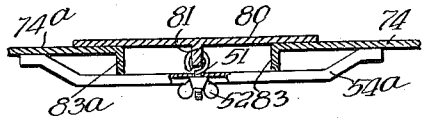


FIG. 19.

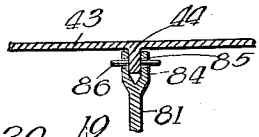


FIG. 20.

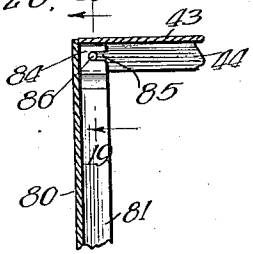


FIG. 21.

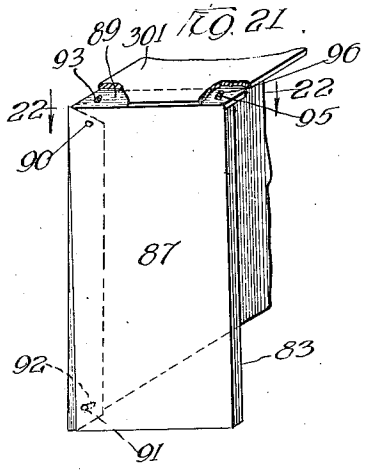
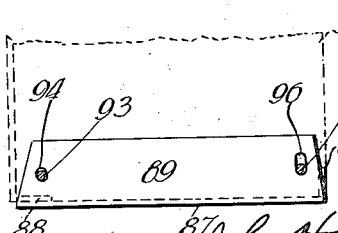


FIG. 22.



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Patented Oct. 16, 1923. 1,470,729

UNITED STATES PATENT OFFICE.

ERIC E. HALL, OF CHICAGO, ILLINOIS.

FORM FOR CONCRETE WORK.

Application filed May 28, 1919, Serial No. 300,344. Renewed April 2, 1923.

To all whom it may concern:

Be it known that I, ERIC E. HALL, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Forms for Concrete Work, of which the following is a full, clear, and exact specification.

My invention is concerned with forms for making concrete floors, ceilings or arch constructions, and is designed primarily to produce simple mold sections that can be used repeatedly without the liability of material damage thereto, either in use or in transportation from one job to another, and in which the wooden faces which come in contact with the concrete can be readily renewed if it should become necessary.

Second, it is further concerned with the production of forms or mold sections that can be quickly and easily set up when they are to be used, and which can be as quickly and easily taken down when the concrete is sufficiently set.

It is further concerned with the production of forms or mold sections that can be readily adjusted to vary the width thereof so as to produce a series of parallel floor girders that are spaced nearer to or further from each other.

It is further concerned with the production of forms of mold sections that can be adjusted to vary the angle of the sides thereof to the vertical within reasonable limits.

It is further concerned with the production of forms or mold sections that can be adjusted to make one end of one section narrower than the other end of the same section, as is desirable where floor girders are to be molded that are wider at their ends to strengthen them at the point of their connection with the main beams or girders.

It is further concerned with the production of forms or mold sections that can be combined and adjusted so as to form floor girders of different lengths, widths or depths.

It is finally concerned with the production of such forms or mold sections as shall be capable of adjustment in any two or more, or in all of the ways incorporated in the four preceding paragraphs.

To illustrate my invention, I annex hereto four sheets of drawings in which the same reference characters are used to designate identical parts in all the figures, of which

Fig. 1 is a central vertical longitudinal section through one of the mold sections and through a part of the adjacent co-operating section;

Fig. 2 is a top plan view on a smaller scale of three of such mold sections and a filler adjusted to form the adjacent sides of two concrete girders that are wider at their ends to strengthen them at the point of their connection with the main girder;

Fig. 3 is a detail in section on the line 3—3 of Fig. 2, but on a larger scale;

Fig. 4 is a view similar to Fig. 3 but showing a slightly modified construction;

Fig. 5 is a view of one end of a mold section as it would appear on the line 5—5 of Fig. 1 if the adjacent section to the left were removed;

Fig. 6 is an end view of a mold section as seen from the left of Fig. 1, but on a slightly larger scale;

Fig. 7 is a detail as seen in section on the line 7—7 of Fig. 6, but on a larger scale;

Fig. 8 is a detail as seen in section on the line 8—8 of Fig. 5, but on a larger scale;

Fig. 9 is a detail in section as seen on the line 9—9 of Fig. 1, but on a larger scale;

Fig. 10 is a detail in section as seen on the line 10—10 of Fig. 5.

Fig. 11 is a top plan view, on an enlarged scale of one of the extensible and adjustable struts, with one end thereof in central horizontal section;

Figs. 12 and 13 are details of the same as seen in section on the lines 12—12 and 13—13, respectively of Fig. 11;

Fig. 14 is a fragmentary view of a portion of the scaffolding with the adjacent sides of two adjacent mold sections resting thereon;

Fig. 15 is a detail in section on the line 15—15 of Fig. 14;

Fig. 16 is a view similar to the central portion of Fig. 2, but showing a modification of the construction of the filler section;

Fig. 17 is a view similar to Fig. 5, but illustrating a mold construction in which the body portion of the side and top pieces of a mold section are formed of sheet metal instead of wood, as illustrated in Fig. 5;

Fig. 18 is a view similar to the central portion of Fig. 9, but illustrating a modification;

Fig. 19 is a detail in section on the line 19—19 of Fig. 20, illustrating how the central section of an end portion is held in place before it is finally secured;

Fig. 20 is a detail in vertical section illustrating the same mechanism as is shown in Fig. 19;

Fig. 21 is a prospective view illustrating one side of an end section adapted for use where the side portions are to be converged, as illustrated at the ends of Fig. 2; and

Fig. 22 is a top plan view of a portion of the end section shown in Fig. 21, but seen on a larger scale.

In the construction of concrete floors and ceilings, it is a common practice to make a floor of a comparatively thin layer of concrete reinforced at suitable intervals by parallel beams or girders formed integrally therewith, extending downwardly therefrom and secured at their ends to the main beams or girders. As these parallel girders are of different lengths, and as they are spaced apart different distances, and are of different widths, and depths, and are sometimes flared outwardly at their ends, if they are to be produced by forms or mold sections that are to be used repeatedly, it is highly desirable that these forms or mold sections shall be capable of adjustment to take care of the different conditions as to dimensions and forms that are met with, and my invention is concerned with such a mold section as is capable of these adjustments, and such as are capable of being used in combination with other similar mold sections, as illustrated in Fig. 2.

The general form of the intermediate mold sections between the ends, is that of an inverted trough, and the end sections differ from the intermediate sections only in that one end of the end sections are modified with means to close that end of the trough. In the preferred form of my invention, the mold section is made up of two symmetrical what I may call top and side portions with a third top portion, together with mechanism for securing the three portions together temporarily to produce rigid trough-like forms, one of which is seen in end elevation in Fig. 5, where the left-hand side and top portion is made up of a wooden side piece 30 and a wooden top piece 31, and the cooperating side is made up of symmetrical but reversed side pieces 30ª and top pieces 31ª. The wooden body portions 30 and 31 are held together by being bolted to a pair of common supports 32 and 33, these supports being of the same construction, but the support 32 is secured at one end a few inches therefrom, while the support 33 is secured at the other end with the horizontal flange of the angle iron extending a short distance, say a very considerable fraction of an inch, beyond the ends of the boards 30 and 31 of that section, so that the boards 30 and 31 of the adjacent section rest on the projecting portion of the horizontal flange of the angle iron 33. Each of the supports 32 and 33, and the symmetrical but reversed supports 32ª and 33ª are preferably made out of a single piece of angle iron, which has a portion of the vertical web cut away, as seen at 34, so that the angle can be bent at this point, for a reason which will be obvious. The vertical flange being cut away entirely to the horizontal flange leaves a weakened portion in the support at the angle so that the support may be bent slightly at the angle as is necessary or desirable in removing the forms, and as may be employed for varying the angle of the sides 30 and 30ª of the forms to the vertical. The boards 30 and 31 are secured to the supports 32 and 33 by the bolts and nuts 35, the bolts having their heads countersunk in the face of the boards so as not to project therefrom. The horizontal ends of the supports 32 and 32ª and 33 and 33ª are adjustably connected by the bars 36, which have the pair of horizontally elongated slots 37 and 37ª therein adjacent the center thereof, and have apertures near the ends through which are passed the bolts 38 and 38ª, which bolts preferably have the squared portions 39 adapted to fit in the right-angular recesses 40 formed at intervals in the edges of the slots 41 and 41ª formed in the horizontal portions of the vertical webs of the supports 32 and 33 and 32ª and 33ª. The ends of the bar 36 have the hooks 42 and 42ª formed on the ends thereof so as to embrace the lower edges of the vertical flanges of the supports 32 and 33 and 32ª and 33ª, respectively. The adjacent ends of the horizontal portions of the supports 32 and 33 and 32ª and 33ª have apertures therein through which pass the bolts 43 and 43ª, which bolts also pass through the slots 37 and 37ª previously mentioned, and by placing the bolts 38 and 38ª in the different recesses of the slots 41 and 41ª, it is possible to make the form of different widths so as to produce thereby girders having different distances between their centers, the notches 40 preferably being half an inch between centers so that the distances between the girders may be varied by inches. When the desired adjustment is made, the bolts 38 and 38ª and 43 and 43ª have their nuts tightened up and the body of the form is rigidly established except in so far as the supports may give at the angles 34.

With the construction thus far described, there would be an open space in the top of varying widths with different adjustments, and to close this space, I employ a top piece 43 which is preferably composed of a long

strip of sheet metal preferably slightly curved transversely and with a downwardly projecting rib 44 on the concave side, and at a location corresponding to the location of the supports 32 and 33 apertures are formed in the rib 44 and through these apertures is passed a hook or ring 45 of a link 46, which has its lower end threaded, and adapted to be swung between the arms 47 of a fork 48 projecting from the lower edge of the bar 36 in the direction away from the co-operating supports 32 and 33. The outer ends of the arms 47 of the forks 48 preferably have the downwardly projecting lugs 49, and a wing nut 50 screwed on the end of the link 46 is tightened up so as to be caught on the under side of the fork 48 and be held in place by the lugs 49. When the parts are to be disassembled, a very few turns of the wing nut will release it from the lugs 49 so that the link 46 can be swung out of engagement with the fork 48, thus releasing the top piece 43 at its ends from the side and top portions. To insure the top portion being held down tightly at the center, I may employ additional but shorter links 51 similarly secured in apertures of the rib 44 and having similar wing nuts 52 co-operating with the under side of a bar 53, which may be of the same general character as the bar 54 shown in Fig. 9, and like it having ends which engage with the under sides of the boards 31 and 31ª so that by tightening up the wing nuts 52, the central portion of the top pieces 43 may be drawn down tightly on the adjacent edges of the boards 31 and 31ª. In the use of these forms, a scaffolding is formed by a series of parallel vertical standards 55, see Figs. 14 and 15, and secured or resting on the top of these standards is a beam or bar 56, ordinarily made of a piece of timber two inches thick and of a width corresponding to the desired width of the bottom of the girders being constructed, and the side pieces 30 and 30ª have their lower edges in engagement with the beams 56, if the girders are to be of the full depth for which the forms are adapted. To support the forms, a number of crosspieces or girts 57 are employed, and these may be boards of any desired width, and they are secured to the standards 55 extending horizontally and at right angles to the beams 56, beneath which they are directly located when the girder is to be of the full depth for which the mold is designed. As a convenient means of holding these girts 57 in place I bore through the upper end of the standards a series of holes 58, the alternate holes extending at right angles to each other so as not to weaken the standards more than is necessary, and through the proper hole, I pass the horizontal threaded portions 59 of the clamp 60, the vertical portion of which engages the side of the girt 57, as shown in Figs. 14 and 15. A wing nut 61 screwed on the threaded end of the clamp serves to temporarily secure the parts together.

When the girder is to be of a less depth than the full depth for which the form is adapted, the beam 56 is placed higher up between the boards 30 and 30ª, as indicated in dotted lines in Fig. 14, and the standard 55 is raised accordingly, the lower portion of the standard being preferably extensible by any suitable means. The clamps 60 are then placed in lower holes 58, as for instance in the second lower hole from those occupied in the full line position of Fig. 14, and this leaves the bottoms of the forms or mold sections supported on the girts 57 as before, but with the beams 56 higher up between the boards 30 and 30ª so as to make a girder of less depth.

The boards 30 and 30ª have to be secured firmly against the beams 56, and for this purpose, I employ the extensible and adjustable strut 62, seen in place in Fig. 5 and illustrated in detail in Figs. 11, 12 and 13. This strut 62 consists of a pair of eye bolts 63 and 63ª oppositely threaded, and pivoted to the vertical webs of the supports by the bolts and nuts 64. The bolts 63 and 63ª have threaded thereon the sleeves 65 and 65ª, and these sleeves have passed radially through the ends thereof the pins 66 and 66ª, which pass through the elongated slots 67 of the sleeve 68, which is preferably made of two sections semi-circular in cross-section with the radially projecting flanges 69 by which the two halves are riveted together. Connected with the slot 67 by the short passages 70 are the short slots 71 parallel to the main slot 67, so that the pins 66 and 66ª may be placed in the main slot 67 for the purposes of preliminary extension and then passed to the adjacent short slots 71, where they are caught as seen in Fig. 11. It will be understood that in shortening or extending the struts 62, the quick adjustment is made by turning the sleeve 68 so that the pins 66 are in register with the main slot 67, when the sleeves 65 and 65ª can slide freely in the sleeve 68. After the quick adjustment is made, the final tightening is secured by turning the sleeve 68 to bring the pins 66 and 66ª in the slots 71 and after this is done, by turning the sleeve 68 in the opposite direction, the sleeves 65 and 65ª must necessarily turn on the threaded links 63 and 63ª to extend the strut and clamp the boards 30 and 30ª securely against the sides of the beams 56.

The sections so far described are say four feet long, and where the girders are of a length other than the exact multiple of four feet, an intermediate filler of some sort is necessary between the ends, and in Figs. 2 and 3, I have shown the simplest form in which a board 69ª is placed over the gap in

the top resting upon the projecting portions of the horizontal flanges of the supports 33 and 33ª, and similar boards will be placed on the sides to fill the gaps, and these filler boards can be secured in any desired manner as by small nails driven diagonally through the edges into the adjacent boards 30, 30ª, 31 and 31ª. In Fig. 4 I illustrate the use of pieces of sheet metal 70ª as a substitute for the boards, and it will be obvious that a single piece of sheet metal might be used for the top and sides both, and the single piece or the three pieces can be secured by very small nails to the wooden pieces which they will overlap. In Fig. 16, I have illustrated still another form of a filler, in which a board 71ª of a narrower width than that of the complete form may be located as is the board 69ª in Figs. 2 and 3, and the sides and the rest of the top may have the sheet metal filler pieces 72, which will be secured to the board 71ª by nails driven thereinto through the apertures 73 formed in the edges of the sheet metal pieces 72.

Where the end sections are not contracted at their outer ends to reinforce the ends of the girders, as indicated in dotted lines in Fig. 2, I may employ the form of an end piece illustrated in Figs. 6, 7 and 9, where the side end pieces 74 and 74ª, symmetrical, but reversed, have the generally rectangular shape shown, with the angular recesses 75 in the upper corner and with an inwardly projecting flange 76, best seen in Fig. 7, the inner corners of the flange being covered by the adjacent corners of that end of the top piece 43. These sections are held in place by the links 46ª, similar to the links 46, but somewhat longer, and passed at their pivoted ends through apertures 77 in the short angle iron pieces 78 secured by the bolts 79 having their heads countersunk in the plates 74 and 74ª. The threaded ends of the links 46ª are swung into the slots 79 and 79ª in the supports 32 and 32ª, and the wing nuts 50 are tightened up to hold the ends securely in engagement with the ends of the boards 30 and 30ª. The adjustable center end piece 80 is similar to the top piece 43 and has the centrally located strengthening rib 81, which carries the previously described short link 51 with its wing nut 52, passed through an aperture in the bar 54, which is channel-shaped in its cross-section and is preferably provided with the recesses 82 in its edges, which recesses are adapted to co-operate with the inwardly projecting flanges 83 and 83ª formed on the inner edges of the side end pieces 74 and 74ª. The ends of the bar 54 are turned outward, as seen in 9, so as to engage the end pieces 74 and 74ª.

In place of the specific structure of the bar 54, shown in Fig. 9, I may employ the substantially equivalent form 54ª, shown in Fig. 18, where the channel is open on the opposite side, and there are no recesses corresponding to the recesses 82, the bar being drawn against the flanges 83 and 83ª, as before, in the plane of these flanges, and its offset ends drawn against the inner faces of the plates 74 and 74ª.

To hold these center end plates 80 in place while the bar 54 is being applied, so that they can be put in place by one man, I preferably employ the construction shown in Figs. 19 and 20, where the upper end of the strengthening rib 81 is seen to have a fork 84 formed or secured on its end, the fork being provided with a pair of horizontally extending slots 85 which are adapted to co-operate with a pin 86 passed through the strengthening rib 44 of the co-operating top center piece 43. With this construction it will be obvious that the center end piece 80 can be hung in place after the side end pieces 74 and 74ª are put in place with sufficient security to hold them while the operator is using both hands to secure bar 54 or 54ª in place.

In Fig. 17, I have shown a modification, in which the parts are just the same as in Fig. 5, except that the outer covering of the side and top pieces is constructed of sheet metal, producing symmetrical, but reversed, side and top pieces 301 and 301ª, these pieces having an angle so that a single piece of sheet metal takes the place of two boards 30 and 31. These pieces of sheet metal are bolted to the supports 32 and 33 and 32ª and 33ª, as before.

Where the end sections have their outer ends narrowed as compared to the inner ends, as shown in full lines in Fig. 2, to strengthen the ends of the girders, I preferably employ the form of side end piece 87, shown in Figs. 21 and 22, and this substantially vertical wall of the pieces 301 and 301ª have inwardly projecting flanges 88 thereon, and the side end piece 87 has the horizontal flange 89 at its upper end, which flange is adapted to extend underneath the horizontal portion of the side and top pieces 301 and 301ª. The side end piece is provided on its inner edge with the flange 83, as before. As this end piece must accommodate itself to the slight swinging movement of the sides of the body sections about the angle formed where the vertical web of the supports 32 and 33 are cut away, this end piece is secured at its upper end to the flange 88 by a bolt 90 having its head countersunk in the plate 87 and extending through an aperture in the flange 88 and secured by a nut screwed on the inside. At the lower end of the plate 87 is a bolt 91 having its head countersunk in the plate 87 and passed through an aperture in said plate and through the slightly elongated aperture 92 in the flange 88 which aperture is curved

about the bolt 90 as the center, so that the plate 87 can be secured to the flange 88 in any necessary angle of the side and top piece 301 or 301ª to the vertical by a nut screwed on the inner end of the bolt 91. To accommodate the necessary swinging outward of the side of the plate 87 having the flange 83 to make the end as a whole stand at right angles to the axis of the form, the side end piece 87 is secured to the horizontal portion of the part 301 by a bolt 93 having its head countersunk in the plate 301 and extending through an aperture therein and through an aperture 94 in the flange 89 and a nut is screwed on the end of the bolt to secure the parts together. Another bolt 95 has its head countersunk in the top of the part 301 and extends through the slightly elongated slot 96 formed in the flange 89 and curved about the aperture 94 as a center. With this construction, the angle of the side end piece 87 can be adjusted so as to make it stand at right angles to the axis of the form, and when thus adjusted a nut screwed on the end of the bolt 95 will secure the side end piece rigidly in place, after which the center end piece 80 is secured in the customary manner.

While I have shown and described my invention as embodied in the form which I at present consider best adapted to carry out its purposes, it will be understood that it is capable of modifications, and that I do not desire to be limited in the interpretation of the following claims except as may be necessitated by the state of the prior art.

What I claim as new, and desire to secure by Letters Patent of the United States is:

1. A horizontally extending form for concrete work comprising a plurality of members each consisting of a plurality of one piece angle bars extending across the member on the inside thereof with the vertical webs of the bars projecting inwardly and cut away at the angles of the members, and a plurality of boards having their faces secured to the outside of the bars and extending lengthwise and transversely of the bars to form the mold surfaces, and means to secure the members into a rigid form, said means being located entirely within the forms so as to leave no projections outside to which the concrete might adhere.

2. A horizontally extending form for concrete work comprising a plurality of members each consisting of a plurality of one piece angle bars extending across the member on the inside thereof with the vertical webs of the bars projecting inwardly and cut away at the angles of the members, and a plurality of boards having their faces secured to the outside of the bars and extending lengthwise and transversely of the bars to form the mold surfaces, the boards at one end terminating in the middle of the horizontal webs to form a support for the adjacent end of a cooperating form.

3. A form for concrete work consisting of a plurality of angle bars extending across the form on the inside thereof with the vertical webs of the bars projecting inwardly and cut away at the angles of the forms, a plurality of boards having their faces secured to the outside of the bars and extending lengthwise and transversely of the bars to form the mold surfaces, and extensible struts connecting the ends of the angle bars for holding said ends spaced firmly apart.

4. A form for concrete work consisting of a plurality of angle bars extending across the form on the inside thereof with the vertical webs of the bars projecting inwardly and cut away at the angles of the forms, a plurality of boards having their faces secured to the outside of the bars and extending lengthwise and transversely of the bars to form the mold surfaces, the boards at one end terminating in the middle of the horizontal webs to form a support for the adjacent end of a cooperating form, a form for concrete work consisting of a plurality of angle bars extending across the form on the inside thereof with the vertical webs of the bars projecting inwardly and cut away at the angles of the forms, a plurality of boards having their faces secured to the outside of the bars and extending lengthwise and transversely of the bars to form the mold surfaces, and extensible struts connecting the ends of the angle bars for holding said ends spaced firmly apart.

5. In a transversely adjustable form for concrete work, the combination with an overlapping sheet metal central top portion, of a pair of associated side and top portions, angular in cross-section, the bodies of which are formed of wood, and mechanism for rigidly securing said three portions together temporarily at suitable intervals to form rigid trough-like forms of different widths in different adjustments.

6. In a transversely adjustable form for concrete work, the combination with a central top portion, of a pair of associated side and top portions angular in cross-section, and mechanism for rigidly securing said three portions together temporarily at suitable intervals to form a rigid trough-like form with the central top portion overlapping the side top portions amounts that may be varied to produce work of different widths.

7. In a transversely adjustable form for concrete work, the combination with an overlapping central top portion, of a pair of associated side and top portions, angular in cross-section, and mechanism for securing said three portions together temporarily at suitable intervals to form rigid trough-like forms, said mechanism consisting of links

suspended from the center of the top portion, cross bars having their ends extending beneath the tops of said side portions and having apertures in their central portion through which the links pass, and nuts threaded on the bottoms of the links and engaging the under side of the bars.

8. In a transversely adjustable form for concrete work, the combination with an overlapping metallic central top portion having a central, downwardly projecting flange, of a pair of associated side and top portions having inwardly projecting transverse ribs near their ends, transverse bars adapted to be connected to the adjacent ribs, links depending from the projecting flange and adapted to be secured to the transverse bars, and means for holding the bottom edges of the side and top portions spaced apart in any position of adjustment.

9. In a transversely adjustable form for concrete work, the combination with an overlapping metallic central top portion having a central, downwardly projecting flange, of a pair of associated side and top portions having inwardly projecting transverse ribs near their ends, transverse bars adapted to be connected to the adjacent ribs, links depending from the projecting flange and adapted to be secured to the transverse bars, and means for holding the bottom edges of the side and top portions spaced apart in any position of adjustment, the connections between the ribs and the transverse bars consisting of slots and bolts extending therethrough, some of the slots having spaced angular recesses to cooperate with squared sections of the bolts passing therethrough.

10. In a form for concrete work, the combination with sides and top portions having means for varying the effective width of the form, of extensible struts connecting the sides, said struts being provided with means for catching them quickly at suitable spaced distances, and with screw mechanism for intermediate adjustments.

11. In a form for concrete work, the combination with sides and top portions having means for varying the effective width of the form, of extensible struts connecting the sides, each of said struts consisting of a pair of threaded members connected to the sides and projecting inwardly toward each other, and a second pair of members screwed onto the first, a single member between said second pair, and connections between said second pair and said single member, whereby the latter can be quickly connected or disconnected to the second pair in any one of various spaced positions, and then rotated to turn the second pair of the first for final adjustment.

12. In a form for concrete work, the combination with sides and top portions having means for varying the effective width of the form, of extensible struts connecting the sides, each of said struts consisting of a pair of threaded members connected to the sides and projecting inwardly toward each other, of a second pair of members screwed onto the first, a single tubular member between said second pair having centrally elongated slots with reverses at the sides thereof at spaced intervals, and a pin carried by each of said second pair and entering its respective elongated slot.

13. In a form for concrete work, the combination with an overlapping top portion, of two side and top portions, and two sets of mechanism for securing said portions together temporarily to form a rigid structure, one of said sets of mechanism being adjustable so as to make a form section that shall be narrower at one end than the other, for the purpose described.

14. In a form for concrete work, the combination with top and side portions, and mechanism for securing them temporarily together to form a rigid structure, of an end portion, and mechanism for temporarily securing the end portion to one end of the rigid structure.

15. In a form for concrete work, the combination with top and side portions, and mechanism for securing them temporarily together to form a rigid structure, of an end portion consisting of an overlapping center piece and two side pieces, and mechanism for temporarily securing the end portion of one end of the rigid structure, said last mentioned mechanism consisting of means to secure the center piece to the side pieces, and the side pieces to the side portions of the body of the form.

16. In a form for concrete work, the combination with top and side portions, and mechanism for securing them temporarily together to form a rigid structure, of an end portion consisting of an overlapping center piece and two side pieces, and mechanism for temporarily securing the end portion to one end of the rigid structure, said side pieces having links pivoted thereon with their other ends threaded, and side portions for rigid forks thereon through which the ends of the links pass, and nuts on the ends of the links, and means for securing the center end piece to the side end pieces.

17. In false work for concrete construction, the combination with a series of forms having their adjacent sides spaced apart to form girders between them, of a series of standards extending between the series of forms, a series of horizontal beams forming the bottoms of the girders supported on the tops of the standards, and series of supports extending transversely of the beams for the lower edges of the forms carried by the standards, and means for securing the

supports at different distances from the tops of the standard to vary the depth of the girder constructed.

18. In false work for concrete construction, the combination with a series of forms having their adjacent sides spaced apart to form girders between them, of a series of standards extending between the series of forms, a series of horizontal beams forming the bottoms of the girders supported on the tops of the standards, and series of supports extending transversely of the beams for the lower edges of the forms carried by the standards, said standards having a series of apertures therein at different distances from the top of the standard, and clamping means to secure the supports to the standards at one of the apertures to vary the depth of the girder constructed.

19. In false work for concrete construction, the combination with a series of forms having their adjacent sides spaced apart to form girders between them, of a series of standards extending between the series of forms, a series of horizontal beams forming the bottoms of the girders supported on the tops of the standards, and series of supports extending transversely of the beams for the lower edges of the forms carried by the standards, said standards having a series of apertures therein at different distances from the top of the standard, the adjacent apertures extending at right angles to each other, and clamping means to secure the supports to the standards at one of the apertures to vary the depth of the girder constructed.

20. In a form for concrete work, the combination with top and side portions, and mechanism for securing them temporarily together to form a rigid construction, of an end portion, means for supporting the end portion in approximately its inner position, and mechanism for securing said end portion temporarily in said final position.

21. In a form for concrete work, the combination with top and side portions, and mechanism for securing them temporarily together to form a rigid construction, of an end portion, a horizontally slotted fork carried by the end portion, a pin carried by the top portion adapted to enter the slots in the fork to support the end portion in approximately its final position, and mechanism for securing said end portion temporarily in said final position.

22. In a form for concrete work, the combination with a side and top portion capable of having the angle of the side to the top varied, of an end portion attached thereto by a pivotal connection at the top of said end portion and a slot and pin connection at the bottom thereof, and means for securing the pin in different positions in the slot.

23. In a form for concrete work, the combination with a side and top portion capable of having the angle of the side to the longitudinal axis of the form varied, of an end portion attached thereto by a pivotal connection at the outer end of the top of said end portion and a slot and pin connection at the inner end of the top of said end portion, and means for securing the pin in different positions in the slot.

24. In a form for concrete work, the combination with a side and top portion capable of having the angle of the side to the top varied and of the side to the longitudinal axis of the form also varied, of an end portion adapted to be attached thereto, the attachment comprising pivotal connections at the outer edge of the top, and slot and pin connections at the bottom and at the inner edge of the top, and means for securing the two pins in different positions in the two slots.

In witness whereof I have hereunto set my hand and affixed my seal, this 26th day of May, A. D. 1919.

ERIC E. HALL. [L. S.]

Witness:
JOHN HOWARD MCELROY.