Oct. 10, 1950 P. F. BLAIR ET AL 2,524,769

PREFABRICATED GRANDSTAND STRUCTURE

Filed Dec. 24, 1947 4 Sheets-Sheet 1

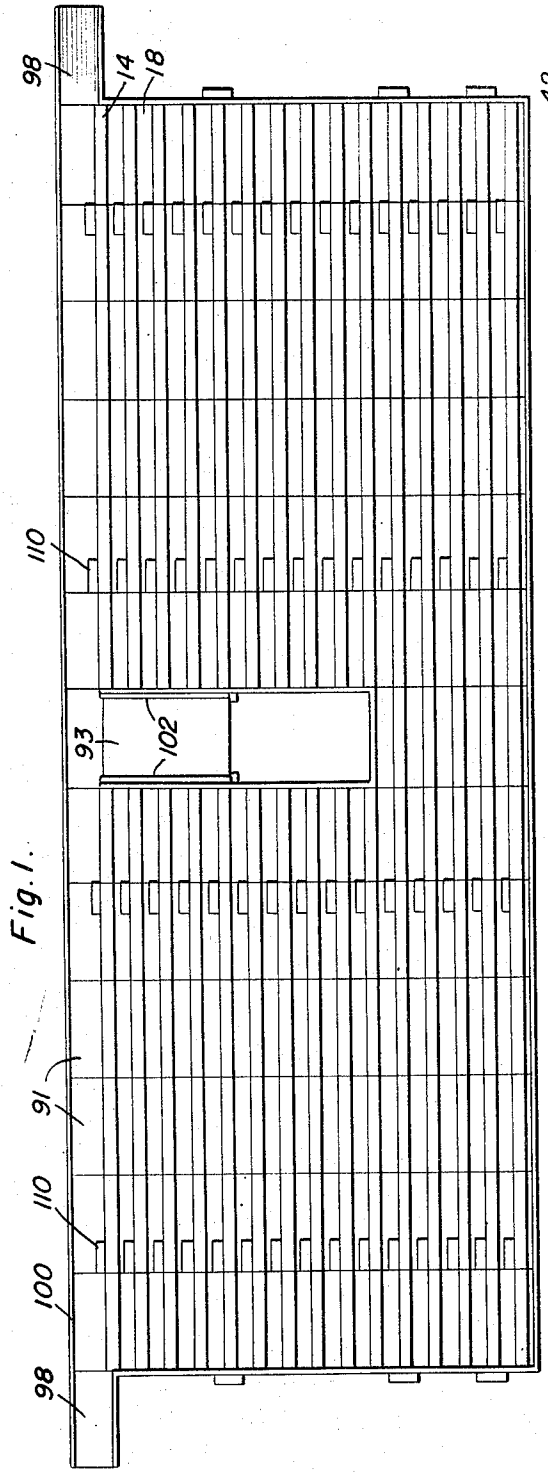


Fig. 1.

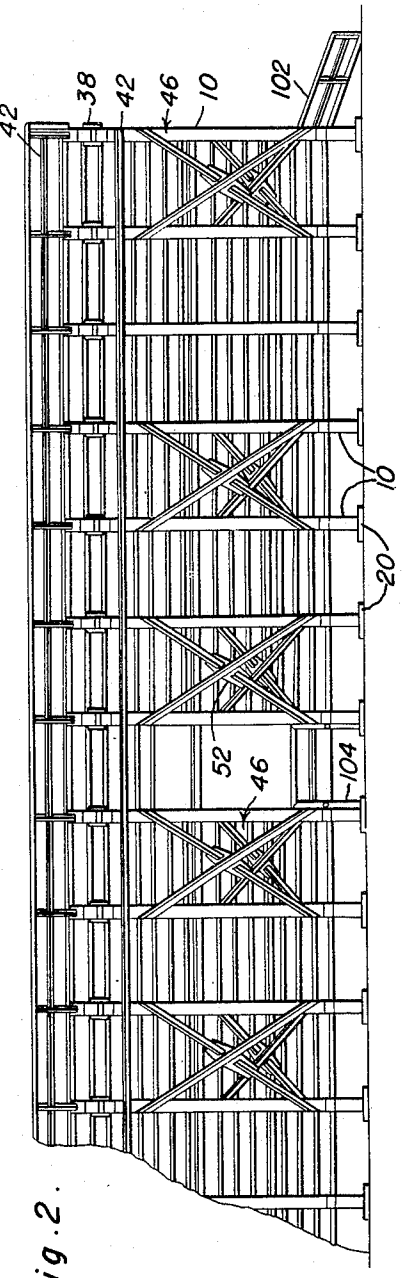


Fig. 2.

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PREFABRICATED GRANDSTAND STRUCTURE

Filed Dec. 24, 1947 4 Sheets-Sheet 2

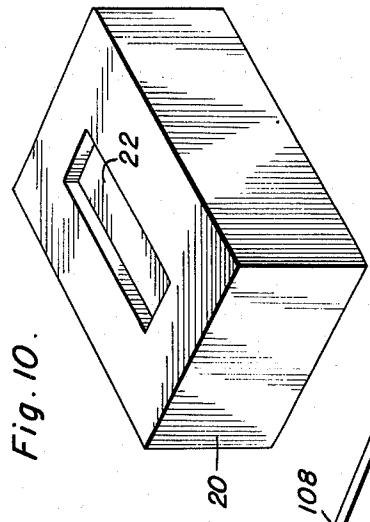


Fig. 10.

Fig. 3.

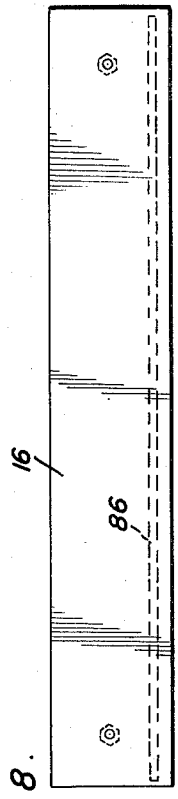


Fig. 8.

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Oct. 10, 1950 P. F. BLAIR ET AL 2,524,769

PREFABRICATED GRANDSTAND STRUCTURE

Filed Dec. 24, 1947 4 Sheets-Sheet 3

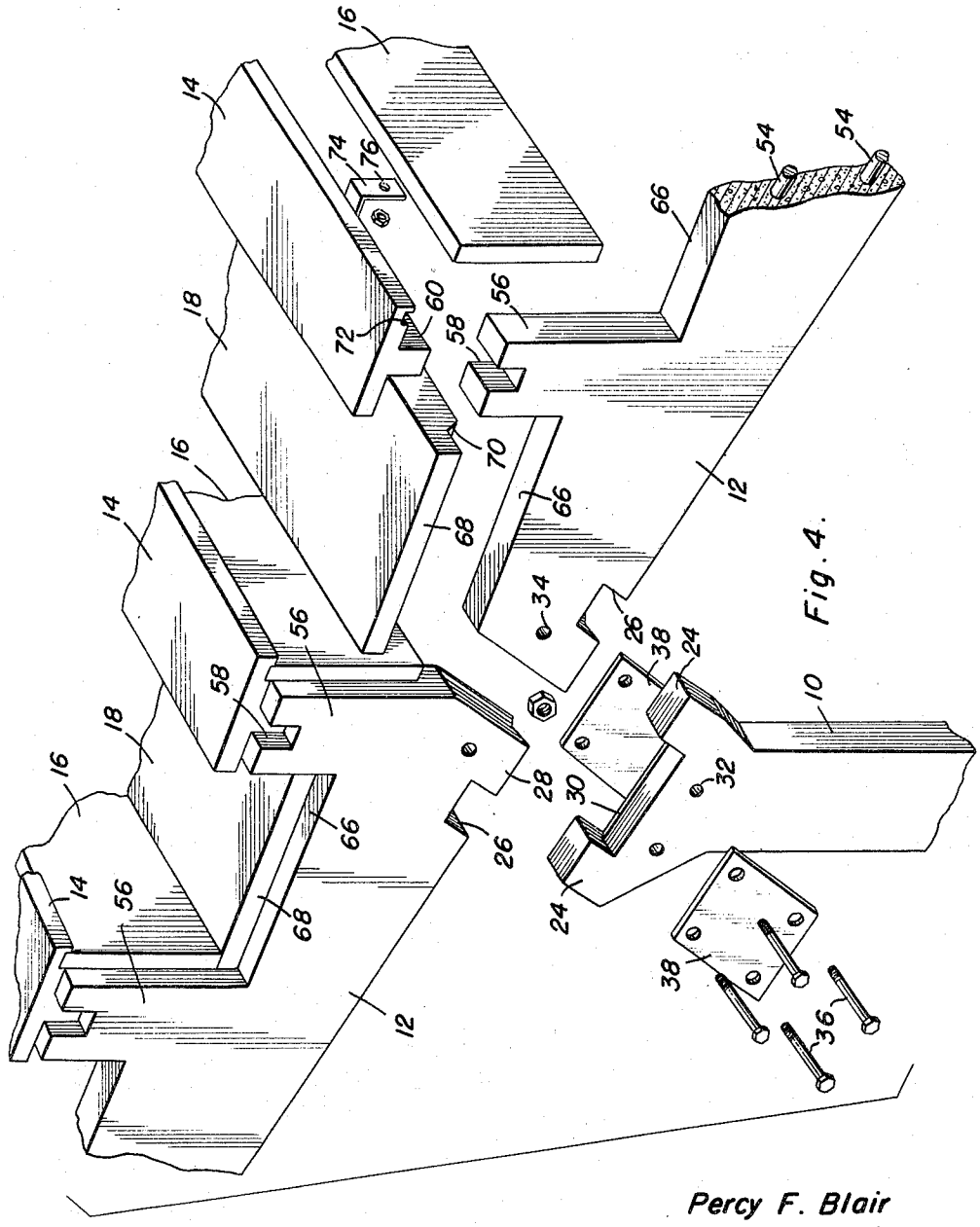


Fig. 4.

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Oct. 10, 1950 P. F. BLAIR ET AL 2,524,769

PREFABRICATED GRANDSTAND STRUCTURE

Filed Dec. 24, 1947 4 Sheets-Sheet 4

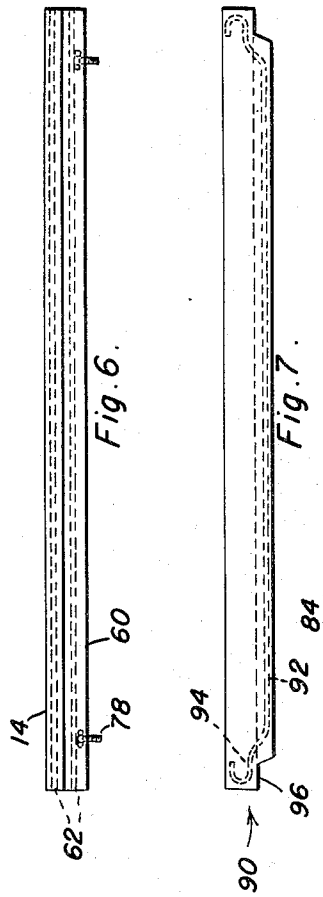


Fig. 6.

Fig. 7.

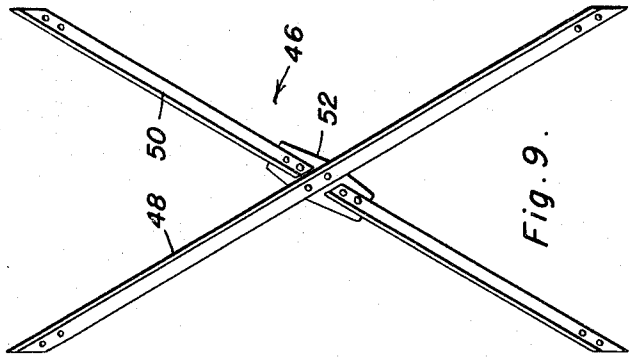


Fig. 9.

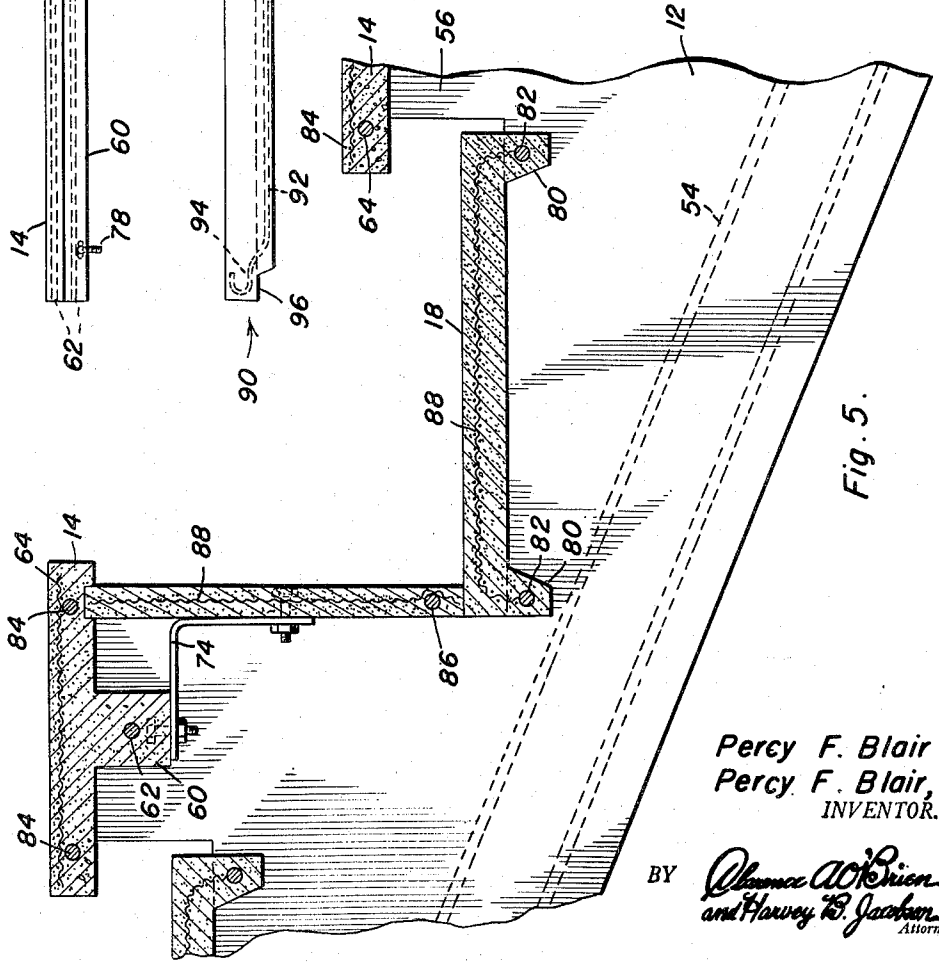


Fig. 5.

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Patented Oct. 10, 1950 2,524,769

UNITED STATES PATENT OFFICE

2,524,769

PREFABRICATED GRANDSTAND STRUCTURE

Percy F. Blair and Percy F. Blair, Jr., Tulsa, Okla.

Application December 24, 1947, Serial No. 793,628

3 Claims. (Cl. 20—1.126)

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This invention relates generally to prefabricated building structures, and more particularly to a prefabricated grandstand structure in which the various elements are easily assembled and disassembled.

A primary object of this invention is to provide a plurality of prefabricated elements, each of which is relatively light in weight and not bulky, these elements being thus easily transported to the site upon which a grandstand is to be erected, the elements being designed so that a minimum number of bolts suffice to hold the elements rigidly together, and in this connection it should be noted that the seat, riser and treads structure is preferably constructed of relatively heavy material so that gravity is utilized to assist in holding these portions in operative positions.

Another important object of this invention is to provide novel and improved means for securing the inclined beam structure of a grandstand to the supporting columns, and to incorporate with this structure means to assist in the orientation of the various elements during assembly thereof.

Still another object of this invention is to provide a grandstand structure which is suitable for having incorporated therewith suitable entrance, ramp and guard rail structure.

And a last object to be specifically mentioned is to provide a grandstand structure which is relatively inexpensive and practicable to manufacture, which is extremely simple, convenient and easy to assemble and disassemble, which provides a very safe grandstand when in assembled position, and which will give generally durable and efficient service.

With these objects definitely in view, this invention resides in certain novel features of construction, combination and arrangement of elements and portions as will be described in detail in the specification, particularly pointed out in the appended claims, and illustrated in the accompanying drawings which form a material part of this application, and in which:

Figure 1 is a top plan view of an assembled grandstand;

Figure 2 is a fragmentary rear elevational view of this grandstand;

Figure 3 is an end elevational view of the grandstand;

Figure 4 is a three dimensional exploded view of portions of two beams, an upper end portion of a column, portions of seat slabs, risers, and tread slabs, together with contiguous structure,

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the figure being designed to illustrate how the various elements represented are locked together in operative position;

Figure 5 is a fragmentary vertical transverse sectional view, the figure being designed particularly to illustrate the internal structure of the seat slabs, risers and tread slabs, the figure also illustrating how the seat slabs are formed with a depending rib which is secured by an angle to the riser slab adjacent thereto, the fragmentary portion of a beam represented in the figure having structural steel reinforcing rods represented in dash line;

Figure 6 is a side elevational view of a seat slab;

Figure 7 is a side elevational view of a walk slab;

Figure 8 is a side elevational view of a riser slab;

Figure 9 is a side elevational view of a cross brace adapted for securement to the rear upright faces of certain pairs of columns; and

Figure 10 is a three dimensional view of a concrete block footing used to support the lower ends of the columns.

Similar characters of reference designate similar elements or portions throughout the specification and throughout the several views of the drawings.

Referring now to the drawings in detail, this invention includes a plurality of sets of columns 10, the columns in each set being of equal length and designed to support a plurality of inclined beams 12 which are also arranged colinearly in sets spaced along the length of the assembled grandstand at distances corresponding with the length of the seat slabs 14, riser slabs 16 and tread slabs 18.

Suitable concrete blocks, indicated at 20 in Figure 10 comprise footings for the pillars 10 and these footings will be ordinarily sunk into the soil in proper positional relationship at the site where the grandstand is to be erected. Each footing 20 is preferably recessed on the upper surface thereof as at 22 to receive the lower end of the corresponding column 10. The upper end of the column is bifurcated and the arms 24 extend upwardly at an acute angle with the axis of the column 10. Each end of the beams 12 which are to be positioned intermediate the height of the grandstand is recessed as at 26 to receive the arms 24 in interlocking relation and terminal portions 28 of the same beams are adapted to fit in abutting relation in the space between the arms 24. In this connection it

should be carefully noted that the lower faces of the terminal portions 28 are grooved while the portion 30 of the bifurcated portion of the column 10 is ridged, this construction facilitating the location of the beams 12 upon the columns 10. In other words, the beams 12 are practically self locating after being placed in approximately correct position. The bifurcated portion of each column and the terminal portion 28 of each beam are each provided with bores 32 and 34 to receive bolts 36, whereby locking plates 38 are clamped into positions preventing relative movement between the column and the corresponding beams 12.

Each column carries a bolt 40 whereby a long angle iron 42 is secured horizontally to the upper end portions of all the columns at a certain level of the grandstand. It is proposed to manufacture the major portions of this grandstand from reinforced concrete, and when this material is used the bolts 40 will be carried by the columns 10 with the head portions of the bolts immersed in the concrete. Other bolts 44 may be similarly provided on the longer columns for securement thereto of cross braces 46, best represented in Figure 9, which are secured to selected pairs of columns, as indicated in Figure 2. The cross braces 46 may be comprised of angle iron straps 48 and 50 and a gusset plate 52 is used to maintain the members 48 and 50 in proper positional relationship.

The beams 12 are represented as having reinforcing rods 54 and are of irregular shape having upstanding seat slab supporting rests 56 which have grooves 58 in the upper ends thereof to receive depending rib members 60, that is, terminal portions of these rib members, and in this connection it should be noted that the seat slabs are reinforced, as illustrated at 62, with a wire screen 64. Flat portions 66 between the rests 56 are used to support end portions 68 of the tread slabs 18. The terminal portions 66 of the seat slabs are notched as at 70 to provide a face inclined to the vertical and adapted to facilitate the location of the seat slabs on the flat portions 66. In this connection it should be carefully noted that the tread slabs 18, as well as the seat slabs 14 and riser slabs 16 are all of equal length and when the grandstand is assembled these slabs 14, 16 and 18 will abut the ends of corresponding slabs along a line bisecting the beams 12, this arrangement being clearly indicated in the upper portion of the Figure 4. The seat slab 14 is provided with a longitudinally disposed groove 72 near one edge thereof, to receive the upper edge portion of the riser slab 16, and this seat slab is further provided with an angle brace 74 on the under and forward portion thereof, this brace being apertured at 76 to receive a bolt, preferably having the head thereof embedded in a corresponding portion of the adjacent riser 16. A similar bolt 78 is illustrated in Figure 6 and is used to secure the angle brace 74 to the seat slab 14. This construction is clearly illustrated in Figure 5 and if reference be had to this figure, it will be noted that the tread slab 18 is provided with laterally extending depending flanges or reinforcing ribs 80, which ribs may be strengthened by reinforcing rods 82. Other reinforcing rods 84 and 86, and screen reinforcing 88 may be added to these slabs to strengthen the same, if desired.

This invention also contemplates provision of a plurality of slabs of the character illustrated in Figure 7 and indicated by the numeral 90.

These slabs will be reinforced by rods 92, curved at the ends, as at 94, and by wire screen if desired, and the slabs will be marginally notched, as at 96. These slabs 90 are used in fabricating ramp means 98 and a walk 91 extending along the lower side of the grandstand, as well as an inclined ramp 93, suitable upright members 95 and 97 being provided for supporting these ramp and walk structures, the exact detail of which is not material in this application. Guard rails 100, 102, and 104 will also be provided on each side of said ramp and walk constructions. It should be noted, however, that the said slabs 90 rest upon the lowermost of the flat portions 66 of those beams 12 which form the lowermost portions of the beam structure, and that the upright members 95 and 97 will preferably be rigidly secured by bolts provided therefor in the portion indicated in dash line at 106 in Figure 3, this portion resting directly upon the lowermost of the footings 20, and it should also be noted that the notches 96 in the ends of the slabs 90 are used to locate these slabs 90 in the same manner as the inclined faces 70 locate the tread slabs 18 on the flat faces 66 of the beams 12. The end rails 102 will preferably be supported on vertical strap members 108 bolted to the beams 12 according to the manner described hereinbefore as in reference to the braces 46. Finally, a plurality of steps 110 may be incorporated in any suitable manner with this device, in order to allow patrons to reach the higher levels of the grandstand.

The operation of this invention will be clearly understood from the foregoing description of the mechanical details thereof, taken in connection with the above recitation of the objects sought to be achieved by this invention. Further description would, therefore, seen to be unnecessary.

Obviously many minor variations may be made in the details of construction and the proportionment of the various elements of this invention without departure from the spirit and scope thereof, and the drawings especially should be considered as illustrative rather than limiting. Accordingly limitation of this invention should be only as determined by proper interpretation of the terminology in the subjoined claims.

Having described the invention, what is claimed as new is:

1. A prefabricated grandstand structure comprising a plurality of sets of columns the columns of each set being substantially equal in length, elongated tie rods removably secured to and between said columns, a plurality of beams having abutting ends removably secured to upper end portions of said columns and having upwardly extending spaced seat rests with grooves in their upper ends, elongated seat slabs terminally mounted on said rests and having depending rib members the ends of which seat within said grooves, and elongated tread slabs terminally mountable on portions of said beams between said rests, a plurality of elongated riser slabs terminally mounted on edge portions of said tread slabs, the forward undersurfaces of said seat slabs having grooves receiving upper edge portions of said riser slabs, angle braces secured to and between the lower ends of said depending rib members and adjacent portions of said riser slabs, said upper end portions of said columns being bifurcated with short integral arms extending upwardly in the same planes as the remaining portions of the columns, said beams having recesses on the sides thereof remote from said rests to receive the upper ends of said arms.

2. A structure according to claim 1 and in which said abutting ends of the beams and portions of said end upper portions of the columns between said arms are configurated to interfit and to prevent relative movement in a direction transverse to said columns, whereby the beams are self-aligning with the columns during erection of the grandstand and rigidity of the fabricated grandstand is increased.

3. A structure according to claim 2 and including lateral clamping plates securable to said upper end portions of the columns and to the abutting ends of said beams further preventative of relative movement between said columns and beams.

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PERCY F. BLAIR, JR.

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