Oct. 7, 1958 W. B. GILBERT 2,854,704

PREFABRICATED GRANDSTAND

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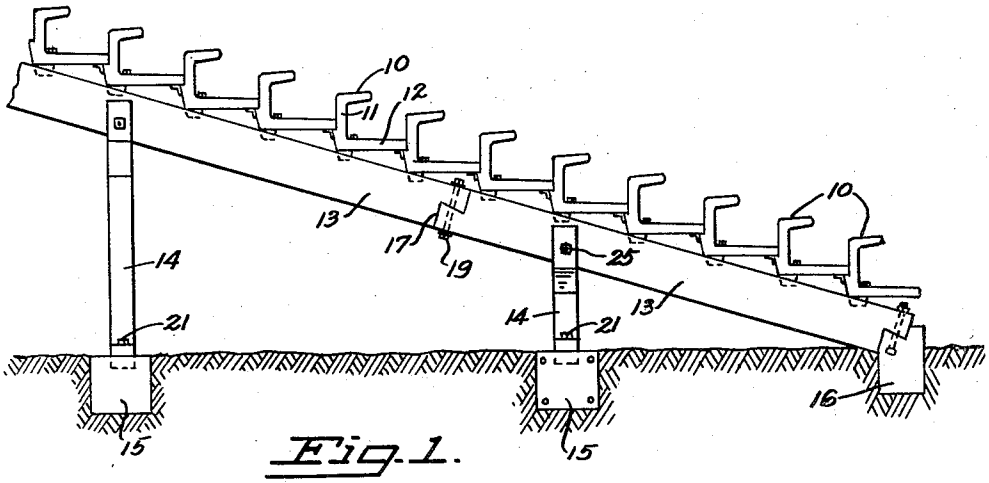


Fig. 1.

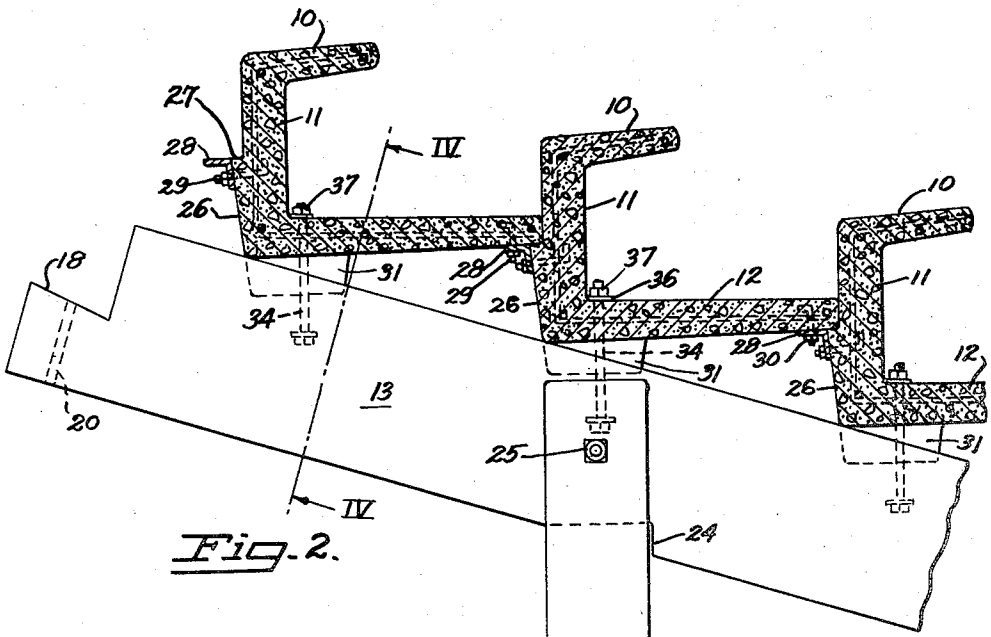


Fig. 2.

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Fig. 3.

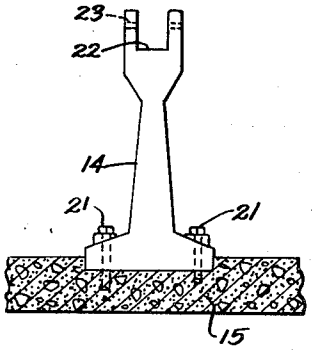


Fig. 4.

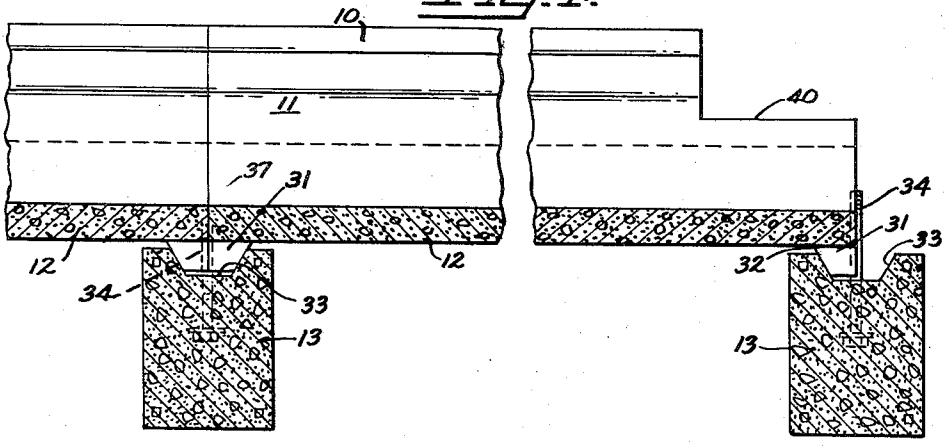
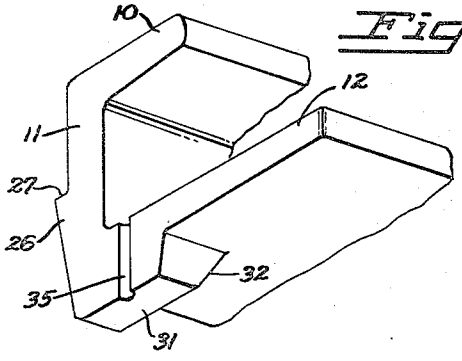


Fig. 5.



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PREFABRICATED GRANDSTAND

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Application January 17, 1955, Serial No. 482,269

1 Claim. (Cl. 20—1.126)

This invention relates to grandstand structures and particularly to a grandstand made entirely of reinforced concrete elements self-sustaining in their assembled position and secured together by metal elements only to insure maximum safety and to prevent relative shifting which might take place under varying load conditions and other stresses.

It is an object of the present invention to provide a grandstand structure with a few basic elements capable of assembly to provide any desired seating capacity and capable of being cast in reinforced concrete either on the site or elsewhere for transportation to the site of erection.

A further object of the invention is to provide a grandstand element which comprises an integrally cast seat, riser and floor section for combination with identical sections in a manner to provide an easily water-proofed roof covering the space beneath the grandstand which may be used for parking, storage or other purposes.

Further and more specific objects and advantages of the invention are made apparent in the following specification wherein reference is made to the accompanying drawings for a detailed description of the invention.

In the drawings:

Fig. 1 is a view in side elevation of the lower portion of a grandstand constructed in accordance with the present invention,

Fig. 2 is an enlarged detail with parts in section of a portion of the grandstand illustrated in Fig. 1,

Fig. 3 is a front elevation of one of the columns which support the grandstand structure with relation to the ground,

Fig. 4 is a sectional view taken on the line IV—IV of Fig. 2, and

Fig. 5 is a perspective fragmentary view illustrating the construction of one end of a combination seat, riser and floor element which forms a portion of the grandstand.

Referring first to Figs. 1 and 2 of the drawings, the principal element of the grandstand structure of the present invention is illustrated as a combination seat, riser and floor element which comprises a seat portion **10**, a riser **11** and a floor **12** all cast as an integral unit of reinforced concrete or similar material. A plurality of these elements are supported at their ends on inclined beams made up of sections **13** which are in turn supported on columns **14** (see also Fig. 3) resting on piers or foundation slabs **15**. At the lower-most or ground engaging ends, the beams **13** rest upon abutment piers, one of which is shown at **16** in Fig. 1, in a manner to prevent their shifting downwardly in the direction of their length.

The ends of the beams **13** are shaped to provide overlapping joints, as illustrated at **17** in Fig. 1, each end of each beam being stepped as most clearly shown in Fig. 2 and preferably having an angularly disposed surface **18** for cooperation with a similar surface on the adjacent beam to provide a sort of interlocking effect. The beams **13** are of such a length that the connections between their abutting ends occur a short distance above

each of the supporting columns **14** so that the combined weight of the beam portion below the column and the seat portions resting upon it provide a sturdy cantilever effect sufficient to support the lower end of the adjacent beam progressing upwardly of the incline. However to insure positively against any dislodgment at the connected ends of the beams, a bolt **19** is passed through registering bolt holes such as indicated at **20** in Fig. 2 adjacent the ends of the beams. The columns **14**, as shown in Fig. 3, are secured in place upon the foundation piers **15** as by tie rods or bolts **21**. At their upper ends these columns are bifurcated to provide a surface **22** and side supports **23** for reception of the beams **13**. As shown in Fig. 2, the lower edges of the beams **13** are notched angularly as at **24** to provide a short horizontally disposed surface to rest upon the surface **22** of each of the columns. A safety bolt illustrated at **25** is also preferably passed through suitable holes in the side supports **23** and the beam **13** at each connection.

The design of the combined seat, riser and floor element is such that the several elements are self-sustaining and present a minimum of joints to be sealed against the penetration of water so that they may provide a protecting roof over the area covered by the grandstand thus making this area suitable for storage or other purposes. These elements, as best illustrated in Figs. 2 and 5, have suitable steel reinforcing members as indicated in dotted lines in Fig. 2 as do all of the other elements referred to. They also have on the back of the riser portion **11** a tapered enlargement **26** providing a shoulder **27** extending throughout the length of the element for the reception of the forward edge of the floor portion **12** so that the back of the riser of each element supports the floor of the next adjacent element above it. The security of this connection may also be insured by the use of a plurality of metal clips such as indicated at **28** perforated for the reception of threaded studs **29** let into the floor and riser sections at suitably spaced intervals. Nuts **30** are threaded onto the studs to hold the angle shaped clips **28** in place.

The length of the combination seat, riser and floor elements is such as to span the supporting beams **13** terminating at the center of the beams as illustrated in Fig. 4. To provide a secure seat for these elements on the inclined surface of the beams **13**, each end of each element is formed with a downwardly projecting lug **31** of substantially rectangular shape but having an inclined wall **32** on the side which faces away from the end of the element. A recess or socket 33 complementary in shape to two of the lugs **31** is formed in the upper surface of the beams **13** at each point where the ends of the seat element will rest. Since the side walls of the recesses **33** are inclined at the same angle as the inclined sides **32** on the lugs **31**, the weight of the seat elements will cause a wedging action tending to draw their abutting ends together. As added security against dislodgment of the combined elements from their intended positions, bolts **34** may be let into the beam to project upwardly between the ends of the elements through half bolt holes formed therein as indicated at **35** in Fig. 5 and large washers or plates **36** span the adjacent ends of the elements and are held in place as by nuts **37** threaded on the bolts.

With the construction herein illustrated, the only portions of the grandstand structure that can be penetrated by water are the joints between the ends of the combination elements and the joints between the forward edges of the floor portions and the backs of the risers. Since these joints are few in number, they can be easily sealed with a caulking compound or similar substance to prevent the penetration of water therethrough. It may also be desirable to provide a slight pitch lengthwise of the

grandstand to overcome the tendency of water to collect on the floor sections.

Access in the form of stairways at any desired intervals may be provided by omitting portions of the combined seat, riser and floor elements as indicated at **40** in Fig. 4 where a part of the seat element **10** and a part of the riser **11** is eliminated so that the floors **12** will form an uninterrupted stairway.

Since the elements required for constructing the grandstand according to the present invention are few in number and relatively small and light in weight, a grandstand can be erected in a short time and at unusually low cost, without the construction of large or temporary forms.

I claim:

In a grandstand structure of the kind having supports in the form of a plurality of spaced inclined beams, a series of members to accommodate people each of which members comprises a rectangular floor portion having a forward edge and a rear edge, said edges being the longer sides of the rectangle, a riser portion extending upwardly from the rear edge of the floor portion, a seat portion extending from the top of the riser portion only in the direction of the said forward edge, and a shoulder projecting from the rear surface of the riser portion approximately midway between its upper and lower edges, said floor riser and seat portions being formed as an integral unit all whereby upon assembly the rear edges of the floor portions will rest upon said inclined beams and the forward edge of each may rest upon said shoulder on the riser portion of another unit, said riser portions being imperforate to provide a continuous smooth safety wall in front of seated persons.

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