March 11, 1952 C. H. WETZEL 2,588,783

GRANDSTAND

Filed June 29, 1948 2 SHEETS—SHEET 1

FIG. 4.

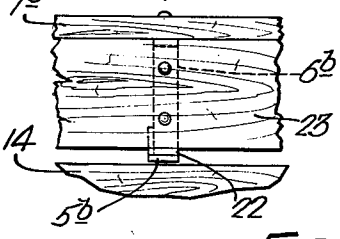


FIG. 5.

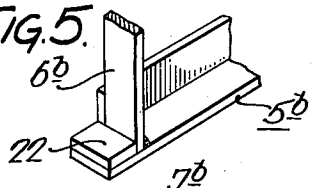


FIG. 1.

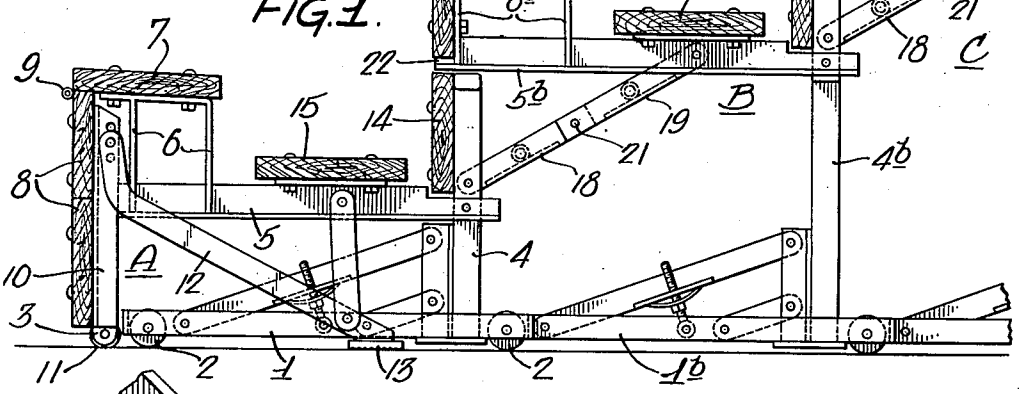


FIG. 6.

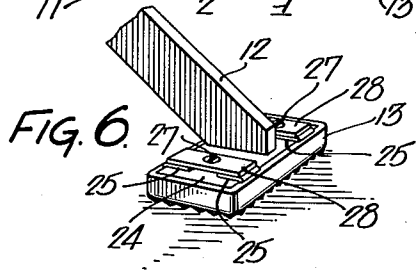


FIG. 2.

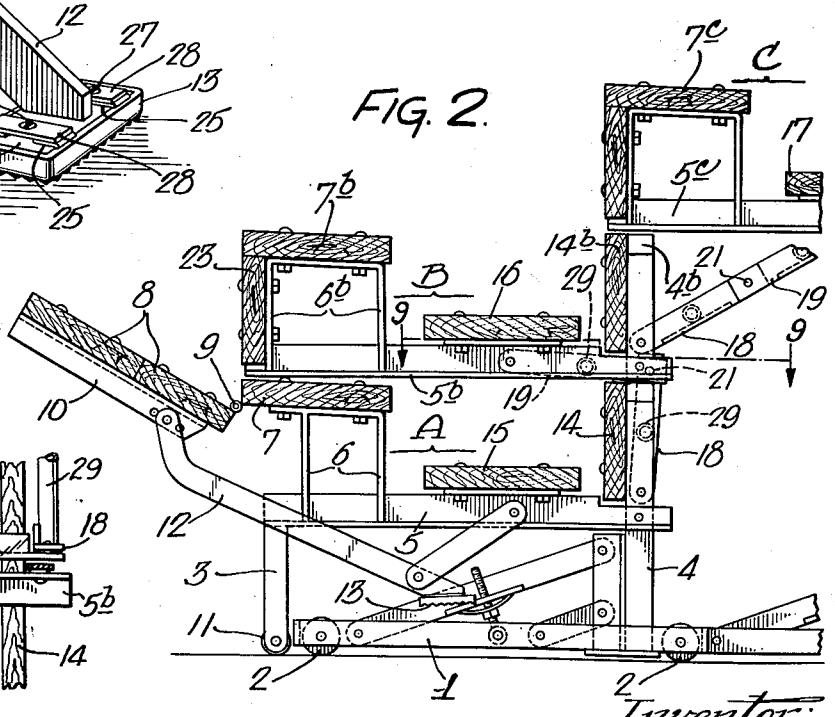
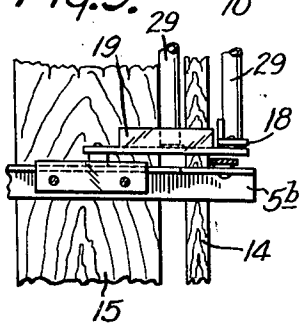


FIG. 9.



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FIG. 3.

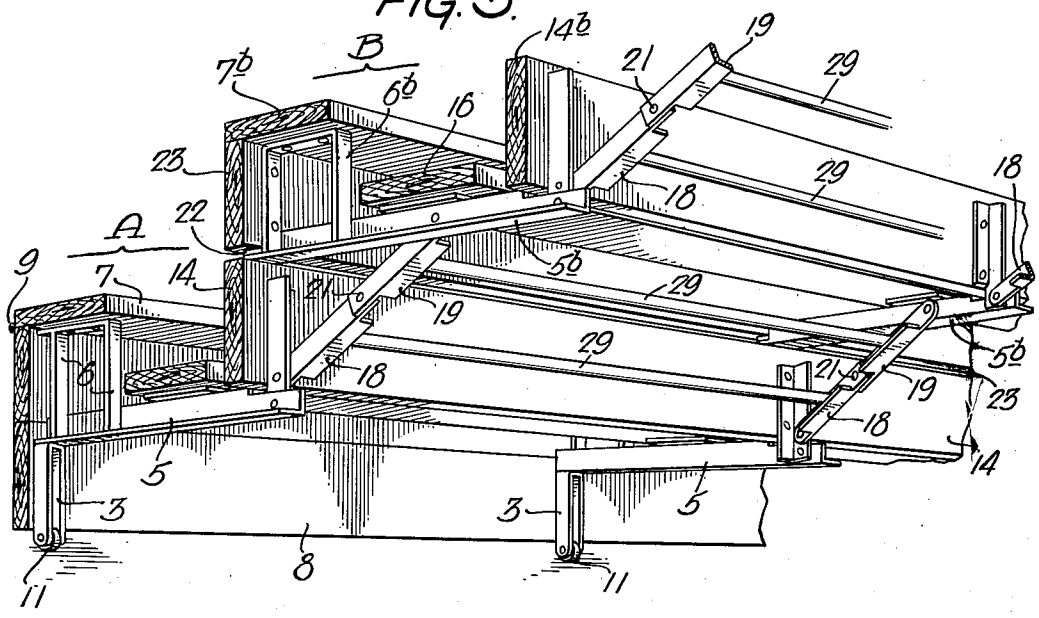
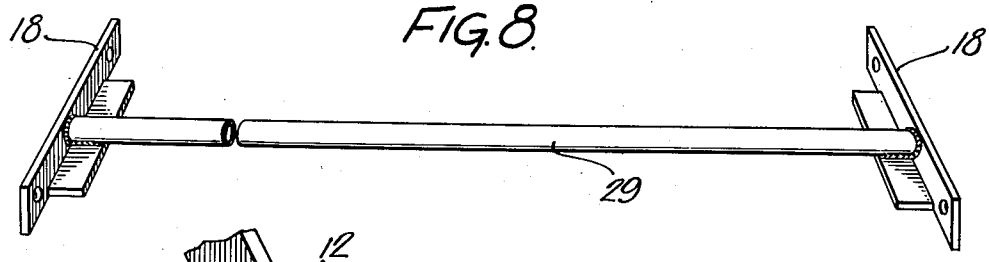


FIG. 8.



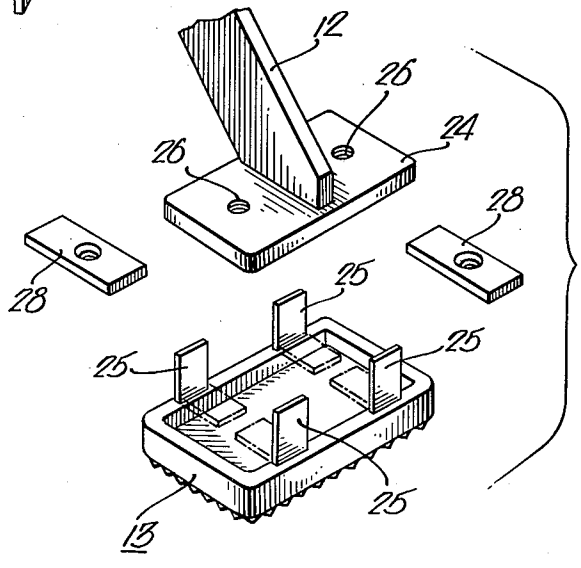


FIG. 7.

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2,588,783

UNITED STATES PATENT OFFICE

2,588,783

GRANDSTAND

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Application June 29, 1948, Serial No. 35,821

1 Claim. (Cl. 20—1.126)

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This invention relates to grandstands and more particularly to stands of the folding type adapted for use in gymnasiums and the like. The present invention has for its primary object the improvement of stands of this type in certain details hereinafter more fully set forth.

A more specific object of the invention is to provide means for rendering the stand more foolproof against accident to the occupants.

Another object is to increase the rigidity and at the same time to reduce the weight of certain reinforcing elements of the grandstand structure.

Still another object is to provide an improved form of friction anchor for maintaining the stand in adjusted position.

The invention will be more readily understood by reference to the attached drawings wherein:

Fig. 1 is a fragmentary vertical sectional view of the lower portion of a stand made in accordance with the invention;

Fig. 2 is a corresponding view showing the stand in the process of being folded;

Fig. 3 is a fragmentary view in perspective showing the under part of that portion of the stand shown in Fig. 1;

Figs. 4 and 5 are fragmentary views showing a detail of the construction;

Fig. 6 is a view in perspective of the friction anchor;

Fig. 7 is an exploded view of the friction anchor shown in Fig. 6, and

Fig. 8 is a view in perspective of one of the alignment frames of the structure illustrating one of the features of the invention.

Fig. 9 is a view taken along line 9—9 of Fig. 2.

The general structural nature of the grandstand is best illustrated in Figs. 1 and 2. The stand, in effect, is composed of a plurality of units, each comprising a base frame 1 supported on rollers 2, 2 at front and rear. The lowermost section A comprises front and rear uprights 3 and 4 respectively and horizontal members 5 which connect said uprights. Small floor-engaging rollers 11 are provided at the lower ends of the uprights 3. To the forward end of the horizontal members 5 are secured the brackets 6 which support the lowermost seat 7 of the stand.

A front panel is hinged at 9 to the forward edge of the seat 7, said panel comprising upright members 10 and transverse facing boards 8, 8. Pivotally attached to the uprights 10 and extending rearwardly are a plurality of strut-like members 12, the lower ends of which are provided with rubber pads 13 which normally engage the floor surface and act as brake or anchor elements as

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hereinafter more fully described. The structure consisting of the uprights 10 and the panels 8 may be elevated about the hinge 9 in the manner illustrated in Fig. 2, and when so elevated retracts the members 12 and elevates the lower ends thereof and the pads 13 from the floor, also as shown in Fig. 2, thereby rendering the friction pads inoperative.

The section B of the stand which adjoins the lower section A consists of the roller supported base frame 1b, rear uprights 4b, and horizontal members 5b extending forwardly from panel 14b supported by the rear uprights 4b and carrying at their forward ends the brackets 6b which support the seat element 7b. In normal assembly the forward end of each of the members 5b overlies an upright 4 of the section A, and the said upright 4 is provided with a facing board or panel 14 which, when the seat 7b is occupied, will form a support for the forward ends of the members 5b of the stand section B. When the section B is not occupied the forward end of the horizontal members 5b will be slightly elevated above the board 14 and the supporting upright 4 of the lower section so that that section may be moved rearwardly on its wheels 2 to a position entirely underlying the horizontal members 5b of the adjoining section B. This retracted position of the section A is shown in Fig. 2. It will be noted that in order to move the lower section A to this position it will be necessary to elevate the friction pads 13 from engagement with the floor and that this can be accomplished by turning up the forward uprights 10 and their facing boards about the pivot 9 as shown.

The section B is similarly adapted to be moved backward on its rollers under the projecting horizontal members 5c of the next adjoining section C, so that when completely folded the stand structure will have an effective thickness from front-to-rear corresponding to the front-to-rear dimension of the individual sections A, B, C, etc. When the stand sections are fully folded one under the other as described above, the forward uprights 10, with their facing boards 8, will again be lowered to the position shown in Fig. 1 whereby the friction pad 13 will be brought into engagement with the floor to act as an anchor retaining the sections in the relatively telescoped positions. It will be noted that each of the horizontal members 5, 5b and 5c constitute supports for footboards, 15, 16 and 17 respectively, which form footrests cooperating respectively with the seat elements of the adjoining section. Thus the footboard 15 functions in conjunction with the

seat 7b, and the footboard 16 with the seat 7c of section C.

Between the uprights 4 of the lower section A and the correspondingly located horizontal members 5b of the section B, a pair of torsion frames 18 and 19 extend, the lower end of the frame 18 being hinged to the uprights 4 and the upper ends of the frames 19 being hinged to the horizontal members 5b. The frames 18 and 19 are pivotally joined together at the upper and lower ends thereof respectively at a point indicated in the drawings by the reference numeral 21. These frames act in pivoted pairs to form reinforcing struts for the structure. When the parts are folded one under the other these frames will fold around the pivot 21 and will assume a position illustrated in Fig. 2.

It will be noted that similar struts are provided between the uprights of each section and the horizontal members of the overlying section. Thus the torsion frames connecting the uprights 4b with the horizontal members 5c are identified in Figs. 1, 2 and 3 by the same reference numerals, 18, 19 and 21, which were used to identify the frames connecting the uprights 4 with the horizontal members 5b.

It will be noted that the forward end of each of the horizontal members 5b of the section B is provided with a rigid pad or spacer element 22 which forms a support for the lower edges of facing boards or panels 23 which are secured to the brackets 6b at the forward ends of the horizontal members 5b. When the section B is loaded and the forward end of the horizontal members are thereby depressed so as to bear upon the facing boards 14 of the uprights 4 of the lower section A, as previously described, the lower edge of the facing board 23, by reason of the presence of the pads 22 upon which they rest, will be spaced well above the upper edge of the underlying facing board 14 and this space will be sufficient to accommodate the fingers with ample clearance. The purpose of this construction is to avoid the possibility of inadvertent pinching of the fingers of occupants of the stand between the facing boards 14 and 23, in the event that the fingers are inadvertently placed between these facing boards 14 and 23 at the time that the section B is initially loaded.

Referring to Figs. 6 and 7, it will be noted that the members 12 have at their lower ends a transverse flange or foot 24 to which the rubber pads 13 are attached. The pads 13, as best shown in Fig. 7, are provided with inserted metal clips 25 which, when the pad is applied to the flange 24, are pressed downwardly over the edges of the flange and against the top face thereof to hold the pad in position. The manner in which the clips 25 are so folded over the foot 24 is shown in Fig. 6. In order to preclude possible displacement of the pad 13 from the foot 24 the said foot is provided with a pair of tapped holes 26, 26 which are adapted to receive screws 27, 27, passing downwardly through plates 28, 28, respectively, said plates in assembly overlying the inturned clips 25 as illustrated in Fig. 6. In this manner the clips 25 are positively held in place to retain the pads 13 in place on the feet 24.

Referring to Fig. 8 it will be noted that each of the torsion frames consists of end members corresponding to the members 18 and so designated in Fig. 8, and a cylindrical cross bar 29 which, in the present instance, is of tubular form as illustrated. The ends of this bar are rigidly connected, by welding in the present instance, to the mid-sections of the said members 18. This simple connecting bar has been found highly effective to prevent relative angular displacement of the members 18, 18 from their normal parallel relation and constitutes a light weight but highly effective means for preventing such torsional displacement.

It will be understood that the herein described structure is susceptible to modification without departure from the invention as defined in the appended claim.

I claim:

A grandstand including a plurality of sections arranged in stepped relation, said sections being supported on rollers and being movable rearwardly to a position underlying the next higher section, a panel at the forward end of the lowermost section, said panel depending from hinges at its upper edge and being movable upwardly and outwardly about said hinges, a pair of links pivotally connected together and respectively to the rear of the panel and to a relatively fixed part of the said lowermost section, said links being arranged so that when the panel is dependent from the hinge substantially in vertical position the connected ends of the links extend downwardly into proximity of the floor surface underlying the grandstand, and when the panel is elevated about the hinges the links are extended and are also elevated from the said floor surface, and an anchor pad at the said connected ends of the links arranged for frictional engagement with the floor surface only when the panel is in the said dependent position.

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