Oct. 17, 1967 T. G. WALKINSHAW 3,347,593

SPECTATOR SEATING STRUCTURE

Filed April 18, 1966 2 Sheets-Sheet 1

Fig. 1.

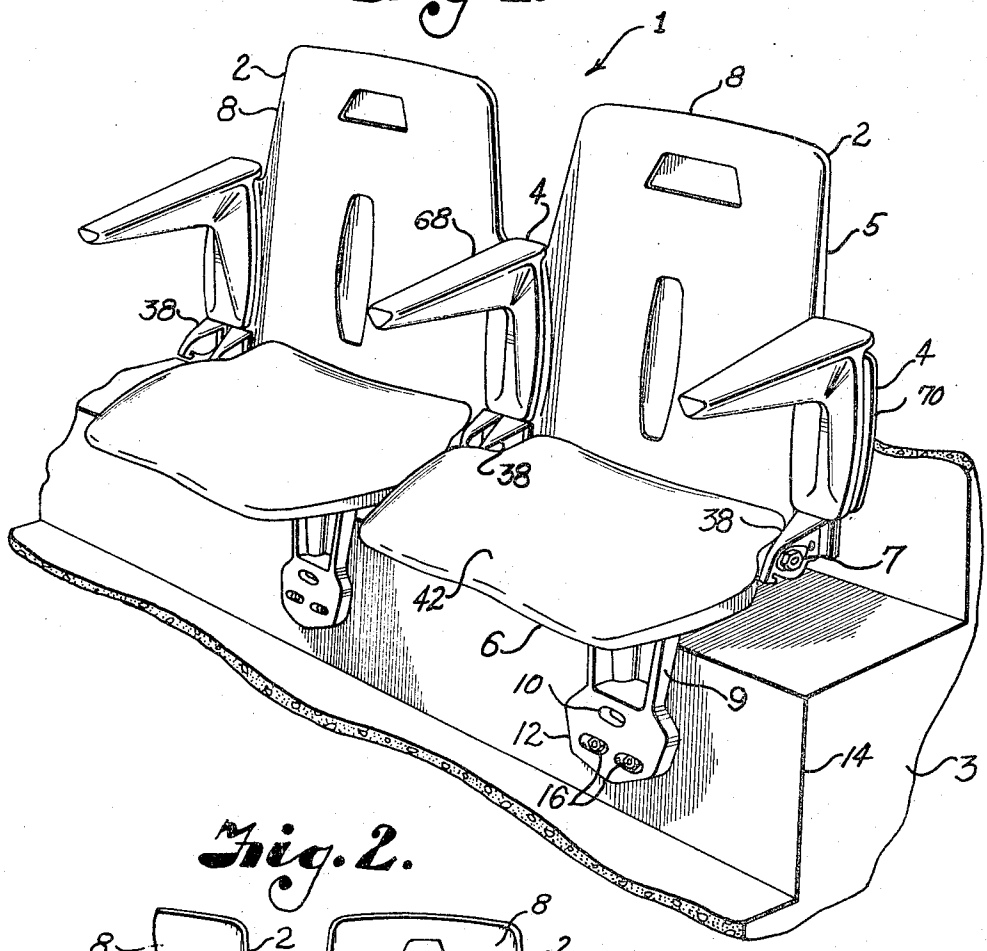
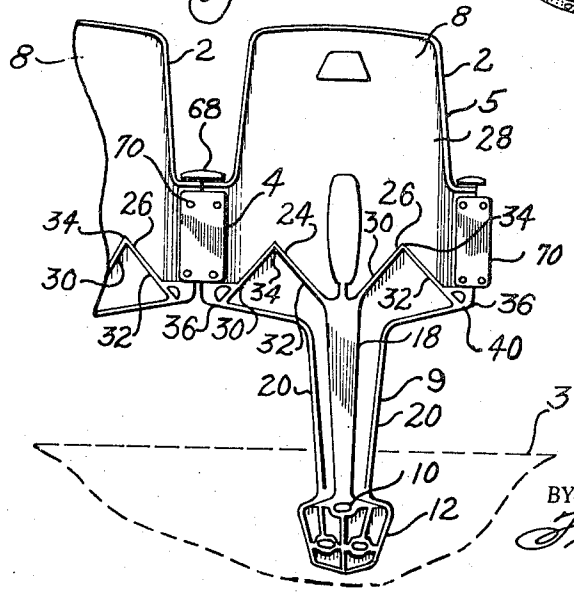


Fig. 2.



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Oct. 17, 1967 T. G. WALKINSHAW 3,347,593

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Filed April 18, 1966 2 Sheets-Sheet 2

Fig. 3.

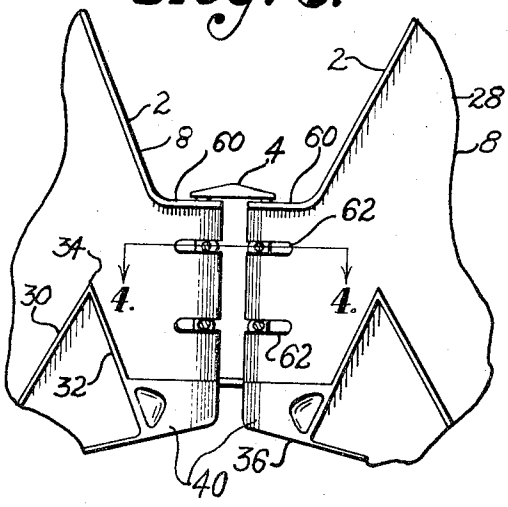


Fig. 4.

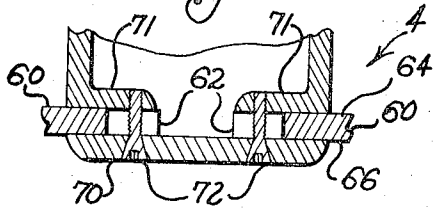


Fig. 5.

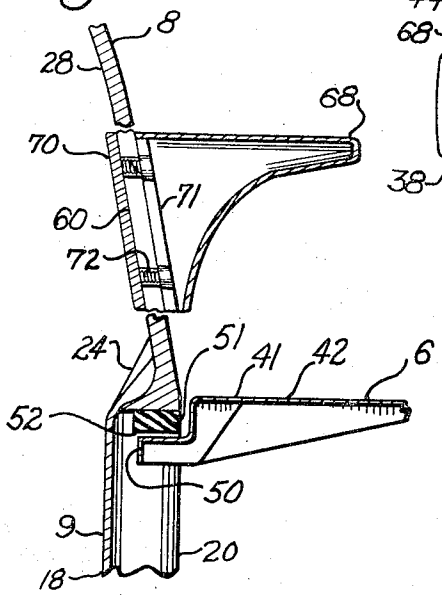
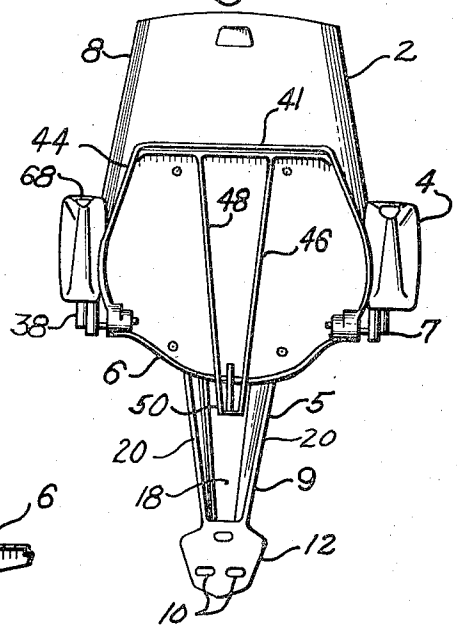


Fig. 6.



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SPECTATOR SEATING STRUCTURE

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10 Claims. (Cl. 297—248)

ABSTRACT OF THE DISCLOSURE

This invention is directed to seating of spectators in a stadium, auditorium, or the like, in large numbers, and is particularly adaptable to be adjusted for the comfort of the spectator, particularly spacing one from another, and the back rest. Each of the seats are connected together, and the seats in each row being staggered so as to provide proper spectator viewing.

This invention relates to audience or spectator seating structures and more particularly, to a new and improved spectator seating unit and a seating arrangement comprised of a plurality of said seating units for use in stadiums, theaters and the like.

The principal objects of this invention are: to provide a new and improved spectator seating unit for use in a spectator seating arrangement comprised of a plurality of said seating units in an interconnected relation; to provide such a seating unit for use in a seating arrangement, said seating unit having a unique supporting and interconnecting system providing a rugged, sturdy and enduring construction; to provide such a seating arrangement having a new and improved adjustable interconnecting means retaining adjoining seating units in said seating arrangement at selected positions at varying spaced intervals such that said units may be arranged in a plurality of spaced rows extending rearwardly of the area being viewed and the seats in each of said rows being properly staggered to provide proper spectator viewing, yet allowing the formation of straight aisles at the ends of said rows; to provide such a seating unit having a minimum of basic seating parts, being only four in number, with each of said parts being cast in a suitable material, said cast parts not requiring expensive machining thereby materially reducing the manufacturing costs; to provide such a seating unit wherein the supporting standard or post is integrally cast with the back rest forming a solid, sturdy seating construction; to provide such a seating unit adaptable for use in a variety of seating arrangements, said arrangements employing a plurality of said seating units all of which have the same dimensions thereby eliminating the necessity of manufacturing variously dimensioned seating units for utilization in a single seating arrangement or for use in different seating arrangements; to provide such a seating unit using a novel seating portion suitably reinforced and operatively connected to the back rest member for swinging movement, said seating portion capable of being formed by a single casting operation, said seating portion not requiring machining, thereby effectively reducing the manufacturing cost; to provide such a seating unit having a new and unique reinforcing system on the back rest for supporting the loading of a cantilevered seating portion; to provide such a seating arrangement wherein the interconnecting means between adjoining seating units which connects adjoining seating units at selected spaced intervals includes an arm rest structure between the adjoining seating units; to provide such a seating arrangement where accurate mounting of the seating units to the floor of the seating area is not essential as variations may be compensated for in the unique adjustable interconnecting means between the adjoining seating units; to provide such a versatile seating unit which may be easily and inexpensively manufactured and installed and adaptable for use in all types of seating arrangements and in all types of spectator facilities.

This invention contemplates new and improved spectator seating units comprised of a back rest having an outwardly extending portion integral therewith comprising a supporting standard, said supporting standard having means thereon for mounting the seating unit in an upright position to the floor of a seating area, said seating unit also including a seating portion operatively mounted to said back rest. The invention further contemplates a unique reinforcing system on the back rest for resisting the cantilevered loading of said seating portion when the seating unit is occupied including reinforcing ribs extending across the rearward surface of said back rest between the portions of said back rest where the seating member is joined or connected thereto. The invention also contemplates a seating arrangement such as a row comprised of a plurality of seating units, each of said seating units having a single supporting standard with means thereon for mounting the seating units to a floor structure of a seating area, said arrangement also including interconnecting means operably connected in an adjustable manner to adjoining seating units in said seating arrangement so as to form a rigid seating arrangement wherein the seating units may be spaced at varying intervals to provide a properly oriented and positioned seating area.

Other objects and advantages of this invention will become apparent from the following description taken in connection with the accompanying drawings where are set forth by way of illustration and example certain embodiments of this invention.

FIG. 1 is a perspective view of a seating arrangement embodying the features of this invention being comprised of a pair of seating units operatively mounted to the floor structure of a seating area by means of a single supporting standard on each of said seating units with an interconnecting means between said seating units.

FIG. 2 is a rear elevational view of the seating arrangement shown in FIG. 1 with a portion of the floor structure broken away to show the rearward side of the seat mounting standard.

FIG. 3 is a vertical sectional view through the retaining bolts which secure a back plate to the arm rest structure showing a plurality of adjustment slots on each of the seating units shown in FIG. 1.

FIG. 4 is a horizontal sectional view taken on line 4—4 of FIG. 3 showing the relationship of the arm rest and back plate to the adjustment slots of the adjoining seating units.

FIG. 5 is a vertical sectional view through the back rest and seating portion of an individual seating unit with a portion of the back rest broken away to show an offset vertical sectional view of the arm rest and back plate between the adjoining seating units of the seating arrangement.

FIG. 6 is a front elevational view of an individual seating unit with the seating portion in its raised position adjacent the back rest of the seating unit.

Referring to the drawings in more detail:

The reference numeral **1** designates a seating arrangement being comprised of a plurality of individual seating units **2** with each of said units **2** being mounted to the floor structure **3** of a seating area and interconnected by an adjustable spacing means or interconnecting means **4** to form a rigid, sturdy seating arrangement **1** wherein the individual seating units **2** may be spaced at varying spaced intervals to provide the desired seating facility.

The individual seating units **2**, as illustrated, are gen-

erally comprised of a back rest and supporting structure 5, a seat portion or seat rest 6 and means 7 for operatively mounting the seat portion 6 to the back rest and supporting structure 5. The best rest and supporting structure 5 and the seating portion 6 are each formed by a casting operation of a suitable material, for instance, aluminum and require little or not machining in order to produce the finished seating unit 2.

The back rest and supporting structure 5 are comprised of a back rest portion 8, said back rest portion 8 having an outwardly extending portion, illustrated as being integral with said back portion 8, and comprising a supporting standard, leg, pedestal or post 9. The supporting standard 9 defines a plurality of openings or through bores 10 in its lower mounting portion 12 which may be employed to secure the seating unit 2 in a desired position to the floor of the seating area. As illustrated, the supporting standard is mounted to a step or curb structure 14 by means of a plurality of bolts 16 which are received in the through bores 10. Other and different mountings may be employed to retain the seating unit 2 to the seating area floor depending upon the nature of said floor and the desired seating arrangement.

The supporting standard portion 9 is cast with a rear wall 18 and a pair of outwardly extending angularly disposed side walls 20 extending forwardly of the rear wall 18 and defining a cavity portion therebetween. The rear wall 18 of the standard portion 9 extends upwardly into and integral with the back rest portion 8 terminating in a pair of reinforcing ribs 24 and 26 which are integrally formed with the standard portion 9 and the back rest porion 8, said reinforcing ribs 24 and 26 extending outwardly from the rearward side 28 of the back rest 8. Each of the structural reinforcing ribs 24 and 26 extends in a V-shaped manner having a pair of angularly disposed leg portions 30 and 32 with an apex portion 34 directed in a generally upright manner. The leg portions 32 of each of the reinforcing ribs 24 and 26 extend outwardly and terminate at the side edge 36 of the back rest 8. The back rest 8 has a forwardly extending flange portion 38 on each side edge 36 which is employed to receive the seat portion mounting means 7 for retaining the seat portion 6 in the desired relation to the back rest 8. The reinforcing ribs 24 and 26 extend inwardly from the rearward surface 40 of each of the mounting flanges 38 in such a unique manner as to distribute the load of the cantilever seating portion 6 across the back rest 8 in such a manner as to reinforce the back rest 8 in a new and novel manner.

Referring to FIGS. 5 and 6, the seating portion 6 is illustrated as a single unit capable of being formed in a casting operation without the requirement of expensive machining of the part in order to produce the finished product. The seating unit 6 has seating member 41 defining a seating or supporting surface 42 with a circumferentially extending outwardly directed flange 44 about said surface 42 and a pair of reinforcing ribs 46 and 48 extending across the seating portion 6 in a V-shaped manner to reinforce the supporting surface 42. The ribs 46 and 48 terminate in a stop member 50 which is employed to engage an abutment surface 52 formed of a synthetic resin to stop the rotation of the swingable seat portion 6 at the desired seating angle. The stop member 50, as illustrated in FIG. 5, protrudes inwardly of the cavity formed in the standard portion 9 and engages the stop member 51 in such a manner that no metal-to-metal contact occurs in stopping or holding the swingable seat portion 6 in the desired seating position. A cushion may be attached to the seating member 41 by suitable means and an insulating means retained beneath the seating member 41 in a conventional manner.

Referring to FIGS. 3 and 4, the interconnecting means 4 is illustrated, said interconnecting means 4 providing for the rigid mounting of the seating units 2 in an arrangement such as a row of seats and allowing for the individual seating units 2 to be spaced at varying selected

intervals within said arrangement in order to establish properly arranged seating areas. In the illustrated embodiment, the back rest portion 8 is provided with a pair of side flanges or portions 60 extending outwardly from opposed sides of the back rest portion 8, each of said side flanges 60 having adjustment means in the form of a pair of inwardly extending adjustment slots 62 defined in said flanges 60, each of said slots 62 illustrated as being in communication with the side edge 36 of the back rest 8. The flange portions 60 on each side of the back rest 8 have a forward surface 64 and a rearward surface 66.

The interconnecting means 4 includes a forward portion illustrated herein as an arm rest 68 with a rearward portion illustrated herein as a mounting or back plate 70. The arm rest 68 is cast with a pair of inwardly extending rearward flanges 71 having a surface in contact with the forward surface 64 of the side flanges 60 and held in clamping abutting relation to said surface 64 by means of a plurality of retaining means illustrated as bolts 72 which clampingly secure the side flanges 60 of adjoining seating units 2 between the back plate 70 and the arm rest 68. The bolts 72 extend through the adjustment slots 62 in the side flanges 60 in such a manner that by securing the bolts at a selected position along slot 62, the spacing between the adjoining seating units 2 may be selected in order to obtain the proper spacing interval for mounting the seating structures 2 in the desired position on the floor of the seating area. The interconnecting means 4 with its adjustment slot 62 allows for the manufacture of a single type of seating unit 2 which may be installed at varying spaced intervals dependent upon the nature of the seating area in which the seating units 2 are to be placed. The arm rest 68 and the mounting plate 70 are cast of a suitable material and require little or no machining in order to produce the finished product. It should be readily apparent that the seating unit 2 embodying the features of my invention is a highly versatile unit which may be mass produced by casting operations with all of said seating units being of the same dimensions, yet adaptable for utilization in all forms of spectator or audience seating areas and seating facilities.

The seating units 2 can be easily and quickly installed in a seating area by merely mounting the standard portion 9 by means of a pair of bolts 16 to the floor mounting structures, as for instance, the step or curb structure 14 illustrated herein. The interconnecting means 4, illustrated as having an arm rest portion 68, a back plate or mounting plate 70 and a plurality of bolts 72, is then installed by extending the bolts 72 through the back plate 70, the adjustment slots 62 and threadingly engaging the flanges 71 of the arm rest 68, then by tightening bolts 72, the arm rest 68 and the back plate 70 clampingly engage or embrace the side flanges 60 of the adjoining seating units. It should be noted that the seating units may be spread or pulled closer together the length of the adjustment slot 62 such that the bolts 72 can be disposed at any selected position along the adjustment slots 62 in order to retain the seating units 2 at the desired spaced interval. The interconnection 4, therefore, provides stability for the seating arrangement with the added advantage of an arrangement adaptable for the adjustment of the spacing between the individual seating units 2.

It is to be understood that while I have illustrated and described one form of my invention, it is not to be limited to the specific form or arrangement of parts herein described and shown except insofar as such limitations are included in the claims.

What I claim and desired to secure by Letters Patent is:

1. A seating arrangement for use in stadiums, theaters and the like comprising:

(a) a plurality of individual seating units, each of said seating units including a supporting post with means on said post for mounting the seating unit to a floor structure,

(b) adjustable cooperative means on each of said seating units to interconnect each of said units with the adjoining units to form a seating arrangement,

(c) each of the seating units including a back rest, said back rest of each of said seating units having opposed side portions and wherein the adjustable cooperative means is connected to each of the side portions of the back rests of the adjoining seating units, and

(d) each of the side portions of the back rest of each of the individual seating units defining adjustment slots extending inwardly of said side portions, said interconnecting means including means movable in said adjustment slots of each of adjoining seating units, said means being retainable at selected positions along said adjustment slots to interconnect the adjoining seating units whereby the seating units may be spaced at varying selected intervals.

2. A seating arrangement as recited in claim 1 wherein said seating units include back rests and the supporting posts of each of the individual seating units are integral with said back rest of said seating unit to provide a combination back rest and supporting post structure capable of being formed in a single casting.

3. A seating arrangement as recited in claim 1 wherein the interconnecting means includes an arm rest structure disposed between said adjoining seating units.

4. A seating arrangement as recited in claim 3 wherein said interconnecting means also includes a back plate which clampingly engages the rearward surface of the side portions of each of a pair of adjoining seating units with retaining means operatively connected to said plate and said arm rest structure to clampingly engage said side portions between said arm rest structure and said plate, said retaining means being received through said slots in said side portions and retainable at selected positions along said slots.

5. A seating arrangement for use in stadiums, theaters and the like comprising:

(a) a plurality of individual seating units, each of said seating units including a supporting post with means on said post for mounting the seating unit to a floor structure,

(b) adjustable cooperative means on each of said seating units to interconnect each of said units with the adjoining units to form a seating arrangement wherein the seating units may be spaced at varying selected intervals,

(c) each of the seating units having means connected thereto to interconnect said seating units to adjoining seating units and each of said seating units and said interconnecting means having cooperative means connected thereto for varying the spacing between the adjoining seating units,

(d) the seating units having means defining adjustment slots and said interconnecting means including retaining means operatively connected to the inter-connecting means and retainable at selected positions along the adjustment slots, and

(e) the means defining the adjustment slots having a forward and rearward surface and wherein the interconnecting means is comprised of a forward portion disposed in contacting relation to forward surface of the slot defining means of adjoining seating units and a rearward portion in contacting relation with the rearward surface of the slot defining means of adjoining seating units, said retaining means connecting said forward and rearward portions of the interconnecting means and said retaining means being disposed through the adjustment slots of each of the adjoining seating units at selected positions along said slots.

6. A seating arrangement as recited in claim 5 wherein the forward portion of the interconnecting means is comprised of an arm rest structure extending forwardly between the adjoining seating units.

7. A seating arrangement as recited in claim 6 wherein the rearward portion is a back plate defining a plurality of apertures therethrough in aligned relation to the adjustment slots and said retaining means includes a plurality of bolts received through said apertures and said adjustment slots, said bolts being operatively connected to said arm rest structure.

8. A spectator seat comprised of:

(a) a back rest having an outwardly extending portion integral therewith, said portion comprising a supporting standard,

(b) a seat portion operatively mounted to said back rest,

(c) said back rest having a lower portion and said supporting standard extending outwardly from a central position of said lower portion, and

(d) said back rest having a pair of forwardly extending flange members, said seat portion being operatively mounted to said flange members, and said back rest having a rearward surface with a reinforcing rib means extending across the rearward surface of said back rest between the rearward surface portion behind said forwardly extending flanges to distribute the load imposed by the cantilever seating portion across said back rest.

9. A spectator seat as recited in claim 8 wherein said reinforcing rib means is comprised of a pair of V-shaped reinforcing ribs extending outwardly of the rear surface of the back rest of said seating unit having their apex portion directed upwardly with one leg of each of said V-shaped ribs integral with the rearward surface portion behind said flanges and the other leg of each of said V-shaped ribs integral with the supporting standard portion of said back rest.

10. A spectator seat comprised of:

(a) a back rest having an outwardly extending portion integral therewith, said portion comprising a supporting standard,

(b) a seat portion operatively mounted to said back rest,

(c) said back rest having a pair of opposed side portions including means on said side portions to receive an interconnecting means for securing said side portions to adjoining seating units, and

(d) each of said side portions including a flange extending laterally of said back rest, each of said flanges defining at least one adjustment slot extending inwardly of said back rest to adjustably receive the interconnecting means between adjoining seating units.

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