Feb. 23, 1965 J. H. MARTIN 3,170,199

RETRACTILE STADIUM SEAT

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Fig. 1

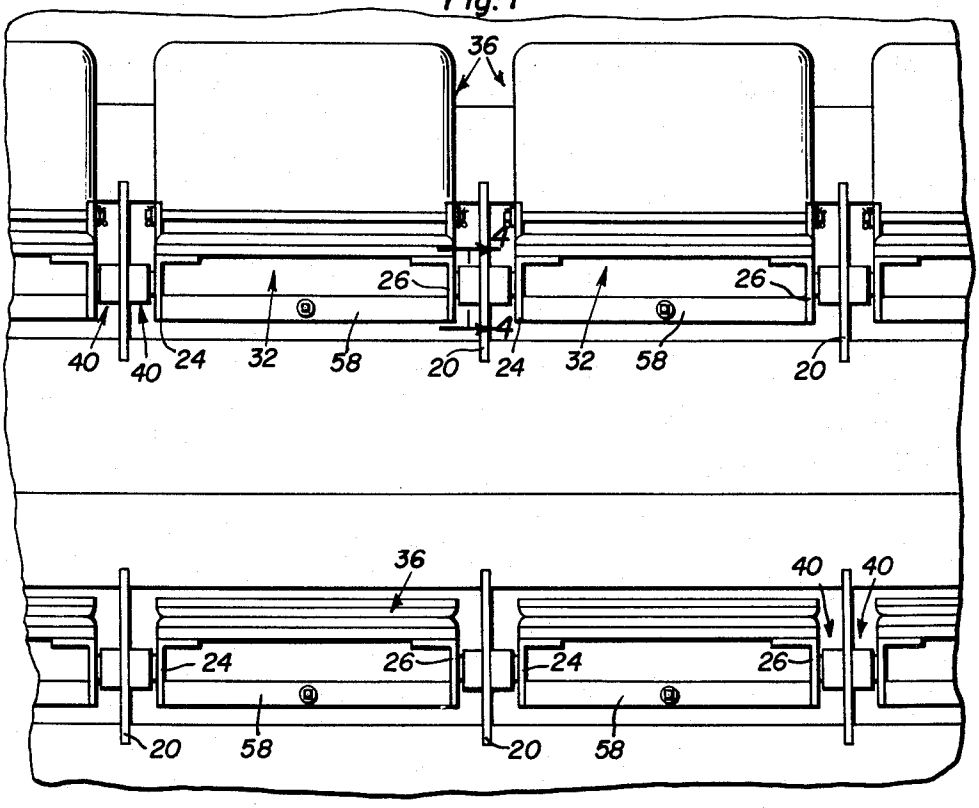


Fig. 3

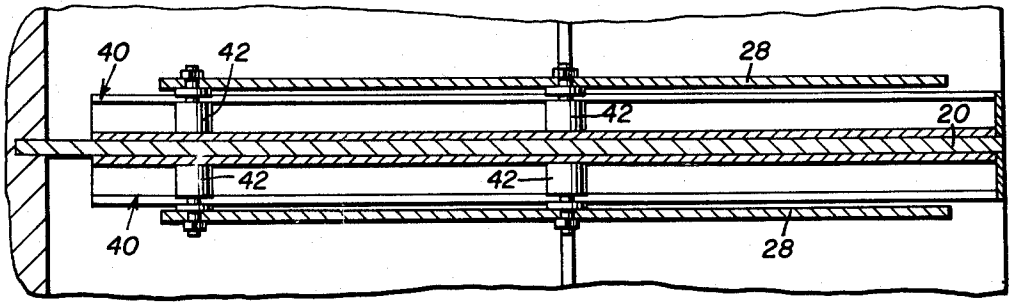
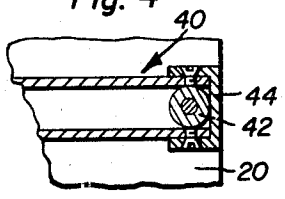


Fig. 4



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Fig. 2

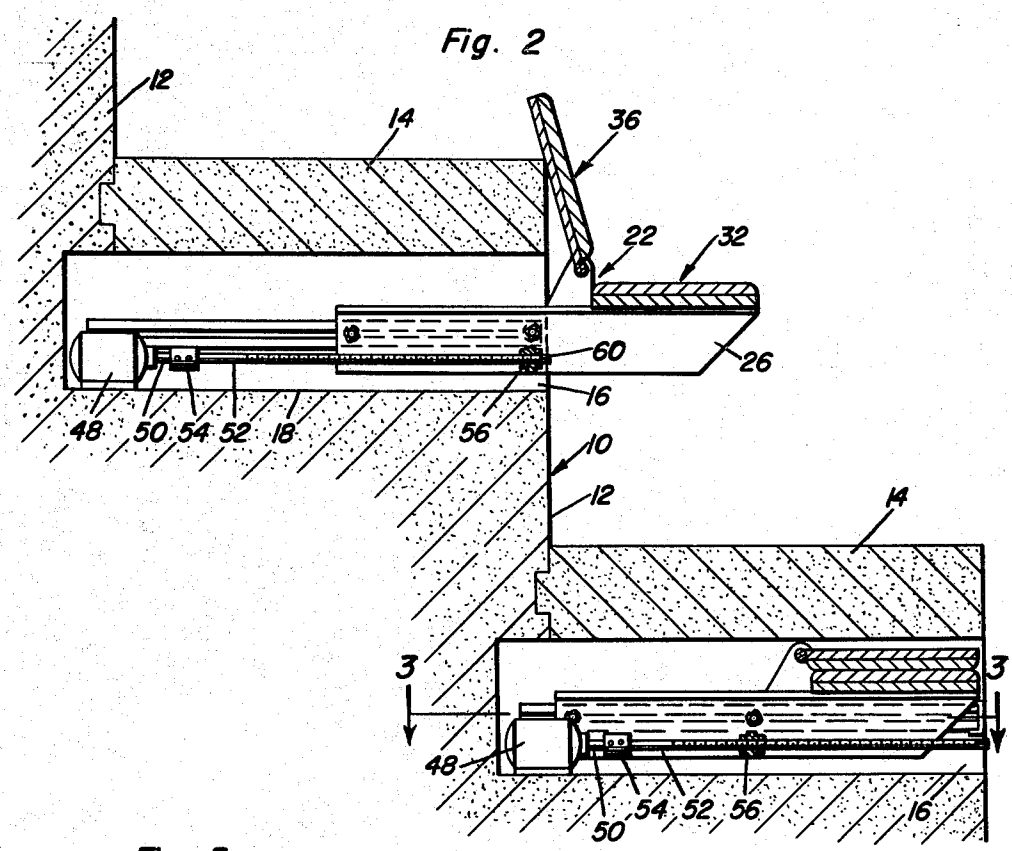
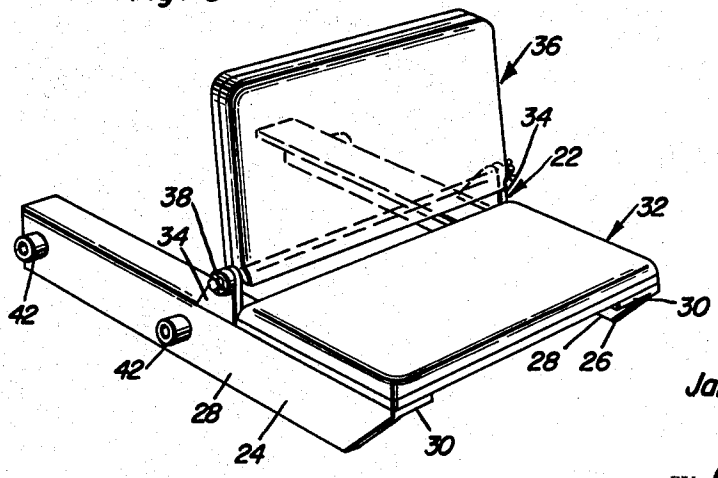


Fig. 5



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RETRACTILE STADIUM SEAT

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1 Claim. (Cl. 20—1.126)

This invention relates to a novel and useful retractile stadium seat.

The retractile or retractable stadium seat of the instant invention has been primarily designed for use in outdoor stadiums of the type utilizing cement stadium structures including treads and risers.

Most modern stadium structures are constructed of cementitious material and include vertically spaced generally horizontal treads and upstanding risers. However, most stadium chairs or seat constructions are of the type similar to that disclosed in U.S. Patent No. 2,568,896 which include only inadequate means for protecting the seat portion of the stadium chair.

Inasmuch as it is next to impossible to provide removable chairs or seats for an outdoor stadium which may be removed and stored after each use of the stadium, the stadium chairs are normally permanently secured to the stadium structure including steps and risers and accordingly are left outdoors in all types of weather and thus naturally in time become severely weathered.

As most stadiums of the outdoor type are now being constructed to seat many tens-of-thousands of spectators, a considerable sum of money must be invested for the provision of stadium chairs. The type of stadium chairs permanently secured to stadium structures are normally constructed of hardwood or other suitable materials which will resist weathering to some degree and considerable expense must be incurred before each season begins for the reconditioning and maintenance of these permanent types of stadium chairs. Each year wooden chairs may be cleaned and refinished at not too great a cost and yet the life expectancy of conventional types of stadium chairs now being used is not great and accordingly, stadium chairs must be completely replaced after several years of use.

In addition to requiring yearly maintenance and replacement every several years, the permanent type of stadium chairs now in use have to be cleaned periodically during each season and accordingly, the total upkeep of the stadium chairs over a relatively short period of time far exceeds the original cost of the chairs.

The main object of this invention is to provide a stadium structure having incorporated therein completely retractable stadium chairs which may be extended for use prior to each sporting event and moved to a fully retracted and protected position after each sporting event. In this manner, the life expectancy of a stadium chair constructed in accordance with the present invention will be very greatly extended and while the retractable stadium chair of the instant invention may be initially somewhat more expensive, as there will be little or no upkeep involved, the total expenditure per year over a relatively short period of years will be far less than that incurred with conventional types of stadium chairs.

A further object of this invention is to provide a stadium structure having fully retractable stadium chairs or seats constructed in a manner whereby individual chairs or seats may be extended from the retracted position if desired or large numbers of individual chairs or seats may be simultaneously extended when desired.

Still another object of this invention, in accordance with the preceding objects, is to provide motor means for extending and retracting the retractable seats whereby the seats may be extended and retracted either singly or simultaneously from a remote position.

A further object of this invention is to provide a means whereby each stadium chair or seat may be manually extended or retracted in the event a power source for the motor means normally provided is temporarily disrupted.

Another object of this invention is to provide a retractable stadium seat utilizing a pivoted back rest which may be pivoted from a position overlying the chair portion of the seat to a position projecting rearwardly and upwardly from the rear edge of the seat portion of the stadium seat in order that even when extended the surfaces of the seat portion and the back rest of the stadium seat normally disposed for contact with a spectator's clothing will be protected from the elements.

Still another object of this invention, in accordance with the immediately preceding object, is to provide a stadium seat constructed in a manner whereby the back rest portion of the seat will automatically be pivoted to a position overlying the seat portion of the seat upon retraction of the stadium seat and whereby extension of the stadium seat will merely extend the seat construction forwardly of one of the risers of the stadium structure without pivoting the seat back portion of the seat from its overlying position relative to the seat portion of the seat.

A final object to be specifically enumerated herein is to provide a retractable stadium seat in accordance with the preceding objects which will conform to conventional forms of manufacture, be of simple construction and easy to use so as to provide a device that will be economically feasible, long lasting and relatively trouble free in operation.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a front elevational view of a portion of a stadium structure constructed in accordance with the present invention and illustrating two vertically spaced rows of retractable seats of the instant invention, the upper row of seats being disposed in the extended position and the lower row of seats being disposed in the retracted position;

FIGURE 2 is a fragmentary vertical sectional view taken through the portion of the stadium structure illustrated in FIGURE 1;

FIGURE 3 is an enlarged fragmentary horizontal sectional view taken substantially upon the plane indicated by the section line 3—3 of FIGURE 2;

FIGURE 4 is an enlarged fragmentary vertical sectional view taken substantially upon the plane indicated by the section line 4—4 of FIGURE 1;

FIGURE 5 is a perspective view of one of the stadium chair structures of the instant invention.

Referring now more specifically to the drawings the numeral **10** generally designates the stadium structure of the instant invention which includes a plurality of upstanding risers **12** and a plurality of generally horizontally disposed treads **14**.

An elongated longitudinally extending and outwardly opening recess **16** is formed beneath each tread **14** and it will be noted from FIGURES 1 and 2 of the drawings that the recesses **16** may each be formed by a separable riser slab **12** supported above a generally horizontally disposed upper surface **18** of the corresponding riser **12** by means of support plates **20**.

With attention now directed to FIGURE 5 of the drawings it will be seen that the retractable seat structure is generally designated by the reference numeral **22** and that the seat structure **22** includes a pair of generally

inverted L-shaped support members 24 and 26. Each of the support members 24 and 26 includes a vertical flange 28 and an inwardly directed horizontal flange 30. A seat portion generally referred to by the reference numeral 32 is secured between the forward ends of each of the horizontal flanges 30 and an upstanding and apertured mounting ear 34 is secured to the mid-portion of each of the support members 24 and 26. A back rest portion generally referred to by the reference numeral 36 is pivotally secured at its lower edge portion for movement about a horizontally disposed axis extending transversely of the retractable seat structure 22 by means of a pivot shaft 38 whose opposite ends are secured through the apertured mounting ears 34. Accordingly, it will be observed from FIGURE 2 of the drawings that the back rest portion 36 may be disposed in the upwardly and rearwardly inclined position when the seat structure 22 is extended as in the upper portion of FIGURE 2 and that the back rest portion 36 may be pivoted forwardly at its upper free end to directly overlie the seat portion 32 when the seat structure 22 is disposed in the retracted position illustrated in the lower portion of FIGURE 2.

From FIGURES 1 and 3 of the drawings it will be noted that a pair of generally C-shaped channel members 40 are secured to opposite sides of each of the plates 20 and that the channel members 40 secured to each of the plates 20 open away from the plate 20.

Each of the flanges 28 has a plurality of rollers 42 journalled thereon which project outwardly therefrom and the rollers 42 of each seat structure 22 are received in the pair of channel members 40 disposed between adjacent plates 20 and which open toward each other. In this manner, each of the seat structures 22 is mounted for rectilinear movement betwen the retracted position illustrated in the lower portion of FIGURE 2 of the drawings and the extended position illustrated in the upper portion of FIGURE 2 of the drawings.

With attention now directed to FIGURE 4 of the drawings it will be noted that a stop member 44 is carried by the forward end of each of the channel members 20 and that the stop member 44 is utilized to comprise an abutment for the forwardmost roller 42 carried by each of the seat structures 22 so as to define a limit for movement of each seat structure 22 toward the extended position.

With attention now directed to FIGURE 2 of the drawings, it will be seen that each of the seat structures 22 is provided with a reversible electric motor 48 which is secured in the corresponding recess 16. Each of the electric motors 48 includes a rotatable output shaft 50 and one end of a screw shaft 52 is coupled to the free end of the output shaft 50 by means of a coupling 54. The other end of each of the screw shafts 52 is threadedly engaged in an internally threaded sleeve 56 carried by the corresponding seat structure 22 by means of a cross brace 58 secured between the mid-portions of the corresponding flanges 28 thereof. Additionally, it will be noted that the outer end of each of the screw shafts 52 terminates in a noncircular end portion 60 which may be engaged with a suitable socket wrench for rotating the screw shaft 52 in the event of a power failure or in the event one of the reversible electric motors 48 should burn out.

Although each of the seat structures 22 illustrated and described herein is provided with its own electrical reversible motor 48, it is to be noted that a large number of adjacent seat structures 22 may be secured together for simultaneous rectilinear movement between the retracted and the extended positions and that in this instance a single motor means may be utilized to extend and retract a complete row of seat structures 22 in a single section of seats within the stadium structure 10.

With attention now directed to FIGURE 2 of the drawing it will be seen that the back rest portion 36 is pivoted for free swinging movement relative to the seat portion 32 and that the forward edge of the tread 14 disposed above each seat structure 22 comprises a stop for the back rest portion 36. In addition, as each of the seat structures 22 is moved toward the retracted position, the lower forward edge of each tread 14 will engage the back of the seat portion 36 and cam the back rest portion 36 into the folded position illustrated in the lower portion of FIGURE 2. Accordingly, it may be seen that movement of the back rest portion 36 to the folded position will be automatic upon retraction of the corresponding seat structure 22 and that the seat structure 22 may then be subsequently extended without the back rest portion 36 being moved to the rearwardly and upwardly inclined position in FIGURE 2. Accordingly, each of the seat portions 32 will be covered until such time as a spectator desires to be seated thereupon and pivots the corresponding seat back portion 36 to the operative position illustrated in the upper portion of FIGURE 2.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling with the scope of the invention as claimed.

What is claimed as new is as follows:

In combination with a stadium structure including vertically spaced treads and upstanding risers interconnecting said treads, a plurality of said risers each having an outwardly opening recess formed therein extending along said riser, a plurality of retractible seat structures, means mounting some of said seat structures in each of said recesses for movement between a retracted position disposed in said recesses and an extended position disposed outwardly of said recesses, said means comprising a pair of generally parallel and horizontally disposed C-shaped channel members for each of said seat structures, means mounting said channel members in said recesses with the channel members extending from front to rear of said recesses, said seat structures each including a pair of generally parallel support members carried by opposite sides of the corresponding seat structure, said support members each including guide roller means guidingly engaged with the corresponding channel member for movement longitudinally therealong, said seat structures each including a generally horizontally disposed seat portion and an upstanding backrest portion, said backrest portions each being swingably mounted for movement relative to the corresponding seat portion between an upstanding position and a generally horizontally disposed position vertically aligned with the corresponding seat portion, and motor means drivingly connected between said stadium structure and each of said seat portions for moving said seat structures between said retracted and extended positions.

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