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FOLDING SEAT

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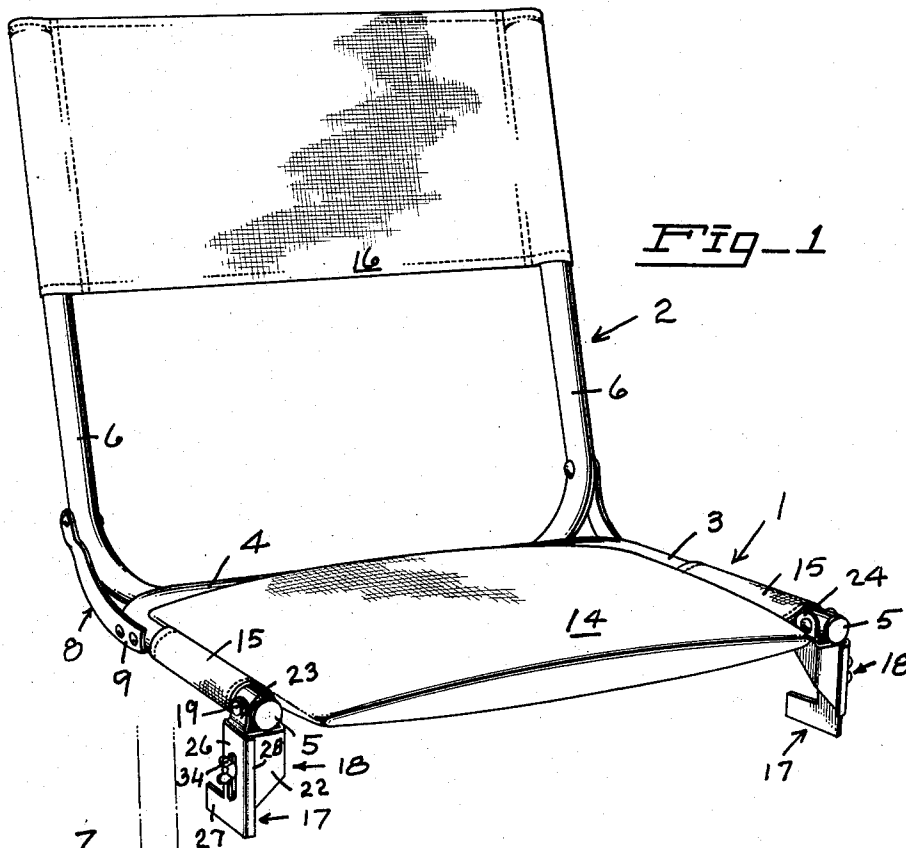


Fig-1

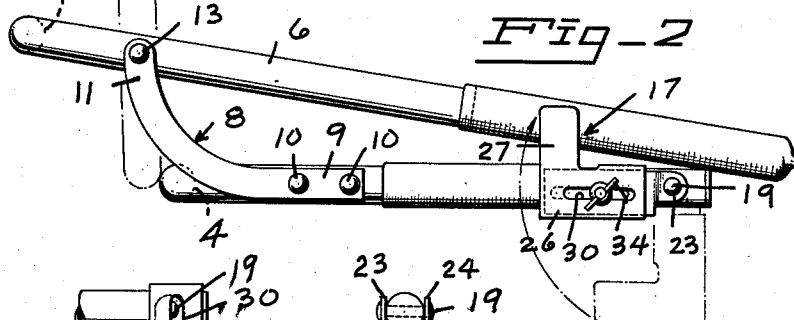


Fig-2

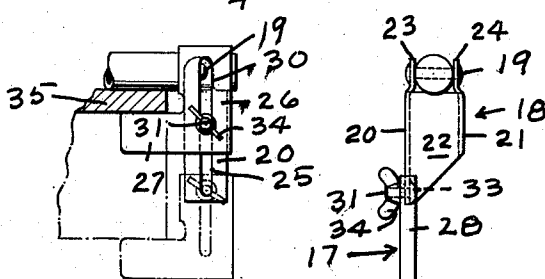


Fig-3

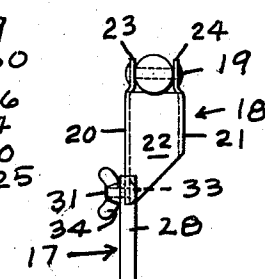


Fig-4

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FOLDING SEAT

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4 Claims. (Cl. 155—133)

This invention relates to a folding seat for use on a bench and the like, and has for one of its objects the provision of such seat having means adapted for firmly securing the seat along its forward edge to a bench, and which means is adjustable for firmly connecting the seat with benches within a wide range of different thicknesses.

Heretofore seats of the general type hereinafter described have had side frame members formed with hooks integral therewith at their forward ends, which hooks are intended to receive the forward edge of the bench therein to prevent rearward tilting of the seat when the person on the latter leans against the back. However, benches vary in thickness from approximately three quarters of an inch in thickness up to approximately two and one-half inches, hence if the hooked end is adapted to receive the forward edge of a bench that is two and one-half inches in thickness, it is loose on a bench that has less thickness. Attempts to overcome this objection have resulted in forming steps in the downwardly and rearwardly projecting hook member, or in slanting such member downwardly and rearwardly to accommodate different bench thicknesses, but in each instance the hook member is objectionable when the seat back is folded over the seat, due to its projection to one side of the seat assembly, and also, when in use, the seat readily becomes loose on the bench and is positioned an objectionable distance forwardly on the bench when the bench is thick. Furthermore, there are certain stadiums where the space between the bench and the bench support is inadequate for the hooks.

One of the objects of the present invention is the provision of a folding seat adapted to overcome all of the foregoing objections to conventional seats intended for the same purpose, and which seat is adapted to be firmly clamped to the bench.

It may be here explained that the term "bench" is intended to include stadium seats, boat seats, and any bench seats not having backs and having forward marginal portions that are spaced above a support or base at least approximately half an inch.

Other objects and advantages will appear in the description and drawings.

In the drawings, Fig. 1 is a perspective view of the seat in operable position.

Fig. 2 is a side elevational view of the seat in collapsed position.

Fig. 3 is a fragmentary side elevational view of the forward portion of the seat secured to a bench, the latter being in cross section.

Fig. 4 is a front elevational view of the portion shown in Fig. 3, but with the bench engaging means in its lowermost position.

In the drawings, the seat illustrated comprises a substantially U-shaped seat frame, generally designated 1, and a substantially U-shaped back frame generally designated 2.

The U-shaped frame 1 is preferably of light weight

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tubular metal providing horizontal, parallel, spaced, opposed side frame members 3 connected at their rear ends by a rear frame member 4 with the forward open ends of the side frame members 3 being closed by plugs 5.

The words "rear," "rearwardly," and words of like connotation, relate to the portion of the seat that is adjacent to the rear edge of the bench on which the seat is intended to be positioned, the forward edge being the edge across which the legs of a person extend.

In using the words "horizontal" and "vertically" or "upwardly" in describing the seat frame and back frame, such words refer to the seat frame when it is positioned horizontal, as when used on a bench. When collapsed and carried, it is obvious that the frames may be vertical or in any position.

The back frame member 2 has parallel, spaced, opposed lateral frame members 6 and a closed lower end frame member 7 (when the frame members 6 extend upwardly). The upper ends of frame members may be closed by plugs that correspond to plugs 5.

Arcuately extending side strips or plates 8 have horizontal lower end portions 9 (Fig. 2) that are riveted to the seat side frame members 3, as at 10, and the opposite end portions 11 curve upwardly to terminate at their upper ends spaced above and slightly rearwardly of the rear frame member 4. These strips or plates 8 are against the oppositely outwardly facing sides of the pair of side frame members 3, hence the latter are between the plates.

When the back frame extends upwardly in back supporting position, the lateral frame members extend between the upper end portions 11 of the side plates 8, and the lower end frame member 7 is rearwardly of and against the rear frame member 7, while coaxial, horizontally aligned pivots 13 connect said upper ends 11 with the lower end portions of the lateral frame members 6.

A horizontal seat cushion 14 has wide loops 15 along its lateral edges through which loops the side frame members 3 extend, and the seat is held taut between said side frame members.

A fabric back strip 16 extends between the upper end portions of the lateral frame members 6, and is held taut between said members and in a common plane therewith. Downwardly opening tubular socket portions formed from said fabric back 16 along its lateral edges receive said upper end portions of the lateral frame members 6.

When in use, the back frame is swung to the generally vertical extending position seen in Fig. 1 in which the rear frame member 4 on the seat frame engages the lower frame member 7 on the back frame.

When the seat is collapsed, the back frame is swung downwardly about pivots 13 to the position seen in full line in Fig. 2 in which the lateral frame members 6 are over the side frame members 3, and in which the back frame projects slightly forwardly of the forward ends of the seat frame.

The foregoing structure, in itself, is conventional, and no claim is made thereto. As has been already explained, it has heretofore been usual to extend the forward ends of the side frame members of the seat downwardly and rearwardly to provide hooks to engage over the forward edges of a bench, but such structure results in a projecting hook, even when the seat is collapsed, and it also results in a structure that is not adapted to securely hold the seat to benches of any thickness.

In the present instance, a pair of right angle bench engaging members generally designated 17 are carried by the forward end portions of the side frame members, and these bench engaging members are adjustably con-

nected with the side frame members by means that includes connecting members 18 that are pivotally connected at 19 with the said forward end portions of the side frame members.

Each of the connecting members 18 comprises a channel strip having spaced opposed side walls 20, 21 and a closed bottom wall 22. The side walls 20, 21 are extended upwardly (Fig. 4) to provide a pair of spaced ears 23, 24 between which the forward end portion of each side frame member 3 is positioned. Each pivot 19 extends through each pair of ears and the forward end portion of each side frame member 3 for securing said connecting members to said forward end portions so they will swing from positions depending vertically below said forward end portions rearwardly to positions with said later portions disposed between the walls 21, 22.

When said connecting members 18 are in said vertically depending positions the upper edges of the bottom or forward walls 22 are against the lower side of side frame members 3 and as the said forward walls 22 are offset forwardly relative to pivots 19 the said upper edges function as stops to prevent the connecting member from swinging forwardly past vertical positions.

The side wall 20 of each channel connecting member is longer than the side wall 21 opposed thereto, although their upper ends (when vertically extending) are at the same level. Hence side walls 20 each project downwardly a substantial distance below the lower ends of walls 21 (Fig. 4), and each wall 20 is formed with a slot 25 (Fig. 3) extending longitudinally thereof.

The side walls 20 are positioned at the oppositely outwardly facing sides of the pair of side frame members 3, which is a desirable feature, as will later appear.

From the foregoing structure it will be seen that the side walls 20, 21 virtually provide a pair of flat opposed legs connected along one of their edges, with leg 20 of each connecting member longer than leg 21 and positioned at the oppositely outwardly facing sides of the pair of side frame members 3.

Each right angle bench engaging member 17 comprises flat arms 26, 27 that are coplanar and that extend at right angles to each other. Arm 26 of each member 17 is flat against the outer surface of leg 20 of each connecting member, such outer surface being that which faces away from the other leg 21 of each member 18. Arms 26 have flanges 28 that respectively extend laterally over the free forward edge of each leg 20 and across the edge of said leg that is opposite thereto. Also, each arm 26 is formed with a vertically elongated slot 30 in register with slot 25 in leg 20.

When the arms 26 are against the outer sides of legs 20 as above described, the other arms 27 of members 17 extend horizontally and rearwardly (Fig. 3).

A carriage type bolt 31 extends through the slots 25, 30 in each adjacent pair of legs and arms 20, 26 with the head 33 of each bolt between legs 20, 21 and against leg 20 with the square shank of the bolt in slot 25 to prevent rotation of the bolt, while the threaded end of each bolt projects from arm 21 and carries a wing nut 34 for releasably locking each adjacent pair of legs and arms 20, 26 together.

In operation, the legs 20 are first swung to depending vertical position and the bench clamping members are moved downwardly relative to the connecting members 18 a sufficient distance to enable the forward portion 35 (Fig. 3) of the bench to extend between the arms 27 and the forward portions of side frame members 3, after which the clamping members are slid upwardly into firm engagement with the lower side of the bench, thereby tightly clamping said forward portion of the bench between the members 27 and the forward end portions of the side frame members 3. Nuts 34 are then tightened.

As indicated in Fig. 3, the lower arm 27 may be locked relative to the leg 20 that carries it at any distance

from the forward end portions of the side frame members from dot-dash line position 36 to the full line position in Fig. 3. When the seat is removed from the bench and is collapsed, the arms 27 may swing to the full line position seen in Fig. 2 in which they do not project beyond the laterally projected outline of the collapsed seat.

The positioning of the arms 20 of the clamping members at the oppositely outwardly facing sides of the pair of side frame members 3 enables the arms 26 to move to positions over the pivots 19 (Fig. 3) and alongside the side frame members 3, which would not be possible if these arms 26 were positioned between the legs 20, 21, hence permits greater adjustment.

I claim:

1. A folding seat structure that includes a horizontally disposed seat frame having a pair of horizontally spaced, opposed, parallel, side frame members provided with front and rear end portions, a rear frame member extending between and connecting said rear end portions, said seat frame being adapted to be supported horizontally across and over a bench having a longitudinally extending front edge with said front end portions adjacent to said front edge; a pair of right angle bench engaging members each having arms extending at right angles to each other; a pair of connecting members, each including an elongated leg pivotally connected at one of its ends with said front portions of said side frame members for swinging about a horizontal axis from a position extending along a laterally facing side of each side frame member and toward said rear end from said axis to a position extending downwardly from each front portion of each side frame member and from said axis, a pair of coaxial, horizontal pivots carried by said front portions connecting said legs with said front portion for so swinging of said legs; means adjustably connecting one arm of each pair of said right angle members with each of said legs in a position extending longitudinally of and alongside each leg for movement of said right angle members with said legs when the latter are swung about said axis and for movement of said one arm of each right angle member longitudinally thereof and of each leg to different adjusted positions relative to each leg in one of which the other arm of each of said right angle members extends vertically upwardly from said one arm and from said side frame members, respectively, when said legs are respectively alongside a lateral side of each side frame member, and extending rearwardly generally toward said rear end portions when said legs are swung downwardly from said side frame members; a back frame; means connecting said back frame with said seat frame adjacent to said rear end portions for swinging said back frame from an upwardly extending position relative to said rear end portions to a position overlying said seat frame and extending between said other arms of said right angle members when said other arms are in said positions extending upwardly from said side frame members.

2. A folding seat structure that includes a horizontally disposed seat frame having a pair of horizontally spaced, opposed, parallel, side frame members provided with front and rear end portions, a rear frame member extending between and connecting said rear end portions, said seat frame being adapted to be supported horizontally across and over a bench having a longitudinally extending front edge with said front end portions adjacent to said front edge; a pair of right angle bench engaging members each having arms extending at right angles to each other; a pair of connecting members, each including an elongated leg pivotally connected at one of its ends with said front portions of said side frame members for swinging about a horizontal axis from a position extending along a laterally facing side of each side frame member and toward said rear end from said axis to a position extending downwardly from each front

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portion of each side frame member and from said axis, a pair of coaxial, horizontal pivots carried by said front portions connecting said legs with said front portion for so swinging of said legs; means adjustably connecting one arm of each pair of said right angle members with each of said legs in a position extending longitudinally of and alongside each leg for movement of said right angle members with said legs when the latter are swung about said axis and for movement of said one arm of each right angle member longitudinally thereof and of each leg is different adjusted positions relative to each leg, the ends of said one arms of said right angle members that are remote from said other arms thereof being movable to positions extending across said axis and over said pivots thereby enabling a substantial movement of said other arms toward said axis, said other arms of said right angle members extending vertically upwardly from said one arms thereof and in positions between said pivots and said rear end portions when said legs are alongside the lateral sides of said frame members and said other arms extending generally toward said rear end portions when said legs are swung downwardly from said side frame member.

3. A folding seat structure that includes a horizontally disposed seat frame having a pair of horizontally spaced, opposed, parallel, side frame members provided with front and rear end portions, a rear frame member extending between and connecting said rear end portions, said seat frame being adapted to be supported horizontally across and over a bench having a longitudinally extending front edge with said front end portions adjacent to said front edge; a pair of right angle bench engaging members each having arms extending at right angles to each other; a pair of connecting members, each including an elongated leg pivotally connected at one of its ends with said front portions of said side frame members for swinging about a horizontal axis from a position extending along a laterally facing side of each side frame member and toward said rear end from said axis to a position extending downwardly from each front portion of each side frame member and from said axis, a pair of coaxial, horizontal pivots carried by said front portions connecting said legs with said front portion for so swinging of said legs; means adjustably connecting one arm of each pair of said right angle members with each of said legs in a position extending longitudinally of and alongside each leg for movement of said right angle members with said legs when the latter are swung about said axis and for movement of said one arm of each right angle member longitudinally thereof and of each leg to different adjusted positions relative to each leg, the ends of said one arms of said right angle members that are remote from said other arms thereof being movable to positions extending across said axis and over said pivots thereby enabling a substantial movement of said other arms toward said axis, said other arms of said right angle members extending vertically upwardly from said one arms thereof and in positions between said pivots and said rear end portions when said legs are alongside the lateral sides of said side frame members and said other arms extending generally toward said rear end portions when said legs are swung downwardly from said side frame member, said lateral sides of said

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side frame members being the oppositely outwardly facing sides of said pair of side frame members, and means for retaining said connecting members and said right angle members at all times in positions spaced rearwardly of the terminating ends of said front end portions opposite to said rear end portions.

4. A folding seat structure that includes a horizontally disposed seat frame having a pair of horizontally spaced, opposed, parallel, side frame members provided with front and rear end portions; said seat frame being adapted to be supported horizontally across and over a bench having a longitudinally extending front edge with said front end portions adjacent to said front edge; a pair of substantially right angle bench engaging members each having a pair of arms extending at right angles to each other; a pair of connecting members each including a pair of ears at opposite lateral sides of each front end portion and spaced opposed extensions integral with said ears projecting downwardly therefrom; a pair of coaxial horizontal pivots connecting the pairs of ears of said connecting members with said end portions respectively, for swinging each pair of said extensions generally toward said rear end portions to opposite sides of each end portion, a web integrally connecting the extensions of each pair thereof movable therewith to a position substantially against the underside of each side frame member and between each of said pivots and each rear end portion when said extensions are swung to positions at opposite sides of said frame members, each of said webs having an upper edge engageable with each of said front end portions at points between said pivots and said terminating ends when said extensions are swung to positions extending downwardly from said end portions to limit the movement of said extensions downwardly and away from the lateral sides of said side frame members; one arm of each right angle member extending longitudinally of and against the extension of each pair that is outermost relative to the space between said pairs of extensions, the other arm of each right angle member extending from the end of said one arm that is remote from said ears in direction generally toward said rear end portions when said extensions extend downwardly from said end portions; means adjustably connecting said one arm of each pair of right angle member with the said extension adjacent thereto for movement of said one arm longitudinally of said extension to different positions for varying the distance between said other end of each right angle member from said one end portion when said extensions are in positions extending downwardly from said end portions in one of which positions said one arm extends across the axis of said pivots, and means for releasably locking said one arm of each right angle member rigid relative to the extension adjacent thereto.

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