March 12, 1940. W. F. McCANN 2,193,339

BLEACHER CONSTRUCTION

Filed Oct. 26, 1938 3 Sheets-Sheet 1

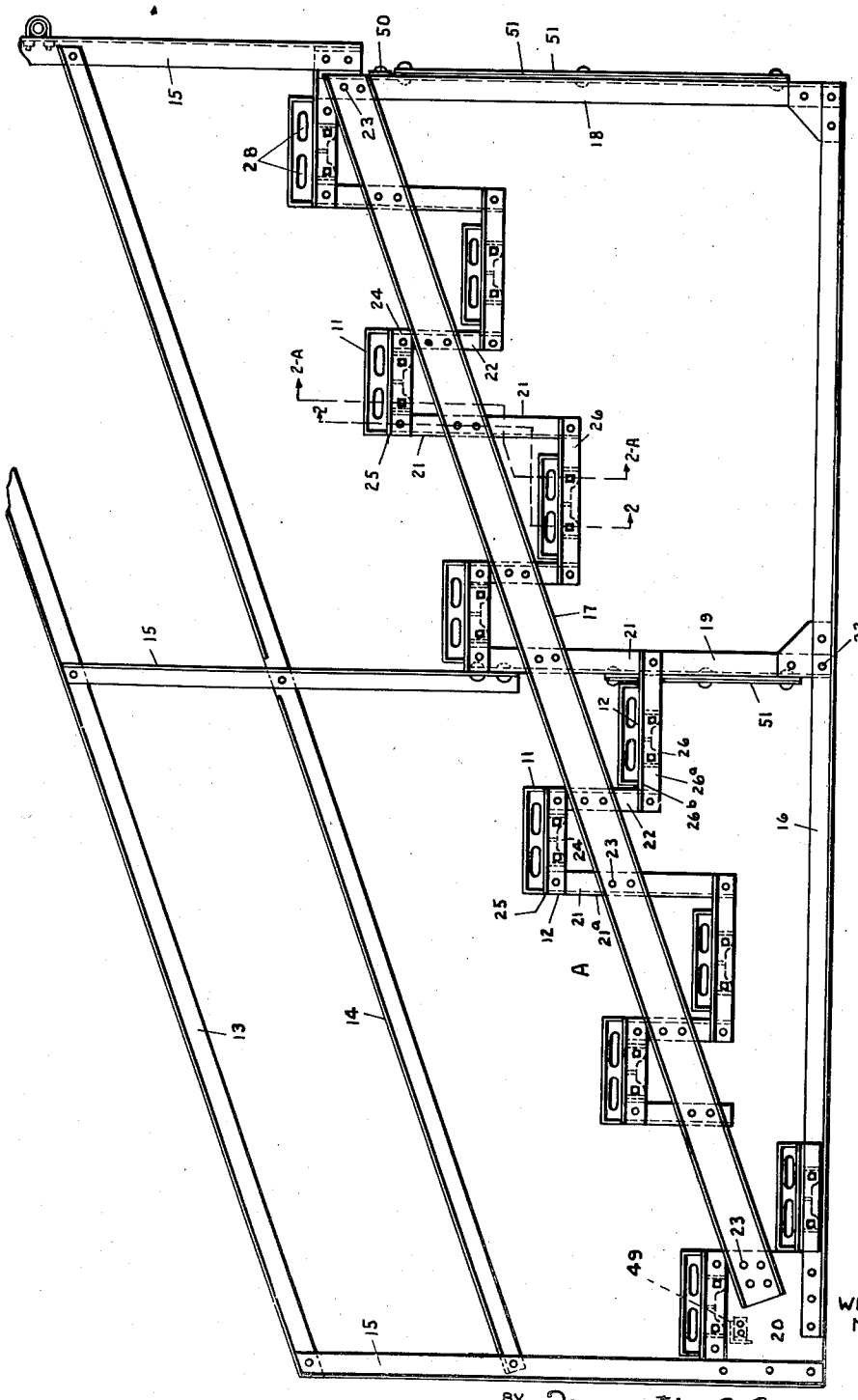


Fig. 1

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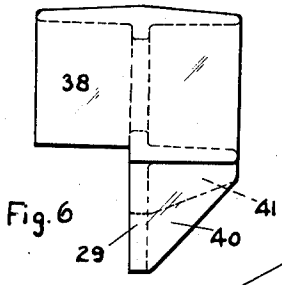


Fig. 6

Fig. 4

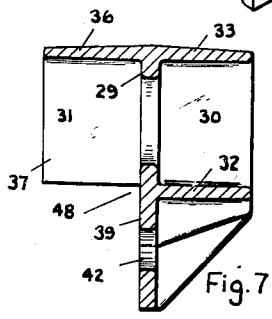


Fig. 7

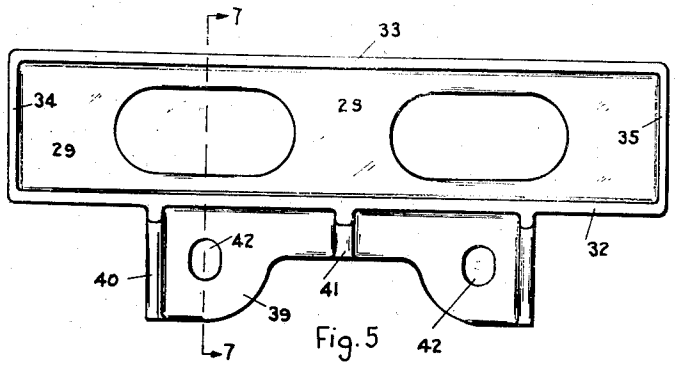


Fig. 5

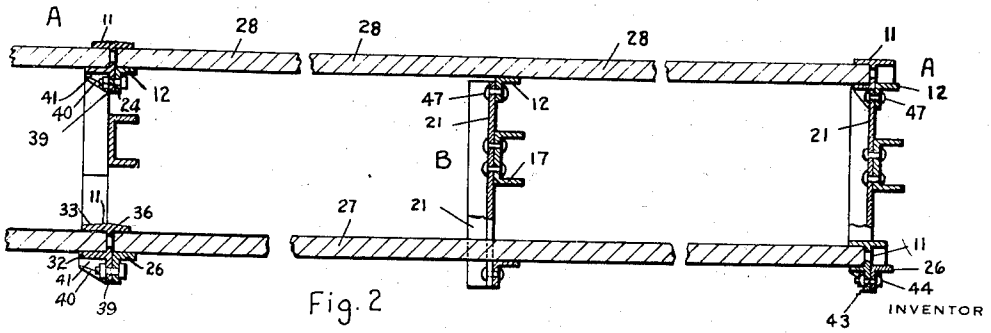


Fig. 2

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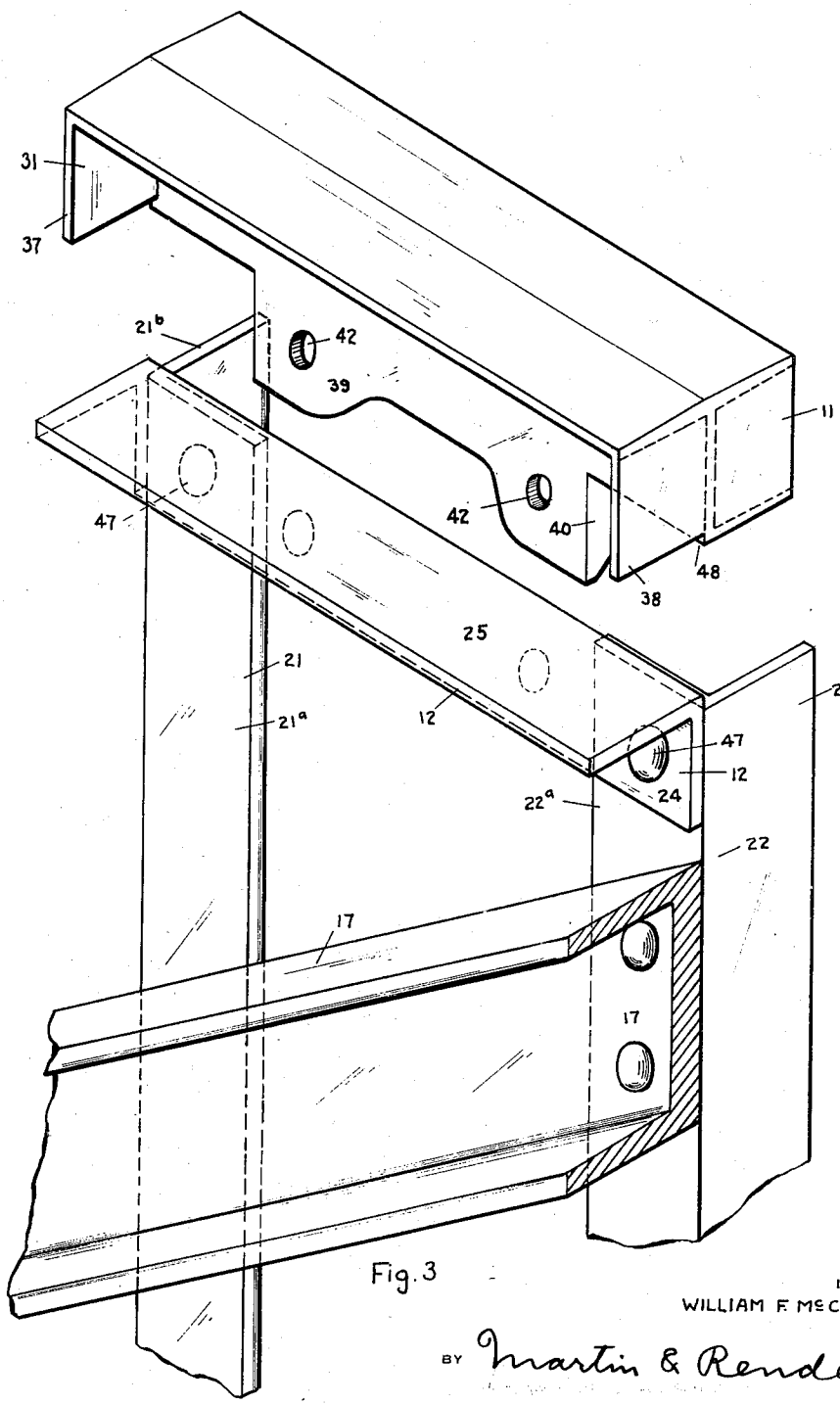


Fig. 3

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UNITED STATES PATENT OFFICE

2,193,339

BLEACHER CONSTRUCTION

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Application October 26, 1938, Serial No. 237,085

4 Claims. (Cl. 155—130)

This invention relates to bleacher construction and more particularly to bleachers that are commonly denoted portable bleachers having a metal framework supporting a series of seat planks and footrest planks.

The purpose of this invention is to provide a bleacher construction of the type indicated which is of new, improved and simplified construction and well adapted to support the seat and footrest planks of wood or metal in reliable manner.

A further purpose is to provide a bleacher construction which uses a minimum number of steel or other metal members for the metal framework of the bleacher and which has said framework so constructed and particularly has its socket members for receiving and holding the ends of the wood or metal planks so constructed in themselves and so combined with the adjoining metal members as to form a bleacher construction that can be very readily assembled and taken down and wherein said planks simply fit into open-ended sockets and are held therein by the mounting and securing in proper place of the successive stringers carrying or supporting the different sets of socket members.

A still further purpose is to provide a bleacher construction of such form that the seat and footrest planks of wood or metal do not have to be attached or secured to the socket members or adjacent parts of the metal-supporting members by any separate fastening means or devices such as screws, bolts, clamps, clips or the like and wherein the ends of the planks do not have to be specially shaped or fitted to the socket and wherein the ends of the planks do not have to even have formed therein holes or recesses for the reception of bolts or screws as has been heretofore one common practice.

A still further advantage of my present construction is that the socket member is of simple and easy construction and is so shaped and formed that it may be constructed so that each socket member provides two oppositely arranged open-ended sockets for the reception of a plank on each side thereof, and further to have this socket member so shaped that the horizontal cross piece usually of angle iron upon which said socket member rests and to which a socket member is attached utilizes the horizontally arranged part of a cross member as the bottom of one of the two sockets provided by said socket member in combination with its supporting cross piece. By so shaping and relating the socket member two complete open-ended sockets are provided by each socket member and its supporting cross bar or cross piece and thus the construction is simplified and made lighter in weight without decreasing the strength of the bleacher or interfering in any way with its efficiency nor the ease of assembling the structure or taking the same apart.

Fig. 1 is an end elevation of a bleacher embodying my present invention.

Fig. 2 is a vertical sectional view through three adjoining crosswise units of a bleacher including two plank-holding units and an intermediate plank-supporting unit, the right hand plank-holding unit and the intermediate plank-supporting unit being sectioned on line 2—2 of Fig. 1 and the left hand holding unit being sectioned on line 2-A—2-A of Fig. 1, the view showing only the parts immediately on the section lines.

Fig. 3 is an isometric sectional view on a larger scale of a socket member and its co-operating horizontally-arranged angle iron cross bar and of the upper ends of the pair of uprights carrying said cross bar and of the adjoining part of the inclined stringer, which in turn carries said uprights, the socket member being shown in vertical alignment with the horizontal cross bar to which it is to be attached, but being still slightly spaced thereabove in order to better show the construction of the several parts.

Fig. 4 is a similar isometric projection of the socket member shown in Fig. 3 together with the horizontal cross bar to which it is attached, said Fig. 4, however, bringing to the front the complete four-sided socket instead of the other or three-sided socket which is towards the observer in Fig. 3.

Fig. 5 is a side elevation of the socket member as shown in Fig. 4; that is, looking towards the said four-sided socket of said socket member.

Fig. 6 is an end view as seen from the left hand end of Figs. 4 and 5.

Fig. 7 is a cross-sectional view through said socket member on line 7—7 of Fig. 5.

Referring to the drawings in a more detailed description, it will be seen that this invention relates to bleacher or grandstand construction generally more or less portable or of knockdown construction and having the planks of wood or proper metal construction consisting of seat planks and footrest planks supported by a metal framework which framework in general consists of several spaced transverse holding units A and preferably intervening or intermediate plank-supporting transverse units B. The desired number of these holding units A and also preferably supporting units B are spaced apart the proper distance ac-

cording to the length of the planks to be used for the seats and footrests and these transverse units are held in that position by longitudinal metal members and with the assembled structure kept from swaying by suitably placed diagonally arranged braces and tie rods.

Figs. 1 and 2 of the drawings show enough of the general construction of the metal framework to illustrate this invention in view of the fact that the invention relates more directly to the open-ended socket members 11 and the cross bars 12 upon which rest and to which are attached the several socket members.

Fig. 1 shows in side elevation one of the transverse holding units A to which has been added a set of hand rails 13 and 14 and vertical posts 15—15—15 usually provided at the two ends of a long set of such bleachers to prevent people from accidentally stepping off or falling from the ends of the bleachers. None of the other holding units A are provided with these hand rails and so the description of the cross unit now to be given is general to all of the cross units A provided in a set of bleachers and no further reference will be made to the hand rails or the supports therefor.

A holding unit A consists of a ground-engaging base 16, a strong stringer 17 commonly of channel form, angle supports as uprights 18 and 19 of different lengths as required to support said stringer in the desired slanting position and usually a front plate 20 supporting the forward end of the stringer the desired short distance above the base 16. The parts forming this triangular structure will be permanently fastened together as by bolts or rivets or welding at the meeting ends of the several parts. At proper spaced distances along on the stringer 17 there are placed the desired number of pairs of uprights being commonly a long upright 21 spaced the desired distance forwardly from a short upright 22. Preferably these uprights will be in the form of angle iron with one web resting flat against the flat side of the channel iron stringer 17 and with each upright preferably permanently and rigidly attached to said stringer as by rivets 23. The upper ends of each long upright 21 and short upright 22 of each pair thereof are connected by a cross bar 12 which conveniently and preferably is of angle iron formation and has its vertically disposed web 24 placed flatwise against the same flat side of the uprights 21 and 22 as engages the flat side of the channel bar stringer 17. It will be understood that these cross bars 12 are horizontally disposed and that they will have an upper flat horizontal part 25 which will be the flat section or horizontal web where as already suggested as preferable, these cross bars are of angle iron construction. Even if these cross bars are not of angle iron construction they will have a flat horizontal part at their top extending all the way from the upper parts or sides of the pair of uprights as 21 and 22 to which they are attached. Conveniently and in the preferred form of the invention the flat top or horizontal web 25 of angle iron cross bars will have such flat parts or flat horizontal webs extending away from the body of the uprights 21 and 22 as best appears in Figs. 2 and 3 of the drawings.

Upon the two ends of this pair of uprights 21 and 22 is rested and securely attached a socket member 11.

As a convenient, very economical and preferred form of construction the uprights 21 and 22 already mentioned as extending upward above the stringer to there carry the top cross bar 12 and a socket member 11 to receive one end of the two seat boards, may also extend below said stringer a proper distance so that the short rear upright 22 with the depending lower end of a rearwardly placed upright 21 from the next rearward seat support will constitute a pair of uprights the lower ends of which will be connected by a lower cross bar 26 which is preferably of angle iron formation and has its upper or horizontal web carrying another socket member 12 which can receive at its opposite sides the ends of the two foot rest planks 27.

Socket members 11 are so shaped and mounted and proportioned in size that one construction thereof will do both for holding the seat planks 28 and the footrest planks 27. For definiteness and simplicity of construction, however, the socket member will be described in detail as applied to the top cross bar 12 and used to receive the adjacent ends of two seat planks.

Socket member 11 as shown entirely separately in Figs. 3, 5, 6 and 7 and as shown in connection with its attached cross bar in Fig. 4, consists of a single unitary member, conveniently a casting and preferably a malleable casting. The socket member consists of a central longitudinally extending vertically arranged partition 29 forming a common inner end for the two open-ended sockets 30 and 31. These sockets are in alignment with each other, but face away from each other and in a direction at right angles to the length of the socket member and so at right angles to the length of the cross bar to which the socket member will be attached. The socket 30 is a full or four-sided socket having a bottom 32, a top 33 and two opposite connecting ends 34 and 35, said bottom, top and end all being connected at their inner edges to said partition 29 and preferably integral therewith as implied by saying that the whole socket member was a malleable casting. This socket 30 is toward the right in Figure 7 and toward the observer in Figure 4 and in Figure 5. The other socket 31 which is towards the left as seen in Figure 7 and towards the observer as seen in Figure 3 has a top 36 and two opposite ends 37 and 38 all projecting forwardly from and integral with the central partition 29. This socket 31, however, has no bottom and therefore is called a three-sided socket. The bottom of this socket, however, is formed as will be presently explained by the flat horizontal web or other flat-topped member of the top cross bar 12 as plainly appears in Figs. 2 and 4 and as suggested by the partly assembled arrangement in Fig. 3.

For about the middle half of the length of the socket member it is provided with a wall 39 depending from the lower edge of the central partition 29 and in vertical alignment therewith. The opposite ends of this wall are braced by integral triangular brackets 40 extending up to the lower side of the bottom 32 of the four-sided socket 30. The central portion of this wall need not extend down so far as its ends as shown best in Figs. 3 and 5. This narrower central part of the wall, however, is braced by a smaller triangular bracket 41 reaching up likewise to the lower surface of the bottom 32 of the four-sided socket 30. The two broader portions of the wall 39 near the ends thereof are respectively provided with a hole 42 for the passage therethrough of the shank 43 of the bolt 44. The shanks of these two bolts extend through the similar holes provided in the cross bar 12 in alignment therewith and there receive nuts whereby after the socket

member has been moved down from the position shown in Fig. 3 to its contacting position as shown in Fig. 4, the socket member 11 and its co-operating cross bar 12 will be securely and rigidly but removably fastened together.

Near their upper end the longer upright 21 and shorter upright 22 have provided in their transversely extending webs 21a and 22a respectively a suitable hole in alignment with holes near the opposite ends of the vertical web 24 of the upper cross piece 12 through which aligned holes bolts and nuts or rivets 47 may be placed to hold the said cross bar firmly to the upper ends of said pair of uprights 21 and 22. Preferably the aligned holes near the upper ends of said uprights 21 and 22 and the co-operating holes near the opposite ends of the vertical webs 24 of the upper cross bars 12 are so placed as to have the horizontally arranged web 25 of the cross bar slightly above the level of the upper ends of said uprights 21 and 22 more or less as indicated in Fig. 3. This results preferably in the arrangement as shown in the drawings of having the lower edges of the end walls 37 and 38 of the three-sided sockets on a slightly higher level than the bottom face of the bottom 32 of the four-sided socket. The amount of this variation is such that, substantially as shown in the drawings, the upper surface of the web 25 of the upper cross bars 12 is on the same level as the upper or inner face of the bottom 32 of the four-sided socket 30. The two sockets thus formed by a socket member and its cross bar 12 will, therefore, be in horizontal alignment and the planks 28 the opposite ends of which extend into these aligned sockets will, therefore, be in alignment as is desired for looks and convenience of such a bleacher. It will now be seen that the upper edge of the second or longitudinally extending webs 21b and 22b of the uprights 21 and 22 respectively will be in position to bear against the opposite lower face of the bottom 32 of the socket member while the upper face of the web 25 of the cross bar 12 will at its opposite ends support the lower edges of the end walls 37 and 38 of the other or three-sided socket 31. It will thus be seen that the socket member is very easily and rigidly placed and secured in position by reason of the shoulder formed by the angle iron cross bar 12 projecting slightly above the uprights 21 and 22 being used to project into the notch 48 in the bottom of the socket member 11 produced by the lower face of the ends 37 and 38 being on a slightly higher level than the bottom face of bottom 32 of the socket member. It will be seen that in practice the offset between the cross bar and its uprights on the one side and the two halves of the socket member 11 on the other side is substantially the thickness of the horizontal web 25 of the angle iron cross bar 12 and the thickness of the bottom 32 of the four-sided socket.

As already suggested, duplicates of the same socket members 11 already described as being used for the holding of the seat planks are used to hold the foot rest plank by having opposing pairs of such socket members 11 placed upon and secured to lower cross bars 26 reaching from the lower end of a short upright 22 rearwardly to the lower end of a long upright 21 that is next in the rear of said short upright 22. For this purpose suitable holes will be provided near the lower ends of said short uprights 22 and long uprights 21 to register with holes provided near the ends of these lower cross bars 26. Preferably the lower cross bars also will be of angle iron formation and their vertical webs 26a will be rested flat against the transversely extending webs 22a and 21a of said uprights so that by suitable rivets or bolts and nuts or welding the said lower cross bars will be rigidly and securely attached to the lower parts of said uprights. The horizontal web 26b of the angle iron cross bar 26 will form the bottom of the three-sided socket 31 when a socket member is used with the lower cross bar and the depending wall 39 of the socket member will be utilized to abut against the vertical web 26a of the lower cross bar and will be fastened thereto by rivets or by nuts and bolts in an obvious manner. Preferably the socket members will be secured to both the upper and lower cross bars by bolts and nuts so that if by any accident a socket member has to be removed and replaced this may be done more readily. It will be seen also that the notch 48 in the lower part of the socket members will aid in the relative positioning of the socket members upon the lower cross bars by fitting against the upper part of the vertical web 26a of the lower cross bars 26.

A transverse supporting unit B will consist of a base 16, uprights 18 and 19 and a front plate 20 carrying the strong stringer 17 and successive pairs of long uprights 21 and short uprights 22 having their upper ends connected by upper cross bars 12 and their lower ends connected by lower cross bars 26 all precisely or substantially as already described. The supporting units B, however, are simply to have their cross bars support the planks of the seats and footrest intermediate the length of the said planks and so the intermediate supporting units are not provided with any socket members 11.

Assuming that preferably one end holding unit A has been placed in upright position and already or then supplied with its proper number of holding socket members 11, and assuming also that a supporting unit B will be placed in upright position spaced substantially the proper distance therefrom towards the position of the next holding unit, the planks for the seats and the footrests will have one of the ends of each plank placed in the socket of each socket member with the intermediate part of the respective planks supported by the respective upper and lower cross bars of the said intermediate supporting unit B, then another holding unit A will be placed in upright position near the as yet unsupported free ends of the said set of seat and footrest planks. Then one end of this second holding unit will be advanced towards the planks and the free end of the first plank will be placed in a socket of the first socket member of that unit and then the second plank will be placed in a socket of the second socket member. The said holding unit will be thus gradually advanced towards the free ends of the planks until all of the planks are supported and held by their respective sockets of this second holding unit. The second holding unit will then be crowded as far as proper towards the first holding unit and the two holding units will be held in this spaced but supporting and holding or locking position by means of longitudinally arranged tie members 49 and 50. At certain pairs of adjoining holding units A and supporting units B diagonal brace or tie members 51 will be attached to said units to brace them from side sway in the manner well known in such bleacher constructions. After a pair of holding units have been placed in position and the planks secured therein, successive holding

units A will be brought up and another set of planks will be placed in the sockets of socket members of the second holding unit and then gradually into the sockets of the third holding unit until all the planks are supported and held at both ends and then the third holding unit will be crowded into permanent place and tied to the second supporting unit A as already suggested. Successive holding units with intervening supporting units B will be placed in position until the whole bleacher is erected.

What I claim as new and desire to secure by Letters Patent is:

1. In a bleacher construction, the combination of a horizontally arranged, transversely extending socket-supporting cross bar having a part thereof flat and horizontal and a socket member resting down upon and secured to said cross bar, said socket member having two open-ended sockets in alignment with each other and facing in opposite directions and at right angles to said cross bar, each socket having a stop at its inner end, one socket being four-sided, having a top, a bottom and two opposite ends, the other socket having a top and two opposite ends, its bottom being formed by the flat horizontal portion of the cross bar on which the socket member is rested.

2. In a bleacher construction the combination of pairs of fixed spaced uprights, a horizontally arranged cross bar for each pair of uprights secured at its opposite ends to said spaced uprights and a socket member for each cross bar having two open-ended sockets in alignment with each other and facing in opposite directions, and having their inner ends formed by a common partition, one socket being four-sided, having a bottom, a top and two opposite ends, the other socket having a top and opposite ends, its bottom being formed by the flat horizontal part of the cross bar on which the socket member is rested.

3. In a bleacher construction the combination of pairs of fixed spaced uprights, a horizontally arranged angle iron cross bar for each pair of uprights having one web secured at its opposite ends to said spaced uprights and having its second web disposed horizontally and a socket member for each cross bar having two open-ended sockets in alignment with each other and facing in opposite directions, and having their inner ends formed by a common partition, one socket being four-sided, having a bottom, a top and two opposite ends, the other socket having a top and opposite ends, its bottom being formed by the flat horizontal web of the cross bar on which the socket member is rested.

4. In a bleacher construction the combination of pairs of fixed spaced uprights, a horizontally arranged angle iron cross bar for each pair of uprights having one web secured at its opposite ends to said spaced uprights and having its second web disposed horizontally and a socket member for each cross bar having two open-ended sockets in alignment with each other and facing in opposite directions, and having their inner ends formed by a common partition, one socket being four-sided, having a bottom, a top and two opposite ends, the other socket having a top and opposite ends, its bottom being formed by the flat horizontal web of the cross bar on which the socket member is rested, each socket member having at its bottom a downwardly extending wall abutting laterally against the vertical web of the cross bar and attached thereto.

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