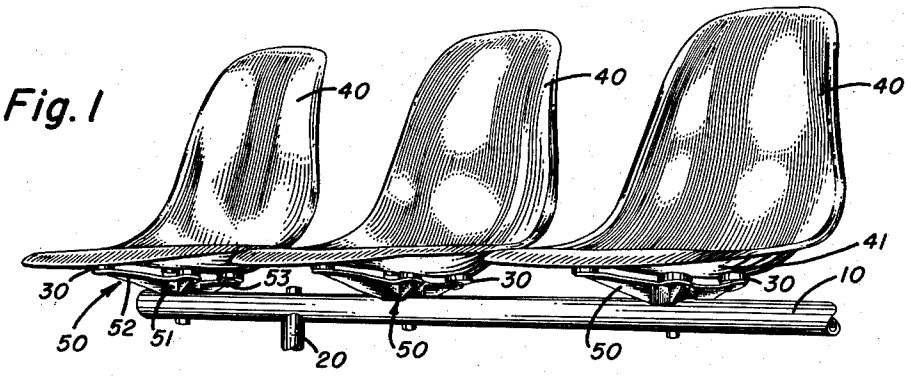
Nov. 12, 1957 C. EAMES 2,812,800

MULTIPLE SEATING ASSEMBLY

Filed May 3, 1956 2 Sheets-Sheet 1

Fig. 1



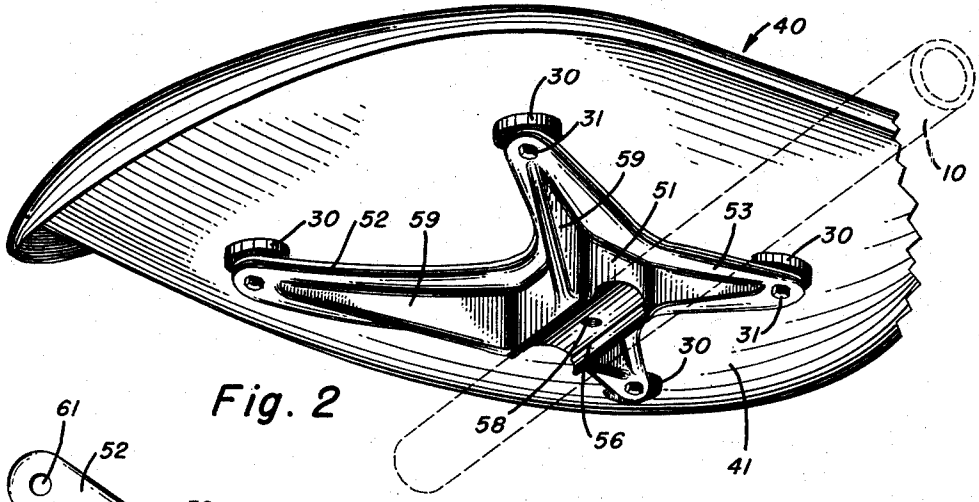


Fig. 2

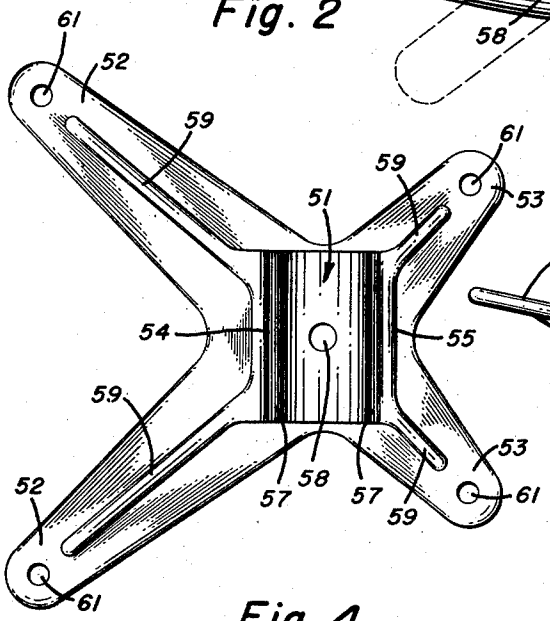
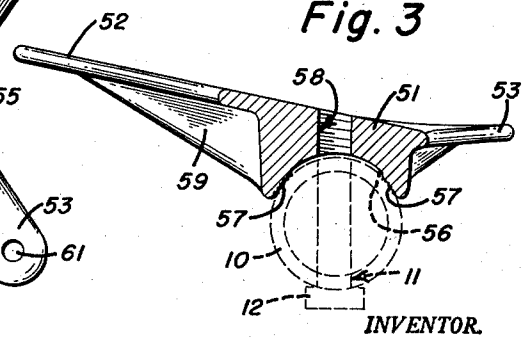


Fig. 4

Fig. 3



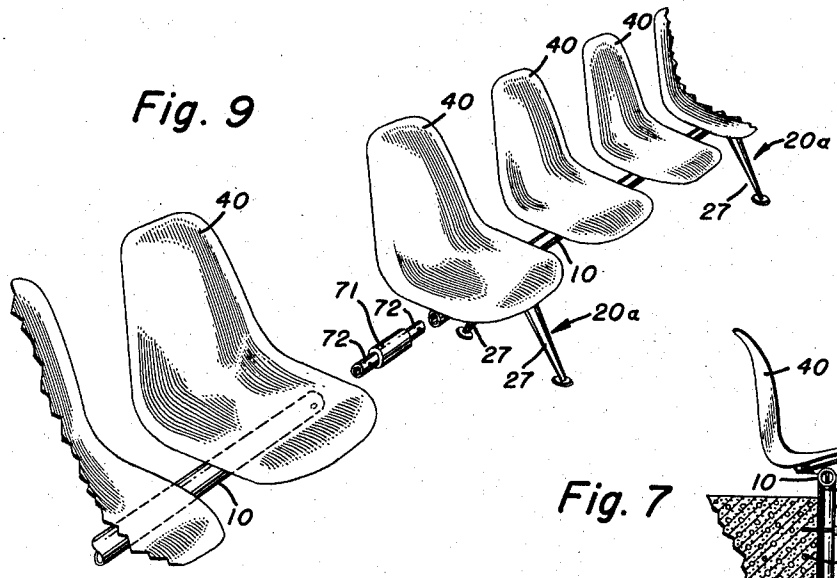
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Nov. 12, 1957 C. EAMES 2,812,800

MULTIPLE SEATING ASSEMBLY

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Fig. 9



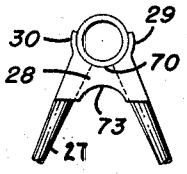


Fig. 10

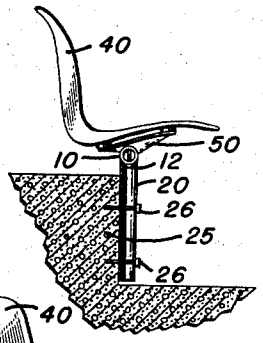


Fig. 7

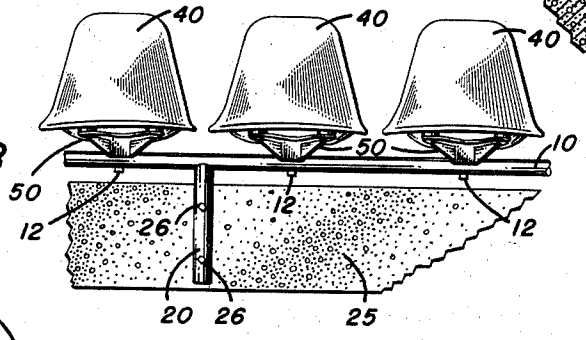


Fig. 8

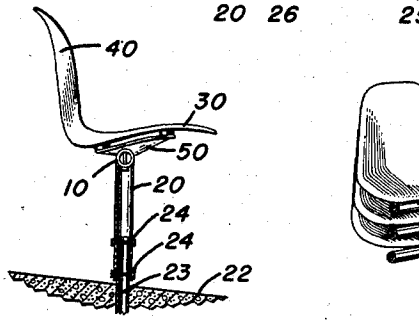


Fig. 5

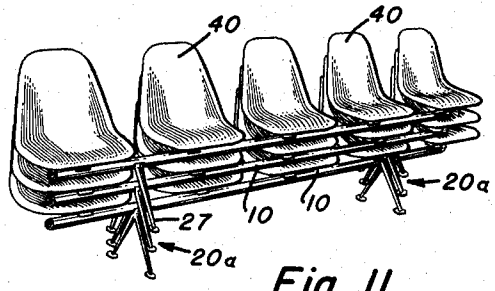


Fig. 11

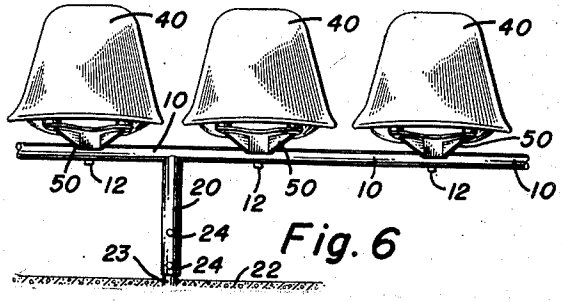


Fig. 6

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2,812,800

MULTIPLE SEATING ASSEMBLY

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Application May 3, 1956, Serial No. 582,427

11 Claims. (Cl. 155—130)

This invention relates to a multiple seating assembly particularly adapted for use in stadiums, convention halls, and other meeting places wherein orderly rows of seats spaced one from the other are required.

Various types of seats have been utilized in meeting places of the type referred to above. Seating arrangements siutable for this use are the well known board type comprising a board supported horizontally on the floor or riser of the meeting place. Another conventional type is the slat chair, such as those found in ball parks. Chairs suitable for use in covered enclosures and buildings, are more elaborate, sometimes having cushioned seats and backs. The multiple seating assembly of this invention is adapted for any of these purposes.

The primary object of this invention is to provide a novel multiple seating assembly.

Another object of this invention is to provide a novel type multiple seating assembly which can be easily installed and removed.

Still another object of this invention is to provide a multiple seating assembly which is easily assembled and disassembled, thus facilitating easy interchangeability of parts when broken or otherwise.

A further object of this invention is to provide a multiple seating assembly that is rigid and strong but still comfortable and simple in construction.

Another object of this invention is to provide a multiple seating assembly constructed in modular units having seats arranged in rows, such units being adapted to be secured together to extend the row and also being adapted to be stacked one on another for storage purposes.

A further object of this invention is to provide a bracket for use in supporting a plurality of shell-like seats along a single support bar, said seats being arranged in rows for use in meeting places such as auditoriums and stadiums.

Other objects of this invention will become obvious upon reading the following specification in conjunction with the accompanied drawings wherein:

Fig. 1 is an oblique, elevational view of the multiple seating assembly.

Fig. 2 is an oblique bottom view of one of the chairs of the assembly, illustrating the bracket for securing the seat to a single cross bar.

Fig. 3 is a cross-sectional, side elevational view of one of the brackets for supporting the seat.

Fig. 4 is a bottom view of one of the brackets for the seats.

Fig. 5 is a side elevational view of one means for supporting the seating assembly.

Fig. 6 is a partial front elevational view of the seating assembly of Fig. 5.

Fig. 7 is a side elevational view of another means for supporting the seating assembly.

Fig. 8 is a front elevational view of the asesmbly shown in Fig. 7.

Fig. 9 is a partial, oblique view of a seating unit illustrating another arrangement for supporting the seating assembly.

Fig. 10 is a partially broken, elevational view of the arrangement illustrated in Fig. 9.

Fig. 11 is an oblique view of a plurality of seating units as illustrated in Figs. 9 and 10, such units being shown stacked one on the other for storage purposes.

Briefly this invention is concerned with a multiple seating assembly having a single support bar and means for supporting the bar substantially parallel to a floor surface. The bar has a plurality of seats supported thereon by brackets. Each of the brackets has on its bottom surface an elongated socket having a cross-section substantially identical to a lateral portion of the bar. The cross bar fits into this socket and means is provided for securing the bracket to the bar in this position. The seats are spaced along the bar to provide a row of seats along it.

In a preferred form of this invention the bracket has a spider shape thus comprising a central base with four arms extending outwardly therefrom. The seats are secured to the ends of the arms. The enlongated socket is located in the central base. In still other embodiments of this invention, the cross support bar is supported by two legs forming a triangle extending radially from the bar. These legs are adapted to fit on a corresponding leg whereby units of these seats can be stacked one on the other for storage purposes. In other forms of supporting the bar, a tubular member is secured to and depends from the cross bar. This tubular member fits over a stub extending from the surface on which the assembly is being supported. In still another form this tubular member is secured to the side of a riser in stadiums and the like.

Referring to Fig. 1, there is shown the basic assembly including the cross bar **10**, the cross bar support **20**, the seat shell **40**, and the brackets **50** for securing the seat **40** to the cross bar **10**.

The cross bar **10** in the embodiment shown is an ordinary galvanized pipe of suitable cross section which will withstand the load exerted thereon by the person sitting on the seats **40**. I have found that a 2½ inch galvanized pipe serves the purpose satisfactorily. Cross bars of other shapes can be used in place of the galvanized pipe, although in the preferred form of this invention, the pipe is used because of its availability as a common article of manufacture. Other forms of cross bars are not necessarily hollow or cylindrical. Solid steel round stock or square and rectangular bar stock can be used. If other forms of cross bars are used, the socket of the bracket will be modified accordingly. The cross-bar **10** can be a straight section or curved to conform with the desired shape of the seat rows. The cross-bars **10** have vertical holes **11** (Fig. 3) spacing along the bar for mounting seats **40** to the bar. These holes **11** determine the relative positions of the seats.

The seat shell **40** is a fiber reinforced synthetic resin, molded under heat and pressure to give the desired shape. Preferably the edges are additionally reinforced to prevent splitting. The resins most conventionally used are polyesters of various color pigmentation. Fiber glass is commonly used as the fibers. The shell **40** is shaped to conform to the body contour of an average person. The resin material is somewhat resilient making the chair comfortable because of the give in the shell itself.

The particular plastic or resin material from which the shell is made is relatively light. It is not readily subject to damage or breakage because of its resiliency. It has high impact and surface abrasion resistance. Changes in moisture content of the air will not effect it. It is vermin proof and may be readily cleaned with soap and water or a damp cloth.

Circular or button shaped shock mounts **30** are adhesively secured to the bottom surface **41** of seat **40**. The shock mounts **30** each has an internally threaded female insert (not shown) adapted to receive the screw **31** (Fig. 2). This shock mount can be of identical construction to that described and claimed in Patent No. 2,647,136. As will be described hereinafter the shock mounts provide the means for securing the seat to the brackets **50**.

The bracket **50** is spider shaped. It has a central base **51** having four arms **52** and **53** extending outwardly and upwardly therefrom. The arms **52** extend from the front **54** and the arms **53** extend from the rear **55**. The central base **51** is somewhat trapezoidal in shape having a top surface inclined downwardly from the front to the rear. The bottom surface of base **51** has a lateral arcuate groove forming a socket **56** for receiving the cross-bar **10**. In the preferred form of this invention as illustrated in the drawings, the socket **56** is arcuate in shape and has a cross section substantially identical to arcuate portion of the cross-bar **10**. Thus the bar **10** fits tightly in the socket **56** (Fig. 3). The serrations **57** are preferably provided on the wall of the socket **51** for gripping the bar **10** to prevent the bracket from turning on the circular bar **10**. As previously disclosed, the bar **10** can have a different configuration. If so, the socket **56** is modified accordingly so that it will conform with the upper portion of the bar **10**. The central base **51** has a threaded tapped hole or aperture **58** extending vertically therethrough. This tapped hole is positioned for alignment with vertical holes **11** extending through cross-bars **10** (Fig. 3).

All of the arms extend upwardly from the top surface of the central base **51** so that when supporting the seat the central base is spaced from the bottom **41** of the seat. The arms **52** are longer than arms **53** and are inclined upwardly at a greater angle. The exact configuration, spacing, and shape of the arms **52** and **53** are made to conform with the shape of the bottom surface **41** of the seat **40** so that when the seat **40** is secured to the bracket and bracket **50** to cross-bar **10**, the seat is upright. The arms **52** and **53** are reinforced by the reinforcement webs **59** which are integral with both the central base **51** and arms. The webs **59** taper from the bottom surface of the central base **51** to approximate the ends of the arms (Figs. 2 and 4). The arms **52** and **53** have apertures **61** on their ends for receiving the bolts **31** which secure, by means of the shock mounts **30**, the seat **40** to the bracket **50**.

The assembling of the shell seat **40**, bracket **50**, and the cross-bar **10** is simple. The bracket **50** is first secured to the bottom surface **41** of the shell **40**. This is accomplished by aligning the apertures **61** with the female inserts (not shown) of the shock mounts **30**. Then the screws of bolts **31** are inserted through the opening **61** and screwed into the female inserts. This rigidly secures the bracket to the bottom of seat **40**.

Having secured the bracket **50** to the seat **40** the bracket is placed directly on the cross-bar **31** in such a manner that the socket **56** receives the cross-bar **10**. The opening **58** in bracket **50** is aligned with a corresponding opening **11** in the cross-bar **10**. In this position the seat **40** is appropriately situated upright so that one can sit comfortably in the seat. A bolt **12** is then inserted through the opening **11** (Fig. 3) and screwed into the tapped hole **58** rigidly securing the bracket to the cross-bar **10**. The bolt **12** may extend through hole **58** and a nut threaded on its end. Assuming that a support member **20** is provided for supporting the cross bar **10**, the seat is then adapted for use. This method of assembly is repeated for several chairs arranged along the cross-bar **10**. In this assembly method the bracket can be secured to cross-bar **10** before attaching the shell **10**. This choice depends upon the particular location and situation of the cross-bars.

The seating assembly described above is adapted for several forms of supporting structure. Fig. 5 shows one of these forms. Fig. 5 shows a stub **23** of a pipe or rod secured in a floor such as cement. The stub **23** extends a sufficient distance above the floor **22** for adequately supporting the support post **20**. In this particular modification support post **20** fits over or telescopes onto the stub **23**. A pair of apertures are provided through the sides of support post **20** and stub **23**. These apertures are spaced an equal distance on both the post **20** and stub **23** so that they can be aligned for receiving bolts **24**. The bolts **24** rigidly connect the support post **20** to the stub **23**. In this type construction it is preferable that the support posts **20** (Figs. 5 and 6) be secured to the cross-bar **10**, by welding or otherwise, at locations spaced every three seats. The particular spacing of the support post **20** depends upon the strength of the cross-bars **10** and accordingly such spacing can be changed to vary with the different cross-bars used.

The particular construction shown by Figs. 5 and 6 is especially adapted for inclined or sloping floors. In meeting places such as auditoriums or stadiums the stubs **23** are permanently secured in the floor in rows. If desirable the stubs can be removably secured in floor making the floor available for other uses. In either arrangement, the seats can be easily installed and removed.

Another form of supporting the seating assembly is shown in Figs. 7 and 8. This particular form is adapted for use in stadiums having stepped up platforms with risers extending vertically between the platforms. In this modification the support post **20** is secured to the risers **25** by lug bolts **26** extending through spaced holes in the post **20** and into the risers **25**. This particular form is also adapted for quick installation and removal.

A further form of this invention is illustrated in Figs. 9, 10 and 11. In this form the seats are arranged in units adapted to be secured together in rows and also stacked one on another for storage purposes. The support structure **20***a* includes two legs **27** arranged at an angle to each other forming a V-shaped supporting structure.

The legs **27** are secured to the cross-bar **10** at the apex of the legs. The legs **27** are braced by a brace plate **28** secured to both of the legs in proximity to the apex. The top edge of the plate **28** has an arcuate cut out portion for receiving the cross-bar **10** of its unit. The bottom edge of the brace plate **28** has an arcuate cut out portion for receiving the cross-bar of another unit underneath it. Preferably, the brace plate **28** extends a sufficient distance down the legs **29** so that when the brace rests on a cross-bar of another unit it will vertically space the units preventing the understructure from engaging and marring the seats.

The legs **27** at their top ends are curved outwardly at **29** to conform with the shape of the cross-bar. The legs **27** and the plates are welded or secured by other suitable means to the cross-bar **10**.

A standard unit consists of five seats spaced along the horizontal cross-bar **10**. Each unit has two pairs of legs supporting the cross-bar in proximity to the ends. The particular lateral spacing of the seat shells on the cross-bars **10**, are predetermined and indicated by the holes drilled in the cross-bar.

Fig. 9 shows the preferred method of securing two units together. In this preferred form, the cross-bars are galvanized pipe having openings at each end. A connector **71** is provided, such connector having at each end, plugs **72** of reduced diameter which fit into the piped cross-bars **10**. Thus, in connecting two units together one plug on one end is inserted into the end of a cross-bar of one unit and the plug on the other end is inserted into a crossbar of another unit. A pin is provided for rigidly securing the connector plugs in the cross-bars of the two units.

When in use the seats can be arranged either in separate units or connected with several units arranged in an

orderly row. The connection being accomplished by the connector **71** as described above. When not in use, the units can be stored by stacking one on another (Fig. 11). This is easily accomplished by fitting the arcuate cut-out portion **73** over the cross-bar of the unit underneath it. The seats and legs which are all located in the same relative position, naturally fit one on each other as shown in Fig. 11. Several units can be stacked one on each other.

It should be evident with the above description that I have provided a simple but strong multiple seating assembly for use in meeting places such as auditoriums and stadiums. This seating assembly has many advantages over conventional type units because of its simplicity and structural characteristics. The entire assembly comprises four components, all of which can be easily replaced and interchanged with new and different type components.

The seat is more comfortable than present day units utilized in most stadiums and auditoriums. The shell itself is resilient and that combined with the resiliency of the shock mounts **30** and the bracket **50** provides a seat that is comfortable as well as simple and strong. There are numerous other advantages, all of which are inherent in the structure.

It should be also understood that although I have described certain modifications and embodiments of this invention, other modifications and embodiments can be used without departing from the spirit and scope of this invention. Therefore, unless expressly stated otherwise in the appended claims, all such modifications and embodiments are covered by the claims.

I claim:

1. A multiple seating assembly comprising: a single support bar having means for supporting it substantially parallel to a plane surface; a plurality of seats; a bracket for each of said seats; said seats being secured to the top of its bracket; each of said brackets having on its bottom an elongated socket having a cross-section substantially identical to a lateral portion of said bar; and means securing said brackets to said bar with said portion of said bar in each of said sockets whereby said seats are secured and arranged side by side in a row along said bar.

2. A multiple seating assembly comprising: a single support bar having means for supporting it substantially parallel to a plane surface; a plurality of seats; a spider shaped bracket for each of said seats, said bracket having a central base with arms extending outwardly therefrom; said seats being secured to said arms; each of said brackets having on the bottom surface of said base an elongated socket having a cross-section substantially identical to a lateral portion of said bar; and means securing said brackets to said bar with said portion of said bar in each of said sockets whereby said seats are secured and arranged side by side in a row along said bar.

3. A multiple seating assembly comprising: a single support bar having means for supporting it substantially parallel to a plane surface; a plurality of molded plastic shell seats; a spider shaped bracket for each of said seats, said bracket having a central base with arms extending outwardly and inwardly therefrom; said seats being secured at its bottom surface to said arms; each of said brackets having on the bottom surface of said base an elongated socket having a cross-section substantially identical to a lateral portion of said bar; and means securing said brackets to said bar with said portion of said bar in each of said sockets whereby said seats are secured and arranged side by side in a row along said bar.

4. A multiple seating assembly comprising: a single tubular pipe support having means for supporting it substantially parallel to a plane surface; a plurality of seats; a bracket for each of said seats; said seats being secured to the top of said bracket; each of said brackets having on its bottom an elongated arcuate socket having a cross-section describing an arc substantially identical to an arc of said pipe; and means securing said brackets to said pipe with said portion of said pipe in each of said sockets whereby said seats are secured and arranged side by side in a row along said pipe.

5. A multiple seating assembly comprising: a single tubular pipe support having means for supporting it substantially parallel to a plane surface; a plurality of seats; a bracket for each of said seats; said seats being secured to the top of said bracket; each of said brackets having on its bottom an elongated arcuate socket having a cross-section describing an arc substantially identical to an arc of said pipe; and means securing said brackets to said pipe with said portion of said pipe in each of said sockets whereby said seats are secured and arranged side by side in a row along said pipe; said socket fitted on said pipe with said seat extending upright; and a bolt extending through said base and transversely through said pipe securing said bracket to said pipe.

6. A bracket for securing a shell-like seat to a single cross-bar comprising: a spider like member having a central base; four arms extending radially outwardly from said base; means on the tops of said arms for securing said bracket to the bottom surface of said seat; said base having on its bottom an elongated socket; said socket having a cross-section substantially identical to a portion of the cross-section of said cross-bar.

7. A bracket for securing a shell-like seat to a single tubular cross-bar comprising: a spider like member having a relatively thick central base; four horizontally flat arms extending radially outwardly and upwardly from a top portion of said base; reinforcement ribs extending from said base and normal to said arms, said ribs being integral with said base and said base having on its bottom an elongated arcuate socket; said socket having a cross-section substantially identical to a portion of the cross-section of said cross-bar.

8. A multiple seating assembly comprising: a single support bar having means for supporting it substantially parallel to a plane surface; a plurality of seats; a bracket for each of said seats; said seats being secured to the top of its bracket; each of said brackets having on its bottom an elongated socket having a cross-section substantially identical to a lateral portion of said bar; and means securing said brackets to said bar with said portion of said bar in each of said sockets whereby said seats are secured and arranged side by side in a row along said bar; said means for supporting said support bar comprising a plurality of pairs of V-shaped legs spaced along said bar and extending radially therefrom; each of said pairs of legs permitting corresponding pairs of legs on another unit to pass over it and rest on said cross-bar whereby said units can be stacked one on each other.

9. A multiple seating assembly comprising: a single support bar having means for supporting it substantially parallel to a plane surface; a plurality of seats; a bracket for each of said seats; said seats being secured to the top of its bracket; each of said brackets having on its bottom an elongated socket having a cross-section substantially identical to a lateral portion of said bar; and means securing said brackets to said bar with said portion of said bar in each of said sockets whereby said seats are secured and arranged side by side in a row along said bar; said means for supporting said support bar comprising a plurality of tubular pipes welded to said cross-bars and extending downwardly therefrom; said pipes being adapted to telescope onto and be secured to corresponding tubular members of smaller diameter than said pipes.

10. A multiple seating assembly comprising: a single support bar having means for supporting it substantially parallel to a plane surface; a plurality of seats; a bracket for each of said seats; said seats being secured to the top of its bracket; each of said brackets having on its bottom an elongated socket having a cross-section substantially identical to a lateral portion of said bar; and means securing said brackets to said bar with said portion of said bar in each of said sockets whereby said seats are secured and arranged side by side in a row along said bar;

said means for supporting said support bar comprising a plurality of tubular pipes secured to said cross-bars and extending downwardly therefrom; said pipes having lateral holes therethrough extending in a direction from the front to back of said seats whereby said seats are adapted to be secured to a riser by bolts extending through said holes and into said riser.

11. A multiple seating assembly comprising: a support bar having means for supporting it substantially parallel to a plane surface; a plurality of seats; a single bracket for each of said seats; each of said seats being secured to the top of its bracket; each of said brackets having at its bottom an elongated socket having across section substantially identical to a lateral portion of said bar; and means for securing said bracket to said bar with said portion of said bar in each of said sockets whereby said seats

are secured to and arranged side by side in a row along said bar.

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