March 23, 1965 H. D. CHAPMAN ETAL 3,174,795

SEATING STRUCTURE

Filed Oct. 11, 1963 2 Sheets-Sheet 1

Fig 1

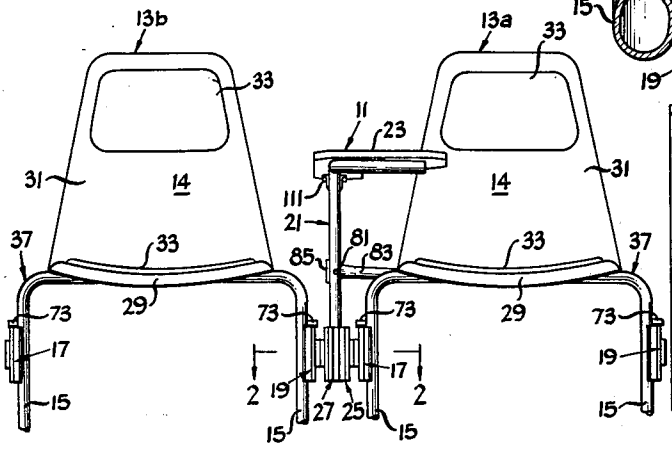


Fig 2

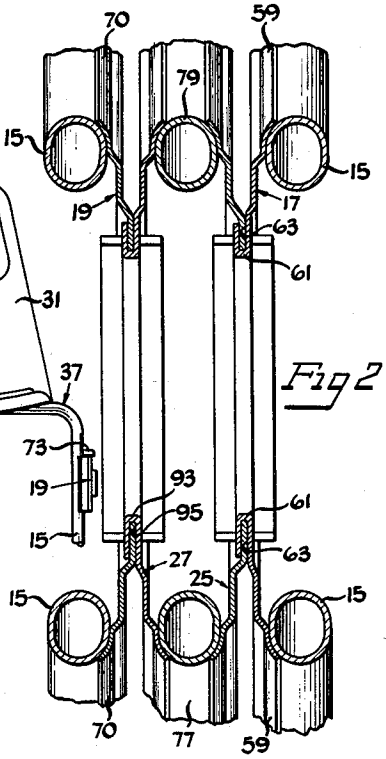


Fig 3

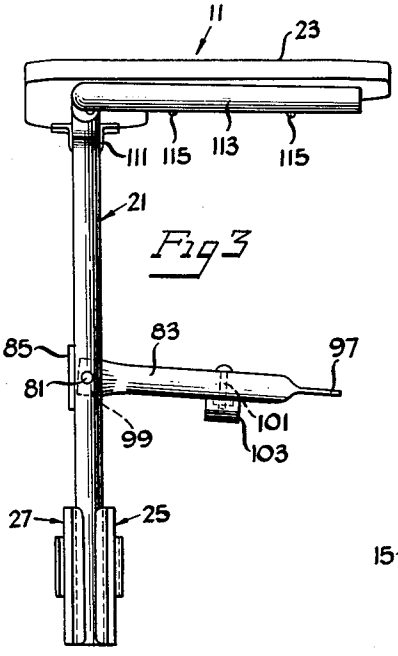
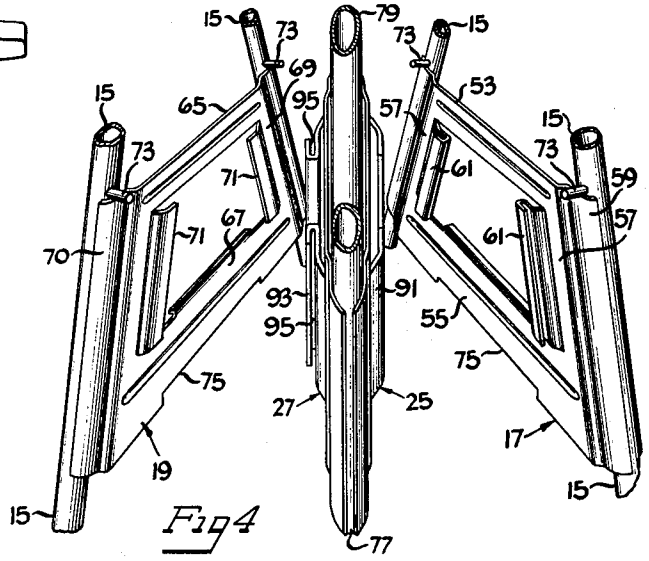


Fig 4



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SEATING STRUCTURE

Filed Oct. 11, 1963 2 Sheets-Sheet 2

Fig 6

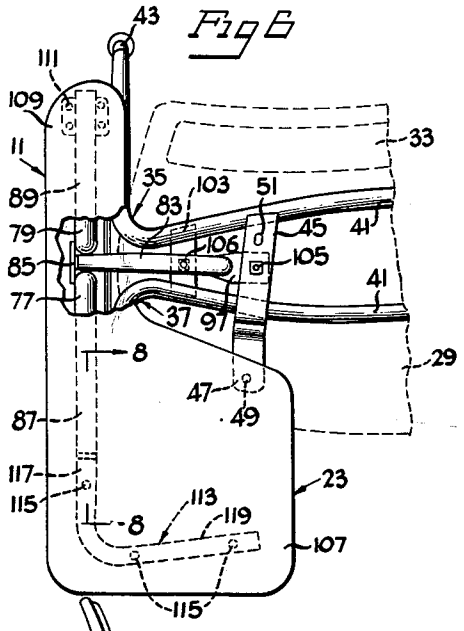
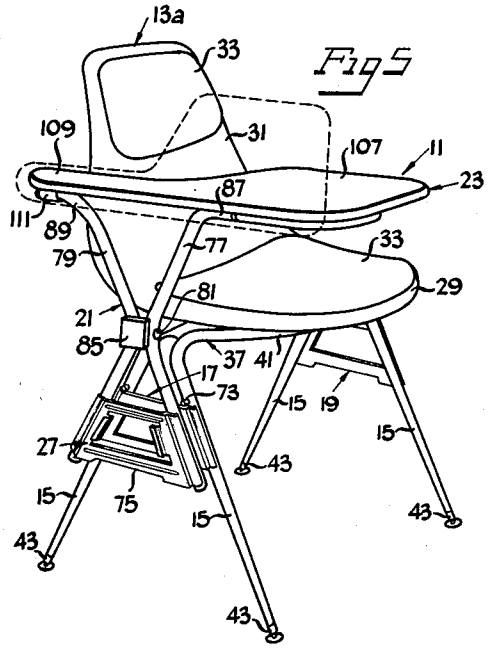


Fig 5



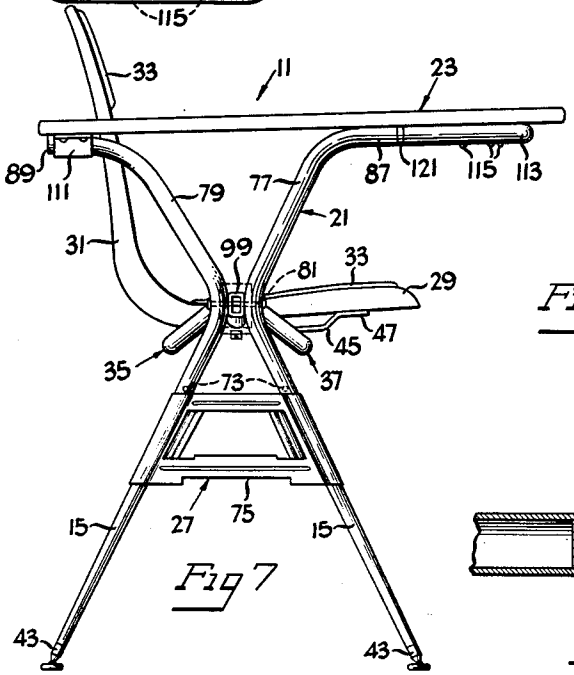
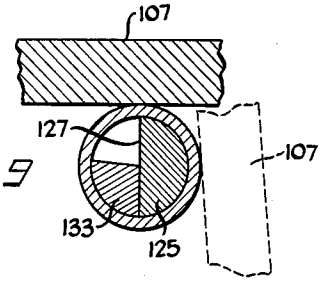


Fig 7

Fig 9



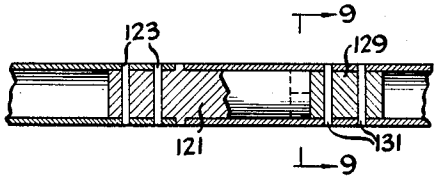


Fig 8

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3,174,795

SEATING STRUCTURE

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Filed Oct. 11, 1963, Ser. No. 315,483
11 Claims. (Cl. 297—160)

This invention relates to seating units. More particularly, the invention relates to seating units which include an arm assembly.

The principal object of the present invention is to provide an improved seating structure including a detachable arm assembly.

An additional object of the invention is to provide a seating arrangement which includes an aligned row of two or more seating units releasably interconnected by a detachable arm assembly supported intermediate adjacent units.

A further object of the invention is to provide an arm assembly adapted to be supported intermediate a pair of adjacent seating units and capable of interconnecting the units to each other to form an aligned row.

A still further object of the invention is to provide seating units adapted to be interconnected with one another in an aligned row and to have an arm assembly releasably attached thereto.

Another object of the invention is to provide an improved seating structure which includes a detachable tablet arm assembly.

A related object of the invention is to provide a tablet arm assembly which is adapted to be detachably mounted on a seating unit.

Other objects and advantages of the invention will become apparent with reference to the following description and the accompanying drawings.

In the drawings:

FIGURE 1 is a front elevational view of a seating arrangement showing various of the features of the invention;

FIGURE 2 is an enlarged fragmentary sectional plan view taken along line 2—2 of FIGURE 1;

FIGURE 3 is an enlarged front elevational view of the tablet arm assembly which forms part of the seating arrangement shown in FIGURE 1;

FIGURE 4 is an exploded fragmentary sectional view of the structure shown in FIGURE 2;

FIGURE 5 is a perspective elevational view of a seating structure showing various of the features of the invention;

FIGURE 6 is a fragmentary partially broken away plan view of a portion of the seating unit shown in FIGURE 5;

FIGURE 7 is a fragmentary enlarged side elevational view of the seating unit shown in FIGURE 5;

FIGURE 8 is an enlarged fragmentary sectional elevational view taken along line 8—8 of FIGURE 6; and

FIGURE 9 is an enlarged sectional elevational view taken along line 9—9 of FIGURE 8.

Very generally, the illustrated embodiment of the present invention comprises an arm assembly **11** which is adapted to be detachably mounted on either or both sides of an individual seating unit **13**, and which can be supported intermediate and detachably mounted on each of a pair of adjacent seating units so as to interconnect the units in an aligned row.

The seating unit **13** is in the form of a chair similar to that shown in U.S. Patent No. 3,084,977 and includes a body-receiving shell **14** supported by a pair of depending leg members **15** adjacent each of opposite sides thereof. A bracket **17** is secured to one of the pair of leg members **15**, and a mating bracket **19** is secured to the

opposite pair. As set forth in the above-mentioned patent, these brackets are formed so as to be capable of being placed in releasable interlocking engagement with each other. Hence, when two such chairs, facing in the same direction, are arranged in side-by-side relation, they can be releasably interconnected or "ganged' in an aligned row.

The arm assembly **11** includes a standard **21** provided at its upper end with a generally horizontally disposed member which, in the illustrated embodiment, is in the form of a tablet arm **23** but which may assume any of various other forms, such as a conventional arm rest, if desired. The standard **21** is provided on one side with a bracket **25** similar to the bracket **19** of the seating unit **13** and capable of being placed in releasable interlocking engagement with the bracket **17** of the seating unit **13**, thereby facilitating detachable mounting of the arm assembly to the seating unit in a manner which renders the tablet arm **23** suitable for use by an occupant of the seating unit. In addition, the standard **21** is provided with a bracket **27** on its opposite side, which bracket is similar to the bracket **17** of the seating unit **13** and is capable of releasable interlocking engagement with the bracket **19** of the seating unit. Accordingly, the tablet arm may be disposed intermediate, and detachably mounted on, each of a pair of like seating units arranged in side-by-side relation, thereby releasably interconnecting the seating units with one another in an aligned row.

More specifically, the body-supporting shell **14** is preferably molded, as from a fiber reinforced resin, and defines a seat **29** and a backrest **31**, each of which may be padded as at **33** if desired. The shell **14** is attached to and supported by the leg members **15** which are defined by outwardly extending end portions of a pair of generally U-shaped tubular members **35** and **37**, which members also define intermediate bight portions **41**, referred to in greater detail shortly. The leg members **15** are tapered toward their outer ends to provide a more graceful and pleasing appearance for the chair, and each of the outer ends has detachably affixed thereto a foot **43** in the form of a universally mounted pad or button constructed to permit swivelling movement of the pad relative to the leg member to thereby ensure full supporting engagement between the pad and the supporting surface.

The bight portions **41** of the U-shaped tubular members **35** and **37** are bent in an arcuate shape (FIGS. 5 and 6) and have a pair of horizontally spaced elongated metallic trips **45**, one of which is shown in FIGURES 6 and 7, secured, as by welding or the like, to their upper surfaces. Each of the strips **45** is adapted to be detachably secured to the under-surface of the seat **29** of the shell **14** and includes an upwardly offset flange portion **47** (FIG. 7) provided with a hole **49** at its forward end to receive a suitable fastener (not shown). An elongated slot **51** is provided in each of the strips **45** in rearwardly spaced relation to the forward ends thereof to accommodate a second fastener (not shown).

The brackets **17** and **19**, previously referred to, render the chair **13** adapted for releasable interconnection with an adjacent chair and, in addition, render the chair suitable for the releasable attachment thereto of the arm assembly **11**. In addition, the particular form of brackets shown in the illustrated embodiment serve to interconnect and brace the leg members **15** adjacent each side of the chair.

More specifically, the bracket **17** is preferably secured to the legs **15** adjacent the right side of the chair and is in the form of a trapezoidally-shaped open frame defined by generally parallel upper and lower cross members **53** and **55** respectively interconnected by a pair of upwardly converging intermediate sections **57**. Each of

the intermediate sections includes outwardly projecting curved side flange portions **59** which are secured, as by welding, to the outer side surfaces of the leg members on the right hand side of the chair. The inner edge portions of the intermediate sections of the bracket are formed to provide oppositely facing channel sections **61** which are open toward the front and rear respectively of the chair and define upwardly converging grooves **63** adapted to receive complementary portions of either the bracket **19** or the bracket **25**, soon to be described.

The bracket **19** is fixed to the opposite, or left hand, side of the chair **13** and, like the bracket **17**, is in the form of a trapezoidally shaped open frame defined by generally parallel upper and lower cross members **65** and **67** joined by upwardly converging intermediate sections **69** and secured to the leg members **15** by curved flanges **17**. However, whereas the intermediate sections **57** of the bracket **17** are formed to provide oppositely facing channel sections **61** defining grooves **63**, the intermediate sections of the bracket **19** are formed to provide a pair of inwardly facing tongues **71** which are offset outwardly of the main plane of the bracket and are arranged in upwardly converging relation to each other. The tongues **71** of the bracket **19** and the channels **61** of the bracket **17** are dimensioned and disposed with respect to each other such that the tongues **71** can be slidably received into the grooves **63** when the bracket **19** is moved downwardly with respect to the bracket **17**.

It will be noted in FIGURE 2 that each of the channels **61** and tongues **71** of the brackets **17** and **19** respectively define horizontally spaced, generally vertically disposed surfaces which engage one another and prevent lateral movement of the brackets relative to one another when the brackets are placed in interlocking engagement. Moreover, the converging configuration of the channels and tongues causes them to define upwardly and downwardly directed interengaging surfaces respectively which limit vertical downward movement of the bracket **19** relative to the bracket **17**. These features are particularly advantageous with respect to the arm assembly **11**, as will become apparent shortly.

To provide for vertical stacking of the chairs, a stud **73** projects outwardly from each of the leg members **15** immediately above each of the brackets **17** and **19** and is engaged by the lower edge of a corresponding bracket of a stacked overlying chair. A recess **75** is formed in the lower edge of each of the lower cross members **55** and **67** of each of the brackets **17** and **19** to receive the studs of an underlying chair.

Referring now to the arm assembly **11**, the standard **21** thereof (FIGS. 3, 5 and 7) is defined by a pair of upright, horizontally-spaced forwardly and rearwardly disposed tubular members **77** and **79** respectively interconnected at approximately their vertical midpoints by a horizontally extending pin **81**. The pin **81** also passes through one end of a brace **83**, soon to be described, which is positioned intermediate the members and is adapted for pivotal movement about the pin. A cap **85** is secured to the outer surface of the standard to conceal the open end of the brace.

The tubular members **77** and **79** are bent so as to diverge relative to one another both above and below the pin **81**, thereby defining a generally X-shaped configuration. The upper ends of the forwardly and rearwardly disposed tubular members **77** and **79** are offset forwardly and rearwardly respectively to provide generally horizontally disposed portions **87** and **89** to which the tablet arm **23** is pivotally secured, as hereinafter described.

The lower end of the standard is provided on opposite sides with the brackets **25** and **27** which are adapted for interlocking engagement with the brackets **17** and **19** respectively of the chair so as to permit detachable mounting of the arm assembly **11** to a single chair **13** or to each of a pair of chairs disposed in side-by-side relation intermediate which the arm assembly is supported. The

brackets **25** and **27** also provide structural support for, and strengthen the lower end of, the standard **21** so as to prevent relative movement of the tubular members about the pin **81**.

More specifically, the bracket **25** is affixed to the innermost side of the standard so as to be adjacent to and engageable with the bracket **17** of a first seating unit **13***a* when the arm assembly **11** is disposed in the desired position adjacent the seating unit (FIG. 1). The bracket **25** is identical to the bracket **19** and, hence, is capable of interlocking engagement with the bracket **17**, thereby detachably securing the tablet arm assembly to the seating unit. In this regard, the bracket **25** includes a pair of inwardly facing tongues **91** which are adapted to be received in the grooves **63** of the bracket **17** when the arm assembly is lowered or moved vertically downwardly relative to the bracket **17**. Such downward movement is halted by the interengagement of the upwardly and downwardly facing surfaces of the channels and tongues respectively, thus providing vertical support for the assembly **11**. Lateral support for the assembly is provided by the interengaging vertically disposed horizontally spaced surfaces of the brackets, thereby preventing or greatly limiting lateral wobbling movement of the assembly.

The bracket **27** is affixed to the opposite or outer side of the standard **21** and is therefore engageable with the bracket **19** of a second seating unit **13***b* disposed adjacent the first seating unit **13***a* on which the arm assembly is mounted. The bracket **27** is identical to the bracket **17** and, hence, is capable of interlocking engagement with the bracket **19**, thereby detachably securing the arm assembly **11** to the second seating unit and, hence, securing the first and second seating units to one another. In this regard, the bracket **27** is provided with a pair of oppositely facing channel sections **93** defining upwardly converging grooves **95** which are adapted to receive the tongues **71** of the bracket **19** when the bracket **19** is lowered or moved downwardly relative to the bracket **27**. The engagement of the arm assembly by a bracket **19** of an adjacent chair provides additional structural support for the assembly.

Accordingly, it should be apparent that the tablet arm assembly can, by vertical movement, be attached to or detached from a first seating unit **13***a* when the bracket **25** and **17** are placed in, or removed from, interlocking engagement with one another, and may have a second seating unit **13***b* attached to or detached from it, thereby detachably securing a pair of the seating units to each other.

In order to ensure the sturdy support of the arm assembly **11** adjacent a seating unit **13***a*, particularly when the assembly is not receiving additional support from a second seating unit **13***b*, as well as to hinder the unauthorized detachment of the arm assembly, the brace **83** is provided and comprises a short tubular member (FIGS. 3 and 6) flattened at one end to provide a vertically disposed portion **97** which, as previously mentioned, is positioned intermediate the tubular members **77** and **79** of the standard **21**. The tubular member of the brace is flattened at its opposite end to provide a horizontally disposed portion **99** which is provided with a hole to enable it to be fastened to one of the strips **45** affixed to the bight portion **41** of the leg members **35** and **37**. In addition, a second hole is provided at approximately the mid-portion of the brace to receive a bolt **101** from which is suspended a clamping plate **103** (FIGS. 3 and 6). The clamping plate **103** is adapted to engage the lower surfaces of the bight portions **41** of the leg members **35** and **37** and, accordingly is preferably provided with a pair of spaced-apart arcuate recesses (not shown).

In the attachment of the arm assembly **11** to the seating unit **13**, the outwardly extending end portion of the brace **83** is positioned intermediate the bight portions **41** of the leg members, with the clamping plate **103** disposed

in parallel relation to the brace, and with the flattened end portion 97 of the brace disposed in partially underlying relation to the strip 45. As the arm assembly is lowered to bring the brackets 17 and 25 into engagement with one another, the brace is pivoted slightly to bring its flattened end 99 into contact with the under surface of the strip 45. The brace is then secured to the strip 45 by a suitable fastener 105 passing through the strip 45 and end portion 99 of the brace, and the clamping plate is rotated to the position shown in FIGURE 6, after which a nut 106 of the bolt 101 is tightened to clamp the plate to the bight portions 41.

The tablet arm 23, carried on the upper end of the standard 21, may be of any conventional design but, as illustrated, comprises an elongated flat board having an enlarged forward portion 107 defining a supporting surface for receiving books, writing materials, etc., and a rearwardly extending narrow neck portion 109 located along the right side of the tablet arm which is disposed farthest from the shell 14 and serves as an arm rest. The tablet arm may be formed of any rigid material, but is preferably formed of wood.

The rearward end of the neck portion 109 of the tablet arm is pivotally secured to the standard by means of a clip 111 affixed to the underside of the neck and defining, with the tablet arm, a generally circular bearing cavity which receives the rearwardly directed horizontally disposed upper end portion of the tubular member 79 of the standard. The curvature of the rearwardly directed portion 89 is such that the clip 111 is unable to slide forwardly therealong and, hence, forward shifting of the tablet arm is prevented. Rearward shifting of the tablet arm is prevented by the pivotal interconnection of the forward portion of the tablet arm and the forwardly directed upper portion 87 of the tubular member 77 of the standard, as hereinafter described.

More specifically, the enlarged portion of the tablet arm has a generally L-shaped tube 113 secured by suitable fasteners 115 to its under-surface and includes an arm 117 extending generally parallel to the side edges of the tablet arm and a leg 119 extending generally transversely to the side edges.

The rearward end of the arm 117 is rotatably connected to the forward end of the horizontally disposed arm portion of the standard so as to permit the arm to be moved between a generally horizontal position, as shown in full lines in FIGURE 5, and an upright position as shown in dotted lines in FIGURE 5, the latter position facilitating ingress to and egress from the shell 14.

More specifically, the forwardly extending horizontally disposed end portion 87 of the tubular member 77 of the standard is formed to define a hollow cylindrical cavity having disposed therein a cylindrical bearing member 121 which is keyed against rotation within the cavity by a pair of pins or dowels 123 and extends outwardly of the cavity. The outer end of this extending portion of the bearing member 121 is formed to provide a projecting semi-cylindrical segment 125 having a generally vertically disposed laterally directed face 127.

The forwardly extending portion of the bearing member defines an axis about which the L-shaped tubular member 113 rotates and, in this regard, is received within a cavity defined by the rearwardly extending arm 117 of the member 113. A plug 129 is disposed inwardly of the cavity of the arm and is keyed thereto by suitable pins or dowels 131. The rearwardly facing end of the plug is disposed adjacent the forward end of the bearing member 121 and is formed to provide a rearwardly projecting stud 133 of pie-shaped or quarter-round configuration adapted to cooperate with the semi-cylindrical segment 125 of the plug 121 to limit rotational movement of the tablet arm.

More specifically, and with reference to FIGURE 9, it will be seen that interengagement between the face 127 of the semi-cylindrical forwardly projecting segment 125 of the bearing member 121 and the faces of the pie-shaped stud 133 of the plug 129 limits the rotation of the L-shaped tubular member 113 and, hence, of the tablet arm 23, to approximately one quarter turn, thereby permitting the tablet arm to assume either a horizontal or an upright position. It has been found preferable to form the pie-shaped stud 133 so that the included angle thereof is slightly greater than 90°, thereby placing the tablet arm at slight angles to the vertical and horizontal in each of the respective positions.

An improved seating arrangement has thus been provided which includes an arm assembly which can be detachably mounted on a single seating unit, or which can be disposed intermediate and attached to each of a pair of side-by-side units, in which case the arm assembly serves to interconnect the units to each other.

While various structural features of the invention have been shown and described with respect to one specific embodiment thereof, it should be apparent that various modifications might be made therein without departing from the scope of the invention.

What is claimed is:

1. An arm assembly adapted to be detachably mounted adjacent one side of a seating unit to which a bracket is fixedly secured, said arm assembly comprising a standard having affixed thereto a bracket adapted for interlocking engagement with the bracket of the seating unit, said brackets being so formed that engagement therebetween is effective to rigidly secure said arm assembly to the seating unit, and an arm member carried on said standard.

2. An arm assembly adapted to be detachably mounted intermediate a pair of seating units arranged in side-by-side relation and having a bracket affixed to each of the adjacent sides thereof, said arm assembly comprising a standard having a bracket affixed to each of its opposite sides, each of said standard brackets being adapted for interlocking engagement with a complementary bracket of one of the seating units so as to detachably secure said arm assembly to each of the seating units and interconnect the seating units with each other, and an arm member carried on said standard.

3. An arm assembly adapted to be detachably mounted adjacent one side of a seating unit provided with a bracket, said arm assembly comprising a standard provided with a complementary bracket adapted for interlocking engagement with the bracket of the seating unit so as to detachably secure said arm assembly to the seating unit, said bracket of said arm assembly including horizontally spaced laterally facing surfaces adapted to cooperate with similarly disposed surfaces on the bracket of the chair to limit lateral movement of said arm assembly in the interlocking position, said bracket of said arm assembly also including a downwardly facing surface adapted to cooperate with an upwardly facing surface on the bracket of the chair to limit downward vertical movement of said arm assembly when in the interlocking position whereby said arm assembly may be lowered vertically into or raised vertically out of mounting engagement with the chair, and an arm member carried on said standard.

4. A tablet arm assembly adapted to be detachably mounted adjacent one side of a seating unit provided with a bracket, said tablet arm assembly comprising an upright standard, a complementary bracket secured to said standard and adapted for interlocking engagement with the bracket of the seating unit so as to detachably secure said tablet arm assembly to the seating unit, said standard including an outwardly extending generally horizontal member, a tablet arm disposed adjacent the upper end of said standard, and means for pivotally connecting said tablet arm to said standard comprising a support member secured to the under surface of said tablet arm in coaxial relation with the member of said standard, a bearing extending from one of said horizontal and sup-

port members in the direction of the other member, the other of said members defining a cavity at one end to receive said bearing, a plug fixedly secured within said cavity and including an end disposed adjacent the inwardly extending end of said bearing, said adjacent ends of said bearing and said plug being provided with meshing projections to limit rotation of said support member and, hence, of said tablet arm to a predetermined included angle.

5. A seating arrangement comprising a seating unit having a bracket affixed adjacent one side thereof, and an arm assembly detachably mounted on said seating unit, said arm assembly comprising a standard, a bracket affixed to said standard and interlockingly engaged with said bracket of said seating unit, said brackets being so formed that engagement therebetween is effective to rigidly secure said arm assembly to the seating unit, and an arm member carried on said standard.

6. A seating arrangement comprising a seating unit, a bracket secured to said seating unit and defining a pair of horizontally spaced laterally facing surfaces and an upwardly facing surface, and an arm assembly detachably mounted on said seating unit, said arm assembly comprising a standard, a bracket secured to said standard, said bracket defining a pair of horizontally spaced laterally facing surfaces and a downwardly facing surface in engagement with said laterally and upwardly facing surfaces respectively defined by said bracket secured to said seating unit, and an arm member carried on said standard.

7. A seating arrangement comprising a seating unit, a bracket secured to said seating unit, said bracket including a pair of channels defining upwardly converging grooves, and an arm assembly detachably mounted on said seating unit, said arm assembly comprising a standard, a bracket secured to said standard, said bracket including a pair of upwardly converging tongues disposed within the said grooves defined by said bracket of said seating unit, and an arm member carried on said standard.

8. A seating arrangement comprising a seating unit provided with a bracket, and a tablet arm assembly detachably mounted on said seating unit, said tablet arm assembly comprising a standard, a bracket secured to said standard and interlockingly engaged with said bracket of said seating unit, said standard including an outwardly extending generally horizontal member, a tablet arm disposed adjacent the upper end of said standard, and means for pivotally connecting said tablet arm to said standard comprising a support member secured to the under surface of said tablet arm in coaxial relation with the member of said standard, a bearing member extending from one of said horizontal and support members in the direction of the other member, the other of said members defining a cavity at one end to receive said bearing, a plug fixedly secured within said cavity and including an end disposed adjacent the inwardly extending end of said bearing, said adjacent ends of said bearing and said plug being provided with meshing projections to limit rotation of said support member and, hence, of said tablet arm to a predetermined included angle.

9. A seating arrangement comprising a pair of seating units disposed in side-by-side relation, a first and a second bracket secured to each of opposite sides of each of said seating units, said first bracket including a pair of channels defining upwardly converging grooves and said second bracket including a pair of upwardly converging tongues, and an arm assembly disposed intermediate said seating units and detachably secured to each so as to detachably secure said seating units to each other, said arm assembly comprising a standard, a first and a second bracket secured to opposite sides of said standard and interlockingly engaged with a bracket of one of said side-by-side seating units, said first bracket including a pair of upwardly converging tongues disposed within the said upwardly converging grooves of said first bracket of said seating unit and said second bracket including a pair of channels defining upwardly converging grooves having disposed therein the tongues of said second bracket of said seating unit, and an arm member carried on said standard.

10. A seating arrangement comprising a pair of seating units disposed in side-by-side relation, a bracket secured to each of opposite sides of each of said seating units, one of said brackets defining a pair of horizontally spaced laterally facing surfaces and a downwardly facing surface, and an arm assembly disposed intermediate said seating units and detachably secured to each so as to detachably secure said seating units to each other, said arm assembly comprising a standard, a bracket secured to each of opposite sides of said standard and interlockingly engaged with a bracket of one of said side-by-side seating units, one of said brackets defining a pair of horizontally spaced laterally facing surfaces and a downwardly facing surface in engagement with said laterally and upwardly facing surfaces respectively defined by said one bracket of said seating unit, and an arm member carried on said standard.

11. A seating arrangement comprising a pair of seating units disposed in side-by-side relation, a bracket secured to each of opposite sides of each of said seating units, one of said brackets including a pair of channels defining upwardly converging grooves and the other of said brackets including a pair of upwardly converging tongues, and an arm assembly disposed intermediate said seating units and detachably secured to each so as to detachably secure said seating units to each other, said arm assembly comprising a standard, a bracket secured to each of opposite sides of said standard and interlockingly engaged with a bracket of one of said side-by-side seating units, one of said brackets including a pair of upwardly converging tongues disposed within the said upwardly converging grooves of said one bracket of said seating unit and the other of said brackets including a pair of channels defining upwardly converging grooves having disposed therein the tongues of said other bracket of said seating unit, and an arm member carried on said standard.

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