

July 3, 1951

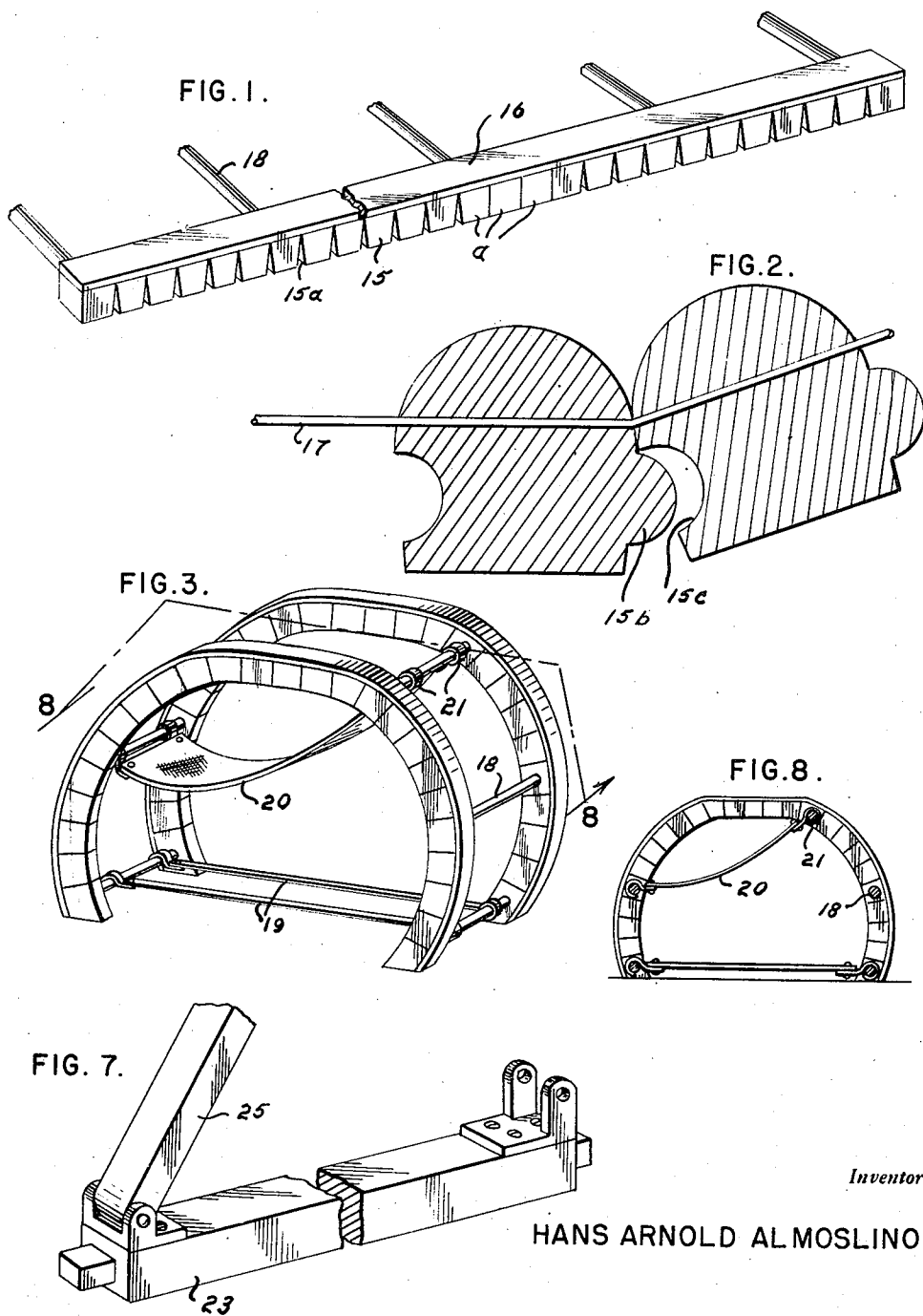
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2,558,722

PORTABLE BODY-SUPPORTING ASSEMBLAGE

Filed June 27, 1949

2 Sheets-Sheet 1



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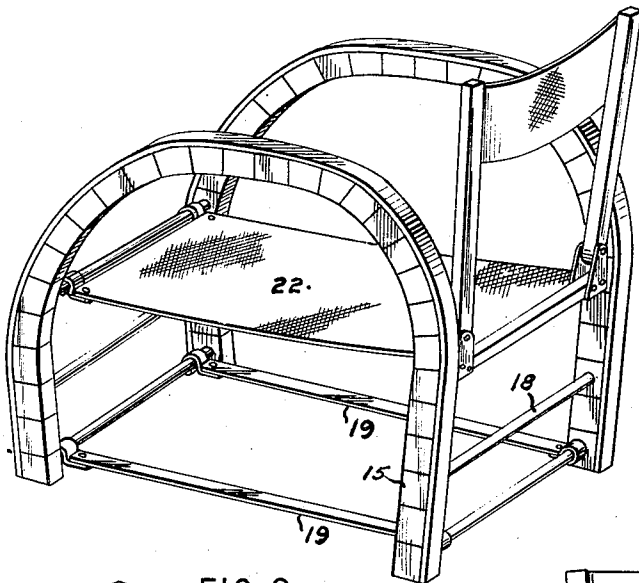


FIG. 4.

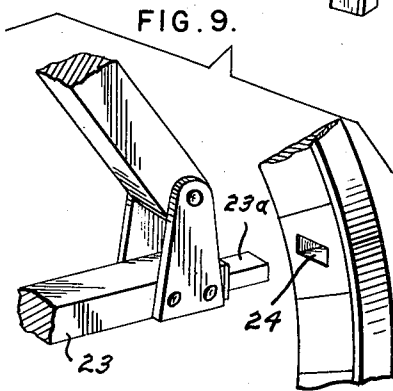


FIG. 9.

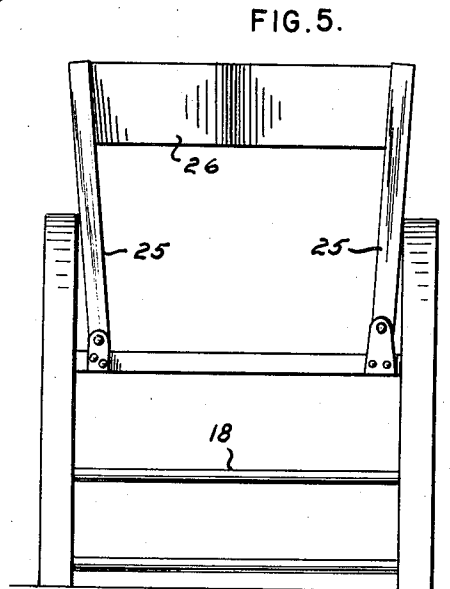


FIG. 5.

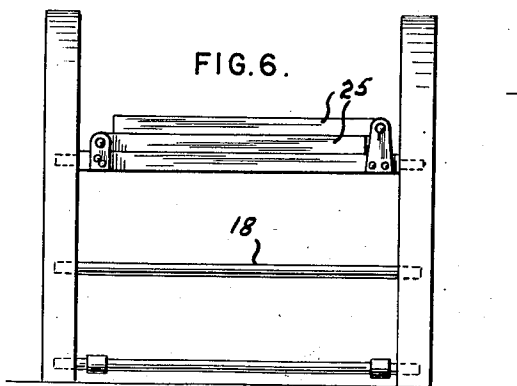


FIG. 6.

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PORTABLE BODY-SUPPORTING
ASSEMBLAGE

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Application June 27, 1949, Serial No. 101,596

7 Claims. (Cl. 155—191)

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This invention relates to improvements in portable body-supporting assemblages, being an elaboration of the assemblages disclosed in my applications filed respectively on October 20, 1948, Serial No. 55,590, now abandoned, and April 19, 1949, Serial No. 88,476.

In the earlier disclosed forms of the assemblages an intermediate zone of the length of the units provides the surface which contacts the floor or other supporting surface, the end zones of the units then being carried upwardly, with the ends then connected by releasable connections, the units thus having a concave relation to the supporting surface. Since the textile body-securing structure is supported by such end zones between adjacent units, the connections for the opposite ends of a section serve to preserve the facial contact of the mating faces of the connected sections with the weight of the occupant aiding in this respect. In addition, such connections can serve as arm supports for the occupant, where the assemblage is of chair form, or as a confining structure where the assemblage is of crib form. Such unit can be given varied configurations through the angularity of the mating faces of the sections, so that the direction of length of a unit may include straight line zones and curved zones, or, as in the case of rocking chair structures, may be substantially of curved form.

The present invention is designed to increase the range of usefulness of such units by varying certain of the characteristics of the assemblages, thereby increasing the number of styles in which the assemblages may be formed. For instance, instead of supporting the textile structure from the end zones of the units, such textile element is supported by an intermediate zone of the units, with the end zones forming foot structures for the assemblage. In other words, the assemblage is reversed with respect to the supporting surface, by changing the relation from the concave form of the earlier disclosures to that of a convex relationship. In such change, the end connections are used, as before, but in the present invention the end connections are positioned close to the supporting surface, and thus below the position of the occupant. As a result, the intermediate zone of the unit becomes the arm rest zone of the assemblage, with the ends contacting the supporting surface as feet for the assemblage. The structure is thus less conducive to rocking chair service, but gives to the assemblage a closer approach to the leg and foot style of furniture assemblage, necessarily absent in the assemblages of the earlier disclosures.

Another advantage resulting from the present invention is the ability to provide a chair form with a back rest capable of being folded into a position in which it can be rolled up with the assemblage for storage or transportation. The

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convex shaped unit construction is particularly adapted to the formation of chair assemblages, the curvature and position of the intermediate zone of the unit in this shape permits the use of the seating method of supporting the body, thus permitting of the use of a back rest which can be anchored in block sections of the connected units.

Another of the advantages presented by the present form is the fact that the convex unit formation has the characteristics of a span of arched type, thus placing the weight of the occupant as practically suspended within the arch, thus greatly increasing the stability of the assembly, since the weight is being supported directly by the unit span. In the earlier disclosed forms, the stability is provided by the integrity of the connections between the unit end zones in preventing spreading of such zones, so that the weight of the occupant must be considered in providing such connections. In the present form, the connections are used only to prevent spreading of the end zones of the unit, with the restraint aided by the contact of the ends of the unit with the supporting surface in producing the foot characteristic, the weight factor being an aid in increasing the friction value of the contacting feet.

The sectional formation of a unit is generally similar to those presented in the earlier disclosures, each section being a block having its opposite mating faces complementary to such faces of adjacent blocks, the succession of blocks being connected together by the use of suitable means which extends throughout the length of the unit and is located in the marginal zone of the unit which forms the outer side of the curved unit. In the earlier disclosed forms of concave type, the marginal zone is the under zone of the unit, while in the present convex type the marginal zone is the upper or outer zone of the unit. The section connection may be an external flexible band secured to the outer faces of the blocks, as in the first of the earlier disclosures, or may be in the form of spaced cables extending through the blocks adjacent such outer block face and thus within the marginal zone. Either form permits the unit to be inverted when it is desired to roll up the assemblage for storage or transportation purposes.

The mating faces of a block are generally planar, but may include a keying formation such as a projection or recess. The planar characteristic is presented through a face which is angular to the general plane of the block marginal zone referred to. If the block forms a section of a unit zone designed to extend in a straight line, the mating face extends at right angles to such outer face. If the block forms a section of a unit zone of curved type, the mating face will in most cases extend at an included angle of 90° or

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slightly less of a right angle, thus providing for the desired curvature. In some instances the angle may, if desired, be slightly more than 90°.

To these and other ends, therefore, the nature of which will be more clearly understood as the invention is hereinafter disclosed, said invention consists in the improved constructions and combinations of parts more particularly described hereinafter, illustrated in the accompanying drawings, and more particularly pointed out in the appended claims.

In the accompanying drawings, in which similar reference characters indicate similar parts in each of the views—

Figure 1 is a fragmentary perspective view of form one of the units employed in practicing the invention.

Fig. 2 is a sectional view of a pair of connected blocks employed in constructing a different form of unit.

Fig. 3 is a perspective view of one form of assemblage formed in accordance with the present invention.

Fig. 4 is a perspective view showing a different form of assemblage.

Fig. 5 is a view in rear elevation of the structure of Fig. 4, the back rest being shown in service position.

Fig. 6 is a similar view showing the back rest folded preliminary to preparing the assemblage for storage or transportation.

Fig. 7 is a detail perspective view of the back rest supporting connection.

Fig. 8 is a sectional view of the assemblage shown in Fig. 3.

Fig. 9 is a composite detail perspective view showing the end zone of the back rest and its support and the cooperating block section by which the support is carried, the two parts being shown as separated.

As above pointed out, the present invention utilizes many of the features disclosed in the two earlier applications above identified, the principal distinction being in the manner of their use. For instance, in the earlier disclosures, the unit formations were so arranged as to set up the characteristics of a supporting formation formed concave with respect to the ground or other surface on which the assemblage is being supported in service. In the present invention the supporting or framing formation has its units arranged so as to present the formation as of convex type relative to such supporting surface, in that, in the present invention the ends of the units provide the contact with such supporting surface while in the earlier disclosures the unit contact with the supporting surface is found in an intermediate zone of the length of the unit with the end zones extending upwardly from such supporting zone.

This distinction in the arrangement of the units as to the relation of the unit to the supporting surface, sets up certain variations in the characteristics of the manner in which the assemblage is made serviceable. For instance, in the earlier forms, the concave type, the assemblage in service depends mainly upon the elements which connect the upstanding end zones of the units, and which must be taut to maintain the units in their desired formation. The supporting structure for the occupant is connected with such end zones, but is generally not taut excepting when the weight of the occupant is present. Hence, the assemblage takes on somewhat of the characteristics of a suspension struc-

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ture, since both the elements and the weight are being made active on the end zones to maintain their spacing, and thereby maintain the mating faces in contact. With the form disclosed herein, the convex type, the end zones are connected by elements, as before, but the elements themselves are adjacent the supporting surface and the ends of the units are in contact engagement with such supporting surface. In this type, the supporting structure for the occupant is supported at intermediate points in the length of the unit. As a result, the contact engagement of the ends of the unit tends to fix the position of the ends and thus aids the connecting elements, while the weight of the occupant, being applied at intermediate points, tends to preserve the contact engagement and at the same time applies weight upon the blocks located between the unit ends and the supporting point, to thereby maintain the mating faces in contact within the upstanding portions of the unit length.

Each of the types presents certain advantages, due to the type itself. For instance, the earlier type is best adapted for use where the occupancy involves reclining; the concave arrangement is especially useful under these conditions, due to the ability to provide any needed unit length without materially affecting the height of the assemblage in service so that the necessary spacing of the end zones to enable the proper length of occupant supporting structure can be readily secured. On the other hand, the present type is more suitable for a seated occupant, the latter requiring a materially shorter length of supporting surface, so that in mounting the ends of such surface, the ends are located at intermediate points in the length of the unit.

The unit shown in Fig. 1 is made up of a succession of blocks 15 of proper dimensions, these being supported in a succession series by a flexible strip 16 having a length equal to the length of the unit, similar faces of the blocks being fixedly secured to a face of the strip with adjacent blocks in contact within the marginal zone, the strip thus permitting a hinge like action between adjacent blocks. The secured blocks each have a pair of mating faces, the faces between adjacent blocks and indicated at 15a, extending generally angular to its secured face. If the unit is to extend in a straight line when in service, the included angle between the mating face and the securing face equals 90°, whereas if the unit is to extend in curved form in service, the included angle is slightly less than such right angle. For the purpose of illustration, Fig. 1 includes both types, zone a providing the straight line characteristic with the remainder of the blocks shown being of the type for producing a curved length. In Fig. 3, the units are shown as of the curve producing type, but it is apparent that if a few of the mid-zone blocks be of the zone a type, the top of the arch will include a straight-line zone and such variation is contemplated within the invention.

As indicated in Fig. 2, the unit may be formed with blocks of a different shape and secured together in a different manner. In this form the strip 16 is designed to be substituted by a pair of cables 17, which are threaded through the outer marginal zone of the blocks instead of being applied on the surface as in the Fig. 1 form, the cables being spaced apart, but with the blocks in contact within the cable zone of the mating faces of adjacent blocks. For illustration purposes, the mating faces of the blocks are

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shown as including a keying formation, a projection 15b opposing a recess 15c on adjacent mating faces, and these serve to reduce strain on the cables at such mating faces. To provide strength, the outer face is of curved form instead of the planar securing face of the Fig. 1 form, this permitting the rolling up of the assemblage. Obviously, the projections 15b and recesses 15c can be applied to the blocks of the Fig. 1 form, and the blocks of the Fig. 2 form may omit the projections and recesses thus leaving the mating faces as in the Fig. 1 form.

In producing the framing formation of the assemblage for either form of unit, two or more of the units, having the block structures duplicated to make the units alike, are arranged in parallel and spaced apart relation, with corresponding blocks of a unit connected by connections 18 having their ends secured in the blocks. A suitable number of these, in spaced apart relation, are employed to give stability to the framing formation. Such a formation can be laid out flat, as in Fig. 1, from which position it will be readily understood that the formation can be readily rolled up with one of the ends forming the core and with the strip as the inside portion of the rolled up formation, thus making the assemblage suitable for storage or transportation. On the other hand, if the intermediate zone of the formation be raised, the units will take on the curved form shown in Fig. 3 through the fact that the adjacent mating faces are brought into contact. This is a service position of the framing formation, and to maintain it, the opposite end zones are connected by suitable connections 19, preferably of strap, rope or cable type which permits ready securing in position and removal when desired. For instance, the connections may have clips or other securing devices permitting location on connections 18 within the end zones.

In Figs. 3 and 8, the units are shown as curved throughout their length, the blocks having their mating faces at similar included angles less than a right angle, the angle selected being such as would provide a circle effect of considerable diameter. This is of advantage in connection with the particular form of body support that is shown in these views, a support 20 of considerable length capable of permitting reclining of children in a prone position. The support is preferably of textile material with its ends provided with suitable disengageable clips 21 which can be detachably secured to a pair of spaced connections 18. As shown, the head end of the support is shown as raised, and to secure this the selected connection must be in an upper portion of the curvature and, therefore, tends to limit the possible length of the support, the latter being located above a horizontal diameter of the circle and, therefore, of less chordal length than the diameter, although the concave effect produced by the slack of the support may actually cause the support length to equal or be greater than such diameter. Hence, in this form, the unit has its blocks of similar angularity and has a length greater than half the circumference of such circle to thus place the feet formed by the end blocks as spaced a shorter distance than the length of the diameter. This practically places the feet of the end zones as in approximate vertical alinement with the lower end of support 20 (Fig. 8), an advantage in that it would permit the occupant to sit on the lower end zone of the support with the lower leg zone

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easily contacting the floor. This showing is, of course, illustrative, since the connections 18 can be mounted in any of the blocks so that it is possible to arrange the support 20 for different kinds of service. For instance, if the support 20 shown had the connection 18 for the support head end positioned closer to the vertical apex of the positioned unit, but be of the length shown, the increased slack would tend to produce a seat effect with a back, when occupied. It will be understood, of course, that connections 18 are omitted for such intermediate zone of unit length as may lie above the support 20.

Figure 4 indicates a variation in the form of the frame formation from that shown in Fig. 3 described above, in that this structure is designed as of chair type in which the seat support extends approximately horizontal, the portions of the units which provide the leg zones of the frame approaching a straight line effect. In this form, the curvature of the intermediate zone of the unit is controlled more or less by the front to rear length of the seat which may be as desired. This curvature is controlled by the angles of the mating faces, the latter also controlling the straight line effect of the leg zones. In this connection, should it be desired to present the arm rest effect, which the unit intermediate zone provides, as of partial straight line type rather than the continuous curvature shown, the central zone blocks of a unit would have blocks with mating faces of the right-angled type or their equivalent.

One of the advantages of the present invention lies in the ability to fashion the assemblage with a definite back to give the chair effect, this being disclosed in Figs. 4 to 7 and Fig. 9. To provide this result, the supporting connection for the rear end of the seat 22 is varied from the connections 18, being in the form of a connection 23, the ends 23a of which are made non-circular in contour, square or oblong in cross-section. The pair of blocks which support this connection have a complementary mortise 24, this being positioned in the block in such manner that the arms presently referred to will extend at the desired angle when in upstanding position; the non-circular contour of the end connections will prevent the connection 23 from turning when the occupant's back is resting on the chair back.

Since the invention contemplates foldability of the chair back when the assemblage is rolled up for storage or transportation, the back is formed of a pair of arms 25 having their lower ends pivotally connected to connection 23 in such manner as to be capable of being moved inward to a folded superposed position, as indicated in Fig. 6, the outer ends of the arms being connected by a web connection 26 which is foldable when the arms are being moved to folded position, or may be removably secured in position by snap or other fastenings. The mountings for the pivotal movement of the arms into the superposed positions may be of any desired form, a simple arrangement being to locate the pivot axis for one arm closer to the top of the connector than the axis of the other arm.

While the arms fold inwardly toward each other and are freely pivotal, they do not collapse in service. Although the pressure of the back of the occupant on the webbing 26 would tend to permit the webbing to yield rearward, such yield would draw the arms into contact with portions of the body of the user to limit the inward move-

ment of the arms and thus limit the amount of yield possible. In other words, the arrangement tends to provide a back rest formation which will conform to the user's body, but tends to prevent excessive rearward pressure since such pressure would cause the arms 25 to exert pressure at the sides of the body to avoid which the rearward pressure must be eased. If desired, removable braces similar to 18 could be positioned between the arms 25 to prevent inward movement of the arms when in use. Of course, these braces would be removed when rolling up the structure for carrying purposes.

As will be understood, either of the block formations shown in Figs. 1 and 2 may be utilized in the formation of the unit. Blocks carrying the projections and recess formation of Fig. 2 are particularly adaptable for use in the present invention to prevent undue strain upon the elements 16 or 17, the arrangement being applied to the blocks of Fig. 1 and is desirable although not necessarily essential when said form of unit is being used in the present invention. Specific claims for the form of the block sections are not presented herein, these being presented in the application, Serial No. 88,476 above identified.

As will be understood, the particular dimensions and shape of the framing support units can be widely varied through the selection of the angles being presented in the mating faces. These included angles are usually not greater than a right angle and the extent of variation from the latter will tend to control the dimension characteristics of the arch, the greater the variation from a right angle the smaller becomes the arch. This possibility enables the assemblage to be formed for service to suit the character of service, as an occupant in prone position requires a greater span dimension than a seated occupant. In addition, the inclusion of block sections of right angular mating faces or different angles of mating faces, permits variation in the contour of the units, thus enabling variations from a true arch form.

While I have shown and described several different forms of the invention, it will be understood that changes and/or modifications therein may be found desirable or essential in meeting the exigencies of service or the individual desires of a user. I, therefore, reserve the right to make any and all such changes and/or modifications so deemed desirable or essential insofar as the same may fall within the spirit and scope of the invention as expressed in the accompanying claims, when broadly construed.

What is claimed as new is:

1. In assemblages for supporting service, wherein the assemblage is serviceable for supporting activities but manipulable into transportation and/or storage form, an assemblage of such type comprising a pair of parallel units extending in spaced-apart relation with the units connected by spaced connectors, each unit being formed of a succession of sections connected in series with the sections formed with mating faces arranged to produce a definite unit contour when the mating faces are in contact and to permit rolling-up of the unit for transportation or storage when the complete mating faces are out of contact, said mating faces being relatively formed to present the unit contour as of convex type relative to the supporting surface on which the assemblage is positioned and with the ends of the unit positioned in contact with such supporting surface, the end zones of a unit being connected

by detachable connecting means supported by connectors carried by the end sections of the units to thereby maintain the units in their framing support position and to locate the connecting means below the supporting element.

2. An assemblage as in claim 1 characterized in that the sections of a unit are maintained in the series succession by connecting means extending throughout the length of the unit and applied to the individual sections in similar marginal zones of the latter with such marginal zones located on the outer marginal zone of the convex unit contour.

3. An assemblage as in claim 1 characterized in that the length of a unit exceeds more than half the circumferential length of a circle conforming to the service contour of the unit, whereby the end sections of the unit are spaced a distance less than the length of a horizontal diameter through the circle to thereby permit location of an end zone of the supporting element in position for convenient sitting posture of the occupant.

4. An assemblage as in claim 1 characterized in that the supporting surface is dimensioned for chair seat service, with the inner end of the seat supported by a connector carrying a collapsible back-rest formation.

5. An assemblage as in claim 4 characterized in that the connector is mounted non-rotatively in its unit section, such connector carrying a pair of arms pivotally mounted thereon for folding into superposed relation, the free ends of the arms having a webbing connection active as a back rest when the assemblage is in service position.

6. An assemblage as in claim 5 characterized in that the connector is formed with end tenons of non-circular contour with the framing unit sections formed with mortise contours complementary to the tenons, the contour of the mortise being arranged to retain the arms against relative swinging when in predetermined service positions.

7. An assemblage as in claim 1 characterized in that the supporting surface is dimensioned for chair seat service, with the inner end of the seat supported by a connector carrying a collapsible back-rest formation, the connector being mounted non-rotatively in its unit sections, the connector having spaced pivot mountings for separate arms adapted to extend upwardly from the respective mountings when in service position and to be moved pivotally to a superposing relation when inactive, the outer end zones of the arms bearing a webbing connection to form a back rest when the arms are in service position.

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