Oct. 20, 1936. F. G. MANSON 2,057,687

PNEUMATIC AIRPLANE SEAT

Filed Aug. 16, 1935 2 Sheets-Sheet 1

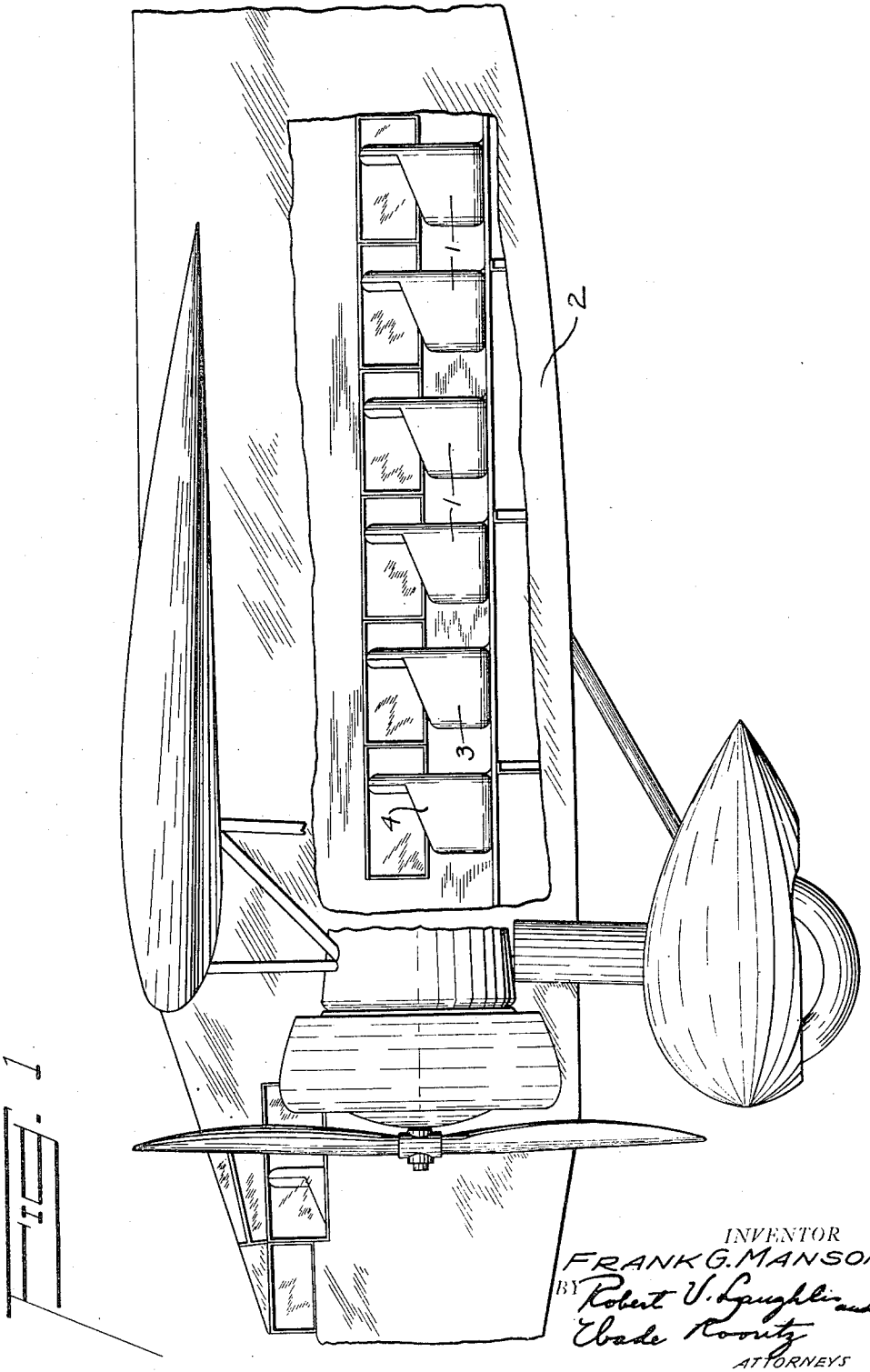


Fig. 1

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FIG. 2

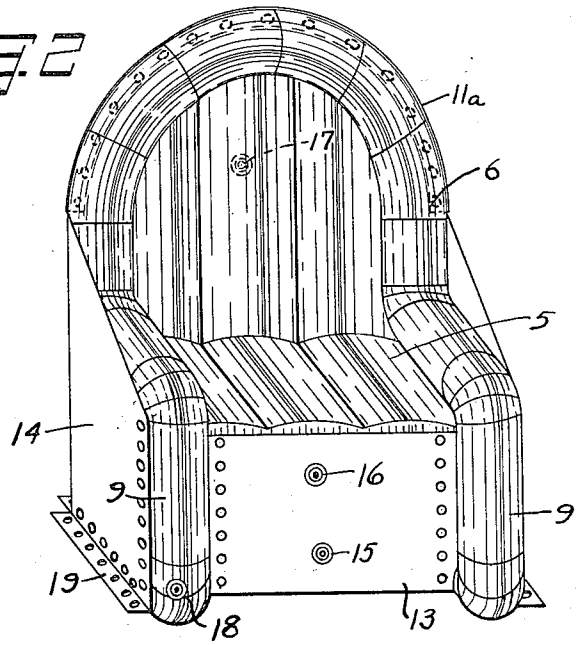


FIG. 4.

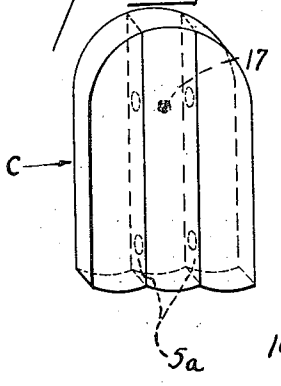


FIG. 3.

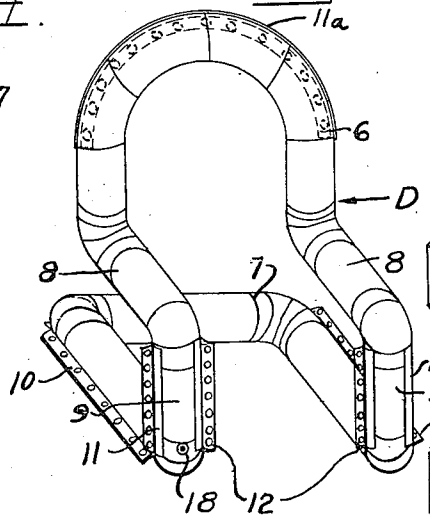
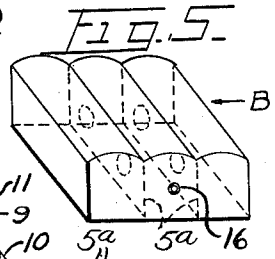


FIG. 5.



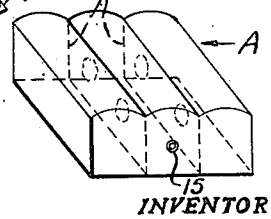


FIG. 6.

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Patented Oct. 20, 1936 2,057,687

UNITED STATES PATENT OFFICE

2,057,687

PNEUMATIC AIRPLANE SEAT

Frank G. Manson, Dayton, Ohio

Application August 16, 1935, Serial No. 36,543

6 Claims. (Cl. 155—179)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

The invention described herein may be manufactured and used by or for the government for governmental purposes, without the payment to me of any royalty thereon.

My invention relates generally to the construction of supports for the person and more particularly to a new and novel construction of pneumatic airplane chairs. In the past, airplane chairs have been constructed as simply as possible consistent with sturdiness in order to have a seat of the least possible weight with little or no concern as to the comfort of the passenger or his safety in case of a bad landing or crash. Bearing in mind the features lacking in the conventional design of airplane chair and also well knowing the necessity of the characteristics inherent in them, I have provided a type of chair incorporating not only lightness and sturdiness but in addition thereto safety and comfort.

The main object of my invention is to provide an airplane chair constructed of a plurality of gas-tight, non-communicating inflatable cells made from rubber inner-tubing, rubberized fabric, artificial rubber, or other similar material and filled with air or gas. With this construction, the entire chair cannot accidentally collapse should one cell become punctured or leaky. Also, according to my invention, each cell constitutes a bracing element for the cells adjacent to it, thereby eliminating the necessity for an outside or rigid frame.

A further object of my invention is to provide a cellular structural arrangement whereby the individual cells may be easily replaceable, as well as means for detachably connecting the chair as a whole to the floor, in substantially fixed relation.

Another object of my invention is to provide a chair formed of this character with a fabric strip or strips for maintaining the cells in assembled relation and for reinforcing the chair as a whole. This also serves to make the seat more attractive to the user.

Another object of my invention is the construction of a chair for an aircraft in which the seat portion of the structure is readily and easily adjustable to different heights. This makes the seat comfortable and at the same time permits the use of a parachute pack without inconvenience to the wearer.

A transport provided with a sufficient number of chairs of the above character will provide sufficient buoyancy to keep the airplane afloat in case of a forced landing of a land plane in water and in case the pontoons of a sea plane are damaged. It is also readily apparent that when my form of chair is used in any vehicle, particularly an airplane, and one seat is immediately rearward of another, the forward seat will form a "crash pad" in case of an accident or forced landing.

With these and other objects in view, I shall now proceed with the description and drawings in which like parts are referred to by like numerals.

In the drawings:

Fig. 1 is a side view of an airplane, partially in section, incorporating my invention.

Fig. 2 is an assembled view of my seat in perspective.

Fig. 3 is a perspective view of one of the cellular structures of the chair.

Fig. 4 is a perspective view of another cellular structure of the chair.

Figs. 5 and 6 are perspective views of a pair of cellular structures that constitute the seat of the chair.

In Fig. 1 it will be seen how I intend to use my seat in the cabin of an airplane **2**. It is also seen how, in placing one seat **3** immediately rearward of another seat **4**, the forward seat forms a resilient pad for a person in the rearward seat in the case of sudden stopping of airplane due to a crash. It will also be seen that in the case of sudden vertical descent of an airplane, especially where the plane suddenly settles to the ground and "pancakes" or suddenly contacts the ground vertically, there will be sufficient shock absorbing in my type of seat to eliminate any ill effects to the persons in the aircraft due to the impact shock.

It is also apparent in Fig. 1 that by incorporating my chair in an airplane, especially in a transport, that my seats will provide sufficient buoyancy to be greatly in excess of the buoyancy provided in conventional pontoons of an aircraft.

Referring more particularly to Figs. 3 to 6, it will be seen that my chair is composed of a plurality of separate or individual collapsible cellular structures A, B, C, and D. Cells A and B constitute the seat cushion proper, both being of like dimensions throughout and being intended to be used in superposed relation with respect to one another. The total height of these cushions is to be the usual height for such seats. In the drawings it will be seen that cells A and B have "formers" **5***a* provided in them to "shape" the cells and keep them in a usable condition. These formers have holes or perforations provided in them of sufficient sizes to permit an easy flow of air therethrough respectively.

Cell C constitutes the back portion of my chair and, as shown in the drawings, this cell is normally in a vertical position and rests at the bottom against the back vertical walls of cells A and B. The lower portion of this cell is of rectangular contour while the upper portion is formed to fit within an inverted U-portion of the cell D. The thickness of this cushion is much less than cushion A and B, but is similarly provided with "formers" 5*a*. These "formers" are also perforated to form a unitary structure.

Cell D, as shown in the drawing, is the frame of the chair and is of circular contour in cross-section. The base 7 of this cell is substantially of U-shaped contour and lies flatwise in a horizontal plane. When disposed in its normal horizontal position, the parallel sides of the U continue vertically as at 9 and bend horizontally as at 8 and lie in the vertical plane of the parallel sides of the U to form inverted L-shaped portions. The inverted L-portions continue vertically to form a vertical U-shaped portion 6 in the vertical plane of the bight, or base, of the horizontal U. This is all one cell and constitutes the frame portion of the chair, this frame portion substantially enclosing the cells A, B, and C. Cells A and B, as shown in Fig. 2, are contained between the horizontally disposed U-portion 7 and the inverted L-portions 8 and 9 of each side. Cushion C is substantially contained in and supports the inverted vertically disposed U-shaped portion 6 and rests upon the base of the horizontal inverted U-shaped portion 7. The inverted L-shaped portions form the arms of the chair 8 and the legs are formed by the base of the L as at A.

The cell D has a series of strips, as at 10, 11, 11*a* and 12, suitably attached thereto. These strips have button fasteners or other suitable quick attaching means on them to cooperate with the front strip of fabric 13 and the strip of fabric 14 on the sides and back. The strips 13 and 14 being detachably connected make it easily possible to replace the different cells of the seat structure. Although the strips are attached to the framelike cell D, it is easily conceivable they might be attached to the other cells.

Fig. 2 illustrates the chair in its assembled condition with the strip of fabric 13 attached to the strips provided on the legs 9, as described above, and substantially enclosing the front of the cushions A and B. This figure also shows fabric strip 14 attached to the strips provided on the base 7, legs 9, and attaching strip 11*a* on the back of U-shaped portion 6. This fabric strip 14 surrounds the sides and back of the chair and constitutes a reinforcing member or sling for the back.

As shown in Figs. 2 and 3 of the drawings, each of the cells A, B, C and D have individual valves 15, 16, 17 and 18, respectively, provided for separate inflation of each. As will also be seen in Fig. 2, this seat has a flap 19 provided around the bottom for easy attachment to the floor of an aircraft or other vehicle such as a train, motor bus, or even in a home. From the foregoing description, the ease with which the cell B may be removed or deflated for the convenience of a passenger or pilot having a parachute attached to his person, is readily apparent. It is also possible to adjust the resilience of the seat by increasing or decreasing the amount of air put into the seat cells A and B, or by valving the gas through valves 15 and 16. It is also readily apparent from the foregoing description, the ease with which my seat may be repaired, replaced or deflated and stowed away when not in use.

I claim:

1. In a chair a collapsible cellular frame structure formed of fabric material and having a horizontally disposed U-shaped portion, a vertically disposed inverted U-shaped portion arranged in the vertical plane of the bight of said first-mentioned U-shaped portion and inverted L-shaped portions connecting the legs of the first-mentioned U-shaped portion with the correspondingly arranged legs of the second-mentioned U-shaped portion, the upper and lower legs of said L-shaped portion serving as arm rests and legs respectively, a back-supporting structure between said U-shaped portions for supporting said U-shaped portions in spaced relation and a seat arranged between the inverted L-shaped portions and the back-supporting structure.

2. In a chair a collapsible cellular frame structure formed of fabric material and having a horizontally disposed U-shaped portion, a vertically disposed inverted U-shaped portion arranged in the vertical plane of the bight of said first-mentioned U-shaped portion and inverted L-shaped portions connecting the legs of the first-mentioned U-shaped portion with the correspondingly arranged legs of the second-mentioned U-shaped portion, the upper and lower legs of said L-shaped portion serving as arm rests and legs respectively, a back-supporting collapsible cellular structure between said U-shaped portions for supporting said U-shaped portions in spaced relation and a seat arranged between the inverted L-shaped portions and the back-supporting structure.

3. In a chair a collapsible cellular frame structure formed of fabric material and having a horizontally disposed U-shaped portion, a vertically disposed inverted U-shaped portion arranged in the vertical plane of the bight of said first-mentioned U-shaped portion and inverted L-shaped portions connecting the legs of the first-mentioned U-shaped portion with the correspondingly arranged legs of the second-mentioned U-shaped portion, the upper and lower legs of said L-shaped portion serving as arm rests and legs respectively, a back-supporting structure between said U-shaped portions for supporting said U-shaped portions in spaced relation, and a collapsible seat arranged between the inverted L-shaped portions and the back-supporting structure.

4. In a chair a collapsible cellular frame structure formed of fabric material and having a horizontally disposed U-shaped portion, a vertically disposed inverted U-shaped portion arranged in the vertical plane of the bight of said first-mentioned U-shaped portion and inverted L-shaped portions connecting the legs of the first-mentioned U-shaped portion with the correspondingly arranged legs of the second-mentioned U-shaped portion, the upper and lower legs of said L-shaped portions serving as arm rests and legs respectively, a back-supporting structure between said U-shaped portions for supporting said U-shaped portions in spaced relation, and a plurality of separate collapsible cellular structures arranged in superposed relation and between the inverted L-shaped portions and the back-supporting structure to form a seat portion.

5. In a chair a collapsible cellular frame structure formed of fabric material and having a horizontally disposed U-shaped portion, a vertically disposed inverted U-shaped portion arranged in the vertical plane of the bight of said first-mentioned U-shaped portion and inverted L-shaped portions connecting the legs of the first-men-

tioned U-shaped portion with the correspondingly arranged legs of the second-mentioned U-shaped portion, the upper and lower legs of said L-shaped portion serving as arm rests and legs respectively, a back-supporting structure between said U-shaped portions for supporting said U-shaped portions in spaced relation, a reinforcing strip of flexible material surrounding and intimately engaging the back portion and the sides of said frame portion, the free ends of said strip being readily detachably connected to the legs of said frame portion and a collapsible seat interposed between the inverted L-shaped portions and the back-supporting structure.

6. In a chair a collapsible cellular frame structure formed of fabric material and having a horizontally disposed U-shaped portion, a vertically disposed inverted U-shaped portion arranged in the vertical plane of the bight of said first-mentioned U-shaped portion and inverted L-shaped portions connecting the legs of the first-mentioned U-shaped portion with the correspondingly arranged legs of the second-mentioned U-shaped portion, the upper and lower legs of said L-shaped portion serving as arm rests and legs respectively, a back-supporting structure between said U-shaped portions for supporting said U-shaped portions in spaced relation, a reinforcing strip of flexible material surrounding and intimately engaging the back portion and the sides of said frame portion, the free ends of said strip being readily detachably connected to the legs of said frame portion, a further reinforcing strip of flexible material arranged forward of said seat and between the legs of said frame portion and readily detachably connected thereto and a flexible cellular seat structure interposed between the L-shaped portions and the back-supporting structure.

FRANK G. MANSON.