

Aug. 22, 1967

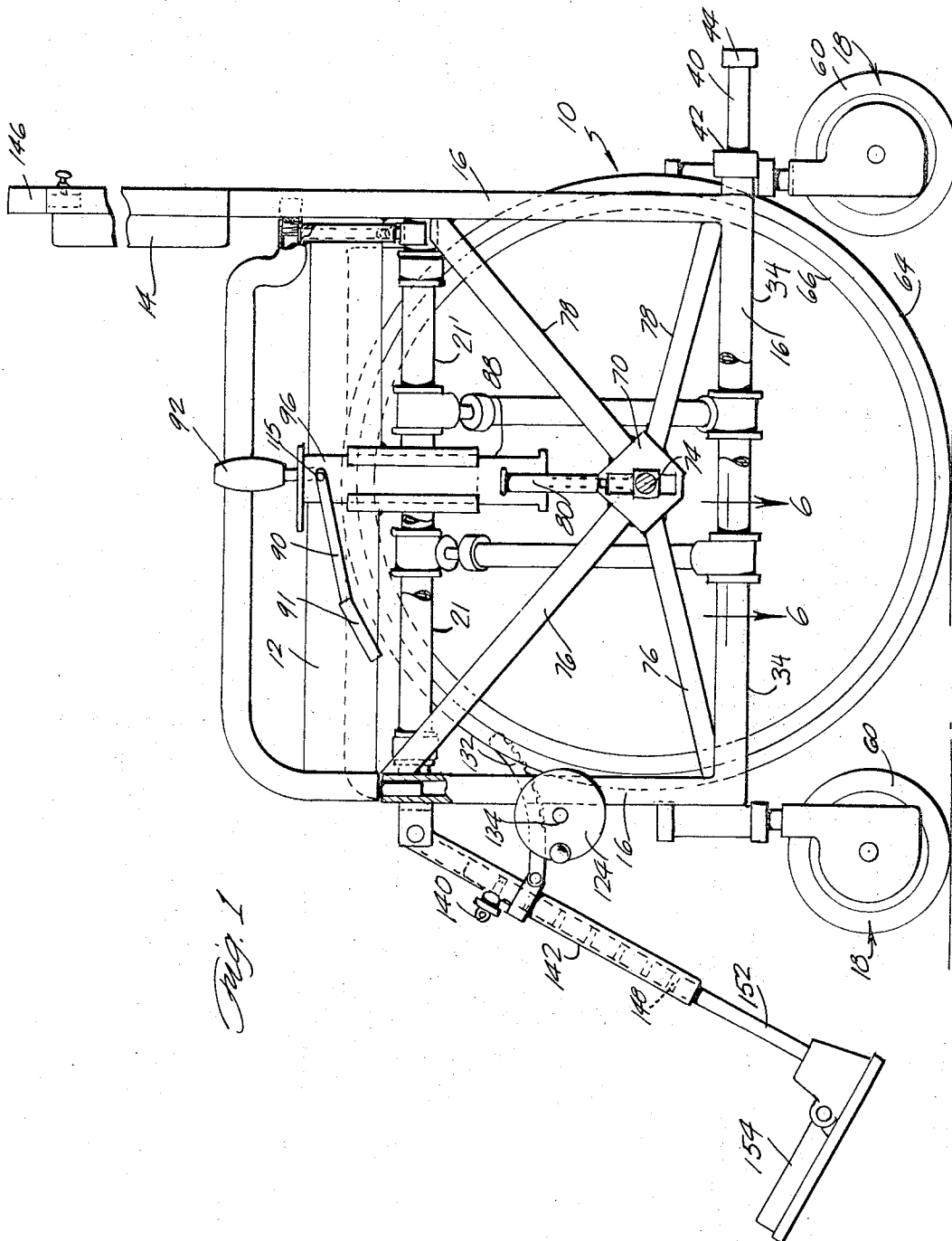
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3,337,261

FOLDING WHEEL CHAIR

Filed Oct. 23, 1965

4 Sheets-Sheet 1



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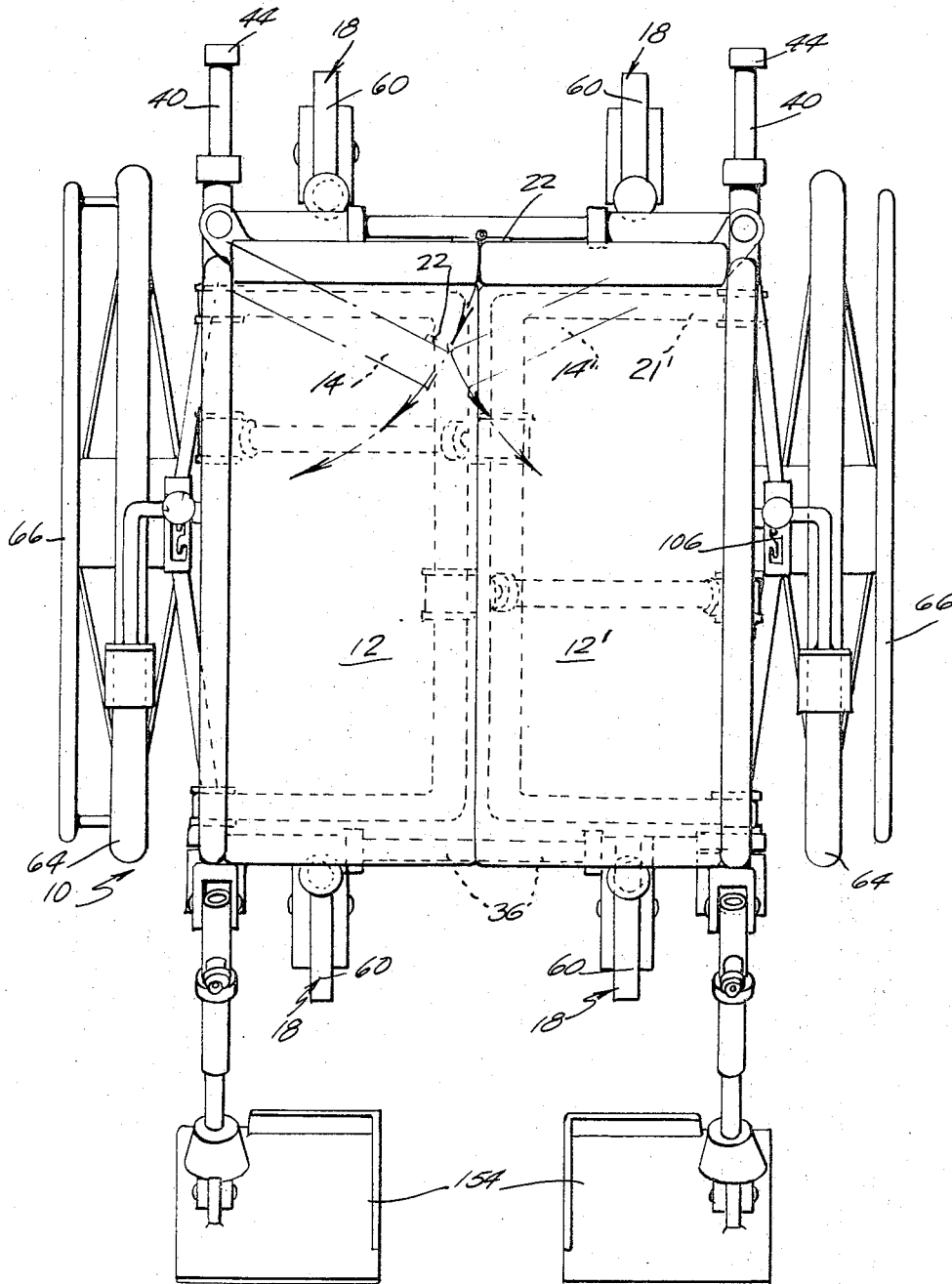


Fig. 2

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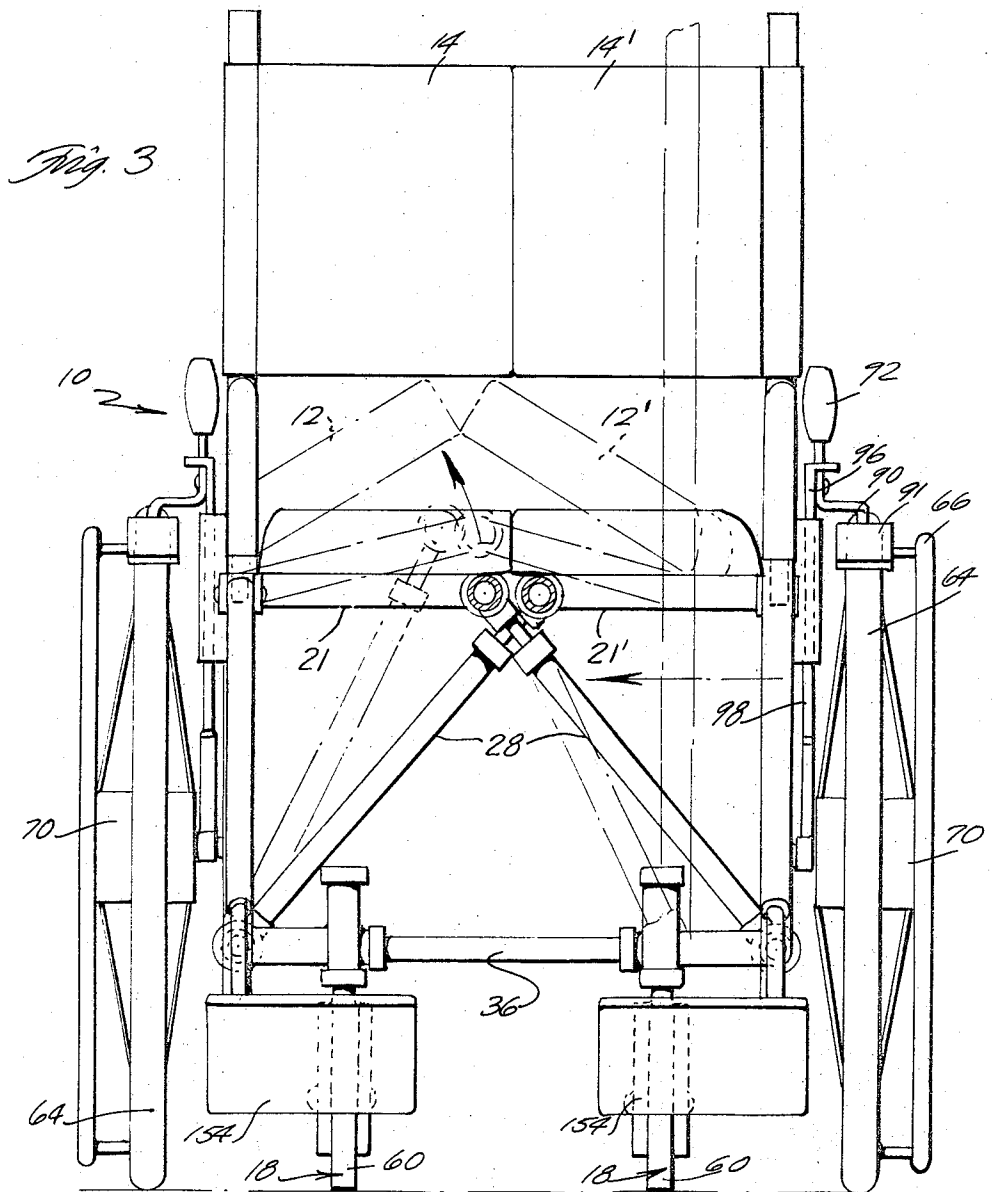
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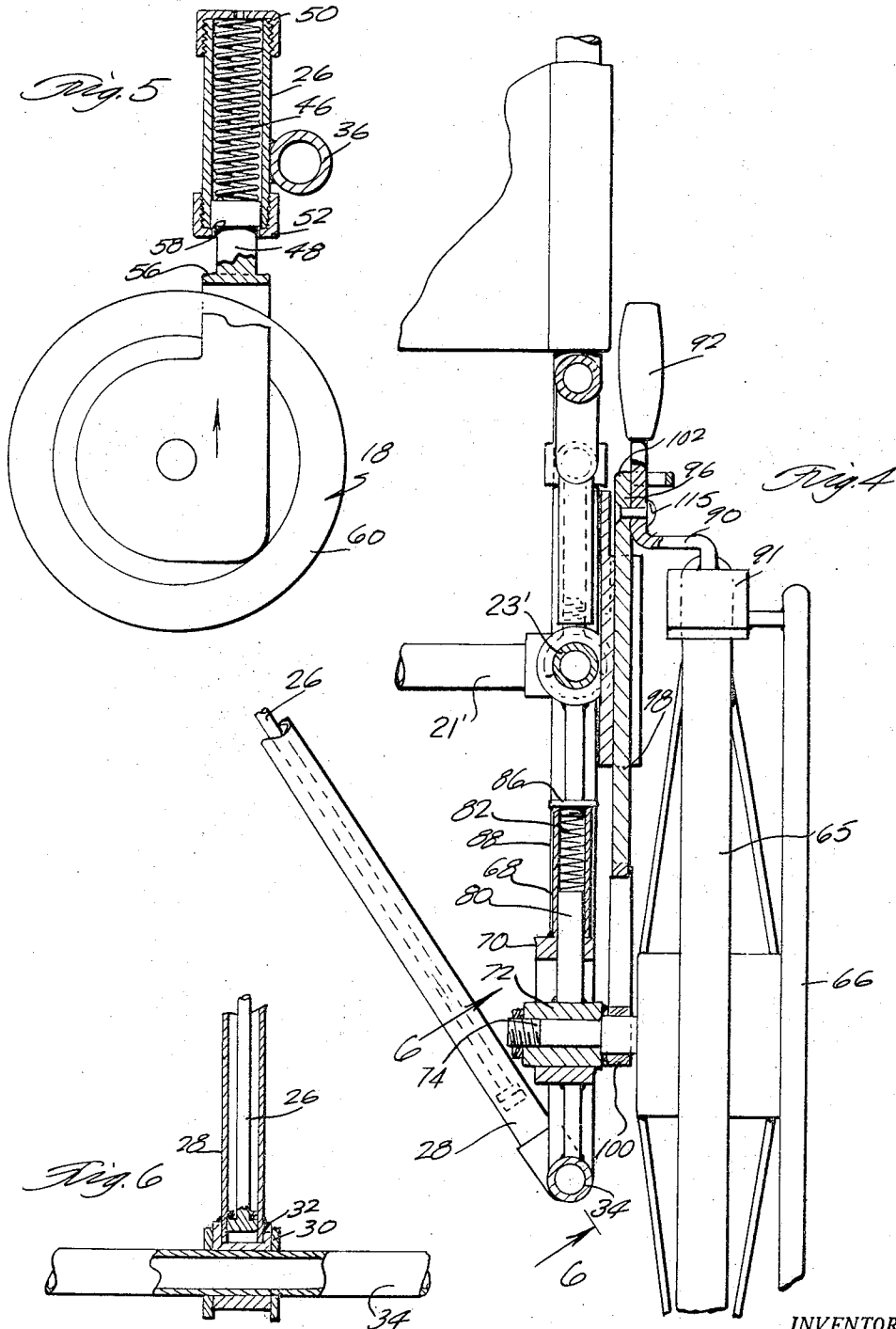
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4 Sheets-Sheet 4



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FOLDING WHEEL CHAIR

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Filed Oct. 23, 1965, Ser. No. 503,194

6 Claims. (Cl. 297—44)

ABSTRACT OF THE DISCLOSURE

A folding wheel chair having frame members, a uniformly applied brake mechanism connected to the drive wheels, and a cylinder-piston arrangement constructed so that the seat sections are normally pushed upwardly to adapt the wheel chair to be partially collapsed and for allowing the seat sections to receive a seated person to create a compressed fluid in the cylinder by the piston, which is released upon removal of the seated person, to then return the seat sections which are again normally pushed upwardly.

The present invention relates to an improved folding wheel chair for providing greater comfort and mobility to the operator of the wheel chair, and more particularly the invention relates to a folding wheel chair having apparatus for the legs so that they may be adjusted, manipulated and positioned for providing the necessary comfort to the user, and having seat sections which are normally pushed upwardly to adapt the wheel chair to be partially collapsed, and for allowing the seat sections to receive a seated person to create a compressed fluid in the cylinder by the person, which is released upon removal of the seated person to return the seat sections which are again normally pushed upwardly.

The object therefore of the present invention is to provide a folding wheel chair having panels that are attached to adjustable arms of the footrest and are constructed and arranged in such a manner that they will conform with the arm of the footrest adjustment, and having seat sections which are normally pushed upwardly to adapt the wheel chair to be partially collapsed, and for allowing the seat sections to receive a seated person to create a compressed fluid in the cylinder by the person, which is released upon removal of the seated person to return the seat sections which are again normally pushed upwardly.

A further object of the present invention is to provide a mechanical arrangement for the support of panels on a leg or foot rest that provides adaptation in allowing the footrest panels to be cooperatively folded while the wheelchair is being folded as well, and having seat sections which are normally pushed upwardly to adapt the wheelchair to be partially collapsed, and for allowing the seat sections to receive a seated person to create a compressed fluid in the cylinder by the person, which is released upon removal of the seated person to return the seat sections which are again normally pushed upwardly.

A further object of the present invention is to make a lightweight construction of a folded wheelchair in which the footrests are easily adapted to being folded in an outward position for use with a folded wheelchair, and having seat sections which are normally pushed upwardly to adapt the wheelchair to be partially collapsed, and for allowing the seat sections to receive a seated person to create a compressed fluid in the cylinder by the person, which is released upon removal of the seated person to return the seat sections which are again normally pushed upwardly.

The above and other objects and advantages of the

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invention will become apparent upon full consideration of the following detailed description and accompanying drawings in which:

FIGURE 1 is a side elevation view of the folding wheelchair in accordance with a preferred embodiment of the present invention.

FIGURE 2 is a plan elevation view showing the features of the invention, the plan view being taken with respect to that of FIGURE 1.

FIGURE 3 is a front elevation view of the embodiment shown in FIGURES 1 and 2.

FIGURE 4 is a detailed broken away view of the support means for one of the wheels of the wheelchair showing the details thereof.

FIGURE 5 shows a partially cross-sectional view of the support means for the wheelchair; and

FIGURE 6 shows the detailed and cross-sectional components, taken along line 6—6 of FIGURE 4.

Referring now to the drawings there is a folding wheelchair 10 having solid seats 12—12' and back sections 14—14' which are mounted from a frame 16—16 and supported from the ground by the four spring loaded casters 18, 18, 18, 18.

The back sections 14, 14' as shown in FIGURE 2 as well as partially in the other figures and which are joined together at the center with a piano hinge 22, and which is mounted on the chair in such a way that when the chair is folded, the back folds into it over the chair itself as will be observed from a study of FIGURES 2 and 3.

The back sections 14, 14' may be padded with a one inch foam rubber and which may then be covered with a plastic fabric.

The seat of the folding wheelchair 10 is made up of two pieces 12—12' and which are mounted upon U-shaped frames 21—21' pivotally mounted upon cross bars 23—23' so that the center of the seat may be pushed upward as the chair is folded. Correspondingly the upper ends of the piston rods 26 are pivoted upon the free sides of the U-shaped frames 21—21'. When the wheelchair is in active use and due to the weight of the occupant seated the air trapped in the cylinders will be compressed and when the chair is unoccupied the air so compressed will operate the piston rods sufficiently to raise the seats and cause some as well as the seat back sections to occupy the dotted line positions as shown in FIGURES 2 and 3 of the drawings.

As shown in FIG. 6, the joint for the seat support comprises a piston rod 26 which is pressed into a cylinder 28, which in turn fits around the lower cross bars 34 and 34' rails of the chair and this fitting is held in place by two press fit washers 30, 32. The bottom rails 36 of the front and back of the chair are telescopic in nature having stops at the point of the chair's full opening to limit the outward movement of the telescopic action. The stops are provided on each of the top and bottom rails 36. The center portion of the bar or rod 34 telescopes into the bar 36, and bar 34 is fitted with a piece at the end that fits into the bar 26. Bar 26 is then fitted with a cap that is drilled to pass bar 34 through it but smaller than the end piece 28, thus serving as a stop when the chair is open.

The two bottom side rails 36, 36 are fitted with an extension to the rear of the chair, and these extensions 40 serve as step bars in aiding the pusher to tilt the folding wheelchair 10 by stepping on them so that the wheelchair is adapted to be raised at the front for proceeding over curbs and other obstructions that may appear.

The extensions 40 thus telescope into the lower side rails 36 of the chair and are to be fitted with a stop 42 for

limiting the full extension of the extension 40 to its open position. A rubber tip 44 on the other end of the extension 40 serves to protect the end from damaging objects with which it may come in contact, as well as providing a stop.

The chair 10 is suspended or supported by four spring-loaded casters 18, 18, 18, 18, as above described, and the details of the casters are shown in FIG. 5. The casters are mounted on the front and rear bottom rails 34, 36 by welding from tube 26. Tube 26 serves as the housing for the spring 46, and the spring exerts its pressure on the shaft or rod 48, the top of the arrangement being terminated in a cap 50. The bottom of the tube 26 is fitted with a drilled cap 52, the aperture therethrough having that of the outside diameter of rod 48, similar to 26. At each end of the rod 48 there are shoulders for retaining the rod of the caster to the chair, the shoulders being shown as 56, 58. The wheel 60 is secured to the caster by a one-quarter inch steel pin, as is well known. The spring loaded caster 18 provides greater use for the chair and its occupant to result in a softer and more comfortable ride.

There is also provided on the wheelchair 10 a large drive wheel, such as a 20-inch drive wheel, 64 which is provided for aiding the mobility thereof with a fitted handrail 66. The drive wheel is mounted on the chair by a type of spring loaded device resembling the spring loading of the caster 18, and it includes the spring loaded mechanism 68, as shown in FIG. 4, comprising a steel block 70 slotted to provide and retain a sliding block or element 72 that is drilled for receiving the axle 74 of the wheel 64. The slotted block 70 is incorporated into a framework of the chair by four bars 76, 76, 78, 78, as shown in FIG. 1. Fitted within the top of the sliding block 72, is a plunger 80 which cooperates with a spring 82 to exert a downward thrust upon the main traction of the plunger 80 as it operates against an end means 86. The spring 82 is housed in a tube 88 which is welded to the top of block 70. The top end of the tube 88 is fitted within a cap which is screwed onto the top of the tube and forms the end means 86, thus giving a stationary top which enables the spring to give a downward continuous thrust.

The wheel chair also is provided with a lever brake on each drive wheel 64, the brake having a lever 90, a brake handle 92, and a brake shoe 94, as shown in FIG. 1. The brake is mounted from the top of the chair by a mounting piece 96 having three holes drilled into it to allow bolting to the top side rail of the chair. The brake lever is formed so that it will allow the brake to slide up and down in a vertical plane so that the lower end of the slide is welded to a rod 98 the lower end of which is fastened to a washer that extends about the axle 74 of the drive wheel, as shown at 100 in FIG. 4. Thus the slide will go up and down in unison with the drive wheel so that the brake when applied will apply a uniform stopping force. The top end of the slide 98 is bent at a 90° angle 102 so that the horizontal portion thereof is slotted with positions to place the brake handle in. These positions are illustrated as spaces 106 in FIG. 2, and thus provide locks for the brake. The slot 102 has wide and narrow portions for providing movement of the handle 92 for actuating the brake. The brake handle is welded to the brake arm at a 90° angle. At the junction of the brake handle 92 is drilled an opening so that it may be bolted to the slide 96 by a pin 115. At the outer end of the brake arm, the steel brake shoe 91 is provided as described above, and the brake handle 92 may be fitted with a rubber grip. As the brake handle is pushed forward, the brake arm 90 is tilted downward and the brake shoe 91 is brought into contact with the drive wheel, thus providing the friction for braking the chair. To release the brake, the opposite action is followed.

There are adjustable foot and leg rests 120 for the chair 10, and are raised or lowered by a crank mecha-

nism 124. The elevating device is shown in detail in FIG. 1 so that the elevating device comprises a block which is slotted to take a set of gears that engage the rack 132 over which the gears on an axle 134 are passed. Thus the elevating of the leg and foot rests is achieved by pushing inward on the hand wheel 124 and turning it in the proper direction. As the proper level of elevation is reached, the leg and foot rest 120 is locked into position by pulling upward on the hand wheel and engaging the partial gear. The arm of the elevating device 120 is fastened to the arm of the leg and foot rest 120 by means of a clamp 140. The lower arm of the leg rest 120 telescopes into an upper arm 142, as shown in FIG. 1, and the upper arm is provided with a spring stop which fits into holes drilled in the lower arm, as shown at 148, thus creating a leg and foot rest that is adjustable to the user. The lower end of the arm 152 is fitted with a foot rest 154 which will tilt upward and will have a raised portion for retaining the foot in position at the same time.

The chair is also provided with rubber handles at the top of the chair or from the rod 16 or 146, as shown in FIG. 1, which are held in position by wing nuts so that they can be removed to preserve the compactness of the chair when used indoors.

Additional embodiments of the invention in this specification will occur to others and therefore it is intended that the scope of the invention be limited only by the appended claims and not by the embodiment described hereinabove. Accordingly, reference should be made to the following claims in determining the full scope of the invention.

What is claimed is:

1. A folding wheelchair comprising a square box frame having the left and right sides thereof telescopically engaged to each other for collapsing, a set of resiliently mounted casters at each corner thereof to support the wheelchair from the ground, and a resiliently mounted drive wheel mounted from an X-shaped frame at the center of each side thereof so that the drive wheel is equally resiliently applied to the ground, a brake mechanism that is disposed in fixed relation to the shaft of the drive wheel so that the brake force is substantially constantly applied throughout, a pair of seat sections being pivotally mounted at the outer edges thereof on the box frame, a cylinder and piston arrangement having one end mounted at the left and right bottom sides respectively of the frame and having the other ends thereof connected to the opposite seat section, so that the seat sections are normally pushed upwardly to adapt the wheel chair to be partially collapsed and for allowing the seat sections to receive a seated person to create a compressed fluid in said cylinder by the piston, which is released upon removal of the seated person to return the seat sections which are again normally pushed upwardly.

2. The invention according to claim 1 wherein an adjustable foot rest is disposed and mounted from a forward part of said wheelchair.

3. The invention according to claim 2 wherein said frame comprises a seat and back support for its occupant that is foldable, said seat and back comprising a piano hinge so that the fold is uniform and continuous throughout the folds thereof and aids in the wheelchair being folded.

4. The invention according to claim 3 wherein foot actuatable means are provided at the rear of the wheelchair for a pusher to step upon in tilting the forward end of the wheelchair.

5. The invention according to claim 1, wherein said brake mechanism is slidably mounted with respect to said frame but is related in a fixed fashion from a rod of the drive wheel so that the brake applies continuous pressure regardless of the amount of resiliency that the resilient means of the drive wheel offers in supporting said wheelchair.

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6. A folding wheel chair comprising a box frame having left and right sides thereof in which the front and back coupling frame members are telescopically engaged to each other for collapsing, a pair of seat sections pivotally mounted at the outer edges thereof on the box frame, a cylinder and piston arrangement having one end mounted at the left and right bottom sides respectively of the frame and having the other ends thereof connected to the opposite seat section, so that the seat sections are normally pushed upwardly to adapt the wheel chair to be partially collapsed and for allowing the seat sections to receive a seated person to create a compressed fluid in said cylinder by the piston, which is released upon removal of the seated person to return the seat sections which are again normally pushed upwardly.

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15 FRANCIS K. ZUGEL, *Primary Examiner.*

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