

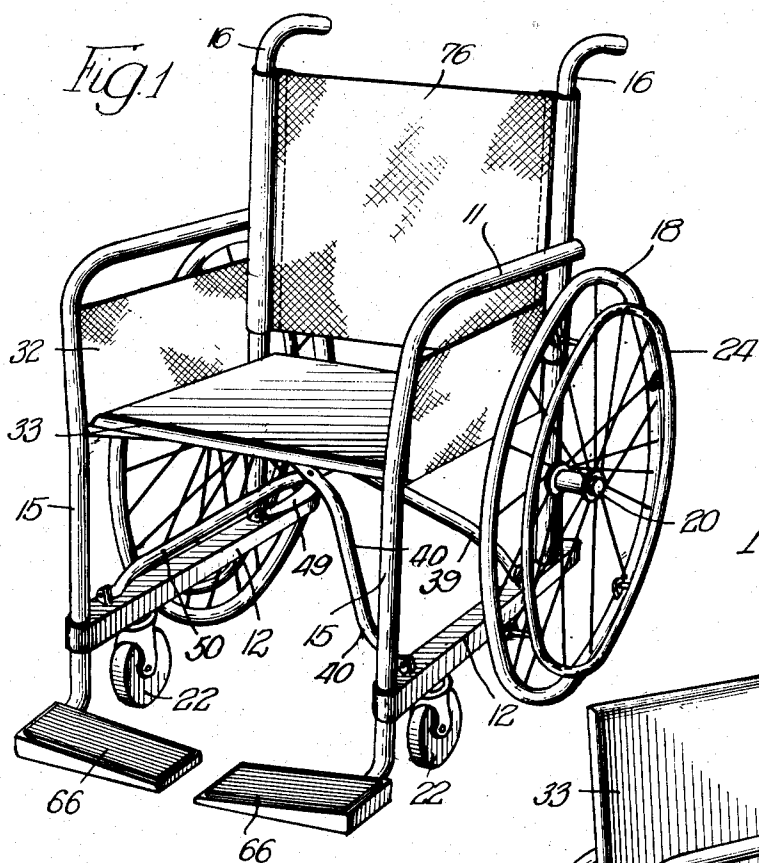
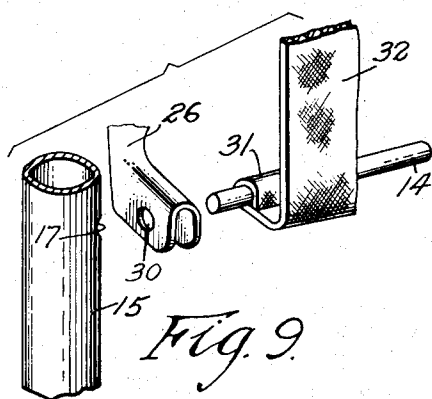
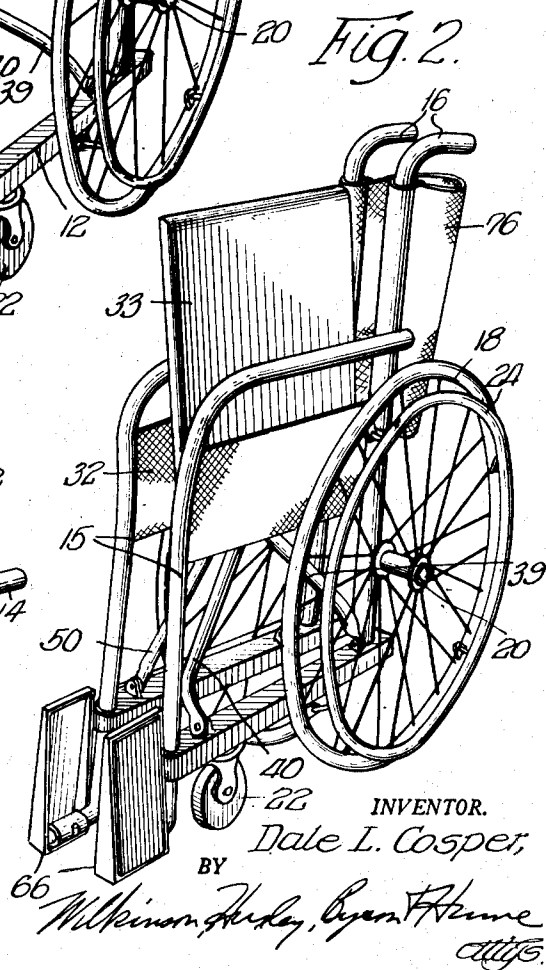
Jan. 12, 1954

D. L. COSPER
FOLDING WHEEL CHAIR

2,665,743

Filed Sept. 30, 1950

4 Sheets-Sheet 1



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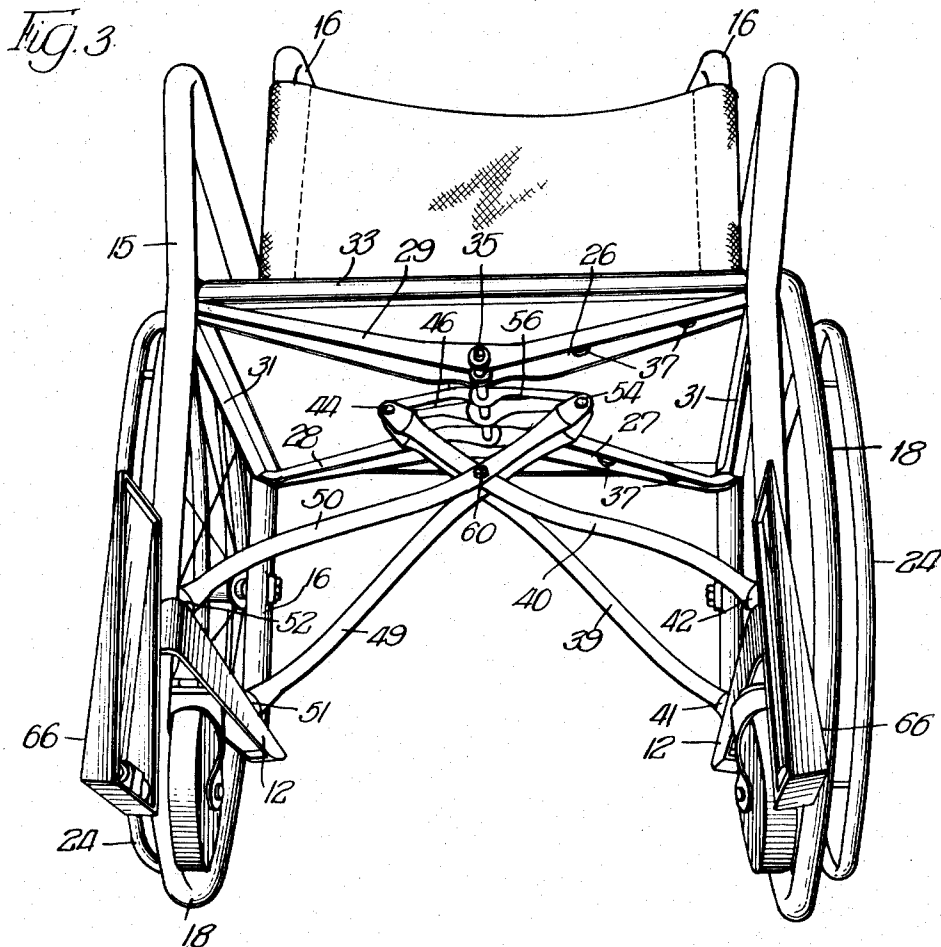
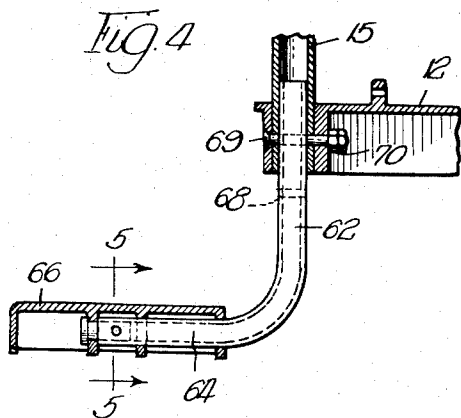
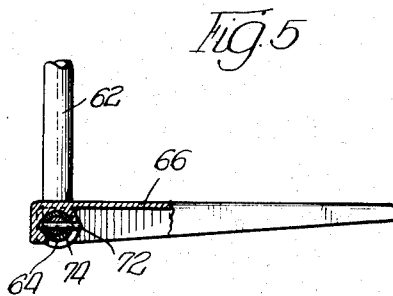
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4 Sheets-Sheet 2



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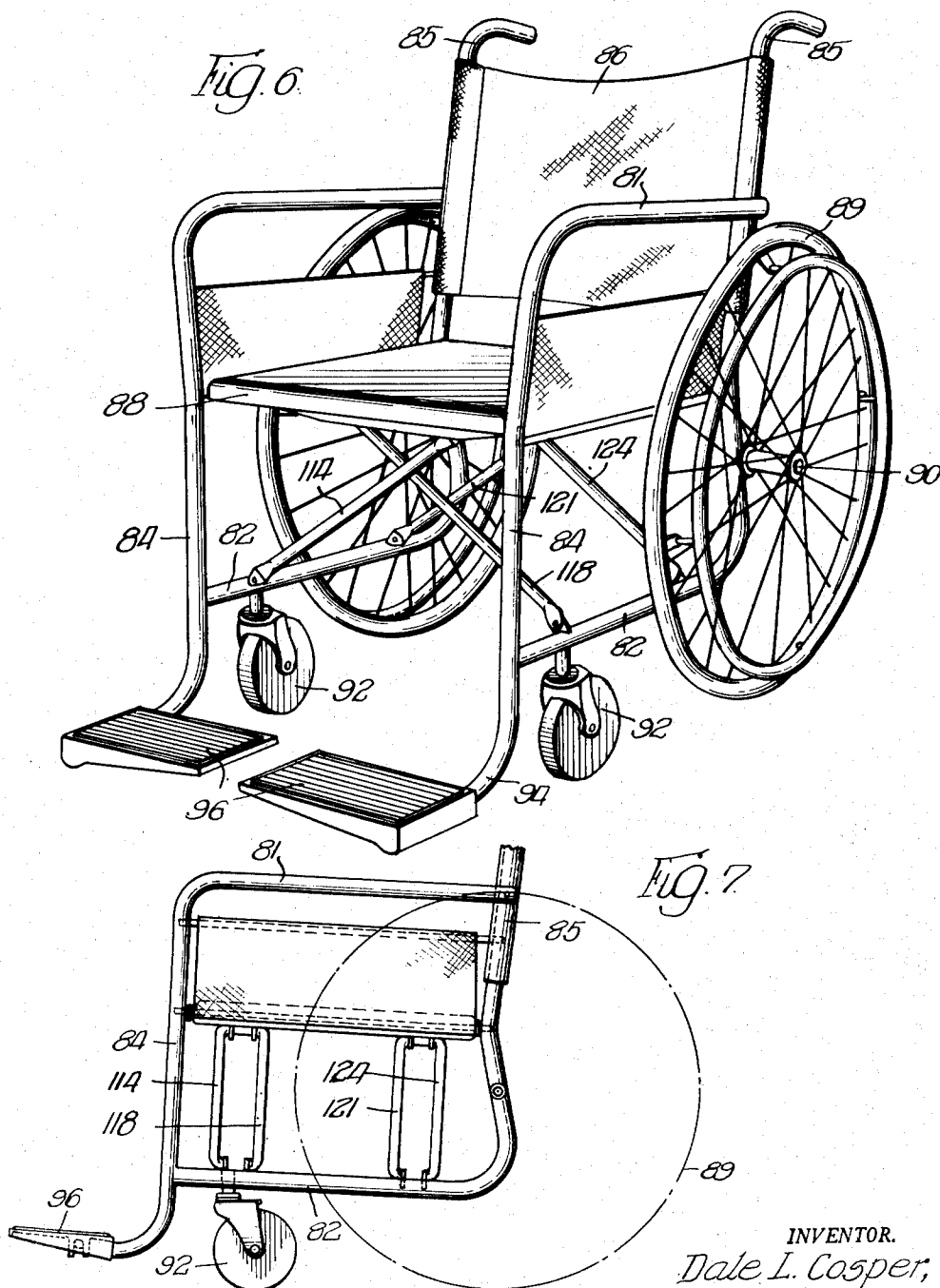
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4 Sheets-Sheet 3



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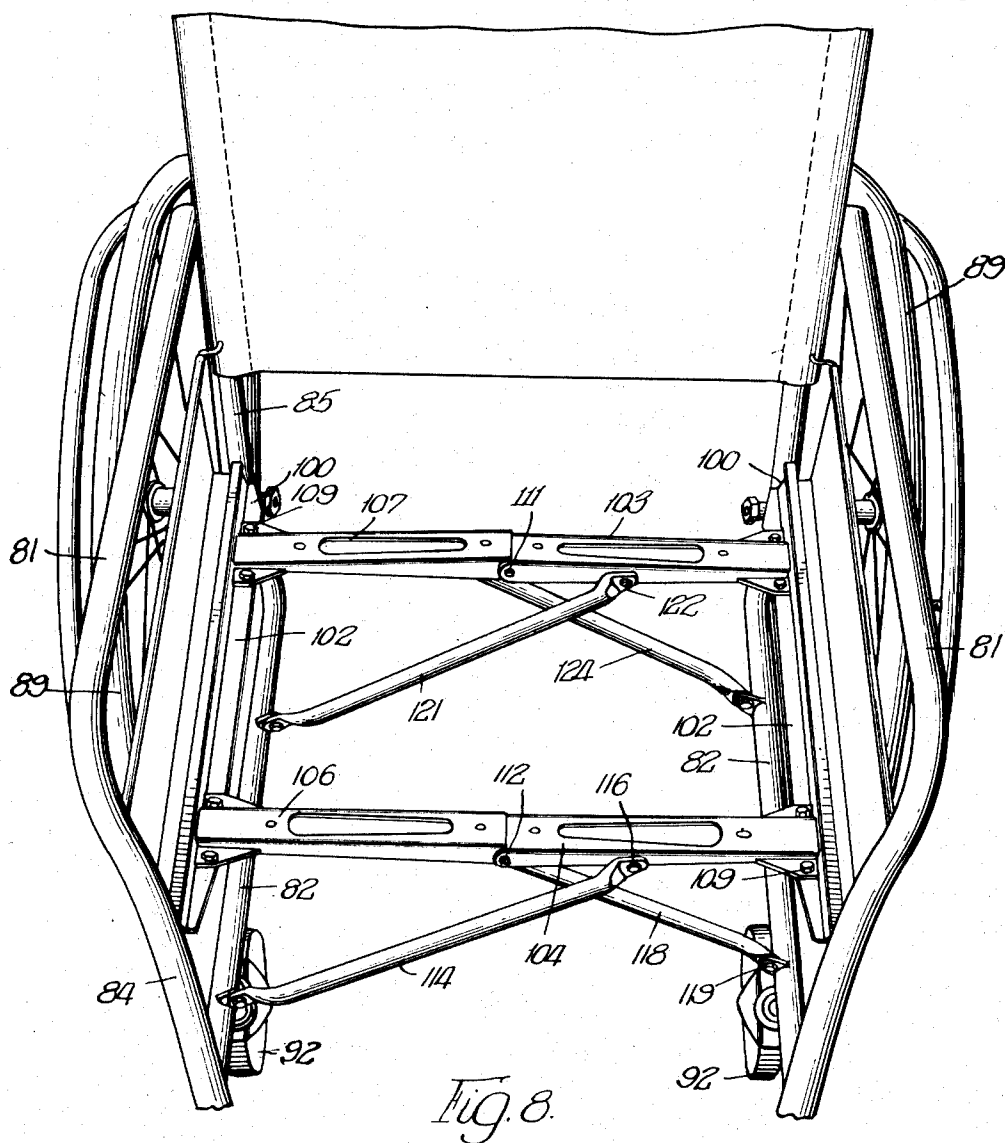
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4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

2,665,743

FOLDING WHEEL CHAIR

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7 Claims. (Cl. 155—30)

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This invention relates to a new and improved folding wheel chair and more particularly to a chair of this type which may be easily folded into a comparatively small space.

Wheel chairs are at present in wide use by persons, who, while they cannot or should not walk, are nevertheless, well enough to be capable of getting around to a considerable extent. This causes a demand for wheel chairs which are capable of being transported in automobiles, and such chairs must be capable of being folded quite compactly. There are also many persons who have lost the use of their legs but are strong above the waist so that they are capable of handling themselves to a very considerable extent. For use by such persons it is important that a folding chair be provided with folding mechanism which is simple in operation and is substantially foolproof. The chair should also be of as light a weight as is compatible with the necessary rigidity and strength.

It is an object of the present invention to provide a new and improved collapsible wheel chair.

It is a further object to provide a chair of this type which is light in weight and capable of folding so as to reduce its width to a minimum.

It is another object to provide a folding wheel chair which is provided with a rigid one piece seat.

It is an additional object to provide a wheel chair having rigid cross bracing supporting the seat and maintaining the side frames and wheels positively in spaced position when the chair is in position for use.

It is also an object to provide a chair of this character in which the seat support and bracing mechanism support the seat on both sides of its center while being secured to the seat on one side only of the center.

It is another object to provide a folding wheel chair which is simple in design and construction and adapted for commercial production and use.

Other and further objects will appear as the description proceeds.

I have shown certain preferred embodiments of my invention in the accompanying drawings in which—

Figure 1 is a perspective view of one form of chair, in position for use;

Figure 2 is a perspective view of the chair of Figure 1 in its folded position;

Figure 3 is a perspective view of the chair of Figure 1 as seen from the front and below, showing the seat support construction;

Figure 4 is a fragmentary section showing the foot support construction;

Figure 5 is a fragmentary view, partly in section taken on line 5—5 of Figure 4;

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Figure 6 is a perspective view of a modified form of chair;

Figure 7 is a side elevation of the frame of the chair of Figure 7,

5 Figure 8 is a perspective view of the chair of Figure 6, with the seat member removed, looking downwardly on the chair from in front of it, and

10 Figure 9 is an exploded view showing the means connecting the seat support members to the chair frame.

Referring first to the form of construction shown in Figures 1 to 5 inclusive, the wheel chair comprises a pair of similar, but oppositely facing side frames which comprise horizontal top and bottom members 11 and 12 with connecting generally vertical front and rear members 15 and 16. In the form shown, the front members 15 are tubular and are formed as a unit with the top members 11. The bottom member 12 is of U-shaped section and has a circular opening in its forward end through which the lower end of the member 15 passes. This lower end of member 15 is secured to the member 12 where it passes through said member and the lower end of the rear member 16 is also secured in the bottom member 12. The rear end of the top member 11 is secured to an intermediate portion of the rear member 16.

30 The large wheels 18 are supported on hubs 20 which extend outwardly from the member 15 at a point intermediate the top member 11 and bottom member 12. The small caster wheels 22 extend downwardly from the forward portion of the bottom members 12 in the rear of the lower ends of the front members 15. The large wheels 18 are provided with the usual circular rail 24 by means of which the occupant of the chair may propel the chair.

40 The seat support members 26, 27, 28 and 29, as best shown in detail in Figure 9, are pivotally supported on horizontal rods 14 extending between the front members 15 and rear members 16. These pivot rods 14 are not shown in the assembly figures of the drawings, as they are covered by the lower flanges 31 of the side guard members 32 but the construction is shown in the exploded view Figure 9. The ends of the rods 14 fit into openings in the front and rear members 15 and 16 as indicated in broken lines at 17 on Figure 9, and the ends of the seat support members as 26, are provided with openings 30 to receive rods 14. The seat support members 26 to 29 inclusive are pivotally connected along the center line of the seat 33 by a pivot pin 35. The seat 33 is a unitary rigid member which may be provided with any desired type

of cushion on its upper surface. Its substantially rigid body may be made of plywood or a sheet of metal or other suitable material.

As seen in Figure 3, the seat 33 is secured to seat support members 26 and 27 by bolts or screws 37 passing through those members. The seat 33 is not secured to the seat support members 28 and 29, but merely rests on those members when the seat is in position for use as shown in Figure 3. The brace members 39 and 40 are pivotally connected at 41 and 42 to the upper face of the right bottom member 12 as seen in Figure 3. The upper ends of the brace members 39 and 40 are pivotally connected by pin 44 to the outer end of a link member 46. The inner end of the link member 46 is pivotally connected to the pivot pin 35 at a point intermediate the seat support members. The brace members 49 and 50 are similar to members 39 and 40 and are pivotally connected at 51 and 52 to the upper face of the left bottom frame member 12 as shown in Figure 3. The upper ends of brace members 49 and 50 are pivotally connected by pin 54 to the free end of a link 56. The inner end of link 56 is pivotally supported on the pivot pin 35 opposite the link 46. The brace members 39, 40 and 49, 50 are pivotally connected together at an intermediate point below the pivot pin 35 by a connecting pin 60, as clearly shown in Figure 3.

It is to be noted that the links 46 and 56 are not in any way secured to the seat 33. These links are merely pivotally connected to pivot pin 35 and to the upper ends of the brace members.

Referring now to Figures 4 and 5, it will be noted that the front member 15 is tubular and has an open end and exposed below the brace member 12. A foot rest support member 62 has a vertical arm extending upwardly into the opening in the tubular member 15 and a horizontal extending portion 64 which supports the foot rest 66. The upwardly extending portion of the member 62 is provided with a plurality of perforations 68 which extend from front to rear of the member. The bolt 69 extends through one such perforation to retain the foot rest support member in position. This bolt 69 passes through a portion of member 12 and through the lower end of member 15 and is retained in place by the nuts 70. By means of the plurality of openings 68 the elevation of the foot rest 66 relative to the seat of the chair may be varied. The foot rest 66 is pivotally supported on portion 64 of member 62 so that it may be swung to the vertical position, as shown in Figure 3 or to the horizontal position as shown in Figures 4 and 5. A stop pin 72 extends through an arcuate slot 74 formed in the foot rest member 66. The pin 72 engaging the end of the slot 74 limits movement of the foot rest 66 and also supports the foot rest in its lower horizontal position as shown in Figure 5.

The chair of Figures 1 to 5 is shown in its folding position in Figure 2. The back rest 76 as shown is merely a piece of flexible material such as canvas with its ends looped around its side members 16. Consequently, this back rest merely folds outwardly as shown in Figure 2. The seat 33 which is substantially rigid is swung upwardly about the pivots of the seat support members 26 and 27. The seat 33 being secured to these members 26 and 27 moves upwardly with them. It is free from support members 28 and 29 which also swing upwardly, all of the support members being guided by their pivotal connection on pivot pin 35.

As the seat is swung upwardly by grasping its

free end, this draws the side frames together. The ends of links 46 and 56 are drawn upwardly by pivot pin 35 moving the pivotal connections 44 and 54 at the upper ends of the brace members inwardly. These members pivot about the pin 60 and draw the lower members 12 of the side frames inwardly. It will be apparent that folding of the chair is accomplished simply and easily by swinging the free left end of the seat 33 upwardly as seen in Figure 2. The chair may be restored to position for use either by pulling the frame members apart or by pressing downwardly on the upper free edge of the seat 33. By using the two hands and combining these movements the chair may be very quickly and easily moved to folded or collapsed position or from that position to position for use.

The form of construction shown in Figures 6 to 8 inclusive is generally similar to that in Figures 1 to 5, but has certain differences of construction. The side frames comprise top and bottom members 81 and 82 connecting front and rear members 84 and 85. The chair is provided with a flexible back 86 and a substantially rigid seat 88. The large wheels 89 are supported on hubs 90 extending from the rear members 85. The front smaller wheels 92 are pivotally secured to the bottom members 82. In this form of construction the bottom members 82 are shown as continuations of the rear members 85. Also the foot rest support portions 94 are continuations of the front members 84 which continuations extend substantially horizontally to support the foot rests 96. These foot rests may be secured to support portions 94 in the manner shown in Figures 4 and 5.

The under frame construction is best shown in Figure 8. The seat support members 100 have their ends pivotally supported in the front members 84 and the rear members 85. These support members 100 are U-shaped with longer horizontal legs 102 to which legs are secured the seat support members 103 and 104, 106 and 107. The seat support members are shown as connected to flanges 102 by means of bolts 109. It will be understood that they may be secured to these members by any suitable means such as rivets or by welding as desired.

The inner ends of seat support members 103 and 107 are connected by pivot pin 111 and the meeting ends of seat support members 104 and 106 are similarly connected by similar pivot pin 112. The diagonal brace member 114 is pivotally connected at its lower end to the left bottom member 82 and its upper end is pivotally connected at 116 to the seat support member 104. The oppositely inclined brace member 118 is pivotally connected at 119 to the right bottom member 82 and its upper end is pivotally connected to the seat support member 106. Similarly the brace member 121 has its lower end pivotally connected to the left bottom member 82 and its upper end pivotally connected at 122 to the seat support member 103. The diagonal support member 124 is similar to the diagonal support 118 and has its lower end connected to the bottom member 82, while its front end is connected to the seat support member 107.

It will be understood that the rigid seat member 88, which is not shown in Figure 8, is connected only to the seat support members 103 and 104 and rests freely on seat members 106 and 107. Consequently, the chair of the construction shown in Figures 6 to 8 inclusive may be moved to the collapsed or closed position in the same

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manner as the construction shown in Figures 1 to 5 inclusive.

While I have shown certain preferred embodiments of my invention these are to be understood to be illustrative only, the construction may be modified to meet varying conditions and requirements and I contemplate such variations as come within the spirit and scope of the appended claims.

I claim:

1. In a wheel chair, a pair of side frames, wheels connected to the side frames, a seat, seat support members pivotally connected to each of the side frames, said members being pivotally connected to each other adjacent the center line of the chair, the pivotal connection of the seat support members comprising a pivot pin extending along the center line of the chair, brace members pivotally connected to lower portions of the side frames and extending diagonally upward below the seat, and link members connecting the upper ends of the brace members to the pivot pin.

2. In a wheel chair, a pair of side frames, wheels connected to the side frames, a seat, seat support members pivotally connected to each of the side frames, said members being pivotally connected to each other adjacent the center line of the chair, the pivotal connection of the seat support members comprising a pivot pin extending along the center line of the chair, brace members pivotally connected to lower portions of the side frames and extending diagonally upward below the seat, and link members connecting the upper ends of the brace members to the pivot pin, said link members extending laterally from the pivot pin and bearing against the under side of the seat.

3. In a wheel chair, a pair of side frames, wheels connected to the side frames, a seat, seat support members pivotally connected to each of the side frames, said members being pivotally connected to each other adjacent the center line of the chair, the pivotal connection of the seat support members comprising a pivot pin extending along the center line of the chair, brace members pivotally connected to lower portions of the side frames and extending diagonally upward below the seat, and link members connecting the upper ends of the brace members to the pivot pin, said link members extending laterally from the pivot pin and bearing against the under side of the seat, each brace member being pivotally connected to the free end of a link on the opposite side of the center pivot pin from the side frame to which said brace member is connected.

4. In a wheel chair, a pair of side frames, wheels connected to the side frames, a seat, seat support members pivotally connected to each of the side frames, said members being pivotally connected to each other adjacent the center line of the chair, the pivotal connection of the seat support members comprising a pivot pin extending along the center line of the chair, brace members pivotally connected to lower portions of the side frames and extending diagonally upward below the seat, and link members connecting the upper ends of the brace members to the pivot pin, said link members extending laterally from the pivot pin and bearing against the under side of the seat, each brace member being pivotally connected to the free end of a link on the opposite side of the center pivot pin from the side frame to which said brace member is connected, the brace members extending in pairs

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from opposite side frames each pair being pivotally connected to each other at a point below the center pivot pin.

5. In a wheel chair, a pair of side frames, wheels connected to the side frames, a seat, seat support members pivotally connected to each of the side frames, said members being pivotally connected to each other adjacent the center line of the chair, the pivotal connection of the seat support members comprising a pivot pin extending along the center line of the chair, brace members pivotally connected to lower portions of the side frames and extending diagonally upward below the seat, and link members connecting the upper ends of the brace members to the pivot pin, the seat member being fixedly secured to the seat support members on one side of the pivot pin and resting on the support members on the other side of the pivot pin when the chair is positioned for use.

6. In a wheel chair, a pair of side frames, wheels connected to the side frames, a seat, seat support members pivotally connected to each of the side frames, said members being pivotally connected to each other adjacent the center line of the chair, the pivotal connection of the seat support members comprising a pivot pin extending along the center line of the chair, brace members pivotally connected to lower portions of the side frames and extending diagonally upward below the seat, and link members connecting the upper ends of the brace members to the pivot pin, said link members extending laterally from the pivot pin and bearing against the under side of the seat, the seat member being a unitary, substantially rigid member secured to the seat support members on one side of the pivot pin and resting on the support members on the other side of the pivot pin and on the link members when the chair is positioned for use.

7. In a wheel chair, a pair of side frames, each frame comprising generally vertical front and rear members and generally horizontal top and bottom members connecting the front and rear members, front wheels connected to the bottom member, rear wheels connected to the rear member, a seat, seat support members pivotally connected to the front and rear members at points between the top and bottom members, said seat support members being pivotally connected to each other by a pivot pin at the center of the seat, diagonal brace members having their lower ends connected to the frame bottom members, and links below the seat connecting the upper ends of the brace members to the pivot pin.

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