June 25, 1968 F. F. SULLY 3,389,934

ADJUSTABLE CONNECTOR FOR COLLAPSIBLE CROSS-BRACES FOR WHEELCHAIRS

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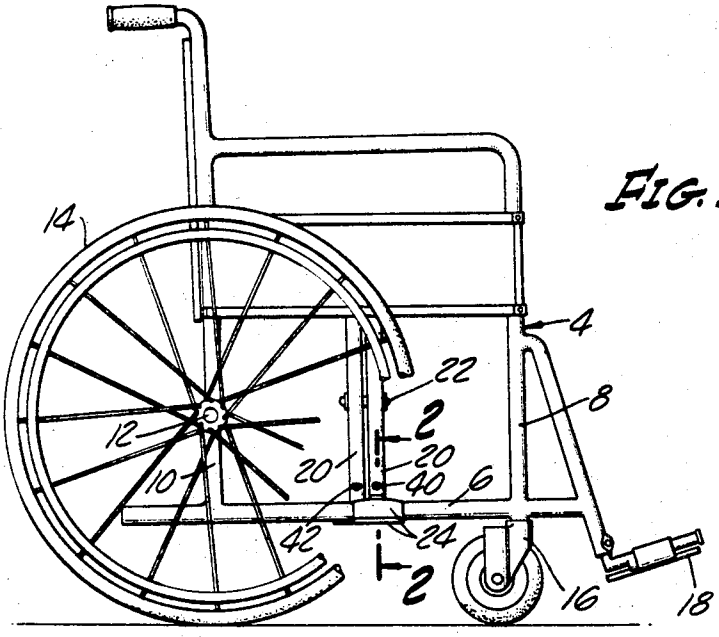



FIG. 1.

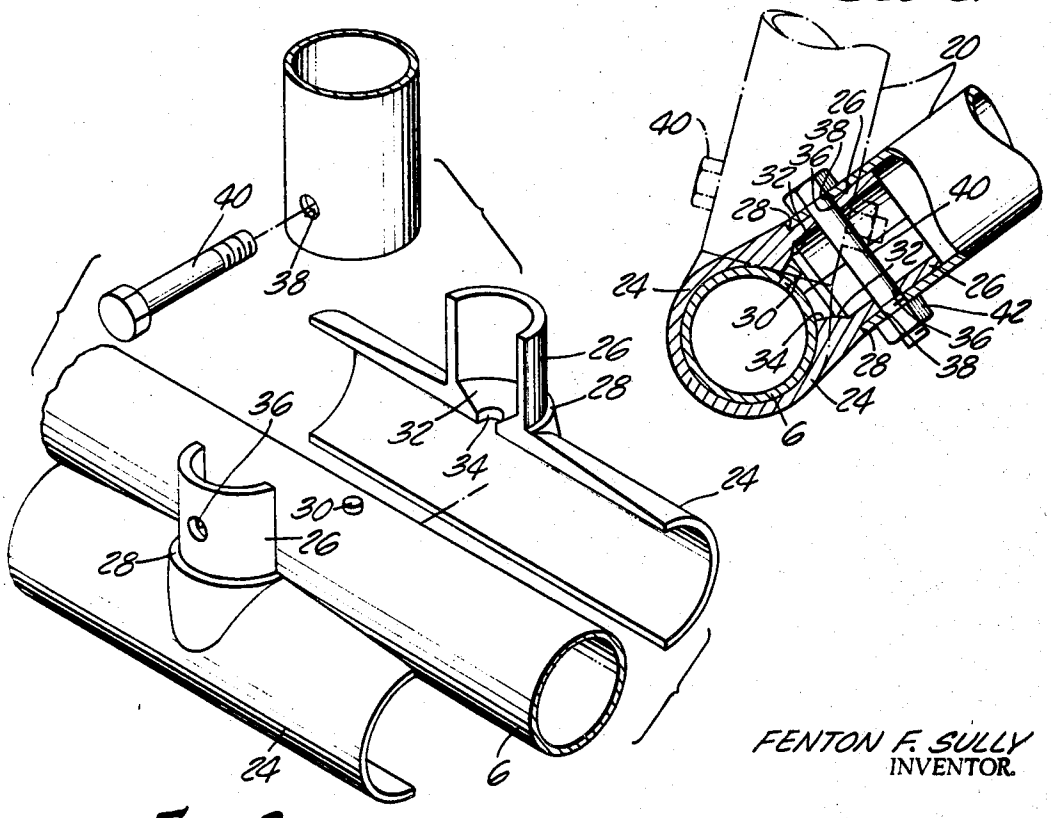



FIG. 3.




FIG. 2.

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# ADJUSTABLE CONNECTOR FOR COLLAPSIBLE CROSS-BRACES FOR WHEELCHAIRS

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This invention relates to wheelchairs, and more specifically, to means for adjustably connecting the vertical cross-brace of a collapsible wheelchair to a continuous bottom rail or lower longitudinal tubular wheelchair frame member. It is particularly adaptable to such a structure wherein the bottom rail or lower frame member of the wheelchair has integrally connected front and rear vertical frame members extending upwardly therefrom thereby preventing a one-piece tubular connector from being slipped upon an end of the bottom rail or lower frame member of the chair to a point intermediate its ends. In general, it is an object of the present invention to provide a collapsible wheelchair with means for connecting the lower ends of a pair of pivoted cross-brace elements to the lower rail or horizontal lower frame members of the chair wherein the connection can be made quickly and easily, and wherein the lower ends of the cross-brace elements will be held properly in position and folding action of the chair and cross-brace elements is permitted within the desired limits.

The above and other objects will more fully appear from the following description in connection with the accompanying drawing.

FIG. 1 is a side elevational view of a collapsible wheel chair with a portion of the near propulsion wheel broken away;

FIG. 2 is an enlarged sectional detail taken approximately on the line 2—2 of FIG. 1;

FIG. 3 is an exploded perspective view of the structure of FIG. 2.

The wheel chair shown in FIG. 1 includes a side frame 4 which is one of an identical pair, only the near side being illustrated for the purpose of the invention. This side frame includes a bottom rail or lower horizontal tubular frame member 6 having a front upright member 8 extending upwardly therefrom and a rear upright 10 which form parts of and support upper chair portions of conventional type generally known in the field. The frame side member 4 supports one end of an axle 12 on which is a large propulsion wheel 14. Beneath the lower forward portion of the bottom rail 6 is a caster wheel assembly 16. A suitable footrest unit 18 is carried by the forward portion of the chair frame.

Extending between the two wheel chair side frames 4 is a cross-brace unit comprising cross-brace elements 20, preferably tubular in form, which intermediate their ends are connected by a suitable pivot 22. The upper ends of the cross-brace elements 20 are suitably secured to portions of each of the side frames 4 in a manner well known in the art, generally to upper horizontal tubes, not shown, which support a collapsible seat member.

In the drawing there is shown a cross-brace connector comprising a pair of complementary saddles 24 which are horizontally elongated and internally are of U-shape in cross-section, their internal curvatures being such as to closely fit about the exterior surface of the tubular bottom rail or lower longitudinal frame member. The saddles 24 are elongated horizontally to provide an extended surface contact with the bottom rail 6 to adequately support the cross-brace element at its lower end. Each saddle has a half-round 26 extending upwardly therefrom intermediate its ends, the half-round of each saddle complementing the other and closely fitting into the lower end



of the cross-brace element 20. At the base of each half-round 26 on at least one of the saddles 24, is an upwardly disposed shoulder 28 which is adapted to support the lower end of the cross-brace element 20.

At the point longitudinally of the bottom rail tubular frame member 6 where the saddle elements 24 are to be located, is a detent 30 of any suitable type which is firmly anchored in the tube comprising said bottom rail 6. The bottom of each half-round portion 26 is defined by a semicircular disc-like portion 32 integral with the saddle 24 and having a slotted portion 34. The slotted portion 34 on each saddle of a pair complements the other to provide an elongated slot as indicated in FIG. 2, in which slot the detent 30 is movably received, so that the pair of saddles 24 with their half-rounds 26 seated in a cross-brace member 20, can be partially rotated about the bottom rail or lower tubular frame member 6, thereby permitting one cross-brace element to rotate about the cross-brace pivot 22 relative to the other cross-brace element.

Each of the half-rounds 26 is provided with an aperture 36 and they are aligned with each other and with apertures 38 in the lower end of each cross-brace member 20. Through these aligned apertures is placed a bolt 40 held by a nut 42.

With the above structure the cross-brace elements 20 can be connected to the bottom rails 6 quickly and efficiently with a strong connector element. The complementary saddles 24 are provided because of the wheelchair frame uprights 8 and 10 which lie at either side of the cross-brace connector location and therefore preclude the use of a connector element which would slip onto an end of the bottom rim or lower tubular frame member 6. The saddles 24 provide more than adequate support for the cross-braces 20 which in many cases are connected to the collapsible seat of the wheel chair and thereby bear the weight of the occupant of the chair. The saddles 24 have their half-rounds 26 neatly fitted into the bottom of the cross-brace, and the entire assembly for each connector is held by a single nutted bolt. The detent 30 which rides in the slotted portions 34 need not be of great size and strength because, conventionally, in collapsible wheel chairs, it is the tension on the collapsible seat which determines the extent of pivotal movement of one cross-brace element 20 relative to the other. Consequently, the detent 30 and slotted portions 34 serve merely to prevent the pairs of saddles 24 from becoming dislocated longitudinally of the bottom rails or lower tubular frame members 6.

It should be understood that various changes can be made in the form, details, arrangement and proportions of the various parts without departing from the spirit of the invention.

I claim:

1. A wheelchair comprising side frames, each of which has a lower longitudinal tubular member with uprights extending upwardly from front and rear portions thereof, a pair of crossed and pivotally connected cross-brace elements having their upper ends connected respectively to an upper portion of one of said side frames, a cross-brace connector comprising a pair of complementary internally rounded connector saddles having means connecting them to the lower end of a cross-brace element and to each other with the saddles embracing said lower longitudinal frame member between said uprights, one each of said lower longitudinal tubular frame member and cross-brace connector having, respectively, a slot and a detent movable therein, the slot being elongated on an arc partially about the circumference of said lower longitudinal tubular frame member.

2. The structure in claim 1, and each saddle having a generally horizontal extension lengthwise of the lower

longitudinal frame member of a length which is a multiple of the thickness of its related cross-brace element.

3. The structure in claim 1, and said cross-brace elements comprising hollow tubes, and each saddle having a complementary half-round extending normal to the axis of the saddle and of a cross-sectional external curvature closely received in the hollow tube cross-brace elements.

4. The structure in claim 3, and at least one saddle of a pair having a cross-brace element abutment shoulder at the base of said half-round.

5. The structure in claim 3, and said half-rounds and the lower end of the cross-brace element having mating apertures, and said means connecting said saddles to the lower end of the cross-brace element comprising a fastener secured through said apertures.




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