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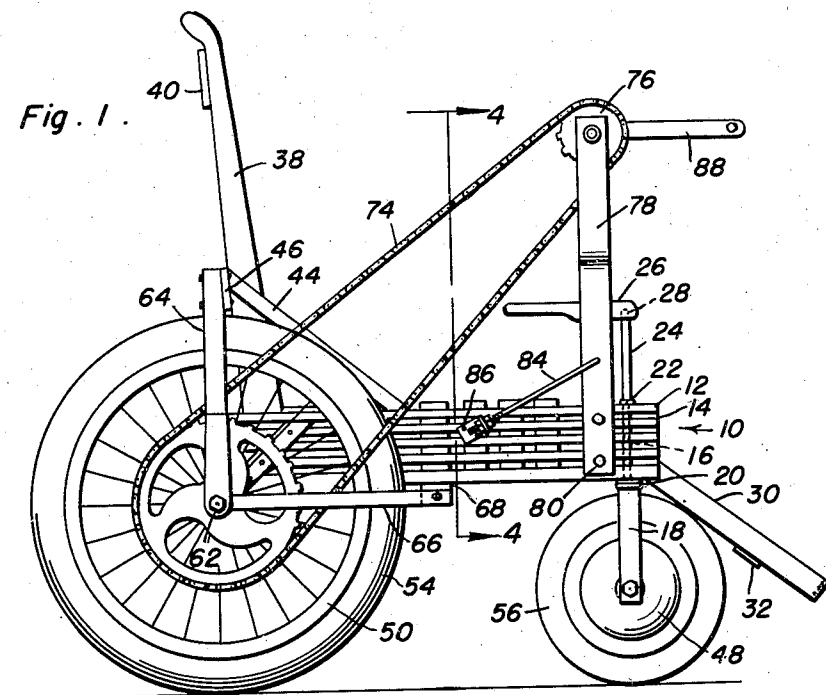
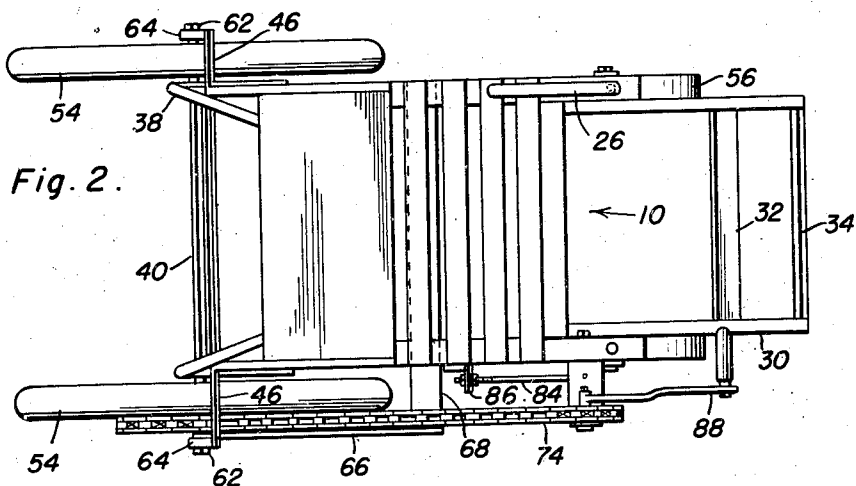
F. E. WOOD

2,452,886

WHEEL CHAIR

Filed Dec. 15, 1947

2 Sheets-Sheet 1



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Fig. 3.

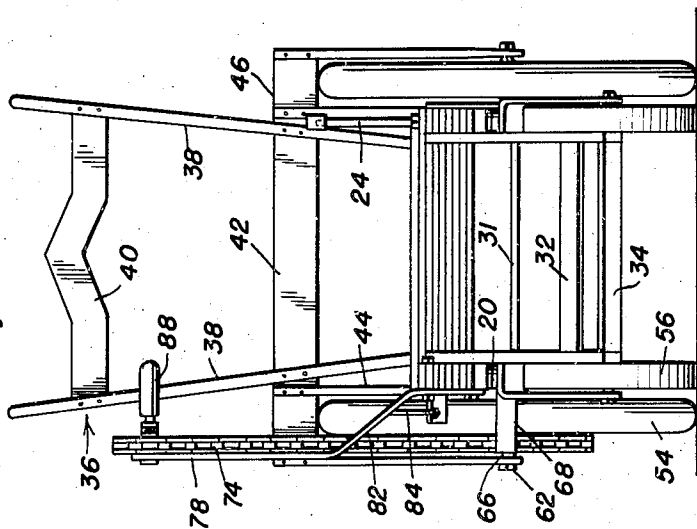


Fig. 4.

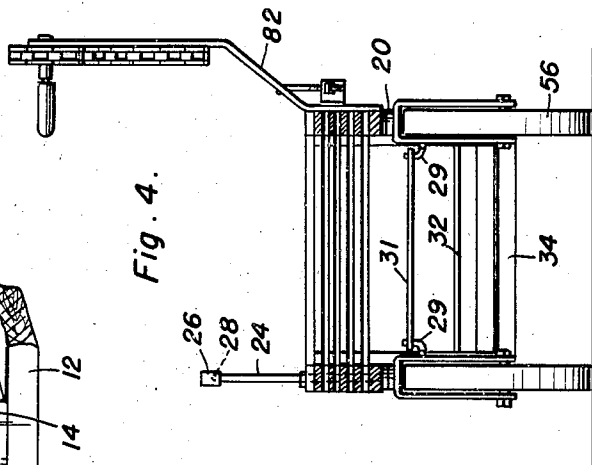


Fig. 5.

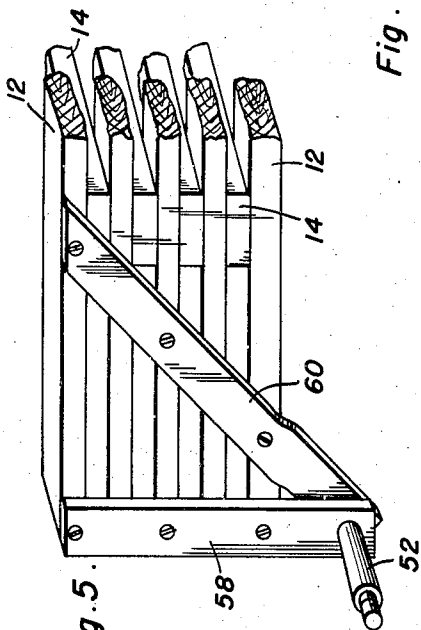
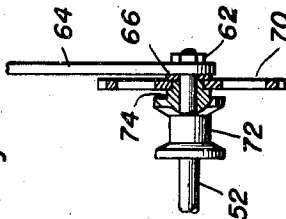


Fig. 6.



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## UNITED STATES PATENT OFFICE

2,452,886

## WHEEL CHAIR

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1 Claim. (Cl. 280—250)

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This invention relates generally to wheel chairs, and more particularly to a wheel chair suitable for use by an invalid having lost full use of his legs and having means whereby the occupant of the chair may propel himself over the ground or floor by operation of a hand crank.

The primary object of this invention is to provide a wheel chair which will be relatively light in weight while being extremely sturdy and simple in construction.

Another object of this invention is to provide a wheel chair having improved steering means including a pair of forks vertically and pivotally mounted in the frame of the chair and operatively linked by a tie rod, a feature of the steering means residing in the removability of the steering handle so that greater freedom of movement, as in gaining access to and leaving the chair, is obtained.

Still another object of this invention is to provide a frame which is a combination seat and supporting frame for the chair and which is relatively thick vertically so that the problem of providing suitable bearings for the above mentioned forks is simplified, and so that a suitable support is provided for the various other elements of the chair.

Still another object of this invention is to provide means whereby the sprocket chain and sprocket wheel assembly employed in the manual driving means for the chair, is made easily tightenable by the manipulation of a brace connected to the said frame and to a vertically disposed upright member carrying one of the sprocket wheels and the crank whereby the chair is operated.

And a last object to be mentioned specifically is to provide a wheel chair which is relatively inexpensive and practicable to manufacture, which is extremely safe as well as convenient and simple to operate, and which will give generally efficient and durable service.

With these objects definitely in view, together with other objects which will appear hereinafter as this description proceeds, this invention resides in certain novel features of construction, combination and arrangement of elements and portions which will be hereinafter described in the specification, particularly pointed out in the appended claim, and illustrated in the accompanying drawings which form a material part of this application, and in which:

Figure 1 is a right hand side elevational view of the assembled chair;

Figure 2 is a top plan view of the assembled chair;

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Figure 3 is a front end view of the assembled chair;

Figure 4 is a vertical transverse sectional view, taken substantially upon the line 4—4 and in the direction of the arrows of Figure 1;

Figure 5 is an enlarged fragmentary detail view of a corner portion of the frame, together with frame braces and one of the stub axles used for mounting the rear wheels; and

Figure 6 is a fragmentary vertical sectional view, taken on a line through the right hand rear wheel and contiguous portions, to show how the sprocket wheel on this rear wheel of the chair is secured to the hub portion of the said rear wheel, and the general arrangement of the supporting braces for the axle, certain portions in the figure being broken away and the underlying portions shown in cross section, and other portions of the figure being shown in elevation.

Similar characters of reference designate similar or identical elements and portions throughout the specification and throughout the several views of the drawings.

Referring now to the drawings in detail, it will be seen that this invention includes a frame 10 of considerable vertical thickness and represented as being of rectangular cross section in three different planes, the frame being very light in weight considering the rigidity thereof and being normally constructed of wooden members 12 and 14 extending longitudinally and transversely of the frame, respectively. A sufficient number of these members 12 and 14 will be supplied to make the frame completely rigid and these members will overlap at the corners of the frame. The overlapping portions at the front corners of the frame are vertically bored to receive an axis member 16 of a fork 18 on either side of the frame. This fork has a bearing portion 20 of enlarged diameter to engage the under surface of the frame 10, and when a conventional bicycle-type fork is adapted for use with this chair, the nut and bearing structure usually associated with such forks and indicated at 22 is made to comprise means whereby the forks are prevented from downward movement relative to the frame, while an extension 24 of the axis member 16 carries a steering handle 26. The steering handle may be made with a socket fitting over a similarly configured terminal 28 on the upper end of the extension 24 so that the handle may be removed easily from this extension, or alternatively, the extension may be removed from the axis member, so that the handle with the extension 24 may be removed, to facilitate a patient or invalid

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person in gaining access to the chair or in leaving the chair. On the inside of each of the forks 18 there is provided an arm 29 and a tie rod 31 is suitably pivoted to and between these arms 29 to cause the forks to move together, the orientation of the arms and the general arrangement being similar to the arrangement of tie rod assemblies in automotive vehicles.

A leg rest 30 with transverse members which may be considered foot rests 32 and 34, is secured to the front portion of the frame 10, while the rear portion of the frame has rigidly secured thereto a substantially upright back 36 comprised of upwardly and outwardly disposed lateral members 38, transverse members 40 and 42 and clothing guards 44 secured to outwardly extending portions 46 of the lower transverse member 42 and to lateral portions of the frame intermediate the forward and rear ends thereof. The device is made mobile by front wheels 48 operatively mounted in the forks 18 and rear wheels 50 carried on stub axles 52, these wheels being preferably rubber tired, as indicated at 54 and 56.

Vertical brace members 58 and forwardly and upwardly extending supplementary brace members 60 are rigidly secured to the rear corner portions of the frame and laterally thereof, and these brace members 58 and 60 have rigidly secured thereto the stub axles 52. The outer ends of the stub axles 52 are threaded to receive nuts 62 and it will be noted that the said outer ends are braced against movement vertically relative to the frame 10 by vertical braces 64 secured to and depending from the extending portions 46 of the transverse member 42 of the back, and against longitudinal movement relative to the frame 10 by a horizontal brace 66, in the case of the right hand wheel, both these braces being held in place by the nuts 62. The forward end of the horizontal brace 66 is secured to a transverse frame member 68 mounted on an intermediate portion of and on the underside of the frame.

A sprocket wheel 70 is secured to the hub 72 of the rear right wheel by means of an extending portion 74 of the hub, the sprocket wheel 70 being thus spaced outwardly so that the sprocket chain 75 will not foul the wheel 50. The other end of this sprocket chain 75, which is endless, is entrained around another sprocket wheel 76 freely rotatably mounted upon the upper end of an upright 78, the lower end of which is bolted at 80 to the forward right hand side of the frame. It will be noted that the upright 78 is offset outwardly, as indicated at 82 and when it is borne in mind that the frame 10 is constructed of wood, it will be understood that a brace 84 pivotally secured at one end to an intermediate portion

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of the upright 78 and adjustably secured at the other end to a bracket 86 bolted or otherwise rigidly secured to the side of the frame 10, will provide suitable means for tilting the upright 78 slightly forwardly or slightly to the rear to tighten or loosen the sprocket chain 75.

The chair structure is completed by provision of a hand crank 88 adapted to drive the sprocket wheel 76 when turned by the occupant of the chair.

The operation of this invention will be clearly understood from the foregoing description of the mechanical details thereof, taken in connection with the above recitation of the objects sought to be achieved by this invention.

Minor variations in the detail of construction and the proportionment of the various elements may be resorted to without departure from the spirit and scope of this invention and the drawings should be considered as illustrative rather than limiting. Accordingly this invention should be limited in scope only as determined by a proper interpretation of the terms used in the subjoined claim.

Having described the invention, what is claimed as new is:

A wheel chair including a combination horizontal frame and seat, a pair of hind wheels mounted on the sides adjacent the rear edge of said frame, a pair of transversely spaced vertical forks pivoted on the forward portion of said frame, an axis member of one fork extending upwardly through said frame and having a steering handle thereon, a pair of front wheels freely rotatively mounted in the forks, and a back for the chair, said frame comprising a plurality of layers of longitudinally disposed members and interspaced transversely disposed members and said axis member extending through overlapping portions of said members.

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