Feb. 24, 1953 J. J. KOCIAN ET AL 2,629,371

WHEEL CHAIR EXERCISING ADAPTER

Filed July 7, 1950 2 SHEETS—SHEET 1

Fig. 2.

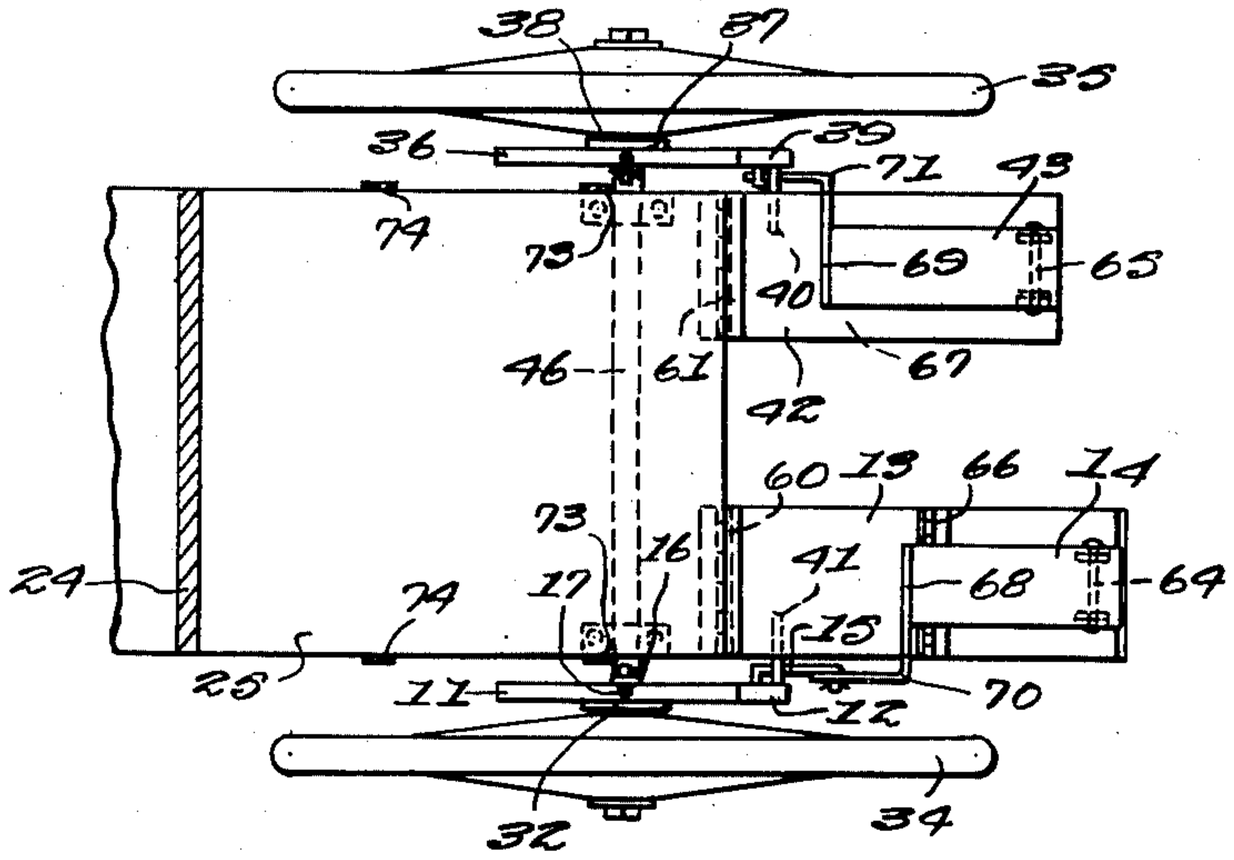
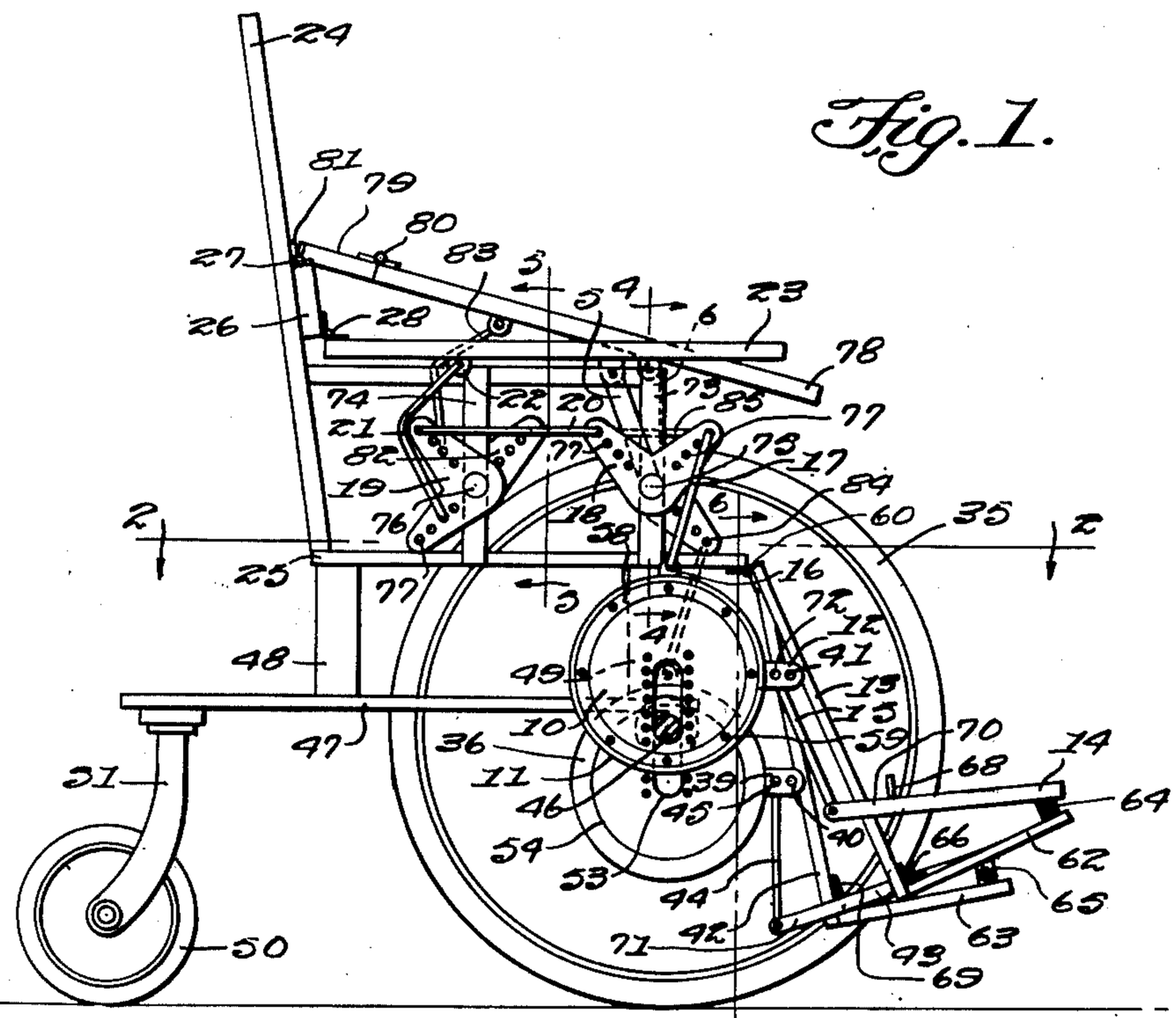


Fig. 1.



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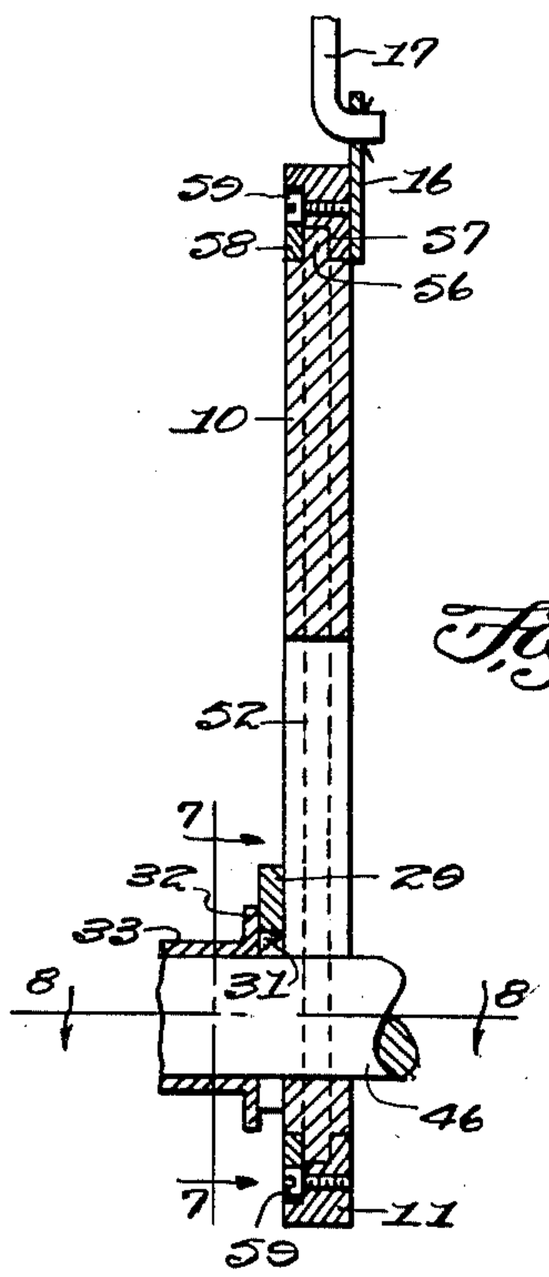

Fig. 4.

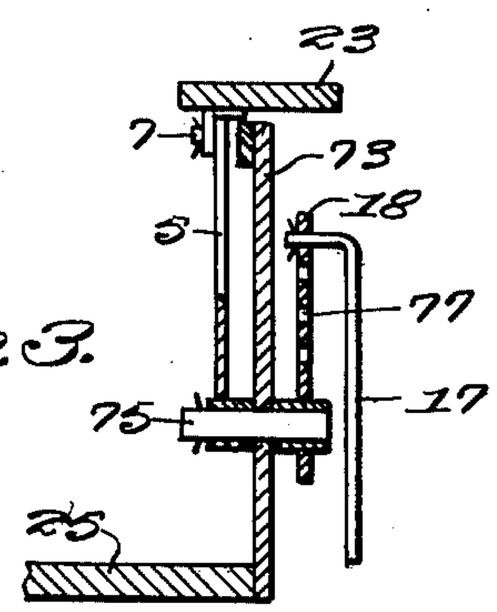

Fig. 3.

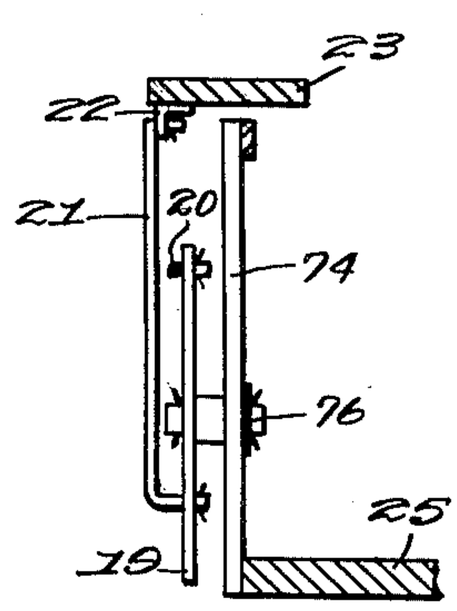

Fig. 5.

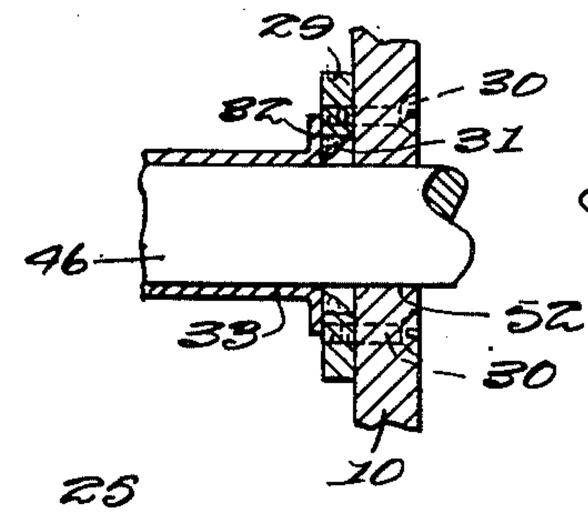

Fig. 8.

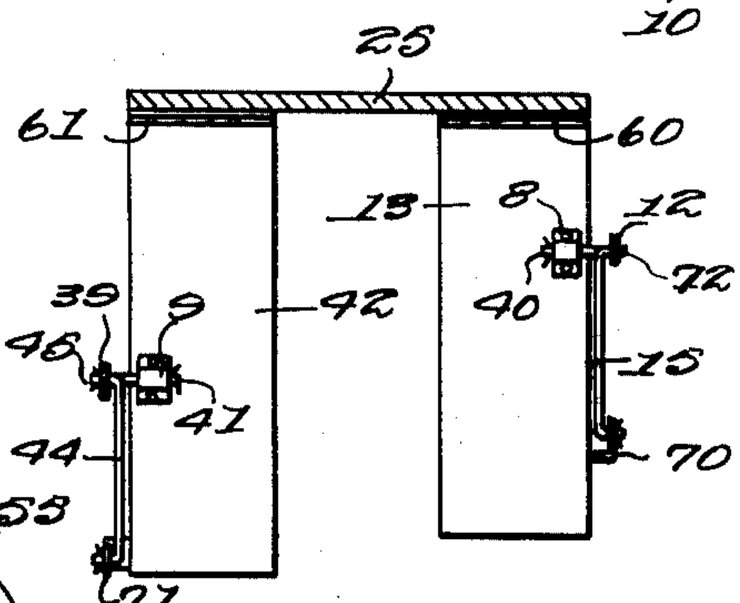

Fig. 7.

Fig. 6.

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WHEEL CHAIR EXERCISING ADAPTER

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Application July 7, 1950, Serial No. 172,518

5 Claims. (Cl. 128—25)

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This invention relates to attachments for wheel chairs of the type normally provided with hand rails or propelled by the occupant thereof, and in particular cams having eccentric slots therein mounted on the inner surfaces of wheels with rings journaled on the cams and having tabs connecting arm and foot rests to the rings with the arms connected through bell cranks with connecting links.

The purpose of this invention is to provide an exercising adaptor for wheel chairs for inducing muscular development in limbs of persons afflicted with certain paralytic or degenerative diseases or traumatic impairment and this is accomplished through regulated rocker action of the arm and leg rests of the chair.

Wheel chairs are normally provided with arm and foot rests and for some diseases and afflictions it is desirable to exercise the arms and legs to stimulate circulation of blood through the afflicted parts and also to keep the muscles active. With this thought in mind this invention contemplates attachments for a wheel chair wherein means is provided for actuating the arm and foot rests as the chair travels.

The object of this invention is, therefore, to provide means whereby a cam action is connected to arm and foot rests of wheel chairs whereby the arm and foot rests are actuated with a rocking action as a chair on which the device is installed is moved over a surface.

Another object of the invention is to provide cam actuated rocker action for arm and foot rests for wheel chairs that may be installed on chairs now in use.

A further object of the invention is to provide a wheel chair having cam actuated arm and foot rests which is of a simple and economical construction.

With these and other objects and advantages in view the invention embodies cams with elongated slots therein bolted to the inner surfaces of the wheels of a wheel chair with the arm and leg rests of the chair pivotally mounted and with means for connecting the cams to the arm and foot rests to provide rocking action in the said arm and foot rest as the chair travels over a surface.

Other features and advantages of the invention will appear from the following description taken in connection with the drawings wherein:

Figure 1 is a side elevational view with the wheel on the near side of the chair omitted and with the shaft on which the wheels are mounted shown in section, illustrating the adaptor mounted on a wheel chair and connected to arm and foot rests thereof.

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Figure 2 is a horizontal sectional view of the chair as shown in Figure 1 taken on line 2—2 thereof.

Figure 3 is a vertical cross section through the cam of one of the wheels of the chair showing the shaft of the wheel in the outer end of the slot.

Figure 4 is a vertical detail view showing a section through one of the arms of the chair taken on line 4—4 of Figure 1.

Figure 5 is a similar vertical detail view taken on line 5—5 of Figure 1.

Figure 6 is a vertical cross section taken on line 6—6 of Figure 1 showing the supporting panels of the foot rests.

Figure 7 is a vertical detail view on an enlarged scale showing a section through the wheel shaft and looking toward the inner surface of the cam, said section being taken on line 7—7 of Figure 3.

Figure 8 is a longitudinal horizontal section through the mounting with the shaft in the cam being taken on line 8—8 of Figure 3.

This invention is an adaptor or an attachment for a wheel chair of the type having wheels mounted on the ends of an axle extended through the underpart of the chair structure and this invention adds cams adjustably mounted on the inner surfaces of the wheels and having rings traveling on the cams with the rings connected by tabs to pivotally mounted foot rests and connected by links to bell cranks which are connected to pivotally mounted arm rests. By this means the cams, one being positioned to coact with each wheel, are set so that as the chair is moved over the ground the arms and limbs of a person positioned in the chair are actuated by the arms and foot rest of the chair to simulate movements of the body in walking.

A conventional wheel chair may be used with the cams mounted on the inner surfaces of the wheels and with rings slidably mounted on the cams and connected to foot rests and arms of the chair.

A cam 10 on one side of the chair is provided with a ring 11 having a tab 12 thereof connected to a foot rest 13 and the tab 12 is connected to a foot rest 14 by a link 15. The ring 11 is also provided with a tab 16 which is connected by a link 17 to a bell crank 18. The bell crank 18 is connected to a second bell crank 19 by a link 20 and the bell crank 19 is connected by a bent link 21 to an eye 22 on the under surface of an arm

23. The bell cranks 18 and 19 are provided with rows of spaced openings 77 in which the links may be positioned to regulate the movement of the arms.

The arm 23 is pivotally connected to a back 24 of a chair having a seat 25 through an intermediate section 26 and the section 26 is pivotally connected by a hinge 27 to the back 24. The section 26 is connected to the main portion of the arm 23 by a hinge 28.

The bell cranks 18 and 19 are pivotally mounted on vertically positioned bars 73 and 74 with pins 75 and 76 and the arm rest 23 is connected to the pin 75 with an arm 5.

The cams 10 and 54 are provided with elongated slots 52 and 53, respectively and the cams are mounted on the shaft 46, on which the wheels 34 and 35 are also mounted with horse-shoe shaped flanges, as indicated by the numeral 29 and the flanges are secured to the cams by screws 30 which are positioned in rows of openings 55. The shaft 46 extends through the slots 52 and 53 of both cams and as hereinbefore stated the wheels 34 and 35 are mounted on the ends of the shaft. The positions of the cams are adjusted in the slots 52 and 53 by moving the flanges 29 so that the screws 30 are positioned in different openings. The flanges 29 are secured, preferably by welding to flanges 32 of hubs 33 of the wheels 34 and 35. The welding between the flanges 29 and 32 is indicated by the numeral 31 as shown in Fig. 8.

The cam 54 is mounted on the wheel 35 with a flange 38, similar to the flange 32 of the wheel 34 and a flange 37 is welded to the flange 38 and secured by screws 30 to the cam 54. The cam 54 is provided with a ring 36, similar to the ring 11 and the ring 36 is provided with a tab 39 similar to the tab 12.

The tab 39 is pivotally connected by a pin 40 to a strut 42 of a foot rest 43 and the inner end of the foot rest is connected by a link 44 to the tab 39 with a pin 45 whereby the foot rest 43 is suspended from two points providing a swinging action.

The extended end of the foot rest 43 is pivotally mounted by a pin 65 on a base 63 and the foot rest 43 is connected by an arm 71 to a pin 45 in the inner part of the tab 39. By the same means a pin 41 extended from the tab 12 is positioned against the under surface of the back 13 of the foot rest 14 and the foot rest 14, the outer end of which is pivotally mounted on a base 62 by a pin 64 is provided with an arm 70 that is connected to the tab 12 by the rod 15. The foot rest 14 is provided with a heel rest 68 and a similar heel rest 69 is provided on the foot rest 43.

The shaft 46 is journaled on the under surface of a platform 47, upon which the seat 25 is supported by posts 48 and 49 and the platform is supported at the back with a caster 50 having a wheel supported in a yoke 51.

The cams 10 and 54 are provided with annular ribs or tongues 56 that extend into annular recesses 57 in the rings 11 and 36, respectively and the rings are provided with side plates 58 that are secured in position by screws 59.

The arm rest 78 on the opposite side of the chair is pivotally connected to the back 24 by a section 79 and the section 79 is connected to the arm rest 78 with a hinge 80 and to the back 24 with a hinge 81.

What is claimed is:

1. An exercising wheel chair comprising a seat having a back, an axle upon which the forward

end of the seat is mounted, a caster supporting the rear portion of the seat, wheels having hubs on the inner surfaces mounted on the ends of the axle, cams mounted on the hubs of the wheels and eccentrically positioned in relation to the axle, rings having laterally extending relatively spaced tabs positioned on the peripheries of the cams, foot rests hinged to the forward edge of the seat, arm rests hinged to the back of the seat, and means connecting the arm and foot rests to the tabs on the rings for actuating the arm and foot rests by the rings on the cams.

2. An exercising wheel chair comprising a seat having a back, an axle upon which the forward end of the seat is mounted, a wheel for supporting the rear part of the seat, wheels mounted on the ends of the axle, cams mounted on the inner surfaces of the wheels and eccentrically positioned in relation to the axle, foot rests hinged to the forward edge of the seat, arm rests hinged to the back of the seat, and means connected to the arm and foot rests and coacting with the cam for actuating the arm and foot rests by rotation of the cams.

3. An exercising wheel chair comprising a seat having a back, an axle upon which the forward end of the seat is mounted, a wheel for supporting the rear part of the seat, wheels mounted on the ends of the axle, cams mounted on the inner surfaces of the wheels and eccentrically positioned in relation to the axle, foot rests hinged to the forward edge of the seat, arm rests hinged to the back of the seat, bell cranks pivotally mounted on the seat and connected to the arm rests, and means connected to the bell cranks and to the foot rests and coacting with the cam for actuating the foot rests and bell cranks of the arm rests by the rotation of the cams.

4. In an exercising wheel chair, the combination which comprises a seat having a back, an axle upon which the forward part of the seat is mounted, a wheel for supporting the rear portion of the seat, wheels having hubs on the inner surfaces mounted on the ends of the axle, cams having annular peripheral tongues mounted on the hubs of the wheels and eccentrically positioned in relation to the axles, rings having annular recesses therein receiving the tongues on the cams for journalling the rings on the cams, tabs on the outer surfaces of said rings, foot rests hinged to the forward edge of the seat, arm rests hinged through hinge sections at the rear ends thereof to the back of the seat, bell cranks pivotally mounted on the seat, a link connecting one of the bell cranks for actuating said arm and foot rests upon rotation of said cams on each side of the seat to the arm of the corresponding side of the seat, links connecting the bell cranks, and means connecting the tabs of the rings journaled on the cams to the foot rests and bell cranks.

5. In an exercising wheel chair, the combination which comprises a seat having a back, an axle upon which the forward part of the seat is mounted, a wheel for supporting the rear portion of the seat, wheels having hubs on the inner surfaces mounted on the ends of the axle, cams having annular peripheral tongues mounted on the hubs of the wheels and eccentrically positioned in relation to the axles, rings having annular recesses therein receiving the tongues on the cams for journalling the rings on the cams, tabs on the outer surfaces of said rings, foot rests hinged to the forward edge of the seat, arm rests hinged through hinge sections at the rear ends

thereof to the back of the seat, bell cranks pivotally mounted on the seat, a link connecting one of the bell cranks for actuating said arm and foot rests upon rotation of said cams on each side of the seat to the arm of the corresponding side of the seat, links connecting the bell cranks, means connecting the tabs of the rings journaled on the cams to the foot rests and bell cranks, and means adjusting the positions of the cams on the hubs in relation to the axle.

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