April 2, 1946. A. KAPUSTA 2,397,790

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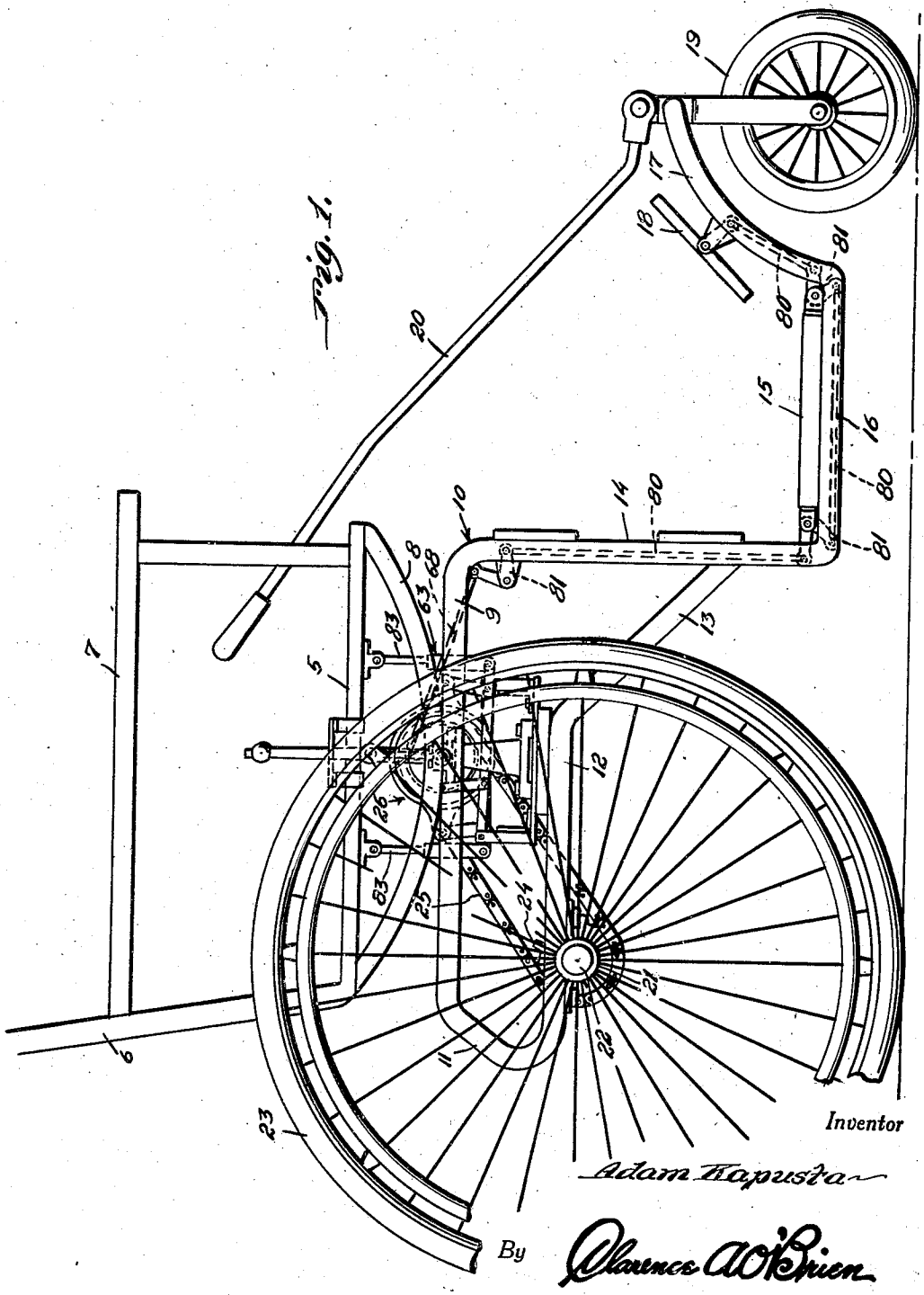


Fig. 1.

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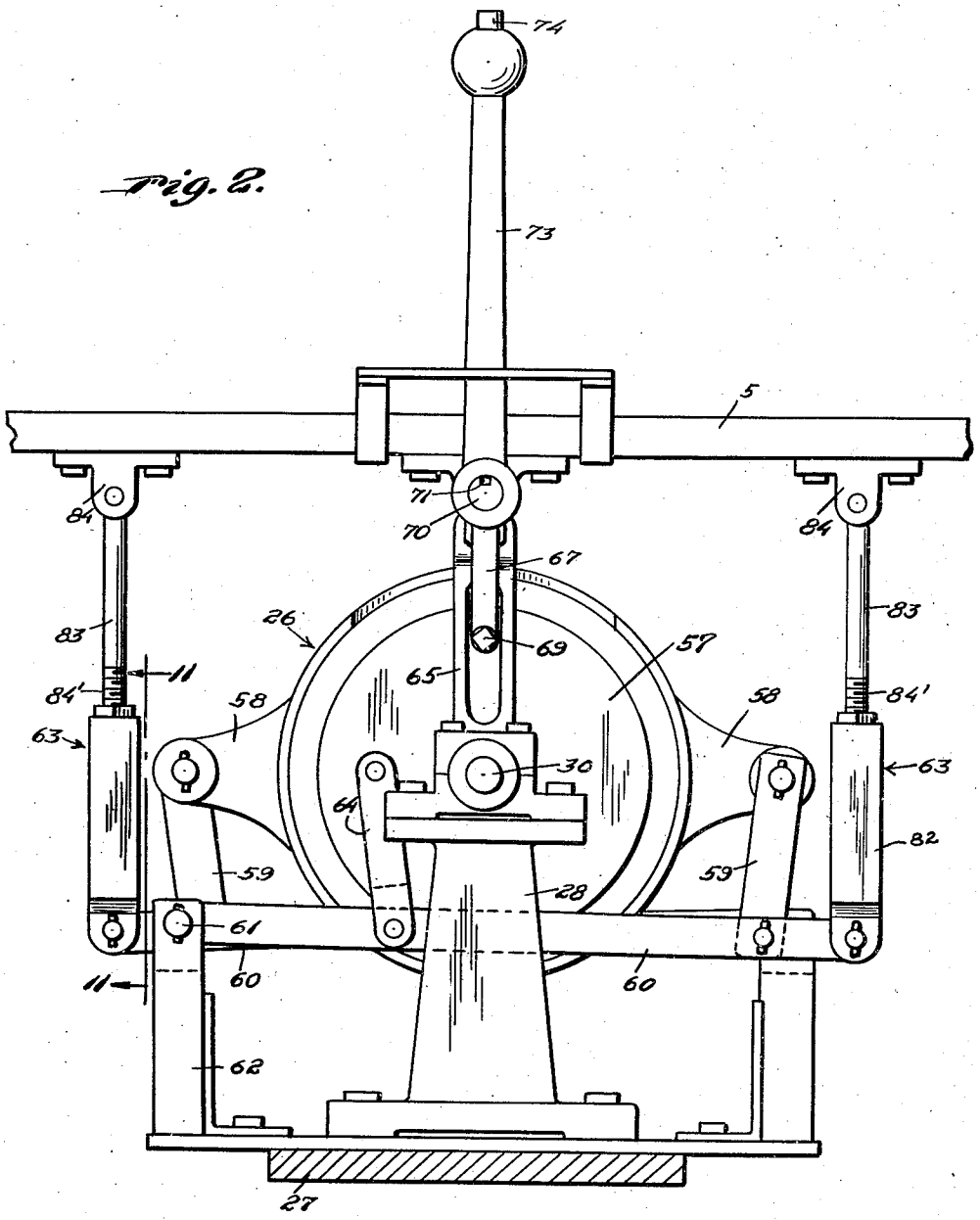
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Fig. 2.



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Fig. 3.

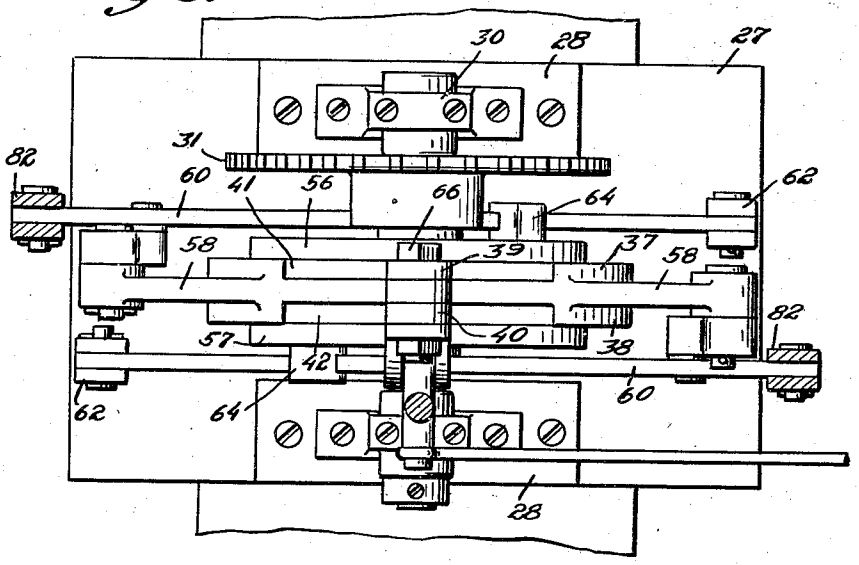


Fig. 5.

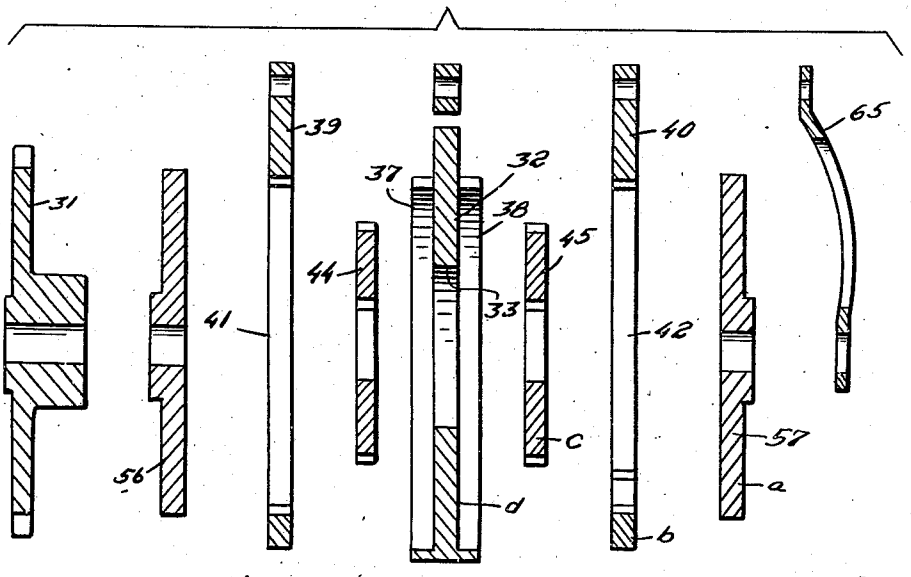
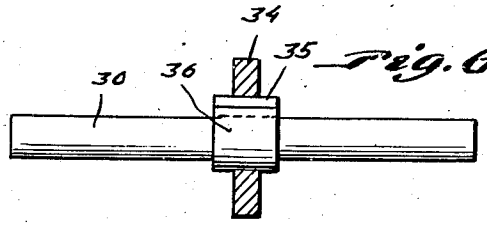


Fig. 6.



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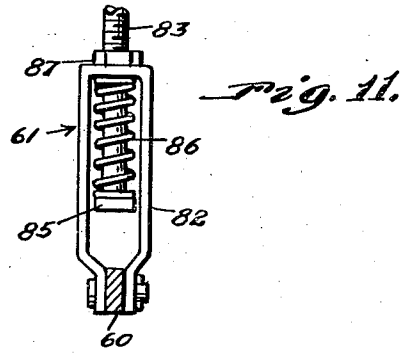


Fig. 11.

Fig. 4.

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Fig. 7.

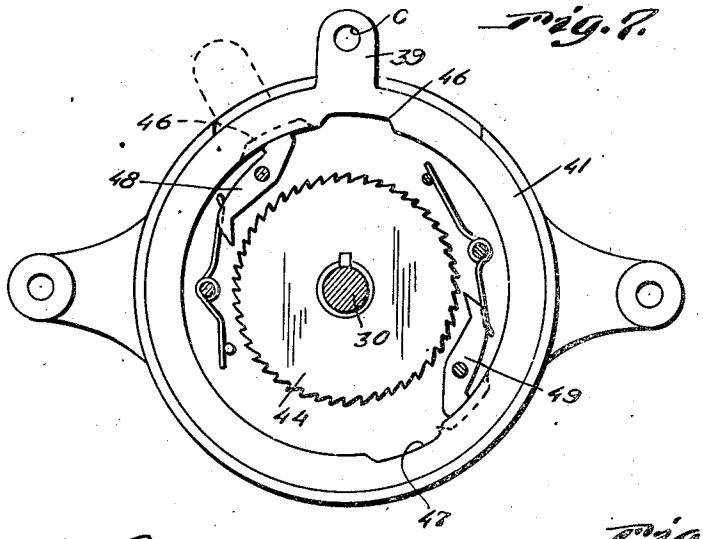


Fig. 8.

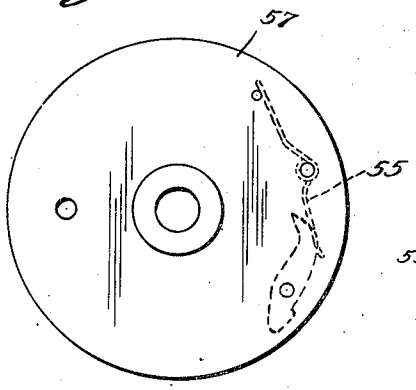
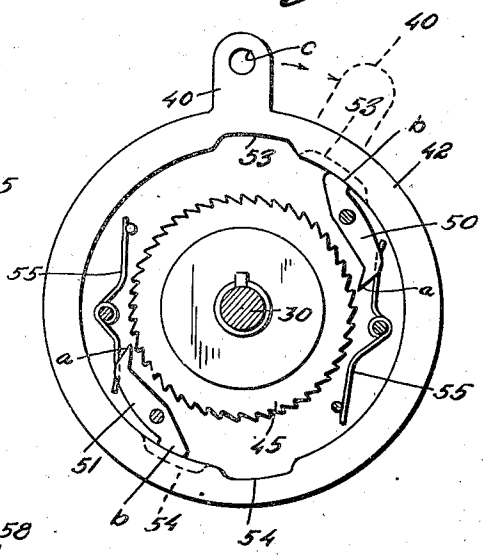


Fig. 10.



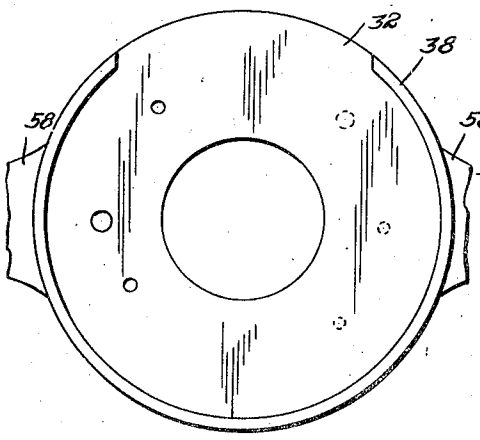


Fig. 9.

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Patented Apr. 2, 1946 2,397,790

UNITED STATES PATENT OFFICE

2,397,790

INVALID CHAIR

Adam Kapusta, Milwaukee, Wis.

Application August 21, 1941, Serial No. 407,809

3 Claims. (Cl. 74—143)

The present invention relates to new and useful improvements in invalid chairs and more particularly to a chair of the occupant propelled type.

The principal object of the present invention is to provide an invalid chair which can be propelled by a normal rocking motion of the occupant.

Another important object of the invention is to provide an invalid chair which by a normal rocking motion and direction selecting means, can be driven in either a forward or backward direction.

Still another important object of the invention is to provide an invalid chair involving direction selecting means which can be controlled by a foot of the occupant if the need requires.

Other objects and advantages of the invention will become apparent to the reader of the following specification:

In the drawings:

Figure 1 represents a side elevational view of the chair.

Figure 2 is a side elevational view of the drive mechanism.

Figure 3 is a fragmentary top plan view showing the drive mechanism.

Figure 4 is a fragmentary vertical sectional view through the drive and shift mechanism.

Figure 5 is an exploded view showing the elements of the drive and shift mechanism.

Figure 6 is an elevational view with a part in section showing the shaft of the drive and shift mechanism.

Figure 7 is a sectional view taken substantially on line 7—7 of Figure 4.

Figure 8 is an outside elevational view of a drive plate, the pawl shown in dotted lines being the pawl to the right in Figure 7.

Figure 9 is a fragmentary side elevational view of the drive annulus with the pawls removed.

Figure 10 is a sectional view taken substantially on the line 10—10 of Figure 4.

Figure 11 is a sectional view taken substantially on line 11—11 of Figure 2.

Referring to the drawings wherein like numerals designate like parts, it can be seen in Figure 1, that numeral 5 denotes a seat from which rises a back 6. Suitable arms 7 can be provided, and as is shown in Figure 1, the seat 5 is mounted on rockers 8 which are supported by horizontal portions 9 of a frame generally referred to by numeral 10, this frame 10 having downwardly disposed portions 11 at the rear of the chair seat 5 from which horizontal portions 12 extend forwardly underlying the portions 9 and being offset downwardly at their forward ends, as at 13, to connect and brace vertical portions 14 depending from the horizontal portions 9. These vertical portions 14 support a foot rest 15 by forward extensions 16 thereof and numeral 17 denotes an upwardly inclined forward portion of this frame on which is mounted a pedal 18, the function of which will be later described.

A caster wheel 19 is mounted at the forward portion 17 of the frame 10 and is controlled by an elongated hand bar 20.

The portions 12 of the frame are equipped with suitable bearings 21 through which an axle 22 extends and suitably secured to the ends of this axle 22 are wheels 23.

A sprocket wheel 24 is keyed to the axle 22 and is driven by a sprocket chain 25 extending from a drive and direction selecting mechanism generally referred to by numeral 26.

In the construction of the drive and direction shift mechanism, a platform 27 is mounted across the portion 12 of the frame 10 and suitably secured thereto. Standards 28 rise from the platform 27 and have bearings 29 at their upper ends through which the ends of a shaft 30 are disposed. On this shaft 30 is a sprocket wheel 31 over which the drive chain 25 is trained.

The drive mechanism consists of a drive annulus 32, this annulus 32 having a substantially large central opening 33 for substantially snug but rotatable fit on a disc 34 which is keyed, as at 35, to a hub 36 on shaft 30. A substantially circular wall 37 is provided at one side of the annulus 32 while a similar wall 38 is provided at the other side of the annulus 32. The upper portions of these walls 37 and 38 have cutout portions defining openings through which upstanding shanks 39 and 40 on direction shift rings 41 and 42, respectively, are movable. These shift rings 41 and 42 operate within the confines of the walls 37 and 38, and within the confines of the rings 41 and 42 operate ratchet wheels 44 and 45 (see Figure 5). These ratchet wheels 44 and 45 are keyed, as at 35, to the hub 36 along with the disc 34 (see Figure 4).

As shown in Figure 7, the shift ring 41 is provided at its upper portion and immediately below its shank 39 with a pocket 46. A second recess 47 is provided at the lower portion of the ring 41. On this particular side of the drive annulus 32 is a pair of pawls 48 and 49, representing upper and lower pawls, while on the other side of the drive annulus are upper and lower pawls 50 and 51 which are controlled by the other shift ring 42, it being understood of course

that all of these pawls are constructed in substantially the same manner, each having a pointed ratchet wheel engaging head *a* and a tail portion *b* which is engageable into an opposed recess of the ring 41 or the ring 42, the ring 42 being provided with upper and lower pockets 53 and 54 into which the pawls 50 and 51 can be disposed by their tail portions *b* in response to the force of springs 55 when the ring is moved to the proper position.

At this point, it will be observed that the lower pawls 49 and 51 are located on drive plates 56 and 57 which are disposed at the outer sides of the ratchet wheels 44 and 45.

Arms 58 extend laterally from the drive annulus 32 and each is connected by a link 59 to a beam 60 and these beams 60 are each fulcrumed, as at 61, on a post 62, and further connected by connecting means generally referred to by numeral 63 to the bottom of the chair seat 5. Links 64 extend from the beams 60 to the drive discs 56 and 57 on which are mounted the pawls 49 and 51.

An arcuate and slotted member 65 has its lower end apertured to receive the shaft 30 while its upper end is apertured to receive a bolt 66 which extends through the openings *c* in the shanks 39 and 40 of the shift rings 41 and 42. One end of the head portion of an inverted T-shaped driver 67 is disposed into the slot of the member 65, while the other end of the head has an opening therethrough for receiving one end of a rod 68 and a set screw 69 prevents displacement of this rod 68 from the head of the member 67.

The inverted T-shaped member 67 is secured to a shaft 70 located under the seat 5 and has one end grooved, as at 71, to receive a spring retracted tooth 72 carried by a hand lever 73. A button 74 in the upper end of the lever 73 operates the rod 75 which in turn projects the tooth 72 into the groove 71 of the shaft 70 when actuation of the lever 73 is to be accomplished with the result that the inverted T-shaped member 67 will shift the rings 41 and 42 so as to bring the pockets therein to position to permit either the pawls 48, 49 or the pawls 51, 50 to be released for effective operation.

When the shift means has thus been set, a rocking motion of the seat 5 will result in the downward and upward movements of the connections 63. For instance, as the forward connection 63 goes upwardly, the link 59 will rotate the drive annulus 32 so that for instance if the pocket 47 has opposed the pawl 49 and the pocket 46 opposed the pawl 48, the pawl 48 engaging the ratchet wheel 45 will rotate the shaft 30 and actuate the drive chain 25 in one direction. Upon the downward movement of this said connection 63 the side plate 57 will be affected by the link 64, the plate 57 being rotated in the opposite direction from the annulus 32 with the result that on the downward movement of the connection 63 the pawl 49 (see Figure 7) will be moved effectively to rotate the ratchet wheel 45 in the same direction, continuing the operation of the shaft 30. These pawls, as shown in Figures 7 and 10 are carried by the opposite sides of the drive annulus 32. In other words, regardless of the direction of travel, either backwards or forwards, rocking movement of the chair seat is effective in operating the drive mechanism.

The pedal 18 is connected by rod sections 80 and bell cranks 81 to the aforementioned rod 68, so that in the event a person cannot use his hands, he may use one foot to actuate the pedal 18 in operating the shift means when he is desirous of going either forward or backward.

At this point, it will be observed that the connections 63 each consists of a clevis 82 pivotally connected to the corresponding beam 60 and a threaded rod 83 pivotally connected at its upper end, as at 84, to the chair seat 5, while its lower end is threaded, as at 84', and disposed through the upper portion of the clevis 82. The lower end of the threaded member 83 is provided with a nut or head 85 between which and the upper end of the clevis 82, is a coiled compression spring 86. Numeral 87 denotes a jamb nut on the threaded portion of the rod 83 for engagement against the top of the clevis 82.

While the foregoing specification sets forth the invention in specific terms, it is to be understood that numerous changes in the shape, size and materials may be resorted to without departing from the spirit and scope of the invention as claimed hereinafter.

What is claimed as new is:

1. Propulsion means for wheel chairs and the like comprising a drive shaft in driving relation to the wheels of the chair, a pair of ratchet wheels carried by the shaft, a drive annulus provided with spring-pressed drive pawls on opposite sides thereof, a control ring for the pawls at each side of the drive annulus, said control rings being provided with constructions adapted to engage the pawls to hold the pawls at one side of the drive annulus disengaged with respect to the corresponding ratchet wheel while the pawls at the opposite side are in engaged position, the pawls at one side of the annulus being in reversed driving position to the pawls at the opposite side of the annulus to drive the shaft in one direction of rotation, manual means for shifting the control rings and manual means for actuating the drive annulus.

2. Propulsion means for wheel chairs and the like comprising a drive shaft in driving relation to the wheels of the chair, a pair of ratchet wheels carried by the shaft, a drive annulus provided with spring-pressed drive pawls on opposite sides thereof, a control ring for the pawls at each side of the drive annulus, said control rings being provided with constructions adapted to engage the pawls to hold the pawls at one side of the drive annulus disengaged with respect to the corresponding ratchet wheel while the pawls at the opposite side are in engaged position, the pawls at one side of the annulus being in reversed driving position to the pawls at the opposite side of the annulus to drive the shaft in one direction of rotation, manual means for shifting the control rings and manual means for actuating the drive annulus, said control rings being connected together and operative in unison.

3. Propulsion means for wheel chairs and the like comprising a drive shaft in driving relation to the wheels of the chair, a pair of ratchet wheels carried by the shaft, a drive annulus provided with spring-pressed drive pawls on opposite sides thereof, a control ring for the pawls at each side of the drive annulus, said control rings being provided with constructions adapted to engage the pawls to hold the pawls at one side of the drive annulus disengaged with respect to the corresponding ratchet wheel while the pawls at the opposite side are in engaged position, the pawls at one side of the annulus being in reversed driving position to the pawls at the oppo-

site side of the annulus to drive the shaft in one direction of rotation, manual means for shifting the control rings and manual means for actuating the drive annulus, said control rings being connected together and operative in unison, a member having an opening at one end for receiving the drive shaft and its other end secured to one of the control rings, said member having a longitudinal slot therein, said manual means for shifting the control rings including a shaft having a crank, said crank having a pintle disposed into the slot for operating the control rings.

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