

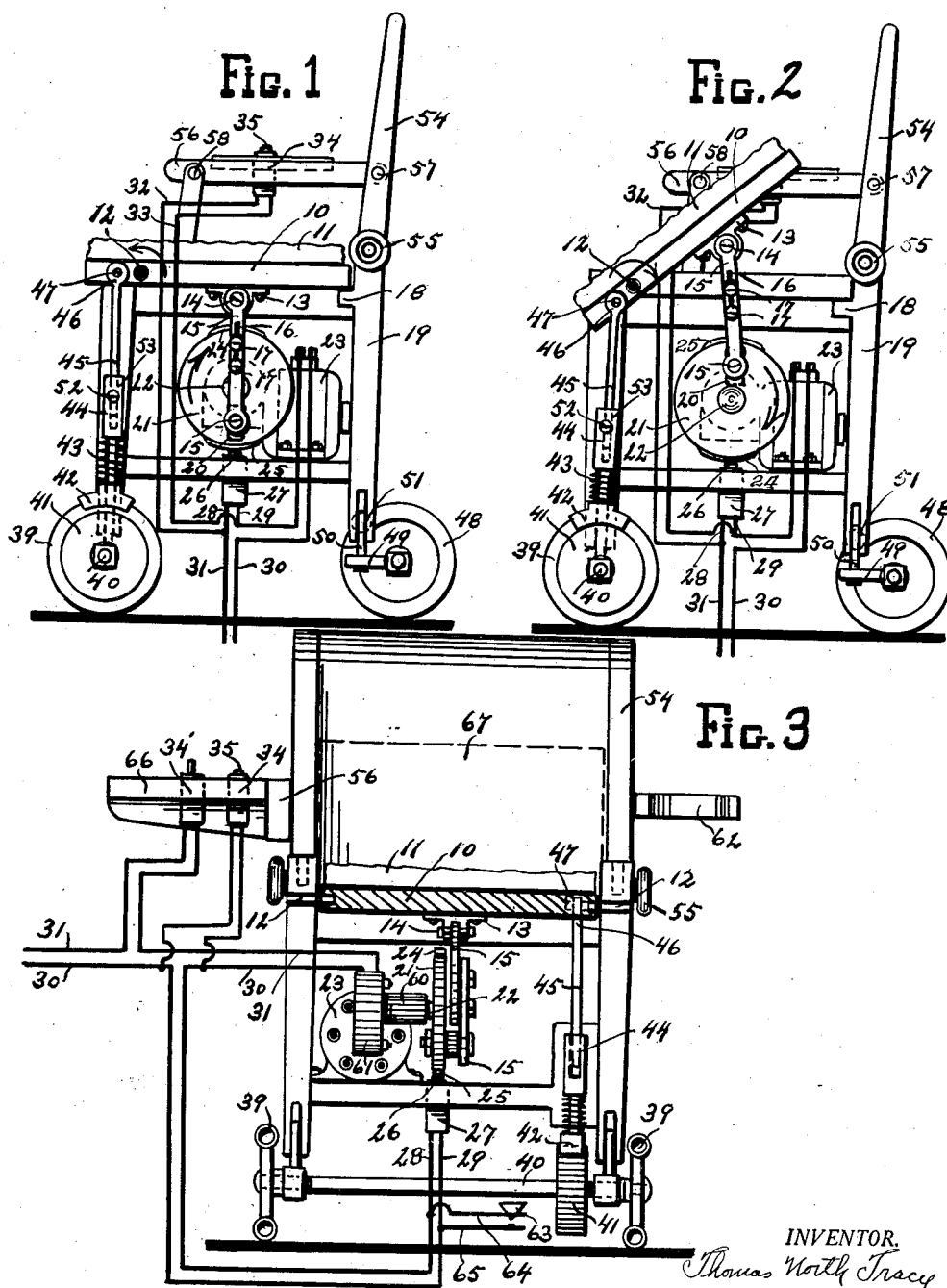
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MECHANICAL CHAIR

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MECHANICAL CHAIR

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8 Claims. (Cl. 155—30)

This invention pertains to chairs with power operated mechanical seats for invalids and cripples, and has for an object to assist the invalid to rise from the chair and stand upon his feet without exertion or assistance, and to enable him to return to the seated position without physical effort or help.

It is also an object to provide, when desirable, a chair on wheels, with a mechanical seat. The chair may be freely moved about, except during the time the mechanical seat is rising, or in the extreme elevated position, or descending, at which times the wheels are automatically locked.

It is also an object of the invention to have the mechanical seat respond to slowly lift the invalid, by a few seconds pressure upon a push button or pedal, and to have the seat rise and automatically come to a stop at its most elevated position,—and when the invalid wishes to return to the seated position, to permit him to cause the seat to slowly descend by a few seconds pressure upon the push button or pedal and automatically come to rest at the lowest position.

It is also an object of this invention to have not only the chair adjustable as to height, but to have the distance of lift of the seat adjustable as well.

It is also an object to provide a right hand side table-like arm, and to provide a rest for crutches at the left hand side, and to have the back adjustable for upright sitting or for reclining.

It is also an object of this invention to construct an operating mechanism which cannot bump or jam on either the up or down travel of the automatic seat, in case of switch failure.

With these and certain other objects in view which will become apparent as the description proceeds, the invention consists in the parts and combinations of parts, all as will be more fully described and particularly pointed out in the claims.

Referring to the accompanying drawing, forming a part of this specification, in which like numerals designate like parts in all the views.

Figure 1 is a side view of one design of one of my mechanical chairs in simple scheme diagram to show the mechanical seat in the down position and the associated mechanism.

Figure 2 is a like side view, but with the mechanical seat in the up position and the associated mechanism.

Figure 3 is a front view of this design of mechanical chair, also in simple scheme diagram.

With further reference to Figure 1: 10 is the seat of the chair and 11 a soft cushion adapted

to be attached thereto; 12 is a hinge or pivot bar about which the seat swings as shown by the small curved arrow. 13 is a metal lifting device screwed or bolted securely to the under side of the seat, adapted to receive the wrist pin 14 of the connecting rod 15, adapted to be adjusted for upward lift through the agency of the slotway 16 and the bolt members 17, 17.

This slot-way with its associated bolt members is adjustable as to provide various degrees of upward lift, but to yield on the downward stroke after the back edge of the movable seat 10 comes down upon the ledge member 18 of the chair from standard 19. The adjustment as to upward lift, more or less, depending upon the length of the legs of the invalid, is effected by the position of the lower end of the connecting rod 15 in the slot-way 20 of the revolving face plate 21. This face plate is mounted upon the end of the shaft 22 which is carried by a stout bearing and gear reduction shown at the back in dotted lines, operated by a worm reduction (not shown) by means of the electric motor 23.

The ratio of the motor speed to the speed of the face plate may be, for example, 100 to 1, or more, depending upon the size and speed of the motor employed.

24 and 25 are lugs disposed in diametric positions upon the periphery of the face plate, adapted to depress the spring plunger 26 of the electric switch 27, adapted to keep the circuit at the ends of the wires 28 and 29 closed so that current may flow through the switch except when the switch plunger is depressed by the lugs on the up and down side of the face plate. The wire 30 connects with one motor terminal and to a fuse main switch (not shown) and thence to a socket or other outlet to a source of operating electric current. The other wire 31 connects likewise to the source of power. It will then be seen that the switch 27 and the motor 23 are in series. The wires 32, 33 which are parallel connected, as shown, go to a push button switch 34, but the action of this push button switch, is just the opposite in action of the switch 27, in that the button or plunger 35 adapted to be manually operated, must be depressed and held down to close the branch parallel circuit.

39 is the tire of the far side back front wheel rigidly mounted upon the axle 40, and 41 is a friction drum wheel, or a toothed drum wheel (teeth not shown in this view) also rigidly mounted upon the same shaft, and 42 is a brake shoe member, with corresponding teeth (not shown in this view) adapted to be forced down upon the

toothed drum and to securely arrest its rotation through the agency of the powerful spiral spring 43, when the member 44 with the adjustable connecting rod 45 is depressed by the connecting rod 5 head 46, connected by means of the wrist pin 47 at the forward edge of the mechanical seat.

48 is the rear wheel, swivel mounted on the member 49 in order that it may turn about the stem member 50, adjustable as to height in the chair upright 19, by means of the screw hand-wheel 51, shown in dotted lines. The forward wheels 39 are likewise adjustable as to height and the set screw 52, in the connecting rod sleeve 53 is provided for adjustment to care for the wheel adjustment.

The back of the chair 54 may be tilted back by relieving the pressure upon the screw hand wheel 55, which carries the arm 56 with it by means of the pivoted end 57 and the pivoted arm 58.

With further reference to Figure 2. Here, as previously stated, the seat 10 is in the elevated position, the forward end of which is shown in the down position, depressing the connecting rod 45 and by compressing the powerful spiral spring 43, securely locks the front wheels.

With further reference to Figure 3. The type of motor and right angle reduction gearing will be made clear. Since the type of reduction is well-known it is not deemed necessary to show the toothed wheel and worm within the housings 60 and 61. Here 62 is a crutch receiving rack, and 63 is a foot pedal switch (when required) adapted to close the small auxiliary multiple circuit 64—65. To simplify the illustration, the rear swivel wheels are not shown here, but the table arm is illustrated extended at 66, and the dotted line 67 represents the mechanical seat in the extreme up position. 34' is an emergency cut-off switch.

The operation of the seat by the invalid may be described as follows.

The wires 30 and 31 are for convenience in the form of an insulated flexible cable provided with suitable plug or other connection to a public service light and power service. Since the motor 23 may be of the universal type, that is series wound with a laminated field, the same will operate upon either direct or alternating current.

When the leads are disconnected and the chair seat is down as shown in Fig. 1, the lug 25 is depressing the spring plunger, 26, of the switch 27, which maintains an open circuit and therefore the motor and associated mechanism are an open circuit. The chair may now be easily wheeled about, with or without the seated invalid.

When the leads are connected to the source of electric current, the motor and associated mechanism contrive to remain at rest, until the invalid depresses the push button 35, or the foot pedal 63. It is only necessary to keep the push button or the pedal depressed for a short time, because the motor immediately starts up, revolving the face plate 21, which carries the switch operating lugs 24 and 25. After a few seconds therefore, the time being dependent upon the speed of the face plate and the length of the lug, the plunger 26 of the switch is left free to rise by the passage of the lug from contact therewith, when its contained coiled spring (not shown) forces the plunger up when the circuit is closed, and therefore the hand of the invalid may be removed from the push button, and is free to reach for his crutches, leaning in the rack member 64, while the motor continues to operate and lift the

seat. When the seat reaches the extreme up position, the face plate 21 will have rotated approximately 180° to bring the other lug 24 carried thereby into its down position to contact and automatically depress the plunger 26, thereby stopping the motor.

When the invalid wishes to return to his chair and sink down to rest, he deposits his crutches in the rack member and pushes the push button again for a few seconds, when the motor starts and lowers the seat and again automatically comes to a stop when the lug 25 contacts the plunger 26, this time when the seat is in the down position. It should be observed that as soon as the mechanical seat has risen a short distance, the wheels become securely locked and that they remain locked until substantially a cycle of operation is completed, making it safe for the invalid to leave and to resume occupancy of the chair.

Whereas I describe the electric motor as a universal motor adapted to the voltage of a public light and power system, I may of course use a motor adapted to operate on a cell or more of storage battery, and mount the said battery upon a shelf either under or behind the chair, for example. In association with a portable step down transformer, also carried by the chair, it is evident that I may construct the system to operate a low voltage universal type of motor upon either a power circuit or a battery.

It is of course obvious that one may vary the ways and means of constructing and operating the features of my mechanical chair without departing from the spirit of the invention, and therefor it is not desired to be limited to the foregoing, except as may be covered by the claims.

Having described my invention, I claim:

1. In a chair for invalids the combination of a frame; a seat pivoted adjacent its forward edge to said frame; a rotatable member having bearings in said frame and connected by an operating rod to said seat to raise and lower the latter about its pivot; a motor operatively connected to and rotating said member; means carried by said member operative to stop the actuation of said motor when the seat is in its extreme raised and lowered positions; and manually operated means for initiating actuation of the motor after it has been stopped.

2. In a chair for invalids the combination of a frame; a seat pivoted adjacent its forward edge to said frame; a rotatable member having bearings in said frame and connected by an operating rod to said seat to raise and lower the latter about its pivot; a motor operatively connected to and rotating said member; means carried on the periphery of said member operative to stop the actuation of said motor when the seat is in its extreme raised and lowered positions; and manually operated means for initiating actuation of the motor after it has been stopped.

3. In a chair for invalids the combination of a frame; a seat pivoted adjacent its forward edge to said frame; a rotatable member comprising a vertically disposed disk having bearings in said frame and connected by an operating rod to said seat to raise and lower the latter about its pivot; a motor operatively connected to and rotating said disk member; means comprising a pair of lugs on the periphery of said disk member operative to stop the actuation of said motor when the seat is in its extreme raised and lowered positions; and manually operated means for initiating

ing actuation of the motor after it has been stopped.

4. In a chair for invalids the combination of a frame; a seat pivoted adjacent its forward edge to said frame; a rotatable member comprising a vertically disposed disk having bearings in said frame and connected by an operating rod to said seat to raise and lower the latter about its pivot; a motor operatively connected to and rotating said disk member; means comprising a pair of diametrically disposed lugs on the periphery of said disk member operative to stop the actuation of said motor when the seat is in its extreme raised and lowered positions; and manually operated means for initiating actuation of the motor after it has been stopped.

5. In a chair for invalids the combination of a frame provided with wheels for rolling the chair over a floor; a seat pivoted to said frame; means to raise and lower said seat about its pivot to aid an invalid in leaving and entering the chair; and braking mechanism operated by the seat in its raised position for holding the chair stationary while the invalid is leaving and entering the same.

6. In a chair for invalids the combination of a frame provided with wheels for rolling the chair over a floor; a seat pivoted to said frame; means to raise and lower said seat about its pivot

to aid an invalid in leaving and entering the chair; braking mechanism operated by the seat in its raised position for holding the chair stationary while the invalid is leaving and entering the same; and means under the control of the invalid for actuating the seat raising and lowering means.

7. In a chair for invalids the combination of a frame provided with wheels for rolling the chair over a floor; a seat pivoted adjacent its forward edge to said frame; means to raise and lower said seat about its pivot to aid an invalid in leaving and entering the chair; and braking mechanism operatively connected to said seat at substantially the forward edge thereof and operated by the seat in its raised position for holding the chair stationary while the invalid is leaving and entering the same.

8. In a chair for invalids the combination of a frame provided with wheels for rolling the chair over a floor; a seat pivoted to said frame; means to raise and lower said seat about its pivot to aid an invalid in leaving and entering the chair; and braking mechanism automatically applied by raising the seat and released by lowering the seat, said braking mechanism for holding the chair stationary while the invalid is leaving and entering the same.

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