

June 22, 1943.

J. COSTA ET AL

2,322,683

COMBINATION WHEEL CHAIR AND STRETCHER

Filed Nov. 29, 1940

4 Sheets-Sheet 1

Fig. 1.

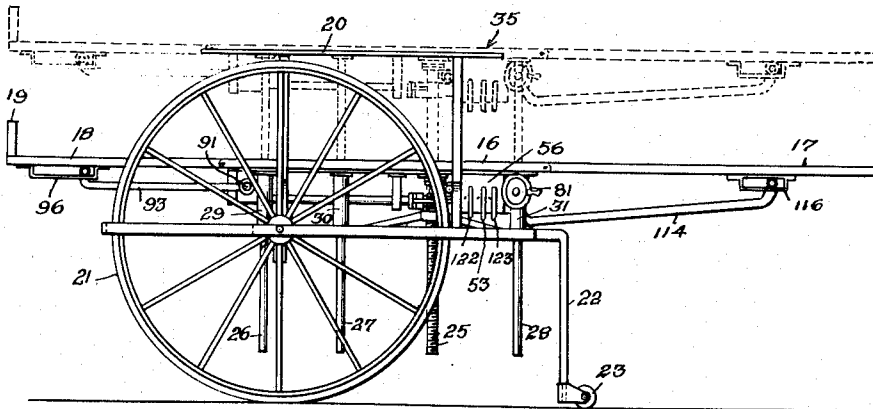
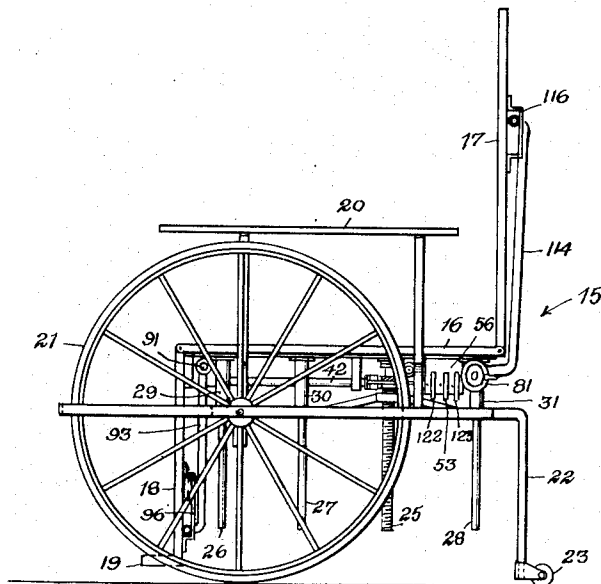


Fig. 2.



WITNESSES
Geo. W. Taylor
John H. Haxum

INVENTOR
Juanita Costa
and Ferrere Costa
 BY
Munn, Anderson & Liddy
 ATTORNEYS

June 22, 1943.

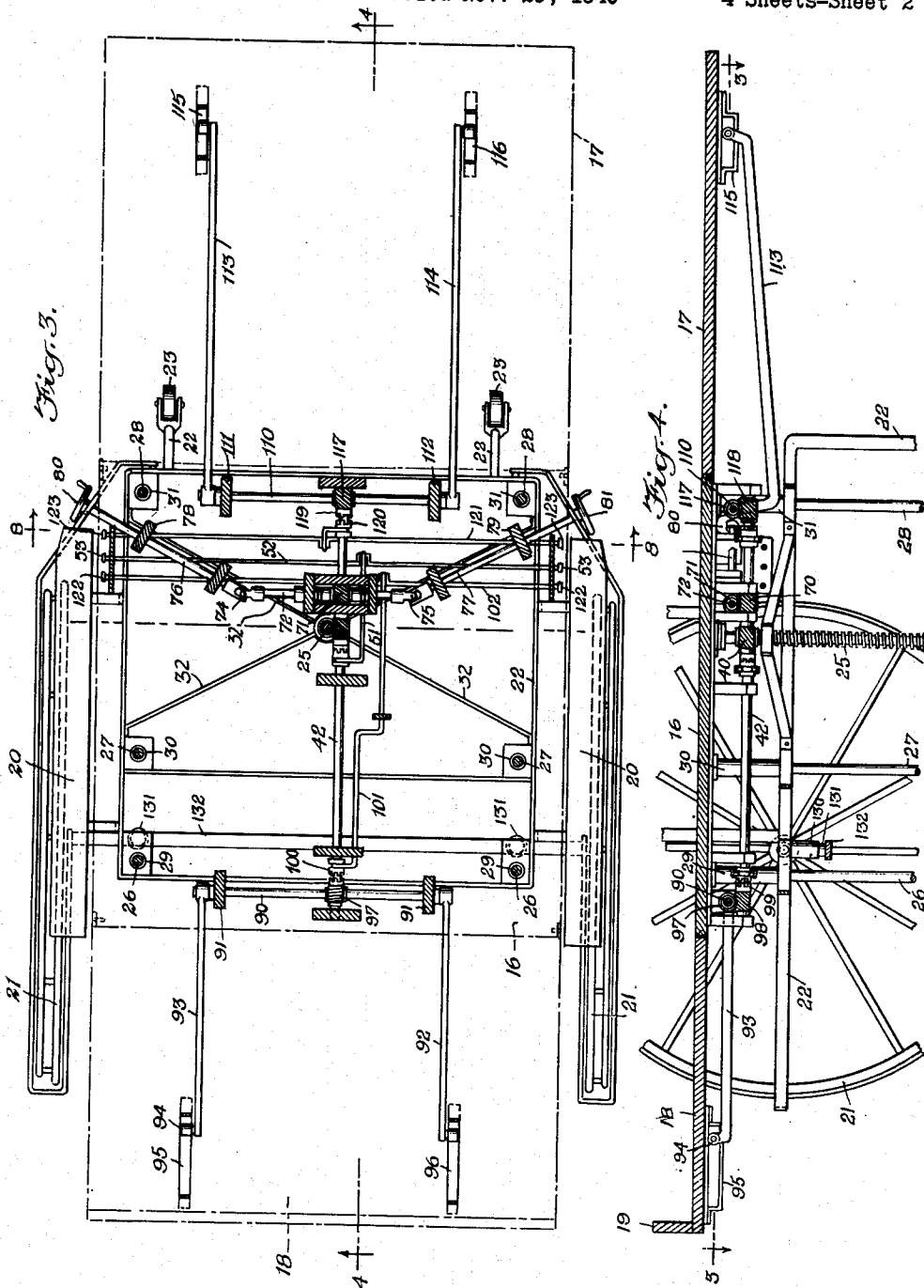
J. COSTA ET AL

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4 Sheets-Sheet 2



WITNESSES
George W. Taylor
John V. Shacum

INVENTOR
Juanita Costa
 BY *and Ferrere Costa*
Munn, Anderson & Liddy
 ATTORNEYS

June 22, 1943.

J. COSTA ET AL

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Fig. 5.

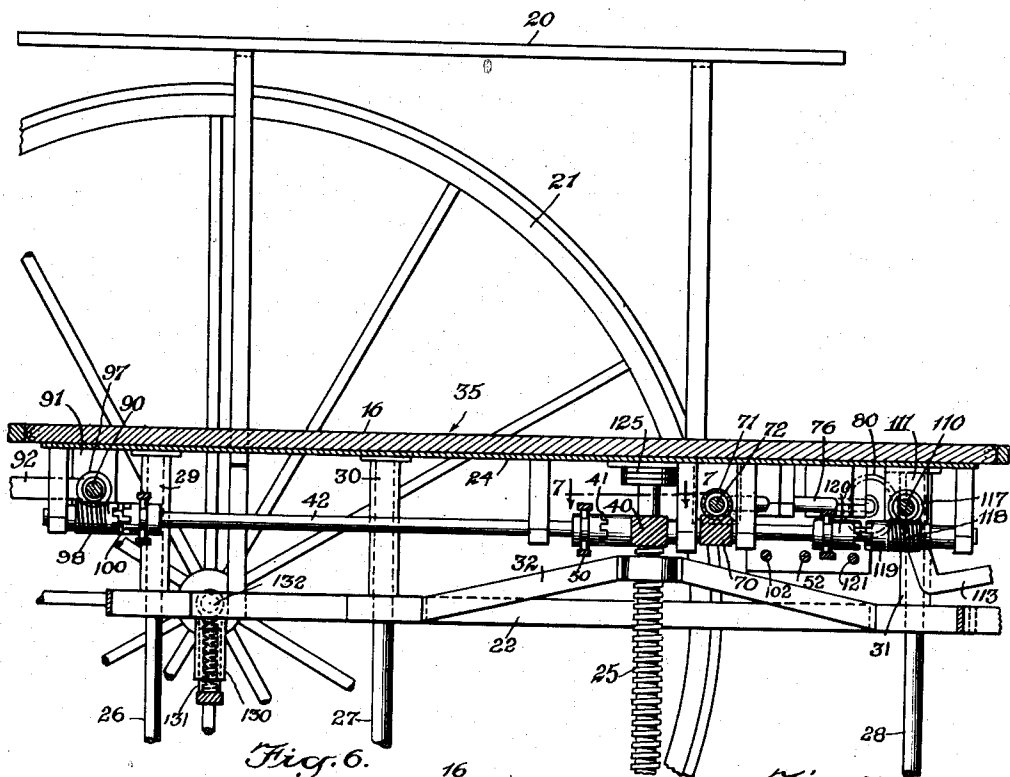


Fig. 6.

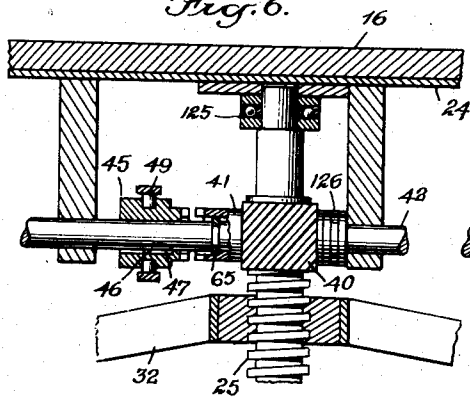
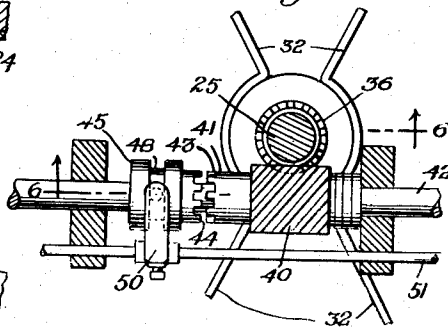


Fig. 7.



WITNESSES

John A. Starnes
John A. Starnes

INVENTOR

Juanita Costa
and Ferrere Costa

BY

Munn, Anderson & Lively
ATTORNEYS

June 22, 1943.

J. COSTA ET AL

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Fig. 8.

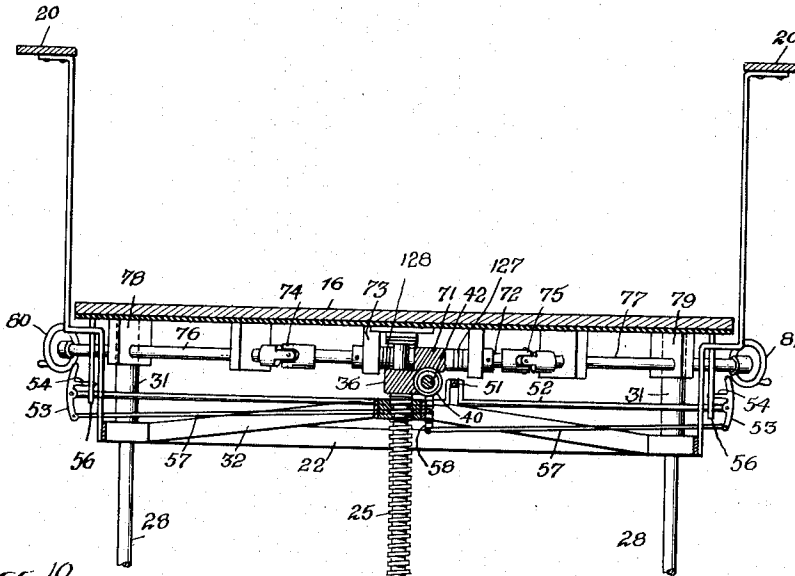


Fig. 10.

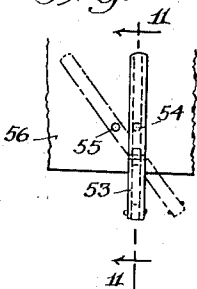


Fig. 9.

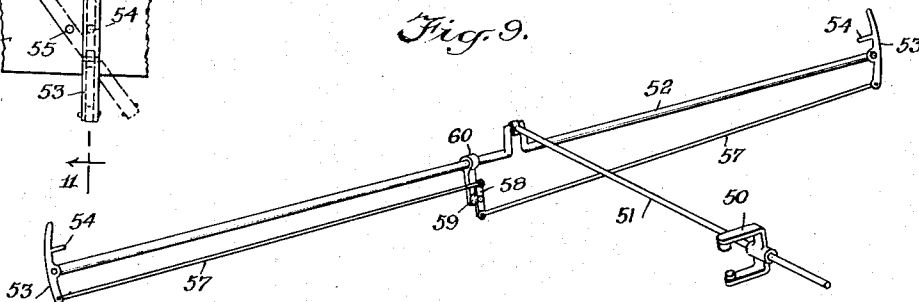
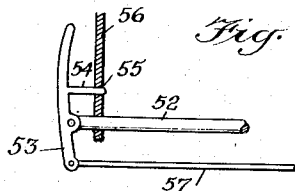


Fig. 11.



WITNESSES

George Taylor
John H. Glaccum

INVENTOR

Juanita Costa
By and Ferrere Costa

Mum, Anderson & Liddy
ATTORNEYS

UNITED STATES PATENT OFFICE

2,322,683

COMBINATION WHEEL CHAIR AND
STRETCHER

Juanita Costa and Ferrere Costa, New York, N. Y.

Application November 29, 1940, Serial No. 367,786

4 Claims. (Cl. 155—30)

This invention relates to a combination wheel chair and stretcher and has for its purpose the provision of a wheel chair which may at the same time be used as a stretcher and which may be raised and lowered. Many patients in hospitals are well enough to sit in a wheel chair and to move themselves from place to place in the chair, but are too ill to move from the bed to the chair. As a result, they must either stay in bed or be carried from the bed to the chair. Practically in all cases patients are more or less helpless; the carrying of the patient is not only a strain upon the nurse but is exceedingly dangerous, and patients risk being dropped or injured while being transferred from the bed to the chair.

The purpose of this invention is to provide a chair with adjustable back and leg portions, which may be flattened into a rolling stretcher and which may be raised to a level with the bed, so that a patient may be moved from the bed to the chair in a prone position with the greatest amount of comfort and safety to the patient.

A further object is to provide a control mechanism whereby the chair may be raised or lowered and the respective leg and back members adjusted to any desired angle where they will remain in position without the use of locks.

Other objects of the invention will become apparent as the description proceeds.

Referring to the accompanying drawings—

Fig. 1 is a side elevation of a chair in the stretcher position, while the dotted lines show the stretcher in the raised position;

Fig. 2 is a side elevation of our chair in the chair position;

Fig. 3 is a plan view of our device taken in the direction of the arrows 3—3 of Fig. 4 showing the operating mechanism for raising and lowering the chair and the leg and back rest members;

Fig. 4 is a cross-sectional view taken on the line 4—4 of Fig. 3;

Fig. 5 is an enlarged view of the raising mechanism shown in Fig. 4;

Fig. 6 is a detailed view of the raising mechanism;

Fig. 7 is a plan view of the raising mechanism;

Fig. 8 is a cross-sectional view taken on the line 8—8 of Fig. 3;

Fig. 9 is a detailed view of the clutch control handles;

Fig. 10 is an end view of the handle;

Fig. 11 is a view of the handle on the line 11—11 of Fig. 10.

Referring more particularly to the chair 15, it

will be noted that the chair resembles the usual wheel chair having a seat 16, a back seat 17, leg rest 18, foot rest 19, arms 20, the usual wheel 21, and a frame 22 carrying a caster 23.

As will be seen from the various illustrations, the back rest 17 and the leg rest 18 are hinged to the seat member 16. The seat member 16 is mounted upon the plate or frame 24 which engages the end of screw 25 and is stabilized by the rods 26, 27 and 28, which rods are slidably mounted within the tubes 29, 30 and 31. The screw 25 is mounted in the usual female manner positioned on the arms 32 of the frame 22, and it will be apparent that as the screw is rotated the body portion 35 of the chair will be raised or lowered depending upon the rotation of the screw 25. The screw 25 carries a helical gear 36 which engages a helical gear 40 on the sleeve 41, which sleeve is freely mounted on the shaft 42. Teeth 43 on the end of the sleeve 41 are adapted to engage similar teeth 44 on a clutch member 45. The clutch member 45 is keyed to the shaft 42 by means of a key 46 and a key slot 47. The clutch member 45 will therefore slide upon the shaft 42 laterally but is keyed to rotate with the shaft. The sleeve 41 is held in its proper position by the retaining ring 65.

The clutch member 45 is provided with an annular groove 48 in which the fingers 49 of the clamp 50 ride. The clamp 50 is positioned on the operating rod 51 which extends and is fulcrumed to the rod 52. Operating handles 53 are placed on either end of the rod 52 so that it may be operated on either side. The handles 53 are pivotally mounted on the ends of the rod 52 and have a finger 54 adapted to engage positioning holes 55 in the plate 56. A rod 57 extends from the bottom of the operating handle 53 to the arm 58 pivoted at its center 59 to the support 60 mounted on the rod 32. It will be seen that by pulling back the operating handle 53 the finger 54 will be disengaged from the holes 55 in the plate 56 on both sides of the chair and the handle may be turned to slide the clutch member 45 so that the teeth 43 engage the teeth 44 on the sleeve 41, and when the shaft 42 is rotated the screw 25 will be likewise rotated and the body of the chair raised or lowered. By inserting the finger 54 in the second hole 55 shown in Fig. 10, the clutch may be held in engagement.

The shaft 42 is provided with another helical gear 70 which in turn engages a similar gear 71 on the shaft 72. Mounted in the hanger 73 at either end of the shaft 72 are universal joints 74 and 75 which connect the shaft 72 with the

shafts 76 and 77 mounted in the hangers 78 and 79. The shafts 76 and 77 have hand wheels 80 and 81 extending on either side of the chair so that the operation of these hand wheels will cause the shaft 72 to rotate and through the helical gears power will be transmitted to the shaft 42.

At the foot end of the chair a shaft 90 is mounted in the hangers 91. The shaft 90 has arms 92 and 93 fixed at either end. The arm 93 has a finger 94 engaging the bracket 95 on the foot rest portion 18 and slidably mounted therein. The arm 92 similarly engages the bracket 96, and it will be seen that by rotation of the shaft 90 the position of the foot rest member with relation to the seat member may be controlled. Mounted on the center of the shaft 90 and fixed thereto is a gear 97 which engages the worm 98 mounted on the sleeve 99, which sleeve is loosely mounted on the end of the shaft 42.

A clutch member 100, similar to the clutch member 45 in all respects, is slidably keyed to the shaft 42 and is controlled by the rod 101 which runs to the operating rod 102 and is operated in the same manner as the rod 52. A similar shaft 110 is mounted at the back rest end of the seat member in the hangers 111 and 112. Mounted at either end of the rod 110 are the arms 113 and 114 engaging the brackets 115 and 116. A gear 117 is fixedly mounted on the shaft 110 and engages a worm 118 mounted on the sleeve 119 on the shaft 42. A clutch member 120 keyed to the shaft 42 and operated by the arm 121 is adapted to engage the clutch member on the sleeve 119 in the same manner as the clutch member 45 is operated. Handles 122 are on the ends of the rod 102 and handles 123 are on the ends of the rod 121.

In the normal use of the chair all of the clutches are disengaged and the position of the head and foot rest will be held due to the worm gears used. The clutches will be held in their disengaged positions due to the fixing of the operating handles 53, 122 and 123 by means of the fingers 54 in the openings 55. When it is desired to raise the foot rest, one of the handles 122 is operated to engage the clutch member 100. The hand wheel is then turned in either direction to vary the position and the clutch member 100 is disengaged. It will be appreciated that the operator may engage one of the clutches or all of them at the same time depending upon the desired manipulation of the chair. If, for instance, she wishes to turn the chair into a stretcher and at the same time raise it to the level of the bed, she may use all operating handles disengaging each as the particular part controlled thereby reaches the desired position. In lowering the stretcher and returning it to the chair position, all of the handles may be used at one time, or, if it is desired, the chair may first be lowered and then moved into the chair position gradually.

Various modifications and additions may be made in our structure without varying from the

conceptive idea. It will be appreciated also that bearings, such as the thrust bearing 125 on the screw 25, 126 on the shaft 42, and 127 and 128 on the shaft 72, will all assist in the easy operation of our device. The usual hand rails may be added to the wheels 21 of the chair and various modifications may be made for particular uses. For spring purposes a sleeve 130 may be mounted on the frame 22 with a spring member 131 engaging the axle 132 so that the chair will ride easily. It will be appreciated of course that the axle will be placed so that the center of gravity is behind the axle in about the position of the screw 25.

We claim:

1. In a chair having a frame, back and leg rest members hinged to a seat member, means for selectively or simultaneously varying the angle between said leg rest, back and seat members and for raising said seat member, said means comprising a central shaft, means for rotating said shaft, gear means engaging said back member, leg rest member and seat member, corresponding gear means loosely mounted on said shaft and clutch members controlling each of said corresponding gear members, whereby one or all of said gear members may be connected to said central shaft at any time.

2. In a chair having a frame, back and leg rest members hinged to a seat member, a shaft mounted centrally of said frame, means on said seat member operatively connected with said shaft to raise and lower said seat member, means on said leg rest and back members operatively connected with said shaft to vary the angle between said back and leg rest members with relation to said seat member, means to operate said shaft, and means to selectively engage or disengage each of said operatively connected means with said shaft to move any one of said seat, back, or leg rest members independently or simultaneously.

3. In a combination wheel chair and stretcher, a wheeled frame, a seat member mounted on the frame so that it may be raised and lowered, back and leg members movable with respect to the seat member to change their relation to the latter, a rotary shaft on the frame, means to operate the shaft, means responsive to the rotation of said shaft to raise and lower said seat member, means responsive to rotation of said shaft to move the back member to change its relation to the seat member, and means responsive to the rotation of said shaft to move the leg member to change its relation to the seat member.

4. In a combination wheel chair and stretcher as set forth in claim 3, wherein the second, third and fourth means each includes a clutch in order that the respective means function independently of the others for the intended purpose, and means to operate the clutch.

JUANITA COSTA.
FERRERE COSTA.