

Jan. 15, 1929.

P. GADBOIS

1,698,754

INVALID BED

Filed Feb. 20, 1924

2 Sheets-Sheet 1

Fig. 1.

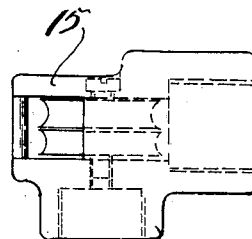
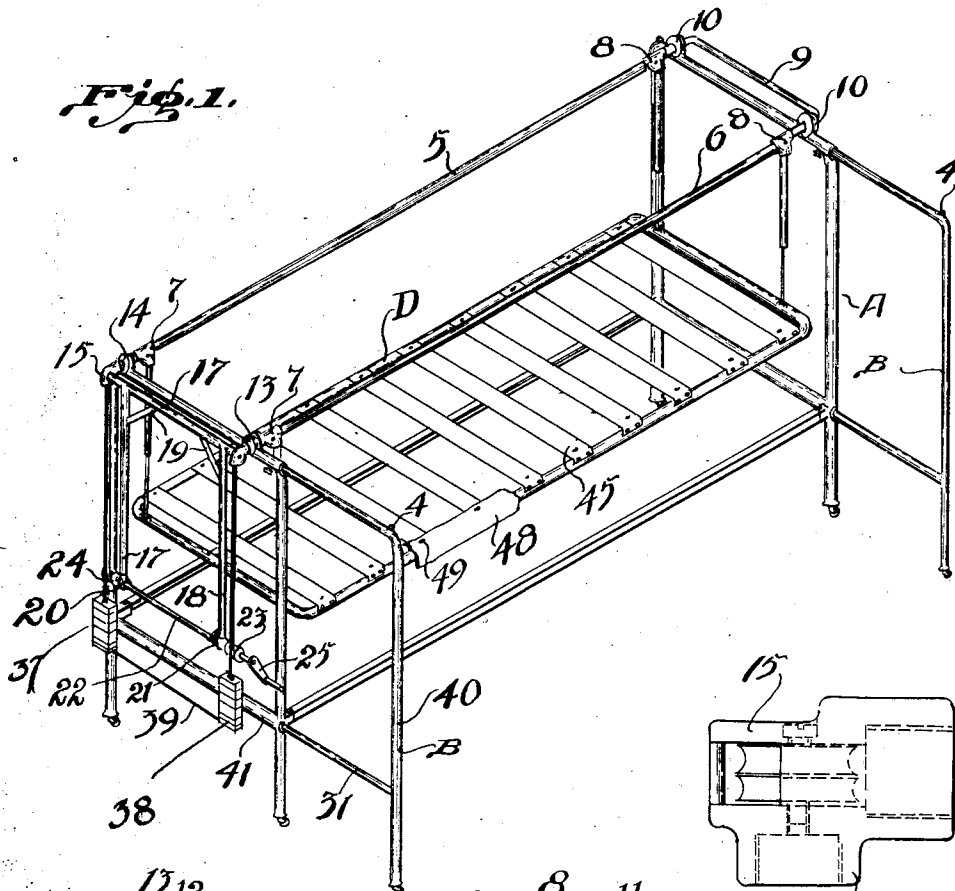


Fig. 3.

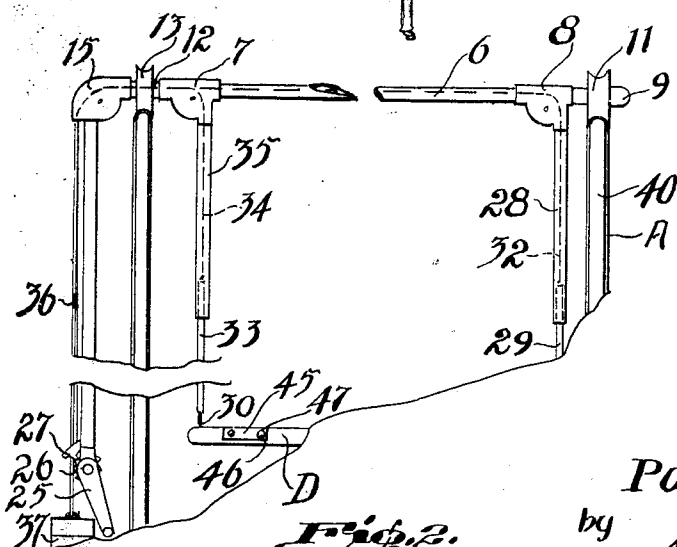


Fig. 2.

Inventor
Paul Gadbois
by *Chas. Johnson*
Att'y

Jan. 15, 1929.

1,698,754

P. GADBOIS

INVALID BED

Filed Feb. 20, 1924

2 Sheets-Sheet 2

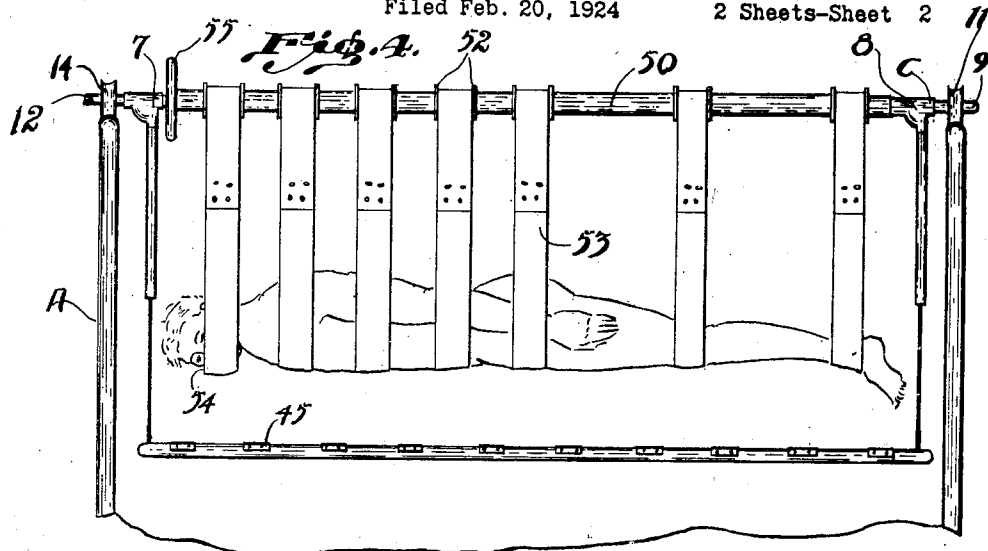


Fig. 6.

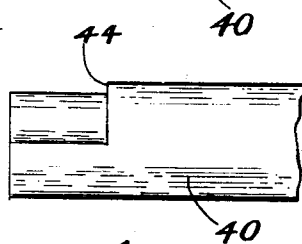
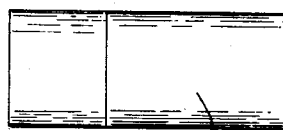
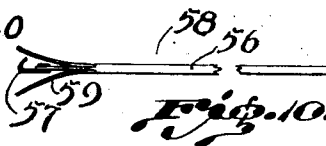


Fig. 7.



Früh. 10.

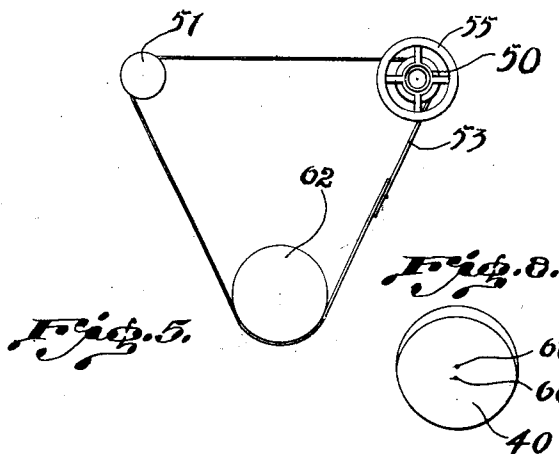
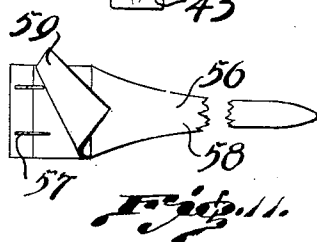
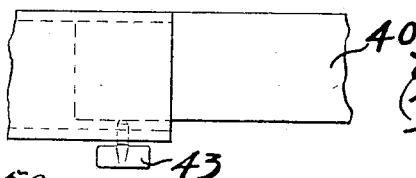


Fig. 9.



Inventor
Paul Gadbois
by *H. S. Johnson*
Att'y.

UNITED STATES PATENT OFFICE.

PAUL GADBOIS, OF ST. PAUL, MINNESOTA.

INVALID BED.

Application filed February 20, 1924. Serial No. 694,127.

The present invention relates to beds, and more particularly to an improved invalid bed with means for handling and caring for a patient confined therein.

5 In a case where a patient is unable to assist himself it is a very difficult matter to care for him, and where an ordinary bed is employed the strength of an attendant is frequently taxed to the utmost in moving and
10 caring for a patient.

An object of the present invention is to manipulate a patient confined to a bed with a minimum of effort.

15 Another object is to improve means for handling a patient confined to a bed.

Another object is to make an invalid bed with means for raising a patient from a normal position and turning him to a desired position with a minimum of effort and a maximum of comfort to the patient.

20 In order to attain these objects, there is provided in accordance with one feature of the invention, a metal bed frame having parallel raised portions in the form of tracks.
25 A secondary frame is suspended from rollers operating on the parallel tracks and a support for a patient is connected to the secondary frame in a manner which will permit the raising and lowering of the patient independently of an ordinary spring and mattress incorporated in the main frame.

A modification of the invention comprises rolling members supported by the secondary frame with straps passing over the rollers,
35 whereby the patient may be turned over by turning one of the rollers in a manner to move the straps passing over the same.

These and other features of the invention will be apparent from the following description and the accompanying drawings, wherein similar reference characters are used
40 throughout to denote similar parts.

Referring to the drawings:

Figure 1, is a view in isometric projection
45 of an invalid bed incorporating the present invention.

Figure 2, is a fragmentary side view of the same.

50 Figure 3, is a bottom view of a pulley used in the construction of the bed.

Figure 4, is a view in side elevation of a portion of a modified form of the invention wherein straps, passing over rollers incorporated with a secondary frame, are used to
55 manipulate a patient.

Figure 5, is a conventional end view of mechanism for turning a patient.

Figures 6, 7, and 8, show, respectively, top, side, and end views of a cutaway portion of a track extension which brings the upper
60 surface of the extension to the same level as the upper surface of a tubular member into which it is inserted.

Figure 9, shows the top surface of the extension at the same level as the top surface
65 of the tubular member into which it is inserted.

Figures 10 and 11, show, respectively, side and end views of a device for passing straps
70 under a patient.

Referring to the drawings in detail, A represents the main frame of a bed incorporating the invention.

B—B represent extensions which are telescopically connected to tubular members of
75 the main frame.

C represents a secondary frame mounted upon the main frame by rollers 10, 11, 13, and 14 which roll along the top of member 3 of the main frame and of the extensions
80 B—B. Studs 4 are provided on the main frame and also upon the extensions to limit the rolling movement of the secondary frame. The secondary frame C comprises tubular side members 5 and 6 which may be of steel.
85 Connected thereto in a manner to extend the central openings of tubular members 5 and 6 at each end, are pulley housings 7—7 and 8—8, housings 7 containing a double pulley wheel and housings 8 containing a single pulley wheel. Fastened to the rear pulley housings 8 on the end opposite that engaging tubular members 5 and 6 is a U-shaped member
90 9 on which are supported by means of annular ball bearings, not shown, rollers 10 and 11.

95 Connected to front pulley housings 7 are short tubular members 12. Rollers 13 and 14 are supported on these short tubular members in the same manner as rollers 10 and 11 are supported on the U-shaped member 9.
100 Connected to the other ends of short tubular members 12 are pulley housings 15 each containing a double pulley. The housings of these pulleys are constructed with side extensions 16 (best seen in Figure 2), which engage
105 a tubular cross bracing member 17. Vertically depending from this cross member and integral therewith are tubular members 17 and 18, braced angularly by members 19 to secure rigidity. Integral with the lower ends of
110

downwardly extending members 17 and 18 are bearings 20 and 21 which rotatably support a rod 22. Integral with rod 22 are spools 23 and 24, while at one end of rod 22 is a crank 25 to provide means for manually rotating rod 22. A ratchet 26 and pawl 27, of a well-known type, serve as means for permitting the rod to be rotated in one direction by means of the crank 25 while normally resisting a turning movement thereof in the opposite direction. Lifting the pawl from engagement with the ratchet will permit the rotation of rod 22 in the opposite direction.

Affixed to the lower openings of each of the four pulley housings 7—7 and 8—8 are downwardly extending tubular members 28 and 35. Rods 29 and 33 are fitted to slide telescopically within these downwardly extending members, the rods engaging at their lower extremities hooks 30 integral with a tertiary frame D, which may be an endless steel tube in the form of a rectangle. Fastened to the upper ends of rods 29 and 33 are flexible members 32 and 34, which may be steel tapes. The arrangement of these tapes may best be seen in Figure 2. Inasmuch as the tape arrangement on each side of the bed is identical with that on the other, we will consider only the arrangement on the near side of the bed shown in Figure 1, which arrangement is shown in dotted and solid lines in Figure 2.

A tape 32 affixed to a rod 29 passes upwardly through member 28 over the pulley wheel contained in housing 8, through tubular member 6 over one of the two pulleys in housing 7, through short tubular member 12 over one of the two pulleys in housing 15, and then vertically downward. Attached to the upper end of rod 33 is a second tape 34 which passes vertically upward through tubular member 35, over the second pulley in housing 7, through the short tubular member 12 parallel to tape 32, over the second pulley in housing 15, and then vertically downward substantially parallel to tape 32. The two tapes are integrally secured together at 36 by any suitable means as by welding and the end of either of the tapes is fastened to spool 13 in any suitable manner, while the other tape extends downward past spool 13 and has secured to its lower end, in any suitable manner, a weight 37 composed of built-up sections, any required number of which may be removed or added as in the manner of counter-balanced scale weights. As previously mentioned, the same procedure is followed on the other side of the bed, and a second weight 38, at the lower end of one of the tapes on the other side of the bed, may be connected to weight 37 as by means of a cross rod 39 to prevent independent swaying of the weights.

The frame extensions B—B may be of metal rod 40 bent to a right angle and with another rod 31 secured perpendicularly to an upright portion of member 40 of each of the

extensions B—B as by means of welding. The rods 31 have sliding fit within a tubular member 41 of the main frame, and the upper horizontal bent portions of rods 40 have likewise sliding fit within tubular members 42 of the main frame. The upper surface of the end of rod 40 is cut away as illustrated in Figures 6, 7, and 8, for the purpose of securing a level track as shown in Figure 9 for the rollers 10 and 11. The surface of the cutaway portion is arcuate and has a radius equal to that of rod 40, but the center of curvature 60 thereof is lower than the center 61 of rod 40 a distance equal to the thickness of the wall of tubular main frame 42. A thumb screw 43 is inserted in the wall of tubular member 42 a slight distance from the opening into which rod 40 is inserted; and when rod 40 is drawn out a sufficient distance to allow a shoulder 44 on rod 40 to clear the end of tubular member 42, a thumb screw 43 may be tightened to force the upper surface of rod 40 into alignment with the upper surface of tubular member 42.

A support for a patient is provided by straps 45, which may be of canvas connected to the tertiary frame D by means of studs 46 on this frame engaging eyelets 47 in the straps. In the normal use of the bed, which, for the purpose of this application may be considered as when the tertiary frame D is lowered and the patient is resting upon a spring, mattress, and bedding, not shown, of an ordinary type inserted in the frame A in a customary manner, the straps 45 will rest upon the mattress and bedding and the patient may be covered as desired. In order to prevent the patient from touching the metal tertiary frame, this frame may be covered by means of a strip of cloth 48 secured to the straps 45 by means of snaps 49, of any suitable type. A portion only of such a frame covering is shown in Figure 1, but it is to be understood that this cloth strip may be extended entirely around the tertiary frame in a manner to partially cover it and prevent the patient from touching it.

To consider a modified form of the invention shown in Figure 4 and conventionally in Figure 5, tubular members 50 and 51 may be placed telescopically over tubular members 5 and 6 of the bed shown in Figure 1. Tubular members 50 and 51 are arranged to rotate with respect to members 5 and 6 by being provided with bearings, which may be annular ball bearings, not shown, placed in a well-known manner intermediate tubular members 5 and 6 and outer tubular members 50 and 51, respectively. Both of the side tubular members 5 and 6 of the main frame are thus enclosed by independently rotatable tubular members. These outer rotatable tubular members are provided with pairs of annular guide flanges 52 at convenient points intermediate their length, which points may

be opposite open spaces between adjacent straps 45 on the tertiary frame. The annular guide flanges serve to prevent lateral movement of straps 53 used in turning a patient from one position to another. As conventionally illustrated in Figure 5, straps 53 pass over tubular members 50 and 51 and under the patient 62 in a manner to support him. The ends of the straps 53 may be secured together by means of snaps of any suitable type to support a patient. The strap passing under the head of the patient may be padded as at 54 to prevent discomfort to a patient while turning him in this manner. The straps 53 may all be of the same length, or they may be made adjustable by any suitable means, as for instance by providing snaps at different points on the connecting ends thereof to allow for adjustment.

A hand wheel 55 is integral with one of the outer rotatable tubular members, and for convenience this hand wheel may be placed on the same side of the bed as the crank 25 so as to allow all patient manipulating operations to be performed from the same side of the bed.

A means for easily passing a strap under a patient is provided in a device 58 provided with a flat handle 56 having hooks 57 arranged to engage the snaps or eyelets of either the turning straps or the supporting straps of the tertiary frame. After engaging a strap by means of these hooks, the handle 56, which may be of smooth wood or celluloid, may be passed under the patient. The handle may then be grasped from the other side of the patient, and the strap drawn through, flaps 59, which may be of leather, preventing the hooks from catching upon the clothing or body of the patient.

The operation of the bed is as follows:

When it is desired to place a patient upon the bed from either a wheel chair or rolling carriage, not shown, the straps 45 of the tertiary frame D are loosened at one end from the tertiary frame D and the tertiary frame is raised by means of crank 25 and associated parts a sufficient amount to clear the patient, in which position it is retained by pawl 27 and ratchet 26, and the secondary frame is rolled out on the track extensions B—B. The patient is then placed under the tertiary frame, which is lowered over the patient, and straps 45 inserted beneath him with the aid of the device 58 and made fast to the studs 46. The tertiary frame is again raised, carrying the patient, and moved back over the bed where it is lowered to place the patient on the mattress. The patient may be removed from the bed and placed in a wheel chair or wheel carriage by reversing this process.

Should it be desired to turn the patient over, the tertiary frame is raised to a point at which the straps 53 can be conveniently passed beneath him. These straps are then

passed over the two tubular members 50 and 51, beneath the patient, and the ends of the straps snapped together. The tertiary frame is then lowered and the patient is supported by the straps 53, in which position he may be turned to any desired degree by manual actuation of the hand wheel 55. The patient may be again lowered to normal position in the bed by reversing this operation.

A very desirable feature of the bed lies in the fact that the patient is easily raised from the normal position, moved out to one side of the bed by means of rolling the secondary frame out on the extensions B—B, in which position the bed can be made or the mattress turned without disturbing the patient. In cases where it is necessary to treat an arm or a leg of a patient by means of a bath or whirlpool treatment, the patient may be so treated without necessitating a disturbance of the body by raising the tertiary frame to a position which will allow the insertion beneath it of a tub or whirlpool bath. The arm or leg may then be lowered between straps of the tertiary frame and placed in the bath while the patient is still in a reclining position. The patient may also be caused to assume a sitting position by raising the tertiary frame, releasing the straps thereof which support the legs below the knees and manually raising the trunk to a vertical position. The patient may aid in supporting his body in an upright position by grasping the tubular side members 5 and 6 of the secondary frame.

In hot weather, a patient, especially if it be a large person, is frequently subjected to extreme discomfort by chafing caused by continuously lying in the same place on a mattress, the perspiration exuded by the skin tending to promote an unhealthy condition thereof. This condition may be greatly relieved by raising the patient by means of the tertiary frame, thereby permitting a circulation of air to reach the skin. Frequent turning of the mattress is facilitated by the use of the vertically raising and laterally moving features herein provided.

The counterweights 37 should be adjusted to the individual needs of each patient by the removal or addition of sections thereof as in the manner used in weighting balance scales.

What I claim is:

1. In an invalid bed, a frame mounted for vertical movement thereon, a plurality of transverse strap members connected to said frame to support a patient thereon, operative means to raise and lower said frame with respect to said bed, a roller mounted longitudinally above said bed, a plurality of straps passing over said roller, the ends of said straps being connectible together to form continuous loops in which a patient may be supported and turned, said straps being posi-

tioned to lie between the straps on said frame.

2. In an invalid bed having a main frame, a second frame mounted thereon, tubular housings firmly mounted to depend from said second frame, rods telescopically mounted in said tubular depending members, a patient supporting frame carried by the rods, and means connected to the upper ends of said rods to raise and lower the frame carried by the telescoping rods, without danger of side sway by said frame. 10

In testimony whereof I affix my signature.

PAUL GADBOIS.