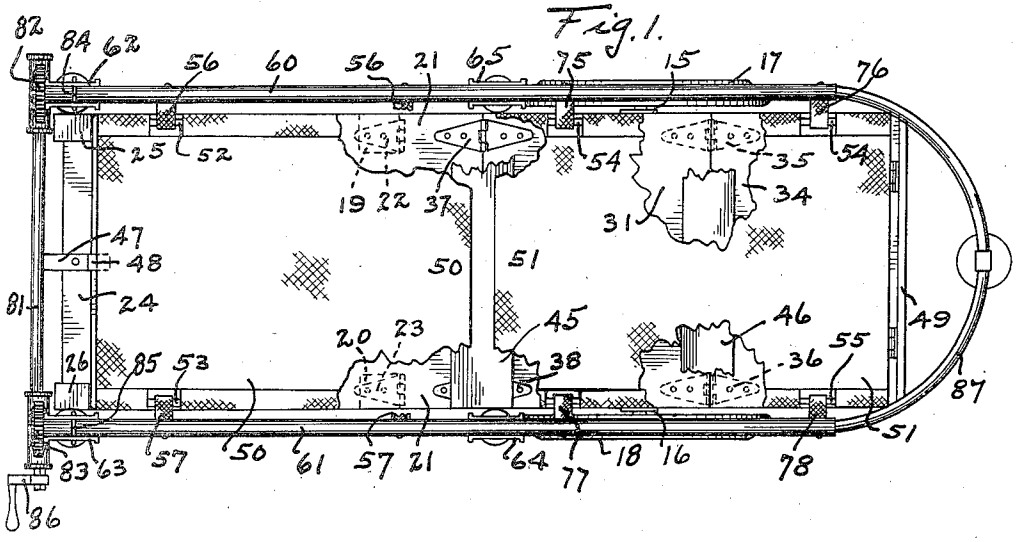
March 16, 1948. E. A. MILLER 2,438,093

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Fig. 1.



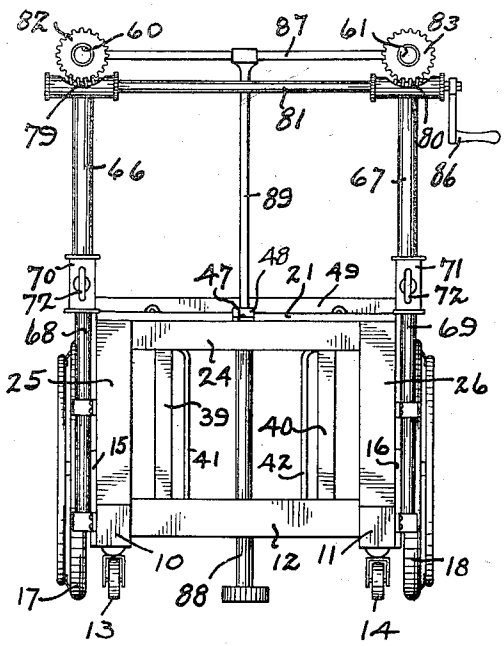


Fig. 2.

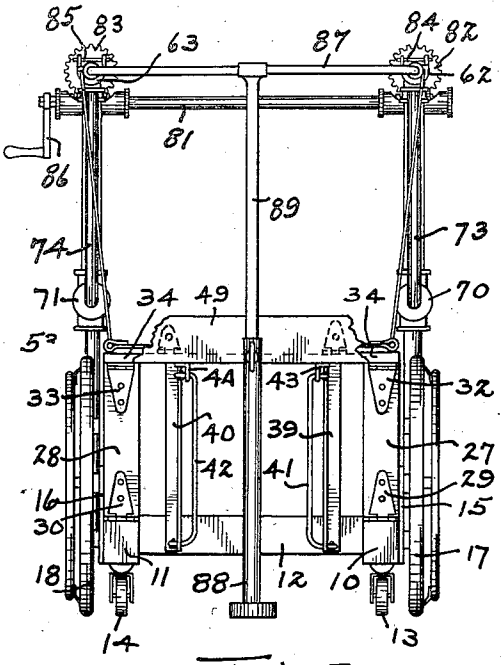


Fig. 3.

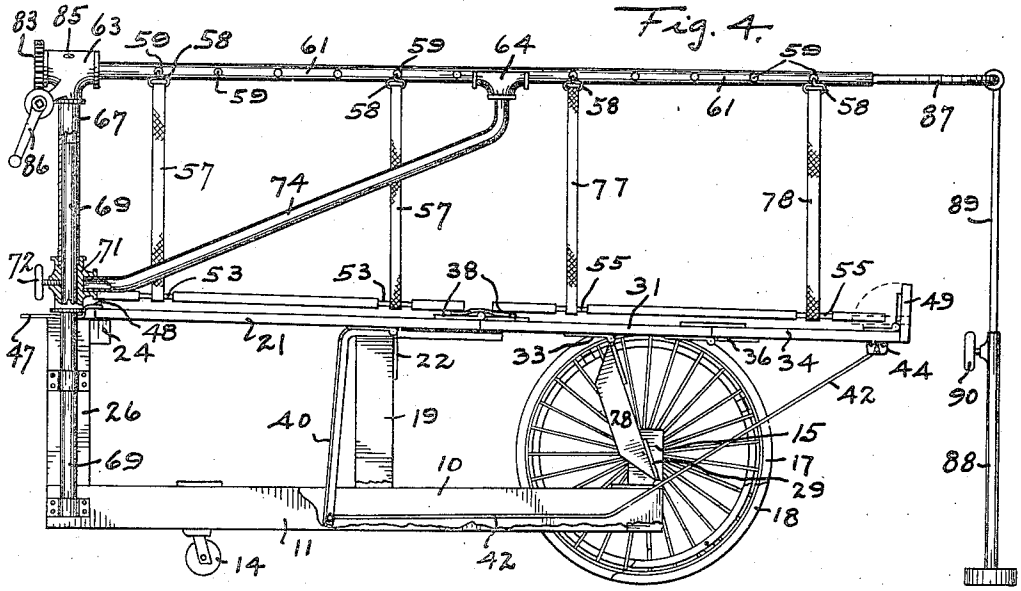
INVENTOR,
ELWOOD A. MILLER,
By Hubert A. Mintum,
ATTORNEY.

March 16, 1948. E. A. MILLER 2,438,093

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Fig. 4.



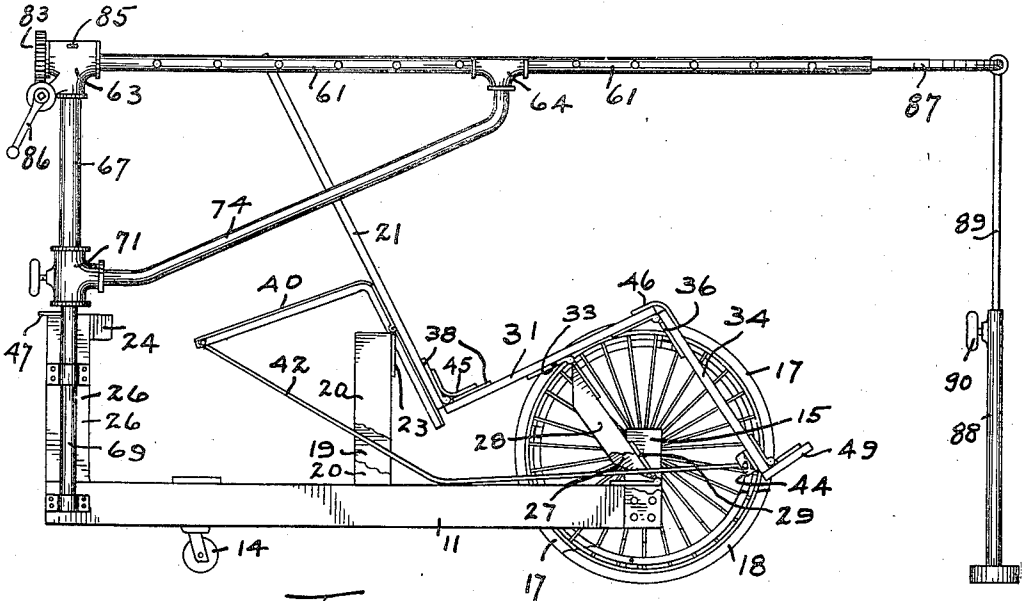


Fig. 5.

INVENTOR,
ELWOOD A. MILLER,
BY Herbert A. Minturn,
ATTORNEY.

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Elwood A. Miller, Indianapolis, Ind., assignor of fifty per cent to Benjamin V. Klain, Indianapolis, Ind.

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2 Claims. (Cl. 5—66)

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This invention relates to an invalid bed and has for a primary purpose the formation of a structure so arranged that an invalid even though paralyzed in respect to his arms and legs may without outside help cause the bed to shift into such position that he may assume substantially a sitting position, starting from a prone position. A further primary object of the invention is to provide such a structure in an exceedingly simple form without complicated parts or mechanisms whereby the bed may be used not only in hospitals but also in private homes and be readily shifted or rolled through standard doorways.

A still further important object of the invention is to incorporate means in such a bed as above indicated whereby the invalid or patient may be lifted upwardly from the bed proper and lowered by an aid.

These and many other important objects and advantages of the invention will become apparent to those versed in the art in the following description of one form of the invention as now best known to me, as illustrated in the accompanying drawings, in which

Fig. 1 is a top plan view of a structure embodying the invention with portions of the lifting canvas cut away to disclose under parts;

Fig. 2, a view in rear elevation;

Fig. 3, a view in front elevation;

Fig. 4, a view in side elevation with portions cut away to disclose otherwise hidden parts; and

Fig. 5, a view in side elevation with the bed shifted toward a sitting position.

Like characters of reference indicate like parts throughout the several views in the drawings.

A base is formed by two side rails 10 and 11 having at least one cross member 12 interconnecting those rails. Under the rear portions of the two rails 10 and 11 are fixed casters 13 and 14 respectively. From the front or foot ends of the side rails 10 and 11 plates 15 and 16 fixed thereto extend upwardly to have attached thereto large diameter wheels 17 and 18. The wheels 17 and 18 are of that nature to be revolved by the invalid or patient should he have sufficient use of his hands and arms whereby the entire structure may be moved about by the patient or invalid at will particularly when he is in the sitting position.

Upon any suitable member or members carried by the base above described, herein shown as posts 19 and 20 each respectively fixed by their lower ends to the rails 10 and 11, is hinged a major bed panel 21, herein shown as by the hinges

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22 and 23 interconnecting the posts 19 and 20 at their upper ends and the underside of the bed panel 21.

The hinges 22 and 23 are positioned to have their common pivot axis located about midway of the lengths of the side rails 10 and 11. The bed panel 21 is made to have a length sufficient to extend rearwardly or toward the head end of the structure to bear normally by an end portion on a cross member 24 which is fixed across any suitable supporting member or members, herein shown as separate posts 25 and 26 each carried respectively by the side rails 10 and 11. The panel 21 is further provided to extend a short distance forwardly of the posts 19 and 20.

Hinged to the base above described are one or more members, herein shown as two members 27 and 28, secured respectively by hinges 29 and 30 to the side rails 10 and 11 at their forward ends. A second bed panel 31 is hinged by one end through hinges 37 and 38 to the forward end of the panel 21 and has the hinged members 27 and 28 hingedly connected to its underside by means of the hinges 32 and 33. A third bed panel 34 is hinged by its rear end to the forward end of the panel 31 by means of the hinges 35 and 36.

For a bed having an approximate length of 6 feet and which is to be covered by a suitable mattress or pad, the preferred dimensions in respect to hinge points are as follows.

From the forward end of the panel 21, the hinge axis of the hinges 22 and 23 is 7 inches to the rear thereof. The axis of the hinges 32 and 33 is located 9 inches ahead of the axis of the hinges 37 and 38, and the overall longitudinal length of the bed panel 31 is substantially 16 inches.

Fixed to the panel 21 to extend downwardly thereunder are a pair of arms 39 and 40, herein shown as angle irons having an upper leg extended forwardly in each instance under the panel 21 and beyond its forward end to have lengths of those legs presented to form supports for the panel 31 when in its position as indicated in Fig. 4. The arm 40 in each instance extends downwardly to receive forwardly extending rods 41 and 42 pivotally connected therewith on centers 17 inches below the underside of the panel 21, and 11 inches back of the forward end of the panel 21. These two rods 41 and 42 are carried forwardly to have their forward ends pivotally engaged in brackets 43 and 44 fixed in transversely spaced apart relation to the underside of the panel 34 substantially 13 inches from

the axis of the hinges 35 and 36. In order to effect clearance, these rods 41 and 42 are bent so that a rear portion extends in substantially a horizontal position, Fig. 4, and thence upwardly to the brackets 43 and 44, all when the panels 21, 31, and 34 are in extended positions to present a continuous planar surface thereover.

The proportioning of the various members above described in respect to the panels and their supports and interconnections are made to be such that when the invalid is placed upon the panels 21, 31, and 34 serving as the bed (it being understood that some padding or a mattress be employed thereover) the hip joints of the invalid will be substantially over or just to the rear of the axis through the hinges 37 and 38, forwardly of the axis through the hinges 22 and 23. The opposing ends of the panels 21 and 31, and 31 and 34, are preferably covered over by any suitable material in the form of bands 45 and 46 that will not bend to enter the bed, the material being preferably leather. The invalid may so contract his muscles particularly through the hips and thereabove as to tend to shift his weight over the axis of the hinges 22 and 23 to cause the intermediate bed panel 31 to lower by its rear end through rearward rocking of the members 27 and 28, causing a corresponding upward tilting of the head portion of the panel 21 whereby the various members will assume those positions indicated in Fig. 5, whereby the invalid may assume a sitting position even though he is not able to move his legs or arms. An important advantage of this action is that the invalid gains confidence that he is able to control himself to some extent at least in changing from the prone to a sitting position whereby that despairingly helpless feeling is tended to be removed and a better mental attitude is achieved which in itself is an aid to recovery from the paralyzed condition, if such be possible. To hold the bed panels 21, 31, and 34 in the straight planar conditions as indicated in Fig. 4, a hand latch 47 is fixed to the topside of the cross member 24 in the rear of the structure to rock horizontally and carry the lip 48 over the topside of the panel 21, Figs. 1 and 4. To further promote comfort a foot board 49 is hinged to the foot end of the bed panel 34 to hinge thereto from the topside so that when not in use it may be swung back over the topside of the panel 34 as indicated by the dash lines in Fig. 4.

Now to lift the invalid upwardly from the bed panels, two fabric sections 50 and 51 are employed, the junction between these two sections coming substantially at the lower end of the bed panel 21, Fig. 1. These fabric sections are each provided with a hem along the outer longitudinal margins to receive therein rods or pipes 52 and 53 in the section 50, and 54 and 55 in the section 51. The hems are cut away to permit a plurality of straps 56 on the one side to engage the pipe 52, and a like number of straps 57 to engage the pipe 53 on the other side. These straps 57 herein shown as two in number are carried upwardly to have their upper ends carry hooks 58 to engage through eyes 59 provided in a horizontally disposed pipe or bar 61 spaced upwardly from the right hand edge of the panel 21. In the same manner the straps 56 have their upper ends interengaged with the pipe 60 which is in parallel relation with the pipe 61 but located above the left edge of the panel 21. These pipes 60 and 61 are respectively carried over brackets 62 and 65 on the one side and 63 and 64 on the other side. These brackets 62 and 63 are each fixed respectively on the top ends of pipes or tubes 66 and 67 which telescope over posts 68 and 69 fixed to the posts 25 and 26 respectively.

The lower ends of the tubes 66 and 67 have brackets 70 and 71 fixed thereto through which any suitable securing means, herein shown as thumb screws 72, extend to engage the posts 68 and 69 therewithin. The brackets 70 and 71 likewise carry forwardly and upwardly extending braces 73 and 74. In turn the braces 73 and 74 carry the brackets 65 and 64 respectively in such manner that the pipes 60 and 61 are maintained in substantial horizontal alignment parallel one with the other. By adjusting the brackets 70 and 71 vertically along the posts 68 and 69, the pipes 60 and 61 may be changed in elevation if desired.

The fabric section 51 has straps 75 and 76 engaged with the pipe 54 by their lower ends and engage through hooks 58 with the pipe 60 thereabove. In the same manner straps 77 and 78 are fixed by their lower ends to the pipe 55 and interengage with the pipe 61 through similar hooks. The brackets 62 and 63 each carry on their rear sides a worm 79 and 80 respectively fixed on an interconnecting shaft 81, to be in engagement with worm wheels 82 and 83 fixed respectively to the rear ends of the pipes 60 and 61. As previously indicated, these pipes 60 and 61 are free to be lifted upwardly from their respective supporting brackets 62, 63, 64, and 65 so that they may be taken out of the way if their use is not desired. In order to prevent rocking of these pipes 60 and 61 over the brackets 64 and 65, pins 84 and 85 are passed through the brackets 62 and 63 over the respective pipes. On one end of the shaft 81 which is carried beyond one of the brackets, herein shown as the bracket 63, the crank 86 will be applied as means for rotating the shaft. The worms 79 and 80 are one left-hand and one right-hand in respect to each other whereby the pipes 60 and 61 will be oppositely revolved to wind preferably the straps over and around the out and topsides of those pipes. By thus manipulating the crank 86, to revolve the pipes 60 and 61, both fabric sections 50 and 51 may be lifted through the respective straps secured to the carrying rods. By use of the worm gearing, the invalid may be left suspended above the table for a period if so desired without danger of his dropping.

A curved pipe 87 has its ends telescoping with the pipes 60 and 61, not only as a means for maintaining fixed parallel relation therebetween but also to carry a supporting post 88, the lower end of which may rest on the floor, and the upper end of which may carry a telescoping rod 89 to engage with the curved pipe 87. A thumb screw 90 passing through the upper end of the post 88 engages the rod 89 to hold it in any desired position of elevation. Not only does this post 88 serve to steady the pipes 60 and 61, but it also prevents tilting of the entire structure when the invalid is able to use his arms and reach up to grasp the pipes 60 and 61 to pull himself to a standing position in an attempt to use his legs or put his weight thereon.

While I have herein shown and described my invention in more or less minute detail in the one particular form illustrated, it is obvious that mechanical changes and dimensions may be employed different from those above set forth, and I therefore do not desire to be limited to that precise form beyond the limitations as may be imposed by the following claims.

I claim:

1. A structure constituting an invalid bed and chair to be operated by the invalid through muscular tensioning to vary applied pressure of the invalid's body to different zones of the structure, comprising a foundation; a major length panel; a fixed fulcrum member carried by the foundation located under said panel, hinge means interengaging said member and said panel to have a hinge axis substantially in the plane of said panel and removed substantially 7/12 of a unit from the foot end of the panel; a second panel substantially 16 5/12 units long hinged by one end to the foot of said major panel; a fixed length, rigid member hinged by a lower portion to said foundation and by an upper portion to said second panel on an axis substantially in the plane of that panel to have that axis substantially 3/4 of a unit from said major panel foot end; a third panel hinged by an end to the foot end of said second panel; the total extended length of all of said panels being substantially 6 units; an arm fixedly carried by said major panel to extend below its underside; a rod pivotally connected to said arm at substantially 11/12 units back of said major panel hinge axis and 1 5/12 units therebelow; and said rod having its forward end pivoted to said third panel substantially 1 1/12 units therealong from its hinge connection with said second panel.

2. An invalid bed and chair comprising a foundation, a fixed support carried by the foundation; a major bed and back panel hingedly carried by said support; an intermediate panel hinged by a rear end to the forward end of said major panel; a rockable, rigid member hingedly carried by one end portion by said foundation and hinged at a fixed location to said intermediate panel, said location being spaced between the rear and forward ends of the intermediate panel removed from the forward end of the intermediate panel; a foot panel hinged by a rear end to the forward end of said intermediate panel; arm means depending from said major panel to the rear of its hinge connection with said fixed support; and rod means rockably connected to said arm means and to the forward end portion of said foot panel, whereby all of said panels may initially be placed in an end to end planar condition for a bed, and upon pressing downwardly on the rear end of said intermediate panel and the forward end of said major panel between said fixed and rockable supports, said panels will shift to a chair conformation under control solely by said rod means.

ELWOOD A. MILLER.

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