Sept. 4, 1956 F. J. PIRONE ET AL 2,761,152

INVALID BEDS

Filed June 27, 1952

2 Sheets-Sheet 1

FIG. 1.

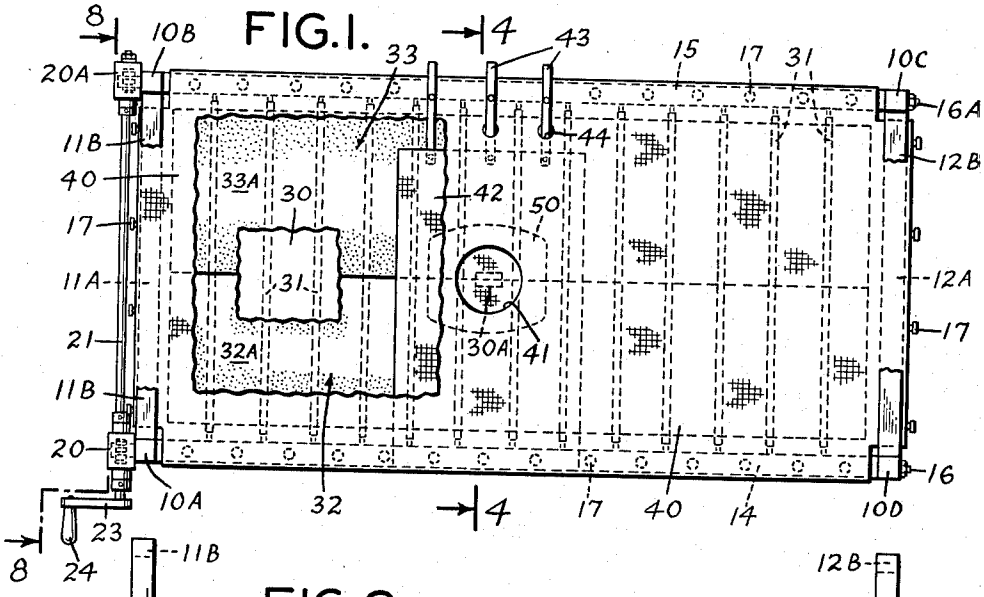


FIG. 2.

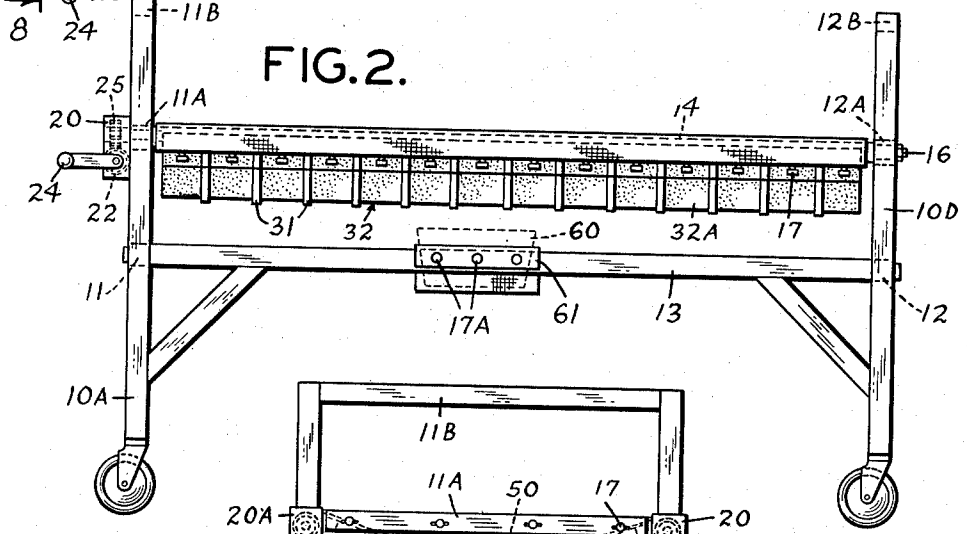
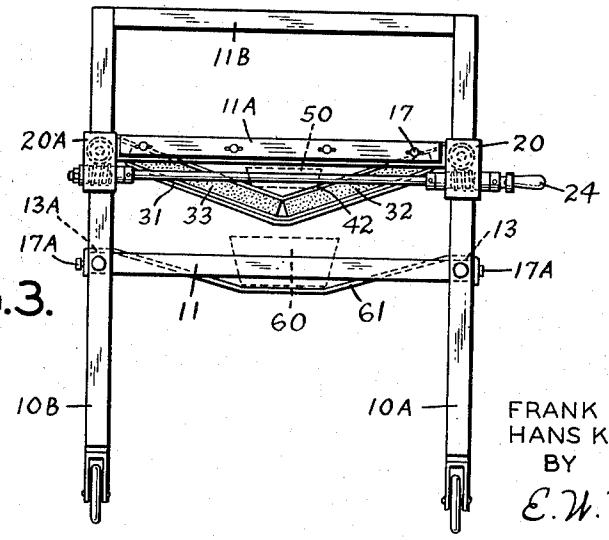


FIG. 3.



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Sept. 4, 1956 F. J. PIRONE ET AL 2,761,152

INVALID BEDS

Filed June 27, 1952 2 Sheets-Sheet 2

FIG. 4.

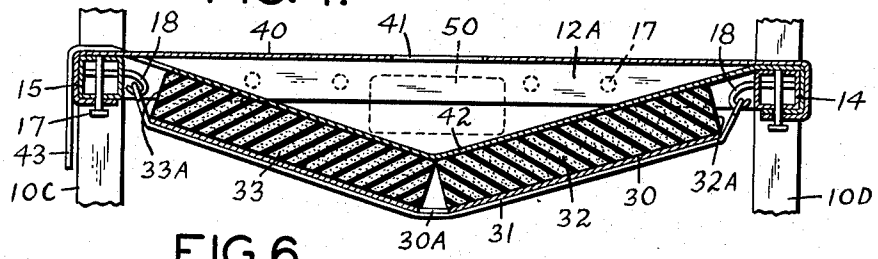
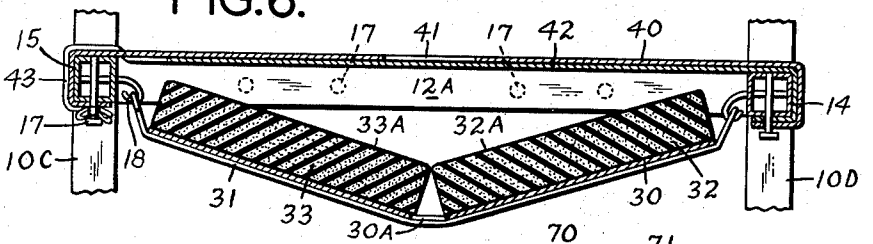


FIG. 6.



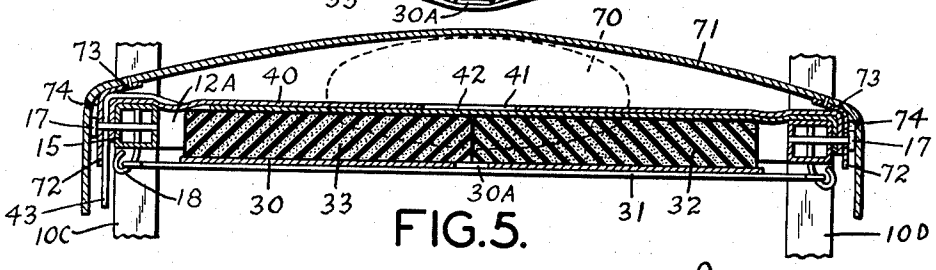


FIG. 5.

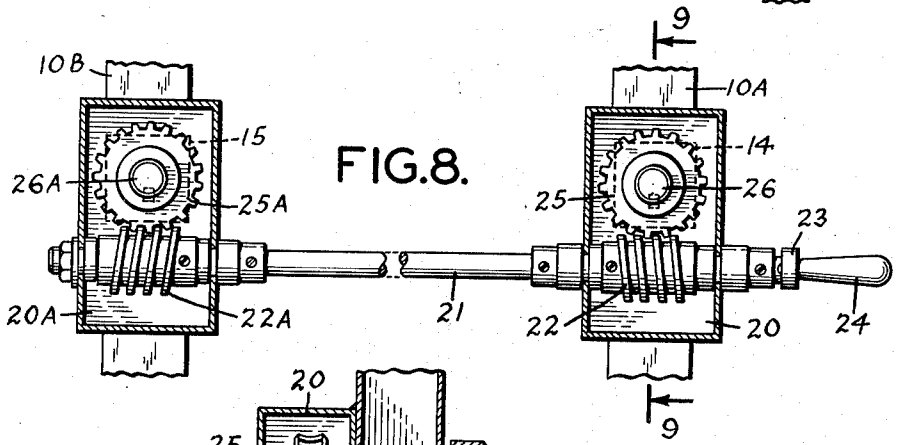
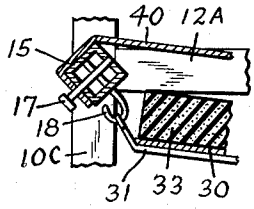


FIG. 8.

FIG. 7.



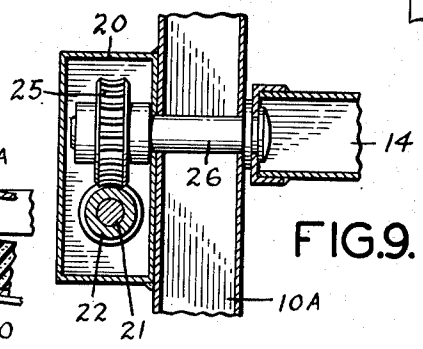


FIG. 9.

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United States Patent Office 2,761,152 Patented Sept. 4, 1956

2,761,152

INVALID BEDS

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Application June 27, 1952, Serial No. 295,998
11 Claims. (Cl. 5—65)

Our invention relates to improvements in beds for invalids which are especially adapted for use in hospitals, sick rooms and nurseries.

Our object is to provide a simple sanitary structure which is designed for the comfort of the patients and which lessens the work of those who care for them.

We have retained the feature shown in our copending applications for U. S. patents, Serial Numbers 86,944 and 165,322, filed respectively on April 12, 1949, and May 31, 1950, of stretching a removable sheet of textile material on a frame to form a support for the patient and have invented certain cooperative features which are disclosed and claimed herein.

Referring to the drawings:

Fig. 1 is a plan view of a bed which is made according to and embodies our invention. Certain parts are broken away to show the construction more clearly.

Fig. 2 is a side elevation of the bed shown in Fig. 1.

Fig. 3 is an end elevation of the bed shown in the preceding figures with some of its parts shown in different relative positions.

Fig. 4 is a sectional end elevation on a larger scale taken on the line 4—4 of Fig. 1, of some of the parts shown in the preceding figures illustrating the initial step in assembling the parts.

Fig. 5 is a similar view of the assembled parts in different relative positions. In this figure a blanket is shown which is not illustrated in the other figures.

Fig. 6 is a similar sectional view of the parts in other relative positions.

Fig. 7 is a sectional end elevation of some of the parts shown in Figs. 1, 5 and 6 in other relative positions.

Fig. 8 is an end elevation, partly in section and on a still larger scale, of operating gearing which forms part of the structure. This section is taken on the line 8—8 of Fig. 1.

Fig. 9 is a sectional side elevation of some of the gearing shown in Fig. 8. This section is taken on the line 9—9 of the latter figure.

The frame of the bed comprises four vertical posts, 10A, 10B, 10C and 10D. The posts 10A and 10B are interconnected by horizontally spaced transverse bars 11, 11A and 11B. The posts 10C and 10D are interconnected by horizontally spaced transverse bars 12, 12A and 12B. Longitudinal bars 13 and 13A interconnect the posts 10A and 10D and the posts 10B and 10C, respectively. These parts are preferably of square tubing and together form a rigid frame upon which the other parts of the structure are supported.

Gear casings 20 and 20A are affixed to the posts 10A and 10B respectively. These form bearings for a shaft 21 to which are affixed right and left hand worm gears 22 and 22A within the casings 20 and 20A. A crank arm 23 is affixed to one end of the shaft 21. From it a handle 24 extends in a direction parallel to the shaft 21. A gear 25 meshes with the worm gear 22 and a gear 25A meshes with worm gear 22A. The gears 25 and 25A are affixed to stub shafts 26 and 26A which are rotatively mounted in the posts 10A and 10B above the bars 13 and 13A.

Longitudinally disposed bars 14 and 15 of square cross section are affixed to and rotate with the shafts 26 and 26A. The opposite ends of these longitudinal bars 14 and 15 are provided with pintles 16 and 16A which

rotatively support them in the posts 10D and 10C respectively.

A spaced series of studs 17 project from one side of the bars 14 and 15 and also from the transverse bars 11A and 12A. Other studs 17A project from a side of the central part of the bars 13 and 13A. A series of spaced hooks 18 project from a side of the rotatable bars 14 and 15 adjacent the sides from which the studs 17 project.

30 is a sheet of rubber or the like to the under side of which are affixed a spaced series of transverse straps 31 having holes near the ends thereof. When the bars 14 and 15 are in the positions shown in Figs. 4 and 6, the hooks 18 are passed through the holes in the straps 31. The sheet 30 thereby becomes suspended loosely between the bars 14 and 15. While in this position two mattress sections 32, 33 of foam rubber or like material of substantial lateral rigidity are pushed onto the sheet 30 from an end of the bed. These are enclosed in water proof covers 32A, 33A.

Now, by rotating the shaft 21 in a direction to rotate the bar 14 as shown in Fig. 4 in a counterclockwise direction, and the bar 15 in a clockwise direction to the positions shown in Fig. 5, the straps 31 will be tightened and the mattress members raised to a horizontal position. The studs 17 on the bars 14 and 15 will then project outwardly.

40 is a sheet of rayon or the like which has reinforced button-holes near its edges, spaced to register with the studs 17 on the bars 14, 15 and 11A, 12A. The sheet is attached to the frame by passing the studs through the buttonholes.

An orifice 41 is formed in the central part of the sheet 40. When not in use this orifice is closed by a narrow auxiliary sheet 42. Button-holes are provided near one of its edges through which a few of the studs on bar 14 are passed before these studs are passed through the button-holes in sheet 40. Straps 43 extend from the opposite edge of the auxiliary sheet. These straps are passed through openings 44 in sheet 40, thence over bar 15 to the studs projecting therefrom to which they are affixed in the manner described previously.

This arrangement is such that although the auxiliary sheet 42 is under the main sheet 40, it may be removed without disturbing a patient lying on the main sheet.

By reversing the previously described rotation of the bars 14 and 15, the parts will be brought into the positions in which they are shown in Fig. 6. The mattress sections will be lowered and the sheet 40 brought into tension sufficient to support the patient.

50 indicates a position into which a bed pan supported by the mattress sections 32, 33 may be moved under the orifice 41. Intermediate positions of the sheet 40 and mattress section 33 are shown in Fig. 7. In either the Fig. 6 or the Fig. 7 positions of the parts, the patient may use the bed pan in comfort and with a minimum of soiling.

In either the Fig. 6 or the Fig. 7 positions of the parts (preferably the latter) the patient or an infant may be bathed. In Figs. 2 and 3, the position of a water receptacle is indicated at 60. This is supported upon a comparatively narrow sheet 61 provided on opposite edges with button-holes through which pass studs 17A which project from the longitudinal bars 13 and 13A. An orifice 30A is provided in the sheet 30 under the orifice 41.

In Fig. 5, the position of a body is indicated at 70. Over it is spread a blanket 71. 72 designated a strip of nylon or the like, a part 73 of which is stitched to three sides of the blanket corresponding to the sides and foot of the patient, in positions spaced from these edges of the blanket. A free part 74 is provided with buttonholes

through which the studs **17** projecting from the longitudinal bars **14** and **15** may be passed.

A similar part (not shown) is provided to receive the studs projecting from the transverse bar **12A**.

When the blanket is thus connected to the bed frame it cannot become displaced, neither can a patient covered by the blanket roll out of bed. This blanket or other suitable covering material when properly modified may be used as a form of restraint for disturbed patients.

Various modifications in construction, mode of operation, method and use of an invention may and do occur to others, especially after benefitting from knowledge of such a disclosure as that herein presented of the principles involved, but the invention itself is not confined to the present showing.

What we claim is:

1. A bed frame, a pair of side bars rotatably supported thereon, a pair of mattress sections supported by the bars, a sheet interposed between the bars above the mattress sections, said sheet being provided with an opening near its central portion, means for connecting the longitudinal edges of the sheet to the bars, a transverse sheet under the opening in the first mentioned sheet, means for detachably connecting the transverse sheet to the bars and gearing for rotating the bars simultaneously in opposite directions.

2. A bed frame, a pair of side bars rotatably mounted thereon, an under sheet interposed between said bars, means for connecting the longitudinal edges of said under sheet to the bars, a pair of mattress sections supported on the under sheet, an upper sheet interposed between said bars above the mattress sections and means for connecting the longitudinal edges of said upper sheet to the bars.

3. A bed frame, a pair of side bars rotatably mounted thereon, an under sheet interposed between said bars, means for connecting the longitudinal edges of said under sheet to the bars, a pair of mattress sections supported on the under sheet, an upper sheet interposed between said bars above the mattress sections, means for connecting the longitudinal edges of said upper sheet to the bars and gearing for rotating the bars simultaneously in opposite directions.

4. A bed frame, a pair of side bars rotatably mounted thereon, an under sheet interposed between said bars, means for connecting the longitudinal edges of said under sheet to the bars, a pair of mattress sections supported on the under sheet, an upper sheet interposed between said bars above the mattress sections and means for connecting the longitudinal edges of said upper sheet to the bars, both of said sheets being provided with openings near their central portions.

5. A bed frame, a pair of side bars rotatably mounted thereon, an under sheet interposed between said bars, means for connecting the longitudinal edges of said under sheet to the bars, a pair of mattress sections supported on the under sheet, an upper sheet interposed between said bars above the mattress sections, said upper sheet being provided with an opening near its central portion, a transverse sheet under said opening, means for detachably connecting the transverse sheet to the bars and means for connecting the longitudinal edges of said upper sheet to the bars, said under sheet being provided with an opening near its central portion.

6. A bed frame, a pair of side bars rotatably mounted thereon, an under sheet interposed between said bars, means for connecting the longitudinal edges of said under sheet to the bars, a pair of mattress sections supported on the under sheet, an upper sheet interposed between said bars above the mattress sections, said upper sheet being provided with an opening near its central portion, a transverse sheet under said opening, means for detachably connecting the transverse sheet to the bars and means for connecting the longitudinal edges of said upper sheet to the bars, said under sheet being provided with an opening near its central portion and means for supporting a liquid receptacle under the openings comprising a second transverse sheet attached to the bed frame.

7. A bed frame, a pair of side bars rotatably mounted thereon, an under sheet interposed between said bars, means for connecting the longitudinal edges of said under sheet to the bars, a pair of longitudinally disposed mattress sections of substantial lateral rigidity supported on the under sheet, an upper sheet interposed between said bars above the mattress sections and means for connecting the longitudinal edges of said upper sheet to the bars, combined with a blanket over the upper sheet having a strip of textile material fixed thereto near some of its edges and means for connecting said strip to the side bars.

8. A bed frame, a pair of side bars rotatably mounted thereon, an under sheet interposed between said bars, means for connecting the longitudinal edges of said under sheet with parts of the bars, a mattress supported on the under sheet, an upper sheet interposed between said bars above the mattress and means for connecting the longitudinal edges of said upper sheet to parts of the bars angularly spaced from the parts thereof to which the edges of the under sheet are connected.

9. A bed frame, a pair of side bars rotatably mounted thereon, an under sheet interposed between said bars, means for connecting the longitudinal edges of said under sheet with parts of the bars, a pair of longitudinally disposed mattress sections of substantial lateral rigidity supported on the under sheet, an upper sheet interposed between said bars above the mattress and means for connecting the longitudinal edges of said upper sheet to parts of the bars angularly spaced from the parts thereof to which the edges of the under sheet are connected.

10. A bed frame, a pair of side bars rotatably mounted thereon, an under sheet interposed between said bars, means for connecting the longitudinal edges of said under sheet with parts of the bars, a pair of longitudinally disposed mattress sections of substantial lateral rigidity supported on the under sheet, an upper sheet interposed between said bars above the mattress, means for connecting the longitudinal edges of said upper sheet to parts of the bars angularly spaced from the parts thereof to which the edges of the under sheet are connected and gearing for rotating the bars simultaneously in opposite directions.

11. A bed frame, a pair of side bars rotatably mounted thereon, an under sheet interposed between said bars, means for connecting the longitudinal edges of said under sheet with parts of the bars, a pair of longitudinally disposed mattress sections of substantial lateral rigidity supported on the under sheet, an upper sheet interposed between said bars above the mattress, means for connecting the longitudinal edges of said upper sheet to parts of the bars angularly spaced from the parts thereof to which the edges of the under sheet are connected and gearing for rotating the bars simultaneously in opposite directions combined with a blanket over the upper sheet having a strip of textile material thereon near some of its edges and means for connecting said strip to the side bars.

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