

Feb. 5, 1924.

W. A. McCOLLOUGH

1,482,439

INVALID'S BED

Filed Feb. 17, 1922

2 Sheets-Sheet 1

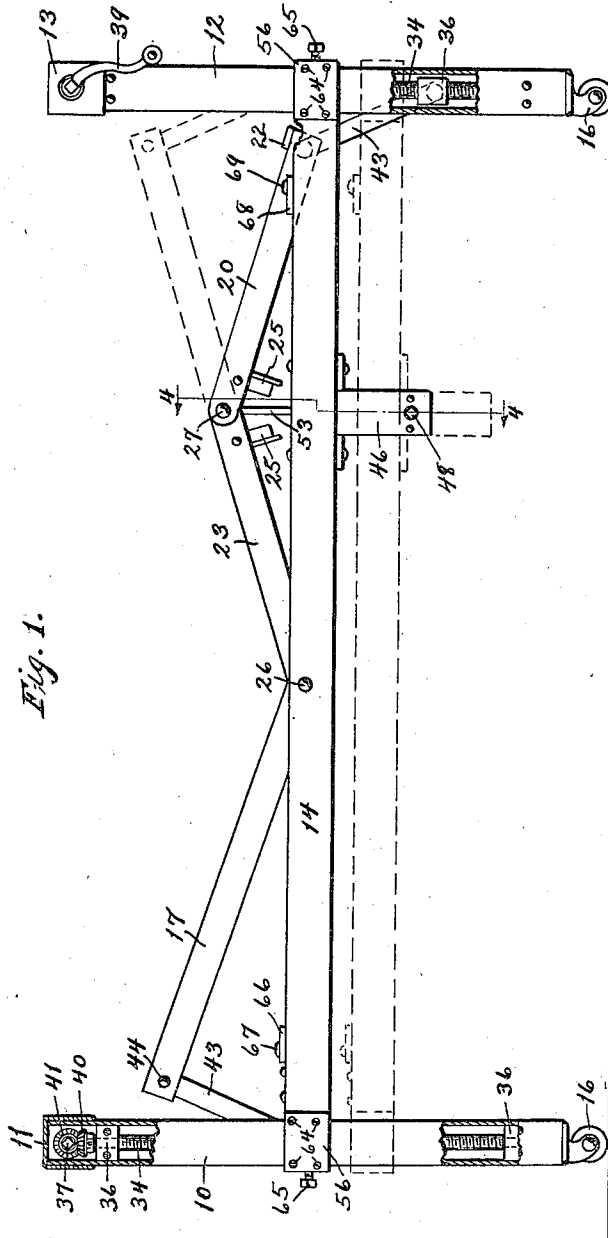


Fig. 1.

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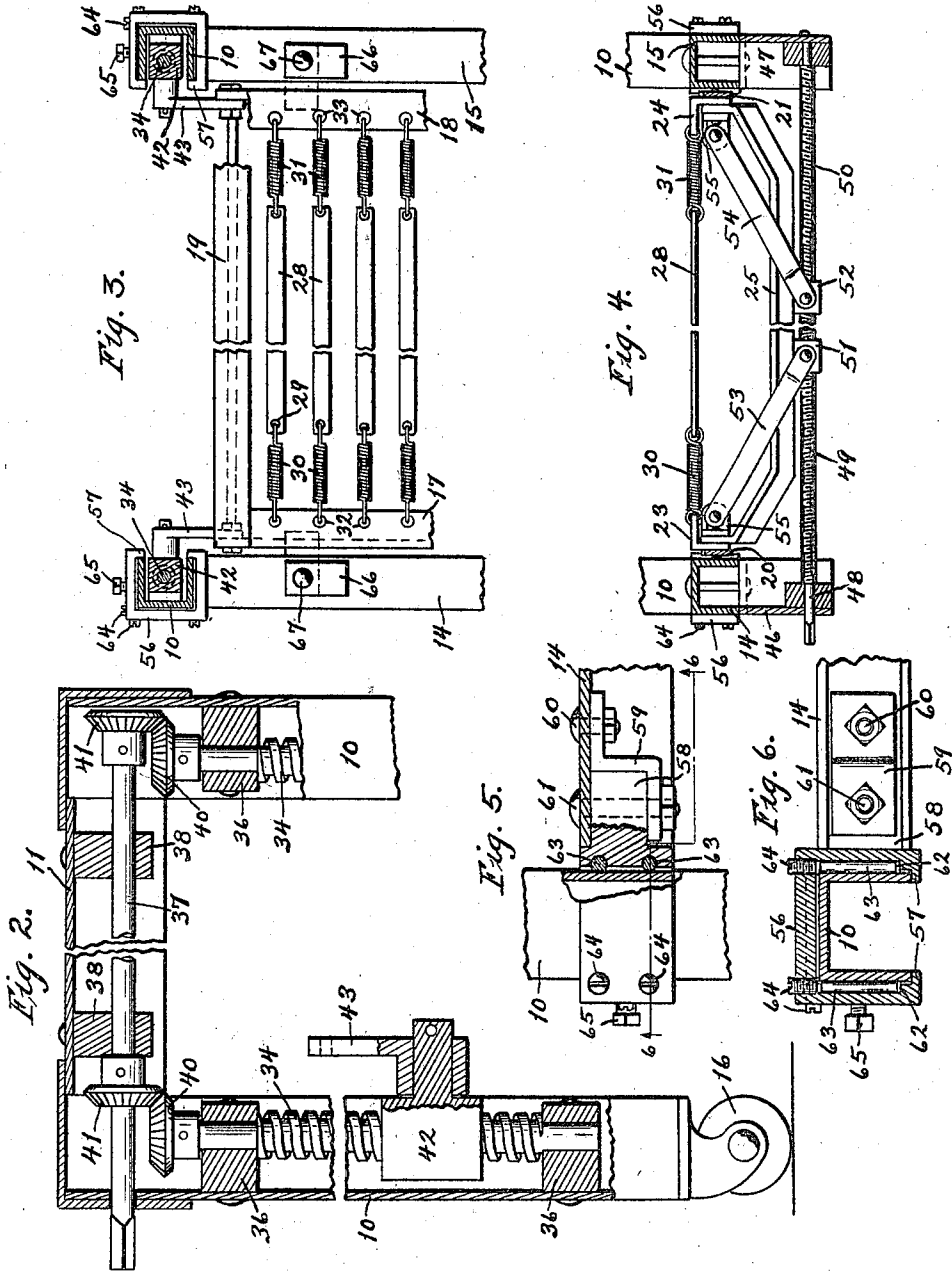
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE.

WILLIAM A. McCOLLOUGH, OF WEBSTER CITY, IOWA.

INVALID'S BED.

Application filed February 17, 1922. Serial No. 537,196.

To all whom it may concern:

Be it known that I, WILLIAM A. McCOLLOUGH, a citizen of the United States of America, and resident of Webster City, Hamilton County, Iowa, have invented a new and useful Invalid's Bed, of which the following is a specification.

An object of this invention is to provide an improved construction for a bed especially adapted for use by invalids and susceptible of being manipulated and adjusted in many different ways to accommodate the patient and to facilitate the work of those ministering to him, it being possible to manipulate the bed in such manner that the occupant may be raised to a reclining or sitting posture with a minimum of disturbance and discomfort to him and of effort on the part of the operator.

Another object of this invention is to provide an improved invalid's bed having a rigid frame and movable head, seat and foot sections pivotally arranged therein and capable of various adjustments, the entire bed bottom being vertically adjustable on occasion.

A further object of this invention is to provide improved mechanical means for adjusting the pivoted and vertically movable members.

A further object of this invention is to provide an improved sliding and anti-friction connection between the side rails and posts of the bed.

A further object of this invention is to provide improved means for breaking the joint and adjusting the relative positions of two bed sections pivoted together.

A further object of this invention is to provide an improved spring construction for a bed.

With these and other objects in view, my invention consists in the construction, arrangement and combination of elements hereinafter set forth, pointed out in my claims and illustrated by the accompanying drawings, in which—

Figure 1 is a side elevation of my improved bed, partly in section, dotted lines indicating various adjusted positions of some of the parts. Figure 2 is a vertical section transversely of the head frame of the bed, illustrating the operating mechanism for the pivoted head section. Figure 3 is a plan of the head end portion of the bed, the posts and portions of the operating mechanism

being shown in section. Figure 4 is a cross-section on the line 4—4 of Figure 1. Figure 5 is a detail elevation, partly in section, showing the anti-friction sliding connection between a side rail and post. Figure 6 is a section on the line 6—6 of Figure 5.

In the construction of the bed as shown the numerals 10 designate spaced head posts connected at their upper ends by a cross-bar 11, which may be integral with or separately formed and suitably connected to said posts; and the numerals 12 designate foot posts spaced apart and connected at their upper ends by a cross-bar 13. The numerals 14, 15 designate side rails connecting the head and foot posts in pairs, and the manner of such connection will be hereinafter described in detail. The posts, cross-bars and side rails preferably are formed of channel bars, but may be of other suitable members. The posts 10, 12 preferably are supported by casters 16.

A pivoted head section is provided and is mounted within and between the upper end portions of the main side rails 14, 15, said head section being formed of spaced side members 17, 18 connected rigidly at their upper or head ends by a cross-bar 19, said members preferably being composed of angle bars. A pivoted foot section is likewise provided and is formed of spaced side members 20, 21 connected rigidly at their lower or foot ends by a cross-bar 22. Between the pivoted head and foot sections is a pivoted seat section formed of spaced side members 23, 24. The open or inner ends of the head and foot sections, and both ends of the seat section, are connected or bridged by arched or trussed cross members 25, offset downwardly between their ends so that the major portions of their lengths are in a plane below the planes of the sections, said cross members preferably being of angle iron. The inner ends of the side members 17, 18 of the head section are pivoted to the side rails 14, 15 respectively of the rigid frame, by means of bolts 26; and the side members 23, 24 of the pivoted seat section are conjunctively pivoted at one end on said bolts. Opposite ends of the side members 23, 24 of the seat section are pivoted to inner end portions of the side members 20, 21 respectively of the foot section, by means of bolts or rivets 27. The head, seat and foot sections are thus arranged end to end within the space enclosed by the side rails 14, 15,

and occupy the major portion of such space. The pivoted sections may at times occupy the same horizontal plane as the side rails 14, 15, and may be adjusted to various inclined positions out of such plane.

The pivoted head, seat and foot sections together carry a suitable yielding or spring bed bottom, of any suitable character. In this instance the spring structure is composed of a plurality of independent metal strips or bars 28 arranged transversely and spaced apart suitable distances, each strip or bar 28 being formed at its ends with apertures 29 adapted to receive the hooked ends of relatively short retractile coil springs 30, 31. The springs 30, 31 are hooked at their opposite ends through apertures 32, 33 formed in the side members of the various bed sections, such as 17, 18 (see Figure 3), whereby the strips or bars are independently yieldingly supported between the side members of said sections. Normally the strips or bars 28 lie in the same plane as the side members which they connect, but may yield, separately and to varying extent, under strains and loads imposed upon the bed, as through the occupancy of the bed by one or more persons.

The channels comprising the head posts 10 open inwardly toward the longitudinal median line of the bed, and the channeled cross-bar 11 connecting them preferably opens downwardly. Screw shafts 34, 34 are arranged vertically in the said posts 10, one in each post, and are journaled for rotation in suitable bearing blocks 36 rigidly mounted in and carried by said posts. An operating shaft 37 is arranged for rotation in the channeled cross-bar 11 and is journaled in suitable bearing blocks 38 rigidly mounted in and carried by said cross-bar. The operating shaft 37 projects at one or both ends through the ends of the cross-bar 11 and is formed angular in cross-section to receive a detachable hand crank such as 39 for manual rotation of the shaft. The screw shafts 34 have fixed to their upper ends bevel gears 40, each meshing with a bevel gear 41 on the adjacent end portion of the operating shaft 37, whereby said screw shafts may be conjunctively rotated (in the same direction) through rotation of said operating shaft. A traveling block 42 is threaded on each of the screw shafts 34 and a pitman 43 is pivoted at one end on each of said blocks 42 and is pivotally connected at its opposite end, as at 44, to the free or head end of the pivoted head section of the bed. Rotation of the screw shafts 34, through operation of the shaft 37, results in an upward or downward movement of the traveling blocks 42, and thus in an elevation or lowering of the free end of the pivoted head section of the bed, through the pitman 43. Thus the head section may be adjusted,

easily and quickly, to any desired inclination.

Similar operating mechanism for the foot section is provided and carried by the foot posts 12 and cross-bar 13, the pitmen 43 thereof being connected to the lower cross-bar 22 of said foot section.

Brackets 46, 47 are fixed to and project downwardly from the respective side rails 14, 15, adjacent the joint between the seat and foot sections of the bed, and a shaft 48 is journaled for rotation in said brackets, projecting at one or both ends through said brackets and being squared to receive a crank such as 39. The shaft 48 is oppositely threaded in its opposite end portions, such threaded portions being designated by the numerals 49, 50; and traveling blocks 51, 52 are threaded on the respective screw portions. Links 53, 54 or pitmen are pivoted at one end to the blocks 51, 52 respectively and are pivotally connected at their opposite ends to the respective side members 23, 24 of the pivoted seat section of the bed, as by means of angle brackets 55 secured to the inner faces of said side members. When the seat section is in its normal horizontal position, as shown in Figure 4, the blocks 51, 52 occupy positions near the center of the shaft 48 and the links or pitmen 53, 54 are in inclined positions. When the shaft 48 is rotated in one direction the blocks 51, 52 are caused to move apart on the oppositely threaded portions of said shaft and the links 53, 54 are caused to move toward vertical positions, thus elevating the lower or foot ends of the side members 23, 24 and parts carried thereby, including the side members of the foot section. Thus rotation of the rod or shaft 48 accomplishes an upward breaking of the joint between the seat and foot sections, or adjustment of the inclination of said sections from their common pivot 27 to their opposite ends.

There are a number of positions to which the bed sections may be adjusted, one of which is shown by full lines in Figure 1, in which the head and body of the occupant are supported in greater or less inclined position by the inclined adjustment of the head section, and his legs and knees are allowed to assume a natural and comfortable position by upward breaking of the joint between the seat and foot section. The feet of the patient also may be elevated by adjusting the foot section into an inclined plane common to the plane of the seat section, as indicated by dotted lines in Figure 1; or all three sections may be adjusted into a common inclined plane, the head section being inclined downwardly from its pivot at 26. The adjustment shown by solid lines in Figure 1 may be carried to an extreme so that the patient may occupy substantially a sitting position, if desired. All of the

adjustments are accomplished with ease and comfort and a minimum of disturbance to the occupant of the bed, and with a minimum of labor on the part of the attendant.

At times it is desirable to adjust the entire bed bodily vertically in a horizontal plane, and for this purpose I have provided a sliding connection between the ends of the side rails 14, 15 and the respective posts 10, 12. Such construction at one corner of the bed is shown in detail in Figures 5 and 6. A substantially U-shaped bearing member 56 is provided which is fitted to and adapted for sliding movement on a leg or post such as 10. The open side of the U-shaped bearing member 56 is directed inwardly, the same as the channel of the leg or post, and the ends of the arms of said bearing member extend past the flanges of said leg or post and are formed with in-turned flanges 57 engaging the margins of said channel, so that the bearing member bears on all four sides against the leg or post. The bearing member 56 is formed on one of its sides with a laterally projecting arm 58 adapted to project within the open end of a channeled side rail such as 14, and be secured thereto. In this instance I have shown a Z-shaped connecting member 59 mounted against the bottom and end of the arm 58 and having its upper flange contacting the top or closed side of the channeled side rail and secured thereto by a bolt 60, another bolt 61 being mounted through the top or closed side of the rail 14, through the arm 58 and the lower flange of the connecting member 59, thus providing a rigid connection between the parts. It is also desirable to provide anti-friction devices between the bearing members 56 and posts, to facilitate the sliding movement and prevent undue rubbing of the bearing member on the post. For this purpose I have provided the bearing member 56 with a number of horizontal bores 62 each opening to one surface and also intersecting the inner face of the part in which it is formed, that is to say the face directed toward the post 10. A roller 63 is mounted in each bore 62 by end-wise movement and its withdrawal prevented by the insertion of a screw 64 in the open end of the bore. As the bore opens to the inner face of the member in which it is formed, the roller 63 is adapted for rolling contact with the adjacent face of the post 10 in vertical movement of the bearing member thereon. There are preferably two rollers in each of three sides of the bearing member 56, one above the other. The bearing members 56, and consequently the side rails and members carried thereby, may be held in their adjusted positions on the posts 10 and 12 by means of set screws 65. When

the set screws 65 are loosened, upward strain may be applied to the side rails 14, 15 through the operating mechanism heretofore described, by latching said side rails to the side members 17, 18, 20 and 21, upon which such operating mechanism works. For this purpose buttons 66 are pivoted at 67 to head end portions of the rails 14, 15 and are adapted to be turned laterally, as shown by dotted lines in Figure 3, to overlie the side members 17 and 18; and similar buttons 68 are pivoted at 69 on the foot portions of said side rails and are adapted to overlie the side members 20, and 21. When lifting strain is applied to the head and foot sections by rotation of the shafts 37 as previously described, such lifting strain is communicated to the side rails 14, 15 and results in an elevation of the entire bed bottom; or the strain may be relaxed by reverse movement of said shafts to lower the bed, as indicated by dotted lines in Figure 1.

I claim as my invention—

1. An invalid's bed, comprising spaced posts, a cross-bar connecting certain of said posts in pairs, a pair of side rails carried by said posts, a bed section arranged between said side rails and pivotally connected thereto at one end, spaced bearings fixed within said posts, screw shafts vertically arranged in said posts and journaled in said bearings, traveling blocks threaded on said screw shafts between said bearings, a pitman pivotally connecting each of said blocks to the free end of said pivoted bed section, spaced bearings fixed in said cross-bar and located in said cross-bar and journaled in the bearings thereof, bevel gear connections between said operating shaft and each of said screw shafts, said operating shaft projecting through the end of said cross-bar, and a crank for rotating said operating shaft.

2. In a bed, a post and a side rail of channel form, a bearing block of generally U-shape embracing and slidable on said post, said bearing member being formed with a laterally extending arm adapted to enter the open end of said side rail, a Z-shaped connecting member engaging the bottom and end of said arm and the closed side of said channeled side rail, a securing member extending through the side rail and one arm of said connecting member, another securing member extending through the side rail, arm and other end of said connecting member, and means for locking said bearing member to said post.

Signed at Webster City, in the county of Hamilton and State of Iowa, this 28th day of January, 1922.

WILLIAM A. McCOLLOUGH,