No. 708,322.

Patented Sept. 2, 1902.

E. B. DONES.

INVALID BED.

(Application filed Aug. 16, 1901.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1

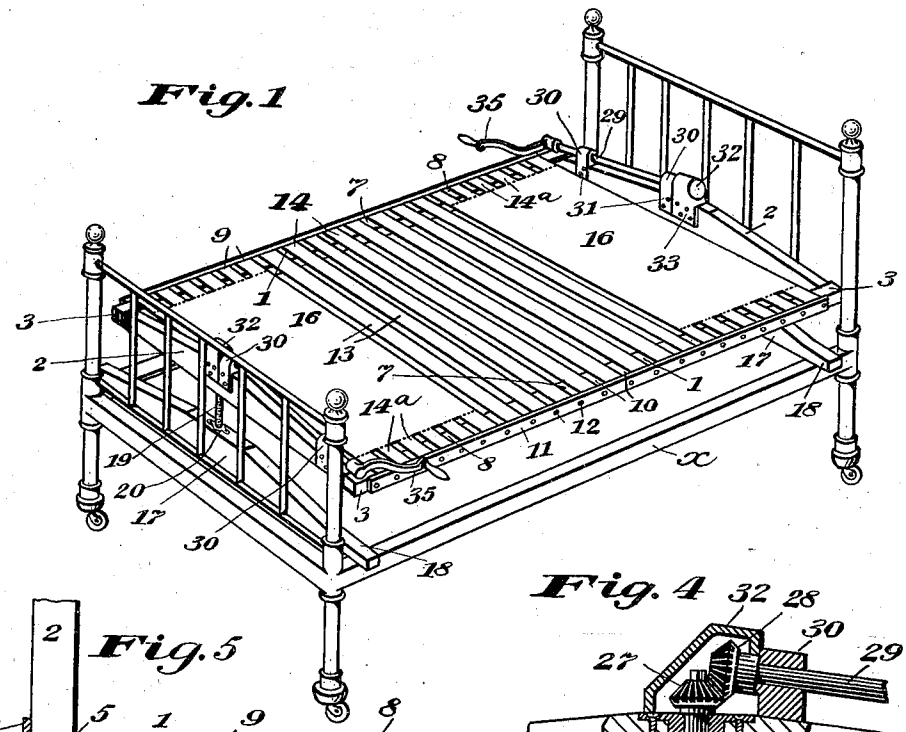


Fig. 4

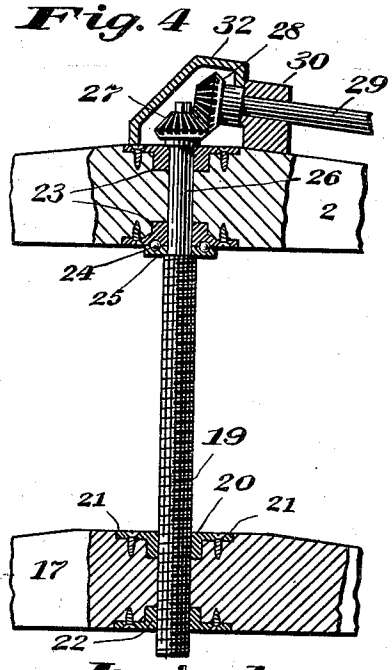


Fig. 5

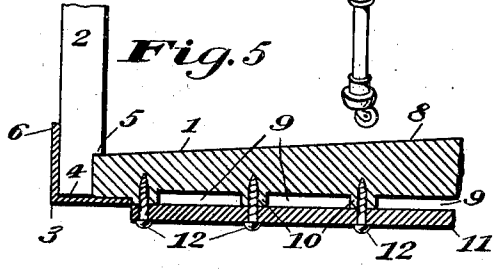


Fig. 6

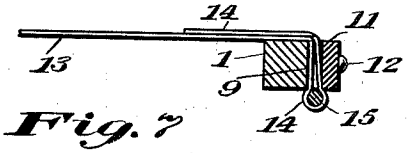
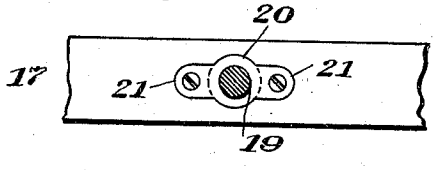


Fig. 7



Witnesses

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No. 708,322. Patented Sept. 2, 1902.

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INVALID BED.

(Application filed Aug. 16, 1901.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 2.

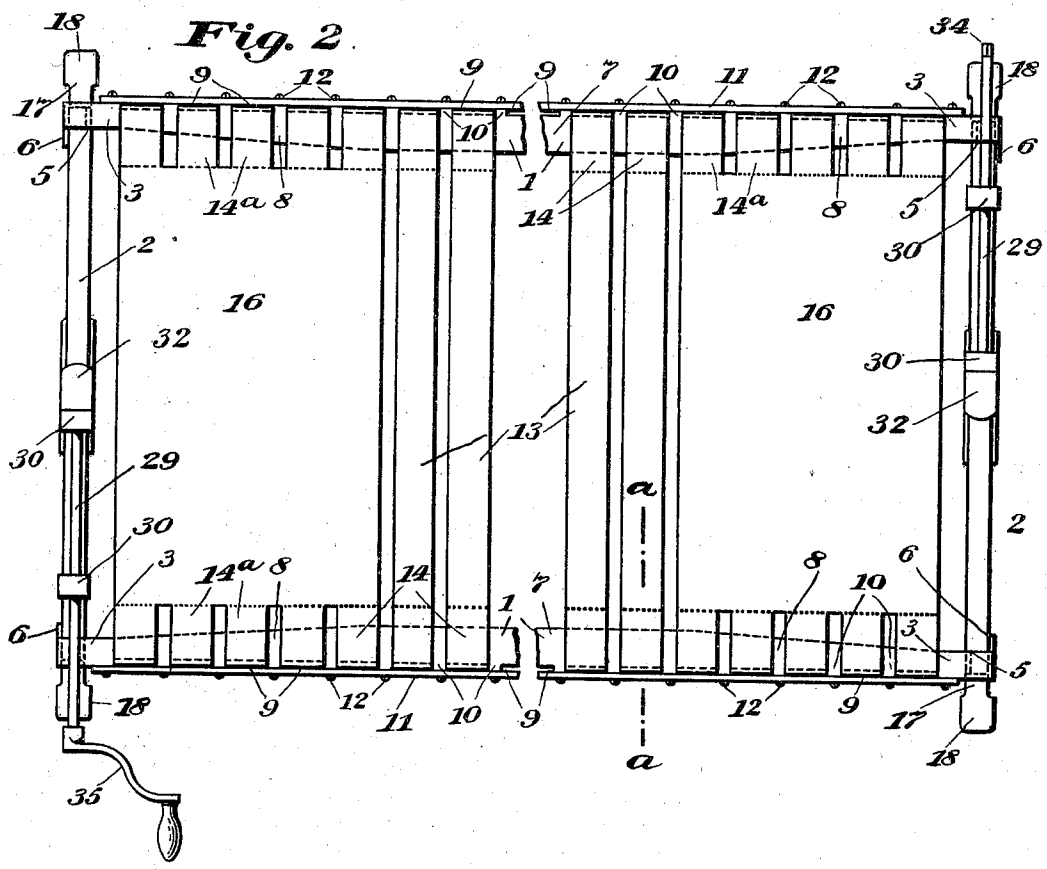
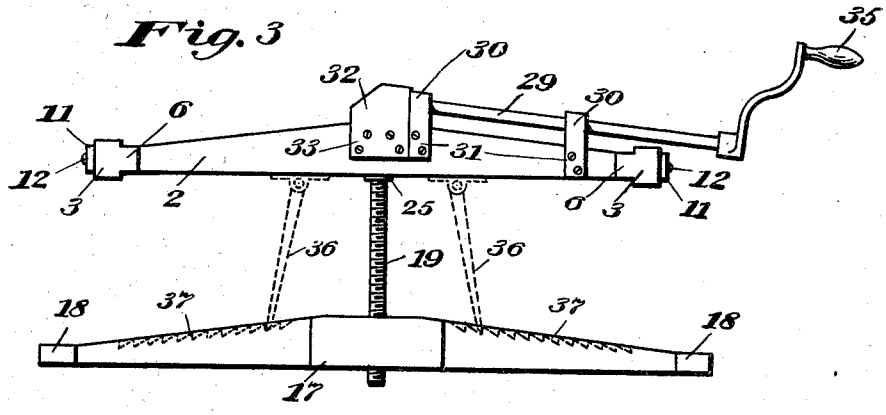


Fig. 3.



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UNITED STATES PATENT OFFICE.

ELLA B. DONES, OF CINCINNATI, OHIO, ASSIGNOR OF ONE-HALF TO FRANK W. HENDLEY, OF CINCINNATI, OHIO.

INVALID-BED.

SPECIFICATION forming part of Letters Patent No. 708,322, dated September 2, 1902.

Application filed August 16, 1901. Serial No. 72,236. (No model.)

To all whom it may concern:

Be it known that I, ELLA B. DONES, a citizen of the United States of America, and a resident of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Invalid-Beds, of which the following is a specification.

This invention relates to certain improvements in invalid-beds, and has for its object to provide a device of this character of a simple and inexpensive nature and of a strong, compact, and durable construction capable of being packed up in a compact manner for storage when not in use or for shipment and having improved raising and lowering means adapted to permit of readily raising the patient to afford access for dressing wounds, changing the bedding, or other purposes.

The invention consists in certain novel features of the construction, combination, and arrangement of the several parts of the improved invalid-bed, whereby certain important advantages are attained and the device is made simpler, cheaper, and otherwise better adapted and more convenient for use, all as will be hereinafter fully set forth.

The novel features of the invention will be carefully defined in the claims.

In the accompanying drawings, which serve to illustrate my invention, Figure 1 is a perspective view showing a bed constructed according to my invention in position for use upon a bedstead; and Fig. 2 is an enlarged plan view of the improved invalid-bed, the central portion thereof being broken out for lack of space. Fig. 3 is an end elevation of the improved bed. Fig. 4 is an enlarged fragmentary sectional view showing certain details of construction of the raising and lowering means of the bed. Fig. 5 is an enlarged partial section taken horizontally through a corner of the bed and showing the detachable connection between the sides and ends of the improved bed. Fig. 6 is an enlarged partial section taken in the plane indicated by line *a a* in Fig. 2 and showing the means for holding the tapes or webbings on which the patient is sustained in place on the frame of the bed. Fig. 7 is a fragmentary detail view showing the nut carried by the cross-bar or end support for the improved bed for engagement with the screw, by means of which the bed is raised and lowered.

In these views, *x* indicates the bedstead on which the improved invalid-bed is arranged for use, this bedstead being, as herein shown, an ordinary iron one, such as is especially adapted for hospital use, owing to its adaptability for ready and thorough cleansing.

The improved invalid-bed constructed according to my invention is rested upon the bedstead *x* and is capable of ready removal therefrom, so as to permit the patient supported on the improved bed to be conveniently moved about.

The improved invalid-bed comprises an open rectangular frame formed of side rails 1 1 and end pieces 2 2, which are detachably joined at the corners of the frame and may be formed from wood or metal, as desired.

The means herein shown for detachably connecting the side rails 1 and end pieces 2 of the bed comprises brackets 3, carried on the end portions of the side rails, with socketed portions 4 extended beyond the extremities of said side rails, as shown in Figs. 2, 3, and 5, in position to receive the extremities of the end pieces 2 of the frame. The said end pieces 2 have their extremities cut out, as shown at 5, on their inner faces to produce shoulders which abut on the inner surfaces of the side rails, and the brackets 3 have extensions 6, which project along the outer sides of the end pieces. This construction greatly adds to the strength of the joint and prevents looseness at the corners of the bed, and the extensions 6 also serve to prevent the bed when taken apart from being put together wrong, since the shoulders 5 will serve by engagement with said extension 6 to prevent the end pieces from being connected to the side rails with said shoulders on the outer side of the bed.

To add strength and stability to the bed-frame, the side rails 1 are thickened at their central portions, as shown at 7 in the drawings, the end portions 8 8 of each side rail being made tapered along its inner side, and in the outer surface of each side rail are cut notches or recesses 9, forming between them lugs or projections 10 10. A strip 11 is secured along the outer surface of each side

rail outside of the notches or recesses 9, being held in place by means of screws 12 or equivalent devices, which pass through the said strip and take into the lugs or projections 10, as shown in Fig. 5.

Tapes or strips 13 of flexible textile webbing form the flexible top sheet for the improved invalid-bed upon which the patient is supported, the said tapes or strips 13 having loops 14 produced in their end portions and having their said looped end portions passed across the upper faces of the side rails 1 and down through the notches or recesses 9 and serving to receive wedges 15 beneath the strips 11, by which means the said looped ends 14 are held securely against disengagement from the notches or recesses 9, and the tapes or strips 13 are maintained tightly stretched across the central space or opening of the rectangular bed-frame to produce a flexible support for the patient.

As herein shown, the narrow tapes or strips 13 are at the central portion only of the improved invalid-bed, the end portions thereof being provided with wider strips or sheets 16 of textile fabric, the said wider sheets 16 having at their opposite ends loops 14^a, similar to the loops 14 of the narrow tapes or strips 13 and also designed to be passed down through the notches or recesses 9 in the side rails 1 and secured in place by means of wedges in a manner similar to that above described for securing the looped ends of the tapes or strips 13.

At opposite ends the bed-frame is sustained above the bedstead x upon supports or cross-bars 17, which are of somewhat greater length than the end pieces 2 of the said bed-frame and are extended horizontally below the same, the opposite ends of each end support or cross-bar 17 forming feet 18 to rest upon the side rails of the bedstead x, upon which the improved invalid-bed is arranged, as shown in Fig. 1. The bed-frame is supported upon the cross-bars or supports 17 by means of vertically-arranged screws 19, collared at their upper ends in the central portions of the end pieces 2 of the bed-frame and having their lower ends engaged with nuts 20, countersunk in the upper surfaces of the cross-bars or end supports 17 and held in place by means of screws or the like passed through lugs 21, extended from opposite sides of said nuts, as shown in Figs. 4 and 7. By this construction it will be seen that the cross-bars or end supports 17 are adapted for turning or pivotal movement upon the screws 19 independently one of the other and in horizontal planes, so as to adapt the device for use upon different bedsteads, either with or without slats, or to adapt the device for setting upon stools or chairs or upon the floor without requiring other articles of furniture to be removed. Thus the device may be set down temporarily without necessitating great care in clearing a space for it, since the cross-bars or end supports may be swung pivotally to enable them to clear other articles of furniture. Also by the pivotal movement of the cross-bars they may be adjusted so as not to project beyond the edges or sides of the bedstead on which the device is rested or may be adjusted to fit upon the slat-supports in the case of wooden bedsteads. By the turning or pivotal movement of said cross-bars or end supports they may also be adjusted to raise or lower the ends of the bed-frame, this turning movement being rendered possible upon lifting the ends of the bed-frame without requiring the fitting of the devices, to be hereinafter referred to, by means of which the screws are turned. On the under side of each cross-bar 17 is secured a plate 22, having a boss through which the lower end of the screw 19 passes, these plates serving to add strength to the structure. The end pieces 2 of the bed-frame also carry plates 23 on their upper and lower faces, which plates are formed with bosses similar to the plates 22. The screws 19 are formed at their upper ends, which are passed through the end pieces 2 of the bed-frame, with reduced plain portions 26, which pass through the bosses of the plates 23, and said reduced portions form shoulders, above which are held collars 25, as shown in Fig. 4, balls 24 being interposed between said collars and the under sides of the lower plates 23 to provide an antifriction-bearing for each screw in the corresponding end piece 2. Above each end piece 2 the reduced end 26 of the screw 19 carries a gear-wheel 27, in mesh with a similar gear-wheel 28, secured on a shaft 29, extended at angles to the screw 19 and held in bearings 30 on the end piece 2, the said bearings 30 being formed with straps 31, extended along opposite sides of the end piece to afford a secure attachment of the bearings thereto. A housing 32 is secured at the central part of each end piece 2 over the gears 27 and 28 to prevent the bedding or hair of the patient lying upon the bed from becoming entangled in the gears. Each shaft 29 has at its end a square 34 or equivalent device adapted to receive a crank-handle 35, by means of which the shaft may be conveniently rotated.

In operation when the bed is in use and it is desired to raise the patient for any reason it is only necessary to turn the shafts 29 at opposite ends of the bed-frame by means of the crank-handles 35, the rotation of said shafts being imparted to the screws, which, owing to their engagement with the nuts 20 of the end supports 17, serve to raise the bed-frame above the bedstead x, so that access may be had to the under side of the bed-frame. The wedges 15, holding the ends of one or more of the tapes or strips 13, may then be removed, and access will then be afforded to the patient through the opening thus provided for any desired purpose—as, for example, the dressing of a wound. While the patient is thus raised the bedding may also be conveniently changed without disturbing or

causing inconvenience to the patient. The gearing at the opposite ends of the bed-frame being arranged for independent operation it will be seen that the head of the patient may, if desired, be raised or lowered with respect to the feet. The tapes or strips 13 are interchangeable and permit of being removed and replaced without disturbing the patient.

From the above description it will be seen that the improved invalid-bed constructed in accordance with my invention is of an extremely simple and inexpensive nature and is especially well adapted for use, since it permits of readily raising the patient without requiring any effort on his part. It will also be seen that the device is capable of being compactly folded up when not required for use, since the detachable connections between the end pieces and side rails permit these parts to be separated, so that the improved bed when taken apart occupies a comparatively small space. The device is also very light and strong and affords a very convenient means for moving the patient about when required.

It will also be obvious from the above description that the improved bed is capable of some modification without material departure from the principles and spirit of the invention, and for this reason I do not wish to be understood as limiting myself to the precise form and arrangement of the several parts herein set forth. For example, in some cases it may be desirable to provide means for bracing the side portions of the bed to lessen the strain upon the screws 19, and in such cases I may employ the devices shown in dotted lines in Fig. 3. These devices comprise braces 36, pivotally held upon the opposite end portions of the end pieces 2, with their lower ends adapted for engagement with series of serrations or notches 37 in the upper surfaces of the end portions of the cross-bars 17.

Having thus described my invention, I claim—

1. In an invalid-bed, the combination of a bed-frame, a horizontally-extended cross-bar extended transversely beneath each end of said bed-frame and means interposed between the bed-frame and said cross-bars for raising and lowering the bed-frame relatively to said cross-bars, each cross-bar having at its central part pivotal connection with the raising and lowering means and being adapted for pivotal movement in a horizontal plane independently of the other cross-bar, substantially as set forth.

2. In an invalid-bed, the combination of a bed-frame, horizontally-extended supports, independent of each other and arranged beneath opposite ends of the bed-frame and raising and lowering means interposed between the ends of the bed-frame and said supports and comprising rotative parts extended between the bed-frame and said supports and upon which the said supports are centrally pivoted and are adapted for turning or pivotal movement in a horizontal plane, substantially as set forth.

3. In an invalid-bed, the combination of a bed-frame, independent horizontally-extended cross-bars arranged beneath opposite ends of the bed-frame and means for raising and lowering the bed-frame relatively to said cross-bars and comprising collared screws extended between the bed-frame and said cross-bars and upon which the cross-bars are centrally pivoted and are adapted for turning or pivotal movement independent of each other and devices for operating said screws, substantially as set forth.

4. In an invalid-bed, the combination of a bed-frame, horizontally-extended supports, independent of each other and arranged beneath opposite ends of the bed-frame and provided at their central portions with nuts, screws having their upper ends collared at the ends of the bed-frame and having their lower ends engaged with the nuts carried by the respective supports, the said supports being arranged for pivotal or turning movement in horizontal planes upon said screws and means carried by the bed-frame for actuating said screws to raise and lower the bed-frame upon said supports, substantially as set forth.

5. In an invalid-bed, the combination of a bed-frame formed of side rails and end pieces arranged for detachable connection with the side rails at the corners of the bed-frame, horizontally-extended supports independent of each other and extended beneath each end of said bed-frame and means interposed between the said supports and the end pieces of the bed-frame for raising and lowering the bed-frame upon said supports, each of said supports having at its central part pivotal connection with the raising and lowering means being adapted for pivotal or turning movement in a horizontal plane and independently of the other support, substantially as set forth.

Signed at Cincinnati, Ohio, this 24th day of July, 1901.

ELLA B. DONES.

Witnesses:
JOHN ELIAS JONES,
FRANK W. HENDLEY.