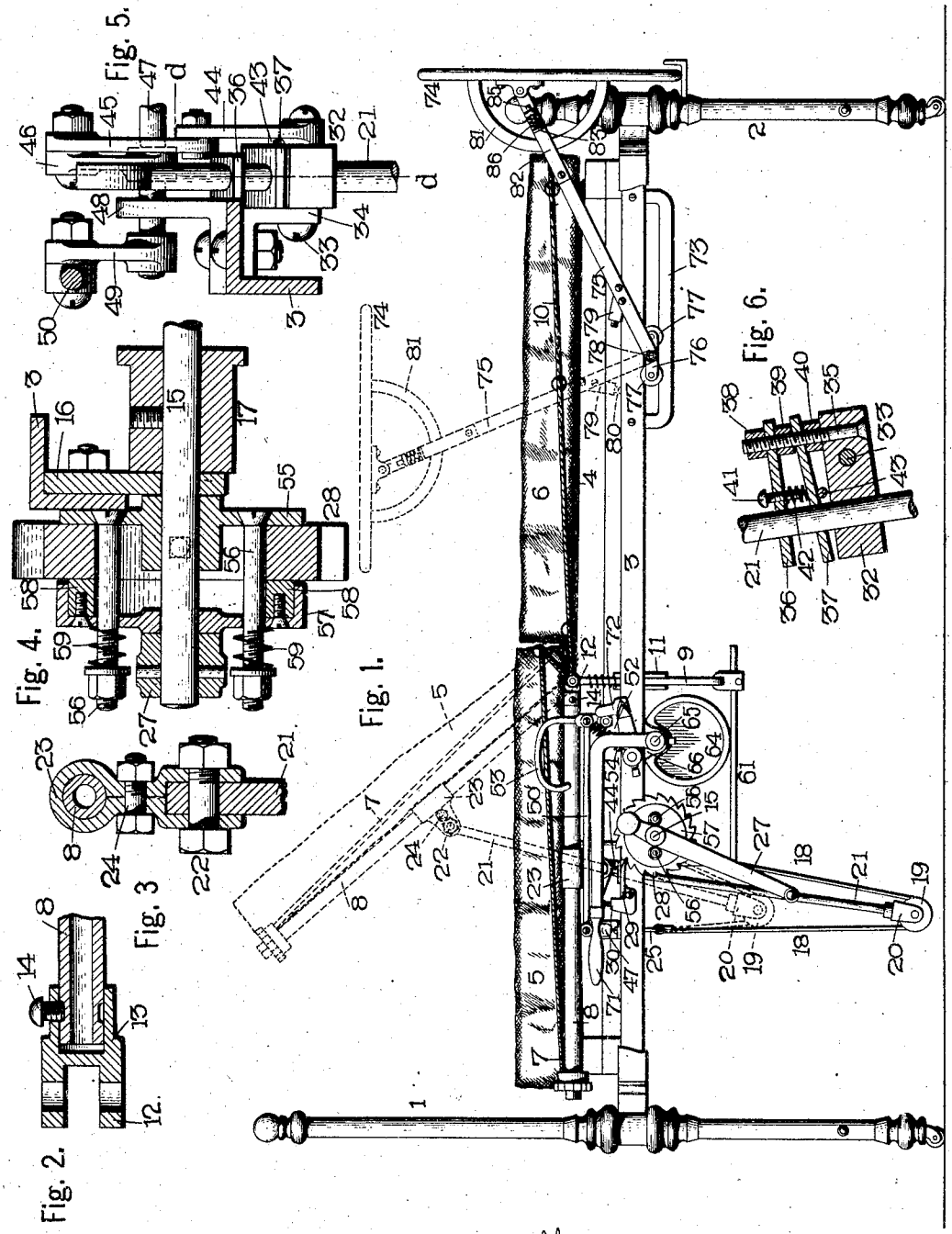
No. 790,588. PATENTED MAY 23, 1905.

W. McLENNAN.

INVALID BED.

APPLICATION FILED NOV. 17, 1904.

2 SHEETS—SHEET 1.



Witnesses.

Chas. J. Pankow.

Geo. A. Neubauer.

William McLennan, Inventor.

By A. J. Langston

Attorney.

PHOTO LITHOGRAPHED BY SACHETT & WILHELMS LITHO. & PTG. CO. NEW YORK.

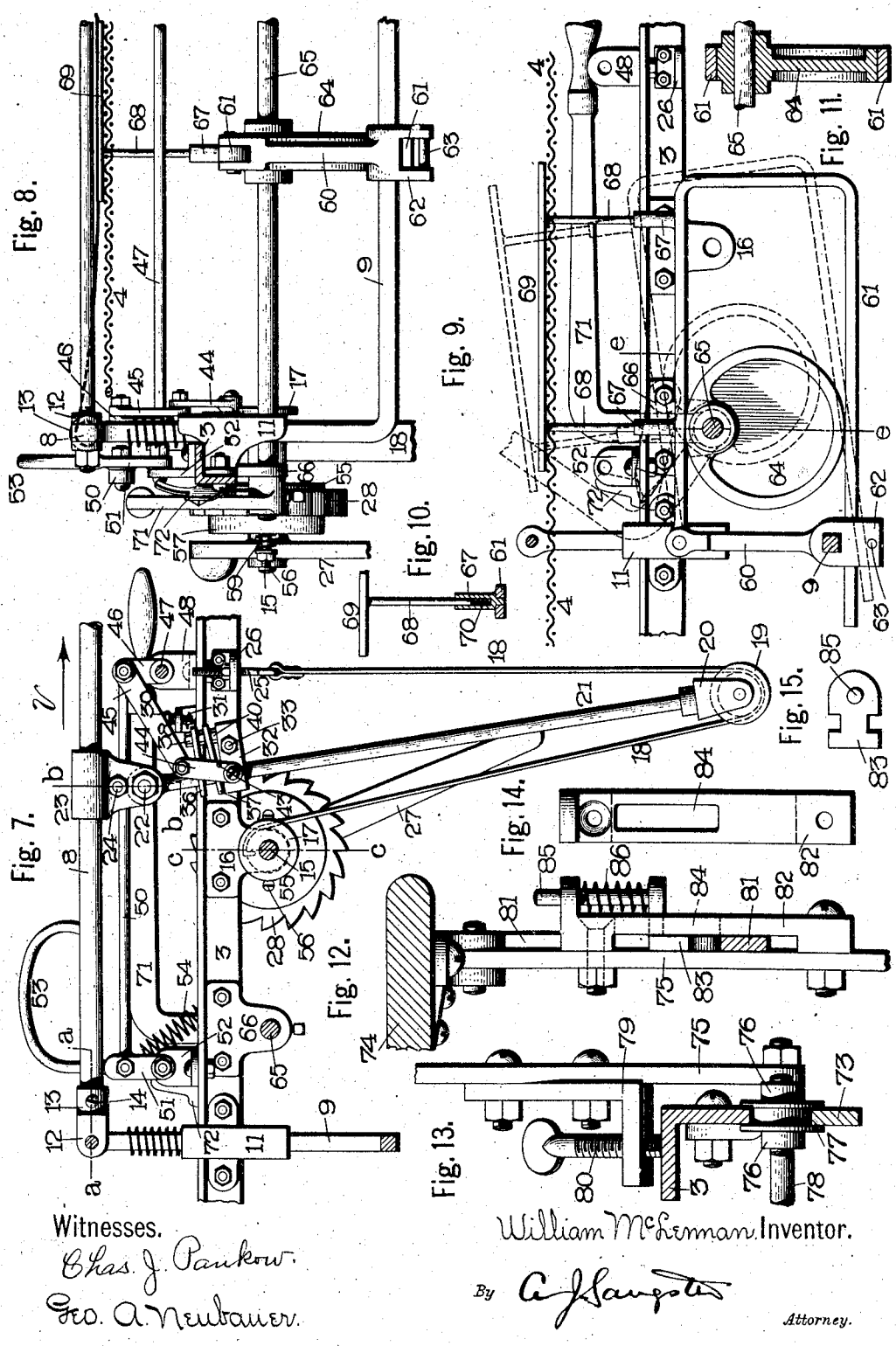
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# UNITED STATES PATENT OFFICE.

WILLIAM McLENNAN, OF BUFFALO, NEW YORK.

## INVALID-BED.

SPECIFICATION forming part of Letters Patent No. 790,588, dated May 23, 1905.

Application filed November 17, 1904. Serial No. 233,105.

*To all whom it may concern:*

Be it known that I, WILLIAM McLENNAN, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Invalid-Beds, of which the following is a specification.

This invention relates to an improved invalid-bed, and more particularly to improved mechanism for tilting or elevating the mattress at least in part for the purpose of raising the patient to a sitting position and for permitting the lowering of said tilted mattress by the patient.

The object of this invention is to provide a mechanism which shall operate smoothly and noiselessly and without a jar or jerk and which when tilted may be easily lowered into its former position by the invalid alone without the assistance of nurses or physicians.

The invention also relates to certain other features and details of construction, all of which will be fully and clearly hereinafter described and claimed, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of the improved bed. Fig. 2 is an enlarged section through the swivel-joint on line *a a*, Fig. 7. Fig. 3 is an enlarged section on line *b b*, Fig. 7. Fig. 4 is an enlarged section on line *c c*, Fig. 7, the ratchet-wheel being turned so as to show the fastening-bolts. Fig. 5 is an enlarged fragmentary view of the friction-stop looking in the direction of the arrow V, Fig. 7. Fig. 6 is a section through the friction-stop on line *d d*, Fig. 5. Fig. 7 is an enlarged fragmentary inside view of the mechanism for elevating the head portion of the bed. Fig. 8 is a view looking in the direction of the arrow V, Fig. 7. Fig. 9 is enlarged fragmentary inside view of the back-support and its operating mechanism. Fig. 10 is a fragmentary view of the back-support and its cushion connection to the C-shaped frame. Fig. 11 is a section through the eccentric and the C-shaped frame on line *e e*, Fig. 9. Fig. 12 is an enlarged fragmentary view of the adjustable table and one of its supporting-bars. Fig. 13 is an enlarged section through the bed-frame, showing the method of supporting the adjustable table therefrom. Fig. 14 is a detached view of the slotted bar of the adjustable table. Fig. 15 is a detached plan view of the clutch-block of the adjustable table.

In referring to the drawings for the details of construction like numerals designate like parts.

The frame of the bed is similar to those in general use in hospitals and comprises a head-piece 1, foot-piece 2, and longitudinally-extending side frame-bars 3, which are secured to the head and foot pieces in the usual manner. The usual spring 4 is supported on the bed-frame, and a mattress, which is preferably made in two parts 5 and 6, is placed upon the spring, the part 5 being supported upon and fastened by a rope 7 to a swinging frame 8, which is pivoted to the upper ends of an elongated U-shaped sliding bar 9, and the part 6 being secured to the spring 4 by a rope 10. The elongaged U-shaped sliding bar 9 is slidably mounted in bearings 11, which are bolted to the frame-bars 3, and the upper ends of the sliding bar 9 are pivoted to the forked ends 12 of swivel-blocks 13. Each swivel-block 13 is provided with a socket in which one inner end of the swinging frame 8 is loosely secured by a set-screw 14. (See Fig. 2.) A transversely-extending shaft 15 is mounted in bearings 16, which are fastened to the frame-bars 3, and has a drum 17 mounted at each end adjacent to the bearings.

The mechanism for elevating the swinging frame is supported from the frame-bars 3 and is in duplicate, one set being located at each side of the bed.

A belt 18 has one end fastened to the drum 17 and passes downward and around a pulley 19, which is mounted in a forked block 20, secured to the lower end of a rod 21, the upper end of which is pivoted by a bolt 22 to a split sleeve or clamp 23, which is securely clamped around each side member of the swinging frame 8 by a bolt 24. (See Figs. 1 and 2.) The other end of the belt 18 extends upward from the pulley 19 and is fastened to any eyebolt 25, which is supported in an angle-plate 26, bolted to the bars 3. (See Fig. 7.) The shaft 15 is rotated to elevate the swinging frame 8 by a crank-arm 27, which

is secured to one end of said shaft, and the shaft is prevented from rotating backwardly, except at the will of the operator, by a ratchet-wheel 28, which engages with a pawl 29. The pawl 29 is pivoted by a screw to the adjacent frame-bar 3 and has a lip 30, which extends over the top of the frame-bar and through which a set-screw is passed. A spring 31 encircles the set-screw and keeps the pawl in engagement with the ratchet-wheel.

A friction-stop is provided which holds the swinging frame 8 in position when elevated. (See Figs. 5, 6, and 7.) A block 32, which has a vertically-extending opening near one end through which the rod 21 passes, is pivoted by a bolt 33 to an angle-plate 34, which is securely fastened to each of the frame-bars 3. (See Fig. 5.) A bolt 33 is passed vertically through the other end of the block 32, and two plates 36 and 37 are supported upon the bolt above the block 32. (See Fig. 6.) The upper plate 36 is rigidly secured between lock-nuts 38 and 39, and the lower plate 37 is loosely secured between the nut 39, which is placed above the plate, and a nut 40, placed below the plate. Openings are formed in the opposite ends of the plates 36 and 37, through which the rod 21 passes. A set-screw 41 is screwed through the upper plate 36, and a spring 42 encircles the set-screw and bears against the top surface of the plate 37 to normally keep said plate in engagement with the rod 21. The plate 37 is released to permit the rod 21 to descend by a pin 43, which extends beneath the plate and has its end fastened in a lever 44. The lever 44 is pivoted at its lower end to the block 32 by a screw and is pivoted at its upper end by a bolt to a connecting-link 45, the opposite end of which is pivoted by a bolt to the upper end of a crank-arm 46, which extends vertically from a shaft 47. The shaft extends from one frame-bar 3 to the other and is supported in bearings 48, which are secured to the top surface of the frame-bars. (See Figs. 5 and 7.) A crank-arm 49 is secured to one end of the shaft 47 and a connecting-rod 50 has one end pivoted by a bolt to the crank 49, and its opposite end pivoted to a crank-arm 51. This crank-arm 51 has its lower end pivoted by a bolt to an angle-plate 52, which is fastened to the top surface of the frame-bar, and has its upper end bent so as to form a handle 53, which is within convenient reach of the patient. A spiral spring 54 has one end fastened to the crank-arm 51 and its other end secured to the frame-bar 3 and serves to return the crank to its normal position after it has been moved to release the friction-stop.

A friction-brake is provided, which allows the gradual lowering of the swinging frame 8 by the weight of the patient when the friction-stop has been released, as above described.

A disk 55, having a hub, is secured to the shaft 15 between the ratchet-wheel 28 and the frame-bar 3. The ratchet-wheel 28 is in the form of a ring, and two bolts 56, which have their heads seated in the disk 55, pass through the central opening in the ratchet-wheel and through openings in a flanged disk 57.

A friction-ring 58, of wood or other friction material, is secured by screws to the inside of the flanged disk 57 and bears against the face of the ratchet-wheel. The friction-ring 58 is forced against the ratchet-wheel by two springs 59, which encircle the ends of the bolts 56 and are held in place by washers and nuts screwed upon the ends of said bolts.

The strength of the friction-brake is regulated by the tension of the springs 59 to provide for the same gradual downward movement of the swinging frame with patients of different weight.

A support is arranged beneath the back of the patient, so that it may be slightly raised to support the patient's back. (See Figs. 1, 8, and 9.) This support is arranged in the center of the bed and near the inner end of the swinging frame, (see Fig. 8,) where one-half of the support is shown.

The elongated-U-shaped sliding bar 9 has two bars 60 secured thereto near its middle, the bars 60 being slightly separated from each other and extending vertically upward. The upper ends of the bars 60 are forked and the rear upper ends of two ⊃-shaped frames 61 are pivoted thereto by pins. (See Figs. 8 and 9.) The lower end of the bars 60, below the bar 9 are also forked, as shown at 62, and the lower rear ends of the frames 61 fit loosely in said fork 62, being held against displacement by transverse pins 63. Two eccentrics 64 are mounted upon a transverse shaft 65, which has its ends supported in bearings 66, depending from the frame-bars 3, one of the eccentrics engaging with each of the U-shaped frames 61. Each of the horizontal top portions of the frames 61 are provided with two tubular sockets 67, in which the lower ends of rods 68, extending from a supporting-plate 69, are adapted to seat. Springs 70 are seated in the sockets 67 and provide a cushion for the plate 69. The shaft 65 is operated by a crank or lever 71, which is secured to one end thereof within convenient reach of the patient. A spring stop-bar 72 is secured to the side frame-bar 3 and has a triangular-shaped block fastened thereto, against which the crank or lever 71 strikes and is held. The lever is released by an inward pressure upon the stop-bar 72.

A table or platform is arranged at the foot of the bed, which can be turned out of the way, as shown in full lines in Fig. 1, or turned up into position for supporting a book or the like, as shown in dotted lines in Fig. 1.

A rail 73 is secured to each of the frame-bars 3 below and parallel to the frame-bars

near the foot thereof and has its ends bent up at substantially right angles and fastened to said frame-bars.

The table 74 is pivoted to the upper end of a table-frame comprising two bars 75, and said bars are pivoted at their lower ends to a sliding carriage, which is composed of short longitudinal frame-bars 76, which are arranged in pairs between which peripheral-grooved pulleys 77 are pivoted. The pairs of bars are connected together by a transverse extending rod 98, the ends of which serve as the pivoting-points of the bars 75. An angular plate 79 is fastened to each of the bars 75, and a set-screw 80 is screwed through said plate 79 and rests against the top surface of the frame-bars 3 when the table is elevated.

The table 74 may be placed in a horizontal position, as shown in dotted lines in Fig. 1, or it may be tilted at any angle desired. A segmental plate 81 is secured to each end of the table adjacent to the bars 75, and a recessed plate 82 is secured to each bar 75 and forms a slot in which the segmental plate 81 slides. The plate 82 is slotted, and an angular clutch-block 83 has its horizontal portion passed through the slot 84 in the plate and its vertical portion operating in the slot between the bar 75 and plate 82. A pin 85 extends upward from the horizontal portion of the block 83 and has its upper end passed through a lug extending from the upper end of the plate 82. A spiral spring 86 encircles the pin 85 and serves to keep the block 83 normally in engagement with the segmental plate to hold the table in any desired position.

One of the great advantages of this improved bed is that the mattress when tilted can be lowered to its former position by the patient alone without the aid or assistance of nurses or physicians, the friction-brake enabling perfect control of the mattress by the patient in its descent.

I claim as my invention—

1. In a device of the class described, a bed-frame, a mattress on said bed-frame, a mattress-supporting frame pivoted to the bed-frame and means for tilting said mattress including a rod pivoted to one section of the mattress-frame and carrying a pulley at its lower end, a belt fastened at one end to the bed-frame and passing under the pulley, a drum to which the opposite end of the belt is fastened and on which said belt is wound and a friction-lock for said drum, substantially as set forth.

2. In a device of the class described, a bed-frame, a mattress on said bed-frame, a mattress-supporting frame pivoted to the bed-frame, a shaft journaled in the bed-frame, rods pivoted at their upper ends to the mattress-frame on opposite sides thereof and each carrying a pulley at its lower end, belts fastened to the bed-frame and passing under the pulleys, drums on the shaft on which the opposite ends of the belts are wound, a friction-stop mechanism connected to the shaft, substantially as set forth.

3. The combination with a bed-frame, a mattress on said bed-frame and mechanism for tilting said mattress at least in part, of a brake controlled by the patient for permitting the gradual lowering of the mattress when tilted into its former position.

4. The combination with a bed-frame, a mattress on said bed-frame and mechanism for tilting said mattress at least in part, of a friction-brake controlled by the patient for permitting the gradual lowering of the mattress when tilted into its former position and means for varying the tension of the springs of the friction-brake to regulate its strength.

5. In combination, a bed-frame, a two-part mattress, an elongated-U-shaped bar slidably mounted on the bed-frame, a swinging frame pivoted to the elongated-U-shaped bar upon which one part of the mattress is secured, and means for tilting the swinging frame, substantially as set forth.

6. In combination, a bed-frame, a two-part mattress, an elongated-U-shaped bar slidably mounted on the bed-frame, a swinging frame pivoted to the elongated-U-shaped bar upon which one part of the mattress is secured, means for tilting the swinging frame and a friction-stop for holding the swinging frame in position when elevated, substantially as set forth.

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