F. R. PAYNE.

INVALID'S BED.

APPLICATION FILED JULY 8, 1910.

1,001,437. **Patented Aug. 22, 1911.**

2 SHEETS—SHEET 1.

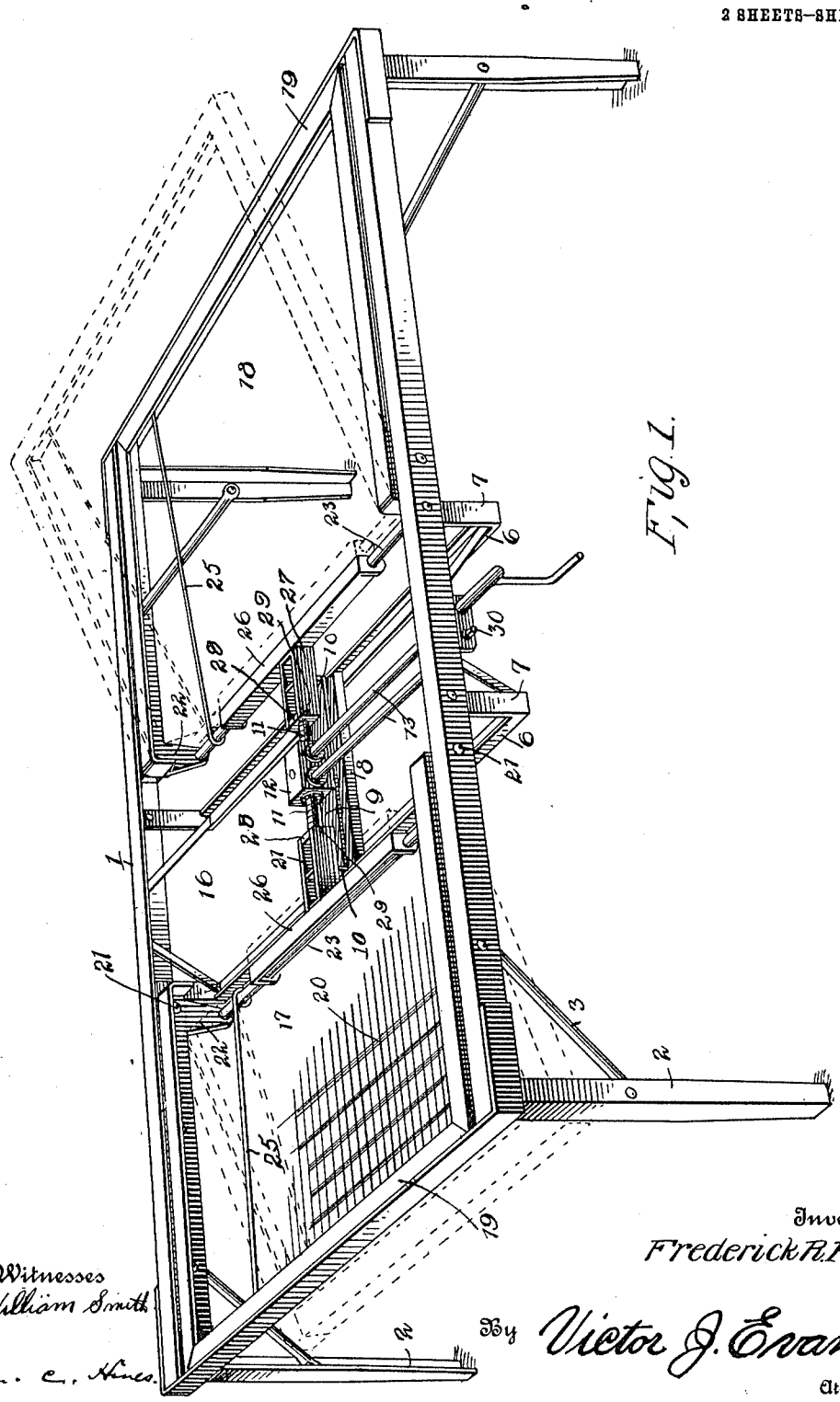

FIG. 1.

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2 SHEETS—SHEET 2.

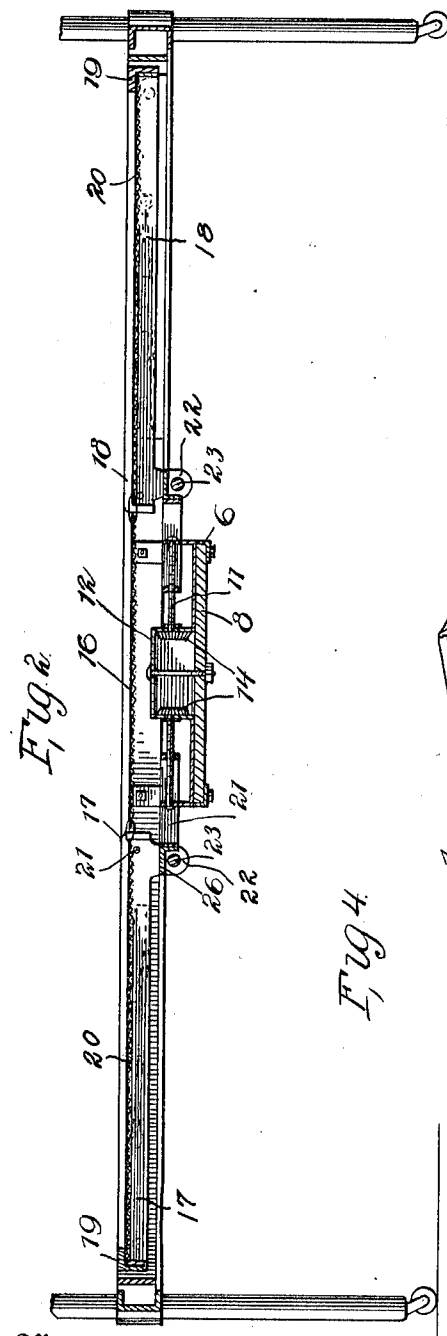

Fig. 2.

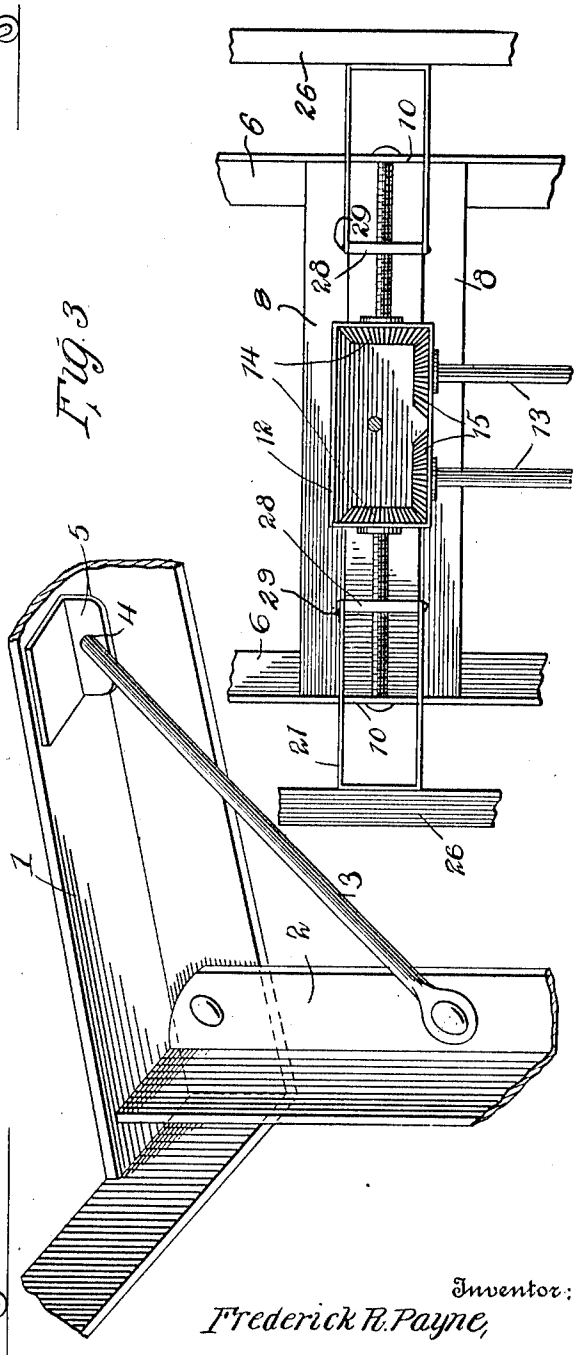

Fig. 3

Fig. 4

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UNITED STATES PATENT OFFICE.

FREDERICK R. PAYNE, OF MARINETTE, WISCONSIN.

INVALID'S BED.

1,001,437. Specification of Letters Patent. **Patented Aug. 22, 1911.**

Application filed July 8, 1910. Serial No. 570,991.

To all whom it may concern:

Be it known that I, FREDERICK R. PAYNE, a citizen of the United States, residing at Marinette, in the county of Marinette and State of Wisconsin, have invented new and useful Improvements in Invalids' Beds, of which the following is a specification.

This invention relates to improvements in invalids' beds, the primary object of the invention being to provide a bed of this character which is simple of construction, susceptible of manufacture at a comparatively low cost, and embodies head and foot sections independently adjustable to different heights or angles to suit the convenience of the patient and dispose the parts in different positions as occasion may demand.

A further object of the invention is to provide a bed of this character embodying a novel construction of self-locking gearing for adjusting the head and foot sections, and which bed, while self-supporting, may be easily and conveniently positioned upon an ordinary bedstead.

With these and other objects in view, the invention consists of the features of construction, combination and arrangement of parts, hereinafter fully described and claimed, reference being had to the accompanying drawing, in which:—

Figure 1 is a perspective view of an invalid's bed constructed in accordance with my invention, and illustrating in full and dotted lines different positions of adjustment of the head and foot sections. Fig. 2 is a longitudinal section, showing the device supported upon an ordinary bedstead. Fig. 3 is a sectional plan view of a portion of the gearing. Fig. 4 is a detail view, showing the construction of one of the supporting legs.

Referring to the drawings, 1 designates the substantially rectangular frame of the bed, which may be made of any suitable material. This frame 1 is provided at its corners with pivoted leg members 2, each carrying a pivoted folding brace 3 having a hooked free end 4 to engage a keeper member 5 upon the frame. The legs and braces are adapted to be folded upon the inner faces of the longitudinal members of the frame when the latter is supported upon a bedstead, as illustrated in Fig. 2.

Arranged on opposite sides of the transverse center of the frame are transverse hanger bars 6, disposed below the plane of the frame and having upturned ends 7 secured to the side pieces of the frame. These bars support a centrally disposed longitudinally extending bracket 8 on which is arranged a longitudinally extending strip 9 having upturned ends 10. The ends 10 form bearings for longitudinally extending shafts 11, the outer ends of which are journaled in said bearings. Mounted upon the bracket 8 between the bearings 10 is a boxing 12 forming a bearing for the inner ends of said longitudinally extending shafts, as well as for the inner ends of transversely extending shafts 13. The said inner ends of the longitudinally extending shafts 11 are provided with miter gears 14, and the inner ends of the transversely extending shafts 13 are provided with miter gears 15, each gear 14 being in mesh with one of the gears 15, whereby upon rotating the transverse shafts the longitudinally extending shafts may be independently operated. As shown, the shafts 11 are screw-threaded and disposed on opposite sides of the transverse center of the bed and in longitudinal alinement with each other.

The bed bottom consists of a fixed or non-adjustable central section 16 preferably formed of woven wire secured to the side bars of the frame and vertically swinging head and foot sections 17 and 18, each consisting preferably of a substantially U-shaped frame portion 19 covered by woven wire fabric 20, the fabric portions 20 being either secured to or forming an integral part of the central fabric section 16 so as to provide a bed bottom which is continuous or without break. The inner ends of the head and foot sections are pivotally mounted to swing upon pins or bolts 21, and each is provided at the inner ends of its side arms with depending cranks 22 connected by a cross rod 23, said cross rod being reinforced from the end piece of the section by braces 25.

Secured to each rod 23 is a cross head or strip 26 carrying an inwardly extending yoke 27 secured at its outer closed end to said strip and pivotally connected at its inner free ends to the sides of a follower or traveler 28, as indicated at 29, the arms 22, rod 23, and cross head 26 constituting a crank element for imparting motion to the swinging section, as will be readily understood. The follower or traveler 28 comprises a block having an internally threaded bore engaging the adjacent screw shaft 11

and forming a nut which is adapted to travel upon said shaft and to carry the yoke with it, the sides of the yoke being arranged to embrace the adjacent bearing 10 and to travel along opposite sides of the shaft 11, whereby said parts of the gearing are partially housed and protected to a large extent from liability of injury. The outer ends of the shafts 13 are journaled upon and project beyond one of the longitudinal side pieces of the frame and have angular extremities 30 to receive a crank handle or wrench whereby either of said shafts may be rotated.

From the foregoing description, it will be apparent that when the nuts or followers are in a substantially central position on the screw shafts the head and foot sections will be in normal position, or arranged to lie in the plane of the bed frame, but that by operating the transverse shafts in one direction or the other, said sections may be independently adjusted to different heights or angular positions both above and below the plane of the main frame, so that they may be disposed to suit the convenience of the patient or as circumstances may require in the use of the bed. It will also be apparent that the screw gearing will be self-locking, so that the head and foot sections will be automatically held in any of their positions of adjustment. Upon folding the supporting legs the bed may be mounted upon an ordinary bed stead or used as a stretcher, and upon unfolding and locking them in normal position the bed will be supported at a desired elevation above the floor surface. It will be seen that the construction is simple and comparatively inexpensive and provides a means whereby a patient may be supported in a variety of positions as circumstances may require.

Having thus described my invention, I claim:—

1. A bed of the character described embodying a main frame, a swinging section provided with a crank element, a longitudinally extending screw shaft, inner and outer bearings for said shaft, a traveler movable longitudinally on the shaft, a yoke coupled to the crank element and traveler, the arms of said yoke being pivotally connected with the traveler, and means for operating said shaft.

2. A bed of the character described embodying a main frame, a swinging section provided with a crank element, a longitudinally extending screw shaft, a bearing for the inner end of the shaft, a support having an upturned portion forming a bearing for the outer end of the shaft, a traveler movable longitudinally on the shaft, a yoke coupled to the crank element and traveler, the arms of said yoke being arranged on opposite sides of the plane of the bearing for the outer end of the shaft and pivotally connected with the sides of the traveler, and means for operating said shaft.

3. A bed of the character described embodying a main frame, a swinging section provided with depending crank arms, a transverse rod connecting said crank arms, a longitudinally extending screw shaft, a traveler movable longitudinally on the shaft, a yoke coupled to the transverse rod and having its arms pivotally connected with the sides of the traveler, and means for operating said shaft.

4. A bed of the character described comprising a frame, swinging sections at the opposite ends of the said frame, said sections being provided at their inner ends with depending crank elements, longitudinally extending shafts, longitudinally extending screw shafts arranged at the center of the frame on a plane below the upper surfaces of the frame and swinging sections, transverse shafts journaled at their outer ends on the frame, bearings for the inner ends of the longitudinal and transverse shafts, bearings for the outer ends of the longitudinal shafts, travelers movable longitudinally on the screw shafts, and yokes coupled to the crank elements and travelers, the arms of said yokes being arranged on opposite sides of the bearings for the outer ends of the longitudinal shafts and pivotally connected with the sides of the travelers.

5. A bed of the character described comprising a main frame, swinging sections pivotally mounted at the ends of the main frame, depending transversely arranged crank elements upon the inner ends of the swinging sections, longitudinally extending screw shafts journaled at the center of the main frame below the horizontal plane of said frame and substantially in the normal plane of said crank elements, travelers movable longitudinally on the screw shafts, and yokes coupling the crank elements with the travelers, said yokes being pivoted to said travelers.

6. A bed of the character described comprising a frame, head and foot sections pivotally mounted upon the frame, longitudinally extending screw-shafts mounted upon the frame, travelers engaging said shafts, connections between the travelers and the respective head and foot sections, transverse shafts journaled on the frame, and gearing between the ends of the respective transverse shafts and the proximate ends of the respective screw shafts.

7. A bed of the character described comprising a frame, head and foot sections pivotally mounted upon the frame, longitudinally extending screw shafts, travelers engaging said shafts, connections between said travelers and the respective head and foot sections, transversely arranged operating shafts, a bearing common to the inner ends

of the screw shafts and operating shafts, and gearing between the ends of the respective shafts and the proximate ends of the respective screw shafts.

8. A bed of the character described comprising a frame, head and foot sections pivotally mounted upon the frame, longitudinally arranged screw shafts, travelers engaging said shafts, yokes fixedly connected with the head and foot sections and pivotally engaging the travelers, transversely arranged operating shafts, and gearing between the respective operating shafts and the respective screw shafts.

9. A bed of the character described comprising a frame, pivotally mounted head and foot sections, longitudinally arranged screw shafts, transversely arranged coöperating shafts, a boxing inclosing the inner ends of the respective shafts, gearing between the inclosed ends of the operating longitudinal and transverse shafts, travelers engaging the screw shafts, cross-heads carried by the head and foot sections, and connections between said travelers and the cross-heads, said connections being pivoted to the travelers and fixed to the cross-heads.

10. A bed of the character described comprising a frame, a pivotally mounted section having depending crank arms, a rod connecting said crank arms, a cross head carried by the rod, a longitudinally extending screw shaft, a traveler engaging said shaft, a yoke fixedly connected with the cross head and pivotally engaging the traveler, a transverse shaft, and gearing between the inner ends of the respective shafts.

11. A bed of the character described comprising a frame, spaced transverse hanger bars secured to and disposed below the plane of said frame, a longitudinally extending bracket supported by said bars, a boxing carried by the bracket, longitudinally arranged screw shafts journaled at their inner ends in the boxing, transversely arranged operating shafts journaled at their inner ends in the boxing, gearing inclosed by the boxing and connecting said shafts, travelers engaging the screw shafts, head and foot sections pivotally mounted upon the frame, and yokes connected with said sections and pivotally engaging the travelers.

12. A bed of the character described comprising a rectangular frame, U-shaped sections pivotally connected with the frame, crank arms connected with the sections, threaded rods journaled on the frame between the U-shaped sections, a traveler upon each of the rods, pivoted yokes connecting the travelers with the crank arms of the sections, and means for rotating the threaded rods.

13. A bed of the character described comprising a rectangular frame, a central support upon the frame, a boxing carried by the said support, transversely extending shafts journaled at their inner ends within the boxing, beveled gears upon the inner ends of said shafts within the boxing, longitudinally extending screw shafts journaled at their inner ends in the boxing and provided with beveled gears meshing with the gears upon the transverse shafts, travelers movable longitudinally upon the said screw shafts, bearings for the outer ends of the screw shafts, swinging sections pivotally connected with the frame and provided with crank elements, and yokes pivotally connected with the travelers and coupled to said crank elements.

In testimony whereof I affix my signature in presence of two witnesses.

FREDERICK R. PAYNE.

Witnesses:
GUSTAV J. REINKE,
DAVID J. NORDBERG.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."