No. 785,220. PATENTED MAR. 21, 1905.

G. KNAGGS.

FOLDING BED.

APPLICATION FILED SEPT. 5, 1903.

4 SHEETS—SHEET 1.

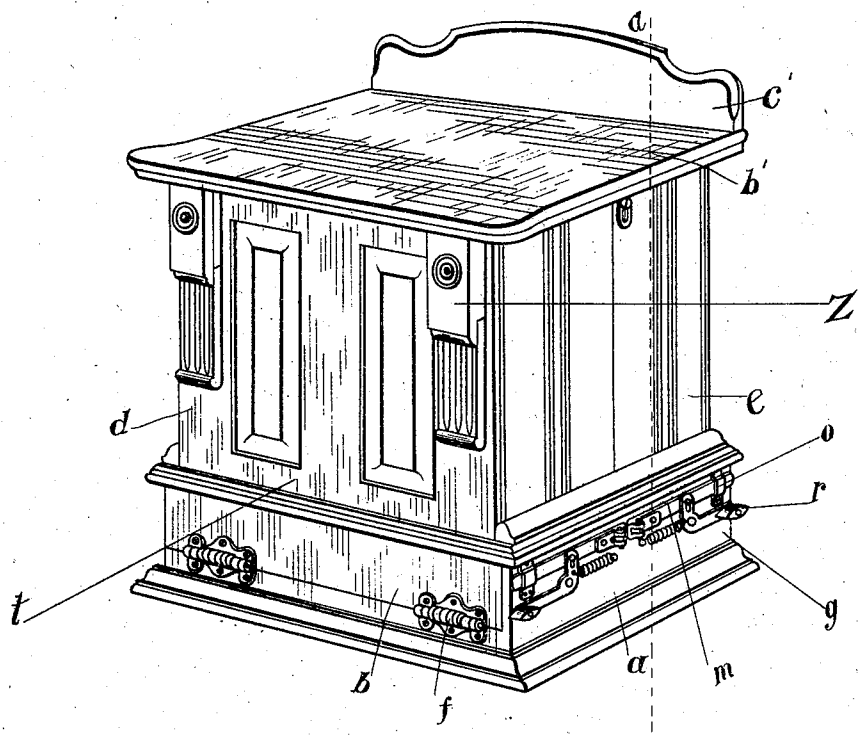


Fig. 1

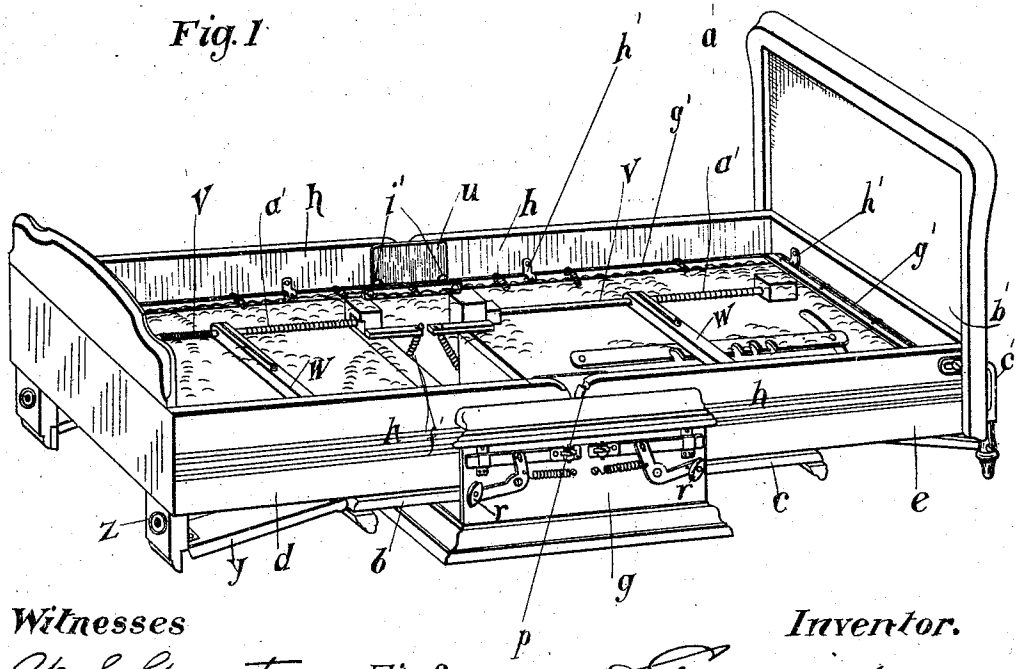


Fig. 2

Witnesses

W. S. Grant

W. A. Anderson

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George Knaggs

by Cox & Sherman

his attorney

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4 SHEETS—SHEET 2.

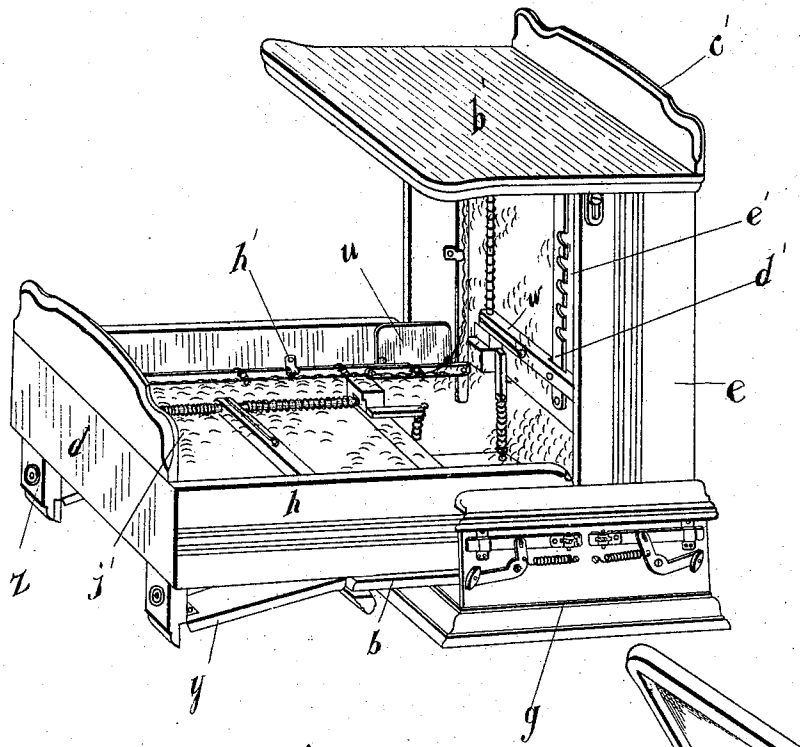


Fig. 3

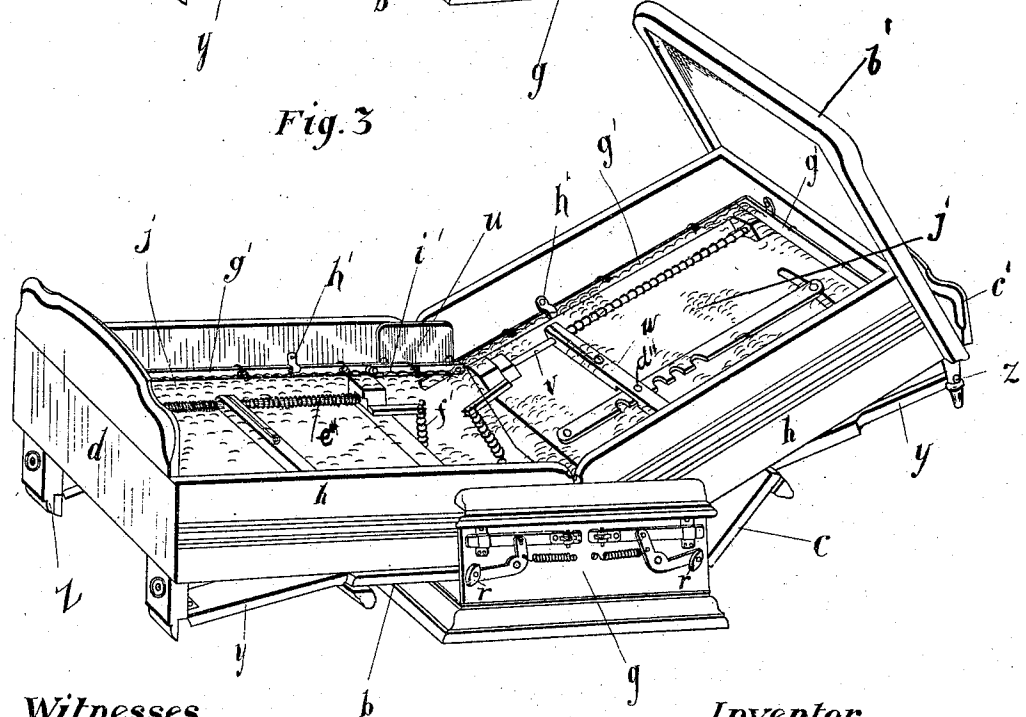


Fig. 4

Witnesses

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4 SHEETS—SHEET 3.

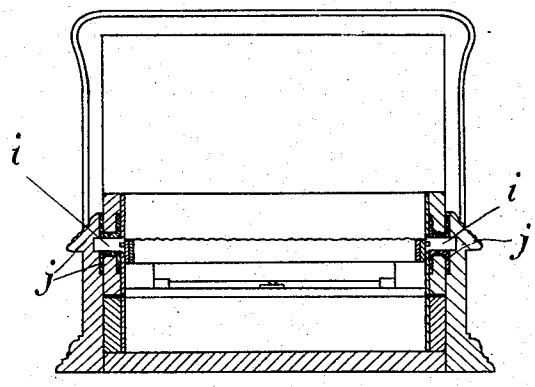


Fig. 5.

Fig. 6.

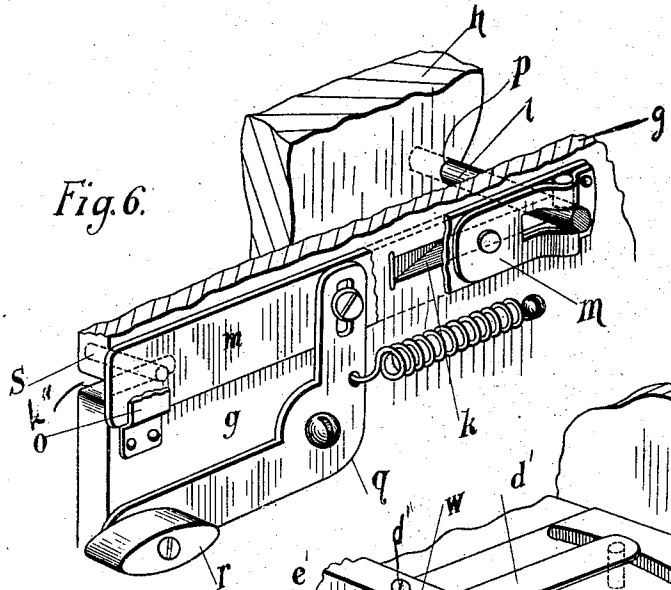
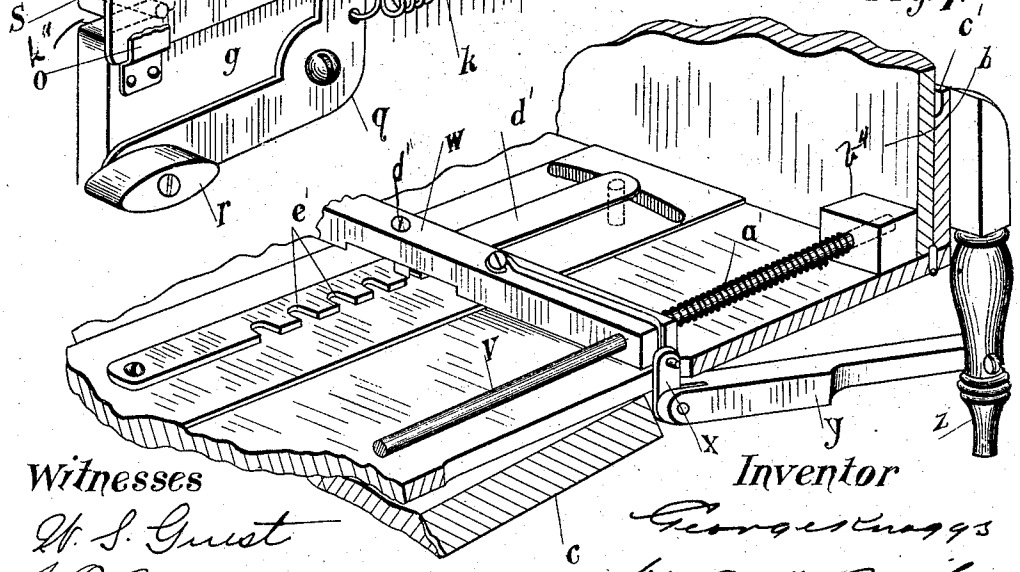


Fig. 7.



Witnesses

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4 SHEETS—SHEET 4.

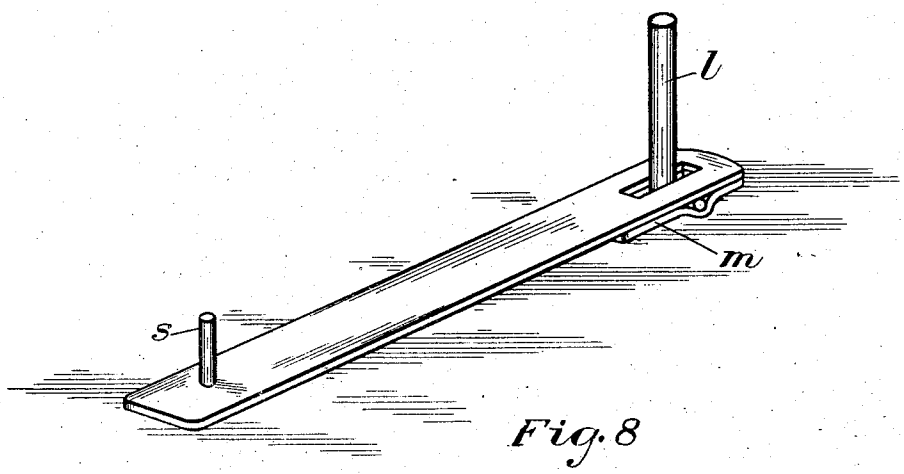


Fig. 8

Witnesses

W. S. Guest

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Inventor

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his attorney

No. 785,220. Patented March 21, 1905.

UNITED STATES PATENT OFFICE.

GEORGE KNAGGS, OF TORONTO, CANADA.

FOLDING BED.

SPECIFICATION forming part of Letters Patent No. 785,220, dated March 21, 1905.

Application filed September 5, 1903. Serial No. 172,085.

To all whom it may concern:

Be it known that I, GEORGE KNAGGS, of the city of Toronto, in the county of York, Province of Ontario, Canada, have invented certain new and useful Improvements in Folding Beds; and I hereby declare that the following is a full, clear, and exact description of the same.

This invention relates to a folding bed embracing in its construction a pair of bed-sections pivoted to a hollow base element so as to be folded vertically together and extended horizontally, the housings of the bed-sections being so constructed that when folded together they will form a structure having the appearance of an ornamental cabinet, of which the base element will constitute an integral part, the object of the invention being to utilize the base element as a constant support for the inner or pivoted ends of the bed-sections and to utilize the housings to support the outer or free ends of the bed-sections when extended and to provide the bed-sections with a locking mechanism which will securely hold them in their folded and extended positions. In carrying out this object the bed-sections are pivoted to the side members of the hollow base element, the front and rear side members which open and close, respectively, with the extension or folding of the bed-sections, and to one side member of the base element are fitted the locking mechanisms which hold the bed-sections, respectively, in either their folded or extended positions, these locking mechanisms being arranged to engage and partially open the front and rear side members of the base element when actuated to release the bed-sections, one of which is fitted with a stopping mechanism to hold it at any inclination between its folded and extended positions, as hereinafter more fully set forth, and more particularly pointed out in the claims.

In the drawings, Figure 1 is a perspective view of the folding bed, showing the bed-sections folded together. Fig. 2 is a similar view showing them in their extended position. Fig. 3 is a similar view showing one of the bed-sections in its extended position and the other in its folded position. Fig. 4 is a similar view showing one of the bed-sections in an extended position and the other bed-section in an inclined position. Fig. 5 is a sectional view on the lines *a a*, Fig. 1, showing one of the pivotal connections for the bed-sections and base elements. Fig. 6 is a detail perspective view of the locking mechanism of one of the bed-sections. Fig. 7 is a detail perspective view showing the means for opening the supports for the outer ends of the bed-sections as they move into their extended position and for holding one of the bed-sections in an inclined position, and Fig. 8 is a perspective view of the locking-bar looking at it from the inner or reverse side.

Like letters of reference refer to like parts throughout the specification and drawings.

The base element *a*, which is preferably of an ornamental character, is fitted with a hinged front side member *b* and a hinged rear side member *c*, capable of opening under the influence of the lowering or extending movement of the bed-sections *d* and *e*, respectively, and of closing under the influence of the spring-tensioned hinges *f* as the bed-sections move into their folded position. These front and rear side members *b* and *c*, respectively, are designed to correspond with the side members *g* of the base element, so that when the bed is in its folded position all of the parts will cooperate to form a cabinet of a symmetrical and ornamental design and entirely conceal the bedding, mattress, and springs. Passing through the inner ends of the side rails *h* and entering escutcheons *j*, secured in the inner faces of the side members of the base element, are pivots *i*, upon which oscillate the inner ends of the side rails, the purpose of the escutcheons being to relieve the side members of the wear caused by the oscillation of the bed-sections. In one side member of the base element are horizontal slots *k*, through which project the locking-bolts *l*, hinged to the locking-bars *m*, movable horizontally in the guides *o*, secured to the side member of the base element in juxtaposition to the slots, the locking-bolts *l* being arranged to enter keepers *p* in the inner ends of the side rails *h* to maintain them in their extended and folded positions. The locking-bars *m* are actuated by spring-

tensioned bell-crank levers q, pivoted to the side member g and fitted with pedals r. By means of the pedals r the bell-crank levers can be easily operated when actuating the locking-bars to release the bed-sections preparatory to the bed-sections being moved from one position to another.

To relieve the pivots i of the weight of the bed-sections when folded, each bed-section has an engaging shoulder t to rest upon and engage the top edge of the front and rear side members b and c of the base element which support and rigidly hold the bed-sections together.

To lower the bed-sections, it is necessary to displace the front and rear side members b and c from engagement with the abutting shoulders t, and to effect this displacement the locking-bars m are provided with displacing-fingers s, which project through the slots k^4 and normally oppose the inner surfaces of the front and rear side members b and c, so that during the operation of the locking mechanism to release the bed-sections it will simultaneously withdraw the locking-bolts from the keepers and cause the displacing-fingers to engage the inner surfaces of the rear and front side members b and c and move these members out of engagement with the abutting shoulders of the bed-sections.

To protect the contents of the bed from injury, the joints formed by the inner ends of the side rails of the bed-sections are covered by shield u, through which pass the pivots i, such shields being so located and arranged that they will not interfere with the action of the bed-sections as they are moved from one position to the other.

Located within the bed-sections d and e are longitudinally-disposed guide-bars v, on which are movably mounted spring-tensioned cross-heads w, connected by links x to the feet-operating levers y, pivotally connected to the feet z, hinged to the outer ends of the bed-sections, the object of the movable cross-heads being to close the feet against the outer faces of the housings for the bed-sections as they move into their folded position, the feet-operating levers y and feet z being of any suitable or fanciful design.

As shown in the drawings, the feet-operating levers y and the feet z of the bed-sections d are of the design of pilasters and form an integral part of the cabinet design, the feet-operating levers and feet of the section e being of a design in keeping with the general appearance of the cabinet. The inner ends of the feet-operating levers y during the lowering movement of the bed-sections are brought into contact with the top edges of the front and rear side members of the base element, which move them outwardly to position and brace the feet z to support the outer ends of the bed-sections when lowered, the inner ends of the bed-sections being supported by their pivotal connections with the side members of the base element. As the bed-sections are raised from their extended to their folded position the cross-heads w, under the influence of the tension-springs a', move back to their normal position and cause the return of the feet-operating levers and supporting-feet to the position shown in Fig. 1.

As shown in the drawings, the springs a' are coiled on the guide-bars v and bear against the cross-head and the guide-bar-supporting blocks b^4. To cushion the return of the cross-head of the section d, the guide-bars v of that section are provided with a second set of springs e^4, coiled on the guide-bars v and bearing against the inner surfaces of the cross-head and guide-bar-supporting blocks b^4.

Hinged on the bed-section e is a headboard b', which constitutes the cabinet-top, and hinged to the headboard is a cabinet-back c', to which is connected the supporting-feet for the bed-section e.

The headboard or cabinet-top b' incloses the top of both bed-sections and engages the top of the supporting-feet for the front bed-section to hold them and the feet-operating levers tightly against the front face of the cabinet. It is not necessary in carrying out the invention that the headboard and cabinet-back should be employed, as they could be dispensed with without affecting the successful operation of any parts; but in this case the supporting-feet would require to be hinged to the bed-section e in a similar manner to the supporting-feet for the bed-section d. To hold one of the bed-sections in an inclined position, a stopping-bar d', having detents e', is pivoted to the inner surfaces of the bottom side of the bed-section e to engage a pin d^4, secured to the cross-head w, and lock the cross-head against outward movement, the locking of which prevents the outward movement of the feet-operating levers when engaging the top edge of the respective side member of the base element to enable them by their engagement with such side member to hold the bed-section in its inclined position. At the upper end of the stopping-bar d' is an arc-shaped slot d^5, and contained in the arc-shaped slot d^5 is a guiding-pin d^6, forming part of the stopping-bar d' to guide the swinging movement of the stopping-bar as it is adjusted to respectively engage or release the stopping-pin of the cross-head.

To the inner or pivoted ends of the bed-sections and to the bottom of the base element are connected tension-springs f' to assist the return of the bed-sections to their folded position, the strength of the tension-springs being regulated with regard to the weight which they would be required to lift during the use of the bed.

The bed-sections are fitted with substantially U-shaped mattress-frame sections g', detachably connected to the bed-sections by

cleats h', and coupling the inner ends of the mattress-frame sections are pivoted links i', which while securely coupling the inner ends of the mattress-frame sections permit them to move with the bed-sections. To the mattress-frame sections and to the links is connected the mattress-bottom j', the folding of the bed-sections and the mattress-frame sections causing a relaxation of the mattress-bottom and the extension of the bed-sections and mattress-frame sections, causing the stretching of the mattress-bottom to its full extent to support the contents and occupants of the bed.

The bed-sections are pivotally connected to the base element, so as to be closed together vertically or extended horizontally. When the bed-sections are folded together into the position shown in Fig. 1 of the drawings, the front and rear side members of the base element move into their closed position under the influence of their spring-tensioned hinges, and their top edges engage the adjacent shoulders of the bed-sections to assist the pivotal connections for the bed-sections and base element to support them in this position. The actuation of the locking mechanism coincident with the release of the bed-sections displaces the front and rear hinged side members of the base element from contact with the engaging shoulders of the bed-sections to permit of the bed-sections being moved from their closed to their extended positions. The feet-operating levers during the descent of the bed-sections engage the adjacent edges of the front and hinged side members and are moved outwardly to position, the feet z to support the outer ends of the bed-sections when extended. The displacement of the feet-operating levers y by the hinged front and rear side members causes the movement of the cross-heads w on the guide-bars v to compress the tension-springs a', so that the tension-springs during the closing movement of the bed-sections will return the cross-heads, feet-operating levers, and supporting-feet to their normal position. In closing the bed-sections the locking mechanism is again actuated to withdraw the locking-bolts from their keepers in the bed-sections and permit of the bed-sections being raised into the vertical position. (Shown in Fig. 1.) This movement permits of the hinged front and side members of the base element moving into their closed position to contact the engaging shoulders of the bed-sections. One of the bed-sections, as shown in Fig. 3, can be lowered independently of the other, or, as shown in Fig. 4, one of the bed-sections can be lowered and the other locked in an inclined position by the pivoted detent-bar and engaging stop or pin of the cross-head.

I do not confine myself to a cabinet of any particular design or size, nor do I confine myself to use all of the parts which I have above described, as it is possible for me to construct a bed of a cheaper design, but embodying the same principle of construction.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a folding bed the combination of the base element having hinged side members, two pivoted bed-sections maintained in their closed position by their engagement with the hinged side members of the base element, a locking mechanism to hold the bed-sections in their adjusted position and means actuated by the locking mechanism to displace the hinged side members from their locking contact with the bed-sections, when in their closed position.

2. In a folding bed the combination of the base element having hinged side members, two bed-sections having their inner ends pivotally connected to the base element and when closed together partly supported by the hinged side members, a locking mechanism for the bed-sections to hold them in their folded and extended positions, and means actuated by the locking mechanism to open the hinged side members to release the bed-sections.

3. In a folding bed the combination of the base element having hinged side members, two bed-sections having their inner ends pivotally connected to the base element and when closed together partly supported by the hinged side members and a locking mechanism for the bed-sections to hold them in their folded and extended positions and when actuated to open the hinged side members to release the bed-sections, and means to hold one of the sections at an inclination to the other assisted by one of the hinged side members.

4. In a folding bed the combination of a base element having hinged side members, two bed-sections the inner ends of which are pivotally connected to the base elements, said bed sections arranged to be folded together vertically and partly supported by the hinged side members when folded and to be extended longitudinally, foldable feet positioned by the adjustment of the bed-sections to support their outer ends when extended, the inner ends of the bed-sections being supported by their pivotal connections with the base element, a locking mechanism to hold the bed-sections in their adjusted position, and means actuated by the locking mechanism to displace the hinged side members from engagement with the bed-sections when in their closed position.

5. In a folding bed the combination of the base element having hinged side members, two bed-sections having their inner ends pivotally connected thereto, a mattress-section for each bed-section, links connecting the inner ends of the mattress-sections whereby they are arranged to relax the mattress-bottom as the bed-sections are folded together and stretch it as they are extended, the bed-sections when in their folded position being supported by

the hinged side members of, and their pivotal connections with, the base element.

6. In a folding bed the combination of the base element having hinged side members, two bed-sections having their inner ends pivotally connected thereto, a mattress-section for each bed-section, links connecting the inner ends of the mattress-sections whereby they are arranged to relax the mattress-bottom as the bed-sections are folded together and stretch it as they are extended, the bed-sections when in their folded position being supported by the hinged side members of, and their pivotal connections with, the base element, and a locking mechanism for the bed-sections to hold them in their adjusted position.

7. In a folding bed the combination of a base element two bed-sections having their inner ends pivotally connected to the base element, hinged front and rear side members for the base element, locking-bolts to engage the inner ends of the bed-sections and hold them in their folded and extended positions, locking-bars to actuate the locking-bolts, and means to actuate the locking-bars, substantially as described.

8. In a folding bed the combination of a base element two bed-sections having their inner ends pivotally connected to the base element, hinged front and rear side members for the base element, locking-bolts to engage the inner ends of the bed-sections and hold them in their folded and extended positions, locking-bars to actuate the locking-bolts, means connected to the locking-bars to engage and displace the front and rear side members as the locking-bolts are actuated to release the bed-sections, substantially as described.

9. In a folding bed, the combination of a base element having movable front and rear side members, two bed-sections pivotally connected to the base element and arranged to open the hinged side members of the base element as they move into their extended position, adjustable feet to support the outer ends of the bed-sections when in their extended position, and feet-operating levers actuated by the hinged side members to adjust the feet to support the bed-sections as they move to their extended position, substantially as described.

10. In a folding bed the combination of a base element having movable front and rear side members, two bed-sections pivotally connected to the base element and arranged to open the hinged side members as they move into their extended position, adjustable feet to support the outer ends of the bed-section in their extended position, feet-operating levers actuated by the hinged side members to adjust the feet to support the bed-sections as the bed-sections move to their extended positions and means to return the feet and feet-operating levers to their normal position as the bed-sections are folded together, substantially as described.

11. In a folding bed, the combination of a base element having movable front and rear side members, two bed-sections pivotally connected to the base element and arranged to open the hinged side members as they move into their extended position, adjustable feet to support the outer ends of the bed-sections in their extended position, feet-operating levers actuated by the hinged side members to adjust the feet as the bed-sections move to their extended position, spring-tensioned cross-heads for the bed-sections, and links connected to the cross-heads and feet-operating levers, substantially as described.

12. In a folding bed, the combination of a base element having movable front and rear side members, two bed-sections pivotally connected to the base element and arranged to open the hinged side members as they move into their extended position, adjustable feet to support the outer ends of the bed-sections in their extended position, feet-operating levers actuated by the hinged side members to adjust the feet as the bed-sections move to their extended position, spring-tensioned cross-heads for the bed-sections, links connected to the cross-heads and feet-operating levers, and a stopping means for one of the cross-heads to hold it in an adjusted position to prevent the outward movement of the feet-operating levers, substantially as described.

13. In a folding bed the combination of the base element having hinged side members, two bed-sections pivotally connected to the inner surfaces of the end members for the base element and supported in their closed position by the hinged side members, a locking mechanism to hold the bed-sections in their adjusted position and means actuated by the locking mechanism to displace the hinged side members from engagement with the bed-sections during the actuation of the locking mechanism to release the bed-sections.

Toronto, August 21, 1903.

GEORGE KNAGGS.

In presence of—
C. H. RICHES,
L. F. BROCK.