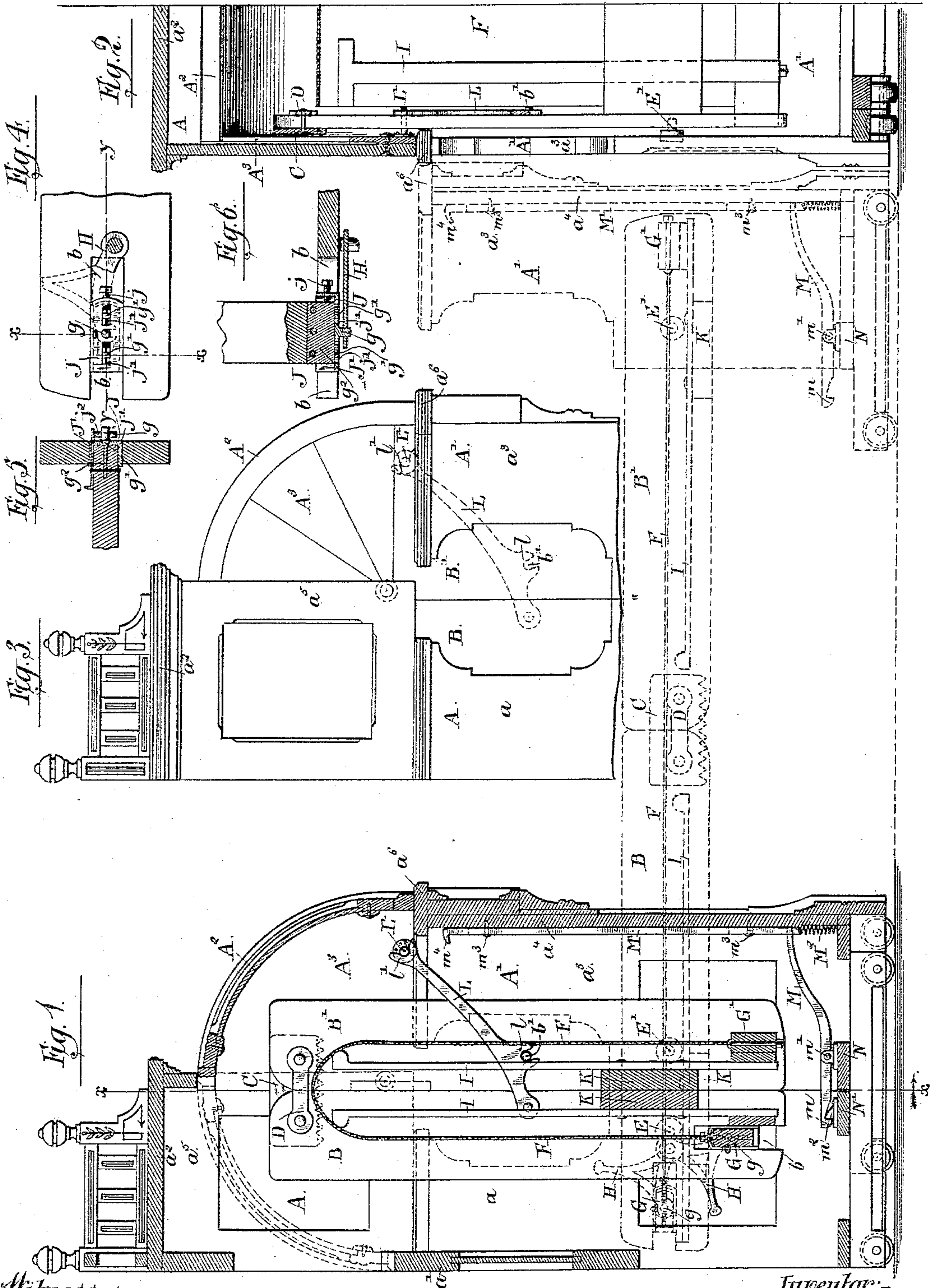


(No Model.)

C. F. HOPF.  
FOLDING BED.

No. 339,414.

Patented Apr. 6, 1886.



Witnesses:-  
Louis M. Whitehead.  
C. C. Poole

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# UNITED STATES PATENT OFFICE.

CARL F. HOPF, OF CHICAGO, ILLINOIS, ASSIGNOR OF TWO-THIRDS TO JOHN C. HORN AND JACOB M. HORN, OF SAME PLACE.

## FOLDING BED.

SPECIFICATION forming part of Letters Patent No. 339,414, dated April 6, 1886.

Application filed July 6, 1885. Serial No. 170,690. (No model.)

*To all whom it may concern:*

Be it known that I, CARL F. HOPF, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful  
5 Improvements in Folding Beds; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon,  
10 which form a part of this specification.

This invention relates to improvements in folding beds; and it consists in the matters hereinafter set forth, and pointed out in the  
15 appended claims.

These several features of improvement constituting my invention are herein illustrated in connection with a folding bed of that class in which the side rails are centrally divided and hinged so as to rise in the middle, and in  
20 which the head and foot parts of the bed-frame, to which the ends of the side rails are pivoted, are moved horizontally toward and from each other in opening and closing the bed. Certain of the improvements herein shown are,  
25 however, applicable to other kinds of folding beds, as will hereinafter appear.

The invention may be more readily understood by reference to the accompanying drawings, in which Figure 1 is a central vertical section of a bed in its folded position,  
30 the position of the parts when unfolded being indicated by dotted lines. Fig. 2 is a sectional view of the parts at one side of the bed-casing, taken upon line *x x* of Fig. 1. Fig. 3 is a fragmentary exterior view of the closed  
35 bed, showing the upper part thereof. Fig. 4 is a detail side view of the end portion of one of the side rails. Fig. 5 is a sectional view of the same, taken upon line *x x* of Fig. 4. Fig.  
40 6 is a sectional view of the same, taken upon line *y y* of Fig. 4.

In the particular form of folding bed herein shown as one embodiment of my invention,  
45 A and A' are respectively the head and foot sections or portions of the external frame or casing, and B B' the parts of the two-part folding body-frame, said parts B B' being pivotally attached to the head and foot sections and hinged together at their inner or contiguous  
50 ends, so as to enable the middle of the body-frame to rise and the head and foot ends

of said body-frame to come together when the parts of the casing are thrust toward each other.

The head frame or section A is principally  
55 composed of upright side pieces, *a*, a partial or complete back, *a'*, and a horizontal top piece, *a''*, forming a part of the inclosing top of the bed-casing when the bed is closed. The foot frame or section A' consists of side up-  
60 rights, *a''*, and a front wall or foot-board, *a'''*, forming the front of the casing when the bed is folded.

The head-section A is made of sufficient height to cover or extend over the upper end  
55 of the folded body-frame; but the foot-section A' is desirably made lower than the head-section, for the reason, among others, that the bed, when opened, thereby presents more nearly the appearance of an ordinary bedstead.  
70

As an improved means for closing or covering the space between the top of the foot-section and the top of the relatively higher head-section, a curved or cylindric top, A<sup>2</sup>, is employed, said top being movably supported  
75 upon the head-section A in such manner that it may be swung backwardly into the upper part thereof when the bed is opened and thrown outwardly, so as to rest upon the upper edge of the foot-section when the bed is closed.  
80

In the particular construction of the cover or top A<sup>2</sup> and adjacent parts herein shown the curved wall of said top extends through approximately one-fourth of a circle, and the said top is provided with vertical side walls,  
85 A<sup>3</sup>, pivoted upon the inner faces of the upper parts, *a''*, of the side walls, *a*, of the head-section, which said parts *a''* are, as shown, extended forward slightly beyond the front edge of the lower part of the said side walls. The  
90 said sides A<sup>3</sup> of the top are desirably fitted closely to the inner faces of the parts *a''* of the side walls, *a*, the parts being so arranged that the upper ends of the side rails, B and B', may pass freely inside of the said sides A<sup>3</sup> when the  
95 bed is folded.

The rear wall or head-board, *a'*, is desirably so arranged with reference to the curved top A<sup>2</sup> that when the latter is thrown back the said head-board and curved top will come together  
100 and form a continuous wall or head-board, having a concave or overhanging top. For



this purpose the meeting parts of the curved top may be made in any suitable manner to give an appearance of continuity to the surface.

5 As herein shown, the upper edge of the head-board  $a'$  is arranged at a proper height to enable the rear edge of the curved top to rest upon it, and thereby make a flush joint at the inner or front surface of the parts, the  
10 space above the partial head-board being left open, as shown, so that a ventilating-aperture will be formed when the casing is closed.

In the particular construction shown a flat top rail,  $a''$ , is placed about the top edges of  
15 the sides  $a''$  and foot-board  $a''$  of the foot-section  $A'$ , against which the front side of the curved top rests when the said top is closed; but the parts may be constructed otherwise at this point, as found desirable or convenient.

20 I am aware that it has been common to employ in writing or office desks a pivoted cylindric cover provided with vertical end pieces, and adapted to extend over the horizontal top part of the desk when thrown forward, and to  
25 enter a higher rear part of the desk when said cover is thrown back or opened, and that a similar construction in which a cylindric cover without ends is adapted to slide in vertical  
30 side walls or pieces of the casing has been employed in a desk which is made part of a folding-bed casing. I am aware, also, that it has been proposed heretofore to employ as a top  
35 for a folding-bed casing made in two separable parts a hinged cover or flap adapted to fold up against the head board when the bed is open, and to swing down in the horizontal position and rest at its free edge upon the foot  
40 portion of the casing, so as to close the top of the casing when the parts are folded together. A bed-casing has heretofore been made, also, having continuous side walls and open at its front, in which a sliding cover consisting of  
45 connected flexible strips has been employed to close the space between a stationary top of the casing and a part of the bed-frame filling the lower portions of the open front of the said casing.

The pivoted cylindric cover herein shown has the obvious advantage over the hinged  
50 cover or flap hereinbefore referred to of affording a much larger space within the casing than can be obtained by the use of such cover or flap when used with a foot-section made of the usual height, while at the same time giving  
55 a more finished and ornamental appearance to the said folding casing both when opened and closed. The sliding cover or curtain, consisting of flexibly-joined strips, above referred to, has the disadvantage of requiring the presence of parts of the side walls to receive and  
60 guide the said sliding cover when the latter is thrown forward, so that the said sliding cover is not applicable to the casing of the character herein shown, in which the side  
65 walls of the casing are divided centrally and form parts both of the head and foot portions of the said casing. The pivoted cylindric

cover above described possesses the important advantage over the said sliding cover or curtain in being formed of a single piece, and also  
70 in being adapted to close both the front and sides of the space between the head-section of a folding bed and a foot-section made lower than the said head-section. Said cylindric cover is furthermore of special advantage as  
75 applied to a folding-bed casing of the character herein shown, for the reason that when folded back into the upper part of the head-section it occupies space which is not otherwise utilized, and at the same time gives an  
80 ornamental appearance to the upper part of the said head-section when the bed is open. It is to be understood, however, that the pivoted cylindric cover herein claimed may be applied to close the space between two folding  
85 parts of a casing composed of two parts, one of which is higher than the other, in folding beds, which are in other respects constructed differently from the particular one herein illustrated and described.

In the particular construction illustrated of the body-frame, its pivotal connection with the bed-casing, and other parts connected therewith, said parts are made as follows: The  
90 hinged joints between the parts  $B B'$ , of the side rails are formed by connecting-plates  $C$  placed against the outer faces of the rails, and links  $D$ , located at the inner faces of the rails, the plates and links being located adjacent to  
95 the lower edges of the rails and connected with the parts of the latter by pivot-bolts  $e$ , passing through the said several parts, as shown. Said parts of the side rails are pivotally supported upon the head and foot sections  $A A'$  by means of pivots  $E E'$ , and the bed-bottom is  
100 formed by means of a woven wire mattress or fabric,  $F$ , attached to cross-bars  $G$  and  $G'$ , which are supported at their ends in the rails  $B B'$  at the head and foot of the bed, respectively. The bar  $G$  at the head portion of the  
105 bed is, as shown, movably connected with the side rails  $B$ , its ends for this purpose being located and adapted to slide in slots  $b$  in the end portion of said rails, and the said bar  $G$  is provided at its ends with projecting studs  
110 or pins  $g$ , engaged by hooks  $H$ , which are pivoted upon the inner faces of the opposite side walls of the head-section eccentrically to the pivots  $E$  of the side rails and at the side of said pivots adjacent to the head-board, the  
115 parts last mentioned so arranged that when the body-frame is unfolded and brought into a horizontal position the ends of the hooks  $H$  engaged with the movable cross-rail  $G$  will be forced away from the pivots  $E$ , thereby carrying the rail  $G$  toward the head-board and  
120 extending or stretching the fabric  $F$ . The body-section of the bed is, as shown, also provided with straight springs  $I I$ , attached to cross-bars  $K K$ , at which are rigidly secured to the side  
125 rails,  $B$  and  $B'$ , the head and foot ends of the body-frame. The springs  $I$  extend from their points of attachment toward the middle joint of the body-frame, and are provided upon their



free ends with short T-heads, said springs being for the purpose of supporting the middle folded part of the mattress when the bed is folded.

5 The devices for stretching and supporting the fabric, as far as described, are similar to those shown in Letters Patent No. 317,361, granted to John C. Horn and C. F. Hopf, the present applicant, upon the 5th day of May, 10 1885. As shown in said patent, means are provided for tightening the fabric F, in which the fabric is attached at the foot of the bed to a movable cross-piece arranged parallel with the cross-piece G' of the body-frame and connected with the said cross-piece G' by screw- 15 bolts, whereby the movable cross piece may be drawn toward the foot of the bed.

An improved tightening device is herein illustrated in which the fabric is attached directly to the cross-rail G', and the studs or pins 20 g, to which the power is applied to stretch the mattress, instead of being secured in or to the ends of the cross-rail, are placed upon metal end pieces or castings, J, having sliding connections with the ends of the rails, and provided with set-screws j or other adjusting devices, whereby the rails may be moved in the 25 castings and held in their changed positions.

In the particular form of the castings J 30 herein shown the latter are provided with side flanges, J', fitted over the side end portions of the rail G, and are fitted to slide in the slots b of the side rails B. Said castings also, as more clearly shown in Figs. 4, 5, and 6, are provided with slots j', adapted to receive headed 35 studs g' upon the ends of the rails G, said studs, as shown, being formed upon plates g<sup>2</sup>, inserted in narrow slots in the ends of the rail, and held therein by suitable pins, as shown. The 40 slots j' are desirably provided at one end with enlarged openings j<sup>2</sup>, through which the heads of the studs g' may be inserted in putting the parts together. The set-screws j are, as shown, inserted through a part of the casting 45 J adjacent to the middle of the bed-frame, and are adapted to bear upon the ends of the cross-rail G in such manner that the latter may be moved in the castings J in a direction to tighten the fabric F.

50 In order to lock the hooks H upon the studs g, so as to prevent said hooks from becoming disengaged from the studs when the bed is folded, or under other circumstances, I have provided slides or bolts J<sup>2</sup> upon the ends of 55 the cross-rail G, said slides or bolts being held upon the bar in such manner that their outer ends, when thrust outwardly, will come over or in contact with the ends of the hooks engaged with the studs in such manner as to 60 prevent any swinging movement thereof. In the particular construction of the parts shown, in which the castings J are present, said bolts J<sup>2</sup> consist of thin pieces of metal, which are fitted to slide in grooves in the under sides of 65 the flanges J' of the castings, and pass through apertures in the outer faces of said castings, as clearly shown in Figs. 4 and 5, the said bolts

being provided with upturned parts j<sup>3</sup>, by which they may be readily moved. The inner ends of the bolts being, by the construction 70 set forth, located inside of the side rails B B', access may be readily had to said bolts when it is desired to release the hooks H or to lock them in place upon the studs g.

L, Figs. 1, 2, and 3, is a locking lever or 75 hook, which is pivoted upon one of the side rails B of the body-frame, and is provided with a hook or notch, l, adapted to engage a stud, b', upon the rails B' when the bed is folded, so as to hold the rails closely together 80 or prevent them from spreading. Said lever L is preferably located upon the inner face of the side rails, and is extended upwardly and forwardly in such manner that when the bed is folded the outer or free end thereof will 85 come forward of the side rail B' and above the top of the side upright, a<sup>3</sup>, of the foot-section A', the said free end of the lever being provided with a notch, l', arranged to engage a stud, L', upon the inner face of the end A<sup>3</sup> 90 of the curved top A<sup>2</sup>, in such manner that when the top is closed the end of the lever engaged with the stud will be forced and held downwardly in position for the engagement of the notch l' with the stud b'. Novel means are 95 also herein shown for locking together the parts A and A' of the casing at the lower part of the latter, consisting of a horizontally-arranged lever, M, pivoted at m' to a cross-piece, N, attached to the foot-frame A', and provided 100 with a hook, m, adapted to engage a projection or catch, m<sup>2</sup>, upon a cross-piece, N', of the head-frame A, the said lever M being held in position for engagement with the catch m<sup>2</sup> by means of a spring, M<sup>2</sup>, and connected at its 105 free end with a movable rod, M', constructed to slide vertically upon the foot-frame, and terminating at its upper end in convenient position for manipulation by a person opening the bed. The surfaces of the hooked end m 110 of the rod and the catch m<sup>2</sup> are, as shown, inclined in such manner that they will engage each other automatically when the head and foot sections are brought together.

In the particular construction of the parts 115 shown the rod M' is movably held in place by headed pins or screws m<sup>3</sup>, passing through longitudinal slots in the rod into the foot-board, and said rod is provided with a lateral projection or head, m<sup>4</sup>, at its upper end, where- 120 by it may be readily grasped and operated. The spring M<sup>2</sup> also is, as shown, applied between the lower end of the rod and a stationary part of the foot-section, the end of the lever M being engaged with the rod by entering an 125 aperture near the lower end thereof.

The parts A and A' of the casing are shown in the drawings as supported upon rollers or casters in the same manner as are the parts of the casing shown in said Patent No. 316,361. 130

I am aware that heretofore the cross-rails of woven-wire-mattress frames have been connected with the longitudinal parts of said frames by sliding connections consisting of



heads or studs in the longitudinal parts engaging slots in castings to which the cross-rails are attached, said castings being provided with adjusting-recesses bearing upon the ends of the longitudinal rails, whereby the end rails of the frame may be adjusted as to their distance apart. My invention, as it relates to means for adjusting the tension of the fabric, therefore is restricted to the particular features of construction herein shown, in which slotted castings connected with the cross-rail by headed studs upon the rail are employed as a means of connecting the hooks H with the said cross-rail, as set forth in the appended claims.

It is to be understood that the several appended claims cover these several devices, parts, or elements therein set forth when said devices, parts, or elements are in form to procure either, any, or all of the advantages, functions, or purposes arising from or obtained by said devices, parts, or elements when constructed in the manner herein shown.

I claim as my invention--

1. The combination, with the head-section of the casing of a folding bed, having suitable side and top walls, and a foot-section lower than the head-section, comprising suitable front and side walls and open at its top, of a cylindric top or cover pivoted to the head-section, provided with side walls, and constructed to rest upon or against the top of the foot-section, so as to close the casing when the parts are brought together, substantially as described.

2. The combination, in a folding-bed casing, with a foot-section and a head-section comprising vertical side walls and a back wall,  $a'$ , of a cylindric top pivotally connected with the head-section, the rear portion of the top and back wall,  $a'$ , being constructed to meet edge to edge when the said top is thrown backward, substantially as described.

3. The combination, with a stationary part of a bed-casing and side rails, B B', pivoted thereto, of a cross-rail, G, castings J, having sliding connection with the ends of the cross-rail and with the said rails B B', said castings being provided with studs  $g$  and also with slots  $j$ , headed studs or projections  $g'$ , secured in the ends of the rails and engaged with the said slots, adjusting devices applied between the said castings and the cross-rail, and hooks H, pivoted upon the bed-casing and engaging the said studs  $g$ , substantially as described.

4. The combination, with a stationary part of the bed-casing and side rails, B B', pivoted thereto, of a cross-rail, G, castings J, having sliding connection with the ends of the said cross-rail and with the side rails, said castings being provided with studs  $g$ , and also with slots  $j'$ , plates  $g^2$ , secured in slots in the cross-rail, and provided with headed studs  $g'$ , engaged with the slots  $j'$ , adjusting devices applied between the castings and the cross-rail, and hooks H, pivoted upon the said casing and engaged with the studs  $g$ , substantially as described.

5. The combination, with a stationary part of the bed-casing, of slotted side rails, B B', pivoted to the said casing, a cross-rail, G, castings J, provided with side flanges,  $J'$ , and fitted upon the end of the cross-rail, said castings being provided with studs  $g$ , slots  $j'$ , and set-screws  $j$ , studs  $g'$  upon the end of the rail engaged with the said slots, and hooks H upon the casing engaged with the said studs  $g$ , substantially as described.

6. The combination, with the head and foot sections of the casing of a folding bed, and jointed side rails, B B', one of said side rails being provided with a pin,  $b'$ , of a lever, L, pivoted to the other side rail, and having a notch,  $l$ , to engage the said pin  $b'$ , and also a notch,  $l'$ , at its free end, and a movable top or cover, as  $A^2$ , provided with a pin,  $L'$ , constructed to engage the notch  $b'$ , substantially as described.

7. The combination, with the head-section A and foot-section  $A'$ , of a horizontal lever, M, pivoted upon the lower part of the foot-section, a catch,  $m^2$ , upon the lower part of the head-section, constructed to engage said lever, a vertical rod,  $M'$ , mounted to slide upon the inner face of the vertical wall of the foot-section and engaged with the lever M at its lower end, and a spiral spring,  $M^2$ , applied to the lower part of the rod to lift the latter, substantially as described.

8. The combination, with the cross-rail G and hooks H, of slides or bolts  $J^2$  upon said cross-rail, substantially as described.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

CARL F. HOPF.

Witnesses:

C. C. POOLE,

G. F. LANAGHEN.