

No. 662,213.

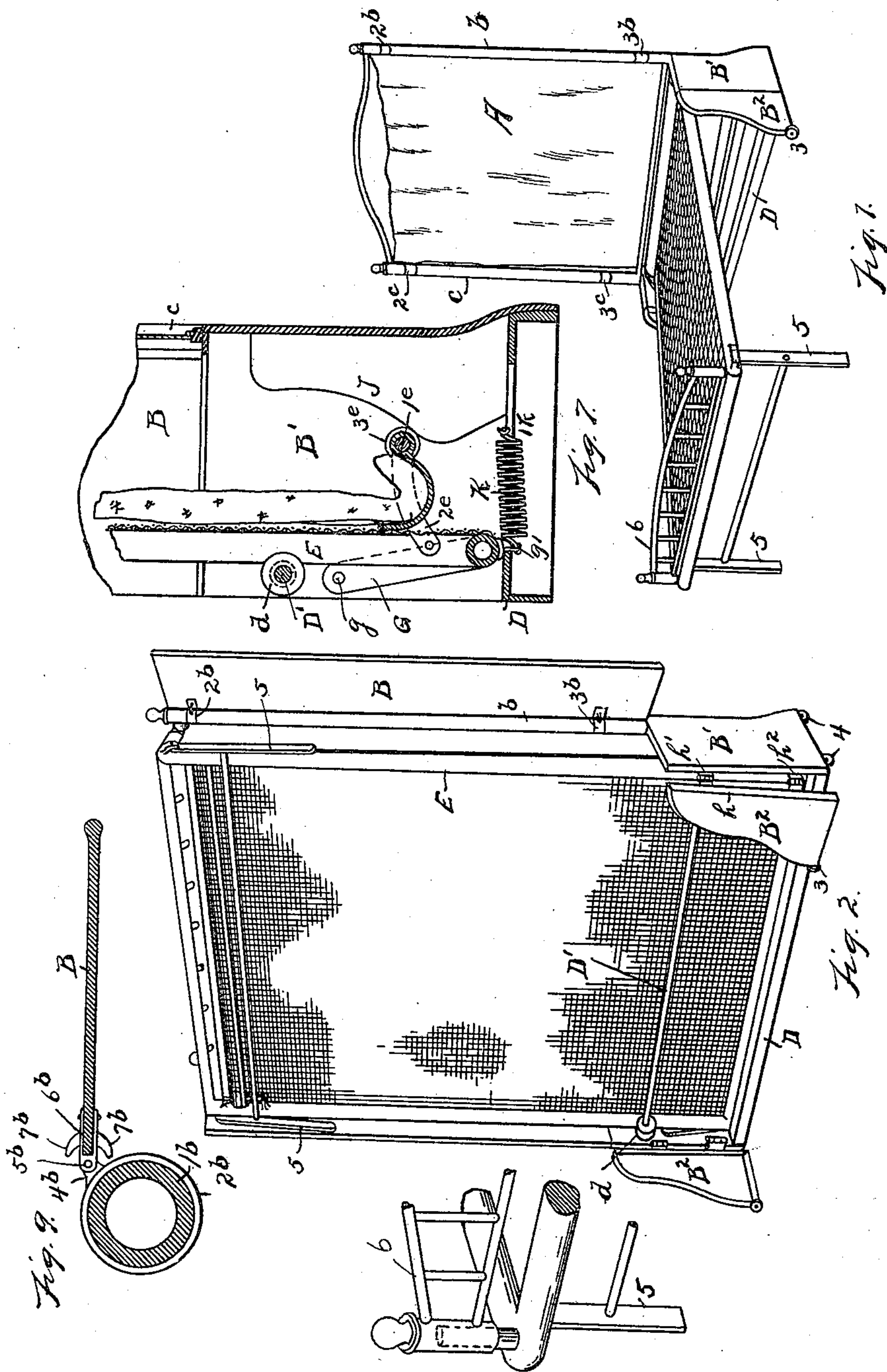
Patented Nov. 20, 1900.

J. F. WILMOT.  
FOLDING BED.

(Application filed Mar. 23, 1900.)

(No Model.)

2 Sheets—Sheet 1.



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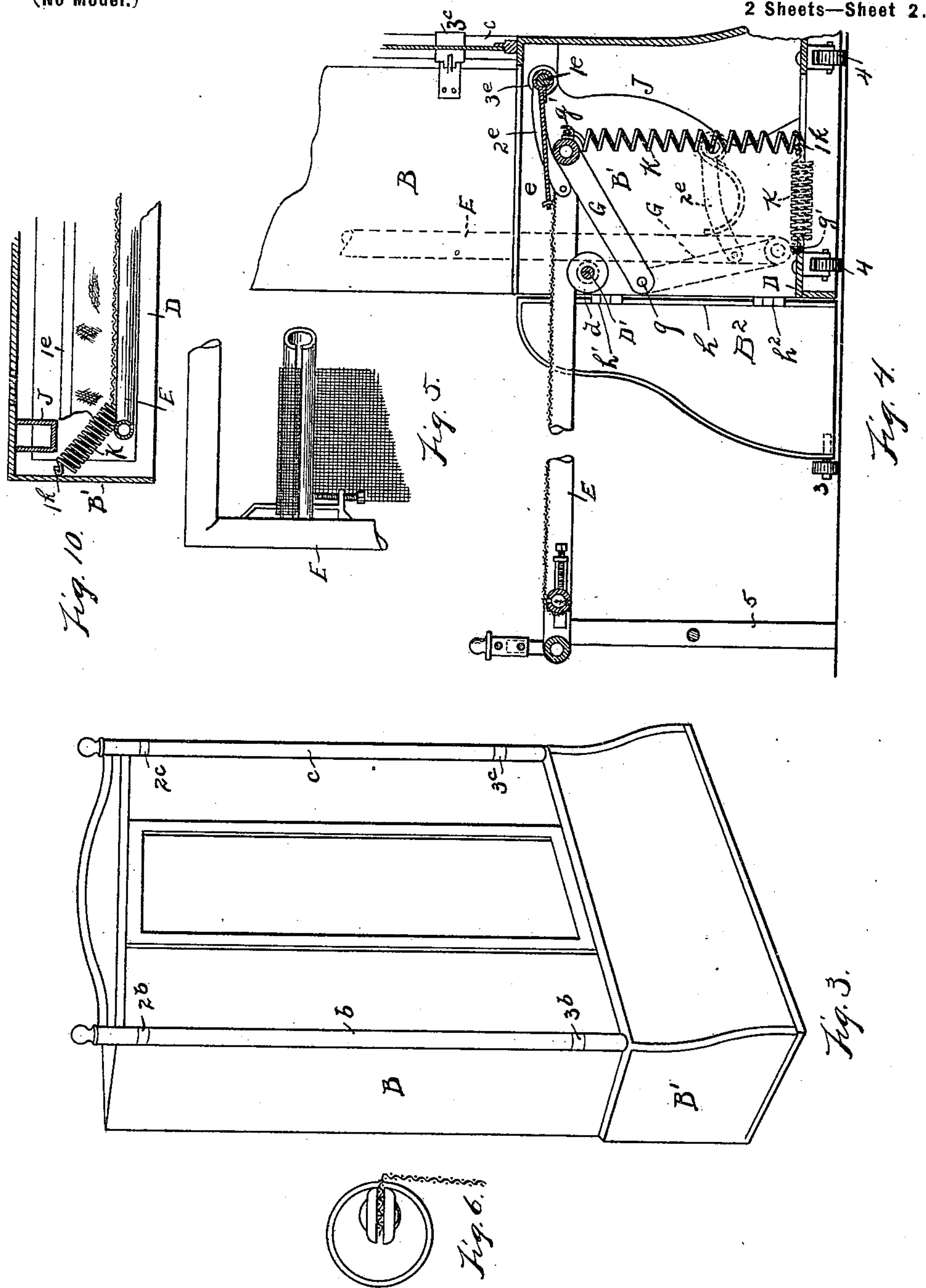
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# UNITED STATES PATENT OFFICE.

JOHN F. WILMOT, OF DETROIT, MICHIGAN.

## FOLDING BED.

SPECIFICATION forming part of Letters Patent No. 662,213, dated November 20, 1900.

Application filed March 23, 1900. Serial No. 9,845. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN F. WILMOT, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented certain new and useful Improvements in Folding Beds; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to folding beds, and has for its object improvements which include several novel features, and these are, first, a frame in which the headboard is supplemented by wing-pieces that are arranged to be folded flat against the outside of the headboard when the bed is turned down, where they are generally out of sight, or if not out of sight are so arranged in conformity with this face of the headboard that they appear to be a part of the headboard itself. These wings also are arranged to turn to a position at right angles with the headboard when the bed is turned up and not being used and with their free edges turned toward the foot of the bed, and in this position they inclose and conceal the edges of the mattress, mattress-support, and bedding and form the upper part of an inclosing cabinet which conceals all the contents of the bedstead, the wings on the bed-posts serving the purpose also of ventilating the bedding when the bed is turned up by leaving the same partly turned outward; second, a second improvement is comprised in the connection between the bed-bottom or mattress-support and the base of the headboard or cabinet into which the mattress-support folds; third, an improvement which relates to a folding brace that is arranged to act as a brace to the cabinet or headboard part of the structure to prevent the top of the headboard from tipping forward and falling onto the mattress-support when the mattress-support is turned down in position to be used for sleeping; fourth, an improvement in the hinge connection between the posts of the headboard proper and the folding wings which constitute the ends of the cabinet into which the mattress-support folds, and this improvement is one which permits the folding

wing to assume either of the two positions before spoken of.

In the drawings, Figure 1 is a perspective of the bedstead with the mattress-support folded down to the position it occupies when in use for sleeping purposes. Fig. 2 is a perspective of the bedstead with the mattress-support folded up against the headboard, one of the wing-pieces folded in to constitute the end of the cabinet and with the other wing-piece partly closed in. In this view the bedstead is seen as it appears to one standing near the foot of the bed. Fig. 3 is a perspective of the bed folded as seen by one looking at the outside of the headboard. The folded bed shown in this view has the appearance of a cabinet. Fig. 4 is a longitudinal broken section, and it shows in full lines the mattress-support lowered to its horizontal position and in dotted lines the mattress-support raised to its vertical position. Fig. 5 is a plan showing a corner of the mattress-supporting frame. This view shows the means by which the wire webbing of the mattress is stretched. Fig. 6 is a section through the bar which supports the head end of the webbing, and it indicates the way the webbing is held to the bar. Fig. 7 shows a folding end support for the mattress, and this end support is arranged to bend the end of the mattress, hold it from sliding when the mattress-support is lifted, and it also folds out and extends the bed-bottom or mattress-support when the mattress-support is turned down, furnishing a support for the extreme head end of the mattress. Fig. 8 shows a corner of the mattress-frame and indicates a manner in which the footboard is made removable from the mattress-supporting frame. Fig. 9 is a cross-section of a side post of the headboard, taken at a hinge connection between the post and the wing. Fig. 10 is a plan view of a corner. This figure, taken in connection with Figs. 4 and 7, shows the action of the spring arranged to pass from a state of tension when the mattress-support is down, as in Fig. 4, through a state of relaxation, and a second state of tension when the mattress-support is lifted, as shown in Fig. 7 and in dotted lines in Fig. 4.

A indicates the headboard. At each side of the headboard is a post *b c*. The form or shape of these posts between the ends is not



material, as any pleasing contour may be adopted, but near the top and bottom of each post there is a part which is finished to a cylindrical form, and the short cylinder, a cross-section of which is indicated at 1<sup>b</sup> in Fig. 9, constitutes the pintle or axis upon which is placed and on which turns a ring 2<sup>b</sup>. The corresponding ring at the bottom of the post *b* is indicated at 3<sup>b</sup> and the rings on the post *c* are indicated at 2<sup>c</sup> and 3<sup>c</sup>. The rings are alike and a description of the one shown in Fig. 9 will be sufficient for a clear understanding of the construction of each.

The ring 2<sup>b</sup> is provided with a lug or hinge-knuckle 4<sup>b</sup>, in which engages a pin 5<sup>b</sup>, that holds this knuckle to a leaf-hinge 6<sup>b</sup>, and the leaf-hinge 6<sup>b</sup> is secured to a wing B. The leaf-hinge 6<sup>b</sup> is preferably a forked or doubled leaf with a socket into which the edge of the wing B is inserted, and on each side of the leaf 6<sup>b</sup> is a horn or stop 7<sup>b</sup>, that limits the motion or swing of the wing B on the pin 5<sup>b</sup>. The wing B has a swing of about ninety degrees on the pin 5<sup>b</sup>. The exact amount of its swing is not material, although it should not vary greatly from the amount mentioned. The wing B has a second capacity of swing or turn on the post *b*, and in making this swing or turn the ring acts as a hinge-knuckle and the post as the pintle on which it turns. This compound hinge enables the wing B to fold flat against the outside of the headboard or to fold to a position two hundred and seventy degrees around therefrom and at right angles to the headboard, and the ornamental post *b* shows as a rounded post or corner when the wing is in both positions, and the post *b* conceals the joint between the headboard and the wing in both positions, and especially conceals it when the wing is folded to the position shown in Fig. 3. The stop or horn 7<sup>b</sup> may be located either on the leaf 6<sup>b</sup> of the hinge or it may be located on the ring and form a part of the ornamental outer surface of the ring 2<sup>b</sup>. The main portion or a large portion of the body of the post is joined to and firmly held by the body of the headboard A, and in reality there is no necessity that the post be separated from the headboard at any place except where the ring encircles it.

The upper end of the wing B should rise above and conceal the upper end of the lifted bed-bottom. The bottom end of the wing B reaches to a line about equal to the horizontal line of the mattress-support, and below this line the sides of the structure consist of sides B', that are permanently fixed to the headboard and are held in place by cross-bars D and D'. Of these the bar D is part of the frame, and the cross-bar D' is also a part of the frame, but is round either in whole or in part and constitutes an axis or journal on which are mounted two friction-rollers *d*, and on these friction-rollers rests the head end of the mattress-support E.

The mattress-support consists of two parts.

One part is a rectangular frame E, to which is secured a tightly-stretched woven-wire fabric, and a folding frame *e*, which consists of a cross-bar 1<sup>e</sup>, held at the end of arms or links 2<sup>e</sup>. This frame supports a fabric slat or cloth extension of the main frame that projects beyond the head part of the frame E toward the headboard A, assuming the nearly-horizontal position shown in Fig. 4 when the mattress-support is lowered and assuming the folded position shown in Fig. 7 when the mattress-support is lifted. The extension or auxiliary head-support in the mattress is caused to assume the positions indicated in Figs. 4 and 7 by means of a track that guides the outer or free end of the auxiliary frame *e* when the main frame E is raised or lowered. The auxiliary frame is provided at its free end with wheels 3<sup>e</sup>, that engage upon a track J. The upper part of this track J is nearly horizontal and is located properly with reference to the main frame, so that the wheel 3<sup>e</sup> rests on the track when the main frame E is turned down. When the main frame E is swinging to its vertical position, the outer or free end of the auxiliary frame is first drawn away from the headboard until the wheel 3<sup>e</sup> drops off from the horizontal part of the track J and the arm 2<sup>e</sup> assumes a position at an angle with the main frame E, and this angle diminishes continually as the free end of the main frame E rises, the free end of the auxiliary frame *e* and the main frame closing together until they assume the position shown in Fig. 7. The head end of the main frame E rests on supporting friction-wheels *d*, as abovesaid. Links G connect the end of the frame E to the pins *g*, that project inward from the side pieces B, just inside (toward the headboard) the journal D' of the bearing-wheels 1<sup>d</sup>.

When the free end of the mattress support or frame E is lifted, the head end of the frame E swings around *g* as a center and the frame and parts connected therewith assume the position shown in dotted lines, with the link G leading downward to near the bottom of the cabinet, with the pin *g'* near the bottom, and with the mattress support or frame E vertical and its free end pointing upward. The auxiliary frame *e* has changed its position and the side or arm 2<sup>e</sup> is now at an angle to the main frame, although it is nearly parallel to its first position, and the fabric which connects the cross-piece 3<sup>e</sup> with the main frame is looped or bent and forms a support which effectually prevents the mattress from sliding along the now upturned mattress support. The mattress is prevented from rising because its now upper end engages against the footboard 6 of the bed.

A spring K is arranged to aid in lifting the free end of the bed-bottom and to aid in holding the bed-bottom in its elevated position. In order that it may do this, the spring K is arranged to be in a state of tension when the free end of the bed-bottom is down, to pass



through its condition of distension, and be brought again into a state of tension when the bed-bottom is lifted. The spring which has this function is a coil-spring, one end of which  
 5  $1^k$  is secured to the inside of the cabinet at a point nearer the headboard than the extreme head end of the frame E, and that end of the spring which is secured to the frame E is nearer the middle line of the bed than is the  
 10 end which is secured to the cabinet. The spring leads from its point of attachment to the cabinet to its point of attachment with the frame diagonally inward and upward, so that the line between the connecting-points  
 15 is longer when the free end of the frame is down than it is when the free end of the frame is partially elevated, and the line between the connecting-points again lengthens as the free end of the frame reaches its most ele-  
 20 vated point. The spring is therefore under tension in what may be called the "two positions of rest" of the frame E, and the spring is relaxed when the frame is midway between the two positions of rest.

25 In folding beds there are two sources of dangerous accidents. One is that the bed-bottom shall fold up against the headboard and the other is that the headboard shall fall over onto the bed-bottom. The mechanisms  
 30 which have been already described prevent the first class of accident, and the main frame, supported between its head and foot ends on a roller  $d$ , furnishes a structure which can be handled readily and which needs no heavy  
 35 weights or strong springs to aid in handling it, and even the light spring K reaches a condition of relaxation long before the closing of the parts together would be sufficient to bring about serious accidents, and the second source  
 40 of danger is obviated by mechanism next to be described.

To the side pieces  $B'$  are hinged folding braces  $B^2$ , which close in against the back of the cabinet when the mattress support or  
 45 frame E is lifted. These braces  $B^2$  are substantially triangular in shape, with a straight hinge edge  $h$ , from which projects two hinges  $h'$  and  $h^2$ , by which the edge  $B^2$  is connected to the side pieces  $B'$ . The hinge  $h^2$  is arranged  
 50 with knuckles which project farther from the meeting edge of the two parts than the knuckles of the hinge  $h$ , so that when the brace  $B^2$  is folded inward against the back of the cabinet the outer end 3 of the lower edge  
 55 lifts from the floor. This outer end 3 is provided with a caster-wheel that engages against the floor when the brace is turned out, so that its outer face is straight or in a plane with the face of the side piece  $B'$ ; but  
 60 when folded in the end of the brace clears the floor and leaves the weight of the cabinet resting entirely on the four caster-wheels 4. The diagonal edge which connects the hinge edge and the bottom edge of the brace  $B^2$  is  
 65 curved with a cyma-reversa curve, and that part of the curved edge which is at the upper

end of the brace when it engages with the side piece of the frame E causes the brace to begin to swing on its hinges from its infolded position to its unfolded or bracing position,  
 70 and as the frame E drops to its down position the side piece of it drops below the extreme upper end of the brace  $B'$ , and the two braces are held in their unfolded position by the frame. In this unfolded position the bottom  
 75 end of the brace extends so far toward the foot of the bed that the headboard cannot possibly tip down on the mattress-support.

The extreme foot of the frame is supported by hinged standards or legs 5, that drop to  
 80 their leg position when the free end of the frame E is lowered and folded parallel or substantially parallel with the frame E when the free end of the frame E is lifted, assuming the position shown in Fig. 1 when the frame  
 85 is down and the position shown in Fig. 2 when the frame E is lifted.

What I claim is—

1. In a folding bed, the combination of the headboard, a post secured to the headboard  
 90 and provided with cylindrical bearings, a folding side board and double-knuckled hinges uniting the post and side board, each of said cylindrical bearings forming the pintle of one of said knuckles, substantially as described. 95

2. In combination with a standard headboard, a swinging side board, a post secured to the headboard provided with cylindrical bearings near its upper and lower ends, rings adapted to turn on said bearings, hinge con-  
 100 nection between the side board and the rings, substantially as described.

3. In a folding bed, in combination a headboard and folding side boards, standards finished in cylindrical form to furnish a bearing for a ring or band, a ring on said bearing, a strap-leaf secured by a pintle to the ring, and stops adapted to limit the swing of the strap, with reference to the ring, substan-  
 110 tially as described.

4. In a folding bed, the combination of a headboard, fixed side pieces, swinging side boards, a folding bottom in two parts adapted to fold into shorter space as the foot end of the bottom is raised, a cam-guide to the head  
 115 part of the folding bottom, and links adapted to draw the hinge of the two-part bottom nearer to the headboard during the first part of the folding, substantially as described.

5. In a folding bed, in combination with a  
 120 frame and a wire fabric stretched thereon, a bearing arranged to support the said frame, a standard headboard, a link connecting the end of said frame with the standard headboard, a folding frame adapted to form an  
 125 extension at the head end of the wire-fabric-supporting frame, and adapted to support the head end of the mattress, a cam-track arranged to engage the folding frame and cause the same to fold with respect to the wire-fab-  
 130 ric-holding frame, the support under the wire-fabric-holding frame being arranged to permit



said wire-fabric-holding frame to travel thereover and turn thereon, substantially as described.

6. In a folding bed, in combination with a headboard, and side boards arranged to simulate a cabinet, a mattress-supporting frame, a base extension provided with folding braces, of which the free edge is disposed diagonally with respect to the back and bottom edges, and which is arranged to fold toward the middle line of the bed with the diagonal edge lying in the path of the mattress-supporting frame, whereby the mattress-supporting frame when lowered, engages the braces and swings them outward to bracing position, substantially as described.

7. In a folding bed, the combination of the mattress-support, the headboard, the base extension connected with said headboard, a folding brace adapted to fold inward toward the middle line of the bed and provided with hinge connections with base extensions having the lower hinge set with its hinge-pintle farther out from the connected piece, that is the hinge-pintle of the upper hinge, whereby the outer end of the brace swings clear from the floor as the brace folds in, substantially as described.

8. In a folding bed, in combination with a headboard, and a swinging mattress-holding

frame, a base extension, a brace hinged to the base extension arranged to fold toward the middle line of the bed and provided at its free edge with diagonal engaging surfaces arranged to be contacted by the mattress-supporting frame when lowered, whereby the brace is adapted to be forced from its infolded position to its bracing position by the lowering of the mattress-support, substantially as described.

9. In a folding bed, the combination of a headboard, a base extension, rollers journaled on said extension, a mattress-supporting frame-link connections engaging in the said frame to the base extension and arranged to rest on said rollers, and spring connections between the head end of the mattress-support and the base connections arranged to be normally in a state of tension when the mattress-support is either in its lifted or its lowered position, but to pass a state of low tension during the swings of the mattress-support between its lifted and its lowered position, substantially as described.

In testimony whereof I sign this specification in the presence of two witnesses.

JOHN F. WILMOT.

Witnesses:

MAY E. KOTT,

ELLIOTT J. STODDARD.