

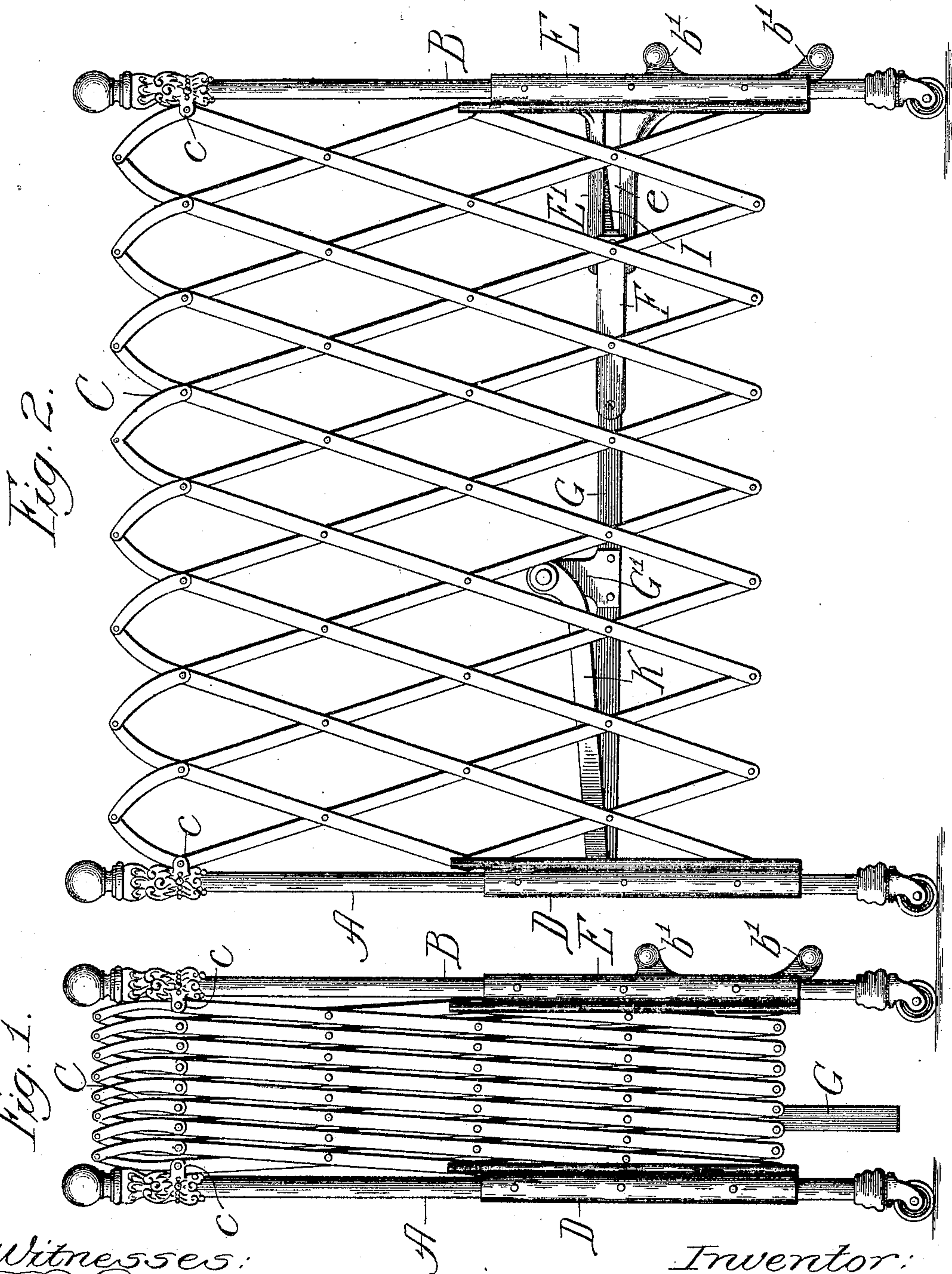
No. 813,004.

PATENTED FEB. 20, 1906.

F. J. HUBBARD.  
FOLDING BED.

APPLICATION FILED APR. 10, 1905

4 SHEETS—SHEET 1.



Witnesses:  
*Edw. Gaylord.*  
*John Enders.*

Inventor:  
*Frederick J. Hubbard,*  
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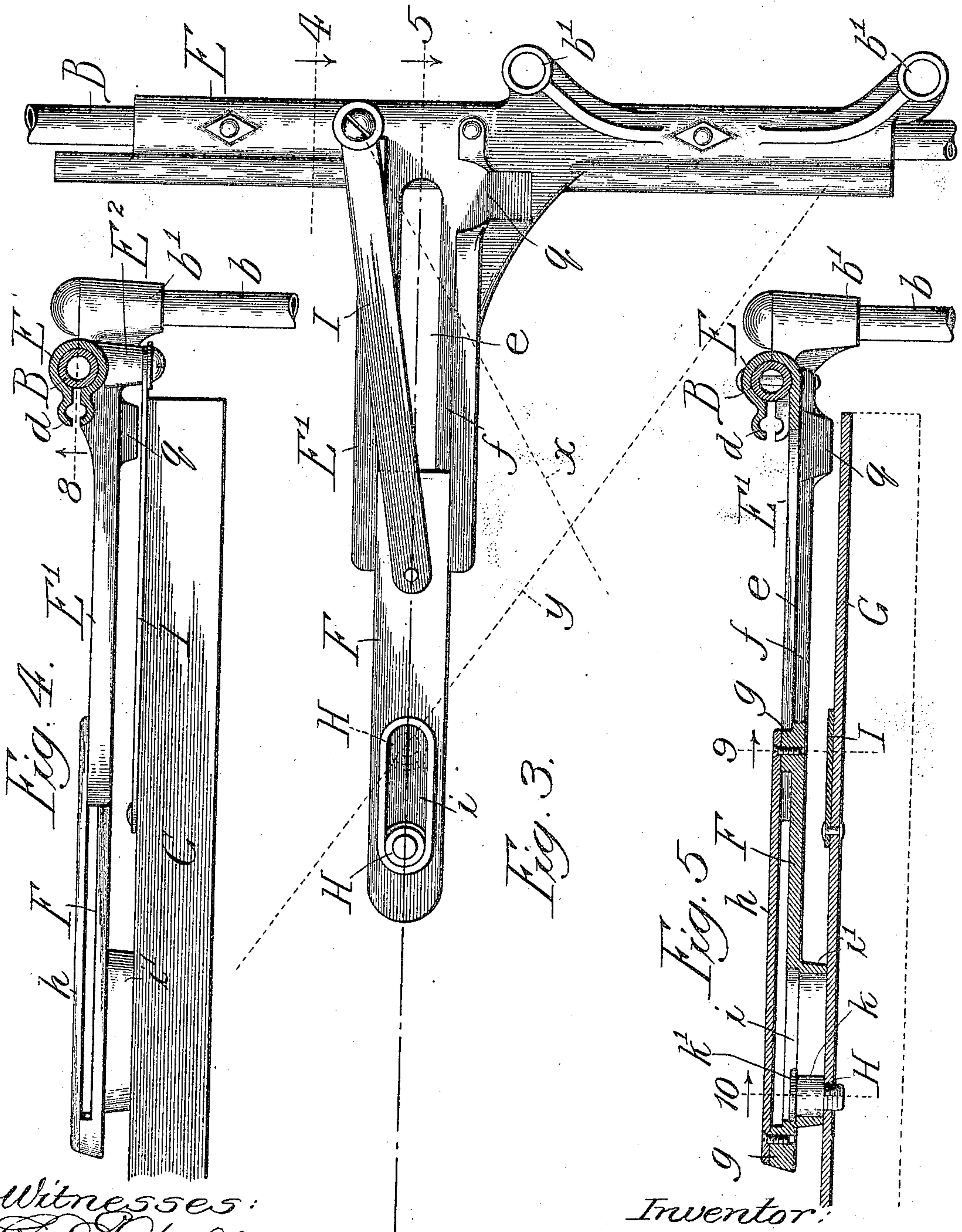
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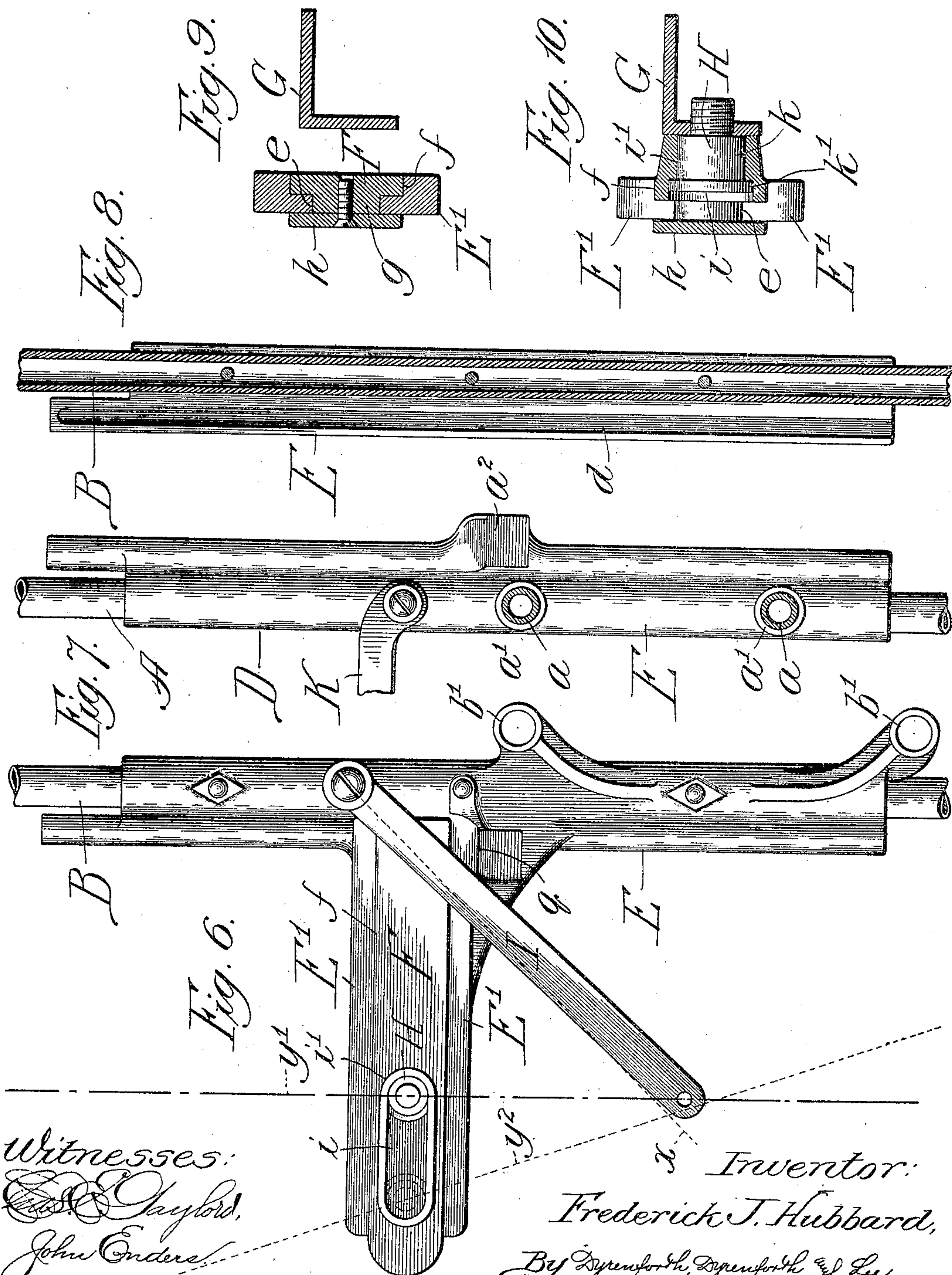
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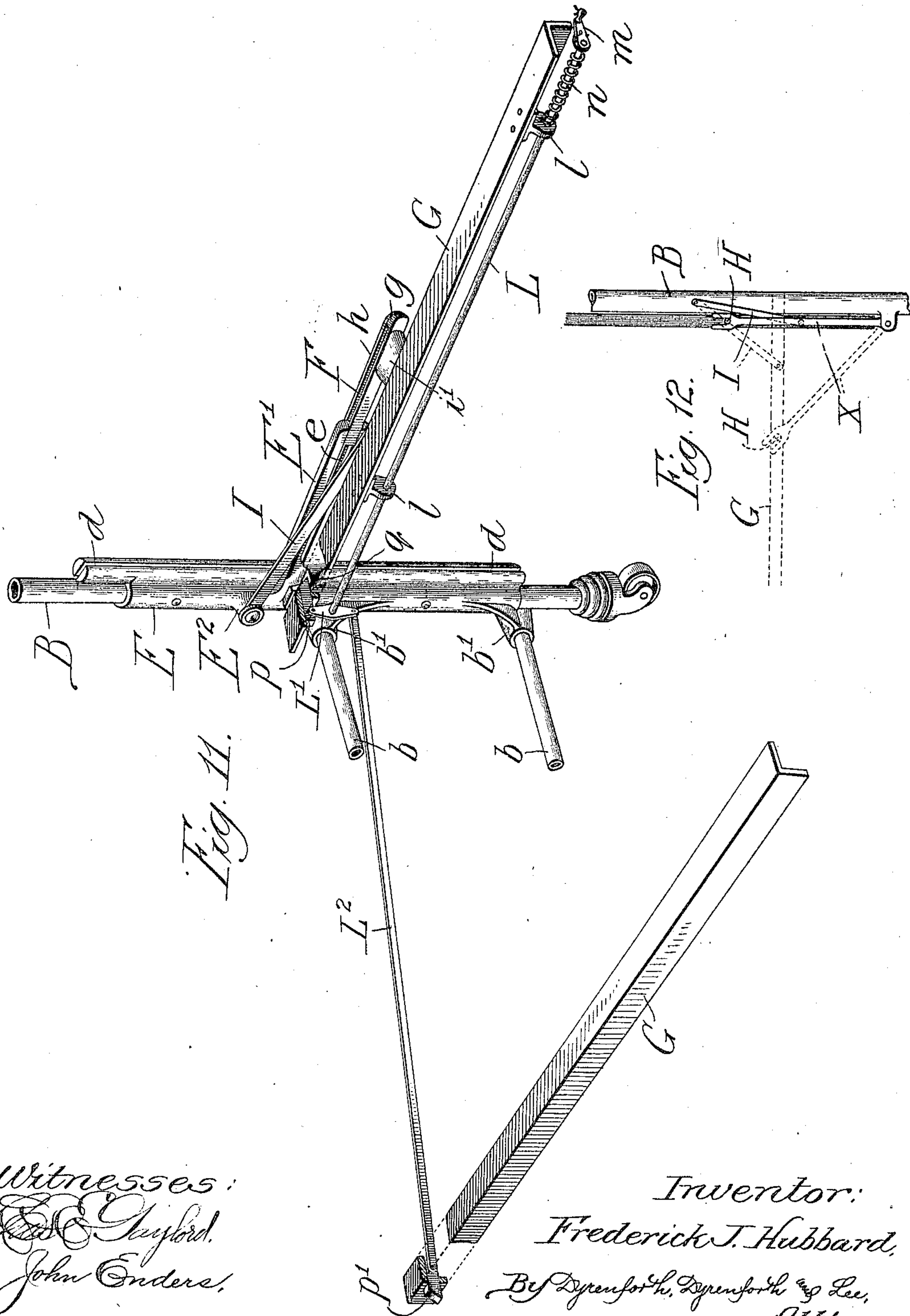
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# UNITED STATES PATENT OFFICE.

FREDERICK J. HUBBARD, OF DETROIT, MICHIGAN, ASSIGNOR TO WILLIAM E. PARDRIDGE AND HENRY BLACKWELL, OF DETROIT, MICHIGAN.

## FOLDING BED.

No. 813,004.

Specification of Letters Patent.

Patented Feb. 20, 1906.

Application filed April 10, 1905. Serial No. 254,704.

*To all whom it may concern:*

Be it known that I, FREDERICK J. HUBBARD, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented a new and useful Improvement in Folding Beds, of which the following is a specification.

My invention relates to improvements in folding beds of the general class, more especially in which the head and foot posts at opposite sides of the bed are connected together by rails to form front and rear frames, which at the head and foot posts are connected together by lazy-tongs to move toward and away from each other in the folding and unfolding operations of the bed and in which a swinging mattress support or frame is pivotally connected with the said front and rear frames in a manner to cause it when turned toward the vertical plane to move the said frames toward each other and when turned toward the horizontal plane to move said frames away from each other.

This invention is in the nature of an improvement upon the folding bed shown and described in Letters Patent of the United States No. 783,204, granted to me February 21, 1905, my present objects being to provide a construction in which the operations of folding and unfolding the bed may be performed with less effort, which will render it possible to materially decrease the height of the head and foot frames and which will permit locking of the bed in its unfolded or opened position, as well as when folded or closed.

It is further my object to provide improvements in certain details of the construction, all to the end of rendering it more perfect and desirable for its purpose.

In the drawings, Figure 1 is an end elevation of the bed folded; Fig. 2, a similar view of the bed unfolded; Fig. 3, an enlarged broken fragmental view of one of the rear posts with moving parts extended; Figs. 4 and 5, broken plan sections taken, respectively, on lines 4 and 5 in Fig. 3; Fig. 6, a view corresponding with Fig. 3, but showing the moving parts in contracted position; Fig. 7, a broken fragmental view of one of the front posts; Fig. 8, a broken vertical section of one of the rear posts, the section being taken on line 8 in Fig. 4; Figs. 9 and 10, enlarged detail sections taken on lines 9 and 10 in Fig. 5;

Fig. 11, a perspective view, somewhat diagrammatic, illustrating means for locking the bed when opened or unfolded; and Fig. 12, a broken view illustrating a modified construction.

The two front posts A are fastened together by means of a rail *a*, secured at the openings *a'* *a'*, (see Fig. 7,) and the rear posts B are fastened together by means of a rear rail *b*, Fig. 11, secured at the openings *b'* *b'*. (See Fig. 6.) The front and rear rails mentioned may be like those illustrated in my aforesaid patent, and as they do not enter into my present improvement it is not thought necessary to further illustrate them. The lazy-tongs C are pivotally fastened to the ears *c* on the posts, and along their lower edge portions they slide in vertical guides *d*, formed in sectional sleeve-castings D E, surrounding the posts and fastened thereto. The rail-attaching openings *a'*, above mentioned, are in the castings D, and the rail-attaching openings *b'* are in the castings E. Formed integral with each casting E is a horizontally-extending arm *E'*, bifurcated to form the horizontal guide-slot *e*. In the forks of each part *E'* at opposite sides of the slot *e* are longitudinally-extending guide-recesses *f* at one side, in which fit a sliding plate or extension F, provided on one side with lugs *g*, fitting through the slot *e*. Fastened against the lugs *g* is a retaining-plate *h*, which in sliding against the face of the arm *E'* holds the parts together in sliding relation. In the free end portion of each sliding extension F is an oblong guide-slot *i*, surrounded by a flange *i'*.

The mattress-support is a frame formed with angle-iron end bars G, spaced apart in a common manner, in rigid relation by means of suitable side rods or bars. (Not shown.) The bars G are provided on their inner sides near but in rear of their transverse centers with laterally-extending antifriction-rollers H, each having an annular surface *k*, moving in the adjacent flange *i'*, and an enlarged annular end surface *k'*, moving in the adjacent guide-opening *i*. The rollers H form the pivots or fulcrums on which the mattress-frame swings between vertical and horizontal positions. On the inner side of each sleeve-casting E at the upper side of the arm *E'* is a lug *E<sup>2</sup>*, to which is pivoted one end of a link I. Each link I is pivoted at its opposite end against the side of the adjacent bar G in rear



of the roller H. On each end bar G of the mattress-frame in the position shown is a bracket G', to which is pivoted one end of a swinging link K, pivotally connected at its  
 5 opposite end to a lug on the side of the adjacent sleeve-casting D, as indicated in Fig. 7.

When the bed is opened or unfolded, the mattress-frame at its forward edge rests upon shoulders  $a^2$  on the front posts of the bed. To  
 10 fold the bed, the mattress-frame is raised on its fulcrums H, thereby drawing the forward frame of the bed in the backward direction. In my former construction the fulcrum of the mattress-frame was close to the rear edge  
 15 thereof, requiring the operator to lift nearly the entire weight of the mattress-frame and bedding thereon for the purpose of closing the bed. In my present construction when the mattress-frame is in its horizontal posi-  
 20 tion the fulcrum thereof is so near midway between the ends of the bars G that but slight effort is necessary to raise it on its fulcrums. When the mattress-frame is in its horizontal position, the rollers H are in the  
 25 outer end portions of the slots  $i$ . During the initial raising of the forward side of the mattress-frame and consequent lowering of the rear side thereof the links I swing downward to the position indicated by the dotted line  $x$   
 30 in Figs. 3 and 6, drawing the rollers H to the rear ends of the slots  $i$ , as indicated by dotted circles in Fig. 3. When the rollers have reached the said position, the mattress-frame extends in the inclined plane indicated by the  
 35 dotted line  $y$  in Fig. 3. Further raising of the forward side of the mattress-frame causes it to force each sliding extension F from the position shown in Fig. 3 to that shown in Fig. 6, at which time the mattress-frame will extend  
 40 vertically, as indicated by the dotted line  $y'$  in Fig. 6. In the movement of the mattress-frame to the vertical position the forward posts and frame are drawn and slid backward upon the floor by the links K, folding the bed,  
 45 as shown in Fig. 1. To open the bed, the mattress-frame is drawn from its top side in the forward downward direction, causing it first to move to the position indicated by the dotted line  $y^2$  by sliding the fulcrums H toward  
 50 the outer ends of the sliding extensions F, after which the extensions are moved outward to the position indicated in Fig. 3, at which time the mattress-frame will rest at its forward edge upon the front rail of the bed-frame.

Means for locking the bed when folded may be provided, as shown in my aforesaid patent. In the present construction, owing to the distance between the rear edge of the mattress-frame and the fulcrum, it is necessary to provide means for preventing the bed's closing  
 60 under weight imposed upon the rear portion of the mattress-frame. Locking means for this purpose are shown in Fig. 11. Journalled in brackets  $l$  on the under side of one  
 65 of the mattress-frame end bars G is a rock-

shaft L, having a handle  $m$  and a return-spring  $n$ . On the rear end of the shaft L is a head or cross-bar  $L'$ , carrying at its upper end a pivotal sliding catch  $p$ , adapted to engage a  
 70 shoulder  $q$  on the sleeve-casting E on the adjacent rear post B. Pivotaly connected with the lower end of the cross-bar or head  $L'$  and extending therefrom to the opposite mattress-frame bar G is a rod  $L^2$ , carrying a  
 75 pivotal catch  $p'$ , adapted to engage a shoulder  $q$  on the other post B. When the mattress-frame is swung to the horizontal position to rest at its forward edge on the shoulders  $a^2$  of the bed-frame, the catches  $p$   $p'$  engage the shoulders  $q$  on the rear posts. The  
 80 catches are caused to slide over the shoulders under the resilient force of the spring  $n$ , thus locking the mattress-frame firmly against turning. When it is desired to close the bed, the rock-shaft L is turned against the resist-  
 85 ance of the spring  $n$  through the medium of the handle  $m$  to withdraw the catches from the shoulders  $q$ , thereby unlocking the mattress-frame and permitting it to be swung to close or fold the bed.

In the modified construction shown in Fig. 12 the ends G of the mattress-frame are fulcrumed on swinging links X, which take the place of the arms E' and sliding extensions F.

The shiftable fulcrums of the preferred or  
 95 modified constructions not only render it very easy to close the bed, but also causes the rear edge of the mattress-frame to move very close to the floor when the bed is folded. In my former construction in a full-sized or dou-  
 100 ble bed the top of the mattress-frame when folded extended a foot or more higher than in the present construction, thus necessitating the employment of a bed-frame having head and foot ends of the same or slightly greater  
 105 height. In the present construction the head and foot ends of the bed-frame may be of materially less height, which is a great advantage in the matter of appearance and in reducing the weight of the bed. The slotted sleeves D  
 110 E tend greatly toward strengthening the bed and form a most desirable construction for guiding the sliding end portions of the lazy-tongs.

What I claim as new, and desire to secure  
 115 by Letters Patent, is—

1. In a folding bed, the combination with relatively movable front and rear frames connected by lazy-tongs, of a vertically-swinging mattress-support having end bars shiftingly  
 120 fulcrumed on the said rear frame, and links connecting the said end bars pivotally with the said front frame.

2. In a folding bed, the combination with relatively movable front and rear frames connected by lazy-tongs, of a vertically-swinging mattress-support having end bars shiftingly  
 125 fulcrumed near their transverse centers on the said rear frame, links connecting the said end bars pivotally with the said front frame, 130



catch mechanism operating automatically to lock the mattress-support, when in its horizontal position, against closing movement, and catch-releasing means.

5 3. In a folding bed having frames which slide toward and away from each other in the folding and unfolding operations, a vertically-swinging mattress-support having parallel bars slidably fulcrumed near their transverse  
10 centers on sliding bearing-supports on one of the said frames.

4. In a folding bed, the combination with relatively movable front and rear frames connected by lazy-tongs, of a vertically-swinging  
15 mattress-support having end bars slidably fulcrumed near their transverse centers on sliding bearing-supports on the said rear frame.

5. In a folding bed, the combination with  
20 relatively movable front and rear frames connected by lazy-tongs, of a vertically-swinging mattress-support having end bars connected by swinging links with the front frame and shiftingly fulcrumed near their transverse  
25 centers on the rear frame.

6. In a folding bed, the combination with relatively movable front and rear frames connected by lazy-tongs, of a vertically-swinging  
30 mattress-support having end bars connected by swinging links with the front frame and slidably fulcrumed near their transverse center on sliding bearings on the rear frame.

7. In a folding bed, the combination with relatively movable front and rear frames, of  
35 a vertically-swinging mattress-support having end bars connected by swinging links toward opposite sides with the front and rear frames, and slidably fulcrumed near their transverse centers on sliding bearing-sup-  
40 ports on the said rear frame.

8. In a folding bed, the combination with relatively sliding front and rear head-posts connected by lazy-tongs and relatively slid-  
45 ing front and rear foot-posts similarly connected, of a swinging mattress-support having end bars shiftingly fulcrumed near their transverse centers on the said rear posts and swinging link connections between the said bars and the said front posts.

50 9. In a folding bed, the combination with relatively sliding front and rear head-posts connected by lazy-tongs and relatively sliding front and rear foot-posts similarly connected, of a swinging mattress-support having end  
55 bars shiftingly fulcrumed near their transverse centers on the said rear posts, and swinging link connections between the said bars and the said front and rear posts at opposite sides of the end-bar fulcrums.

60 10. In a folding bed, the combination with relatively sliding front and rear head-posts connected by lazy-tongs and relatively sliding front and rear foot-posts similarly connected, of forward-extending arms upon the  
65 said posts, and a vertically-swinging mattress-

support having end bars slidably fulcrumed near their transverse centers upon the said arms.

11. In a folding bed, the combination with relatively sliding front and rear head-posts  
70 connected by lazy-tongs, and relatively sliding front and rear foot-posts similarly connected, of forward-extending arms upon the said rear posts, sliding bearing extensions on the said arms, and a vertically-swinging mat-  
75 tress-support having end bars fulcrumed near their transverse centers upon said bearing extensions.

12. In a folding bed, the combination with relatively sliding front and rear head-posts  
80 connected by lazy-tongs, and relatively sliding front and rear foot-posts similarly connected, of forward-extending arms upon the rear posts, sliding bearing extensions on the  
85 said arms, and a vertically-swinging mattress-support having end bars slidably fulcrumed near their transverse centers upon said bearing extensions.

13. In a folding bed, the combination with relatively sliding front and rear head-posts  
90 connected by lazy-tongs, and relatively sliding front and rear foot-posts similarly connected, of forward-extending arms upon the rear posts, a vertically-swinging mattress-  
95 support having end bars fulcrumed near their transverse centers upon said arms, and link connections between the said end bars and the front and rear posts.

14. In a folding bed, the combination with relatively sliding front and rear head-posts  
100 connected by lazy-tongs, and relatively sliding front and rear foot-posts similarly connected, of forward-extending arms upon the rear posts, sliding bearing extensions on the  
105 said arms, a vertically-swinging mattress-support having end bars fulcrumed near their transverse centers upon said bearing extensions, and link connections between the  
110 said end bars and the said front and rear posts.

15. In a folding bed, the combination with relatively sliding front and rear head-posts connected by lazy-tongs, and relatively slid-  
115 ing front and rear foot-posts similarly connected, of forward-extending arms upon the rear posts, sliding bearing extensions on said arms, a vertically-swinging mattress-sup-  
120 port having end bars slidably fulcrumed near their transverse centers upon said bearing extensions, links pivotally connecting the end bars in rear of their fulcrums with the said rear posts, and links pivotally connecting the forward end portions of said end bars with  
125 the said front posts.

16. In a folding bed, the combination with relatively sliding front and rear head-posts connected by lazy-tongs, and relatively slid-  
ing front and rear foot-posts similarly connected, of slotted guide-sleeves on the rear  
130



posts for the lazy-tongs, forward-extending arms on the said sleeves, and a vertically-swinging mattress-support having end bars fulcrumed near their transverse centers upon the said arms.

17. In a folding bed, the combination with relatively sliding front and rear head-posts connected by lazy-tongs and relatively sliding rear and front foot-posts similarly connected, of slotted guide-sleeves on all of said posts for the lazy-tongs, forward-extending arms upon the rear-post sleeves, and a verti-

cally-swinging mattress-support having end bars fulcrumed near their transverse centers upon said arms, links connecting the said end bars in front of their fulcrums with the said front-post sleeves, and links connecting the said end bars in rear of their fulcrums with the said rear-post sleeves.

FREDERICK J. HUBBARD.

In presence of—

CARL G. SCHWARZE,  
E. G. OTTEN.