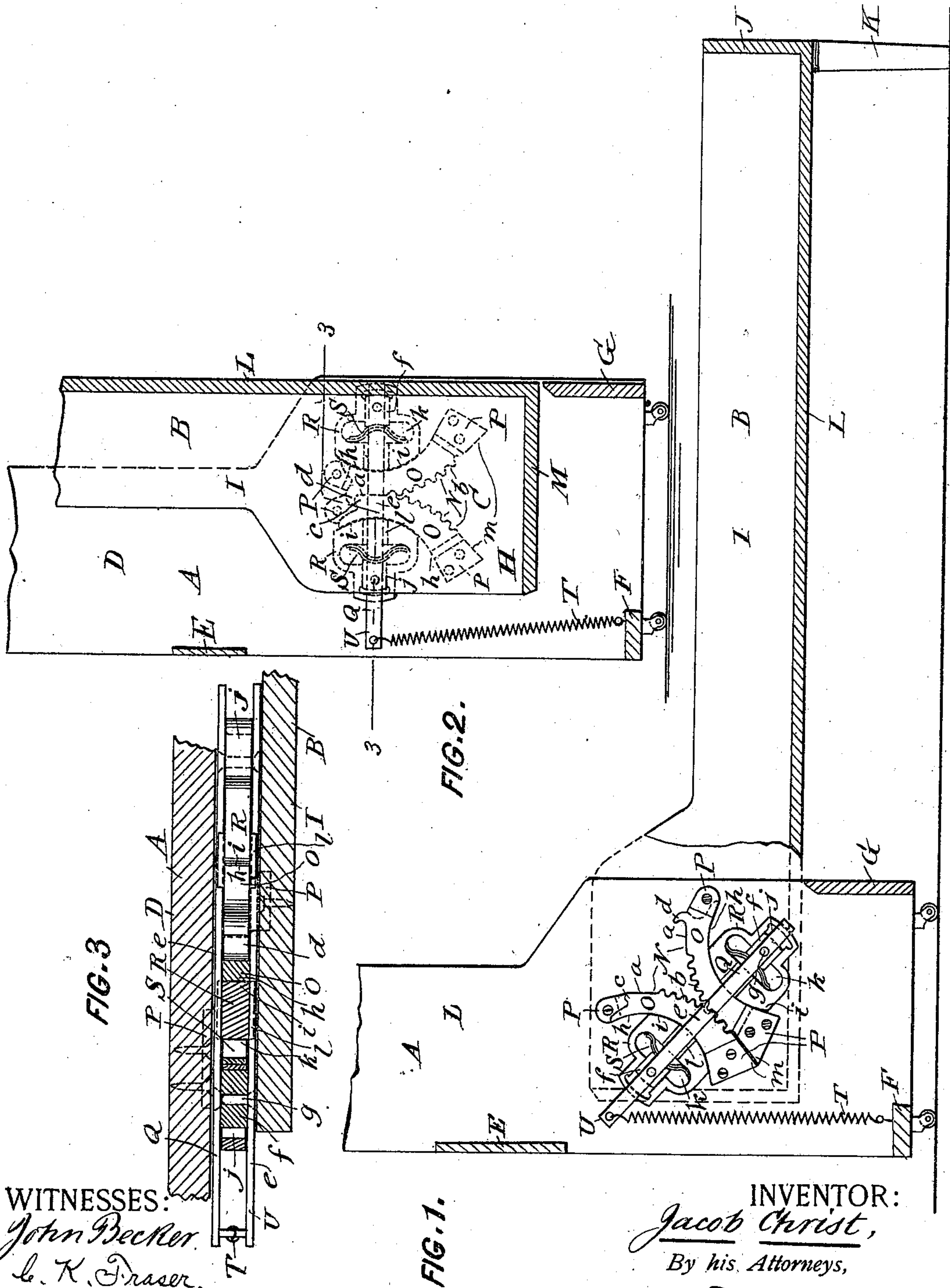


(No Model.)

J. CHRIST.  
FOLDING BED.

No. 504,328.

Patented Sept. 5, 1893.



WITNESSES:

John Becker.  
L. K. Fraser.

INVENTOR:

Jacob Christ,

By his Attorneys,

Arthur C. Fraser & Co.



# UNITED STATES PATENT OFFICE.

JACOB CHRIST, OF BROOKLYN, ASSIGNOR, BY MESNE ASSIGNMENTS, OF ONE-HALF TO CHRISTINA OHL AND WILLIAM D. STEWART, OF NEW YORK, N. Y.

## FOLDING BED.

SPECIFICATION forming part of Letters Patent No. 504,328, dated September 5, 1893.

Application filed July 14, 1892. Serial No. 439,966. (No model.)

*To all whom it may concern:*

Be it known that I, JACOB CHRIST, a citizen of the United States, residing in the city of Brooklyn, Kings county, New York, have invented certain new and useful Improvements in Folding Beds, of which the following is a specification.

This invention relates to folding beds and similar folding articles. Heretofore such devices have been constructed with pivotal connections between the fixed case and the folding section and with counterbalancing weights and springs for counterweighting the folding section.

My invention aims to provide an improved folding bed which shall be simple and cheap of construction, in which the ordinary weights will not be required, which will operate more easily than heretofore, and in which the counterbalancing of the folding section can be applied to substantially balance it in all its positions. To this end, in carrying out the preferred form of my invention I provide an improved pivotal or folding connection between the fixed case and folding section, improved counterbalancing provisions, and certain structural features of improvement, all of which will be fully hereinafter set forth.

In the accompanying drawings, which illustrate certain adaptations of my invention, Figure 1 is a fragmentary longitudinal section of a folding bed constructed according to the preferred form of my invention, the folding section being shown in the unfolded position and partly broken away to show the pivotal connection. Fig. 2 is a similar view showing the folding section in the folded position. Fig. 3 is a fragmentary cross section cut on the line 3—3 in Fig. 2.

Referring to drawings let A indicate the fixed case, B the folding section, and C the folding or pivotal connection between these parts.

The case A may be of any suitable or known construction. As shown it consists of vertical side boards D, back E, rear cross piece F and front cross piece G. As usual the sides D are disposed sufficiently apart to receive between them the head end H of the folding section or bed B, the latter folding partially within the fixed case when in the folded position

and extending horizontally in front thereof when in the unfolded position.

The folding section or bed B may be of any suitable or usual construction. That shown consists of side boards I, top board J, legs K, pivoted thereto at the outer end, front or bottom board L and head board N. As thus far described, the fixed and folding sections are of usual construction.

According to my invention I provide an improved folding or pivotal connection between the fixed case and the folding section and I provide an improved brake and counterbalancing provision for resisting a movement of the folding section in its various positions. Preferably my improved connection between the parts consists of an improved construction of the usual reciprocal faces on the respective parts constructed to abut at successive points as the section is folded or unfolded relatively to the case, whereby the fulcrum point between the parts shifts during the folding operation. These abutting faces may be variously constructed and disposed as circumstances may dictate. Preferably I provide in conjunction with these abutting faces an improved spring or equivalent provision constructed to impart to the folding section a tension resisting its unfolding movement. Preferably I provide an improved locking provision for preventing the separation of the case and section in order that their abutting faces may preserve the proper relative location during the folding operation. This locking provision may constitute a link engaging the respective parts, and the counterbalancing spring may transmit its tension through or against this link as desired. Preferably the counterbalancing spring is connected to one or both the main parts of the bed by an improved movable connection adapted to vary the tension of the spring in coincidence to the movement of the folding section.

I will now describe the preferred adaptation of my invention, referring to Figs. 1, 2 and 3 of the drawings. According to this construction I employ abutting faces N N, the one fixed to the side wall of the case A, and the other to the adjacent side wall of the section B. These faces are of substantially arc



shape having reciprocal outer edges adapted to engage with each other at successive points during the movement of the folding section relatively to the case. In this construction the faces have substantially rectilinear portions *a* at one end and curved tooth or rack like portions *b* at the other end. The portions *a* are vertical and in engagement when the section B is in the closed position and the portions *b* when the section moves toward the open position, the extreme ends of these portions being in engagement and extending at an angle of approximately forty-five degrees at the full open position of the section B. Preferably the one on the section is constructed with a shoulder *c* beyond its portion *a* and the other with a reciprocal horn or shoulder *d* taking over the shoulder *c*, whereby the weight of the folding section when in the closed position, is transmitted through its horn *d* and the shoulder *c* to the fixed section as seen in Fig. 2. In the construction shown the faces *N N* constitute the outer edges of plates *O O*, which plates have projecting feet *P P* through the medium of which they are clamped, the one plate to the outer side of the wall of the folding section, and the other plate to the inner side of the wall of the case *A*. These feet are preferably disposed to leave a slight space between the inner side of the plate *O* and the adjacent wall to which it is attached, as best seen in Fig. 3. The faces *N N* being both convex, and disposed as shown, that on the case having vertical portion *a* at front and extending thence downwardly and rearwardly and ending in portion *b*, and the other being the reverse, permits the section to move inwardly against the case as it unfolds, and outward in advance of its open position as it folds up. Preferably the parts are connected together by a link crossing constructed to preserve their faces *N* in proper relative position, and a counter-balancing spring is provided to react against the weight of and resist movement of the folding section. In the construction shown this is accomplished by the link *Q*, consisting of side straps *e e* at each side of the plates *O* and end blocks *f f* between and pivotally connected to said straps by bolts *g* and shoes *R R* are engaged by these links at their outer ends and engaging the rear faces of the plates *O O*, springs *S S* intervening between the links and shoes, as shown. The outer edges of the plates *O O* are preferably constructed as curved tracks *h h*, being nearest to the reciprocal faces *N* at the closed position opposite their portions *a* and extending thence gradually farther from the faces at their other ends, whereby the opposite sides of each plate are slightly wedge shaped. Preferably the shoes *R* are constructed with faces *i* at their inner edges adapted to ride on the tracks of the plate. Preferably the shoes have guide ways *j* for receiving the block *f* of the link *Q* and recesses *k* for receiving the springs *S* between the blocks and the inner portion of the shoes, and guide ways *l* at their

sides for receiving the straps *e* of the link. The springs *S* preferably react against the inner edges of the blocks of the link and the opposing surfaces of the shoes. Thus the opposite straps of the link embrace the opposite sides of the plates *O O*, of the shoes *R R* and springs *S S*, maintaining the parts in position, and the shoes are prevented from tilting relative to the links by the guide ways *l* embracing the edges of the straps. When the parts are in the position shown in Fig. 2 the shoes occupy the position of minimum separation. As the folding section is unfolded the upper ends of the tracks *h h* separate and the shoes ride on the tracks toward their other ends by reason of the arc shape of the tracks and the tension of the springs *S S* until when the section *B* is in the extreme open position, whereupon the shoes rest at the lower ends of the tracks, where they occupy the position of maximum separation, as seen in Fig. 1. Because of the gradually increasing distance between the track and the face *N* the shoes are gradually separated during the unfolding and thus the tension of the springs *S* is gradually increased by reason of their greater compression between the link and the shoes, thereby increasing the counter-weighting tension of the springs as well as their resistance to movement of the section in coincidence with the movement of the folding section. The tendency of the springs to counterweight the section is determined by the extent of inclination of the tracks *R R*, while the resistance to movement of the section is dependent upon the frictional engagement between the shoes and tracks. Preferably an auxiliary spring *T* is provided, connected to the fixed case preferably at its cross bar *F* and reacting against the folding section to partially counter-balance it. Preferably it is connected to a prolongation or arm *U*, consisting of the outer end of one of the straps of the link *Q*, whereby its tension is transmitted through the link to the connection between the parts.

In operation as the folding section is moved, the faces *N* abut at the successive points, the shoes *R* traverse their respective tracks, the link *Q* retains the faces in proper relative position and the springs *S*, either alone or in conjunction with the spring *T*, counteract the weight of the folding section. There is sufficient frictional resistance between the shoes and track which constitute a friction brake to preserve the folding section in substantially all intermediate positions at which it may be left, the tension of the spring being substantially sufficient at each position of the folding section to counter-balance the latter because of its corresponding condensation due to the separation of the tracks.

It will be seen that my invention provides an improved folding bed of simple, cheap and substantial construction which will be facile of operation and not liable to become impaired in use.

It will be understood that my invention is



not limited to the particular details of construction and arrangement hereinbefore set forth as the preferred form of my invention, since it may be variously availed of, as experience, circumstances or the judgment of those skilled in the art, may dictate without departing from its essential features. Preferably the plates *O* are constructed with opposing faces *m* at their lower ends which abut when the section *B* is in the extreme unfolded position and receive part of the strain at this point when the bed is in this position.

What I claim is the following-defined novel features and combinations, substantially as hereinbefore set forth, namely:

1. In folding beds or similar devices, a fixed case, and a folding section, in combination with a pivotal connection between said parts consisting of arc shaped reciprocal faces fixed the one to said case and the other to said section, that on said case having a substantially vertical upper forward portion and extending thence downwardly and rearwardly and terminating in a portion extending at an angle of substantially forty five degrees, and that on said section having a contour the reverse of that on said case and disposed to contact at its lower end with the lower end of that on said case when in the open position and at its upper end with the upper forward portion of that on said case when in the closed position, said faces constructed to abut at successive points during the folding of said section, and means for maintaining said faces in contact, whereby when in the folded position said section occupies a position relatively to said case in advance of that occupied when in the open position.

2. In a folding bed or similar device, a fixed case and a folding section, in combination with a pivotal connection between said parts consisting of reverse convex faces fixed the one to said case and the other to said section and constructed to contact at successive points during the folding operation, and a track carried by one of said parts and engaged by the other of said parts and con-

structed to preserve said faces in contact during the folding operation.

3. In a folding bed or similar device a fixed case and a folding section in combination with a pivotal connection between said parts consisting of reciprocal abutting faces constructed to abut at successive points during the folding operation, tracks carried by said parts, a link crossing said faces and shoes carried by said links and engaging said tracks for locking said parts together, and a spring or equivalent counterbalancing provision.

4. In a folding bed or similar device, the fixed case and folding section, in combination with the pivotal connection between said parts, consisting of reciprocal faces *N N*, tracks as *h h*, links as *Q Q* crossing said faces, shoes carried by said links and engaging said tracks, and a counterbalancing spring acting against said folding section, substantially as and for the purpose set forth.

5. A pivotal connection for folding beds or similar devices consisting of plates as *O O* having reciprocal faces as *N N*, tracks as *h h* and shoulders as *c d*, said plates adapted the one for connection to one part of the bed the other to the other part thereof, in combination with a link as *Q* embracing said plates, shoes as *R* engaged by said link and engaging said tracks, and a spring as *S* interposed between said link and one of said shoes.

6. In a folding bed or similar device, a fixed case and a folding section, in combination with a pivotal connection between said parts consisting of plates as *O O* fixed one to said case and the other to said section, having abutting faces as *N N*, and tracks as *h* back of said faces, a link traversing said faces, and shoes engaging respectively said tracks and constructed to preserve said faces in contact.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JACOB CHRIST.

Witnesses:

FREDERICK BLATT,  
GEORGE H. FRASER.