F. BENNETT.

SOFA BED.

APPLICATION FILED MAR. 17, 1910.

1,053,774.

Patented Feb. 18, 1913.

2 SHEETS—SHEET 1.

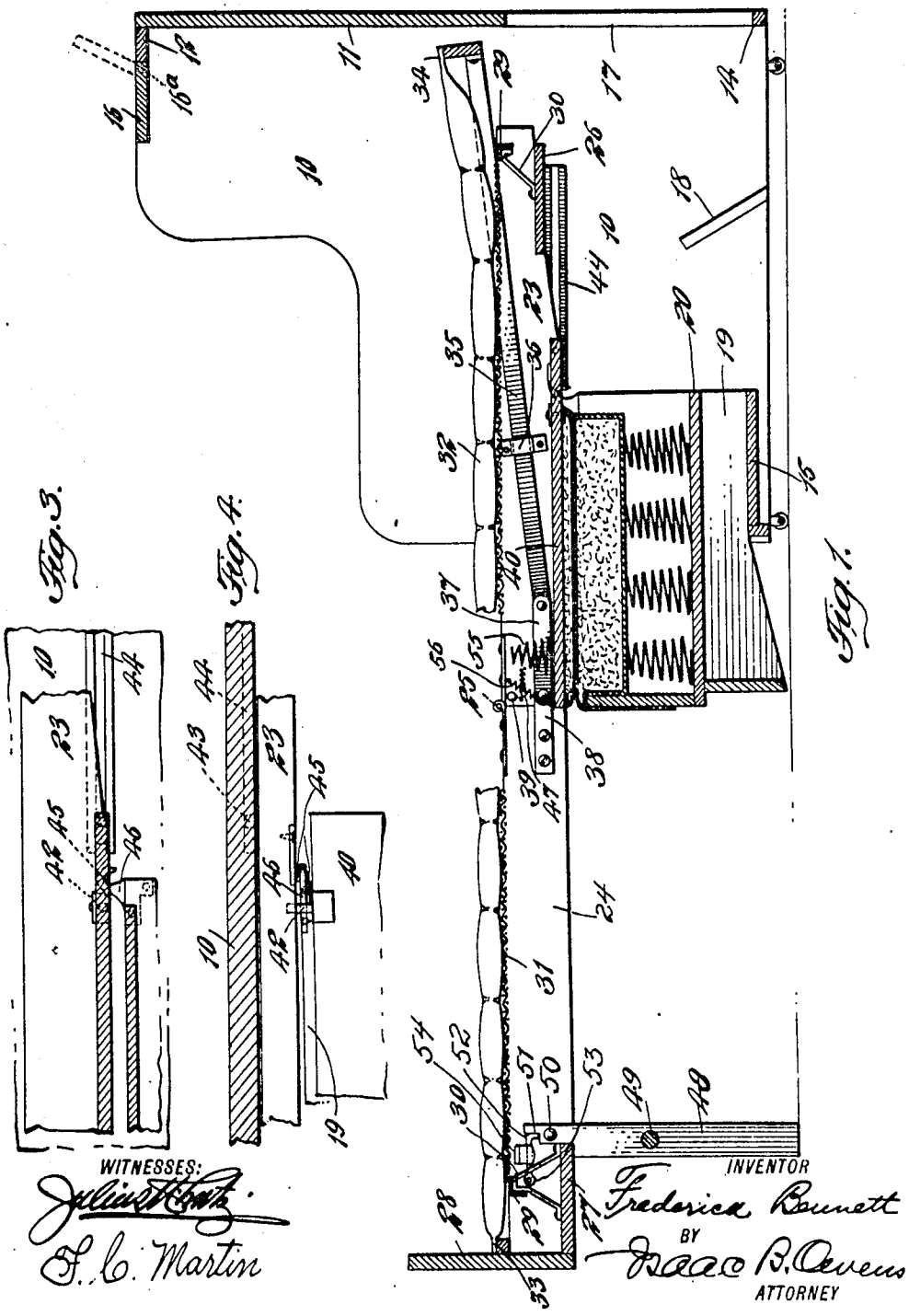


Fig. 1.

Fig. 3.

Fig. 4.

WITNESSES:

Julius Katz

E. C. Martin

INVENTOR

Frederick Bennett

BY

Isaac B. Owens

ATTORNEY

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

F. BENNETT.

SOFA BED.

APPLICATION FILED MAR. 17, 1910.

1,053,774.

Patented Feb. 18, 1913.

2 SHEETS—SHEET 2.

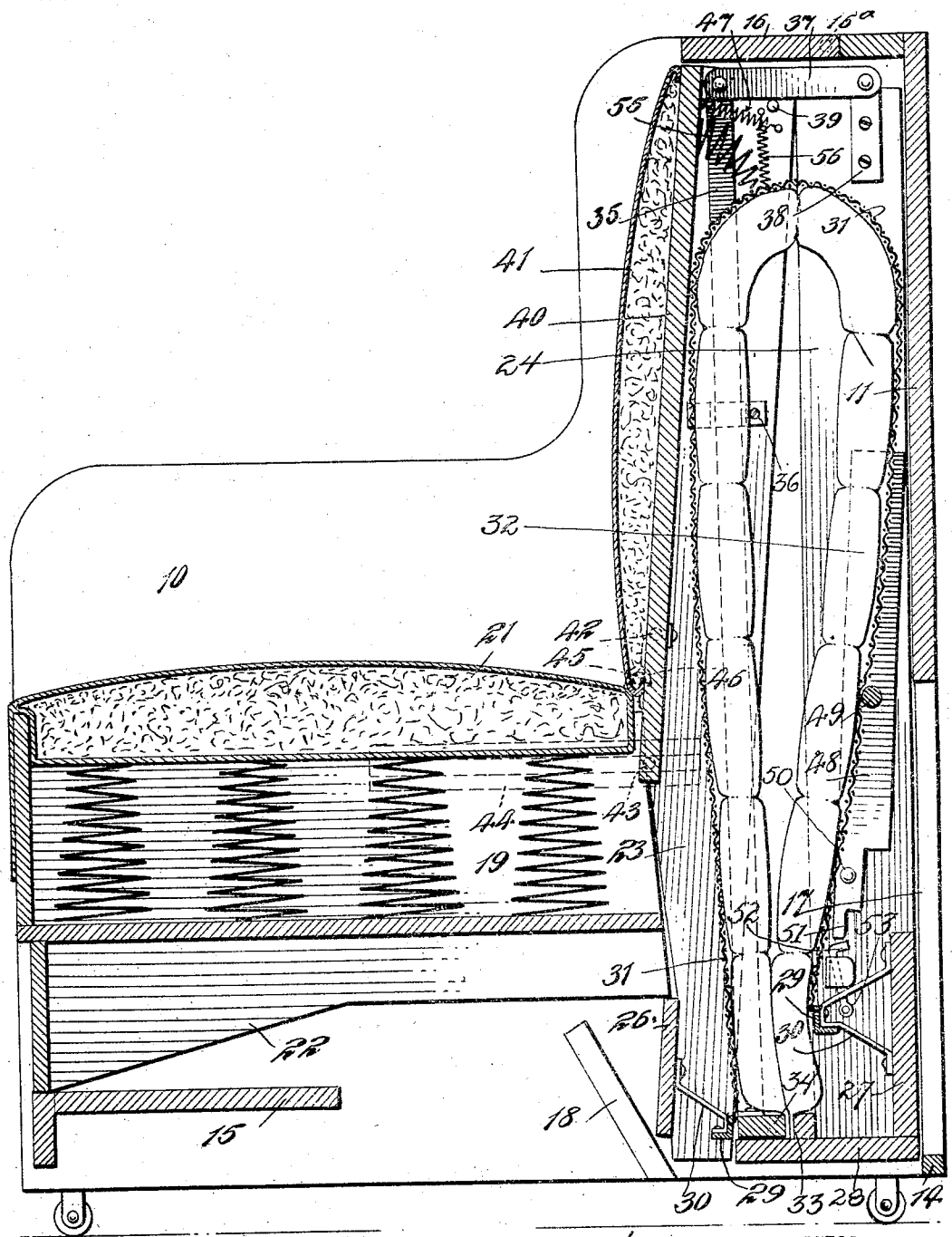


Fig. 2.

WITNESSES:

F. C. Martin

INVENTOR

Frederick Bennett

BY

Isaac B. Owens

ATTORNEY

UNITED STATES PATENT OFFICE.

FREDERICK BENNETT, OF RAVENSWOOD, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO UNITED STATES METAL PRODUCTS COMPANY, OF NEW YORK, N. Y., A CORPORATION OF MASSACHUSETTS.

SOFA-BED.

1,053,774. Specification of Letters Patent. Patented Feb. 18, 1913.

Application filed March 17, 1910. Serial No. 550,017.

To all whom it may concern:

Be it known that I, FREDERICK BENNETT, of Ravenswood, county of Queens, State of New York, have invented certain new and useful Improvements in Sofa-Beds, of which the following is a full, clear, and exact specification, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to a sofa bed of the type in which it is not necessary to move the bed from the wall to change its adjustment.

The object of my invention is to increase economy of space, enabling the sofa bed to be used in narrow confines, such as city apartment houses.

A further object of the invention is to provide means for lowering the moving parts when in bed adjustment so that the bed will not be beyond standard height and to so organize these parts that the frame or head piece also may be made in proper proportions presenting the appearance of a perfect sofa when in sofa adjustment.

Still a further object of the invention is to arrange the parts so that when adjusted as a bed the upholstered surfaces will be completely out of use and protected, the occupant lying on a standard mattress sustained by a standard spring.

Still a further object of the invention is to provide means for supporting and stretching out the mattress as the parts move to bed adjustment, thus lengthening the bed to the proper point for comfort, but allowing the frame parts to be made small enough to retain the proper proportions of the sofa.

My invention has various other objects and involves various other features of importance, all of which will be fully set forth hereinafter and particularly pointed out in the claims.

Reference is now had to the accompanying drawings, which illustrate, as an example, the preferred embodiment of the arrangement, and in which drawings:—

Figure 1 is a longitudinal section showing the parts in bed adjustment, but with part of the mattress and spring broken away; Fig. 2 is a sectional view of the parts in sofa adjustment; Fig. 3 is a fragmentary sectional elevation of the connections between the head or stationary part, the head section of the folding frame and the seat section; and Fig. 4 is a sectional plan of the same connections.

The head or stationary body section of the bed, which is adapted to be placed permanently against the wall of the apartment in which the bed is used, comprises side walls 10 which are shaped to constitute, at their upper edges, the arms of the sofa and which are joined rigidly together in one part by means of a back-board 11, a cross-connection 12 at the top, a tie-rod or connection 14 at the bottom-rear edge, and a cross-connection 15 at the bottom-front edge. A lid or cover-board 16 is employed forming a continuation of the cross-connection 12 and pivoted, as indicated by broken lines 16ª in Figs. 1 and 2, this serving, as will fully appear hereinafter, to cover the moving parts when in sofa adjustment and to drop down out of position over the head of the occupant when the parts are in adjustment. The back-board 11 terminates considerably above the bottom of the body-section and from the lower edge of the back-board cleats or ribs 17 project down to the tie-bar 14, said cleats being fastened to the inner surfaces of the side walls 10.

18 indicates guide-cleats which are secured to side walls 10 somewhat forward of the ribs 17 and which incline forward from their lower ends. The parts 17 and 18 serve to guide the moving parts of the bed as will fully appear hereinafter.

The seat section comprises side walls 19 connected by a horizontal wall 20, which supports the upholstering 21 of the seat. The lower edges of the side walls 19 of the seat-section have their rear portions horizontal, but their forward portions are inclined downward toward the front as indicated at 22 and are designed to run on and be supported by the cross-connection 15 of the back or body section. When the adjustment is changed from a sofa to a bed, the seat section is pulled forward and the edges 22 ride on the cross-connection 15, thus allowing the seat section a combined forward and downward movement as may be seen by comparison of Figs. 1 and 2.

The folding frame comprises a head and foot section respectively formed of side rails

23 and 24 of which there are two in each section joined together in pairs by hinges 25. The side rails 23 of the head section of the sliding frame are connected to each other by a cross-connection 26, while the side rails 24 of the foot section of the folding frame are joined by cross-connections 27 and 28 angularly disposed as shown. The connections 26 and 27 sustain transverse angle bars 29 by means of brackets 30 or the like and between these angle bars the woven wire or other spring 31 extends, the spring being joined to and supported by said angle bars.

The sections of the folding frame have a hinging jack-knife motion, which will be fully described hereinafter, and which is utilized, among other things, to stretch out the mattress 32 and lengthen the bed to the necessary extent. The mattress has its foot end joined to the cross-connection 28 of the foot section of the folding frame as indicated at 33, while its head end is joined to a cross-member 34. To the ends of the cross-member 34 rods 35 are rigidly fastened, said rods being two in number respectively lying against the inner surfaces of the side rails 23, and bearing on the head angle iron 29 with the spring 31 between them.

36 indicates guides secured to the rails 23 and embracing the rods 35 to limit their independent lateral motion, but allowing them free, longitudinal motion. The rods 35 are articulated by links 37 to the respective side rails 24. Preferably this is effected by means of bracket-fixtures 38 on the said side rails.

39 indicates fulcrum-pins, which are fastened respectively to the inner sides of the rails 23 at the ends adjoining the rails 24 and are adapted to coact with the links 37 transforming them into levers. When the parts are in the position shown in Fig. 2, the links 37 extend across between the rails 23 and 24 and bear against the fulcrum-pins 39 39. These pins prevent downward motion of the rods 35 and therefore hold them raised until the cross-members 34 are at the same level as the head angle 29. This loosens the mattress which, it will be seen, is confined primarily by the spring 31. When, however, the sections of the folding frame are straightened out as in Fig. 1, the links 37, by reason of their location and the location of the hinge 25, push or advance toward the head of the bed correspondingly and advancing the rods 35 and stretching out the mattress. This pushes the head end of the mattress toward the wall 11 and practically closes the space between the head ends of the side rails 23 and said wall and lengthens the mattress surface to that extent. Upon returning the parts of the folding frame to the position shown in Fig. 2, the links 37 first draw back or "footward" and finally rock against the fulcrumed pins 39 pulling back the rods 35 and returning the parts to the position shown in said view.

The back section of the sofa bed comprises a frame-wall 40 with upholstery 41 on its exposed side. This back section, when its parts are in sofa adjustment, extends vertically with a slight backward inclination and meets the lid or cover-board so that the bed parts are completely concealed when the adjustment, shown in Fig. 2, is made. Said frame-wall 40 of the back fits in between the side rails 23 and is pivoted thereto somewhat above its lower edge as indicated at 42. The side rails 23 in turn have pins 43, which project outward and run in guideways 44 formed in the inner sides of the walls 10. These guideways are horizontally disposed and are of a length approximately equal to that of the travel of the seat section. The side rails 23 of the folding frame are further provided at their sides, with projecting pins 45, which are adapted to engage by hooks 46, attached respectively to the upper rear corners of the side walls 19 of the seat section, forming a pivotal connection which, however, may be readily separated by detaching the hooks. It will be seen, therefore, that the back section is pivoted at its lower portion by the pins 42 to the side rails 23, while its upper edge is free to have a limited motion backward and forward.

For preventing the back from falling forward when in sofa adjustment, springs 47 are attached to the upper portion of the back and to the ends of the side rails 23 adjacent thereto. This yielding of the back has an important advantage which will hereinafter develop. It will also be observed that the folding frame, composed of the side rails 23 and 24, has a combined pivotal and sliding motion in the guideways 44 and that the rear of the seat section is pivotally sustained by the pins 45 and hooks 46. When, therefore, the seat section is drawn forward the back and the folding frame are pulled forward, the upper portion of the folded folding frame swinging forward and downward and the bottom portion having a rocking motion between the ribs 17 and guides 18. The continued forward motion of the seat section and corresponding motion of the folding frame and back finally allow the lower end of the folded folding frame to clear the cleats or ribs 17 and wall 11, and at the end of the motion of the seat section all of the parts are lowered, owing to the inclines 22, the back section lies on the seat section, with the upholstery of each section against each other, and the folding frame will lie folded over the back. Then it is only necessary to lift the foot section of the folding frame upward and swing it through one-half of a circle, it then taking the position shown in Fig. 1. In this position the outer or foot

ends of the side rails 24 are sustained by legs 48. Of these legs there are two connected by a cross-bar 49 and pivoted to the side rails 24 as indicated at 50 in Fig. 1. The upper ends of the legs 48 above the pivots 50 are formed with notches 51 adapted to be engaged by gravity latch 52 pivoted at 53 to the side rails 24. 54 indicates a ledge or housing which when the side rails 24 are swung upward and thence downward reversing their position confines the swinging motion of the gravity latch. This latch, when the parts are in the position shown in Fig. 1, falls into the notch 51 and locks the legs, but when the position of the foot section of the folding frame is reversed the latches are below the legs and then fall back upon the case 54 disengaging the legs and allowing them to fold downward between the side rails 24 preparatory to the folding up of the folding frame. When the parts are opened, as above described, as the foot section of the folding frame finally swings downward and outward the legs also swing downward into operative position and the latch engages them, as explained.

When the parts are in the above-described bed adjustment, should a heavy person lie on the bed, there would be danger of the spring 31 sagging until it rested upon the back 40. To prevent this, a series of springs 55 are arranged between the back section and the spring 31. These springs are attached to the woven spring 31 and to the back 40 and are, of course, inactive when the parts are in the sofa adjustment, but when the parts are in the bed adjustment the springs 55 sustain the middle of the mattress and prevent the occupant of the bed from resting upon the back 40. Further, the upper end of the back being allowed a pivotal motion by reason of the pins 42, the back is compressed firmly with its upholstery against the upholstery of the seat and a yielding effect is produced throughout which adds greatly to the comfort of the occupant. The spring 31 will be held up when in sofa adjustment by the springs 55, but if additional security in this direction is desired, springs 56 may be employed. These are attached to the woven spring 31 and to the side rails 23 at their inner ends and serve to hold the spring up in the position shown in Fig. 2.

The construction and arrangement of parts which I have resorted to, as above described, enables me to attain numerous important advantages, all of them resulting in the production of a sofa of perfectly conventional appearance without the slightest suggestion of a bed when in sofa position and capable of any degree of ornamentation, while without moving the body or stationary part of the structure away from the wall and by simply lifting the lid or cover 16 the top of the back may be grasped and the back and folding frame thrown down on the seat, simultaneously lowering and projecting the seat. The final operation of transforming the structure into a bed consists simply in turning over the foot section of the folding frame, the legs 48 automatically swinging out and being locked in position. To restore the structure to sofa adjustment, the operation is simply reversed, the foot section of the folding frame being thrown back upon the head section and the back and folding frame being rocked up on the pivots 45, whereupon by the combined action of the slideway 44 and guides 17 and 18 the parts are returned to the position shown in Fig. 2, and compressed tightly together by reason of the inclination of the guides 18. It is further pointed out that the guides 18 at this time serve to hold the seat section and the head section of the folding frame from swinging outward. They also serve to position the seat section properly and cause it to match with the other ornamented parts of the structure. The bed clothes and pillows may be folded in with the mattress or disposed of in any way desired.

Having thus described my invention what I claim as new and desire to secure by Letters Patent of the United States is:

1. A sofa-bed having in combination, a main or stationary section, a slidable seat-section and a movable back-section, a foldable section comprising head and foot-members hinged together and pivotal connections between the head-member and the back-section, whereby said back section may be folded down upon the seat and the head member moved forward and downward upon the back-section.

2. A sofa-bed having in combination, a main or stationary section, a movable seat and back-section, a foldable section comprising a head-member and a foot-member hinged together, pivot-connections between the head-member and the back-section, and connections between the side-walls of the main or stationary section and the head-member, whereby the back-section and said head-member may be folded down upon the seat.

3. A sofa-bed having in combination, a main or stationary section, a movable seat and back-section, a supplmentary foldable section comprising a head-member and a foot-member hinged together, a mattress supported upon the foldable section, pivotal connections between the head-member and the seat-back to permit the simultaneous forward and downward movement of said head-member and seat-back, connections between the side-walls of the main or stationary section and the head-member, and means for tightening the mattress when in extended position.

4. A sofa-bed having in combination, a main or stationary section, a movable seat and back-section, and a supplementary foldable section composed of a head-member and a foot-member hinged together, a mattress supported upon the foldable section, pivot-connections between the head-member and the seat-back, extension-rods connected to the mattress-head, and links connecting said rods with the foot-member, whereby the mattress may be tightened when in open position.

5. A sofa-bed having in combination, a main or stationary section, a movable seat and back-section, a supplementary foldable section composed of a head-member and a foot-member hinged together, pivot-connections between the head-member and the seat-back, connections between the side-walls of the main or stationary section and the head-member, a mattress supported upon the foldable section, means for stretching the mattress to tighten the same, and springs for sustaining the middle portion of the mattress out of contact with the seat-back.

6. A sofa-bed having in combination, a main or stationary section, a movable seat and back-section, a supplementary foldable section composed of hinged head and foot members, said movable seat and back-section adapted to support the foldable section when said supplementary foldable section is in extended position, pivot-connections between the head-member and the seat-back, connections between the side walls of the stationary section and the head-member, whereby the seat and back-section and the connected ends of the foldable section are capable of being moved forward and downward and the other ends of said foldable section rearward and upward.

7. A sofa-bed having in combination, a main or stationary section, a movable seat and back-section, a supplementary foldable section comprising hinged head and foot-members, a mattress supported upon the foldable section, rods or bars fastened to the head-member, links pivoted to the foot-member and to the rods or bars, whereby the mattress, when in extended position, may be stretched to tighten the same, pivot-connections between the head-member and the back, connections between the side walls of the stationary section, whereby the seat and back section and the connected ends of the foldable section are capable of a forward and downward movement, and fulcrum pins upon which the links connecting the bars to the foot-section are adapted to operate in lowering or raising the foldable section.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FREDERICK BENNETT.

Witnesses:
B. BIGGE,
F. C. MARTIN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."