C. J. KINDEL.

SOFA BED.

APPLICATION FILED JAN. 2, 1912.

1,270,741.

Patented June 25, 1918.

3 SHEETS—SHEET 1.

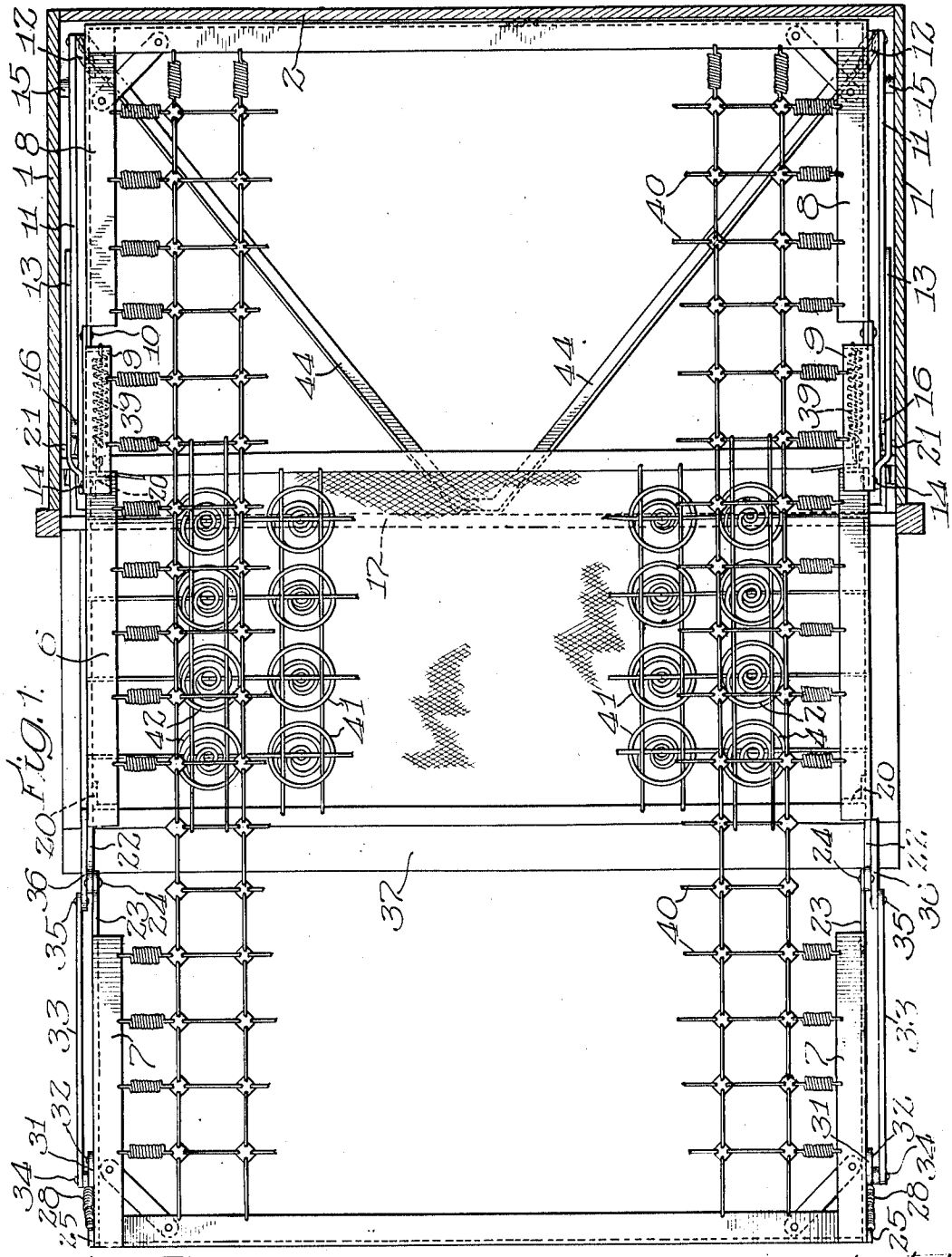


FIG. 1.

Witnesses:
G. W. Duarus Jr.
R. Burkhardt.

Inventor:
Charles J. Kindel
By Jones Addington Ames & Seibold
Attys

C. J. KINDEL.

SOFA BED.

APPLICATION FILED JAN. 2, 1912.

1,270,741.

Patented June 25, 1918.

3 SHEETS—SHEET 2.

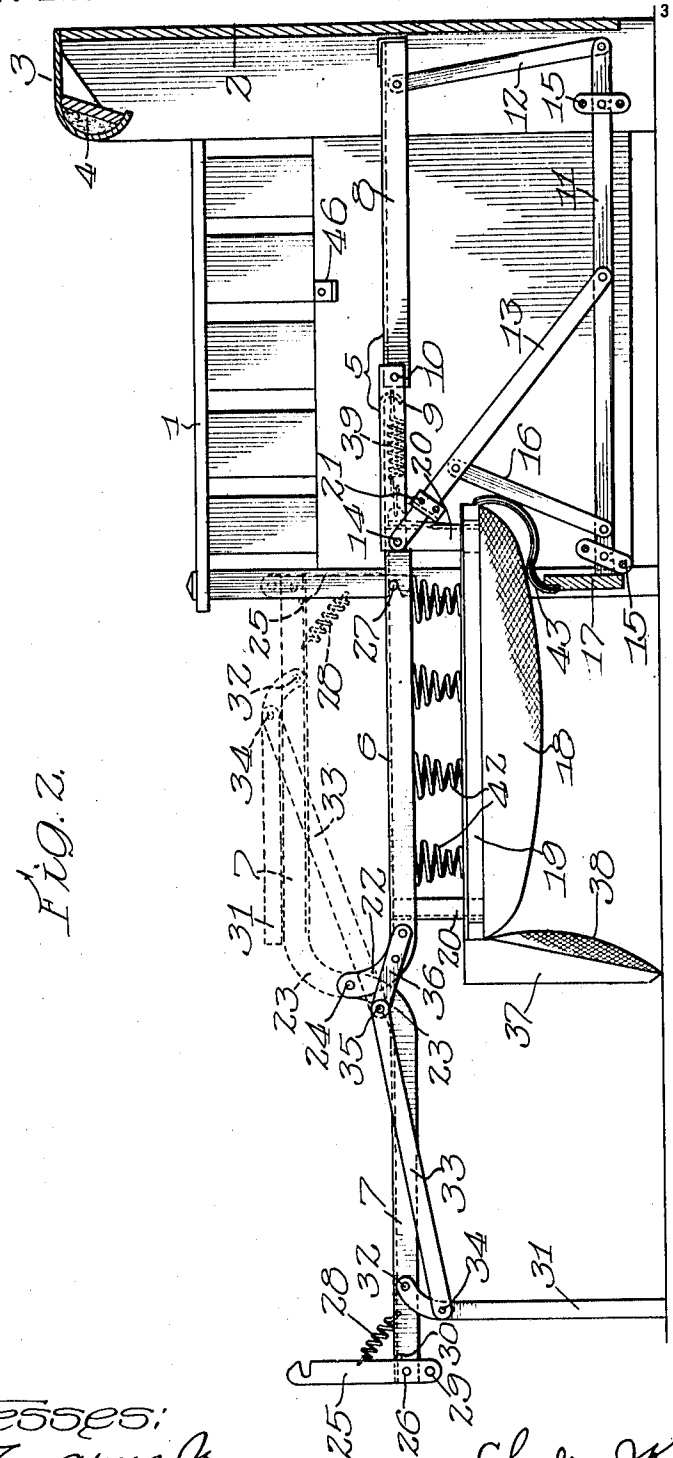


FIG. 2.

Witnesses:
G. W. Edwards Jr.
R. Burkhardt.

Inventor
Charles J. Kindel
By Jones Addington Ames & Seibold
Attys.

C. J. KINDEL.

SOFA BED.

APPLICATION FILED JAN. 2, 1912.

1,270,741.

Patented June 25, 1918.

3 SHEETS—SHEET 3.

Fig. 3.

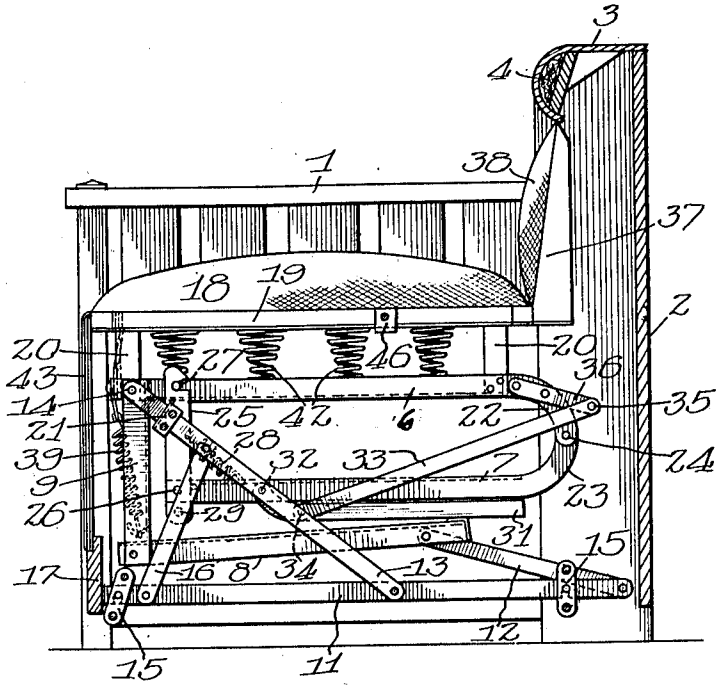
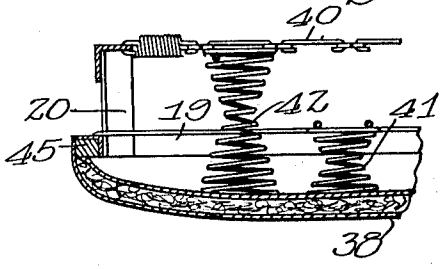


Fig. 4.



Witnesses:
G. W. Romaris Jr.
R. Burkhardt.

Inventor
Charles J. Kindel
By Jones Addington Ames & Seibold
Attys

UNITED STATES PATENT OFFICE.

CHARLES J. KINDEL, OF WILMETTE, ILLINOIS, ASSIGNOR TO GRAND RAPIDS TRUST COMPANY, OF GRAND RAPIDS, MICHIGAN.

SOFA-BED.

1,270,741. Specification of Letters Patent. Patented June 25, 1918.

Application filed January 2, 1912. Serial No. 668,946.

To all whom it may concern:

Be it known that I, CHARLES J. KINDEL, a citizen of the United States, residing at Wilmette, in the county of Cook and State of Illinois, have invented new and useful Improvements in Sofa-Beds, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

This invention relates to improvements in sofa-beds, and more particularly to that class thereof employing a plurality (more than two) bed-frames in its mattress-support.

The principal objects in view are to construct, in a bed of this class, a mattress-support wherein the bed-frames composing the same are so relatively arranged, as well as connected, that when folded they are adapted to be stored in the sofa-bed frame and below the seat thereof and when unfolded they combine to constitute a continuous practically unbroken mattress-supporting surface, and wherein, in both the operation of folding and unfolding, the plurality of frames composing the bed are successively operated and continuously in the same direction; furthermore to provide in a sofa-bed suitable supports for the several frames composing the mattress-support or bed while extended into bed-form as well as when folded and stored, as well as means for locking the outer frames together during a manipulation thereof either in the act of closing or unclosing or folding, and also means for properly and relatively spacing the frames apart when folded whereby the mattress and bedding too, if desired, may be folded and stored with the bed-frames below the seat of the sofa.

Other objects and advantages of the invention will hereinafter appear, and the novel features thereof will be particularly pointed out in the claims.

Referring to the drawings:

Figure 1 is a plan view, partly in section, and with parts broken away, of a sofa-bed embodying my invention.

Fig. 2 is an end-elevation of the same, the sofa-end removed, and the mattress-support opened and in position for use as a bed; the mattress-support also being shown partly folded by dotted lines;

Fig. 3 is a view similar to Fig. 1, the mattress-support being shown completely folded and stored within the sofa-frame;

Fig. 4 is an enlarged detail sectional-view hereafter referred to.

Similar numerals of reference indicate similar parts in all the figures of the drawings.

Referring to the drawings more in detail and for the purpose of describing a practical embodiment of the invention, it will be seen that I employ a conventional form of sofa-frame, wherein are embraced a pair of sofa-ends 1, and a connecting back-board 2, the latter, as is usual, extending above the ends, and in this design of sofa-bed, terminating above the ends in an upholstered section 4 and constituting a convenient head-rest, and when the sofa-back is in position for use as such, a part of the same. To bring the head-rest to a proper position, the same may be supported at the front of a ledge 3, extending forwardly from the back-board 2 of the frame.

The mattress-support, and with this my invention principally has to do, comprises, in the form illustrated, three bed-frames pivotally connected in series and so that they will both fold and unfold with respect to each other successively as well as continuously in the same direction; and so that, further, when unfolded or open, there will be presented a practically unbroken mattress-support at a proper elevation for convenient use as a bed, and when folded the frames will be compactly and relatively arranged, whereby, not only are they all stored within the sofa-bed frame below the seat, but are also locked together, certain of them, to facilitate manipulation, and are relatively positioned so as to permit of the bedding being folded and stored therewith.

The mattress-support comprises, in the present embodiment of the invention, three bed-frames, designated as 5, 6 and 7, or, in other words, the main, the intermediate, and the foot-frames. The main-frame 5 is arranged within the sofa-bed frame, and is formed sectionally, comprising bars 8 and 9, pivotally connected, as shown at 10, and is supported from bars 11, removably arranged in and adjacent the bottom of the sofa-frame, in any desired manner, so that

said frame 5 may be adjusted or folded with respect thereto. For this purpose, a pair of rear links 12, may be pivotally connected at the rear ends of the bars 11, and also with the frame-bars 8, near the rear ends of the latter, and a pair of front links 13, are connected with the bars 11, near their front ends, and pivotally connected with the frame-bars 9, at their front ends, as indicated at 14. The bars 11 may be supported in position by suitable lugs or castings 15, secured to the sofa-ends 1, and inclined braces 16, may be pivotally connected at their ends to the bars 11 and the links 13, for reinforcing and bracing the latter.

A front-board 17, may be arranged at the base and front of the sofa-frame to partly close the same and thus conceal the parts in rear thereof.

The intermediate bed-frame 6, is pivotally connected with the frame-bars 9, of the frame 5, as at 14, and, in the present design of sofa-bed, constitutes a support for the sofa-seat 18, the frame 19, of the latter, being supported some distance therefrom, by means of rigid standards 20.

If desired, the links 13, may be additionally supported at their upper ends, by clips 21, secured to the inner sides of the sofa-ends.

The side frame-bars of the intermediate frame 6, are preferably curved upwardly (when the parts are unfolded as in Fig. 2) or made quadrant-shaped, as indicated at 22, and the adjacent ends of the side frame-bars of the outermost or foot-frame 7, are similarly disposed, as at 23, the curved ends of these two sets of side or frame-bars being pivoted together, as at 24.

The outermost or foot-frame 7, is adapted to be folded rearwardly upon the middle-frame 6, against that side thereof opposite which the sofa-seat 18 is located, and one or more yielding latches, as, for instance, 25, may be pivotally connected intermediate their ends to the side frame-bars of the foot-frame 7, as at 26, and adapted to engage over suitable corresponding catches, as pins 27, projecting from the middle or intermediate frame 6, whereby, these two frames will become locked when folded to the position shown in Fig. 2, and thereafter may be turned or manipulated as one element. The latches may be controlled by springs 28, connected to the same above their pivot-points and to the side frame-bars of the frame 7, and said latches, below their pivot-points, or otherwise, if desired, may be connected by a rod 29, which will serve as a convenient handle for simultaneously operating the latches to disconnect the same from the catches when necessary. A stop-lug 30, may project from each of the frame-bars of the frame 7, whereby to maintain the latch at a suitable angle against its spring.

The outer or foot-frame 7, is, of course, intended to be supported upon suitable legs, the same being arranged to be folded out of the way when not in use. In the present instance, legs 31, are pivotally connected at the sides and near the outer end of the frame 7, as at 32, and these I arrange to automatically fold and unfold with respect to the foot-frame 7 and during the folding and unfolding movement of the same, by means of leg-operating links 33, pivotally connected to the respective legs, as at 34, and eccentrically with relation to the pivots 32, and also pivotally connected at their opposite ends, as at 35, to short links 36, carried by the intermediate frame 6. The pivots 35 are eccentrically located with relation to the pivots 24, so that when the frames 6 and 7 are folded into the position shown by dotted lines in Fig. 2, the legs 31 will he held against pivotal movement.

In the present instance, the sofa-seat 18 is provided with an upholstered back-section 37, the latter being rigid with the seat, and the former positioned as described with respect to the intermediate-frame 6, the upper or free edge of the back will, when the bed-frames are opened, serve as a support for the intermediate-frame 6. This back is so proportioned and designed with respect to the other parts having relation thereto, that when the parts are adjusted to sofa-form, as in Fig. 3, the free or the then upper edge of the back will pass below the adjacent edge of the head-rest 4, combining with it to form a conventionally appearing back for the sofa. The mattress-supporting bed-structure I have described, is not necessarily intended for use in connection with this style of sofa, that is, one wherein the seat and back turn and the latter constitutes a support for the intermediate-frame. To the contrary, I have merely suggested supporting the intermediate-frame by the sofa-back as one means that may be used, but it will be obvious that any other desired means may be substituted.

Helical springs 39, are disposed between the frames 5 and 6, connecting the rear ends of the frame-bars of the former with the front ends of the frame-bars 8 of the latter, such springs serving as a means for assisting in the unfolding operation of the structure, as is more fully described in my Patent No. 1,065,373.

A continuous elastic mattress-supporting surface 40, of any well-known woven-wire design, is secured in the usual manner to the frames 5, 6 and 7, such mattress-support being omitted in some figures of the drawing, for the purpose of clearness.

The sofa-seat may be provided with the usual springs 41, (see Fig. 4), and is adapted, when unfolded, to assume a position with respect to the remaining bed-frames at the

point where the greatest weight or strain usually occurs upon the wire fabric when the bed is occupied. In order, therefore, to more thoroughly and yet yieldingly reinforce the fabric at this point, a bank of doubly coiled springs 42, may be mounted to project beyond the ends of the springs 41 and the frame 19, so as to engage and support the wire fabric as clearly shown in Fig. 4.

A flexible apron 43, may be provided to form a closure at the front of the sofa-frame between the edge of the seat-frame and the top of the front-board 17, when the sofa is folded.

It will, of course, be understood, that the several bed-frames are rectangular in plan, and preferably constructed of angle-iron, the frame-bars thereof being so connected as to enable the frames to break joint in one direction only, all as is usual in this class of beds.

Moreover, the sofa-frame, in order to lend rigidity, may be suitably braced, as for instance, by diagonal braces 44. So also, may the seat-frame 19 be formed of angle-iron, within such frame being arranged the usual filler 45.

Assuming the parts to be in the position shown by full lines in Fig. 2, the bed is closed by the following operation: The foot-frame 7, is swung upward and rearward, whereby to bring it over and upon the intermediate or adjacent frame 6. During this movement of the foot-frame 7, the links 33 being held stationary at their inner pivoted ends and moving in an eccentric circle at their outer ends, will cause the legs 31 to move upon their pivots 32, into the position shown by dotted lines, Fig. 2, against the upper side of the frame 7. By this time, the latches 25 will have engaged automatically with the catches on the intermediate-frame 6, thus locking as well as spacing the two frames 7 and 6, so that thereafter they are capable of turning or being manipulated as one. The thus partly closed bed will, in the present construction, be partly supported by the inverted back. To continue the operation of closing the bed, the two frames 6 and 7 are swung upward and rearward and over upon the main-frame 5, during which operation the frame-bars 9 of the main-frame break joint with the frame-bars 8 thereof, and swinging downward upon their pivots 10, assume substantially a vertical position. This movement of the frame 6 will be against the tension of the helical springs 39, which tension may be later utilized to aid in the subsequent unfolding operation of the bed. As the frame-bars 9 assume the vertical position mentioned, the main-frame 5, together with the frames 6 and 7, will lower to and within the base of the sofa-frame and at a point near the bottom thereof, the rear supporting-links 12 swinging forward and downward at their upper ends and thus permitting the lowering of the bed-structure and serving to guide the same during such movement. By the time this point of the closing operation has been reached, the upholstered seat will have become reversed and occupy its normal position upon the upper side of the frame 6, which, as will be seen, will now be uppermost in the series. As will be perfectly obvious, a reversal of this operation will again adjust the sofa-bed in bed-form. The mattress, it will be observed, opens, closes and folds with the bed-frames and is stored therewith in the base of the sofa-bed frame.

Both during the folding and unfolding operation of the mattress-support, it will be seen that the bed-frames are not only successively operated, but also, are continuously operated or moved in the same direction, and as a result of this successive as well as continuous operation of the frames in the same direction, when the frames are folded and occupy their stored position in the base of the sofa-bed, the main-frame, or a part thereof, is at the bottom, the intermediate-frame is at the top, and the foot-frame is spaced from and in between these two, this forming, so far as I am aware, a new and distinctive type of sofa-bed.

Having described my invention, what I claim, is:

1. The combination, with a sofa-bed frame, of opposite fixed supports at the front of the same, a mattress-support comprising a main-frame formed in two rigid pivotally connected sections the front one of which is pivoted at opposite sides to the said fixed supports, whereby it is adapted to assume a vertical position and its companion section a horizontal position within the base of the sofa-bed frame, a foot-frame, an intermediate-frame, means for pivotally connecting said frames and the front section of the folding main-frame at their meeting-edges, whereby they are adapted to fold one upon the other within the base of the sofa-bed frame and to unfold into bed-form both successively and continuously in the same direction, and a movable means within the base of the sofa-bed frame for supporting the sectional main-frame when elevated and for guiding the same into and out of said base when the bed is folded and unfolded.

2. The combination, with a sofa-bed frame, of opposite fixed supports, a folding mattress-support adapted to fold within the base of the sofa-bed frame, and comprising a rear main-frame formed of two rigid sections hinged together and adapted to fold within the base of the sofa-bed frame and at an angle to each other, the front section of the main-frame being pivoted to said fixed supports, an intermediate-frame pivotally connected at its rear edge to the adjacent

edge of the front section of the rear main-frame, and a foot-frame pivotally connected to the outer edge of said intermediate-frame at a point above the horizontal plane of these two frames, whereby, when said foot-frame is folded over the intermediate-frame, it will be spaced therefrom, and whereby, when these two frames are folded over the main-frame, the said foot-frame will be positioned between the latter frame and the intermediate-frame, and means within the base of the sofa-bed frame for guiding, elevating, and supporting the said frames of the mattress-support.

3. The combination, with a sofa-bed frame, supporting-means at the opposite sides of the said frame, a folding mattress-support adapted to fold within the base of the sofa-bed frame and comprising a rear main-frame composed of two rigid pivotally connected sections the front section of which is pivoted to the said opposite supporting-means, the two sections being adapted to fold at an angle to each other within said base, an intermediate frame foldably connected at its rear edge to the front edge of the outer section of the main-frame, a foot-frame foldably connected to the outer edge of the intermediate-frame, whereby said main-frame, intermediate-frame, and foot-frame are adapted to open and close successively and continuously in the same direction, and whereby, when folded, the foot-frame will lie between the rear main-frame and the intermediate-frame and the said main-frame will be positioned at the bottom of the series, and a pair of levers pivoted in the base of the sofa-frame and to the rear section of the main-frame and adapted to guide the latter and its companions when opening and closing and to support said main-frame when elevated.

4. In a sofa-bed, the combination with the sofa-frame, of a folding mattress-support vertically movable therein, said mattress-support comprising a rear main-frame formed in sections adapted to fold at an angle to each other, an intermediate-frame foldably connected at its rear edge to the free edge of the outer section of the main-frame, and a foot-frame loosely connected to the outer edge of the intermediate-frame at a point above the horizontal plane of these two frames, whereby, when said foot-frame is folded over and upon the intermediate-frame it will be spaced therefrom and when these two frames are folded over and upon the main-frame the foot-frame will be positioned between the latter frame and the intermediate-frame, and a latch pivoted upon the foot-frame and disposed at an angle thereto and adapted to engage a catch on the intermediate-frame, whereby the foot-frame becomes rigidly held in spaced relation with the intermediate-frame.

5. In a sofa-bed, the combination with a sofa-frame, of a folding mattress-support comprising a series of frames, the meeting-ends of the two side-bars of the two outermost frames, when the latter are in bed-form, being upwardly disposed and pivoted together at a point above the plane of the bed, whereby the outer frame may be folded over and above the adjacent frame, and means for automatically locking the two frames together in their folded and spaced apart relation.

6. In a sofa-bed, the combination with the sofa-frame, of a folding mattress-support comprising frames, the meeting-ends of the side-bars of the two outermost frames, when the same are in bed-form, being upwardly disposed and pivoted together at a point above the plane of the bed, whereby the outer frame may be folded over and above the companion frame, and spring catches pivoted on the free end of the outer frame and disposed at an angle thereto and adapted to automatically engage the companion frame when the frames are thus folded and lock the frames in their folded spaced apart relation.

7. In a sofa-bed, the combination with the sofa-frame, of a folding mattress-support comprising frames, the meeting-ends of the side-bars of the two outermost frames, when the frames are in bed-form, being upwardly disposed and pivoted together at a point above the plane of the bed, whereby, the outer frame may be folded over and above the innermost of the two frames, means for locking the two frames in their folded and spaced apart relation, legs pivoted to the sides of the outermost frame, links connected to the legs below the outermost frame, and means for pivotally connecting the rear ends of the links in advance of and below the pivotal points of the two frames, whereby when the outermost frame is folded rearward upon the innermost frame, the legs will automatically fold over and upon the upper side of the outermost frame.

8. The combination, with a sofa-bed frame, of a mattress-support, comprising a main, a foot, and an intermediate-frame, means for connecting said frames whereby they are adapted to fold one upon the other and to fold into bed-form successively and continuously in the same direction, and whereby, when so folded, the foot-frame will be positioned between the main and intermediate-frames, and a combined seat and back mounted on the upper side of the intermediate-frame when folded and reversed when said frame is open whereby the said back serves as a support for said frame.

9. The combination of foldable bed-sections, a catch secured to one of the sections and having a stop, a pin located on another of the sections coacting with the catch and

stop to maintain the sections when folded in spaced relation with respect to each other, and a spring continuously operating in a manner tending to maintain the catch and pin in engagement while the sections are folded.

In witness whereof, I have hereunto subscribed my name in the presence of two witnesses.

CHARLES J. KINDEL.

Witnesses:
F. H. DRURY,
MABEL REYNOLDS.