

H. D. BARTLETT.

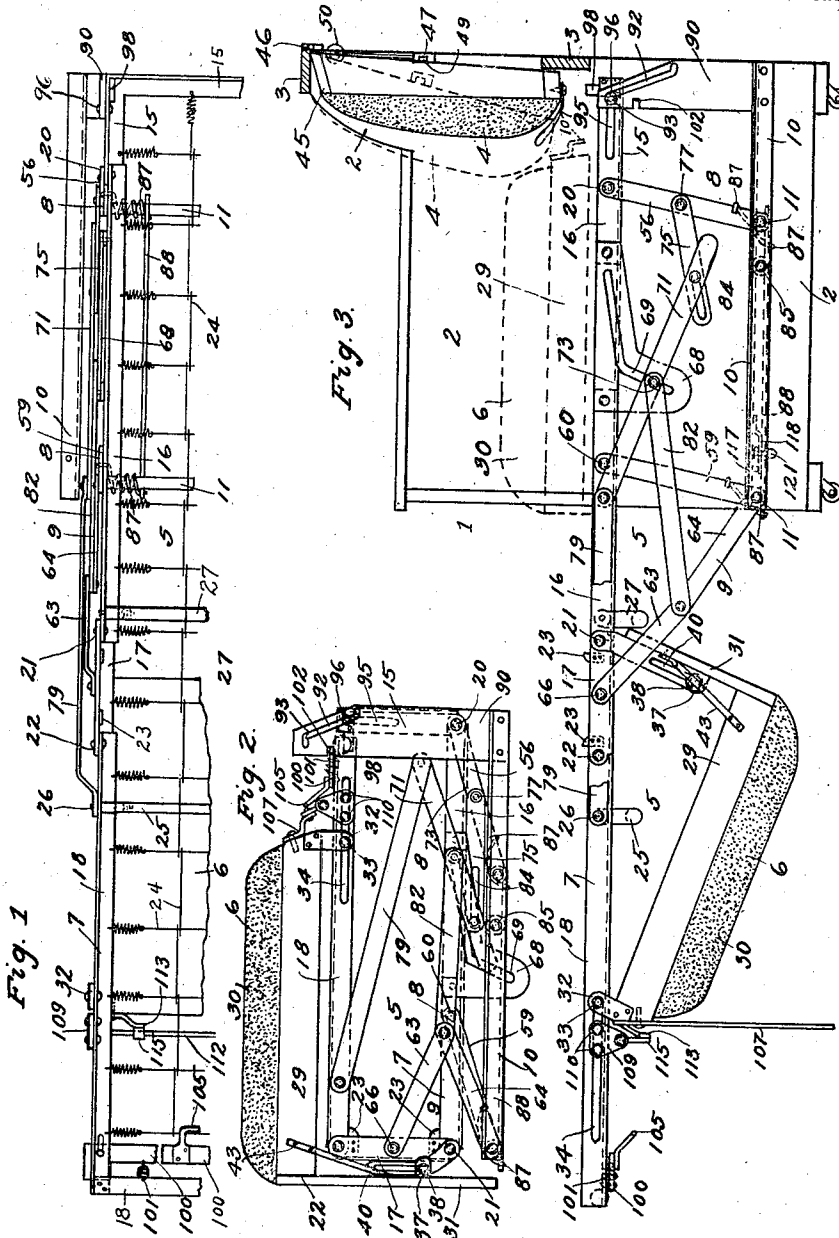
SOFA BED.

APPLICATION FILED MAY 24, 1915.

1,296,612.

Patented Mar. 11, 1919.

3 SHEETS—SHEET 1.



Witness

Walker J. Stone

F. M. Davis.

Inventor

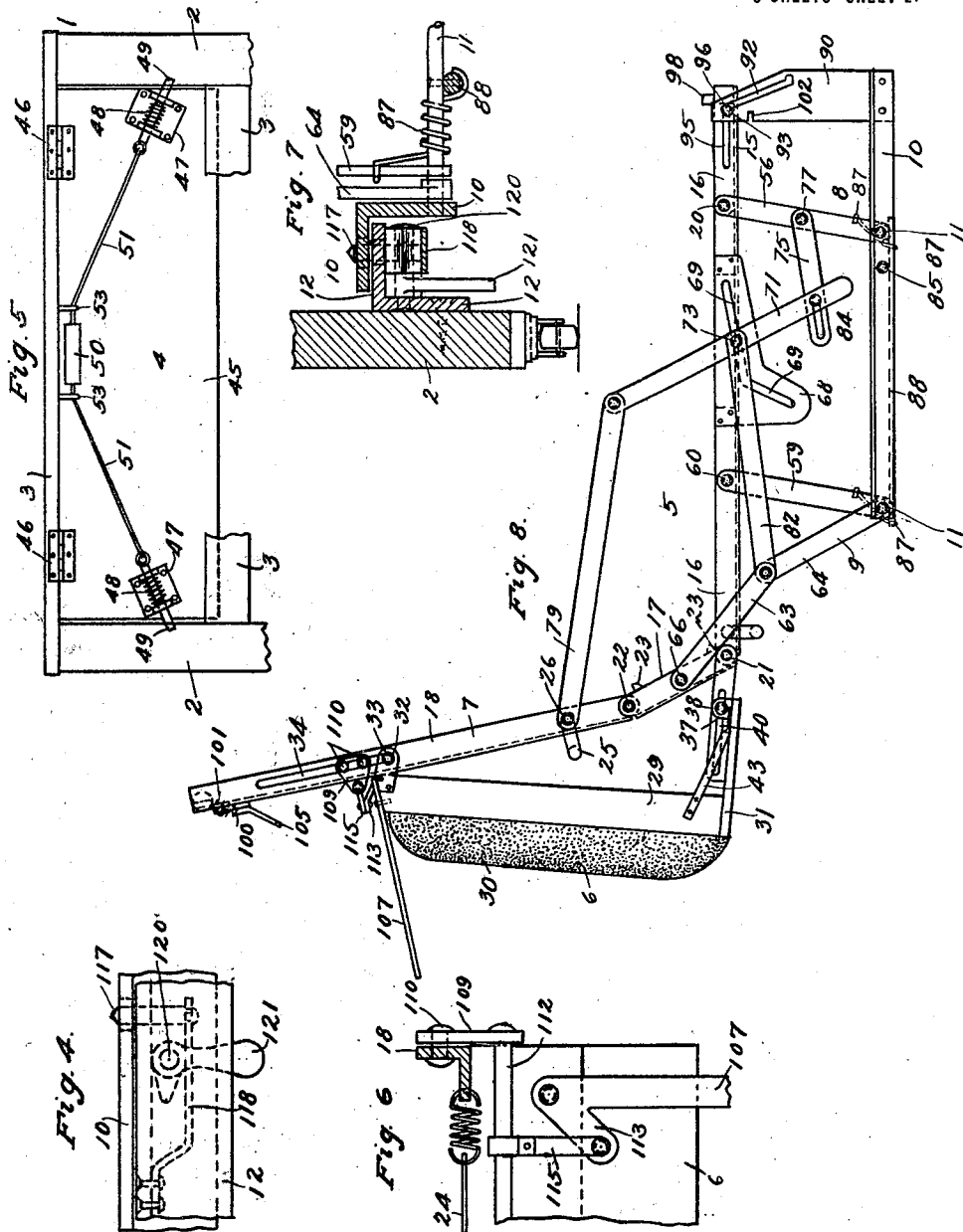
Harry D. Bartlett

By Hummel & Hummel,
Atty's.

H. D. BARTLETT.
SOFA BED.
APPLICATION FILED MAY 24, 1915.

1,296,612.

Patented Mar. 11, 1919.
3 SHEETS—SHEET 2.

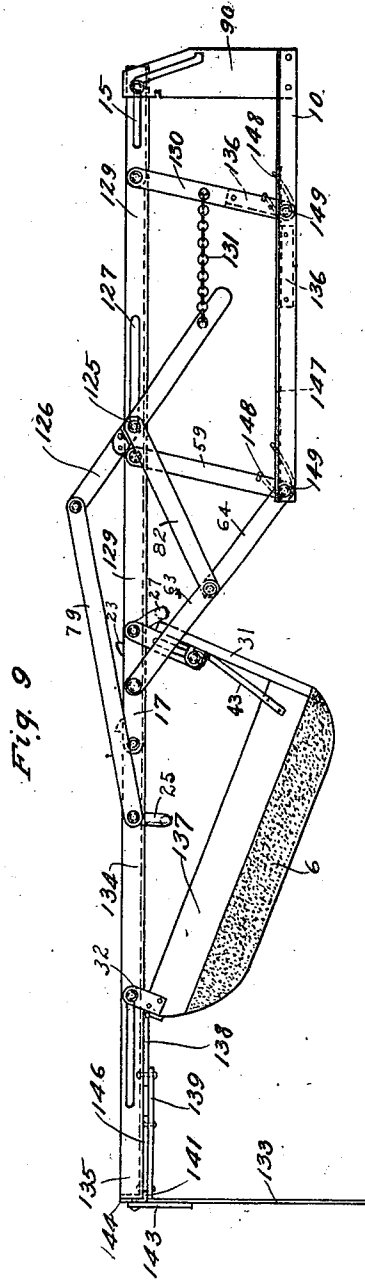
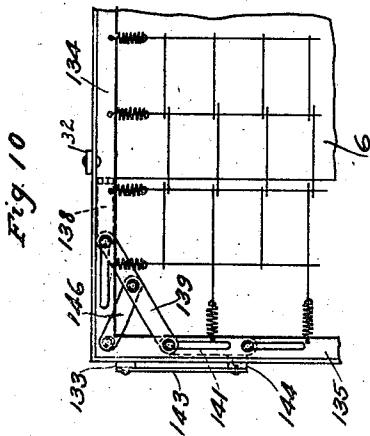
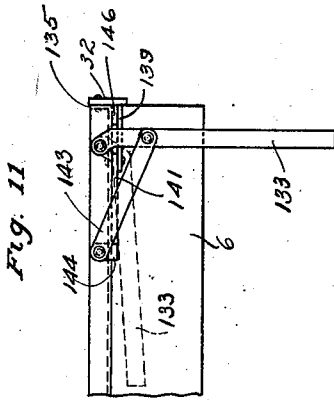


Witnesses:
Walter S. Stone
F. M. Davis.

Inventor:
Harry D. Bartlett,
By *Rumpler & Rumpler*
Attys.

1,296,612.

Patented Mar. 11, 1919.
3 SHEETS—SHEET 3.



Witnesses:

Walter F. Stone
F. M. Davis

Inventor
Harry D. Bartlett,
By *Sumner & Sumner*,
Attys

UNITED STATES PATENT OFFICE.

HARRY D. BARTLETT, OF DELAVAN, WISCONSIN, ASSIGNOR TO PULLMAN COUCH COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

SOFA-BED.

1,296,612.

Specification of Letters Patent.

Patented Mar. 11, 1919.

Application filed May 24, 1915. Serial No. 30,074.

To all whom it may concern:

Be it known that I, HARRY D. BARTLETT, a citizen of the United States of America, and a resident of Delavan, county of Walworth, and State of Wisconsin, have invented certain new and useful Improvements in Sofa-Beds, of which the following is a specification.

This invention relates to convertible furniture of the class in which a foldable bed bottom is concealed normally in retracted position, and in which the bed member is movable extensibly by one motion to its bed position.

The main objects of the invention are to provide an improved form of sofa bed of the character stated, in which a full length bed bottom, extensible crosswise of the sofa frame, may be folded beneath the seat in such manner as to carry the bedding in made-up form; to provide such a device in which the bed bottom and seat are combined for folding compactly and locking in a unitary manner for demounting from the sofa frame; to provide a foldable device of the character stated adapted for mounting in a frame of substantially the usual shape and size; to provide a bed bottom which when folded forms a storage receptacle of greater size than usual in sofa beds, and is adapted to accommodate a mattress of the usual thickness, together with all bedding required in a made-up bed; to provide a bed bottom which when folded incloses the bedding on the top, bottom, rear and front sides; to provide improved automatic leg folding means, and to provide a sofa bed having the foregoing features which is so balanced mechanically as to be easily operatable with one hand.

Illustrative embodiments of this invention are shown in the accompanying drawings in which—

Figure 1 is a plan showing one side of the device in its bed position.

Fig. 2 is a side view of the bed bottom and seat in their sofa position but removed from the sofa frame.

Fig. 3 is a side view of the device in its bed position with the rear end of the sofa frame removed.

Fig. 4 is an enlarged fragmentary view of the lock for securing the demountable mem-

ber in the sofa frame, the frame end being removed.

Fig. 5 is a rear view of the sofa back.

Fig. 6 is an enlarged fragmentary end view of the automatic leg control mechanism with the leg extended.

Fig. 7 is an enlarged cross-section of the lock for securing the demountable member in place on the sofa frame.

Fig. 8 is a side view of the coacting bed bottom and seat removed from the sofa frame and swung part way to their bed position.

Fig. 9 is a side view of a modified form of the demountable member removed from the sofa frame.

Fig. 10 is a plan of one corner of the foot section showing a modified form of automatic leg control means.

Fig. 11 is a fragmentary end view of the foot section showing a front elevation of the modified form of leg control means.

In the construction shown in Figs. 1 to 8 inclusive, the device comprises a sofa frame 1 having ends 2 and connecting members 3, in combination with a back 4 and a demountable member 5 including a seat 6, a foldable bed bottom 7, and supporting means 8. The back 4 is mounted turnably on the frame 1 for swinging rearwardly so as to make head room for the bed when the device is unfolded. Said supporting means 8 comprises lifting mechanism 9 and a frame having side bars 10 to which said mechanism is attached and cross bars 11 holding said bars in spaced relation. The seat 6 is carried by the bed bottom 7. Bars 12 are attached to the frame ends 2 for coaction with said bars 10, to support the member 5 demountably.

The bed bottom comprises a series of sections, preferably four, arranged to fold to inclose the bedding on its top, bottom, front and rear sides, and includes a short head section 13, a main section 16, a connecting section 17 and a foot section 18 connected turnably at their adjacent edges respectively, as at 20, 21 and 22. The bed bottom joints for section 17 are formed to limit the opening to 180 degrees, said joints in this respect being of the nature of rule joints. The head section joint is preferably formed likewise. The joints 21 and 22 are formed

to limit closing to about 90 degrees, for which purpose shoulders 23 may be provided as illustrated in Figs. 2 and 3. The bed bottom includes a continuous yielding fab-

24, as for instance woven wire or the like, attached to the frame members of the sections, as illustrated in Fig. 1. A spacing bar 25 is provided for the foot section and is pivoted thereto near the joint 22 but preferably spaced therefrom as at 26. Another spacing bar 27 is provided for the main section 16 and is preferably located at the joint 21. Said spacing bars are bent to give clearance for the bed spring 24.

The seat member 6 comprises a frame 29 formed to give clearance for the bed spring, and upholstered part 30 and a front panel 31 substantially integral and rigid with the frame 29. The rear part of the seat is mounted slidably on the foot section as by means of a bracket 32 having a shoulder 33 formed to coact with a longitudinal slot 34 in the side rail of the foot section. The front of the seat is secured to the bed bottom by means of a bracket 37 on the lower part of panel 31, which bracket is provided with a shoulder 38 arranged to coact with a slotted link 40 pivoted to the bed bottom, preferably at the joint 21. A brace 43 is secured at its ends to the seat frame and the lower part of said panel 31.

The back 4 comprises a frame 45 with upholstery thereon, said frame being swingably connected to the upper part of the sofa frame, as by means of hinges 46 secured to the top cross bar 3, the lower part of the back being swung forward normally to its sofa position where held by lock means or latches 47. Upon releasing said latches the back is swung by gravity to a retracted position so as to increase the head room for the bed. Said latches 47 are of an automatic character, preferably having springs 48 normally urging a plunger 49 carried on the back into engagement with one of the frame ends 2 formed to receive the same when the back is swung forward. When retracted the lower part of the back may rest against one of the cross members 3. Manual means are provided for retracting the plungers, as for instance a handle 50 adjacent to the upper edge of the back and connected to each of said plungers, as by means of a cord or chain 51 held in guides 53.

The mechanism for swinging the bed sections from one position to the other consists mainly of links and levers disposed in like manner on each side of the bed. The main section 16 is carried by legs or links front and rear on each side. Each rear link 56 is pivoted at its lower end to a medial part of the bar 10 adjacent to its rear end, as at the point where the rear cross-bar 11 is attached. The upper end of link 56 is

pivoted to the main section at or adjacent to the joint 20. The front link 59 is pivoted at its upper end to the medial part of the main section, as at 60, adjacent to its front edge, and at its lower end to the front part of the bar 10, as at the point where the front cross bar 11 is connected.

Toggle links 63 and 64 are provided, one pair on each side of the bed bottom, one of the toggle links being turnably connected to an intermediate part of the connecting section as at 66, and the other to the front part of the bar 10, preferably at 11. Guide means are provided on each end of the main section 16, preferably in the form of plates 68 each having a cam slot 69.

An operating lever 71 has a shoulder 73 intermediately of its ends formed for coaction with said guide, said shoulder preferably being in the form of a headed pivot or stud, fitting in said cam slot 69. The lower end of the operating lever is connected by means of a link 75 to a medial part of the rear link 56, as at 77, and the upper end is connected by a link 79 to a medial part of the foot section adjacent to its rear edge, preferably at 26.

A toggle actuating link 82 has one end connected to the coacting ends of said toggle links, and the other end to a medial part of the operating lever, preferably at the point where the cam-engaging shoulder 73 is located.

The link 75 has a longitudinal slot 84 at one end so as to provide for limited independent movement of the operating lever with respect thereto. Because of such freedom of movement the section joint 22 is the first to straighten in unfolding the bed, and is the first to fold in restoring to sofa form. The length of slot 84 determines the relative position of the foot section to the other sections in unfolding, and by adjusting the length and position of said slot when the device is made and assembled, the proper balancing of the movable parts may be provided for.

The lower end of the operating lever 71 extends beyond its connection with the balance lever 75, and coacts at times with a bearing shoulder, preferably in the form of a stationary roller 85 secured to the bar 10, said shoulder being effective during that part of the operation in which the bed bottom is nearly folded, as shown in Fig. 2, the link 75 at such time having no effect. Each cam plate 68 is secured at its ends to the side rail of the main section 16 and is spaced therefrom somewhat so as to provide clearance for the coacting shoulder 73 of the operating lever.

Yielding means are arranged for urging the bed bottom upward to its bed position, said means preferably comprising a set of four coiled springs 87 disposed upon the

cross bars 11 and having their ends hooked over the rear edges of the links 56 and 59 and around the bars 88 respectively, which are disposed crosswise of the bars 11, as shown in Figs. 1 and 8.

A rigid supporting member or cam leg 90 is provided on the rear end of each mounting bar 10 for guiding and supporting the rear part of the head section in folding and unfolding the bed bottom. Said cam leg is plate-like and is provided with a diagonal slot 92 terminating at the top with a horizontal shoulder 93 on which the head section rests in its bed position. Each side rail of the head section has a longitudinal slot at 95, and a pivot-like bolt or stud 96 slidable in said slots secures the head section to the cam legs in operative relation.

The member 15, preferably formed as a bed section, serves as a link connecting the main section 16 and the upright 90, and limits the forward swing of the bed bottom when raised to its bed position.

Stops means are provided on one of the end sections for arresting the folding movement of the bed bottom. Said means include shoulders 98 on the rear part of the head section. The stops 98 project forward so as to receive and support the foot rail when the device is folded.

An automatic lock is provided for securing the sections in folded relation, said lock comprising a sliding bar 100 disposed transversely of the foot section on its under side adjacent to the foot rail. Yielding means 101 urge the sliding bar into engagement with the uprights 90, each of which is provided with a shoulder 102 formed by cutting a notch in the adjacent edge of the plate constituting the upright. Said bar 100 is provided with a handle 105 arranged to be gripped by the operator for releasing the lock and for swinging the foot section to its bed position. Said bar slides downwardly against the adjacent edge of each upright 90, in folding the bed, so as to operate automatically for locking the sections together.

Automatic legs 107 support the seat 6 and foot section 18 in their bed position. The rear upper corner of the seat frame is beveled and the legs are pivoted thereto. Each leg is angled at its upper end and connections are provided for controlling the legs by the somewhat divergent movement of the beveled edge of the seat frame with respect to the foot section in folding the bed bottom, as shown in Fig. 3.

A lug 109 preferably in the form of a plate is provided on each side of the foot section for sliding longitudinally of the adjacent slot 34, said plate having shoulder means 110 to engage said slot. The plates 109 are connected by a cross bar 112 to which the short arm 113 on each leg is connected by means of a link 115 attached somewhat loosely to

the short arm of the leg. Said link is connected more or less loosely so as to accommodate the swinging of the leg as will be understood. In folding the bed the leg is pulled up into folded position by the link 70 115, while in unfolding the bed the leg is released and permitted to swing downward by gravity, assisted more or less by the action of said link.

The coacting rails 12 and 10 of the sofa 75 frame 1 and demountable part 5 respectively, are angular in shape each with one flange disposed vertically and the other disposed horizontally and resting slidably one upon the other as shown in Fig. 7. Locking means 80 are provided for securing the rails 10 in position, comprising a stud 117 carried by a yielding member preferably in the form of a leaf spring 118, the coacting rail flanges being perforated to register when assembled. 85 This lock is arranged for manual control to release the demountable part 5. Release means preferably in the form of a rotary cam 120 is provided with a handle 121 arranged for convenient turning by the operator to withdraw the stud 117.

In the construction shown in Figs. 9 to 11, a modified construction is shown in which the shoulder 125 on the operating lever 126 travels in a guide slot 127 in the side rail of 95 the main section 129 instead of in a cam guide such as shown in Fig. 3. In this instance the lower part of the operating lever is connected to the rear leg-link 130 by means of a chain 131, and the automatic legs 100 133 for the foot section 134 are secured directly to the foot rail 135. Guides 136 preferably in the form of angle bars are provided on the link 130 and bar 10 against which the lower end of the operating lever 126 reacts 105 at times, as when the bed begins to unfold. A series of links is provided, connecting each leg 133 with the adjacent part of the seat frame 137, whereby the longitudinal movement of the seat frame on the foot section 134 serves to control the legs. One of said links—138—is connected turnably to the adjacent edge of the seat frame, and the other end is guided by a slot in the side rail of the foot section. Pivoted to link 138 is a 115 diagonally disposed link 139 the outer end of which is guided by a slot in the foot rail. Another link, 141, to which link 139 is pivoted, is mounted slidably on the foot rail. A link 143 has one end pivoted to the adjacent leg 133 and the other to a bracket 144 on link 141.

The diagonal link 139 is further guided by a link 146 pivoted at one end to the medial part of link 139 and at its other end to the 125 corner part of the foot section.

In this instance the bars 147 for the lifting springs 148 are disposed on the upper side of the cross bars 149.

The operation of converting the device 130

from a sofa to a bed consists in first releasing the back by pulling on the handle 50, and then swinging the foot section upward and forward to its bed position by pulling on the handle 105, the lock for securing the section in folded relation being released automatically by the initial pull on the latter handle. The device is converted from a bed to a sofa by an operation substantially the reverse, consisting in lifting the foot section and swinging it backward and downward to its sofa position, and then restoring the back to its normal forward position.

The action of the different parts in unfolding the bed bottom, as illustrated in the preferred form, is substantially as follows: The initial turning of the foot section on its pivot 22 actuates the operating lever 71 by pulling on the link 79, and the operating lever in turning reacts against the roller 85 and by pushing on the link 82 tends to urge the toggle links into alinement. As the operation continues the shoulder 73 on the operating lever travels forward in the guide slot 69 and the leg-links 56 and 59 swing upwardly. As soon as the operating lever and the link 56 have swung through a sufficient angle to bring the link 75 into compression, the roller 85 becomes inoperative and lever 71 reacts against link 75 instead. When the bed bottom is entirely unfolded the toggle links swing somewhat past the point of alinement so as to lock and constitute a rigid support for the section 17. As the foot section swings downward to its bed position the seat swings away somewhat by gravity, the pivot 38 sliding to the lower end of the links 40, and the shoulder 33 sliding inward along the slot 34 of the foot section. As the sections unfold, the foot section 18 swings into alinement with section 17, after which the remaining sections swing into alinement. The head section rides upwardly between the cam legs 90, and the lower part swings forward, bringing the head section into alinement with the main section. As the seat swings to an angle with the foot section and slides away from the foot rail, the lugs 109 slide inwardly and the links 115 permit and assist the legs 107 to swing down to their supporting position.

In folding the bed bottom, the parts operate as follows: The foot section swings to an angle of 90 degrees with the adjacent section 17, and in so doing pushes the link 79 inward, thereby giving initial movement to the operating lever which swings so as to bring tension on the link 75. As the operation continues, the stud 73 travels rearwardly and the toggle links are retracted by tension of the bar 82. The rear part of the head section first slides backward somewhat and upward as the front part swings downward, and finally slides bodily downward to its folded upright position. As the

device folds, the seat swings downward and backward by gravity upon the folded sections. As the foot section swings into place the locking bar 100 enters the notches in the upright 90. The movement of the seat on the foot section causes the links 115 to pull up the legs 107 to their folded position across the beveled rear corner of the seat.

In the modified form the movement of the seat on the foot section in unfolding pulls the leg control links 138, 139 and 141 in such manner as to unfold the legs, and in folding the bed bottom the reverse movement pushes said links in such manner as to swing the legs upward against the foot rail.

Although but two specific embodiments of this invention are herein shown, it is to be understood that no attempt has been made to show specifically all useful embodiments, and that some of the details of the constructions shown may be altered or omitted without departing from the spirit of this invention, as defined by the following claims.

I claim:

1. In a device of the character described, a supporting frame, a bed bottom foldable with the bedding in made-up form to a substantially rectangular parallelogram shape mounted thereon comprising a pair of long sections disposed oppositely and spaced apart from each other, a short section connecting two adjacent edges of said long sections, another short section disposed oppositely from the connecting section and joined turnably to one of said long sections, means for locking said sections in folded relation including upright means on said frame overlapping the edges of said long sections adjacent to their divergently movable edges and embracing the last mentioned section when folded, and manually operatable means carried by one of said long sections for releasably engaging said overlapping means.

2. A sofa bed comprising a frame in combination with a foldable sectional bed bottom, a seat member carried by said bed bottom, a part of said seat being connected in slidable and turnable relation with one of the bed sections, folding legs carried by said seat, and connections for said legs operatable by the relative movement of said seat and said section for controlling said legs.

3. A sofa bed comprising a frame in combination with a foldable sectional bed bottom, a seat member carried by said bed bottom, a part of said seat being connected in slidable and turnable relation with one of the bed sections, folding legs carried by said seat, connections for said legs operatable by the relative movement of said seat and said section for controlling said legs, said connections comprising a pair of lugs movable longitudinally on the side rails of said sec-

tion, a bar disposed transversely of the bed bottom and carried by said lugs, and links connecting said legs respectively to said bar.

4. A device of the class described, comprising a foldable series of bed bottom sections in combination with a rigid frame, links turnably connected to said frame for swinging forwardly and upwardly one behind another at each side of said series, said series including a main section, and said links being turnably connected to said section adjacent to their free ends, and a member turnably connected to said section and a rigid part of said frame for positively limiting the forward swing of said links, which said member may serve also as a bed section.

5. A device of the class described comprising a foldable sectional bed bottom, in combination with a rigid frame, links turnably connected to said frame for swinging forwardly and upwardly one behind another at each side of the bed bottom, said bed bottom including a main section, and said links being turnably connected to said section adjacent to their free ends, one of said sections being turnably connected to said section and a rigid part of said frame for limiting the forward swing of said links, a toggle device connecting the next forwardly disposed section and said frame, a lever having a medial shoulder coacting slidably with said main section, a link connecting said lever and the adjacent ends of the toggle members, a link connecting one end of said lever and the foot section, and means limiting the movement of the other end of said lever.

6. A foldable sectional bed bottom, in combination with a frame having a horizontal part and an upright part adjacent to one edge, links for bodily swinging one of the sections upwardly from said horizontal part and away from said upright part, and another of the sections, adjoining said section, being disposed uprightly beside said upright part, and connecting means attached slidably to both said upright part and the upright section, said sections being swingable upwardly into alinement.

7. A foldable sectional bed bottom, in combination with a frame having a horizontal part and an upright part adjacent to one edge, links for bodily swinging one of the sections upwardly from said horizontal part and away from said upright part, and another of the sections, adjoining said section, being disposed uprightly beside said upright part, and connecting means attached slidably to both said upright part and the upright section, said sections being swingable upwardly into alinement, said upright part and the coacting section having longitudinal slots for the connecting means, the frame slot being inclined upwardly and forwardly.

8. In a sofa bed, a demountable member

comprising a rectangular frame having upright means at one edge, in combination with a sectional bed bottom foldable upon said frame, links connecting said frame and bed bottom arranged for swinging the latter to and from its bed position, a latch carried by one of the sections for securing the bed sections in folded relation, said upright means being notched to receive said latch, and yielding means urging said latch into engagement with the notched member when the bed bottom is folded.

9. In a device of the class described, a foldable sectional bed bottom, in combination with a frame, front and rear links connecting said frame and one of the bed sections, a lever having a medial part mounted slidably on said section, toggle links connecting said frame and another section adjacent to the first mentioned section, a link connecting the adjoining ends of said toggle links and a medial part of said lever, a link connecting one end of said lever and a third section adjacent to the second mentioned section, and bearing means for the opposite end of said lever.

10. In a device of the class described, a foldable sectional bed bottom, in combination with a frame, front and rear links connecting said frame and one of the bed sections, a lever having a medial part mounted slidably on said section, toggle links connecting said frame and another section adjacent to the first mentioned section, a link connecting the adjoining ends of said toggle links and a medial part of said lever, a link connecting one end of said lever and a third section adjacent to the second mentioned section, bearing means for the opposite end of said lever, said frame having an upright disposed at the other side of the first mentioned section from the second mentioned section, and said bed bottom including means connecting said upright and said first mentioned section.

11. In a device of the class described, a foldable sectional bed bottom, in combination with a frame, front and rear links connecting said frame and one of the bed sections, a lever having a medial part mounted slidably on said section, toggle links connecting said frame and another section adjacent to the first mentioned section, a link connecting the adjoining ends of said toggle links and a medial part of said lever, a link connecting one end of said lever and a third section adjacent to the second mentioned section, and a link turnably connected at its ends to a medial part of one of said rear links and to the opposite end of said lever respectively, one of the connections of the last mentioned link being slidable lengthwise thereof.

12. In a device of the class described, a foldable sectional bed bottom, in combination with a frame, front and rear links con-

necting said frame and one of the bed sections, a lever having a medial part mounted slidably on said section, toggle links connecting said frame and another section adjacent to the first mentioned section, a link
5 connecting the adjoining ends of said toggle links and a medial part of said lever, a link connecting one end of said lever and a third

section adjacent to the second mentioned section, and a bearing member on said frame 10 for the adjacent end of said lever, said bearing and the last mentioned link being operative together in unfolding the device.

Signed at Delavan this 21st day of May, 1915.

HARRY D. BARTLETT.