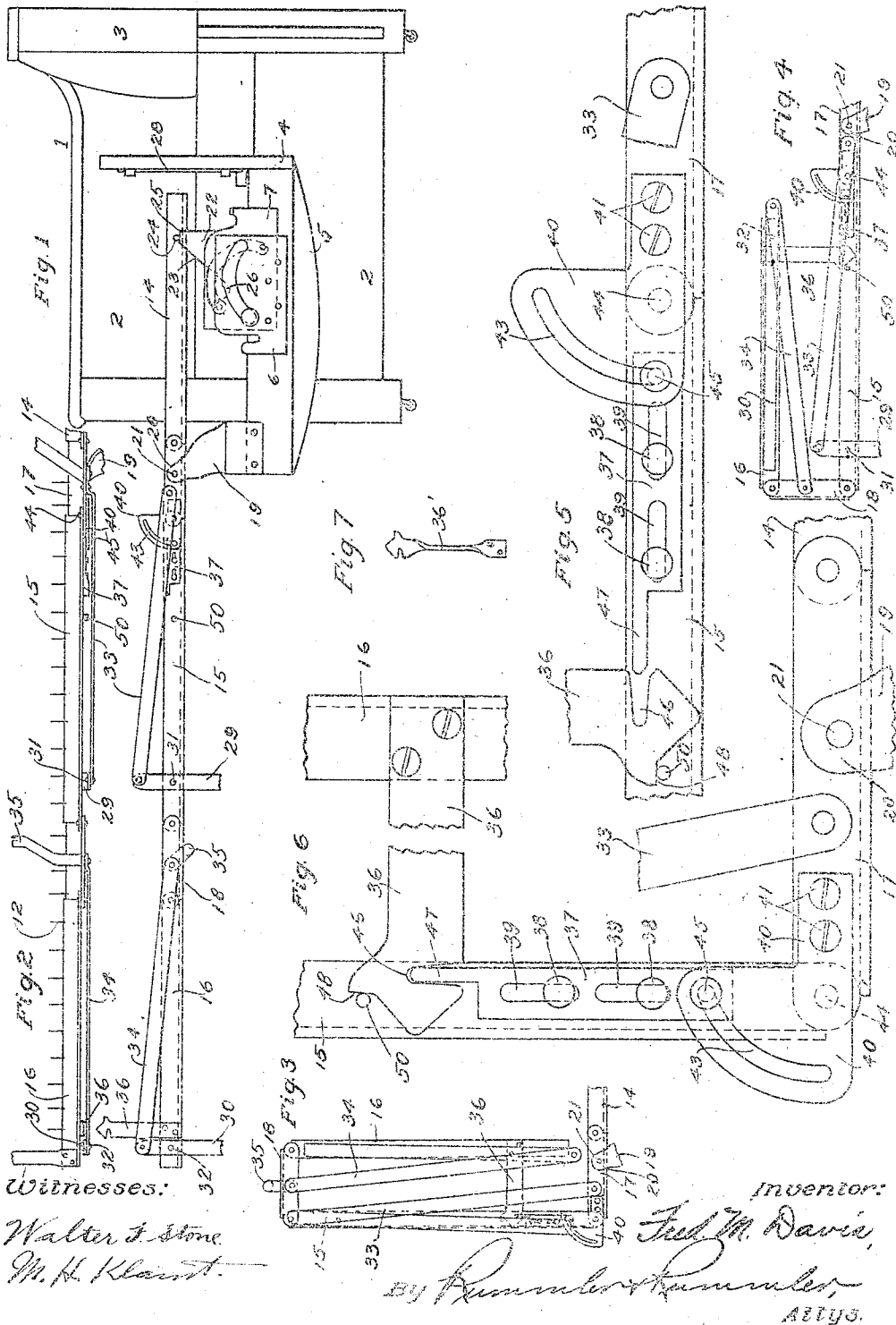


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SOFA BED.  
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# UNITED STATES PATENT OFFICE.

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## SOFA-BED.

1,120,911.

Specification of Letters Patent.

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*To all whom it may concern:*

Be it known that I, FRED M. DAVIS, a citizen of the United States of America, and a resident of Chicago, in the county of Cook and State of Illinois, 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 series of foldably related bed sections are arranged to unfold to form a bed, and more particularly to sofa beds in which means are provided for securing part of the sections in spaced folded relation while being unfolded or folded with respect to the remaining section or sections. Beds of this character have been made in different ways, usually with a three fold bed portion pivoted directly to the front of the sofa frame, or carried by a rotatably mounted hollow seat frame having a seat member for the sofa formed directly upon or carried by one side, and having the bed portion pivotally connected to and carried by the reverse side, the bed in either case being extensible transversely of the sofa and being foldable one section over another in the same direction for storage under the seat member when the bed is not in use.

The main objects of this invention are to provide an improved form of fastening means adapted for securing part of the sections in folded relation during the folding and unfolding of the remaining sections; to provide an improved form and arrangement of fastening means carried by a pair of sections and adapted for automatic operation by the relative turning movement of said sections, to secure and release another section in its folded position in folding and unfolding the bed respectively; and to provide cam means operatable automatically by the folding and unfolding of the bed sections for locking and unlocking some of said sections in spaced folded relation.

An illustrative embodiment of this invention is shown in the accompanying drawings, in which—

Figure 1 is a side elevation of a sofa bed with the bed sections unfolded and with the rear end of the sofa frame removed to show the details of the seat member and operating means associated therewith. Fig. 2 is a fragmentary plan view of a portion of the bed bottom extended, and shows the rela-

tive position of the leg folding and section locking members on one side of the bed. Fig. 3 is a side elevation of the foot and middle sections of the bed illustrating the first stage of the unfolding operation with the foot section locked in spaced folded relation upon the middle section and disposed in an upright position. Fig. 4 is a side view similar to Fig. 3 but illustrating the next stage of unfolding, the middle section being in its bed position with the foot section folded thereon, and the locking plunger being retracted. Fig. 5 is an enlarged fragmentary side elevation of the locking mechanism shown centrally on Fig. 1, the spacing latch being in position ready to receive the locking plunger. Fig. 6 is an enlarged fragmentary view of the locking mechanism in the position shown in Fig. 3. Fig. 7 is a side elevation of a latch member having its middle portion twisted ninety degrees from the plane of its ends.

In the construction shown in the drawings, the sofa bed comprises the usual housing or frame 1 having ends 2 and back 3 in combination with a rotary seat frame 4 operatively mounted between and supported by the ends 2. This seat frame on one side is adapted to serve as a seat 5, and the reverse side is formed as a hollow frame adapted and arranged to support the bed sections pivotally attached thereto for unfolding when the seat frame 4 is turned to its inverted position, as shown in Fig. 2. The connection of the seat frame 4 to the sofa frame 1 may comprise any of the means well known in the art, as plates 6 and 7 secured to the sofa ends 2 and seat frame 4 respectively and having pivotal relation.

The bed bottom 12 comprises three long sections 14, 15 and 16 and two short connecting sections 17 and 18 hinged together end to end in alternate position and adapted to be folded together upon the under side of and within the seat frame 4, with the long sections lying substantially horizontal and with the short sections disposed vertically.

Bed supporting brackets 19 are secured to the ends of the seat frame 4 adjacent to that edge of the seat frame which is in front when in the bed position. The outer and upper ends of these brackets are formed and adapted, as at 20, to receive the pivot members 21 carried by the side rails of the short

section 17 intermediate of their ends. Section 17 thus mounted is adapted to swing from a vertical storage position to a horizontal bed position. The head section 14 and the middle section 15 are hinged to the section 17 at opposite ends thereof, lower and upper respectively when folded.

The head section 14 is raised and lowered in horizontal position within the seat frame with the shifting of section 17 to and from its horizontal position respectively, by means of plates 22 located rearwardly of the brackets 19 and adjacent to the ends of the seat frame 4. Each plate 22 is formed with a rearwardly inclined forward surface 23 on which slide the studs or shoulders 24 secured to section 14, each of which surfaces 23 terminates at its upper end in a horizontal surface 25 on which the studs 24 rest when the section 14 is shifted to its elevated or bed position, and at its lower end terminates in a socket 26 which coacts with its respective stud 24 for securing section 14 in its lowered position.

Sections 16 and 18 are adapted to be folded with section 15 upon the seat frame with section 16 between sections 14 and 15. The head and middle sections may be of substantially the same length, but the foot section 16 is somewhat shorter so that it may be folded between the longer sections, the difference in length being substantially equal to the thickness of the mattress and usual bedding (not shown). The short sections 17 and 18 are also of different lengths, the difference being a little more than the thickness of the mattress and bedding. A locking bar 28 is carried by the frame 4 for securing the sections in complete folded relation.

The outwardly disposed sections 16 and 18 are supported in their bed position by means of foldable legs 29 and 30 pivoted at 31 and 32 to the outer ends of sections 15 and 16 respectively. These legs are controlled automatically by means of links 33 and 34 pivoted to the upper ends of the legs and next rearwardly adjacent short sections 17 and 18 respectively. Section 18 is braced by a rod 35 connected at its ends to medial portions of the sides, said rod being U-shaped and having pivotal connection, whereby the U-portion may be swung parallel with the bed section when the bottom is folded and downward away from the bottom when it is unfolded.

A spacing member or latch 36 is carried by the foot section adjacent to its outer end, and is preferably attached rigidly thereto, though if desired it may be pivoted for folding in any desired manner, as for instance as shown in the Bartlett Patent No. 1,074,342 issued September 30, 1913. Improved automatic locking means are provided for engaging said spacing member

when the foot section is folded upon the middle section, said means comprising a plunger 37 carried by the middle section and slidable forward and backward by relative movement of the sections. The mounting for said plunger preferably comprises a pair of guide pins 38 spaced apart longitudinally on the side rail of the middle section, said plunger being slotted lengthwise at 39 to receive said guide pins.

The plunger 37 is controlled by means of a cam member preferably in the form of a plate 40 secured to the side of the adjacent section 17, which plate is attached rigidly in a vertical position by suitable means 41. Said plate projects forward and overlaps the adjacent end of section 15. The cam slot 43 is substantially vertical at its lower end and curves backward somewhat and recedes gradually from the adjacent hinge pivot 44 toward its upper end. The rear end of the plunger is provided with a guide pin 45 which coacts with the cam slot to reciprocate the plunger when the middle section 15 is moved with respect to the cam supporting short section 17. The slotted plate 40 and pin 45 constitute the coactive cam members or cam mechanism proper and serve to actuate the lock.

The latch 36 is provided with a notch 46 in one edge adjacent to its outer end adapted to receive the finger 47 of the plunger 37 when the latter is advanced in folding the bed. The opposite edge of the latch is provided with a downwardly facing shoulder 48 adapted to seat upon the projecting shoulder or stop pin 50 carried by the side rail of the middle section. The outer end of the latch is beveled on its opposite corners so as to facilitate and insure proper entry between the stop shoulder 50 and plunger 37 in folding the foot section upon the middle section.

Preferably the lower side of the notch 46 adjacent to the edge of the latch and the lower forward corner of the plunger finger 47 are correspondingly beveled somewhat so that they are urged apart upon lifting the foot section when the plunger and latch are only slightly engaged as shown in Fig. 5. Moreover, the latch 36 and plunger 37 are preferably positioned and related so that when the notched end of the latch passes the tip of the plunger finger 47 in folding the bed, the latch is sprung back slightly by coaction of its beveled lower edge with the forward end of said plunger finger, whereby the plunger and latch are sprung into yielding engagement to a small degree, but sufficient to overcome the expansive force of the more or less elastic bedding (not shown) so as to hold the foot section definitely in its folded position when the middle section is being raised. The yielding quality of the spacing member may be

somewhat increased if its middle portion is twisted 90° from the plane of its ends, as shown by the latch 36' in Fig. 7.

The plunger and cam are preferably, though not necessarily, made in separate parts as shown specifically in the drawings, and the cam plate is preferably, though not necessarily, the rigidly mounted member of the cam mechanism.

The operation for unfolding the bed is as follows: The seat frame is inverted from its sofa position and the bed sections are then unfolded to the position shown in Figs. 3 and 6, the middle and foot sections being held in folded relation by the fully engaged latch and plunger. When the sections are further unfolded to the position shown in Fig. 4, the plunger is thereby withdrawn by action of the cam almost wholly from engagement with the latch, and the slight remaining engagement may be readily overcome by lifting upward on the foot section in unfolding the latter to its bed position.

The folding operation is as follows: First, the foot section is folded upon the middle section, whereby the outer end of the latch is projected downward between the stop shoulder 50 and the forward end of the plunger where, if the latch member is suitably adjusted for such purpose, the latch and plunger spring slightly into yieldable engagement. Upon further folding the bed by raising the middle section, the plunger 37 is impelled forward by the cam member into full engagement with the latch notch 46 whereby the foot and middle sections are securely locked in spaced folded relation. Then upon completing the folding operation by swinging the foot and middle sections down upon the head section the sections may be locked together by the bar 28 in the manner provided and the seat frame may be rotated to its normal sofa position.

Although but one specific embodiment of this invention has been herein shown and described, it will be understood that numerous details of the construction shown may be altered or omitted without departing from the spirit of this invention as shown by the following claims.

I claim:

1. A foldable bed bottom, comprising a plurality of sections hinged together, in combination with a pair of locking members carried by directly adjacent sections and having coactive cam relation with each other, one of said members being movable both by the folding and unfolding of said adjacent sections to lock and unlock another of said sections.

2. In a foldable bed bottom, a plurality of sections hinged together, in combination with automatic section locking means comprising a pair of coactively arranged members carried on two adjacent sections re-

spectively, one of said locking members and another of said sections being adapted and arranged for springing into yieldable engagement when said section is folded, and said pair of locking members having cam relation adapted for throwing said one member into non-yielding engagement with said other section by the folding of said two sections with respect to each other.

3. In a foldable bed bottom, a plurality of sections hinged together, one of said sections having a section spacing member substantially integral therewith, in combination with automatic section locking means comprising a pair of coactively related members carried by two adjacent other of said sections respectively, one of said locking members and said spacing member being adapted and arranged to spring into yieldable engagement when the said one section is folded, and said pair of locking members having cam relation adapted for throwing said one locking member into non-yielding engagement with said spacing member by the folding of said two sections with respect to each other.

4. A foldable bed bottom, comprising a plurality of bed bottom frame sections hinged together, in combination with a cam carried by one of said sections, and section locking means operatably mounted elsewhere on said bed bottom, said section locking means being adapted and arranged to coact with said cam for control thereby in folding and unfolding the sections.

5. A foldable bed bottom, comprising a plurality of sections hinged together, in combination with locking means comprising a spacing member carried by one of the sections, a plunger carried by another of said sections and adapted to engage said spacing member, and a cam member carried by a third section adapted to actuate said plunger in folding and unfolding the bed bottom.

6. A foldable bed bottom, comprising a pair of long sections, a short section connecting said long sections, a fourth section hinged to the opposite edges of one of the long sections, in combination with a spacing member carried by one of said long sections, a plunger carried by the other of said long sections adapted for engaging said spacing member to hold the long sections in spaced folded relation, and a cam member carried by the said fourth section adapted and arranged for sliding said plunger into and out of engagement with said spacing member in folding and unfolding the bed bottom respectively.

7. A foldable bed bottom, comprising a pair of long sections, a short section connecting said long sections, a fourth section hinged to the opposite edges of one of the long sections, in combination with a spacing member carried by one of said long sec-

tions, a plunger carried by the other of said long sections adapted for engaging said spacing member to hold the long sections in spaced folded relation, and a cam member carried by the said fourth section adapted and arranged for sliding said plunger into and out of engagement with said spacing member in folding and unfolding the bed bottom respectively, said cam and spacing members being mutually adapted to spring into yieldable engagement upon partial folding of said bed bottom and said cam being adapted and arranged to throw said locking members into non-yielding engagement by further folding said bed bottom.

8. A foldable bed bottom comprising a

plurality of sections hinged together, in combination with section locking means comprising a pair of co-active members having cam relation to each other, both for locking and unlocking the sections, said members being carried by immediately adjacent bed bottom sections respectively, one of said members being secured rigidly to its supporting section and the other being reciprocatably mounted.

Signed at Chicago this 8th day of May 1914.

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Witnesses:

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