F. M. DAVIS.

CONVERTIBLE FURNITURE.

APPLICATION FILED AUG. 11, 1916.

1,386,397.

Patented Aug. 2, 1921.

4 SHEETS—SHEET 1.

Fig. 2

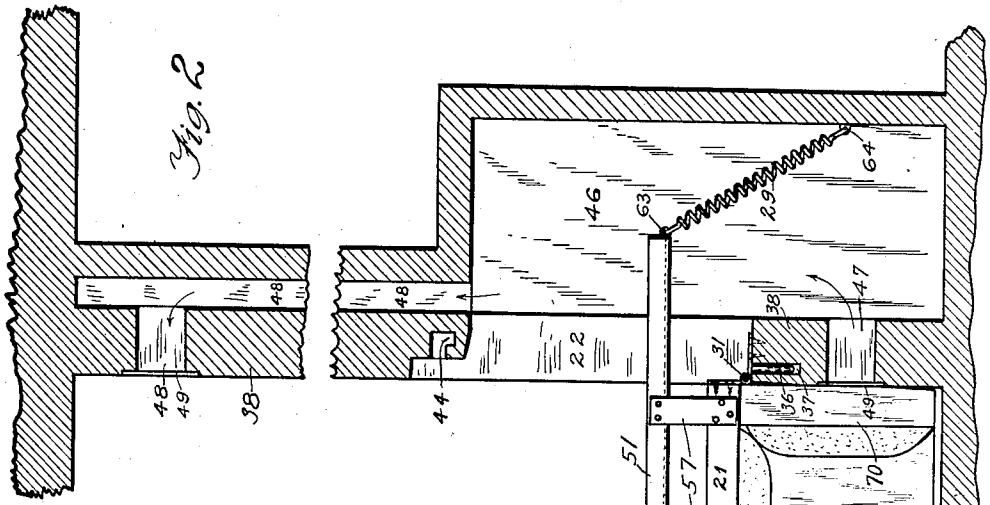
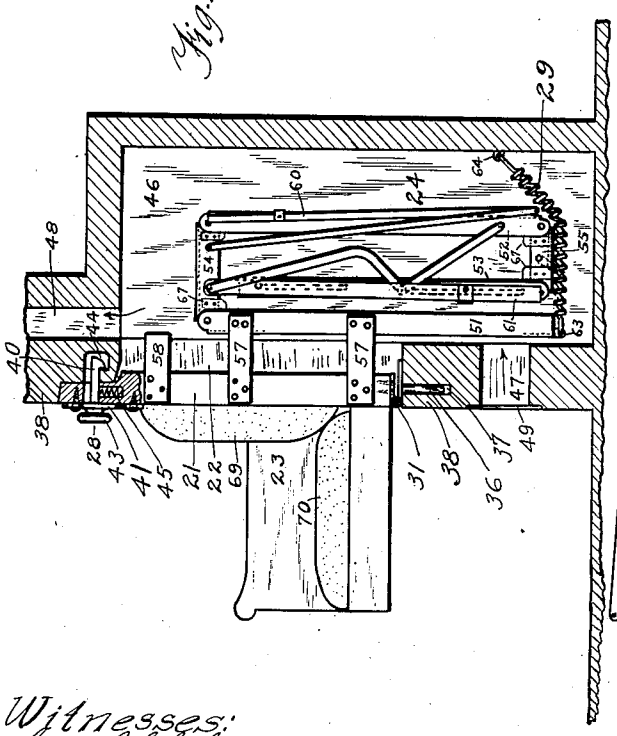


Fig. 1



Witnesses:
George E. Schultz
William E. Hann.

Inventor:
Fred M. Davis.
By Rummler & Rummler,
Attys.

F. M. DAVIS.

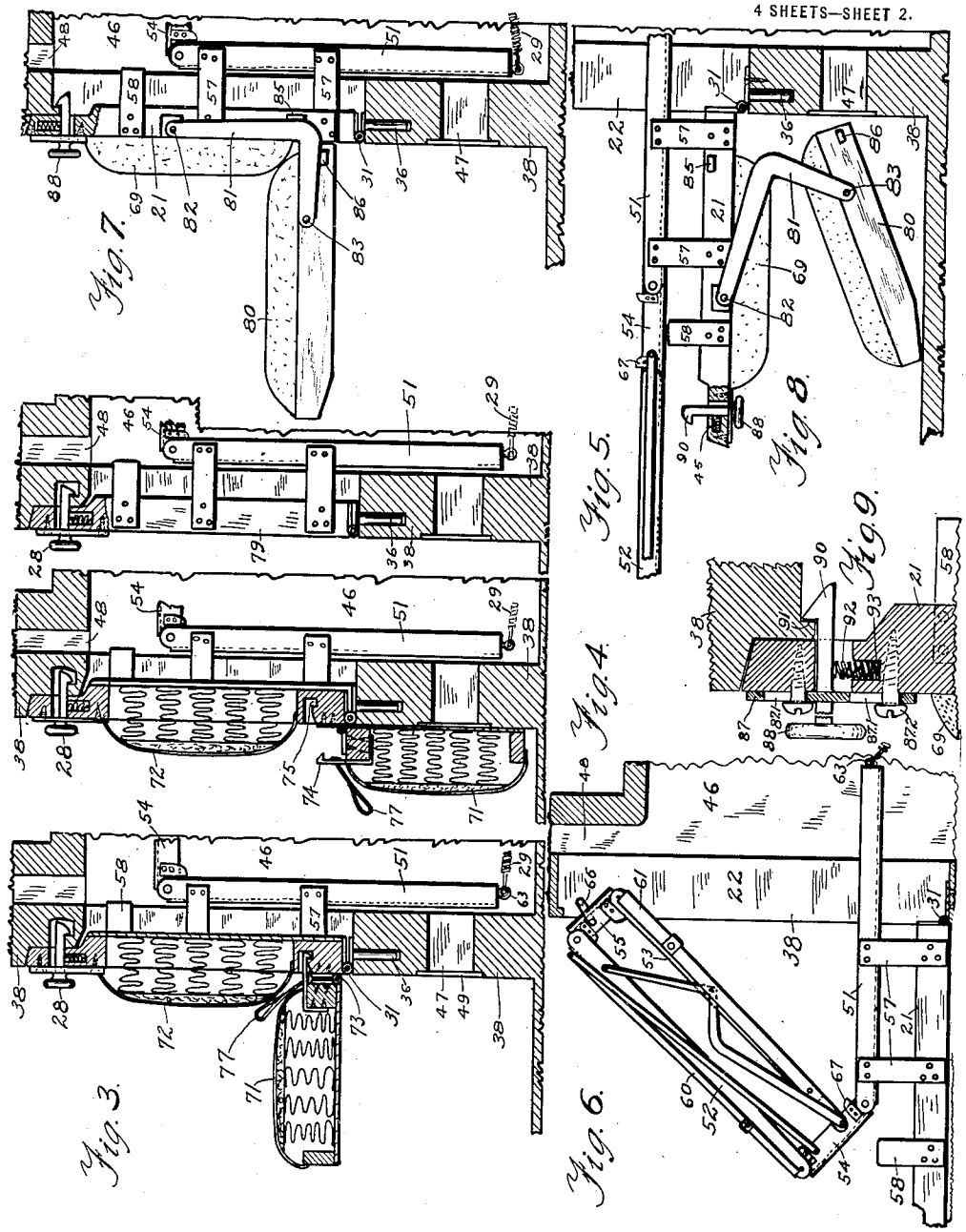
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4 SHEETS—SHEET 3.

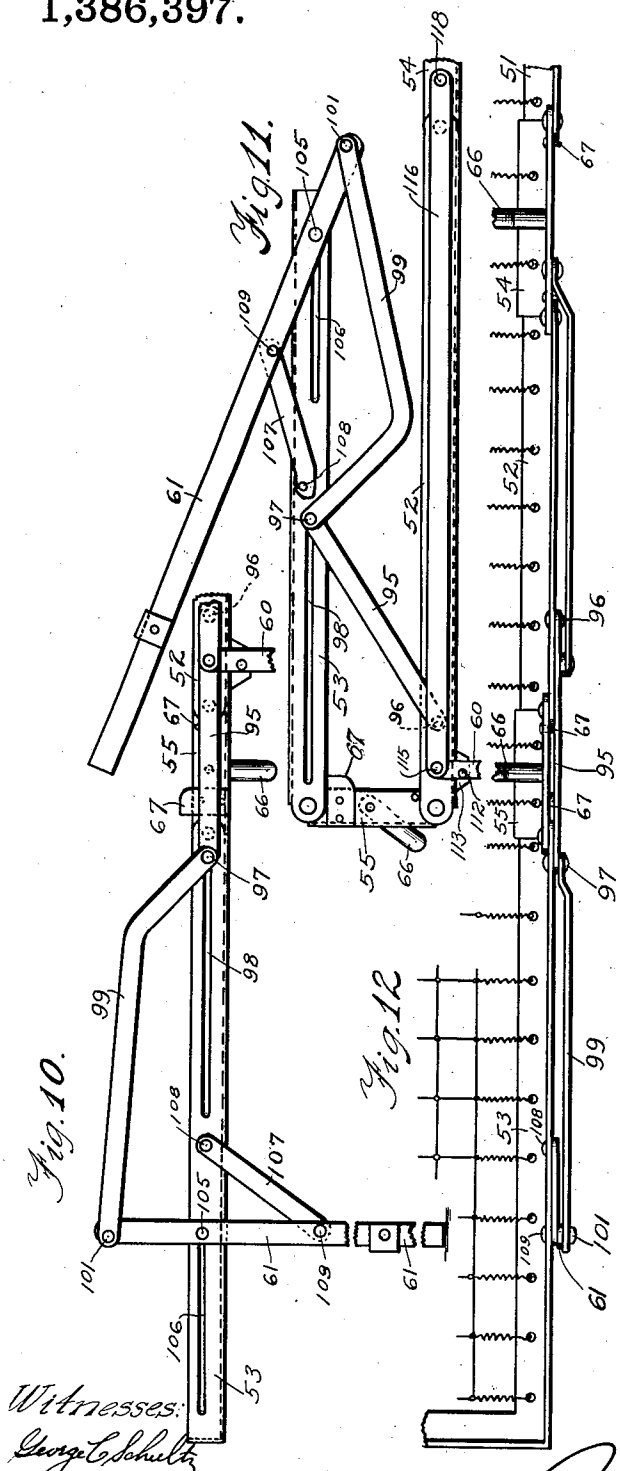


Fig. 10.

Fig. 11.

Fig. 12.

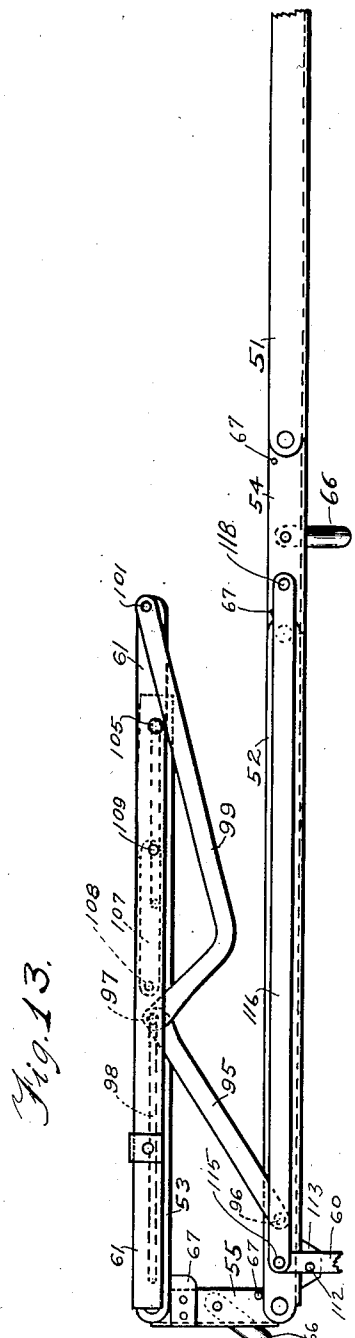


Fig. 13.

Witnesses:
George E. Schultz
William E. Hann.

Inventor:
Fred M. Davis.
By Rummler & Rummler,
Attys.

F. M. DAVIS.

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4 SHEETS—SHEET 4.

Fig. 14.

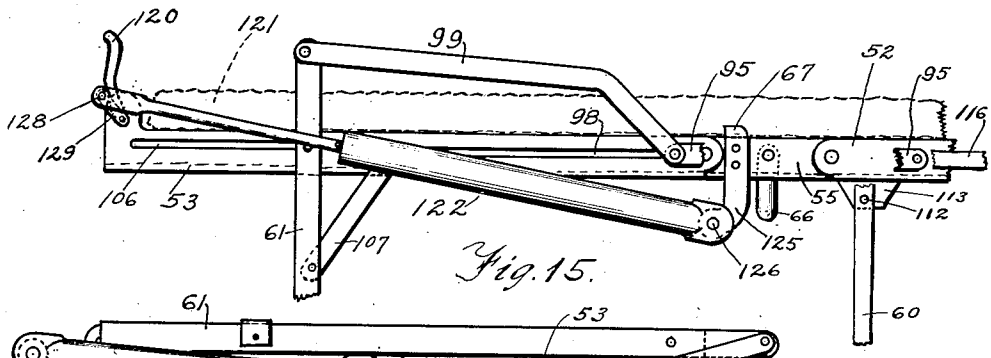


Fig. 15.

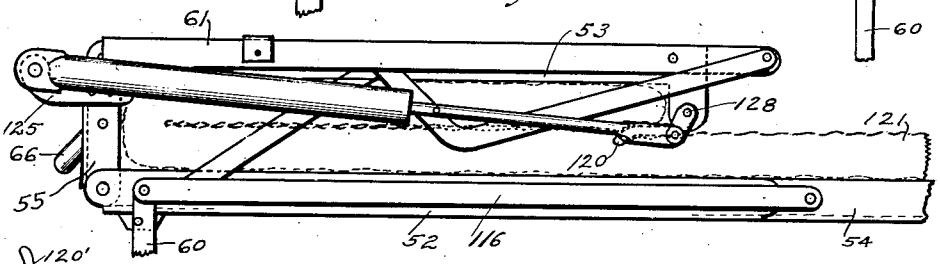


Fig. 18

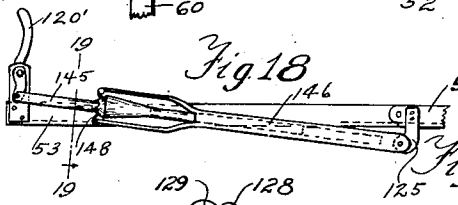


Fig. 16.

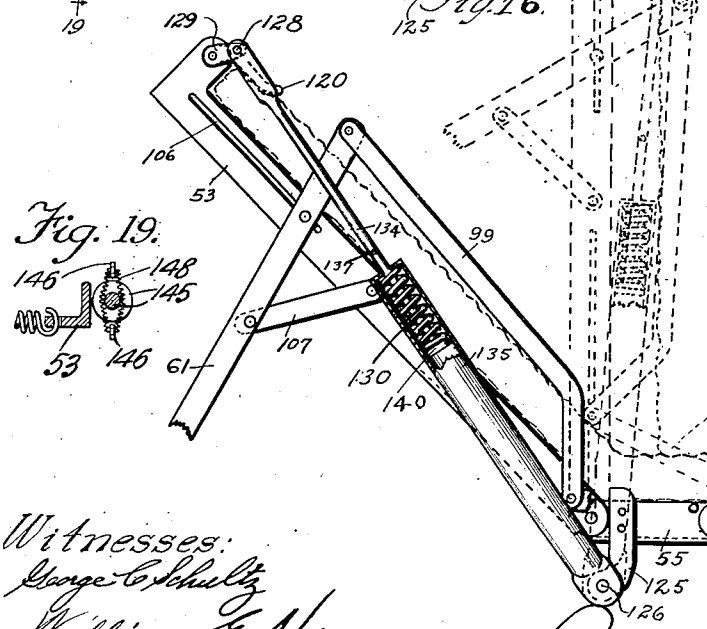


Fig. 17.

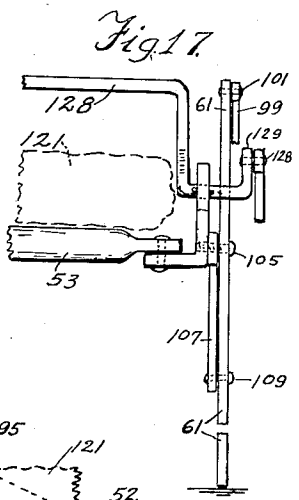


Fig. 19.

Witnesses:

George C. Schultz

William E. Hann.

Inventor:

Fred M. Davis

By Rummler & Rummler,

Attys

UNITED STATES PATENT OFFICE.

FRED M. DAVIS, OF CHICAGO, ILLINOIS, ASSIGNOR TO PULLMAN COUCH COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

CONVERTIBLE FURNITURE.

1,386,397. Specification of Letters Patent. **Patented Aug. 2, 1921.**

Application filed August 11, 1916. Serial No. 114,365.

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, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Convertible Furniture, of which the following is a specification.

This invention relates mainly to convertible furniture of the type which comprises a foldable sectional bed-bottom adapted when folded to house the bedding in made-up form, and more particularly to means for mounting and operating the bed bottom, to means for securing the bedding in place, and to means for locking the sections in folded relation.

The main objects of this invention are to provide an improved and simplified form of bed section lock adapted for positive operation automatically as the bed bottom folds and unfolds; to provide improved automatic means adapted for controlling a bedding fastener at the free end of the outer section, so as to cause the fastener to securely grip the bedding promptly during the initial folding movement of the outer section, and to so hold the bedding during the overturning or folding of said outer section, and thus to prevent any possibility of the bedding sliding down toward the connecting section in folding and unfolding; to provide an improved mounting for the foldable bed bottom in such manner as to minimize the bed room space occupied by the device when unfolded; and to provide improved means for combining a seat with a swinging bed bottom adapted for mounting in or on the wall.

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

Figure 1 is a side view of a sofa bed mounted in a wall aperture and disposed in its folded or sofa position, the near end of the sofa frame being removed and parts of the view being in section.

Fig. 2 in a similar manner shows the device of Fig. 1 in its unfolded or bed position.

Fig. 3 is a fragmentary view of a sofa bed device positioned like and somewhat similar in construction to that shown in Fig. 1, except that the seat member is hinged relative to the back member.

Fig. 4 shows the device of Fig. 3 with the seat lowered or retracted.

Fig. 5 shows an embodiment similar to that of Fig. 1, with the omission of the seat and upholstered back members, the support member for the bed bottom being in the form of a closure panel for the wall aperture.

Fig. 6 is a fragmentary view showing the device of Fig. 1 with the sofa bed swung forward and the bed bottom partly unfolded.

Fig. 7 is a sofa bed embodiment having a wider seat than shown in the preceding views, the device being shown in its sofa position.

Fig. 8 is similar to Fig. 7, but disposed in its bed position.

Fig. 9 is an enlarged fragmentary vertical section through the manual release latch which automatically locks the device in its sofa position.

Fig. 10 is a fragmentary view of the outermost and two adjacent sections of the bed bottom, equipped with an automatic leg control lock for securing the sections in folded relation.

Fig. 11 is substantially like Fig. 10, except that the outer section is folded over on the adjacent main section, the leg being partly folded.

Fig. 12 is a fragmentary plan of the device shown in Fig. 10.

Fig. 13 is a side view similar to Fig. 11, except that the leg is entirely folded and the section lock is in its set or effective position.

Fig. 14 is a side view of the outer sections of a bed bottom in bed position, and equipped with automatic means for gripping the outer edge of the bedding, said means becoming effective by the initial movement of the outer section in folding.

Fig. 15 shows the device of Fig. 14 with the outer section folded over on the adjacent main section and with the outer edge of the bedding gripped by the automatic fastener.

Fig. 16 shows the device of Fig. 14 with the outer section raised or turned upward about 45°, sufficiently to render the bed fastener effective, a still further folded position being indicated by dotted lines.

Fig. 17 is a fragmentary end elevation of one side of the bed bottom showing the automatic bedding fastener.

Fig. 18 shows a form of bedding fastener

employing a tension spring member or clasp in combination with a double cone plunger.

Fig. 19 is an enlarged view of some of the details of the clothes clamping means, the view being on the section line 19 of Fig. 18.

In the embodiment shown in Figs. 1 and 2, the sofa bed comprises a frame or panel member 21 mounted turnably in a wall aperture 22, a sofa 23 mounted on the outer side of said panel, and a bed bottom 24 mounted on its inner side. A latch 28 is provided for securing the device in its sofa position, and a lifting spring 29 urges the device toward its bed position.

The pivotal support member 31 is preferably in the form of a hinge secured to the lower end of the panel 21 and is adapted for ready demountability with respect to the lower edge of the wall aperture 22. With this end in view, one leaf of the hinge is screwed or otherwise fixed to said panel and the other is provided with a pin or stud 36 adapted for insertion into a corresponding vertical socket 37 in the wall 38. As thus mounted, the sofa bed as a whole may be removed by lifting it off from its bearings when swung forward, and may be replaced or mounted by a reverse operation.

The fastening 28 may be mounted either on the wall or on the swinging panel as shown in Fig. 1, in which instance the latch proper or part 40 is mounted on a vertically slidable plate 41 provided with a handle 43 to facilitate lifting out of engagement with a correspondingly notched part 44 of the wall member, as will be apparent, said latch being urged downward as by a tension spring 45.

Ventilation of the wall chamber 46 is effected by means of the opening 47 under the seat, and a flue 48 extending from the chamber to a point near the ceiling, suitable gratings or perforate covers 49 being provided.

The bed member or bottom 24 may be either of the three-section or five-section type, a five-section bed being shown in Figs. 1 and 2, comprising head, middle and outer main sections 51, 52 and 53 respectively and connecting sections 54, and 55 at the inner and outer ends of the middle section respectively. The inner section 51 is carried directly by the swinging panel 21, being attached rigidly thereto by means of brackets 57 projecting backward from the panel so as to hold the bed in spaced relation to the latter, thus providing clearance for the bed spring. A further support 58 is provided on the upper part of said panel in a position to receive and support the adjacent connecting section 54 in bed position.

Legs 60 and 61 are provided for supporting the outer parts of the middle and foot sections 52 and 53 respectively, the inner part of the middle section and adjacent connecting section 54 being supported by the forwardly tilted sofa member, and the inner part of the foot section and connecting section 55 being supported by the leg 60.

The lifting spring 29 is connected at 63 to the inner part of the head section and at 64 to the back part of the wall chamber 46, and is so disposed as to be placed in suitable tension for both positions of the sofa bed, so as to be effective for assisting in the initial movement both in folding and unfolding the device.

One or more bent truss rods or braces 66 are disposed crosswise of the bed for holding the side rails apart. The side rails of the head section are held rigidly by the brackets 57.

Stop means 67 suitably limit the folding of the sections, the limiting angle being about ninety degrees, as shown in Fig. 1.

The sofa part 23 comprises a back 69 and seat 70 rigidly related to each other and both being fixed on the panel 21, so that when tipped forward the sofa serves as a bracket or support for the inner part of the bed.

The device of Fig. 1 when nearly folded assumes a position such as shown in Fig. 6, where all parts are shown in their bed position, except the four outer sections which, folded together as a unit, are swinging either inward upon or outward away from the inner or head section 51, the view being somewhat fragmentary.

In the embodiment shown in Figs. 3 and 4, the device is substantially like that shown in Fig. 1, except that the seat member 71, instead of being fixed to the combined back and panel member 72, is mounted turnably thereon by a hinge 73 so that whenever desired, the seat may be let down against the wall 38 in such manner as to minimize the room space occupied by the device.

A latch member 74 and corresponding latch aperture 75 are provided so that when the seat is raised, the latch acts automatically to engage and lock the seat in place. A handle or strap member 77 is provided on the latch to facilitate manual release when it is desired to drop the seat to its retracted position. The bed bottom 24, only a fragment of which is shown, may be similar in all respects to the embodiment shown in Fig. 1. When the device is swung forward to its bed position the sofa part serves to support part of the bed in the manner above described in connection with Fig. 1.

In the embodiment shown in Fig. 5, the seat and back members are omitted and the panel 79 is made plain or may be decorated in such manner as may be desired. As said panel fits flush with the wall, it is apparent that when the device is in its retracted position, the room space is entirely clear.

In the embodiment shown in Figs. 7 and

8, the device is substantially like that shown in Fig. 1, except that the seat member 80, instead of being fixed to the back panel, is supported swingingly thereon by means of the arms 81, the seat in this instance being wider from front to back than illustrated in Figs. 1 to 4, requiring that it take a more or less horizontal or inclined position when the device is swung forward for use as a bed. Said arms 81 are L-shaped and are pivoted at or near their outer ends to intermediate points 82 and 83 on the back and seat members, stops 85 and 86 being provided on said members adjacent to the lower and rear edges respectively, to coact with said arms adjacent to the angle for limiting the swing of the arms and seat in moving the members from their bed to sofa position.

The lock embodiment shown in Fig. 9 is adapted to be pressed down for opening, and comprises a vertically movable plate 87 having guide slots 87.1 to coact with the screws 87.2. On said plate is a handle 88, and a latch 90 adapted to engage the shoulder 91 of the wall 38. Said latch is normally urged upward by the compression spring 92 seated in the wall socket 93.

Means for locking the outer bed sections 52, 53 and 55 in their folded relation with respect to each other are shown in Figs. 10 to 13. On each side of the bed is provided a link or locking bar 95, turnably connected at one end by means of a pivot 96 to the outer part of the middle section 52, and at its other end, slidably connected by a pivot 97 coacting with a slot 98 extending lengthwise of the foot section from a point near the adjacent connecting section 55 outward toward the center. The leg 61 is mounted turnably on the outer part of the foot section, with the upper end projecting above the bed when unfolded. A link 99 has one end connected to the pivot 97 and the other end is pivoted at 101 to the upper end of said leg 61.

In order to provide sufficient amplitude to the swing of the pivot 101, so as to operate the lock, the bed supporting pivot 105 is carried by a longitudinal slot 106 in the foot section, and a link 107 is provided for throwing the upper end of the leg 61 outward when the latter is folded, said link 107 being attached to the foot section by the pivot 108 at one end and to the medial part of the leg 61, below the pivot 105 by means of a pivot 109. When the foot section is folded upon the middle section and the leg 61 is nearly folded against the foot section as shown in Fig. 11, a toggle effect results whereby the link 107 throws the upper end of said leg outward and the link 99 draws the locking bar 95 forward to the outer end of the slot 98 in such manner as to urge the foot section inward and secure it folded tightly against the adjacent stop 67 on the connecting section 55. When the leg 61 is forced down against the foot section, the pivot 109 passes down past alinement with the pivots 105 and 108, and the outer pivot 101 passes upward beyond alinement with the pivots 97 and 105, whereby the lock is snapped into place or set in a very definite manner, such as to require a very substantial lifting force applied to the leg 61 in order to release the lock.

In order to assure a definite and positive toggle action of the lock, (see Fig. 11) the pivot 109 is placed in or near the lower edge of the leg 61 and the pivot 101 is placed near the upper edge, the pivot 108 and slot 98 are placed near the upper edge of the foot section, and the slot 106 is placed near the lower edge, as viewed in said figure.

The inner leg 60 is folded and unfolded automatically as the section 52 folds and unfolds with respect to section 54, said leg being pivoted at 112 to the downwardly projecting bracket 113 near the connecting section 55, and the upwardly projecting part of said leg being pivoted at 115 to a controlling link 116, the opposite end of which is pivoted to the inner connecting section 54 at 118. The inner spacing bar 66 supplements the sofa frame in holding the side rails apart.

The bedding fastener 120 is connected operatively to the sections in such manner as to be rendered fully effective by the initial movement of the foot section in folding, so that the bedding 121 is firmly gripped and retained in place before the foot section has swung upward to such a steep angle as would otherwise cause the bedding to slip or fall down toward the connecting section 55 and thereby interfere with the folding of the bed. In order to accomplish this purpose, the connecting means or link 122 therefor is so arranged and attached as to effect a maximum pull when nearest the bed position. With the above purpose in view, a downwardly projecting bracket 125 is provided on the adjacent connecting section 55 to the lower end of which the link means 122 is connected at 126. The front end of the link means 122 is connected at 128 to the outer end of the crank arm 129 of the fastener 120. In order that a slight turning of the foot section and corresponding pull of the link means 122 may throw the bed fastener fully over to its gripping position, the arm 129 is made much shorter than the bracket 125. The link means 122 is made extensible so as to permit continued swinging of the foot section after the bedding fastener has come to rest in its effective position on the bedding. Such extensibility is provided for by making the link means in two sections arranged telescopically, with a compression spring 130 arranged to urge the link members 134 and 135 so as to shorten

the member 122. A stop 137 is provided on the inner member 134 to coact with the adjacent end of the complementary member 135 to limit the inward movement of the rod 134. The tubular part 135 is provided with a peripheral shoulder at its outer end to serve as a seat for a coiled spring 130, and the inner end of the rod 134 is provided with a head 140 against which the inner end of the spring is seated.

In Fig. 18, is shown another embodiment of the bedding fastener, in which a different form of yielding means is provided for urging the telescopic members toward each other. In this instance, the member 145 slides into the member 146, the latter being forked at its outer end and provided with an annular coiled spring 148. Said member 145 is provided with two conical surfaces or frustums abutting together at their bases, the outer cone being short and blunt and the inner cone long and pointed. When the foot section is raised, the coiled spring 148 rides over the cone bases and upon passing the thickest part, tends to ride down toward the apex of the long cone member, thereby tending to thrust the outer rod 145 outward and accordingly throwing the bed fastener 120′ inward against the bedding. In unfolding the device, as soon as the coiled spring passes the thickest part of the rod 145, it slides down over the short cone part and serves to pull the link member 145 inward, thereby throwing the bedding fastener outward and releasing the bedding.

Although several embodiments of this invention are shown and described, it is to be understood that no attempt has been made to show specifically all of the useful embodiments, and that many 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. A device of the character described, comprising an apertured house-wall, a full-sized double bed mounted in the wall aperture, jointed connecting means for said wall and bed whereby the latter may be swung forward and backward with respect to the aperture for use and storage respectively said bed including a foldable sectional bed bottom having a plurality of joints and fold lines disposed crosswise of the bed whereby the storage aperture may be of small width and low height, and a small-sized sofa attachment secured to the underside of the bed, adapted to hide said aperture and to serve as a seat when the bed is folded and stored.

2. A wall having a rectangular aperture, a closure panel therefor turnably connected to said wall at the lower edge of said aperture, means supplementing said wall for supporting said panel when the latter is swung forward to a horizontal position, a foldable bed bottom including a pair of main sections and a short connecting section arranged with their hinge axes parallel with the panel turning axis, bed supporting brackets fixed to said panel and to one of said main sections and arranged to hold said section and panel in spaced parallel relation, means on said panel projecting substantially into alinement with said one section to support said connecting section when unfolded, and foldable legs on the other main section.

3. A wall having an aperture and a closure panel therefor, said panel having pivotal support means at its lower edge adapted for ready mounting and demounting with respect to the wall at the lower edge of said aperture, in combination with seat and bed members carried by and mounted upon opposite sides of said panel, said support means including a hinge, one member of which is provided with a stud projecting downward and fitting removably in said wall at the lower edge of the aperture.

4. An apertured wall, in combination with a closure panel hinged thereto at the lower edge of the aperture, a foldable sectional bed bottom mounted upon and carried by said panel, and resilient lifting means connected to an end of the bed on the opposite side of the hinge axis from the main body of the panel and arranged to assist manual control of said panel and bed bottom.

Signed at Chicago this 4th day of August 1916.

FRED M. DAVIS.