

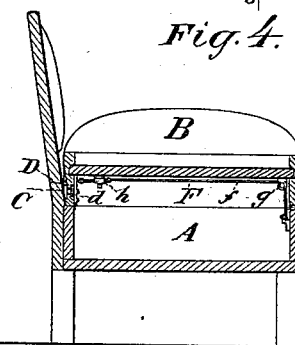
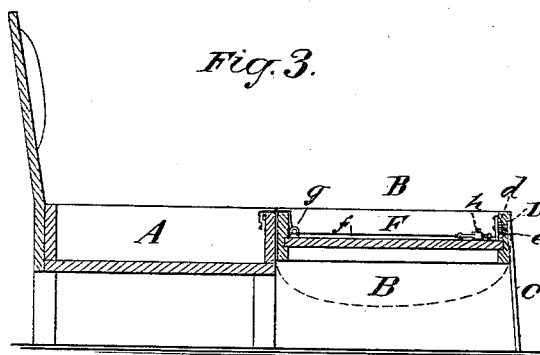
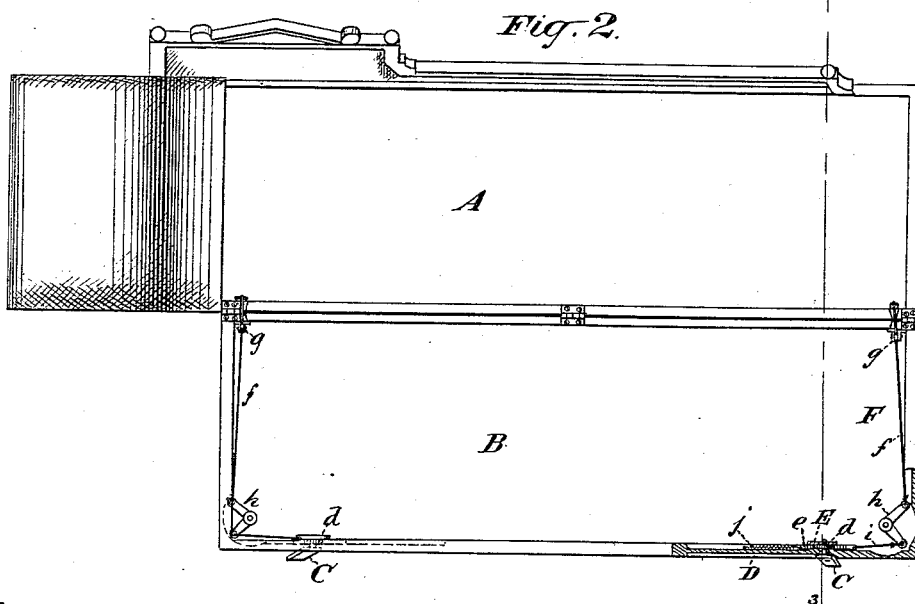
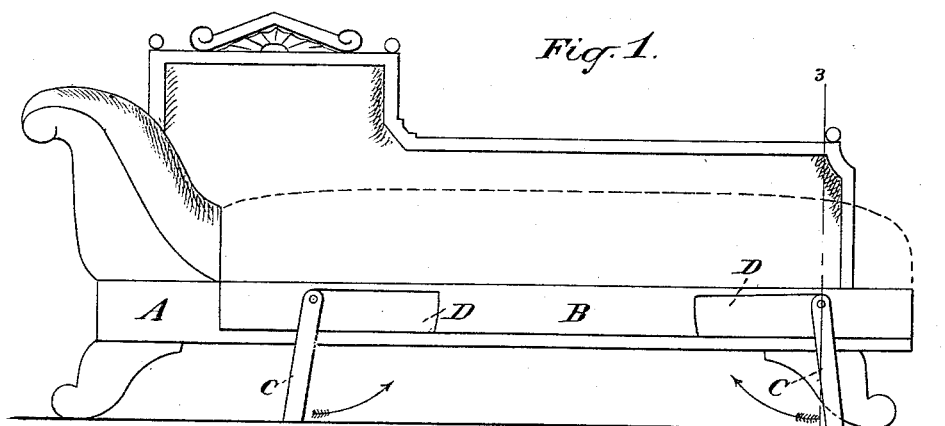
(No Model.)

2 Sheets—Sheet 1.

L. MEIROWITZ.
SOFA BED OR OTHER FOLDING ARTICLE.

No. 420,206.

Patented Jan. 28, 1890.



WITNESSES:

John Becker
J. A. Griswell

INVENTOR:

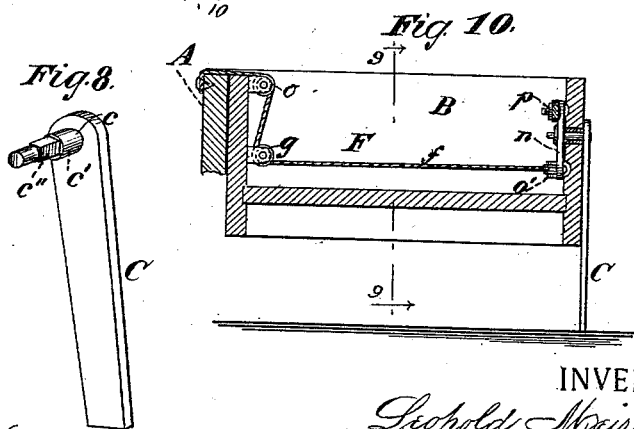
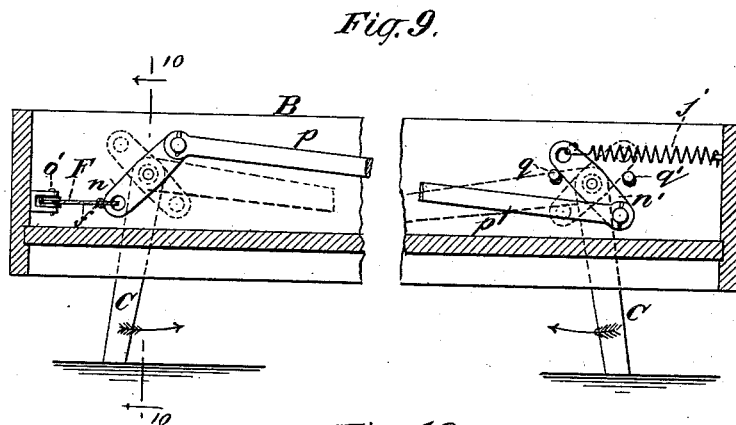
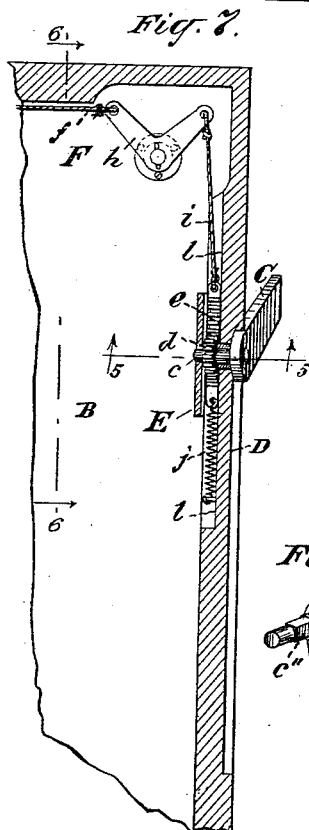
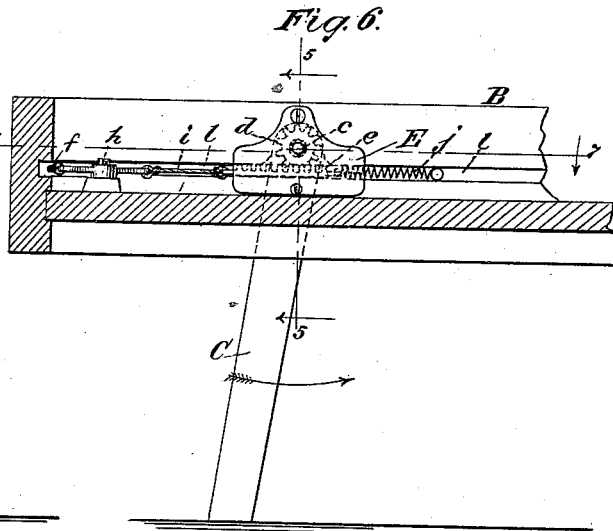
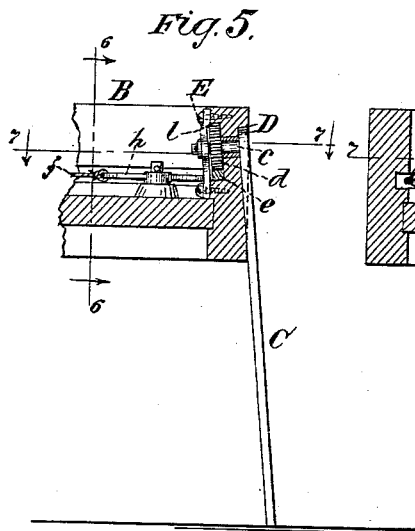
Leopold Meirowitz
By his Attorneys,

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UNITED STATES PATENT OFFICE.

LEOPOLD MEIROWITZ, OF NEW YORK, N. Y.

SOFA-BED OR OTHER FOLDING ARTICLE.

SPECIFICATION forming part of Letters Patent No. 420,206, dated January 28, 1890.

Application filed December 20, 1888. Serial No. 294,167. (No model.)

To all whom it may concern:

Be it known that I, LEOPOLD MEIROWITZ, a citizen of the United States, and a resident of the city of New York, in the county and State of New York, have invented certain new and useful Improvements in Sofa-Beds or other Folding Articles, of which the following is a specification.

This invention relates to that class of articles in which one section is hinged to and folds upon another or base section, and in which the folding section is supported by a leg when unfolded, and is superposed on the base-section when folded. Among other articles comprised in this class are sofa-beds.

The objects of this invention are to provide improved means for automatically projecting or withdrawing the supporting leg or legs by means of the movement of the folding section; also, to provide means for attaching the supporting-leg without consuming any additional space when the folding section is folded, and to prevent the obstruction of the leg-operating mechanism by the cushion filling of the folding section.

In the accompanying drawings, which illustrate my invention as applied to a sofa-bed, Figure 1 is a front elevation showing the folding section unfolded. Fig. 2 is a plan showing one corner in horizontal section. Fig. 3 is a cross-section cut on the line 3 3 in Figs. 1 and 2. Fig. 4 is a cross-section similar to Fig. 3, but showing the sofa-bed as folded up. Fig. 5 is a fragmentary vertical cross-section of a sofa-bed. Fig. 6 is a fragmentary longitudinal section thereof cut on the line 6 6 in Fig. 5. Fig. 7 is a fragmentary horizontal section of the same cut on line 7 7 in Figs. 5 and 6. Fig. 8 is a perspective view of a supporting-leg. Fig. 9 is a longitudinal vertical section of the folding section of a sofa-bed partly broken out in the center and showing a modified form of my invention. Fig. 10 is a vertical cross-section thereof cut on line 10 10 in Fig. 9.

I will describe my invention as applied to a sofa-bed.

Referring to the drawings, let A represent the base-section of a folding sofa-bed, B the folding section thereof, and C C the supporting-legs, which are pivoted to the folding section.

The preferred form of my invention is shown in Figs. 1 to 8, inclusive. In this construction two recesses D D are formed in the outer face of the side of the folding section B, and the legs C C are each pivoted to the section B in one of these recesses, so that in turning on their pivotal axis they will move in the recesses. Each of the legs C C has an arm or axle c, Fig. 8, on which it is pivoted. This axle c projects through the wall of the section B and carries a pinion d. The axles c are cylindrical at c' to form a journal portion. This part of the axle fits into a bearing-hole in the wall of section B, (which hole is preferably bushed in order to afford a better bearing-surface,) and this portion of the axle supports the section B when the latter is unfolded and the leg is down. At c'' the axles c are squared or otherwise adapted to receive the pinion d. At its extremity the axle is again cylindrical to take into a bearing-hole in an additional bearing or re-enforce plate E. The pinion d, carried by the axle c of the leg C, meshes with a rack e, carried by the section B. The movement of this rack imparts motion through the pinion and axle to the leg C. To further support the axle c and to inclose the pinion d and rack e, so that the excelsior or other cushioning packing in the section B will not enter and interfere with their operation, the bearing-plate E is made to serve as a shield which covers the rack and pinion. For retaining the legs C C in position I prefer to drill a cross-hole through the smaller end of axle c, back of the shield-plate E, and to drive a cotter therein, which will prevent the axle from sliding out.

A flexible connection F connects the rack e with the base-section A and serves to impart motion to the rack e when the folding section B is being unfolded. The connection F consists of a cord, strap, or chain f, attached at one end to any convenient part of the base-section A, and extending across the hinging-axis of the two sections A and B. The cord f is carried into section B and under a pulley g therein, and thence to the outer part of section B, where its other end is fastened to one arm of an elbow-lever h. The other arm of the elbow-lever h is connected to the rack e by means of an intermediate link i.

I prefer to cut a notch or groove in the hinged wall of the folding section B, where the cord *f* crosses the same, so that the cord may be guided thereby, and it is also preferable to place a roller or other anti-frictional device at the corner of the hinged wall of section B, to carry the cord at this point and ease its friction. A spring *j* exerts a retracting force on the rack *e*, and serves to retract the rack when the section B is being folded, thereby turning up the leg C during the operation of folding back the section. The greatest extent of movement of the rack *e* in the construction shown in Fig. 3 is equal to the combined thickness of the two hinged walls of the sections A and B.

The recess D, for receiving the leg C, is constructed so that when the leg is turned up it will rest within the recess. To accomplish this the recess D is deeper at its upper part than at the edge of the outer side of section B, and its face is inclined relatively to the outer face of that wall. The leg C extends parallel with the inclined face of this recess, and therefore when it is turned down it stands out of the perpendicular, and when turned up it lies in the deepest part of the recess D, and as the recess is of a depth equal to the thickness of the leg the latter does not project beyond the plane of the outer side of the folding section B. The side wall of the recess D serves as a stop to limit the movement of leg C when the latter is turned down, and the top wall of the recess serves to stop the movement of the leg when the latter is turned up. The recess D is made inclined to avoid cutting into the lower edge of the side wall of the folding section B, as such cutting would mar the appearance of that wall when the section B is folded up, and would also weaken the wall.

To avoid placing the rack *e* and pinion *d* in the space intended for the stuffing or cushioning substance usually placed in the section B, I provide a groove or recess *l* in the inner side of the wall of the section B, and in this recess *l*, I place the rack *e*, pinion *d*, and spring *j*. The shield or bearing-plate E is fastened to the inner face of the wall of section B and serves to keep the rack *e* in position in its groove *l*.

When the sofa-bed is folded up, the legs C C are turned up into the recesses D D and the flexible connection F is slackened. Upon unfolding the folding section B the flexible connection F is tightened, and through the medium of elbow-lever *h* and intermediate link *i* moves the rack *e*, which latter through pinion *d* turns out the leg C as the unfolding operation continues. The mechanism is so proportioned that the leg C will complete its outward movement just as the section B reaches its complete unfolded position. When the folding section B is being folded up, the flexible connection F is slackened, and the retracting-spring *j* retracts the rack *e*, thereby turning the leg C up into the recess D. By

constructing the recesses D D so that they will contain the legs C C when the section B is folded the section can be arranged to fold close against the back board of the base-section A, so that no apparent space or aperture will be left between the back board and the section B when the sofa-bed is folded up.

My invention is susceptible of many modifications and structural alterations without departing from the essential features thereof, and although in the preferred construction I have shown and described many details and parts which are desirable in the operation of my invention, it will be understood that these may be altered or omitted in part without materially affecting the operation or departing from the nature thereof. For example, the recesses D D may be omitted or other leg-operating mechanism than the rack and pinion may be used, or any suitable stops for the movement of the legs may be used instead of the ends of recesses D D; or the elbow-lever *h* may be replaced by some equivalent device—such as a pulley, for example.

Referring to Figs. 9 and 10 of the drawings, I will now describe a modification embodying my invention, wherein several of the parts are modified and the general construction is simplified as compared to the construction shown in Figs. 1 to 8. In Figs. 9 and 10 the recesses D D are omitted and the legs C C stand perpendicular to and parallel with the wall of section B. A cross-head *n*, having a journal-arm, is placed inside the section B, and its journal-arm projects through a cylindrical hole in the wall of section B and is secured to the leg C, so that this arm serves as the axle of leg C. The connection F is carried from section A over pulleys *o*, *g*, and *o'* on section B, and is fastened to the lower arm of a cross-head *n*. If two legs are used and it is desired to operate both legs by one connection F, a rod *p* is connected at one end to one arm of the cross-head *n*, and is connected at its other end with the opposite arm of the other cross-head *n'*, whereby the movement of one leg will be communicated to the other leg and the two will operate together. If it is desired to use a retracting-spring with this construction for turning in the legs, such a spring may be applied to act on one of the cross-heads. I have shown such a spring lettered *j* as applied to cross-head *n'*. In this construction the shield or bearing-plate E is not used, as owing to the simplicity of the parts it can be dispensed with. The movement of the legs C C is limited by pins *q* and *q'*, (see Fig. 9,) the former pin serving as the stop for the outward movement of the legs, and the pin *q'* serving to stop the inner or upward movement of the legs.

I prefer to construct the legs C C of metal and the connection F of cord or chain; but any suitable materials may be used instead.

My invention is especially adapted to be applied to sofa-beds; but it may be applied to

trunks, writing-desks, and other folding articles.

What I claim, and desire to secure by Letters Patent, is, in a folding sofa or other folding article, the following-defined novel features and combinations, substantially as herein set forth and shown, namely:

1. The combination, with the folding section having a recess in one of its outer sides, the face of said recess inclined relatively to the outer face of the section, of a leg pivoted in said recess adapted to be turned up thereinto and extending in a plane parallel with the inclined face thereof, whereby when the section is unfolded the leg stands at an inclination, and when folded the leg is sunk within the deeper part of said recess.

2. The combination, with the base-section, of a folding section hinged thereto and constructed to fold upon the base-section when folded up and to rest in the same plane therewith when unfolded, a leg pivoted to the folding section, and a connection secured at one end within the base-section, and extending thence across the axis of the hinge-joint between the two sections and into the adjacent side of the folding section and connected to said leg for turning it down, whereby upon unfolding the folding section the mechanical connection will be tightened and the leg will be turned down.

3. The combination, with the base-section, of a folding section hinged thereto and constructed to fold upon the base-section when folded up and to rest in the same plane therewith when unfolded, a leg pivoted to the side wall of the folding section and constructed to move in a plane parallel with such wall, a flexible connection secured at one end within the base-section, and extending thence across the axis of the hinge-joint between the two sections and into the adjacent side of the folding section and connected to said leg for turning it down, whereby upon unfolding the folding section the mechanical connection will be tightened and the leg will be turned down.

4. The combination, with the base-section and a superposed folding section and a leg pivoted to the latter, of connections between said leg and the base-section carried by the folding section for automatically turning down the leg by the unfolding of the latter, and a spring acting to turn up the leg by the release of said connections upon the folding of the folding section, such connections secured at one end to a fixed point of the base-section, and extending thence across the axis of the hinge connecting the two sections and into engagement with the leg.

5. The combination, with the base-section and a superposed folding section, of a leg pivoted to the latter and having a pinion, a movable rack carried by the folding section and engaging said pinion, and a flexible connection secured at one end to a fixed point on the base and at its other end to said rack, and extending across the axis of the hinge connect-

ing the two sections, whereby upon unfolding the folding section the flexible connection will be tightened and the rack will be moved, and thereby the leg turned downward.

6. The combination, with the base-section and the superposed folding section hinged thereto and folding thereagainst and forming a seat when folded up, of a leg pivoted to the latter and having a pinion on its axle, a movable rack engaging said pinion and carried by the folding section, a connection between said rack and the base fixed at one of its ends rigidly to the base, and extending thence across the axis of the hinge of the section and secured at its other end to the rack, whereby upon unfolding the folding section the connection will be tightened and the rack will be moved, and thereby the leg turned downward, and a retracting-spring engaged to retract said leg when the folding section is folded up.

7. The combination, with the base-section and a superposed folding section hinged thereto, of a leg pivoted to the side wall of the latter and having an axle extending through such wall and carrying a pinion, a movable rack carried on the inner side of said wall and engaging said pinion, and a connection secured to the base beyond the axis of hinging of the two sections, and extending thence across said axis and into the adjacent side of the folding section and secured to said rack, whereby upon unfolding the folding section said connection will be tightened, the rack will be moved, and thereby the leg turned downward, the folding section being formed with a recess in its side wall, in which said pinion and rack are inclosed.

8. The combination, with the base-section and a superposed folding section hinged thereto, of a leg pivoted to the side wall of the latter and having an axle extending through such wall and carrying a pinion, a movable rack carried on the inner side of said wall and engaging said pinion, and a connection secured to the base beyond the axis of hinging of the two sections, and extending thence across said axis and into the adjacent side of the folding section and secured to said rack, whereby upon unfolding the folding section said connection will be tightened, the rack will be moved, and thereby the leg turned downward, and a shield covering said rack and pinion, whereby said rack and pinion are protected.

9. The combination, with the base-section and a superposed folding section hinged thereto, of a leg pivoted to the side wall of the latter and movable in a plane substantially parallel therewith, a flexible connection secured to a fixed point on the base-section, and extending thence across the axis of the hinge connecting the two sections and across the adjacent side of the folding section, a bell-crank on the latter, to which the other end of the said connection is secured, a movable rack connected to the bell-crank, and a pin-

ion on the leg meshing with said rack, said
connection so constructed that when the
sections are unfolded it will be tightened,
whereby upon tightening the flexible connec-
5 tion by unfolding the folding section motion
is imparted to the rack, and the leg is thereby
turned down.

In witness whereof I have hereunto signed
my name in the presence of two subscribing
witnesses.

LEOPOLD MEIROWITZ.

Witnesses:

GEORGE H. FRASER,
CHARLES K. FRASER.