(No Model.)

3 Sheets—Sheet 1.

R. H. GARLAND.

FOLDING SOFA BED.

No. 302,904. Patented Aug. 5, 1884.

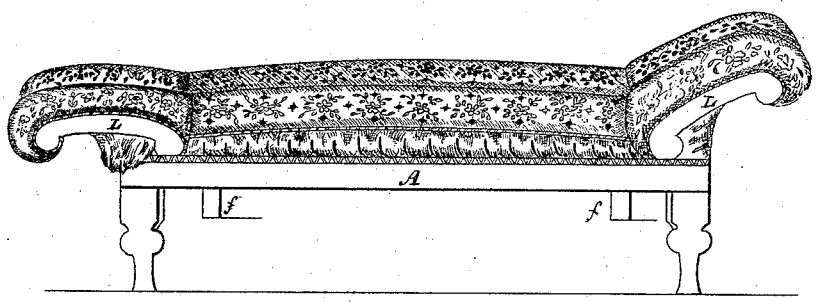


Fig. 1.

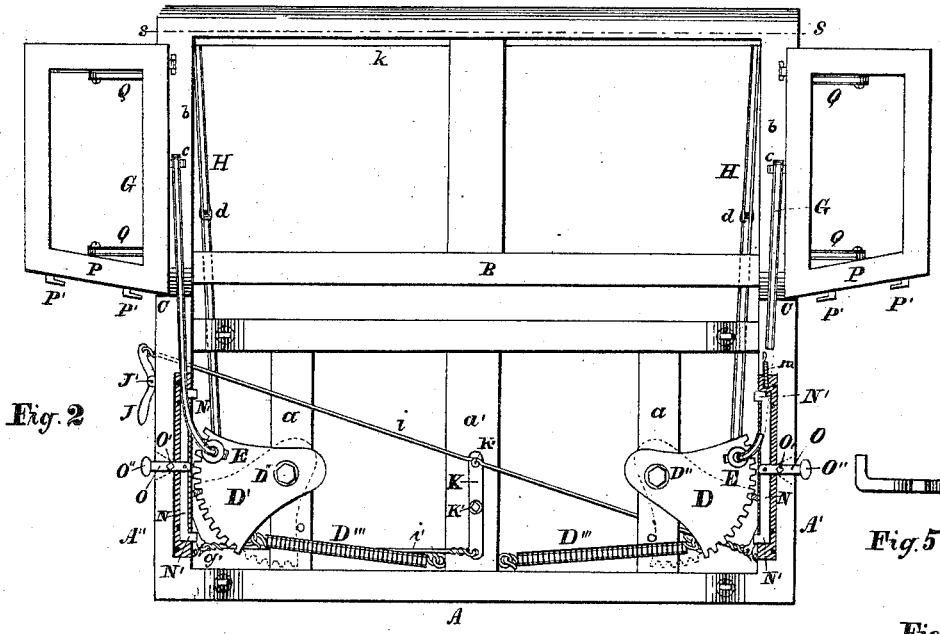


Fig. 2

Fig. 5

Fig. 3

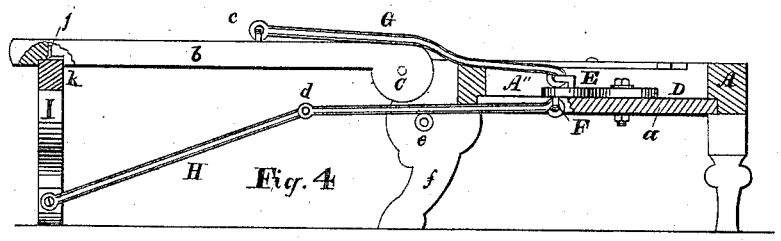
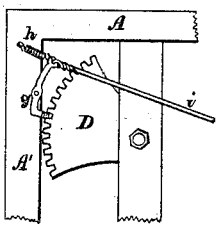


Fig. 4



Witnesses.

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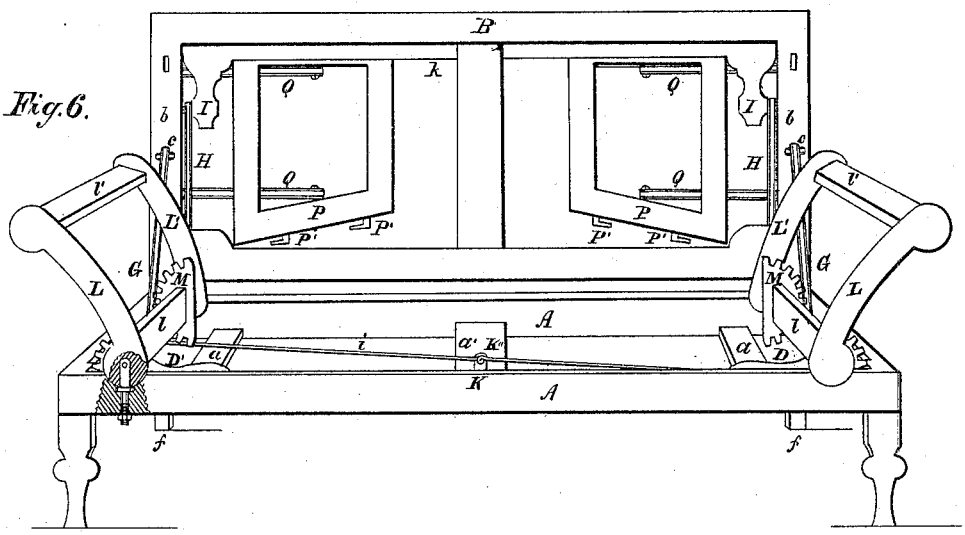
(No Model.) 3 Sheets—Sheet 2

R. H. GARLAND.

FOLDING SOFA BED.

No. 302,904. Patented Aug. 5, 1884.

Fig. 6.



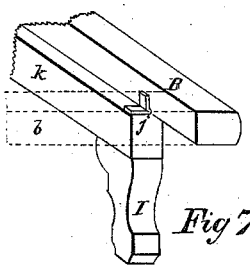


Fig 7.

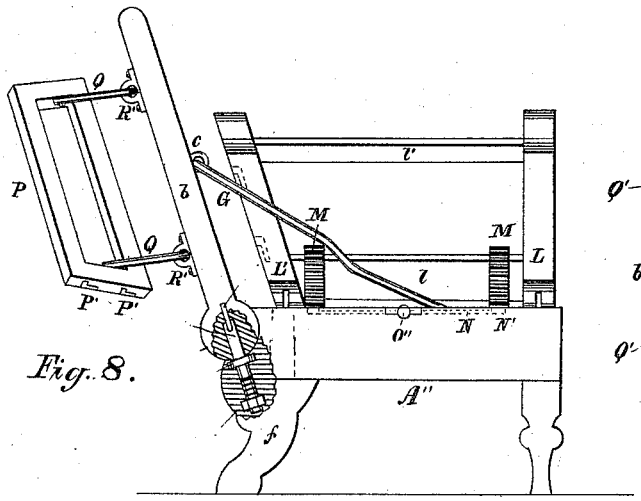


Fig. 8.

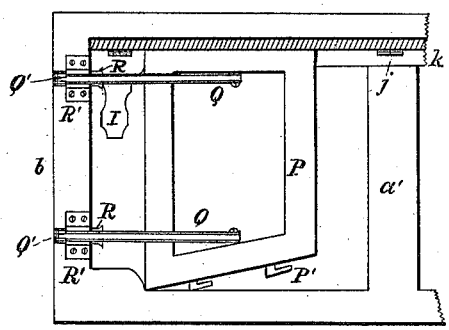


Fig. 9.

Witnesses

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(No Model.) 3 Sheets—Sheet 3.

R. H. GARLAND.

FOLDING SOFA BED.

No. 302,904. Patented Aug. 5, 1884.

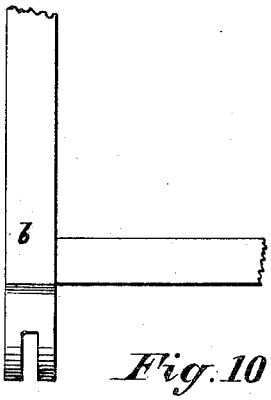

Fig. 10

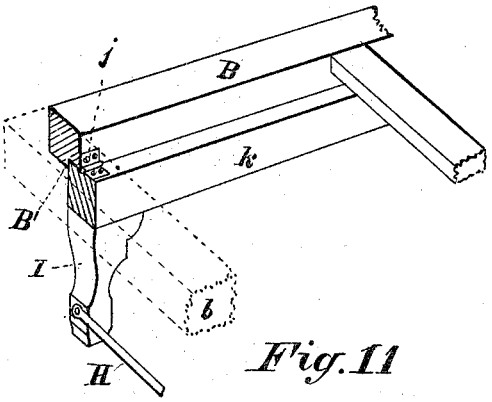

Fig. 11

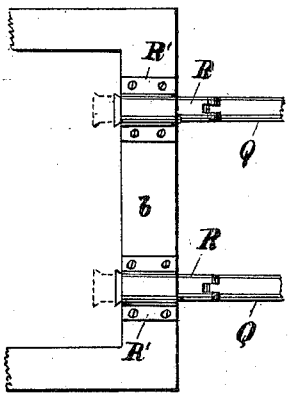

Fig. 12.

Witnesses;
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Jonas Starr

Inventor
Richard H. Garland
per J. D. Clark
Attorney

UNITED STATES PATENT OFFICE.

RICHARD H. GARLAND, OF CHICAGO, ILLINOIS.

FOLDING SOFA-BED.

SPECIFICATION forming part of Letters Patent No. 302,904, dated August 5, 1884.

Application filed March 27, 1883. (No model.)

To all whom it may concern:

Be it known that I, RICHARD H. GARLAND, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in a Folding Sofa-Bed, of which the following is a specification.

My invention relates to a sofa that may be quickly and conveniently opened to form a bed with adjustable back and arm sections, with swinging end sections, arms and end sections so constructed that either end may be used as the head part of a bed; also is so arranged that the arms and sections may be lowered or raised to any desired height.

The objects of my improvements are, first, to provide a sofa wherein the upholstering, when the arm-sections and back are lowered, will form a bed, with a continuous line of upholstering from end to end and side to side, without ridges or breaks; second, in so constructing the main frame-work of a sofa as to dispense with a central longitudinal rail under the fabric when unfolded, whereby the fabric is left free to spring down, under the weight of the occupant, without coming in contact with the frame. I attain these objects by the illustrations shown in the accompanying drawings, in which—

Figure 1 is a perspective view of my sofa as opened for a bed. Fig. 2 is a plan of the frame with upholstering and arm-sections removed; Fig. 3, a reverse view of Fig. 2, showing the pawl and manner of holding segment-gears of the frame A; Fig. 4, an inside view of end elevation, showing the working of the back and leg support; Fig. 5, a plan view of pawl used; Fig. 6, a perspective view of the frame of my sofa, broken away at left-hand corner to show manner of placing the bolt-hinge on front rail. Fig. 7 represents a section on the line *s s* in Fig. 2, looking across the back-frame; Fig. 8, a left end elevation with head-section half thrown out from back-frame; Fig. 9, a detached view of head-section folded, as seen from the back when the invention is used as a sofa; Fig. 10, a detached view of the rail *b;* Fig. 11, a detailed view in perspective of the support-legs I, with rail *b* shown in dotted lines; Fig. 12, a detached view of the rods R and rail *b*.

The same letters denot the same parts in all the figures.

A represents the stationary frame of the sofa, of which there are the usual number of pieces, consisting of a front and back rail, end rails, A′ A″, and center girts, *a a a′*. The frame B is similarly constructed, but having only one girt in the center to brace or stiffen it. The end standards, *b b*, of frame B are extended a little below the line of their juncture with the lower rail, and hinged to the rails A′ A″ by a bolt-hinge, C, which allows the said frame B to be vertically and horizontally adjusted.

Pivoted by bolts D″ to the upper side of the girts *a* are the segment-gears D and D′, so constructed that their cogged surfaces occupy about one-fourth of the arc of a circle. Said gears may be constructed entirely of iron, or the main body may be composed of wood and the cogged surface made of cast-iron or other like material and pinned on after. On the upper and lower surface of these gears are securely fastened rings E and F. In the eye of the rings E are held the rods G, which rods are further attached to screw-rings *c*, said rings being united to the rails *b* on their under surface. The rods G are bent near their center at such an angle that when the back B is lowered, the rods will lie almost parallel with the rails A′ A″ and *b b*, which object is to avoid being in the way of the operation of the arm-section and the knuckle of the hinge C. The rods H are attached to the rings F in a similar manner as rods G. The other ends of the rods H are loosely pivoted to the support-feet I I. Said rods H are hinged at *d*, so as to fold and unfold readily with the movement of the back B, and are so constructed that they cause the feet I to move simultaneously with the movement of said back, so that when the back is clear down for a bed, the feet I are in a vertical position to hold the weight of the occupant. (See Figs. 4 and 7.) The rods H are further provided with anti-friction rollers *e*, secured to the inner side of the back of the back legs, *f*, of frame A, so that the reciprocation of these rods may be accomplished with as little friction as possible. The teeth of gears D engage with pawls *g* and *g′*, which serve to secure the gears in the positions desired. The

pawls *g* are loosely pivoted to the under side of the end rails, A, Fig. 3, and are held in position against the gears by coiled springs *h*. Attached to the same end of the pawl *g* with the spring is a rod, *i*, that extends diagonally across the bottom of the frame A from inside front right-hand corner of rail A′ to outside left-hand corner of rail A″, and is there united to a lever, J. The lever J has its fulcrum in a fixed support, J′, which is fastened to the rail A″. The pawl *g′* is pivoted to the rail A″ in a similar manner as pawl *g*, and is secured to a rod, *i′*, which in turn is fastened to a lever-arm, K. The lever K has its fulcrum in the bolt K′, which secures said lever to the upper surface of rail *a′*. The upper end of lever K is provided with a pin, K″, around which the rod *i* is coiled. Through this pin the pawls *g* are operated, shown as follows: The lever J being pressed backward by the hand, the pawls *g*, through their rods *i i′*, are thrown out of the gears D and the frame B is adjusted up or down. The springs *h* recall the movement of the pawls as soon as the lever J is released, and thus fasten or relieve the gears. The coiled springs D‴ return the movement of the gears D after being drawn back by the movement of the frame B. The dotted lines in Fig. 2 indicate the extent of the movement of the segment-gears D when the frame B is brought forward to form a sofa.

The support-legs I are secured to the frame B by butt-hinges *j*, one strap of which is secured to the inner lower side of the top rail of frame B, and the other strap is secured to the top of the slat *k* that unites the legs. The lower outside corner of the top rail of frame B is grooved longitudinally its entire length, forming a recess, B′, for the slat *k* to rest in when the frame B is down for a bed, and also taking off all strain and pressure from the hinges, Figs. 4 and 7.

The arm sections of the stationary frame A consist of the curved side rails L L′, connected by slats *l l′*. By reference to the drawings Figs. 6, 8, it will be noticed that said slats stand at different angles with each other, and also at different angles with the side rails L. When the arm-sections are adjusted to form a sofa, the slat *l* stands about vertical, and crosses the grain of the wood, where it is united with the rails L at an obtuse angle. The slat *l′* stands at the same time at an angle of forty-five degrees from the perpendicular, and crosses the grain in the upper part of rails L in a similar manner as the lower slat, *l*. Usually these slats have been so constructed that they were united to the side rails parallel with the grain of the rail, and the pressure on these sections was liable at any time to split the rails, and so spoil the utility of the arm. The object in placing my slats in the position in which they are shown is to overcome this objection and to render the arms stronger, and thereby more durable; so they are placed at such an angle with the grain of the rails as to bring the strain of the arm on the grain, where it is best able to bear it. The rail L′, by reference to Fig. 10, it will be seen, stands at a different angle than the front rail L. The object is that it may operate when upholstered to give the right pitch for the back B when folded as a sofa.

In the lower slat, *l*, at each end, near its connection with the side rails L, are fastened segment-gears M. These gears are so arranged that in the vertical adjustment of the arm-sections their teeth just clear the inner edge of the rails A′. Inserted in a socket in the upper surface of said rails is a horizontal bar, N, which is provided at each end with a tongue, N′, that engages the teeth of the gears M, and serves to lock the arm-section in any desired position. The center of the bar N is pivotally attached to levers O, which stand at right angles with the bars. The levers O are pivoted at O′ to the upper surface of the rails A′, which pivot forms the fulcrum for said levers. The movements of these levers are horizontal, and the extent either way is indicated by the dotted lines in Fig. 2. The springs *m* serve to keep the tongues N′ into the teeth of the gears M. The levers O are operated by thumb-pieces O″.

P P represent head-sections operating in connection with and locking in the arms L, when used as a bed, and detached and swinging in back of the frame B, out of sight when used as a sofa. (See Fig. 6.) The sections P are united and locked with the arm-sections L through fastenings P′, which fit into a socket of similar shape in the rails L′, under the same principle as an ordinary bedstead-fastening.

On the inner side of the top and bottom rails of sections P are pivoted rods Q. These rods are hinged at Q′ to connecting-rods R, which are held in bearings R′. Said bearings are secured to the back of side rails *b* by set-screws, and stand parallel with each other at equal distance apart. The rods R have a short horizontal movement in said bearings R′ when adjusting the sections P, said movement being necessary in order that the rods Q may clear the outer corner of the side rails *b*.

In constructing the frame of any of the parts of my sofa I can employ other material than wood, so long as it accomplishes the object desired—the cheapness and durability of manufacture. In shipping my sofa to any distance, by unfastening the rods G and H from the rings *c* and withdrawing the pintle of the hinge C, I fold the frame B down upon the stationary frame A, and thereby save space in packing.

By doing away with the longitudinal rail in center of my sofa, which is the one great drawback in the comfort of resting on one of these sofas when used as a bed, I gain a great advantage over other sofa-beds. In order to accomplish this, I extend the side rails, A, beyond the back rail (shown in dotted lines in Fig. 8) of frame A, which leaves a space between the bottom rail of frame B and the back

rail of frame A. This space I fill up with upholstering.

In upholstering my sofa I employ a strong canvas lining or other strong material, which covers up all the movements of the various parts, so that there is nothing to show its use as a bed when folded as a sofa. The slats *l* in the arm-sections extend below the knuckle of the hinge C, which forms a back on which to place the upholstering, and thereby fill up the space left when the arms L are thrown down to form a bed.

The bolt-hinge C forming subject-matter of a following application, I do not claim any of its parts broadly, only so far as it combines with the movements of the various parts of my present invention.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the main frame of a sofa with back hinged thereto, a support, I *k*, hinged to said back, geared segments pivoted to the main frame, as described, rods connecting said segments and the back and its support, as specified, and means, as set forth, for locking the geared segments, as and for the purpose described.

2. The combination of the back frame of a sofa with bearings R′ secured thereto, the head-sections P, connected to the back by the rods R and Q, as specified, and means for uniting the head-sections with the arm-sections, as and for the purpose described.

RICHARD H. GARLAND.

Witnesses:
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R. S. KITTREDGE.