

R. DEIMEL.
SOFA BED.
APPLICATION FILED JUNE 17, 1909.

993,656.

Patented May 30, 1911.

3 SHEETS—SHEET 1.

Fig 1

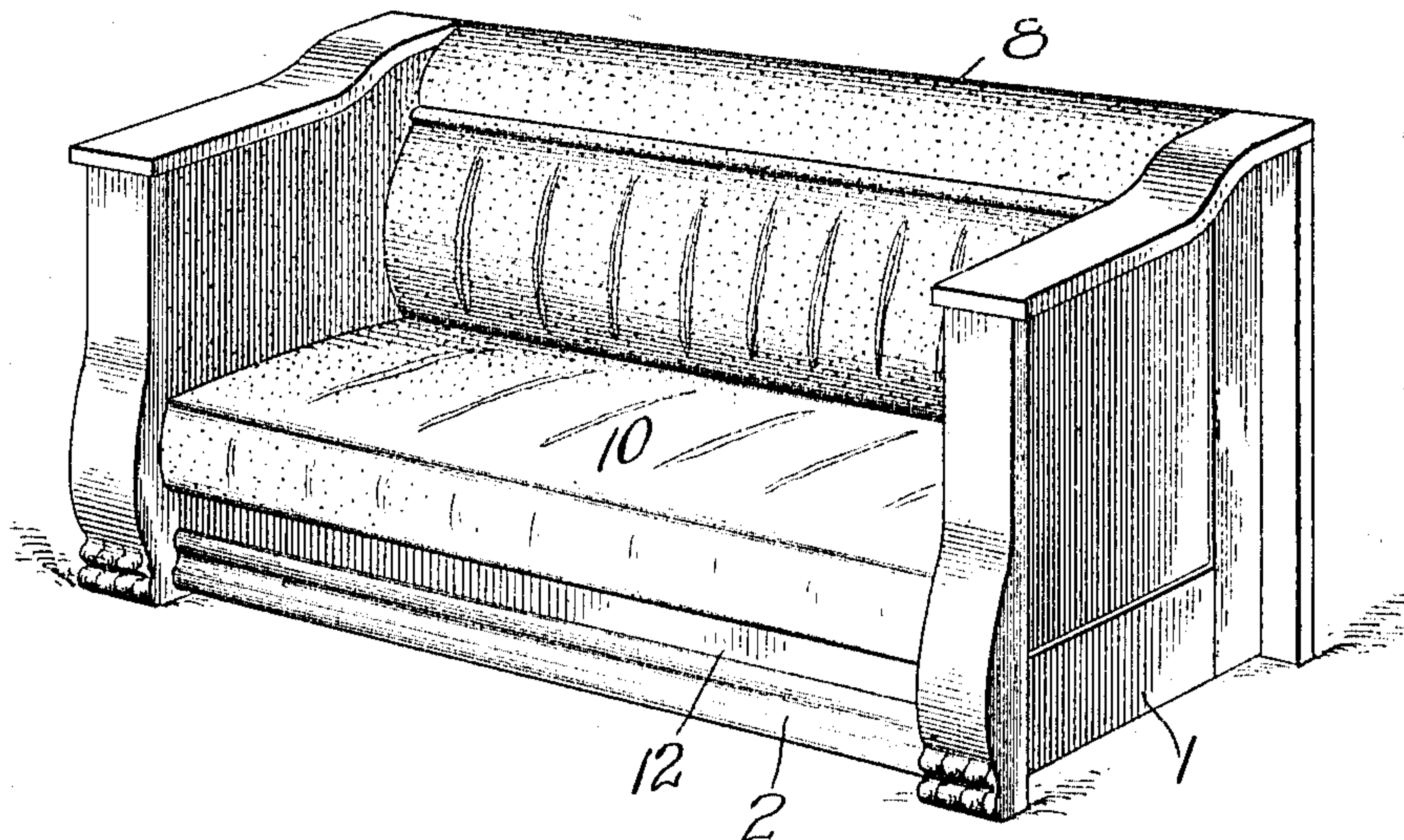
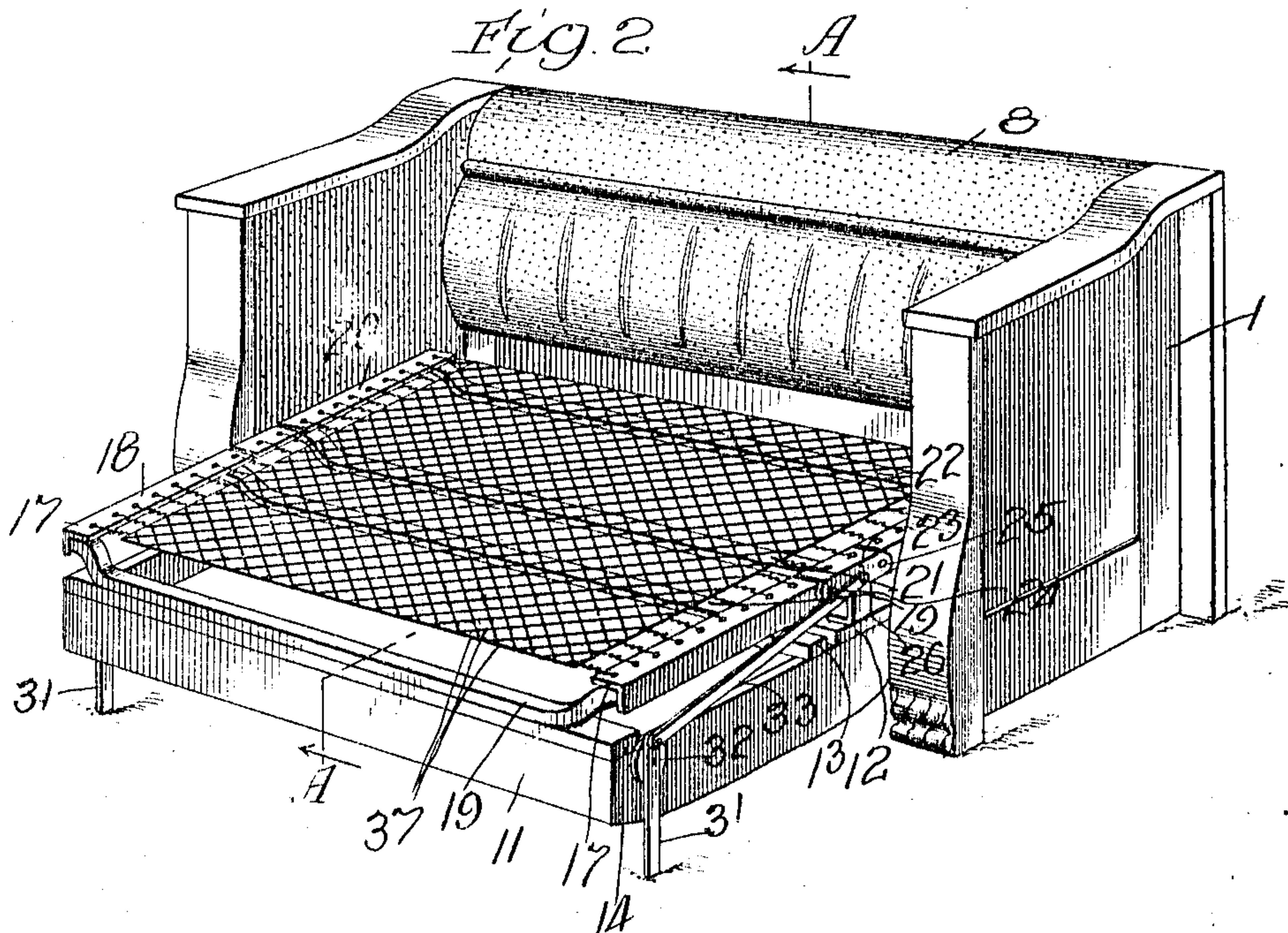


Fig. 2



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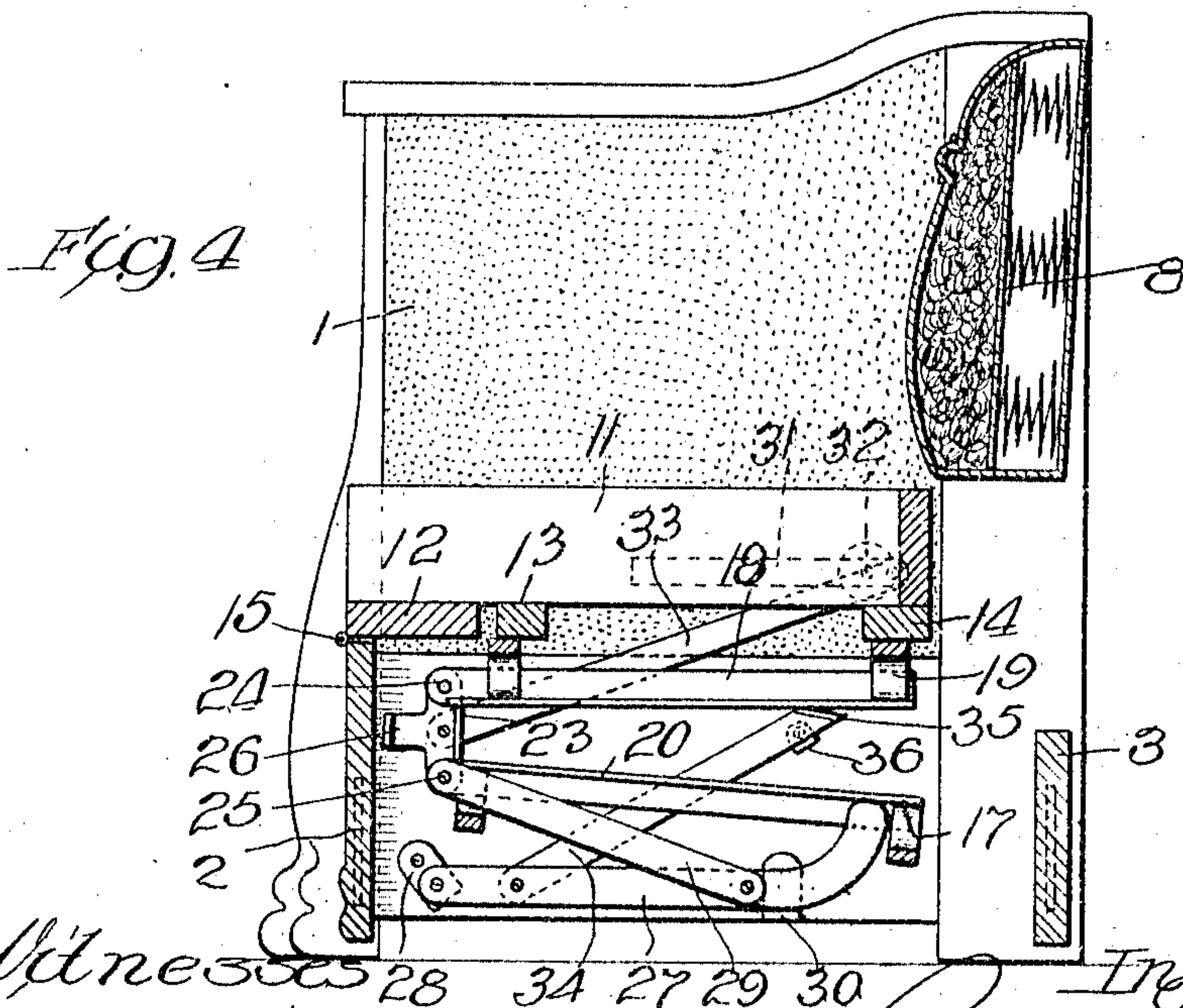
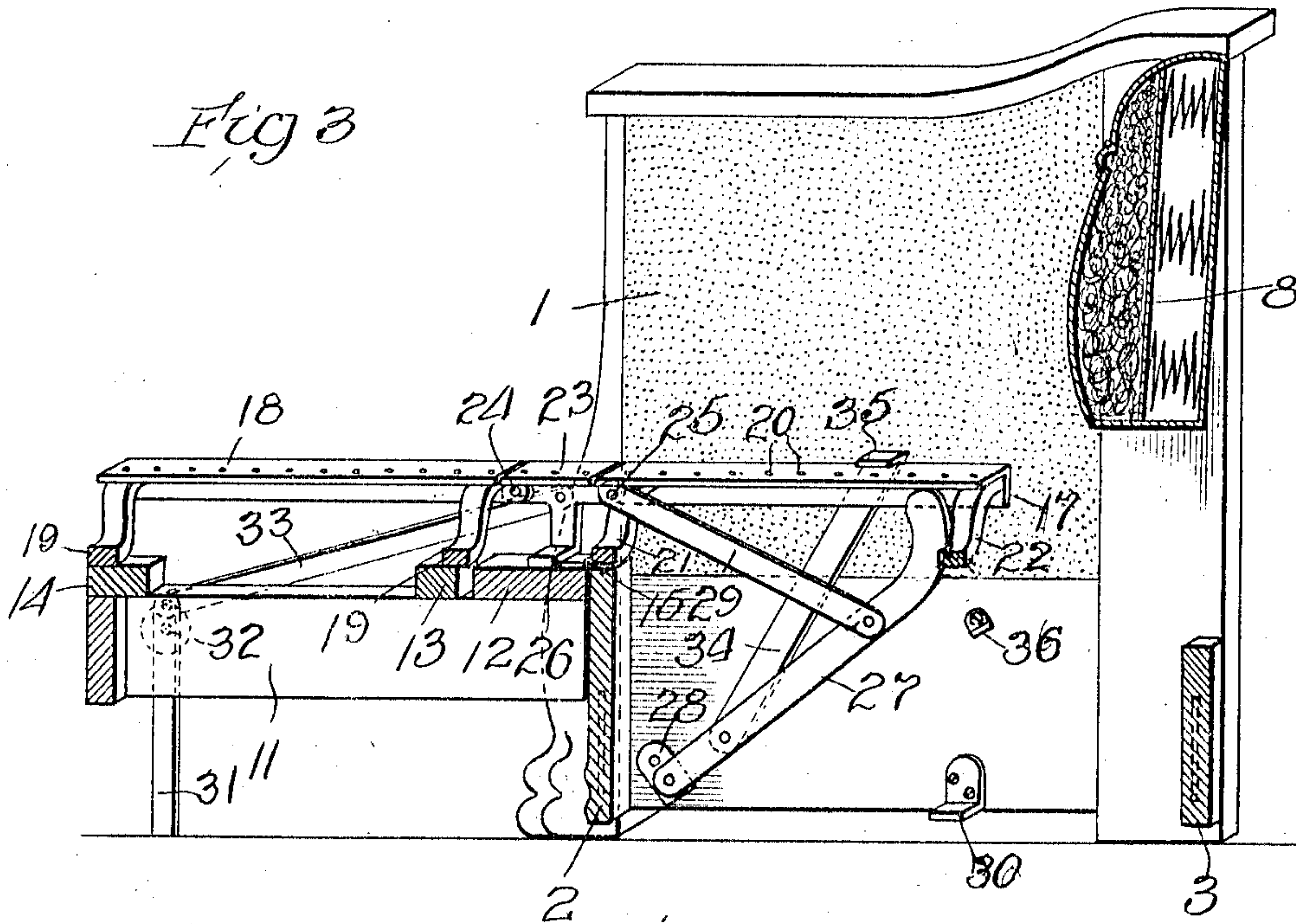
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3 SHEETS-SHEET 3.

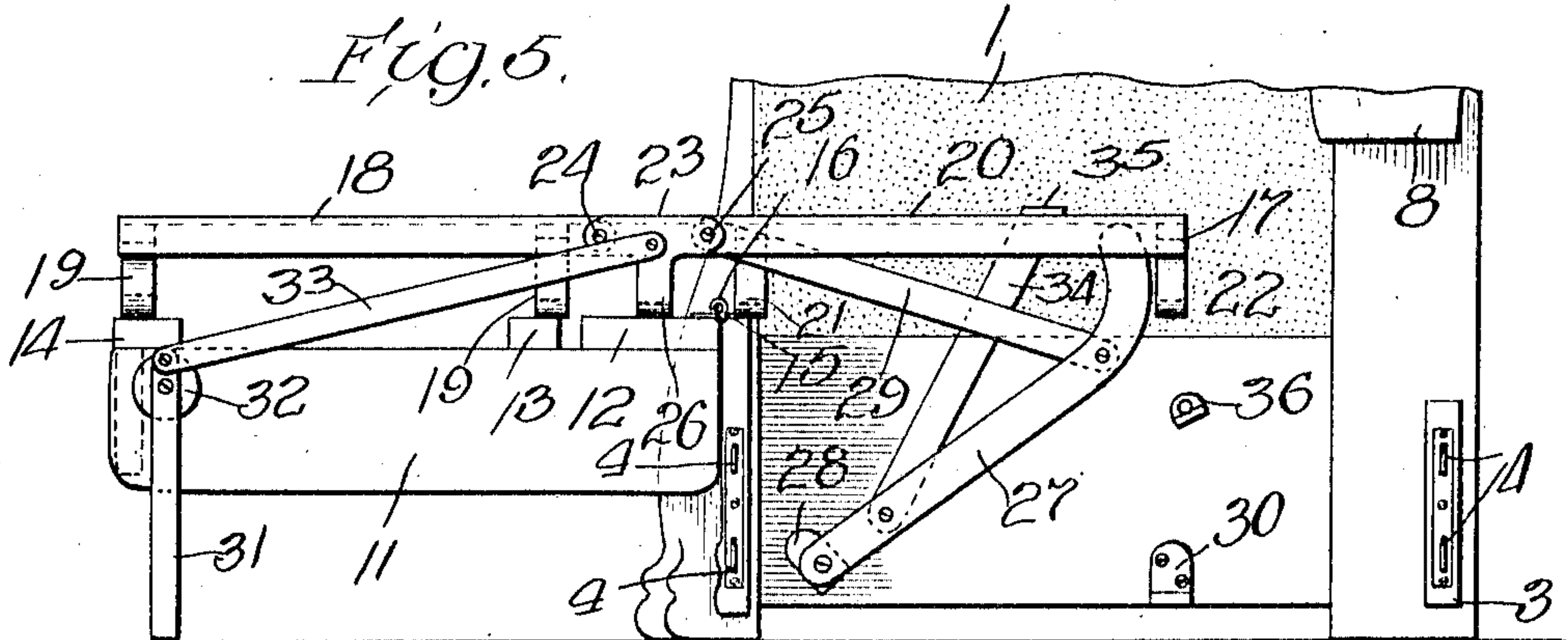


Fig. 6

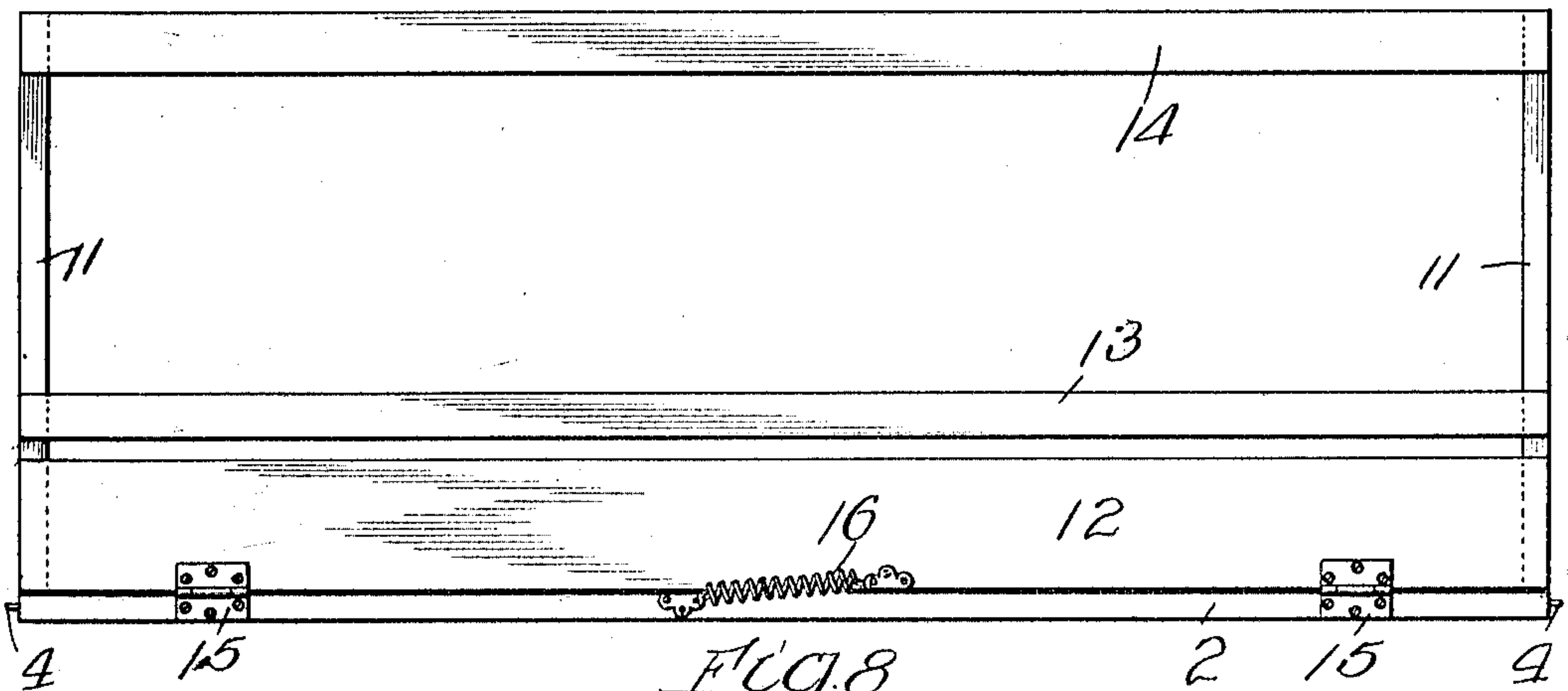


Fig. 7

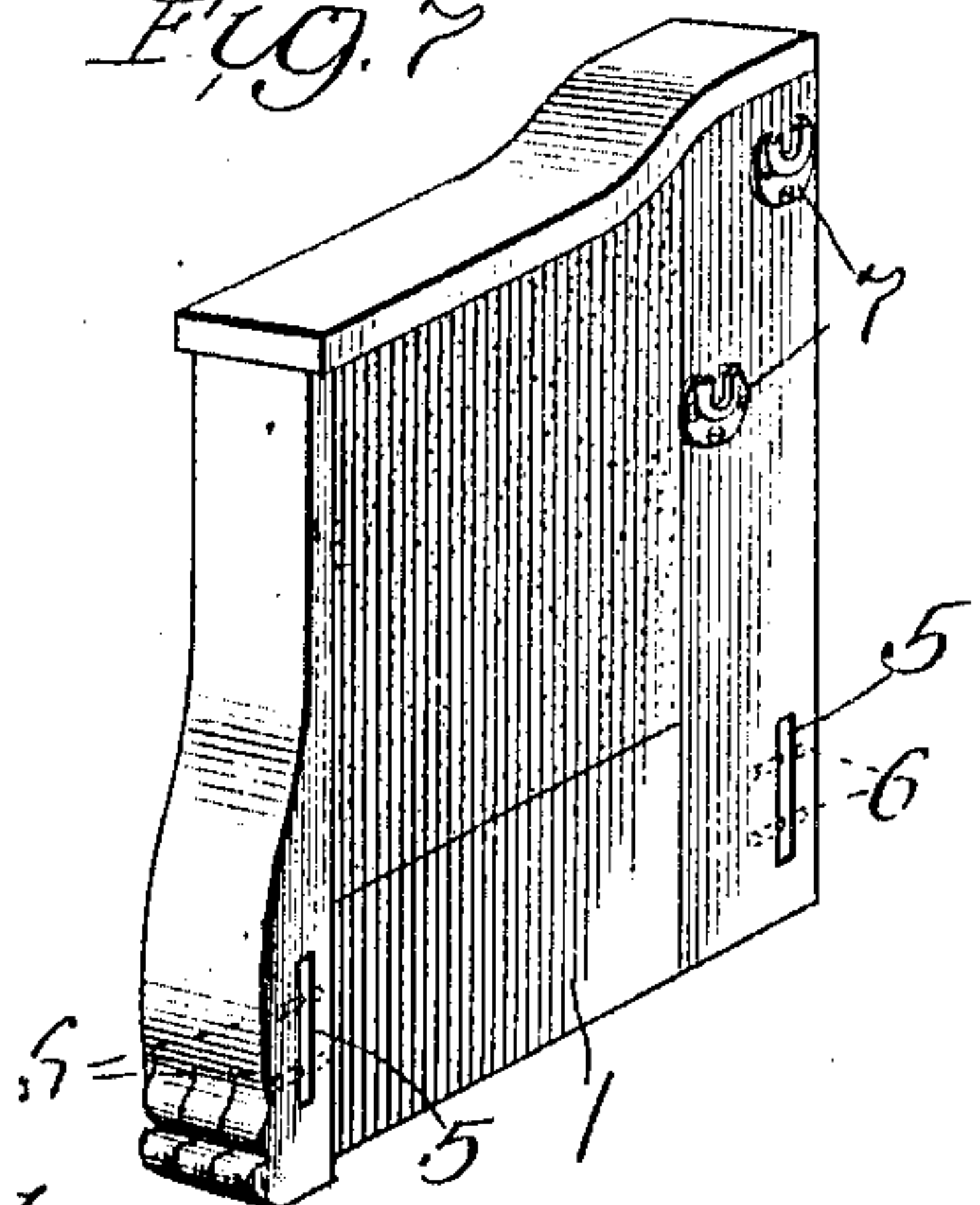


Fig. 8

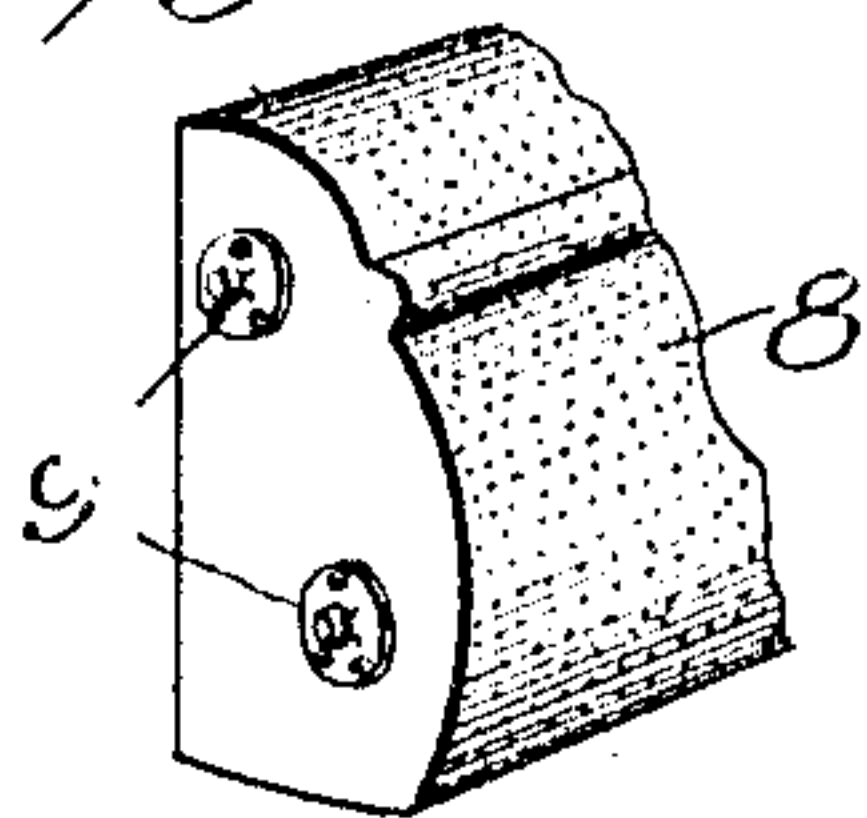


Fig. 9

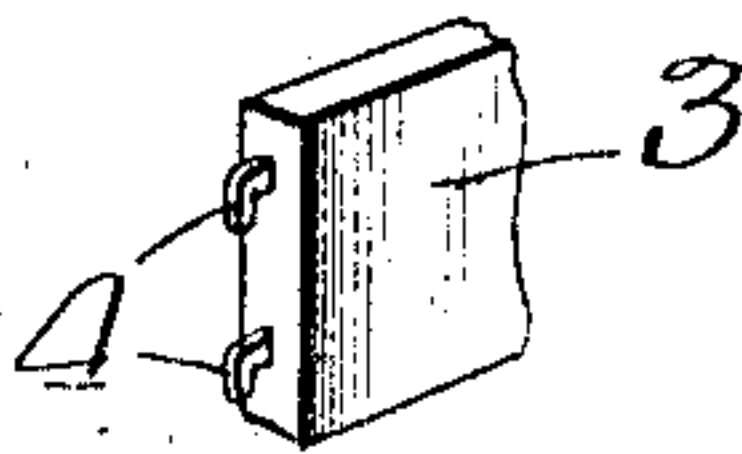
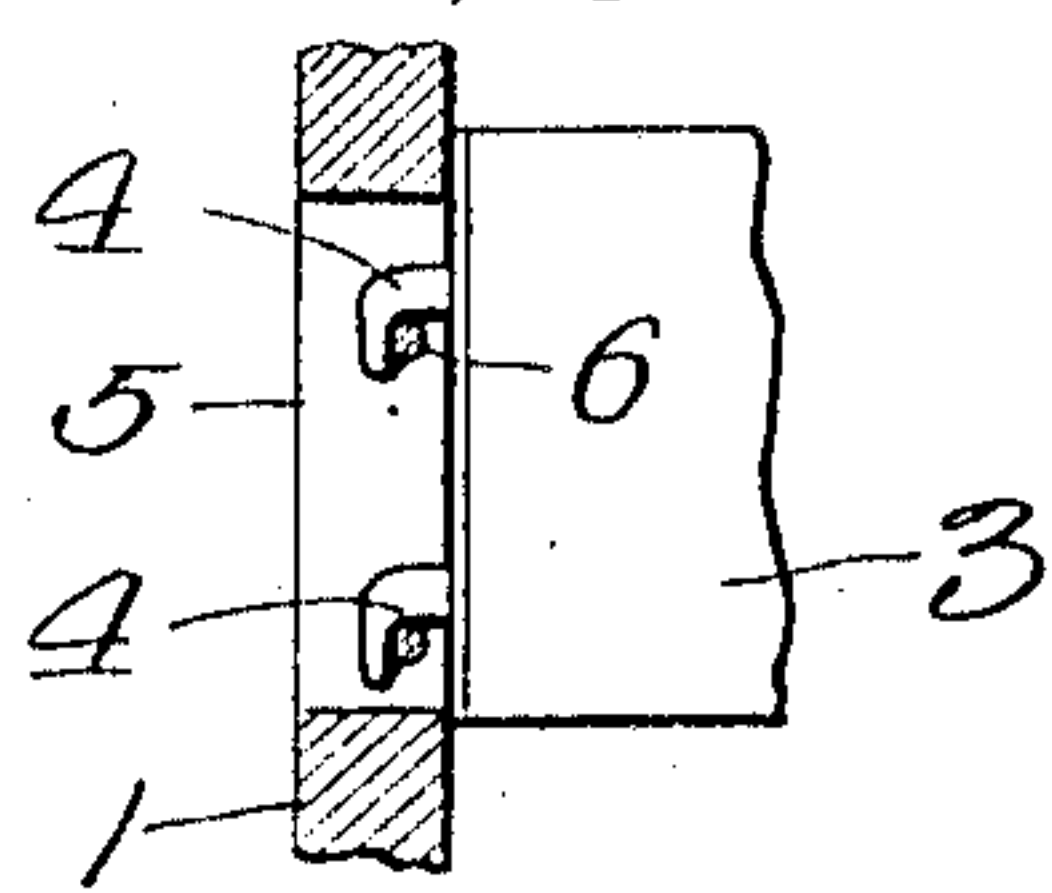


Fig. 10.



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UNITED STATES PATENT OFFICE.

RUDOLPH DEIMEL, OF CHICAGO, ILLINOIS.

SOFA-BED.

993,656.

Specification of Letters Patent.

Patented May 30, 1911.

Application filed June 17, 1909. Serial No. 502,650.

To all whom it may concern:

Be it known that I, RUDOLPH DEIMEL, a citizen of the United States of America, and a resident of Chicago, Cook county, State of Illinois, have invented certain new and useful Improvements in Sofa-Beds, of which the following is a specification.

The main objects of this invention are to provide an improved form of sofa-bed, which is of simple construction and which has but few parts to its operating mechanism; to provide a sofa-bed which is adapted to be quickly converted from a sofa to a bed or vice versa with but a slight expenditure of labor; and to provide a sofa-bed in which the bed springs and the supporting mechanism therefor are adapted to be automatically folded into small compass within the sofa or supporting frame, through the simple act of lifting the seat frame.

A specific construction embodying this invention is illustrated in the accompanying drawings, in which:

Figure 1 is a perspective view of the sofa-bed in its closed or folded position. Fig. 2 is a perspective view of the sofa-bed in its open position. Fig. 3 is a transverse section taken on line A—A of Fig. 2. Fig. 4 is a central, transverse section of the sofa-bed in its closed position. Fig. 5 is a fragmentary, end elevation of the sofa-bed with one end board or member removed. Fig. 6 is a plan view of the front rail and of the seat frame in open position, with the bed-spring frame removed. Fig. 7 is a perspective view showing the front and inner sides of one of the end members. Fig. 8 is a fragmentary, perspective view of the back section. Fig. 9 is a similar view of the rear rail. Fig. 10 is an enlarged, fragmentary detail showing the connection between rails and the end members.

In the construction shown, the sofa or supporting frame comprises end boards or members 1, which are rigidly but detachably connected together by means of the front and back rails 2 and 3. Said rails are provided at their ends with longitudinally directed hooks 4 which are adapted to enter sockets 5 in said end members and engage over pins or bolts 6 in said sockets and thereby rigidly secure said end boards and rails together.

Secured on the inner faces of the end boards 1, near the rear upper corners thereof, are the upwardly opening sockets 7, and the upholstered back section 8 is provided with headed pins or studs 9 in its ends adapted to engage in said sockets. The back section 8 may therefore be quickly attached or detached when desired.

The sofa seat 10 comprises a frame or boxing 11, in which the upholstering is secured. The frame is provided on the side which is down when the seat is closed and up when the seat is open, with longitudinally directed supporting strips or bars 12, 13 and 14, the two former of which are adjacent to the front edge of the closed seat, and the latter adjacent to the rear edge of the closed seat, as shown more clearly in Fig. 4.

The seat frame 11 is hinged to the top of the front rail 2 by means of hinges 15 which are secured to the bar 12 and to the top of said rail. When in closed position, as shown in Fig. 4, the front edge of the seat rests on the top of said rail 2, and when in open position the frame is inverted and extends forwardly from the rail with the upper surfaces of said strips on a level with the top of the rail, as shown in Figs. 3 and 5. A helical spring 16 is secured at its ends to the strip 12 and the top of the rail 2 in such manner that when the seat is closed the spring is under tension, and acts to help raise the seat.

The bed-spring frame 17 is constructed in sections which are pivotally connected together and, when the sofa-bed is in closed position, the frame 17 is folded and concealed beneath the seat frame. Said spring frame comprises an outer, an inner or rear, and an intermediate section. The outer section comprises end pieces 18 which are constructed of angle bars and are rigidly secured to supporting bars 19, which extend along the seat frame and are rigidly secured to the strips 13 and 14. Said bars 19 are curved at their ends away from the strips so as to support the end pieces 18 above the seat frame when the bed is open. The inner or rear section of the spring frame is likewise constructed of angle iron end pieces 20 and supporting bars 21 and 22. When the bed is in open position the bar 21 rests upon the rail 2 and supports the outer edge of said

inner section. The outer and inner sections are connected by the intermediate section, which comprises angle iron end pieces 23, similar to the pieces 18 and 20, and which are pivoted thereto at 24 and 25, so as to permit the intermediate section to be turned upwardly with respect to the inner section, and the outer section to be folded inwardly above the inner section, as shown in Fig. 4.

The rails 23 are each provided with a downwardly directed foot or brace 26, adapted, when the bed is open, to rest on the strip 12 and support the intermediate section.

The inner edge of the inner spring frame section is supported upon self adjusting legs 27 which are adapted to be automatically raised or lowered with the section and to support the section in either its lowered or elevated positions. The legs 27 each comprise a bar pivoted at one end to a bracket 28 which is secured to the inner side of the end board 1, adjacent to the lower front corner of the board. The other end of said bar is curved upwardly into position for the inner end of the rail 20 to rest thereon. A connecting bar 29 is pivoted at one end to the pivot pin 25, and at the other end is pivoted to the leg 27 near the curved end. When the bed is being opened the connecting bars raise the curved ends of the legs so as to support the inner spring frame section at the desired height, and when the bed is closed said connecting bars lower the legs 27 to an approximately horizontal position where their curved ends rest upon brackets 30 carried on the end boards 1.

The edge of the seat frame 11 which is at the front when the bed is open is supported on legs 31 which are pivoted to plates 32 on the ends of the seat frame. Each leg 31 is provided with an operating link 33 which is pivoted at one end to the upper end of the leg, and at its other end is pivoted to the end piece 23 at a point about midway between the ends of said end piece. When the seat frame is being closed, the bending of the joint at 24 reduces the distance between the pivotal point of the leg 31 and the pivotal point of the bar 33 on the end piece 23 and causes the operating links 33 to turn the legs 31 to a horizontal position at the ends of the seat frame, as shown in Fig. 4.

For the purpose of supporting the free or swinging edge of the seat frame and the outer spring frame section when the sofa-bed is in closed position, an arm 34 is pivoted to the outer side of each leg 27 and extends upwardly and rearwardly, and is provided with an intumed end 35 adapted to engage beneath the end piece 18. The upper or free end of said arm is supported at the proper height, when the bed is closed, by means of a bracket 36 carried on the end board, and when the bed is opened the end 35 rests on the end piece 20.

The bed-springs 37 are secured directly to the end pieces 18, 23 and 20 and are adapted to be folded with the spring frame sections.

The operation of the device shown is as follows: When it is desired to open the device, or to convert it from a sofa into a bed, the rear edge of the seat is raised and the seat turned forwardly on the hinges 15 to a horizontal inverted position in front of the front rail 2. As the seat frame is turned outwardly, it carries the front spring section, which is rigidly secured thereto, upwardly and outwardly over the front rail 2. The pivots 24 travel through arcs of circles whose centers are in the hinges 15. As the pivots 24 swing about the axis of the hinges 15, the intermediate section 23 of the spring frame is gradually swung out of a vertical position, as in Fig. 4, to a horizontal position, as in Fig. 3. The weight of the inner section of the spring frame resting upon the legs 27 causes the links 29 to swing the feet 26 of the intermediate section rearwardly enough so that they clear the upper edge of the front rail 2. The parts therefore pass freely from the folded to the extended positions without interference with each other or with the frame. When the seat frame reaches its open position, the feet 26 come to rest upon the bars 12, while the bar 21 comes to rest upon the upper edge of the front rail 2, and the rear section of the bed-frame is supported by the legs 27 in horizontal alinement with the front and middle sections. While the seat frame is being opened the operating links 33 are moved longitudinally by the straightening of the spring frame, and the legs 31 are thereby turned down to position for supporting the seat frame. When closing the bed, the sections 23 are raised with the seat frame so that the feet 26 and the bar 21 will pass inwardly clear of the rail 2. The inner spring section is moved inwardly and downwardly by the movement of the sections 23, and the connecting bars 29 lower the legs 27 until they rest on the brackets 30. The arms 34 lower by gravity until they rest on the brackets 36 in position to support the seat in a horizontal position.

Although but one specific embodiment of this invention has been herein shown it will be understood that numerous details of the construction may be varied or omitted without departing from the spirit of this invention.

I claim:—

1. A sofa-bed comprising a supporting frame, a seat frame mounted thereon and adapted to be moved from a normal sofa-position to an extended bed-position, a three-section folding spring frame adapted to extend between the front of said seat frame and the rear of said supporting frame

when said seat frame is extended and to be housed in the frame below said seat frame when the seat frame is retracted, legs for the rear section of said spring frame, said
 5 legs being pivotally mounted near the front of said supporting frame and slidingly engaging with said rear section, and connecting bars pivoted to said legs and to the middle section of said spring frame for folding
 10 and unfolding said spring frame through the movement of said seat section.

2. A sofa-bed comprising a supporting frame, a seat frame hinged thereon, a sectional spring frame having one section
 15 rigidly secured to the seat frame, movable supports mounted on the supporting frame for supporting another section of said spring frame, means pivotally connecting said supports with the spring frame and arms pivoted to said movable supports, and limiting
 20 upward movement of the inner edge of said spring frame.

3. A sofa-bed comprising a supporting frame, a seat frame hinged thereto and
 25 adapted to be opened outwardly from the supporting frame, a spring frame comprising outer, inner and intermediate sections pivotally connected together, the outer one of which is rigidly connected to said seat
 30 frame, pivotally supported legs adapted to support the inner spring-frame-section, and connecting bars pivoted to said intermediate section and adapted to raise or lower said legs when the seat frame is operated.

35 4. A sofa-bed comprising a supporting frame, a seat frame hinged to the supporting frame, outer, inner and intermediate spring frame sections pivotally connected together and the outer one of which is
 40 rigidly secured to the seat frame, a support on the central spring-frame-section adapted to rest on the seat frame when the latter is in open position, legs for the rear spring-frame-section pivoted on the supporting
 45 frame, and links pivotally connected to the spring frame and to said legs and adapted to raise or lower the legs with the rear section of the spring frame.

5. A sofa-bed comprising a supporting
 50 frame, a seat frame hinged on the supporting frame, outer, inner and intermediate spring-frame-sections pivotally secured together, said outer frame-section being rigidly secured to the seat frame, legs pivoted on the seat frame, operating links connecting said legs with the intermediate
 55 spring-frame-section and adapted when the seat frame is operated to throw said legs into or out of operative position, legs pivotally connected to the supporting frame and adapted to support the rear side of the inner spring-frame-section, means for operating said legs, and means adapted to support the rear side of the seat frame when it
 60 is in closed position.
 65

6. A sofa-bed comprising a supporting frame, inner, outer and intermediate spring-frame-sections, legs pivotally supported on the supporting frame and adapted to support the rear side of the inner section, means
 70 pivotally connected to said sections and adapted to operate said legs, a seat frame hinged to said supporting frame and rigidly connected to the outer spring-frame-section and adapted when opened to lift the intermediate and inner sections clear of the supporting frames, legs pivoted on said seat
 75 frame, and means for throwing said legs into and out of operative position when the seat frame is operated.
 80

7. A sofa-bed comprising a supporting frame, a seat frame hinged to said supporting frame and adapted to be swung to a forwardly extending position, inner, outer and intermediate spring-frame-sections pivotally
 85 connected together, said outer section extending along and being secured to said seat-frame, a support pivotally mounted near the front end of said supporting frame and extending rearwardly for supporting the rearward end of said inner section, a link pivotally connected to said support and to said intermediate section, all arranged to lift said inner section and cause said sections to
 90 assume positions of alinement with each other when said seat frame is swung to its normal extended position, a support for said seat-frame-support being connected with said support for the inner section and adapted to be lifted out of the path of said inner section during the upward movement thereof.
 100

8. In a structure of the character set forth, the combination of a sofa-frame, a forwardly swinging seat connected at its front
 105 portion with said frame and adapted to assume an inverted position in front thereof, a bed-frame section secured to and movable with said seat and disposed beneath the seat, an intermediate bed-section pivotally connected with said front section and equipped with a bearing member adapted to support it on the seat frame when the structure is in the open position, a rear bed-section pivotally connected with said intermediate bed-section, and links connected with the main frame and serving to lift the rear bed-section when the seat is swung to the open position.
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9. A sofa-bed comprising a supporting frame, a seat frame mounted thereon and adapted to be moved from a normal sofa-position to an extended bed-position, a three-section folding spring frame adapted to extend between the front of said seat frame and the rear of said supporting frame when said seat frame is extended and to be housed in the frame below said seat frame when the seat frame is retracted, the middle sec-
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tion having a bearing member adapted to support it upon the seat frame when the structure is in open position, and links connected with the supporting frame and serving to lift the rear section of said spring frame when the seat is swung to the open position.

Signed at Chicago this 15th day of June 1909.

RUDOLPH DEIMEL.

Witnesses:

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