

March 7, 1944.

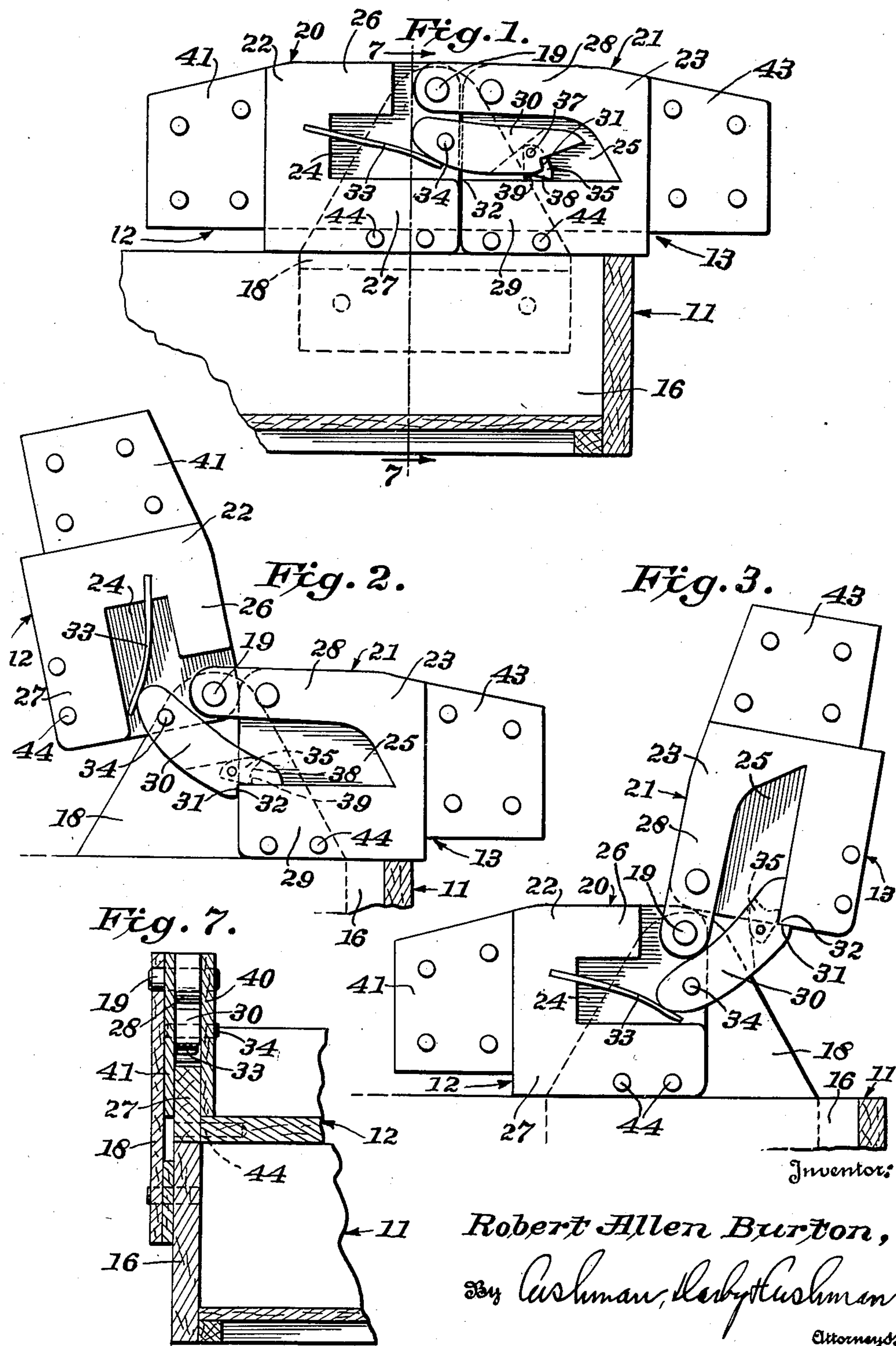
R. A. BURTON

2,343,642

SOFA BED

Filed Dec. 2, 1942

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March 7, 1944.

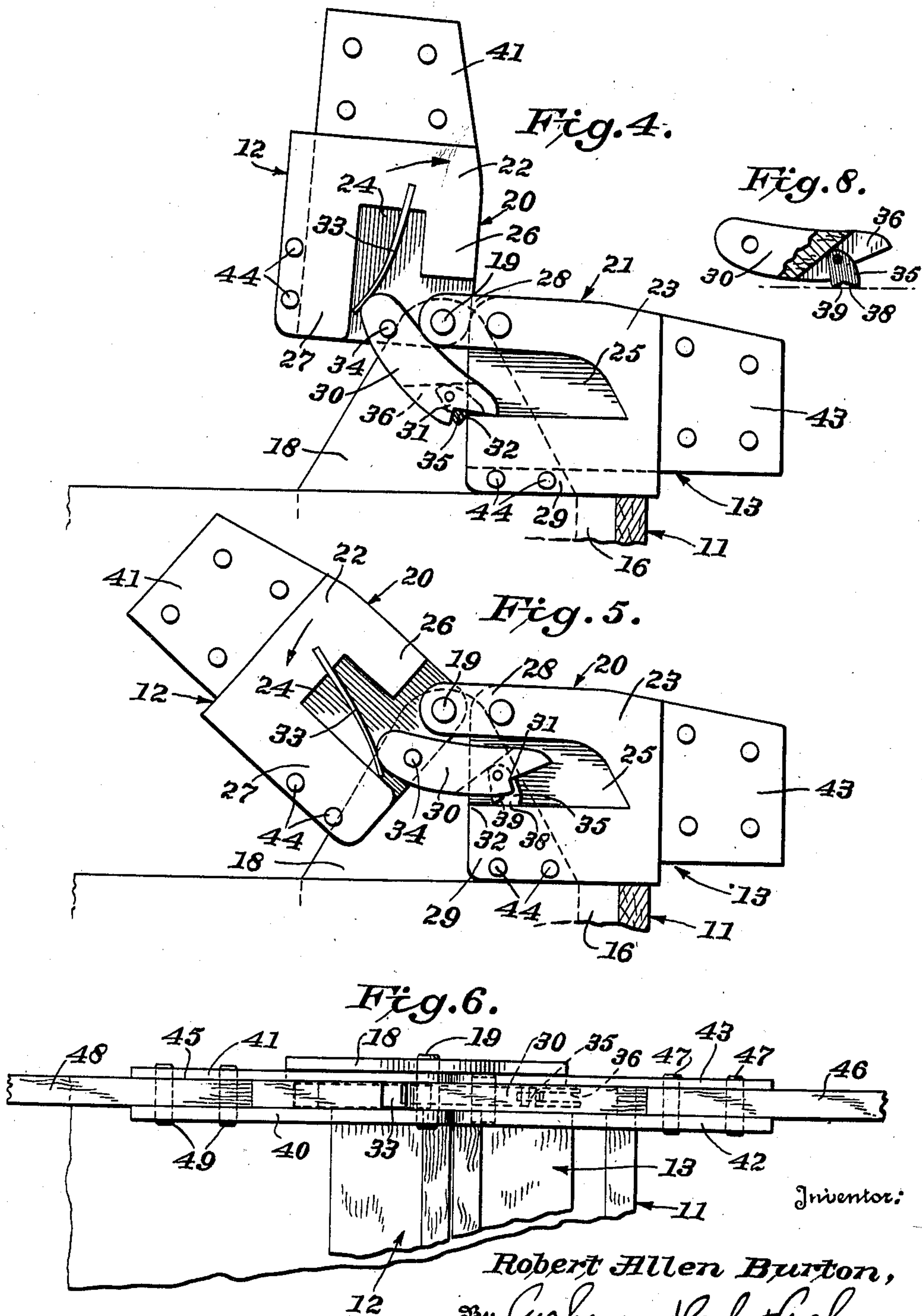
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3 Sheets-Sheet 2



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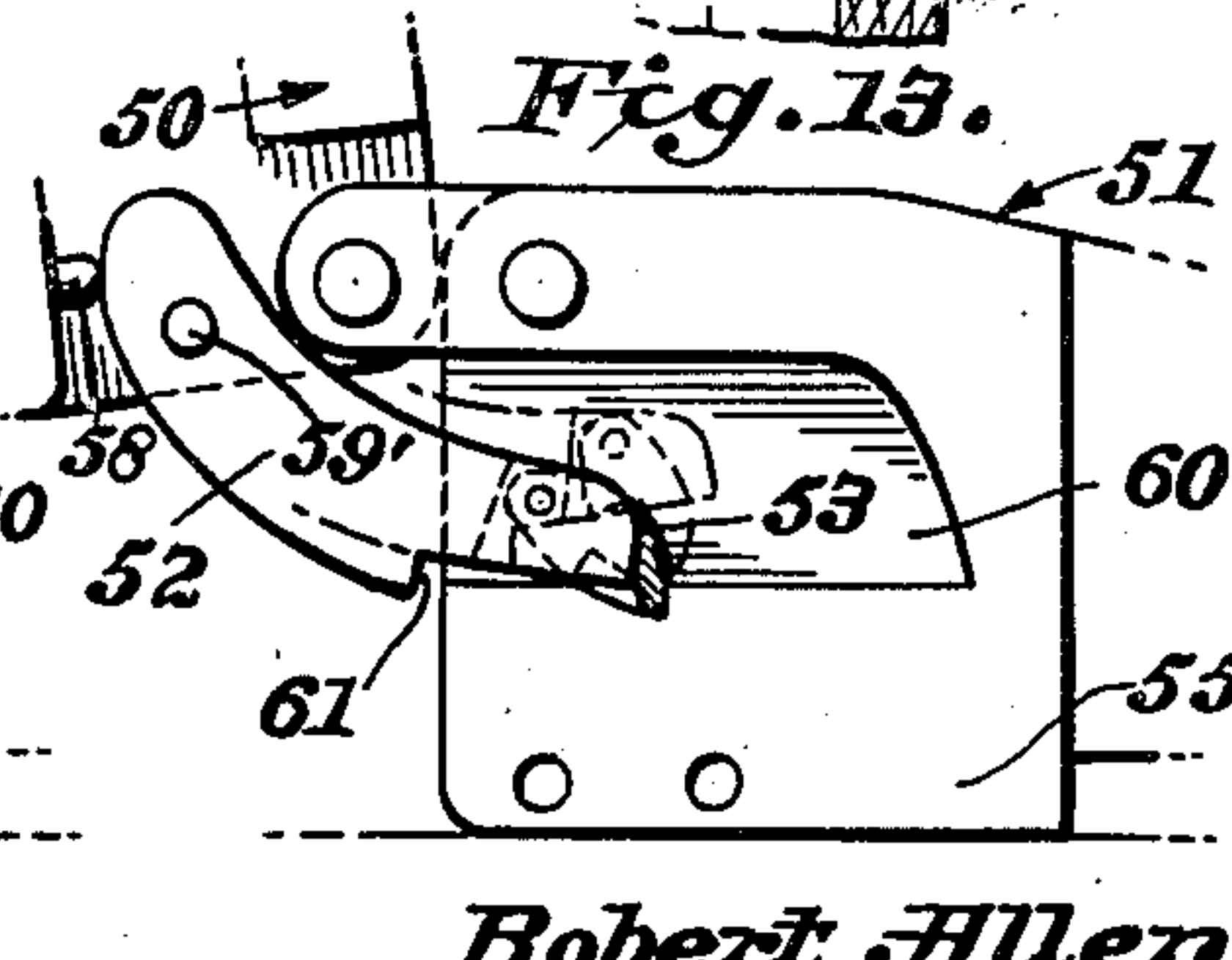
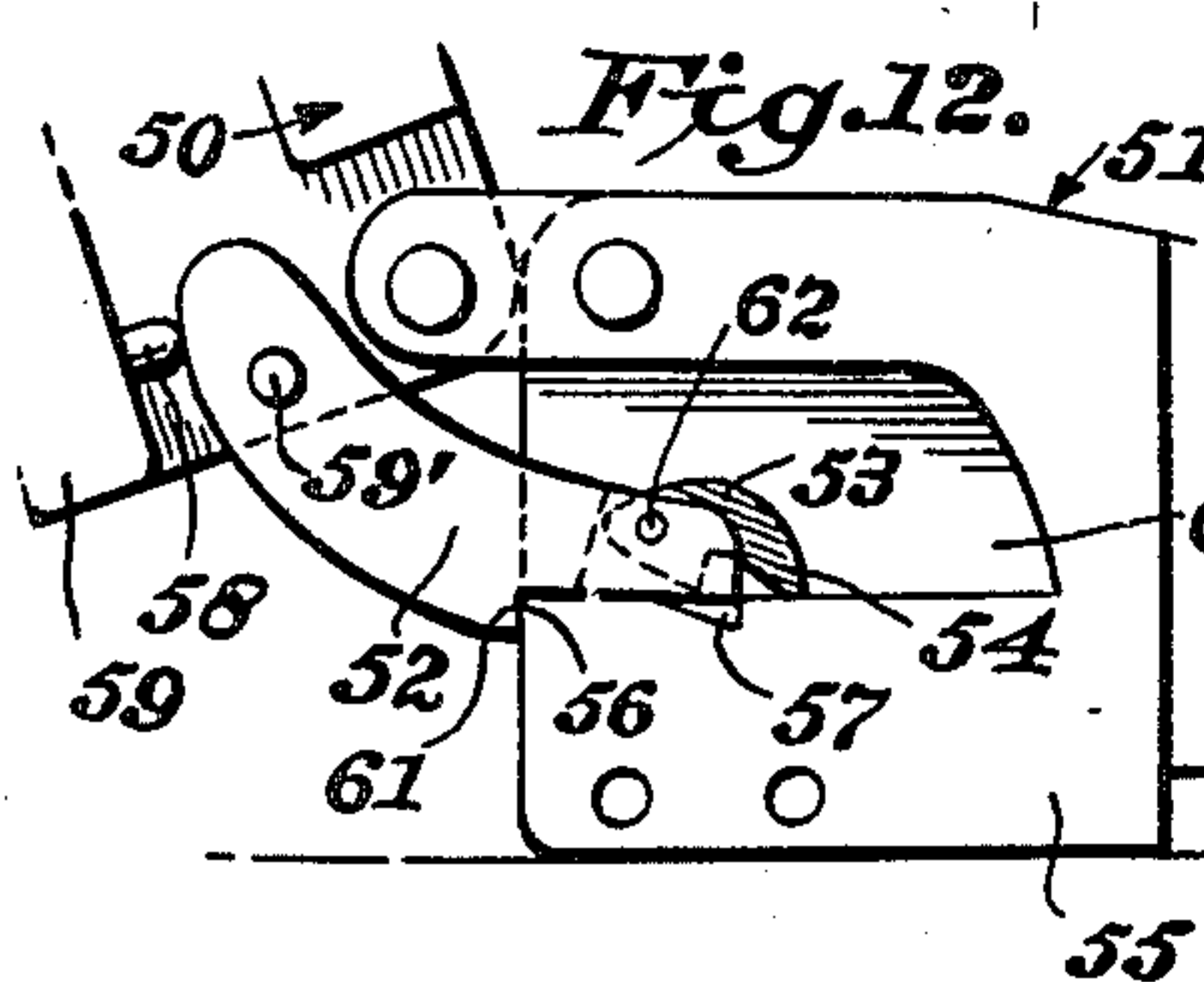
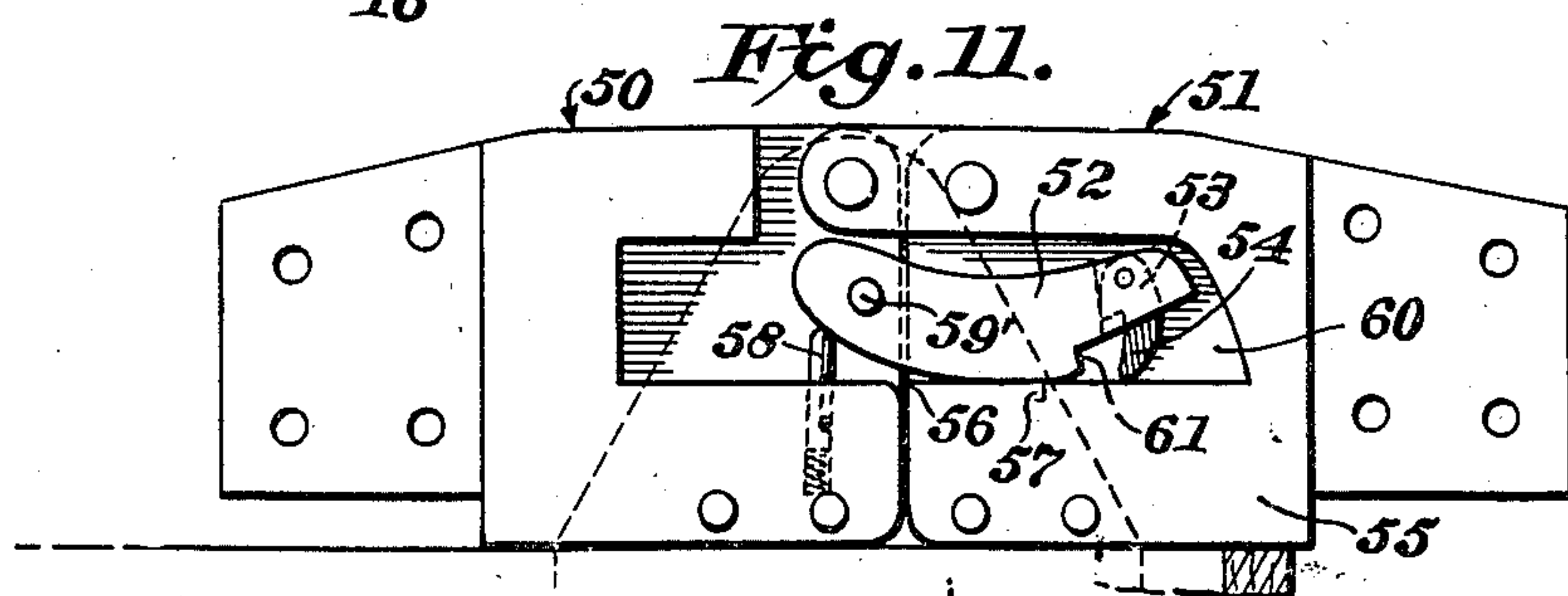
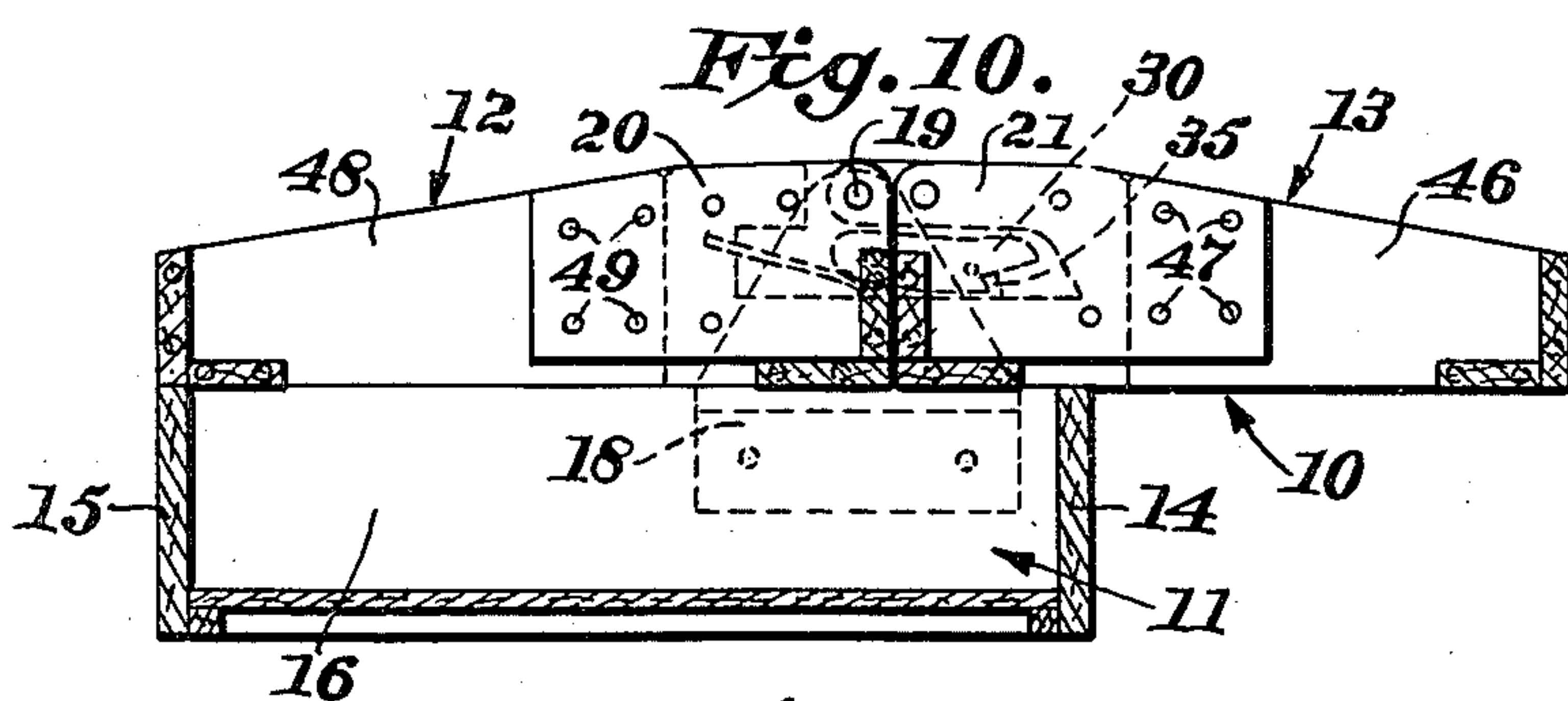
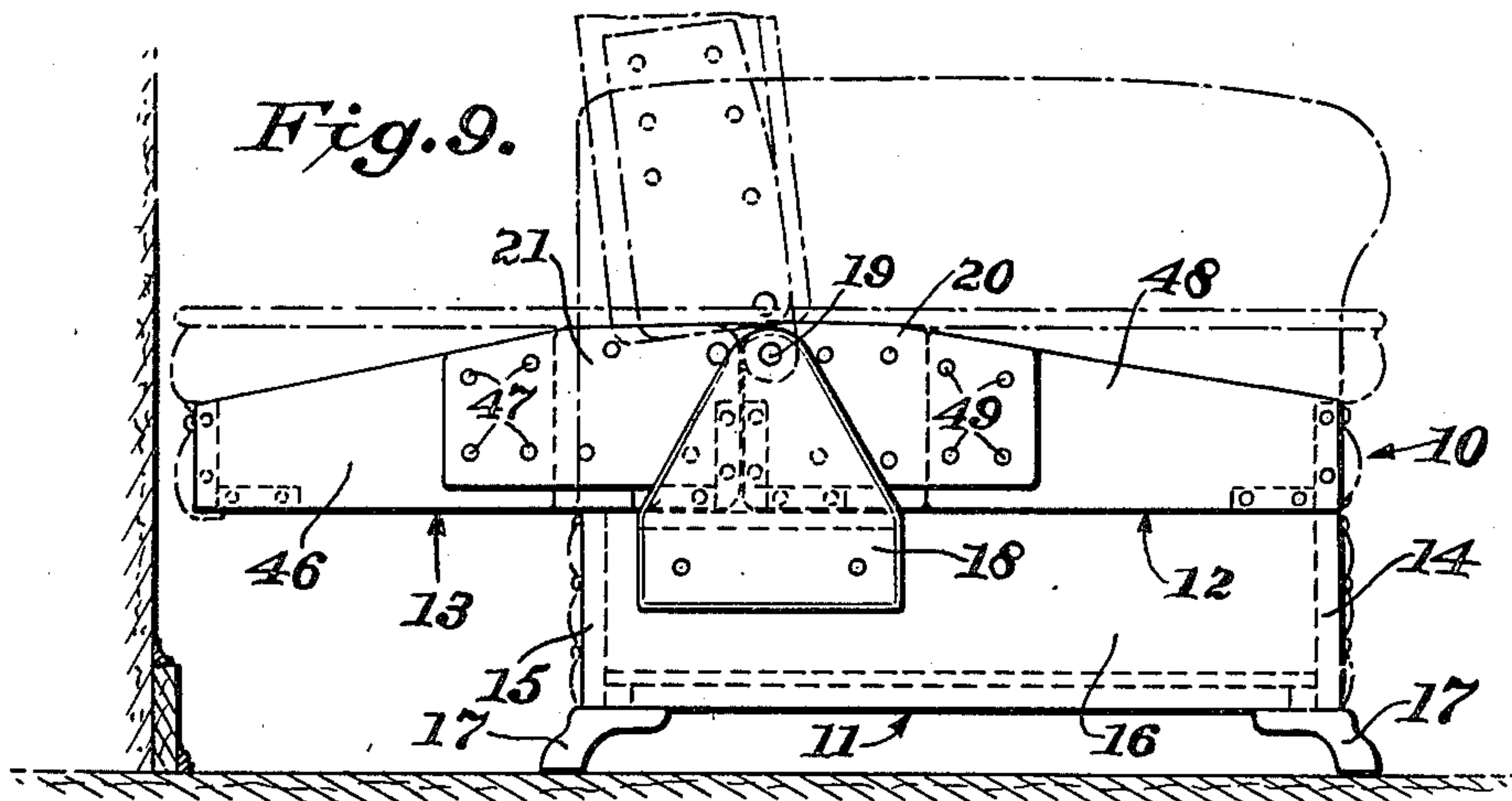
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,343,642

SOFA BED

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Application December 2, 1942, Serial No. 467,633

11 Claims. (Cl. 5—37)

The present invention relates to sofa beds and particularly to a hinge construction for pivotally connecting the seat and back sections of the sofa bed to the bed frame.

An object of the invention is the provision of a hinge construction which will permit the seat and back members to be easily shifted from bed to sofa or couch position and vice versa.

A further object is to provide a hinge construction having latch mechanism adapted to maintain the seat and back members in different positions of adjustment, said latch mechanism being easily controlled to move the latter from latched to unlatched position.

Another object is the provision of a hinge mechanism capable of being made entirely of wood, thereby eliminating the use of metal or other material unavailable at the present time.

A further object is to so form the latch mechanism, that part of the hinge structure may be utilized in retaining the latch in operative position.

Still another object is to provide means for partially concealing and protecting the latch mechanism from foreign matter, such as portions of the upholstery which may work into the mechanism and thereby prevent operation of this mechanism.

With the foregoing and other objects in view, the invention will now be more fully described, reference being had to the accompanying drawings in which:

Figure 1 is an enlarged detail view, showing the hinge mechanism in full open or bed position;

Figure 2 is an enlarged detail view, showing the seat raised to permit the notch of the latch to engage the shoulder on the back of the hinge;

Figure 3 is a similar view, showing the back raised by the seat to a normal "couch use" position;

Figure 4 is a similar view, showing the seat lifted and moved far enough to the rear to cause the supplemental latch or dog to engage the shoulder on the back;

Figure 5 is a similar view, showing the dog tripped, in a downward movement of the seat;

Figure 6 is a fragmentary top view of one of the end hinges and associated seat, back, and bed frame members;

Figure 7 is a vertical sectional view, substantially on the line 7—7 of Figure 1;

Figure 8 is a detail view of the latch element, partly broken away to expose the dog;

Figure 9 is an outside face view of the complete

frame outline, on a reduced scale, in relation to the dotted outline of the couch;

Figure 10 is a fragmental detail of the seat and back frames in same open position as Figure 9, and

Figures 11, 12, and 13 are detail views of a modified form of the latch element, showing the seat and back members in different positions of adjustment.

Referring now to the drawings, and particularly to Figures 9 and 10, there is disclosed a sofa bed 10 incorporating the hinge construction of the present invention. This bed comprises a base or frame 11 supporting the seat and back 12 and 13, respectively. As is usual in pieces of furniture of this type, the base or bed frame 11 is of substantially rectangular formation, comprising front and rear panels 14 and 15, and end panels 16. Legs or other suitable supporting means 17 are attached to the base 11 and support the same in slightly elevated position (see Figure 9). Upon the outer face of each end panel 16 is mounted a hinge-supporting bracket 18. At the upper end of each bracket 18 is a fixed pivot 19 about which seat and back hinge sections 20 and 21 are mounted, to swing to different positions of adjustment, as will be hereinafter described.

Since each hinge is identical in construction, only one will be described in detail, but it is to be understood that there is a set of hinge sections 20 and 21 at each end of the base 11, pivotally secured to its respective support 18 by the fixed pivot 19. While substantially all of the elements of the hinge sections are preferably formed of wooden parts, it is to be understood that the invention is not limited in this respect and that these elements may be made of plastic, metal, or other suitable available materials.

Referring now to Figures 1 to 3, there is disclosed the preferred form of the invention. Each hinge section includes as part of its structure, a recessed block, the seat section 20 being provided with the block 22 while the back hinge section is provided with a block 23. These blocks are formed with substantially centrally disposed, longitudinally extending recessed portions 24 and 25, respectively, which cooperate to form a partially closed latch-receiving pocket (see Figure 1). The block 22 of the seat hinge section is formed with upper and lower legs 26 and 27, the upper leg terminating short of the lower leg. Block 23 is likewise provided with upper and lower legs 28 and 29. The lower leg 29 is of substantially the same formation as the lower leg 27 of block

22, but the upper leg 28 is longer than leg 29 and overlaps the lower leg 27 of the seat hinge section. This upper leg 28 extends over to a point directly in advance of the short leg 26 of the block 22 and is provided with an aperture for receiving the pivot pin 19 about which the hinge sections swing.

Means are provided to lock or maintain the hinge sections in different positions of adjustment and to permit the sections to become automatically unlocked whereby they can be moved to other positions of adjustment. This means comprises a latch 30 pivoted adjacent one of its ends on the seat hinge section 20 and extending partially into the recessed portion 24. In the position of the seat and back shown in Figure 1, the latch extends well into the recessed portion 25 of the back hinge section. This latch is provided with a notch or tooth 31 adjacent its free end, which notch is adapted to directly engage a shoulder 32 formed on the block 23. This shoulder is formed by the intersection of the end face of the leg 29 with the lower wall of the recessed portion 25.

As shown in Figure 2, the notch 31 engages the shoulder 32 when the seat hinge section is swung about its pivot away from the back section 21. In its movement from its position shown in Figure 1 to that of Figure 2, the lower edge of the latch 30 slides upon the lower wall of the recessed portion 25 until the notch 31 finally drops by gravity upon the shoulder 32. To assist this action and assure that the several parts will always function in this manner, a leaf spring 33 is mounted in the recess 24 of the seat hinge section and has its free end constantly in engagement with the lower portion of the latch inwardly of the pivot point 34. Thus, the spring 33 will constantly exert pressure upon the latch 30 to move it about its pivot so that the lower face of the latch will tend to move into engagement with the lower wall of the recessed portion 25 and thereby assure that the notch 31 will eventually engage the shoulder 32 when the seat hinge section 22 has been moved sufficiently about its pivot, that is, to the position shown in Figure 2.

Means are also provided to automatically release the latch 30 from its engagement with the shoulder 32, and this comprises a dog or trigger 35 pivotally mounted in a slot 36 formed in the free end of the latch 30 (see Figure 8). The arrangement of the dog 35 in the slot 36 is such that the outer side of the dog will be in the position shown in Figure 1 when the back and seat sections 12 and 13 are in their horizontal or bed position. It will be observed that the outer or that edge which is farthest removed from the pivot point 37 of the dog is so formed as to provide two inwardly inclined faces 38 and 39, respectively, the face 38 being somewhat longer than the face 39. When the hinge section 20 is moved from the position shown in Figure 1 to that of Figure 2, the dog 35 will move about its pivot from the position shown in Figure 1 to that shown in Figure 2 and will remain in this position as long as the latch notch 31 is in engagement with the shoulder 32.

When, however, it is desired to bring the hinge sections together back to the position shown in Figure 1, this may be easily and quickly accomplished by initially moving the hinge section 20 from the position shown in Figure 2 to that disclosed in Figure 4. This will have the effect of

moving the latch 30 outwardly so that the notch is slightly spaced from the shoulder 32. During this movement, the dog 35 will fall by gravity to the position shown in Figure 4 wherein its outer edge will engage the shoulder 32, with the longer face 38 lying or resting upon the top of the shoulder, and the face 39 extending downwardly and outwardly therefrom. With the elements located in this position, pressure on the hinge section 20 to swing it toward the hinge section 21 will press the face 39 upwardly against the shoulder and effect a movement of the dog about its pivot. This will raise the dog so that its faces 38 and 39 will slide on the lower wall of the recessed portion 25 as shown in Figure 5. As the dog is raised, the notch 31 will likewise be raised above the shoulder 32 and will clear the same to permit the latch to be moved inwardly of the recessed portion 25 and finally into the position shown in Figure 1.

In order to conceal and also protect the latch 30, dog 35, and spring 33 against foreign matter, the side faces of the blocks 22 and 23 are provided with sets of detachably connected plates. In this connection, block 22 of the seat hinge section 20 is provided with inner and outer plates 40 and 41, respectively, while plates 42 and 43 are secured to block 23 of the back hinge section. These plates are preferably detachably connected to their respective blocks by means of a plurality of wooden dowels 44 which pass through aligned openings in both the blocks and plates. It will be furthermore noted (see Figures 1 and 2) that the fixed pivot 19 passes through not only the extended leg portion 28 of block 23 but also through plates 40 and 41 of the seat hinge section 20 which are located on opposite sides of the extended leg portion 28. The dowel pivot pin 34, upon which the catch 30 is pivoted, also passes through the plates 40 and 41. It will also be observed that each set of plates extends somewhat beyond the outer extremity of its respective block to form a panel-receiving pocket 45. With this construction, each end panel 46 of the back is received within one of the sets of spaced plates 42 and 43. These elements are also perfectly secured together by means of wooden dowels 47. In like manner, the end panels 48 of the seat are secured between the plates 40 and 41 by means of dowels 49 (see Figure 6). It is to be understood, of course, that in place of the wooden dowels, screws or other fastening means may be utilized, if desired.

With the hinge sections formed in the manner above described and assuming that the seat 12 and back 13 are in the horizontal bed position shown in Figure 1, it is an easy matter to convert the sofa bed from bed to couch or sofa position. This is accomplished by first raising the seat to the position shown in Figure 2 wherein the notch 31 of the latch 30 will engage the shoulder 32 of the back hinge section. Thereafter, the seat is moved downwardly about its pivot to the couch or sofa position shown in Figure 3. Such movement will, by reason of the engagement of the latch notch with the shoulder, swing the back to its upward position as shown in Figure 3.

When it is desired to reverse this procedure and move the several sections to their horizontal or bed position, this may also be easily accomplished by first lowering the back to the position shown in Figure 2, which movement will simultaneously raise the seat to a substantially vertical position. Thereafter, the seat is moved further about its pivot to the position shown in Figure 4. This will

disengage the latch notch 31 from the shoulder 32 and permit the dog 35 to drop down into the position shown in Figure 4. Thereafter, by a downward pull upon the seat section, the dog will initially pivot about the shoulder 32. This will cause the dog, together with the free end of the latch, to be raised so that the latter will clear the shoulder 32, whereby by a continued downward movement of the seat section, the latch will slide within the recessed portion 25, permitting the seat to be moved back to its full horizontal bed position illustrated in Figure 1. These operations may be repeated as often as desired, and in view of the substantial counter-balancing of one section relative to the other, little or no exertion is necessary to change the device from bed to sofa position or from sofa to bed position.

Referring now to Figures 11, 12, and 13, there is disclosed a modified form of the latching mechanism. In this construction, the hinge sections 50 and 51 are identical with the sections 20 and 21. The catch 52 is also very similar to the catch 30, but the dog 53 is somewhat different in construction in that it is formed with a substantially elongated arm 54. The block 55 is also provided with a shoulder 56 similar to the shoulder 32, and in addition is formed with a dog-receiving indentation 57 inwardly of the shoulder. In place of the leaf spring 33, a spring-pressed plunger 58 may be provided, movable in a recess formed in the lower face of the recessed portion of the block 59. The arrangement is such that this plunger will always exert pressure on the latch inwardly of its pivot point 59'. Thus, the portion of the latch within the recess 60 of the block 55 will always be urged downwardly into engagement with the lower face or wall of the recessed portion. It is to be understood that the leaf spring and spring pressed plunger may be used as desired in each form of the invention. That is, the leaf spring 33 may be used in the form shown in Figures 11, 12, and 13, while the plunger 58 may be employed in the construction disclosed in Figures 1 to 10.

When the seat section 50 is raised to the position shown in Figure 12, the catch 52 will slide partially out of the recessed portion 60 until the notch 61 engages the shoulder 56. In this position, the elongated portion 54 of the dog 53 will have fallen by gravity into engagement with the lower wall of the recessed portion 60 directly in advance of the indentation 57.

It is to be understood that the same operations will be performed as described hereinbefore in moving the back and seat portions from bed position to seat position and vice versa. As distinguished from the function of the dog 35 in Figures 1 to 4, the dog 53 will not be moved rearwardly to a position where it engages the shoulder 56. Instead, a slight upward movement on the hinge section 50 will move the dog so that its elongated portion 54 will fall into the indentation 57. Thereafter by a downward pull on the section 50, the dog will tend to pivot in the indentation 57. This will move the dog about its actual pivot 62 which will have the effect of not only raising the dog but also the latch notch 61 to the dotted line position in Figure 13. Thus, the notch 61 will clear the shoulder and subsequently ride into the recessed portion 60, permitting the seat to be moved down to its bed position, as shown in Figure 11.

As hereinbefore stated, while the majority of the elements of the hinge sections are preferably formed of wood, it is to be understood that the

invention is not limited to this particular material, but that plastic, metal or other materials may be utilized in whole or in part, as desired.

Furthermore, the term "block" in the specification and claims is to be interpreted as including either a one-piece or a multi-piece member. For instance, the legs of the block could conceivably be separate elements positioned in approximate contact with the rest of the block, without departing from the scope of the invention.

It is to be further understood that the invention is not limited to the details of construction shown in the drawings, and that the phraseology employed in the specification is for the purpose of description and not of limitation.

I claim:

1. In a hinge for a sofa bed, a pair of pivotally connected hinge sections, each section including a block having a recessed portion cooperating with the other recessed portion to form a latch-receiving pocket, a latch pivotally mounted in one of the recessed portions and having one end extending into the other recessed portion, said last-mentioned recessed portion having a shoulder, said latch having a notch engageable with said shoulder to maintain the hinge sections in certain predetermined positions of adjustment, and means for disengaging the latch notch from the shoulder to permit movement of the hinge sections to other positions of adjustment, the free end of said latch being located in its respective pocket in all positions of said latch.

2. In a hinge for a sofa bed, a pair of pivotally connected hinge sections, each section including a block having a recessed portion cooperating with the other recessed portion to form a latch-receiving pocket, a latch pivotally mounted adjacent one end thereof in the recess of one of said hinge sections and having its free end slidable in the recess of the other hinge section, said last-mentioned recessed portion having a shoulder, said latch having a notch engageable with said shoulder to maintain the hinge sections in certain predetermined positions of adjustment, spring means mounted in the recessed portion of the first-mentioned hinge sections inwardly of the pivot point of the latch and engageable with the inner end of the latch to urge the latter about its pivot and maintain it in contact with the shoulder, and means for disengaging the latch notch from the shoulder to permit the latch to slide into the recess of the second-mentioned hinge section to thereby allow the hinge sections to swing toward each other.

3. In a hinge for a sofa bed, a pair of pivotally connected hinge sections, each section including a block having a recessed portion cooperating with the other recessed portion to form a latch-receiving pocket, a latch pivotally mounted adjacent one end thereof in the recess of one of said hinge sections and having its free end slidable in the recess of the other hinge section, said last-mentioned recessed portion having a shoulder, said latch having a notch engageable with said shoulder to maintain the hinge sections in certain predetermined positions of adjustment, a leaf spring having one end thereof anchored in said first-mentioned hinge section and extending longitudinally of its recessed portion, the free end of said leaf spring contacting the latch inwardly of its pivot point to urge the latter about its pivot and maintain it in contact with the shoulder, and means for disengaging the

latch notch from the shoulder to permit the latch to slide into the recess of the second-mentioned hinge section to thereby allow the hinge sections to swing toward each other.

4. In a hinge for a sofa bed, a pair of pivotally connected hinge sections, each section including a wooden block having a recessed portion cooperating with the other recessed portion to form a latch-receiving pocket, a wooden latch pivotally mounted in one of the recessed portions and having one end extending into the other recessed portion, said last-mentioned recessed portion having an abutment forming a part of its wooden block, said latch having a notch engageable with said abutment to maintain the hinge sections in certain predetermined positions of adjustment, and a wooden dog carried by said latch adjacent the notch and engageable with the abutment for disengaging the latch notch therefrom to permit movement of the hinge sections to other positions of adjustment, the free end of said latch being located in its respective pocket in all positions of said latch.

5. In a hinge for a sofa bed, a pair of pivotally connected hinge sections, each section including a wooden block having a recessed portion cooperating with the other recessed portion to form a latch-receiving pocket, a wooden latch pivotally mounted in one of the recessed portions and having one end extending into the other recessed portion, said last-mentioned recessed portion having an abutment forming a part of its wooden block, said latch having a notch engageable with said abutment to maintain the hinge sections in certain predetermined positions of adjustment, said latch being bifurcated in the area of the notch to form a dog-receiving slot, a wooden dog pivotally mounted in said slot and having a two-faced abutment engaging edge adapted to ride on the abutment and lift the latch out of engagement therewith to permit movement of the hinge sections to other positions of adjustment.

6. In a hinge for a sofa bed, a pair of pivotally connected hinge sections, each section including a wooden block having a recessed portion cooperating with the other recessed portion to form a latch-receiving pocket, a wooden latch pivotally mounted in one of the recessed portions and having one end extending into the other recessed portion, said last-mentioned recessed portion having an abutment forming a part of its wooden block, said latch having a notch engageable with said abutment to maintain the hinge sections in certain predetermined positions of adjustment, means for disengaging the latch notch from the shoulder to permit movement of the hinge sections to other positions of adjustment, each wooden block having substantially flat side faces, and a pair of wooden plates detachably connected to each of said wooden blocks and closing the sides of its respective recess to partially conceal and protect the latch.

7. In a hinge for a sofa bed, a pair of pivotally connected hinge sections, each section including a block having a longitudinally extending recessed portion cooperating with the other recessed portion to form a latch-receiving pocket, each block having a pair of spaced upper and lower legs defining its respective recess, the upper leg of one block terminating short of the lower leg, the upper leg of the second block extending beyond its lower leg and overlapping the lower leg of the first block, a latch pivotally mounted in the recessed portion of the first

block and projecting into the recessed portion of the second block, the recessed portion of the second block forming with an edge of its block a shoulder, said latch having a notch engageable with said shoulder to maintain the hinge sections in certain predetermined positions of adjustment, means carried by said latch for disengaging the latch notch from the shoulder to permit movement of the hinge sections to other positions of adjustment, a pair of plates detachably connected to each of said blocks and closing the sides of its respective recess to partially conceal and protect the latch, and a pivot pin passing through the extended portion of the upper leg of the second block and the plates of the first block in advance of its shortened leg to form the pivot point of the hinge sections.

8. In a hinge for a sofa bed, a pair of pivotally connected hinge sections, each section including a block having a recessed portion cooperating with the other recessed portion to form a latch-receiving pocket, a latch pivotally mounted in one of the recessed portions and having one end extending into the other recessed portion, said last-mentioned recessed portion having a shoulder, said latch having a notch engageable with said shoulder to maintain the hinge sections in certain predetermined positions of adjustment, means for disengaging the latch notch from the shoulder to permit movement of the hinge sections to other positions of adjustment, and a pair of plates detachably connected to each of said blocks and closing the sides of its respective recess to partially conceal and protect the latch and dog, each set of plates extending in spaced relation beyond the outer edge of its respective block to form a socket to detachably receive a frame element of the sofa bed.

9. In a hinge for a sofa bed, a pair of pivotally connected hinge sections, each section including a block having a recessed portion cooperating with the other recessed portion to form a latch-receiving pocket, a latch pivotally mounted in one of the recessed portions and having one end extending into the other recessed portion, said last-mentioned recessed portion forming with an edge of its block a shoulder and having an indentation in its lower side inwardly of the shoulder, said latch having a notch engageable with said shoulder to maintain the hinge sections in certain portions of adjustment, and a dog pivotally carried by said latch in advance of the notch and having a curved elongated free end portion adapted to be moved into the indentation when the notch is moved away from the shoulder, the free end of said dog, upon reverse movement of the latch, being temporarily retained by the indentation and functioning to raise the notch out of contact with the shoulder to permit movement of the hinge sections to other positions of adjustment.

10. In a hinge for a sofa bed, a pair of pivotally connected hinge sections, each section including a block having a recessed portion cooperating with the other recessed portion to form a latch-receiving pocket, a latch pivotally mounted adjacent one end thereof in the recess of one of said hinge sections and having its free end slidable in the recess of the other hinge section, said last-mentioned recessed portion having a shoulder, said latch having a notch engageable with said shoulder to maintain the hinge sections in certain predetermined positions of adjustment, the recessed portion of said first-mentioned hinge section having an aperture in

its lower face, a spring-pressed plunger movable in said aperture and having its upper end pressed into engagement with the latch inwardly of its pivot point to urge the latter about its pivot and maintain it in contact with the shoulder, and means for disengaging the latch notch from the shoulder to permit the latch to slide into the recess of the second-mentioned hinge section to thereby allow the hinge sections to swing toward each other.

11. A sofa bed having a back section and a seat section, a latch pivotally carried by one of said sections and having a notch formed therein adjacent one of its ends, the other of said sections having a latch supporting surface terminating in a shoulder, said shoulder adapted to

be engaged by the latch notch to maintain the sections in one predetermined position of adjustment, said latch supporting surface having an indentation formed therein inwardly of the shoulder, and a dog pivotally carried by said latch in advance of the notch and having a free end portion adapted to be moved into the indentation when the notch is moved away from the shoulder, the free end of said dog, upon reverse movement of the latch, being temporarily retained by the indentation and functioning to raise the notch out of contact with the shoulder to permit movement of the hinge sections to another position of adjustment.

ROBERT ALLEN BURTON.