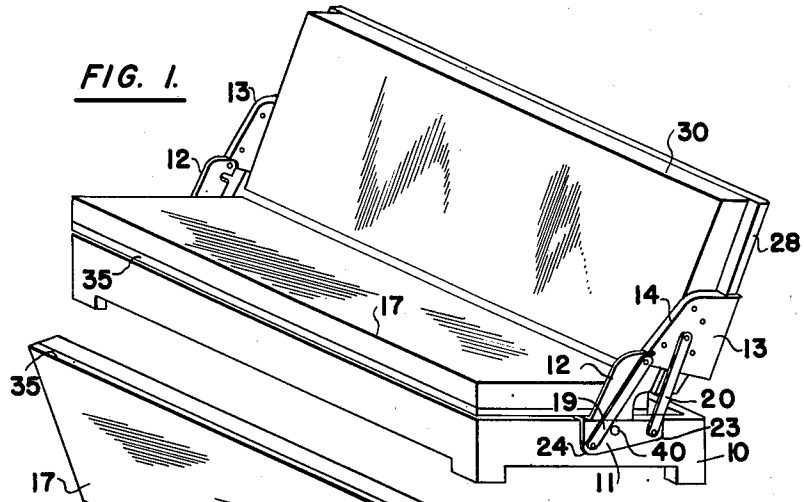
Dec. 16, 1952 G. H. LITTLE 2,621,339

COMBINED COUCH AND DAY BED HINGE

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FIG. 1.



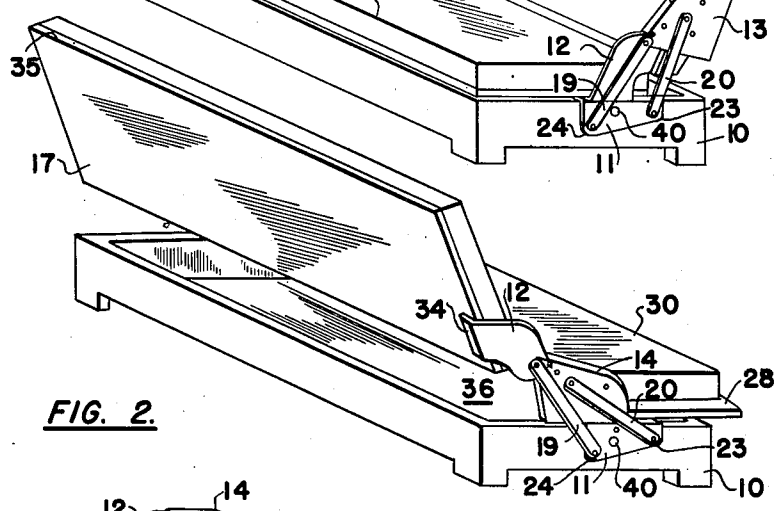


FIG. 2.

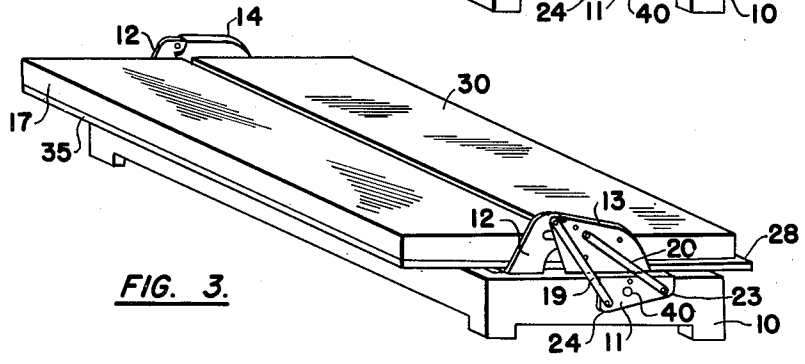


FIG. 3.

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COMBINED COUCH AND DAY BED HINGE

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FIG. 6.

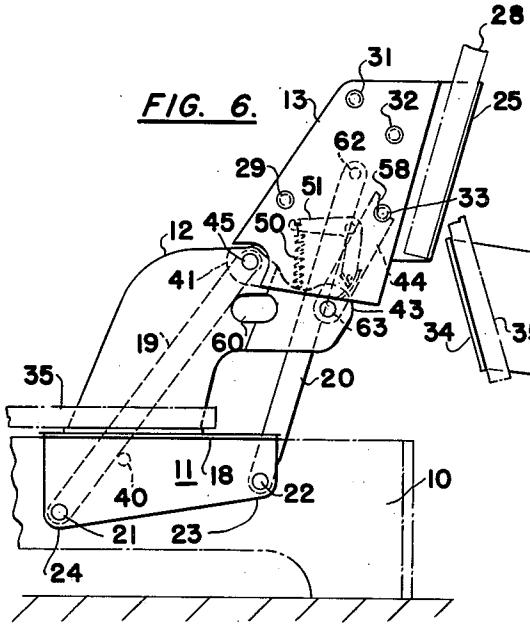


FIG. 7.

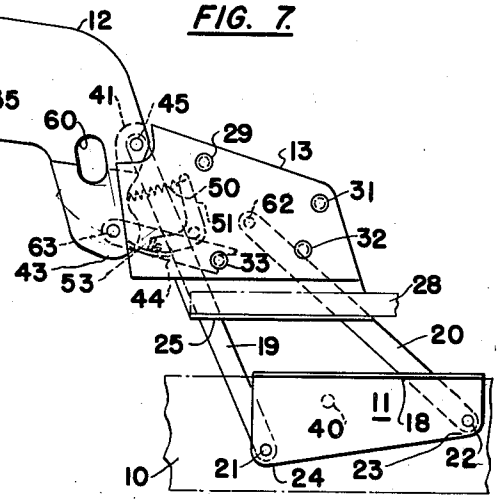
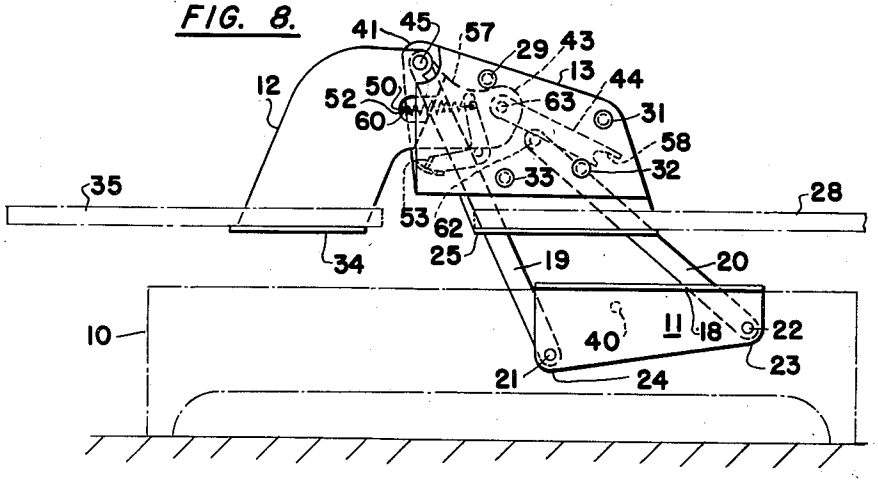


FIG. 8.



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Dec. 16, 1952 G. H. LITTLE 2,621,339

COMBINED COUCH AND DAY BED HINGE

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FIG. 9.

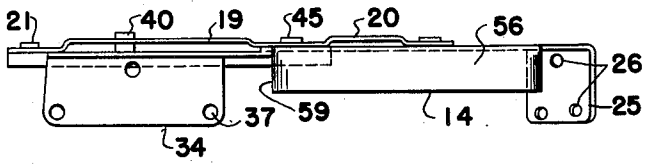


FIG. 10.

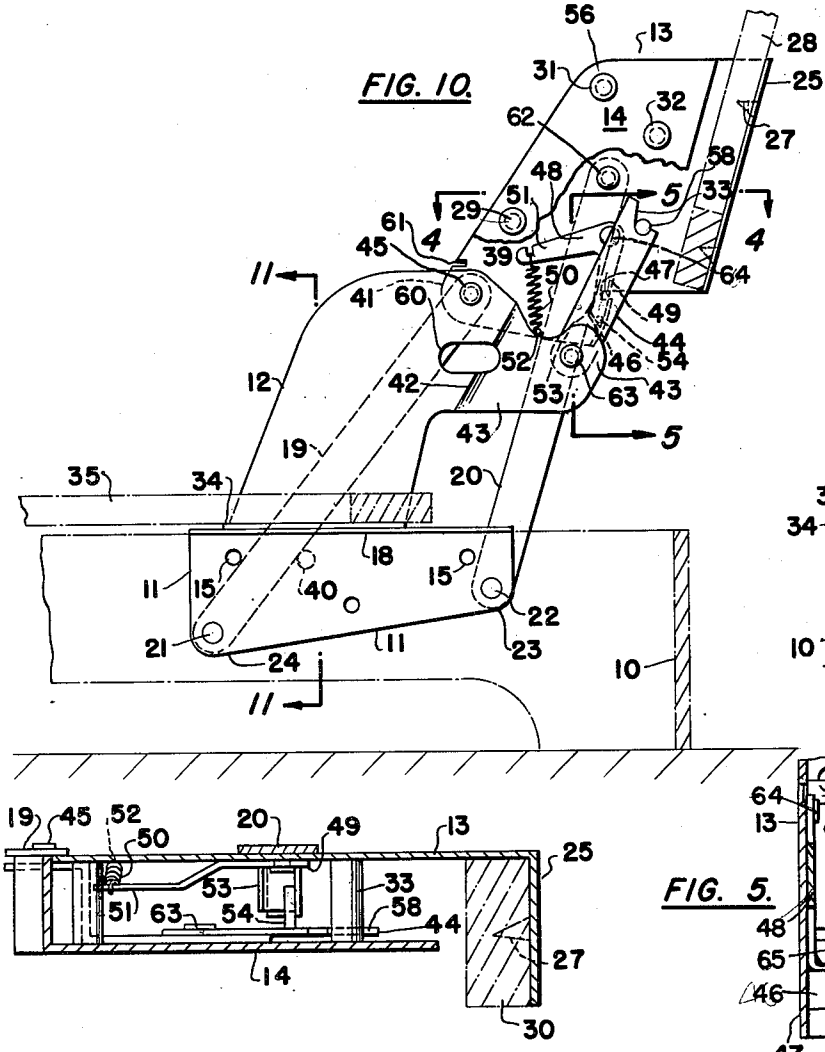


FIG. 11.

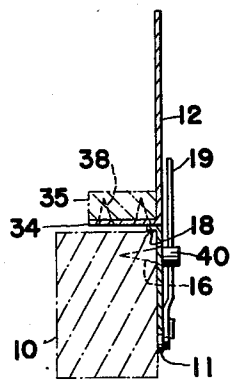


FIG. 4.

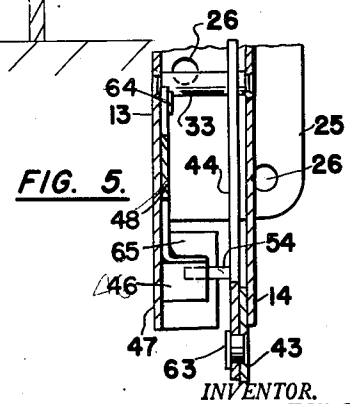


FIG. 5.

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Dec. 16, 1952 G. H. LITTLE 2,621,339

COMBINED COUCH AND DAY BED HINGE

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FIG. 12.

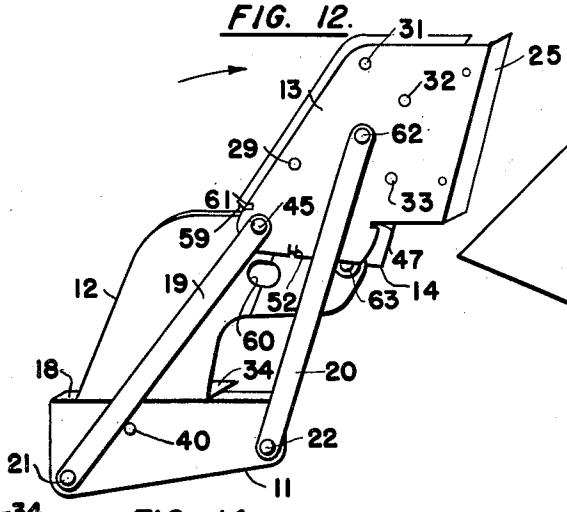


FIG. 13.

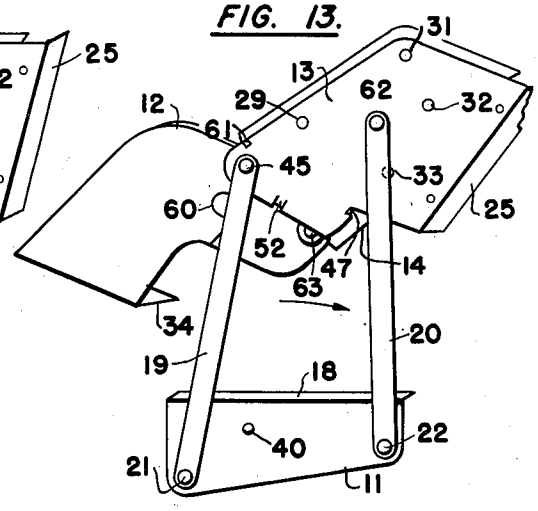


FIG. 14.

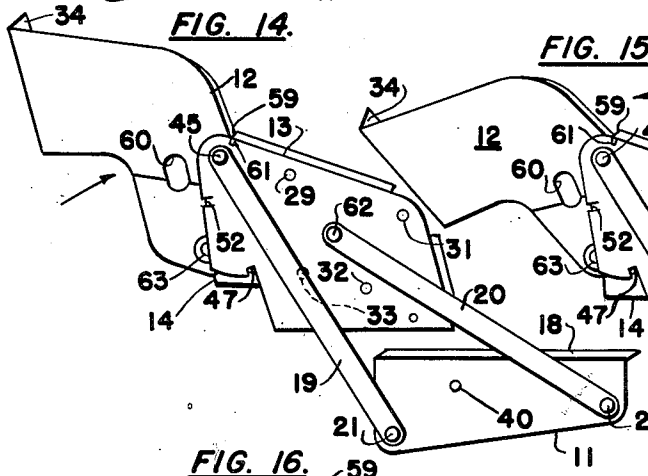


FIG. 15.

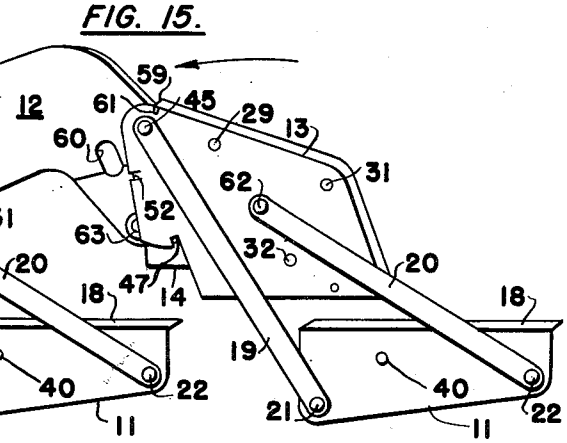


FIG. 16.

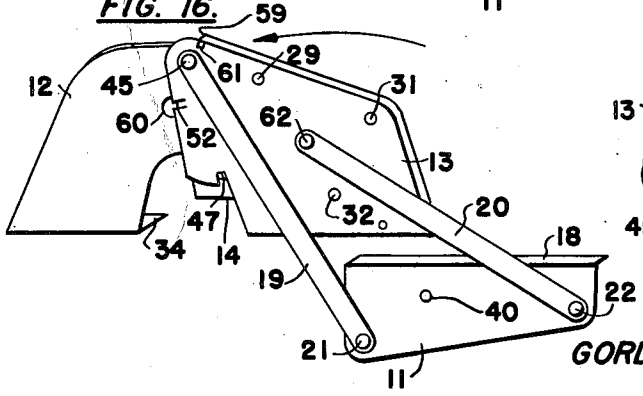
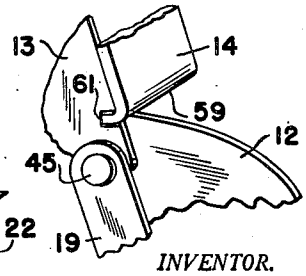


FIG. 17.



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Patented Dec. 16, 1952 2,621,339

UNITED STATES PATENT OFFICE

2,621,339

COMBINED COUCH AND DAYBED HINGE

Gordon H. Little, Essex, Md., assignor to Murray J. Rymland, Baltimore, Md.

Application March 29, 1948, Serial No. 17,743

2 Claims. (Cl. 5—47)

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This invention refers to furniture and more especially to couches that are convertible to beds by suitable manipulation of the mechanism that sustains the permanent cushions attached to the couch structure.

In the usual type of convertible couch the sustaining mechanisms supporting the permanent cushions at each side of the couch, are arranged to move the cushions and their supporting structure from a seat position to a bed position, without any intermediate stops. The disadvantage of this type is that no provision is made for storage of the bed clothes, and therefore the linen, blankets and other coverings or bedding used when the bed form is utilized, have to be kept in a closet or other location extraneous to the couch structure. This is more or less inconvenient and involves more time when changing from the couch to the bed and vice versa.

It is therefore an object of this invention to provide a new and improved mechanism for the manipulation of the permanent cushions of a convertible couch that will avoid one or more of the disadvantages and limitations of the prior art.

Another object of the present invention is to provide a new and improved mechanism for the manipulation of the permanent cushion structure of a convertible couch so it can adopt several positions of rest in its travel for the convenience of the user, such as a seat position, a bed position, and a position in which access may be had to a storage space in the couch structure.

An additional object of the invention herein described, is to provide a new and improved hinge mechanism for the manipulation of the parts of a convertible couch to its various positions of use, that will be effective in use and easy to operate, while at the same time of a form that may be manufactured economically.

Other objects will become apparent as the invention is more fully disclosed.

The drawings illustrate a particular form of the invention by way of example.

In the drawing:

Figure 1 is a perspective view of a convertible couch in "seat" position, embodying this invention;

Figure 2 is a perspective view of the couch shown in "access" to storage space of couch position;

Figure 3 is a perspective view in "bed" position;

Figure 4 is a sectional view of a cushion structure mechanism or bracket hinge for a convertible couch, taken along line 4—4 of Figure 10;

Figure 5 is an elevational sectional view of the part of the mechanism viewed on line 5—5 of Figure 10;

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Figure 6 is an inside view of the mechanism shown in Figure 1 in normal position when the permanent cushions are arranged in a seating position;

Figure 7 is a view in elevation of the bracket hinge in its position to provide access to the storage space provided in the couch as shown in Figure 2;

Figure 8 is a side elevation of the bracket hinge shown in Figure 7 in its position converting the couch into a bed, as shown in Figure 3;

Figure 9 is a plan view of Figure 10;

Figure 10 is a side elevation of Figure 1, in "seat" position with parts broken away to show its internal construction;

Figure 11 is a sectional view in elevation of a part of the mechanism taken on line 11—11 of Figure 10;

Figure 12 is a diagrammatic view of the bracket mechanism in the original seating placement;

Figure 13 is another diagram showing the bracket raised and balanced, ready for movement to the next position;

Figure 14 is another diagram following in sequence Figures 12 and 13, and permitting access to the storage space in the couch framework;

Figure 15 is a diagram indicating a placement after movement from the position shown in Figure 14 and advancing towards the seat position;

Figure 16 is a diagram of the bracket mechanism when in bed position, and

Figure 17 is a detail showing how the cover is positioned and acting as a buffer.

Similar reference characters refer to similar parts throughout the drawings.

The cushion structure mechanism of a particular couch shown in this invention, consists of two bracket hinges laterally mounted on the body 10, of a convertible couch that has a space or compartment for bed clothes. The hinges are right hand and left hand and similar symmetrically and formed into units having four distinct elements. These elements are termed respectively, the body mount 11, the seat cushion holder 12, the back cushion support 13, and the cover plate 14. The body mount 11 consists of an angle piece provided with holes 15 through which bolts 16 pass to hold it rigidly to the side wall of the body 10 at a level below that of the seat cushion 17 when in normal seating position. The mount 11 has a flange 18 forming its upper edge and resting on the body 10. On the inner surface of the mount 11 opposite to that of the flange 18 are pivotally held two links 19 and 20 respectively, link 19 being somewhat longer

than link 20. These links 19 and 20 are rotatably secured by rivets 21 and 22 to the front and rear lower corner portions 24 and 23 of the mount 11 and swing thereon. The rear corner portion 23 is at a higher level than the front corner portion 24. This locates the rivets 21 and 22 on different levels.

The links 19 and 20 extend from the mount 11 to the back cushion support 13. There they are movably riveted to the support 13 in one front corner and in its central space respectively at 45 and 62. The support 13 is preferably of angular and of quasi-polygonal form, with its flange 25 extending angularly therefrom on the same side of the hinge as the flange 18, with the links 19 and 20 operating together on the opposite side. The flange 25 has holes 26 through which bolts 27 secure it tightly to the framework 28 for supporting the back cushion 30. On the same side as the flange 25 project four pins 29, 31, 32 and 33 extending at right angles to the support 13 and they are used to control the incidental moving parts of the cushion holder 12 as well as the amount of travel of support 13. These pins are located as indicated and are held rigidly in place to the back cushion support 13.

The seat cushion holder 12 of each bracket hinge consists of a bent flat plate, like the mount 11 and cushion support 13. It has a contour including a right-angle flange 34 for attachment to the framework 35 of the seat cushion 17. The holes 37 with the bolts 38 through them provide for this attachment. One corner portion 39 of this holder 12 has a hole through which a rivet 45 is placed to pivotally or hingedly hold the holder 12 to the corner portion 41 of the support 13 and enable the holder to swing through an arcuate travel in which the link 19 cooperates. The holder 12 is bent at right angles away from the surface of the support 13 to form a step 42 and a riser 43. This riser 43 has a forked-end latch bar 44 pivoted thereto by a rivet 63. Between its pivot point and its forked end, the latch bar is provided with a short protruding pin 54 which is capable of being guided by and to ride along, for a short distance, an arcuate lug 46 formed in a corner portion 47 of the support 13. The pin 54 rides along the lug 46 on its upper periphery and at a point diametrically opposed to its point of contact with the lug 46, the pin 54 rests upon an inturned portion 65 of the arm 49 of a bell crank 48 pivoted at 64 to the support 13. The other arm 51 of the bell crank is connected to one end of a helical spring 50 the other end of which is secured to the hook 52 on support 13. The pin 54, in one direction of travel, rides up along the internal arcuate face of the lug 46 and presses against the inturned portion of the arm 49 of the bell crank 48. When the holder 12 is raised from the position of Figure 7, the forked-end of the latch bar 44 is moved away from the pin 33 and pin 54 presses against and rides past portion 65. When holder 12 is lowered, pin 54 rides up over portion 65 and latch 44 rides over pin 33. This permits the holder 12 to be swung to the position shown in Figure 8 into "bed" or horizontal position. It should be understood that the purpose of spring 50 is to tension the bell crank 48 while still permitting yielding engagement and disengagement of the pin 54 with the inturned portion of lever arm 49. A slot 60 of quasi-elliptical double-plane disposition is provided in the support 12. This slot allows room for the spring to operate in. The cover plate 14 fits on the holder 13 by aligning holes in its wall with the pins 29, 31, 32 and 33. The cover plate 14 is arranged with a flange 56 secured to its upper edge and contoured to rest on the edge of the holder 13. A slot 61 is cut into the edge of the holder 13 to enable a hooked edge 59 on the cover plate to engage therein and form a bumper surface. The inner portion of upper edge of the holder 12 bumps into pin 29 when rotatably raised. This obstructs the movement of the holder so it cannot rotate further on its pivot 45. Further rotation of the holder 12 takes place in conjunction with the holder 13 as it is integrally fastened thereto. This cover plate closes in the mechanism operating under it, to protect the latter as well as those who use the couch.

The operation of the mechanism and the parts of the couch connected with it is outlined in the following paragraphs. When the couch is in seat position, its mechanism is arranged as indicated in Figures 1 and 10. Each body mount 11 is stationary on the body 10 of the couch and stays rigidly secured in the same position during all operations of the mechanism. There are two bracket hinges for the mechanism, one on each lateral end of the couch and modified to form a right and left hand type, in accordance with their respective positions on the body. In the seat position, the links 19 and 20 are tilted so their upper ends are back of the front ends and angularly disposed to suit the angle of the back cushion 30 in that position. The couch is locked in this position by the forked-end latch bar or lever 44. If the latch lever 44 is released off pin 33 it will permit the couch to fall or move into "bed" position easily. This facility is due to the balance of the back cushion weight, acting to provide this. The front link 19 and rear link 20 swing on the stationary rivets 21 and 22 and stop when the former engages against the stop pin 40. They in the rotation adjust themselves to the changing positions of the upper rivets and are then in the position shown in Figures 2 and 7 and the latch lever 44 has its jaw 58 engaged with the pin 33. The latch lever 44 is kept down and its pin 54 guided on the lug 46 during the movement of the bracket hinge to the position shown in Figures 2 and 7. When so positioned, the latch lever 44 latches its respective hinge rigidly so it will hold the cushion structure 35 of the couch securely in the seat position. As the front link 19 stops against the stop pin 40 it prevents the back cushion support 13 from tilting back further than its proper angle of use, see Figure 6. The rear link 20 also cooperates in this action. The next position of the mechanism when rotated backwardly raises the cushion structure 35 used for the seat 17 from a horizontal position, through an arcuate travel, to the angular position indicated in Figure 7. This places the seat cushion structure 35 at an angle high above the mount 11 and body 10 of the couch. At the same time the back cushion 30 is lowered from an angular position to a horizontal plane close to the mount 11. The latch lever 44 locks on pin 33 and retains the mechanism in the position in which the user is given access to the bed clothes space 36 in the body see Figure 2. On further rotation upwardly from Figure 7 of the holder 12 after unlocking the latch lever while keeping the support 13 steady in its horizontal position, the pull on the latch lever 44 brings its jaws 58 away from the pin 33 and rides its pin 54, on the upper surface of the cam 53, against portion 65. This moves the arm 51 of the bell crank 48 against the tension of the spring 50 and allows the latch lever 44 with its stop pin 54 to retreat

and the jaw 58 to be raised above its previous level, see Figure 8. The latch lever 44 being unlatched from the pin 33 and on a higher level, allows the seat holder 12 to be rotated on its rivet 45 so the loose jaw end 58 of latch lever 44 will go past the pin 33 and ride above it. It also rides on the pin 32, in a horizontal direction, in a free and unrestricted manner, except that the cam surface 53 will carry it above the pin 32. Thus the cushion holder 12 is rotated on its pivot 45 from a perpendicular plane to a horizontal one until it reaches that shown in Figures 3 and 8. In this position both the cushions, seat and back, are horizontal and spread out over the body 10, to form the basis for a bed. In the previous position, the body 10 was uncovered so that access was given to the storage space 36 in the body where the bedding material is located.

In the last position, the frames for the cushions are supported by the holder 12 and support 13, and spread out so as to cover the bedding space and extend outside the body 10 in front and back of the couch as indicated in Figures 3 and 8. The main suspension for the cushion holder 12 and the back cushion support 13 is by the pivot 45 on the link 19. The pin 29 acts as a stop to limit the movement of the holder 12 by its contact through the riser 43 in the depression 57 formed on its upper edge adjacent the rivet 63 that supports the arm 44. The other link 20 also partially supports the weights of the parts and transmits them to the mount 11 and the body of the couch. The slot 60 enables the spring 50 and the hook 52 that holds it, to move into the area occupied by the holder 12 without striking it, until it has reached its final position, as shown in Figure 8.

The manipulation of both hinges on the cover is performed simultaneously and without much effort. Little effort is required during the disengagement of the arm 44 and in overcoming the tension of the spring 50. When this is accomplished in the seat and access positions, shown in Figure 1 and 2, the fork is unlatched from the pin 33 and permits the holder 12 to be moved to the horizontal position shown in Figure 3. The hinge of the mechanism therefore has a three-way function that enables all but the mount 11 to swing back and forward on themselves. The links operate in a tumbling manner to arrive at the respective positions intended for the cushions and their framework, during the use of the couch.

When the bracket hinges are used for equipment other than couches the equivalent of the cushion structures are termed "leaves" to include such in generic language.

A particular feature of this invention that is unique, is in the mechanism that each bracket unit involved is balanced. The bracket 12 may be manipulated with ease from any of its normal positions to another. This it does without requiring powerful springs or weights to do so or at least provide a potential source of power available for the purpoe. To emphasize the facility with which the mechanism may be operated, it can be stated that the couch can be swung to these various positions by pressure with a finger on it. That is why it is termed "feather balanced." Actually the arrangements of the levers and links in the mechanism is such as to provide considerabl leverage, which is employable by the operator to his great convenience in performing the work. The conventional folding couch requires appreciable muscular energy and

the use of powerful springs. These springs are subject to breakage that can do great damage and possible injury to the operator. The balance is brought about by the judicious position of the pivot points between the parts. In addition there is cover 14 over the mechanism. It affords protection of the mechanism in one instance. Hair pins, pencils and other items are excluded and prevented from becoming locked inside the mechanism, obstructing its operation or causing breakage. Further, the user is not apt to be caught in the mechanism, even his clothes are not caught in it. This occurs in the conventional types of couches. But in a particular manner, the cover plate 14 serves as an element of the mechanism to facilitate its operation. The ledge 59 projects sufficiently from the cover plate 14 to hold the end of the latch lever 44 from coming or rotating out of position. The spring 50 affords additional assurance that it will work. The mechanism is arranged so as to place the cushions and their supporting structures in a balanced position by the use of the links, so that a slight pressure will enable the weights to assist in the movement and continue the work of placing the cushions and structures in the next position intended.

While but one general form of the invention is shown in the drawings and described in the specifications, it is not desired to limit this application for patent to this particular form, as it is appreciated that other forms of construction could be made that would use the same principles and come within the scope of the appended claims. Having thus described the invention, what is claimed is:

1. In a couch of the class described, a mount adapted to be secured to the couch, a seat cushion holder, a back cushion support, a pair of links each having one end pivoted at spaced points of said mount and at different levels, each link being pivoted at its opposite end to said support, said holder and said support being pivoted together at the pivot point of one of said links with said support, a latch lever having one end pivoted to said holder, and having its opposite end fork-shaped, a bell crank member pivoted to said support, cooperating means between said latch lever, support and said bell crank member to control the movements of the latch lever, a pin secured to said support and engageable with the forked end of said latch lever to latch the said lever in fixed position and a spring fixed at one end to the support and having its other end connected to said bell crank member to bias said lever in a predetermined position.

2. A couch as set forth in claim 1, the cooperating means between the latch lever, the bell crank and support comprising a pin carried by said latch lever, and cam means carried by said support in contact with said pin to enforce the path of movement of said pin.

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