March 20, 1956 W. L. MURPHY ET AL 2,738,520

COMBINED SOFA AND BED

Filed March 13, 1953 7 Sheets-Sheet 1

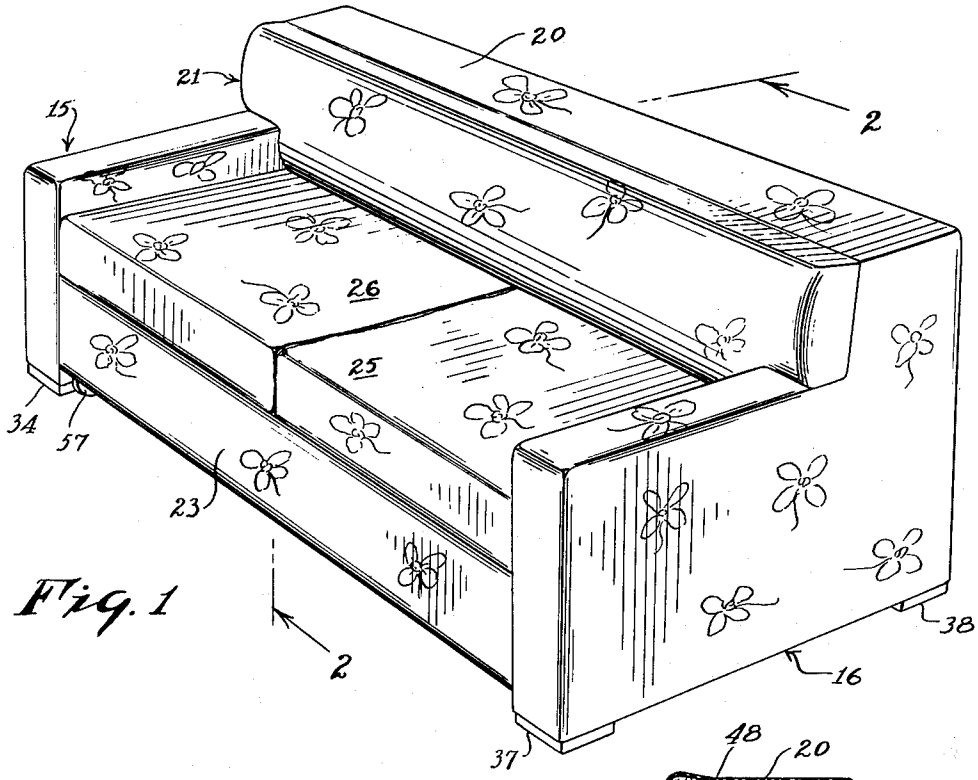


Fig. 1

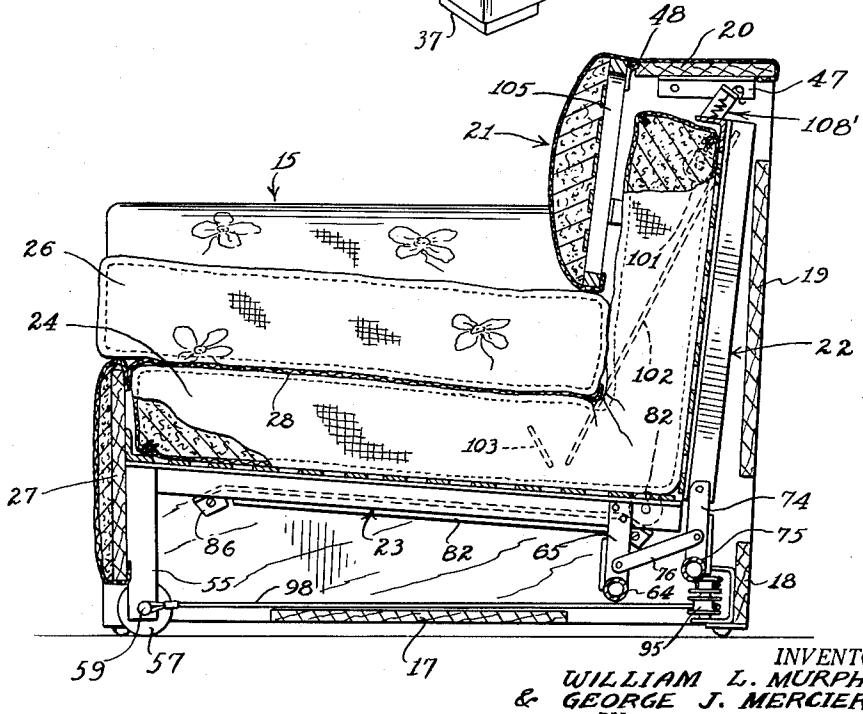


Fig. 2

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COMBINED SOFA AND BED

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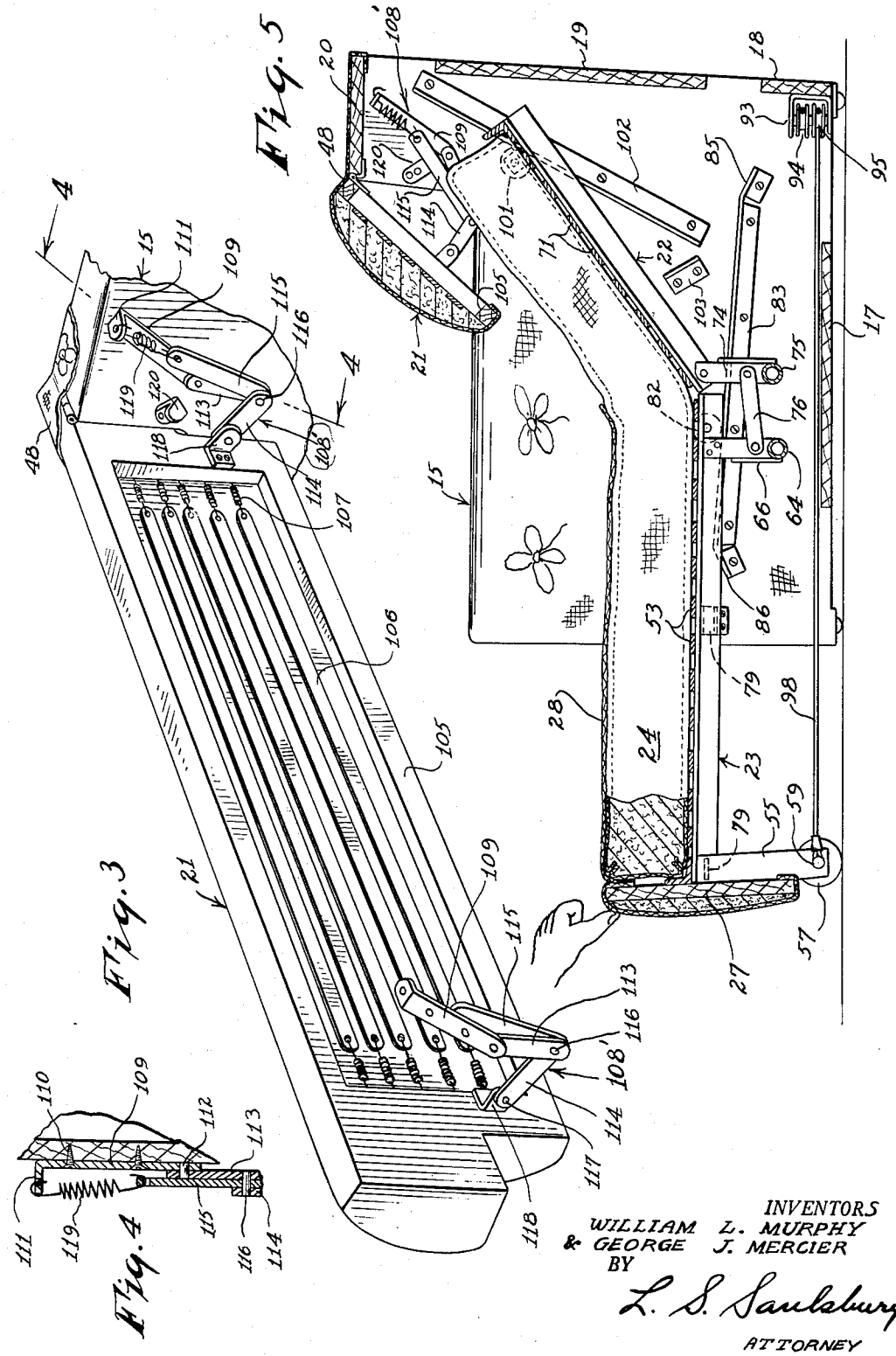


Fig. 5

Fig. 3

Fig. 4

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COMBINED SOFA AND BED

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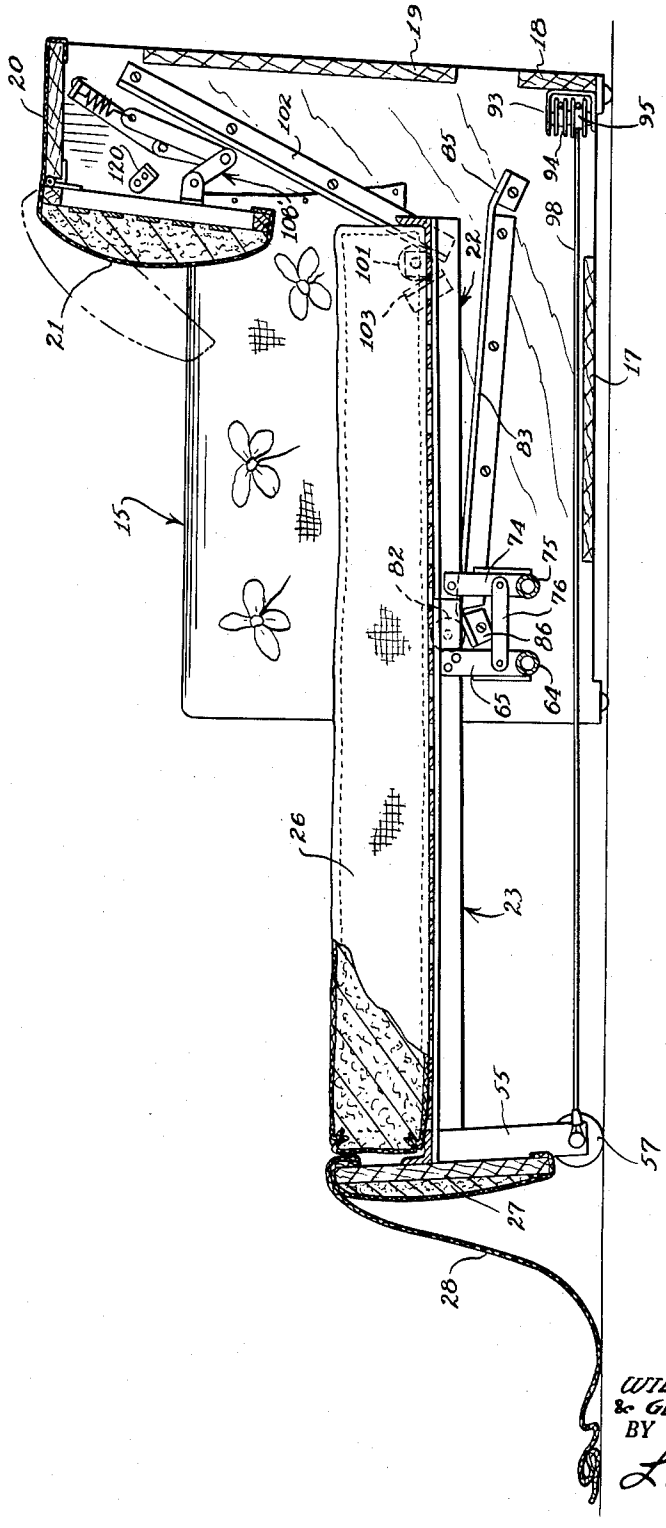


Fig. 6

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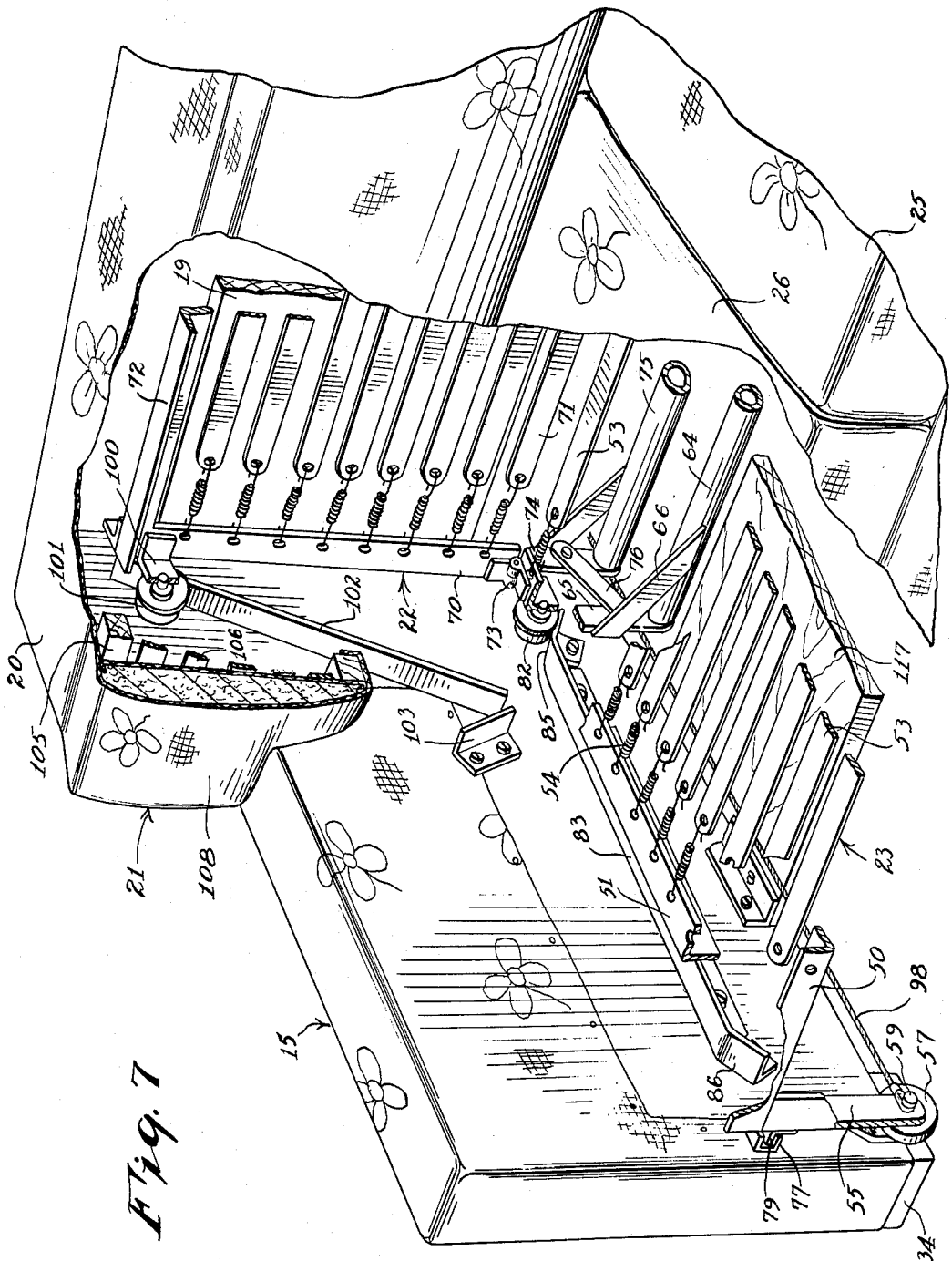


Fig. 7

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COMBINED SOFA AND BED

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Fig. 8

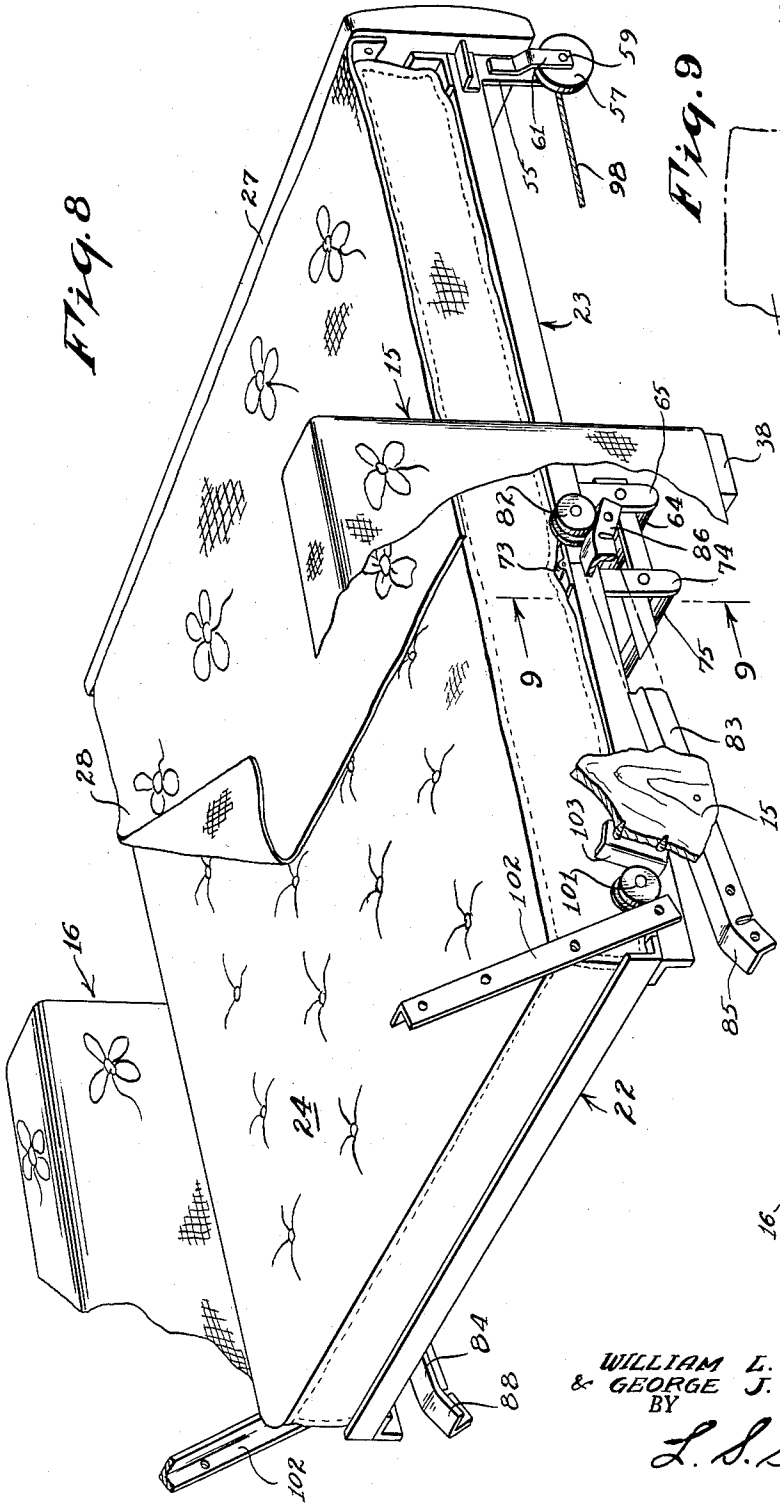
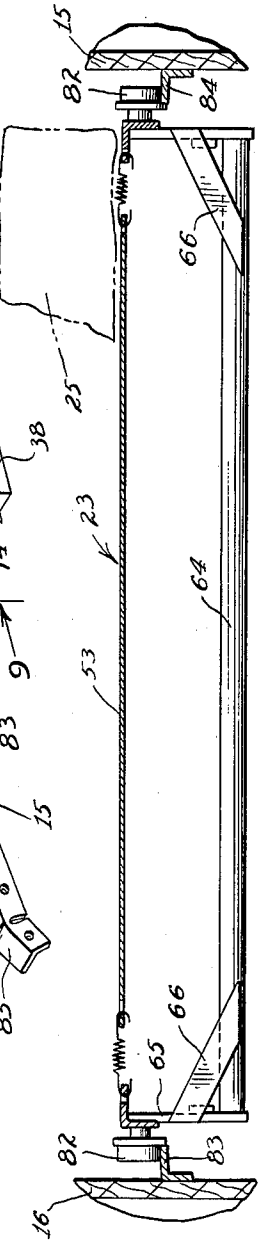


Fig. 9



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COMBINED SOFA AND BED

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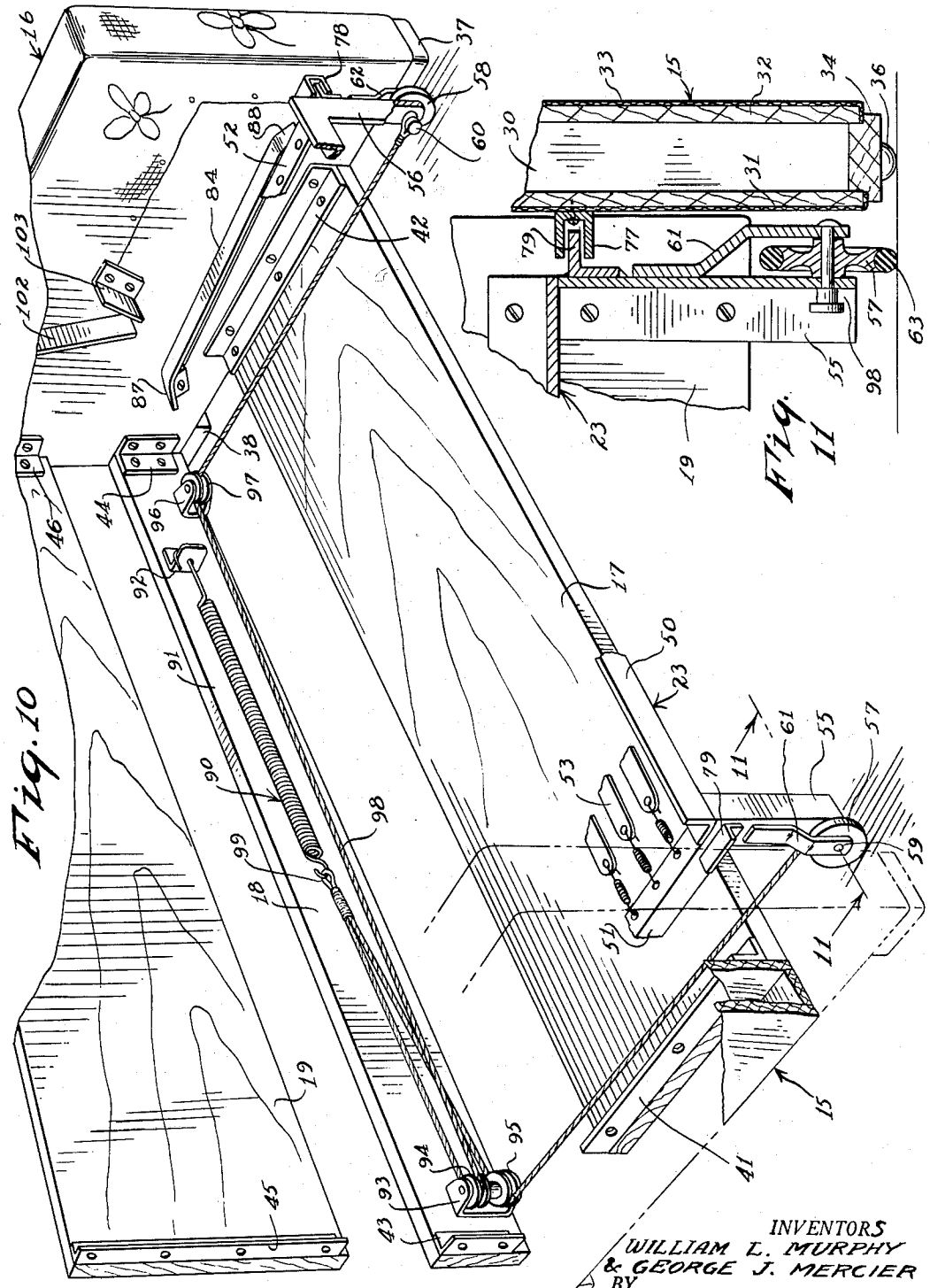


Fig. 10

Fig. 11

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COMBINED SOFA AND BED

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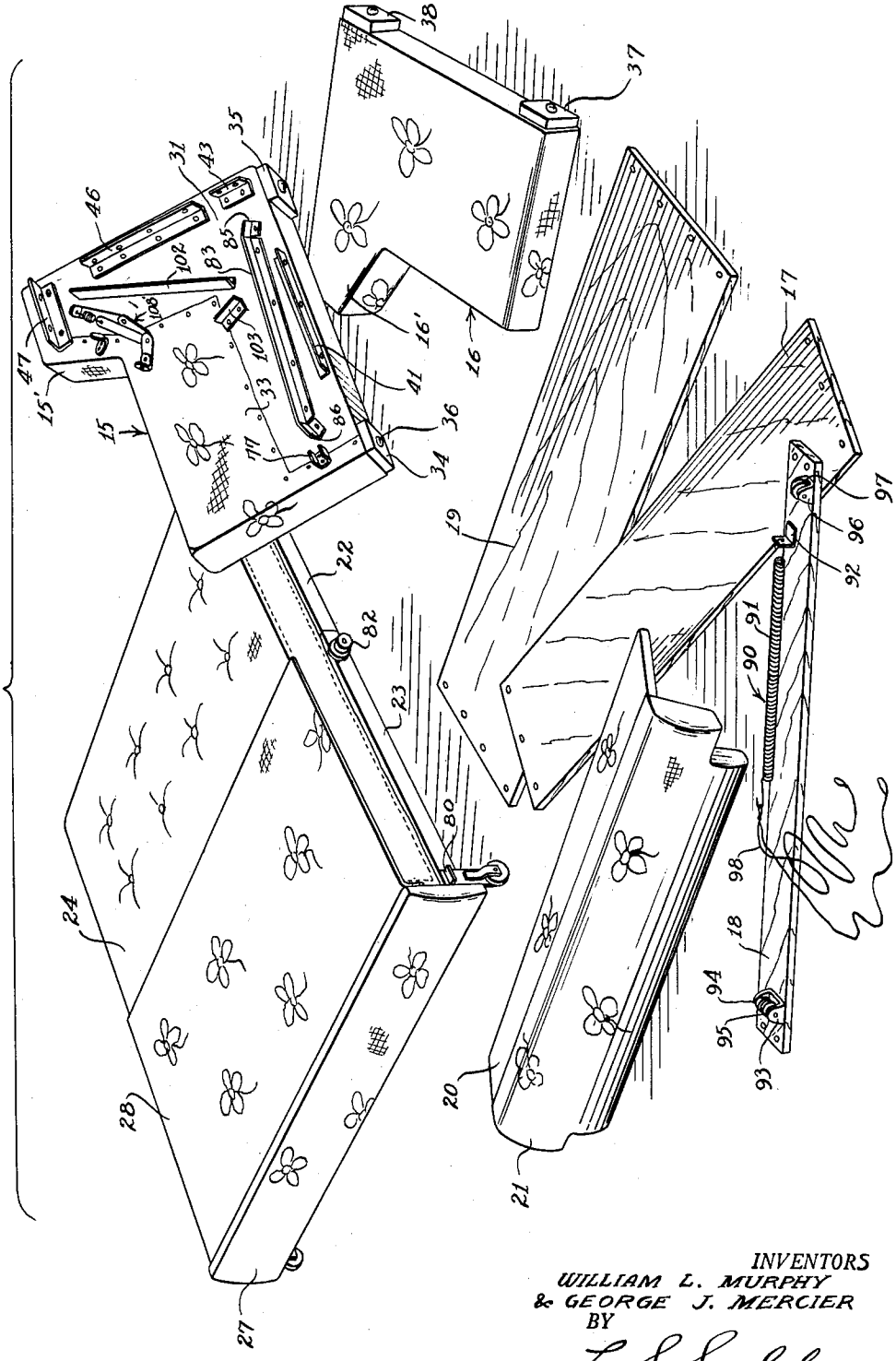


Fig. 12

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United States Patent Office

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COMBINED SOFA AND BED

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Application March 13, 1953, Serial No. 342,078

2 Claims. (Cl. 5—47)

This invention relates to a combined sofa and bed.

It is an object of the present invention to provide a combined sofa and bed which requires only the simplest form of operation to convert it from a comfortable sofa to a full size bed.

It is another object of the invention to provide a combined sofa and bed having a full size mattress in which the mattress need not be completely folded over upon itself when returned for storage within the sofa and wherein at that time it needs to be bent only approximately 90 degrees and whereby to provide a combined sofa and bed wherein the mattress will not need to be completely doubled up and will have long life.

It is another object of the invention to provide a foldable bed construction having foldable springs wherein there are no cross bars or pipes to interfere with the full spring action of the bed or with the user of the bed and to thereby make for a comfortable sleep.

It is another object of the invention to provide a combined sofa and bed wherein the bed is adapted to be pulled out of the sofa parts in such a manner that the parts of the bed that protrude from the sofa parts have clear and free lines without there being any projecting mechanism appearing outside of the sofa parts or interfering with the use of the bed as when getting in and out of the same.

It is still another object of the invention to provide a combined sofa and bed which can be easily dismantled for the purpose of shipment and wherein it can be brought into a room of a household where the door or the entrance thereto might be too small to allow the combined sofa and bed to be passed therethrough when in an assembled condition and wherein the same can be easily and quickly reassembled when once brought into the room.

Other objects of the invention are to provide a combined sofa and bed which is of simple construction, has a minimum number of parts, inexpensive to manufacture, well braced and durable, of pleasing appearance, compact and easily fitted in a room and efficient in use.

For other objects and for a better understanding of the invention, reference may be had to the following detailed description taken in connection with the accompanying drawings, in which:

Figure 1 is a perspective view of the combined sofa and bed embodying the features of the present invention;

Fig. 2 is a vertical cross-sectional view taken on line 2—2 of Fig. 1;

Fig. 3 is a rear perspective view of the back rest and of the mechanism for adjustably supporting the same;

Fig. 4 is a detail sectional view taken on line 4—4 of Fig. 3 and of the over-center mechanism for retaining the back rest in its retracted or extended positions;

Fig. 5 is a vertical sectional view similar to Fig. 2 but with the bed spring members being partly pulled forwardly, the back rest having been adjusted and lifted to its elevated position to permit the withdrawal of the bed springs and mattress;

Fig. 6 is a vertical sectional view similar to Figs. 2 and 5 with the bed springs fully pulled and the furniture piece having been converted into a full double size bed;

Fig. 7 is an enlarged fragmentary perspective view looking upon the operating parts of the sofa and bed with the bed springs fully retracted into the sofa;

Fig. 8 is a perspective view looking upon the sofa and bed with the same made into a bed, portions of the sofa parts being broken away to show the operating parts;

Fig. 9 is a transverse sectional view taken through one of the bed spring members and on line 9—9 of Fig. 8;

Fig. 10 is a fragmentary persective view of the sofa parts with portions of the bed springs removed and looking upon the counter-balancing spring mechanism;

Fig. 11 is an enlarged fragmentary sectional view taken on line 11—11 of Fig. 10 and looking upon a projection from the inner side of the sofa side part adapted to engage with an angle bracket in order that the bed spring members may be lifted with the sofa side parts without dropping downwardly therefrom upon the furniture piece being transported;

Fig. 12 is a collective and perspective view of the sofa parts disassembled for the purpose of being shipped or stored and for being brought through a small door or entrance to a room.

Referring now to the figures, 15 represents with 16 respectively side arm parts that are held together in spaced relation by boards 17, 18 and 19. On the top of the side arm parts and at the rear thereof there is a transverse top board 20 to which is hingedly connected a depending back rest 21. Foldable bed spring members 22 and 23 and a double size mattress 24 are normally retained in a folded state within the sofa parts, as shown in Fig. 2, with the bed spring member 22 and a portion of the mattress extending vertically and rearwardly of the depending back rest 21 and the bed spring member 23 extending with a portion of the mattress in a horizontal position and receiving cushions 25 and 26 when the furniture piece is being used as a sofa. A front board is connected to the bed spring member 23 as indicated at 27 and from this front board there extends a cover fabric 28 on which the cushions 24 and 25 may rest. The fabric 28 will serve to protect the mattress and keep the same clean while the furniture piece is being used as a sofa.

To convert the furniture piece into a double size bed, the front board 27 may be grasped and a pull given to withdraw the bed spring members 22 and 23 so that the mattress 24 will be fully extended to provide a double size bed. The back rest 21 will hinge outwardly to allow the bed spring member 22 and the mattress 24 to be easily pulled outwardly from behind the same. When the mattress has been fully withdrawn, the back rest 21 can be returned to its retracted or vertical position. The bed can thereafter be made up in the usual manner.

The arm rest part 15 may comprise an inner frame 30 having on its opposite sides fixed wood side pieces 31 and 32. These side pieces are cushioned and covered with a covering layer 33. Foot pieces 34 and 35 depend from the bottom of the arm rest part on which there are rounded caps 36. The rear portion of the arm rest part 15 extends upwardly as indicated at 15'. On the inner wall board 31 of the part 15 there are fixed several brackets and guides for supporting the several transverse brace boards and the guide tracks for the spring bed members and over-center brackets for the back rest.

The arm rest part 16 is similarly constructed and has a raised rear portion 16' and foot members 37 and 38 serving to support the arm rest member when in an upright position and assembled. The inner wall board of the side rest member 16 also has transversely extending board brackets, guide tracks for the bed members and a toggle bracket for the back rest. The bottom brace board

17 is connected by means of screws between angle brackets 41 and 42 extending along the lower edges of the respective side arm parts 15 and 16, Fig. 10.

The transverse brace board 18 is secured by screws between angle brackets 43 and 44 secured respectively to the respective arm rest parts 15 and 16. The transverse back board 19 is connected between angle brackets 45 and 46 on the respective arm rest parts 15 and 16. These transverse boards are all fastened by screws to the angle brackets and serve to hold the arm rest parts against lateral displacement and to maintain the form of the sofa. On the upwardly extending rear portions 15' and 16' of the arm rest parts are respective brackets 47, only one being shown to support the top board 20 to which the back rest is hinged by hinges 48.

The bed spring member 23 comprises a front frame piece 50 to the opposite ends of which there is connected respectively end frame members 51 and 52. Between the end frame members 51 and 52 there extend bed spring members 53 having their ends connected by tension springs 54 to the end frame members 51 and 52. Depending from the front frame member 50 and at the respective opposite ends thereof are respective legs 55 and 56 having respectively wheels 57 and 58 adapted to roll over the floor as the bed is withdrawn or retracted. The rollers or wheels 57 are journalled respectively upon axles 59 and 60 extending through the lower ends of the legs 55 and 56 and through depending brackets 61 and 62 respectively associated with the respective legs 55 and 56. These wheels 57 and 58 preferably have rubber tires 63.

At the rear of the bed spring member 23 is a transversely extending pipe 64. The ends of this pipe are connected to the lower ends of depending brackets 65 respectively connected to the end frame pieces 51 and 52. The pipe 64 is braced with the respective brackets 65 by diagonally extending braces 66, Fig. 7. It will be seen that the pipe 64 which connects with the bed spring member end frame pieces 51 and 52 is dropped to a location where it will not interfere with the user of the bed. The bed spring member 23 is thus made rigid without the rear frame member 64 being in the way.

The bed spring member 22 is similarly constructed and comprises end frame members 70 between which are connected a plurality of bed spring assemblies 71 and a rear angle frame member 72, Fig. 7. The respective end frame members 70 of the bed spring member 22 are respectively connected by hinges 73 with the respective end frame members 51 and 52 of the bed spring member 23.

Pivoted respectively to the respective forward ends of the frame members 70 of the bed spring member 22 are pivotal brackets 74 between the lower ends of which are rigidly connected a dropped frame pipe piece 75, serving to brace the front of the bed spring member 22. It will thus be seen that by this means the brace pipe 75 will be retained out of the way of the user of the bed. Connecting links 76 respectively connect together the brackets 65 and 74 whereby to retain the pivotal brackets 74 in vertical parallel positions and the frame pipe 75 always under the bed spring member 22.

It will now be seen that the bed spring members 22 and 23 are hingedly connected together and that the bed spring member 22 can be hinged upwardly so as to be located in the back of the sofa but which will be automatically hinged downwardly as the bed spring members are pulled outwardly of the sofa parts. It will be clear now that the bed spring member frame pipes 64 and 75 will always be in a position such that no cross bars or pipes will interfere with the full spring action of the bed and that the spring assemblies are free of the frame pipes and adapted for comfortable sleep.

Extending inwardly from the arm rest parts 15 and 16 are respective brackets 77 and 78 adapted to underlie respectively lugs 79 and 80 weldingly secured to the respective front legs 55 and 56 of the bed spring member

23. Upon lifting the ends of the combined sofa and bed the brackets 77 and 78 will engage with the respective lugs 79 and 80 so that the front edge of the bed spring member 23 will be supported as the arm rest parts are lifted whereby to keep the bed spring members from dropping downwardly on to transverse brace board 17.

On the respective end pieces 51 and 52 of the bed spring member 23 are respectively guide rollers 82 adapted to travel respectively over guide tracks 83 and 84 secured to the inner boards of the respective arm rest parts 15 and 16. The ends of the guide track 83 are turned down as indicated respectively at 85 and 86, Fig. 7. The ends guide track 84 are respectively turned down as indicated at 87 and 88. With the rollers 82 resting on the turned down ends 85 and 87, the bed spring members will be locked against outward movement from the sofa parts. Upon the rollers 82 being rolled down over the forward bent ends 86 and 88, the bed spring members will be held in their outwardly extended positions and against the rearward pull of a counterbalancing spring mechanism indicated generally at 90 and mounted on transverse brace board 18.

The counterbalancing mechanism comprises a heavy tension spring 91 which is anchored to a bracket 92 mounted on the front face of the board 18. A double pulley bracket 93 having pulleys 94 and 95 is mounted on the end of the board 18 adjacent the arm rest part 15, Fig. 10, and on the opposite end of the board 18 adjacent the arm rest member 16 is a single pulley bracket 96 having a pulley 97. A cable of wire rope 98 has its respective ends run through the respective pulleys 95 and 96 for connection with wheel axles 59 and 60 on the legs 55 and 56 of the bed spring member 23. The wire rope cable is doubled on itself and extended over pulley 94 and connected to the free end of heavy tension spring 91 in the manner as indicated at 99. With the counterbalancing mechanism arranged in this manner, an equal pull will be effected upon the opposite ends of the front bed spring member 23. The rollers 82 will be held against depending ends 86 and 88 of the side tracks 83 and 84 by the spring tension of the counterbalancing mechanism 90 and in order to relieve the front bed spring member 23, a slight pressure will be required to start the rollers 82 upwardly over the bent ends 86 and 88.

On the rear end of the bed spring member 22 are guide roller brackets which are upstanding 100, disposed respectively on the opposite frame pieces 70 and having respectively guide rollers 101. Extending in an inclined manner on the respective arm rest parts 15 and 16 and over the rear upstanding portions 15' and 16' thereof are respectively guide tracks 102 over which the guide rollers 101 will run. As the bed spring members are drawn outwardly, the guide roller 101 will roll down the guide track 102, Fig. 7, and will finally come into engagement with a guide bracket stop 103 located at the lower end of the guide track 102 and secured to the arm rest part. So that the bed spring member 22 will remain in a position for use as a bed part, there is a guide track 102 and a stop bracket 103 on each arm rest part.

The depending back rest 21 comprises a frame 105, Fig. 3, between the ends of which there are extended a plurality of spring assemblies 106 having tension springs 107 against which a cushion 108 may be pressed. In order to permit the back rest to be elevated, the same is hinged to the top plate or brace 20 and is held in either its lifted or lowered positions by an over-center toggle bracket mechanisms 108' secured to the opposite ends of the back rest 21 and connected respectively to the arm rest parts 15 and 16. Each of the over-center toggle brackets comprise an attaching member 109 that is fixed by screws 110, Figs. 3 and 4, to the arm rest part. The upper end of the attaching member has an inwardly bent end 111. The lower end of the attaching member 109 has a pivot pin 112 with a toggle link 113 pivotally connected thereto. A toggle link 114 and a pull link 115

are pivotally connected to the toggle link **113** by a pivotal pin **116**. The toggle link **114** is pivotally connected by a pin **117** to a bracket **118** that is fixed to the end of the back rest frame **105**. The pull link **115** is connected by a tension spring **119** to the inwardly bent end **111** of the attaching member **109** to exert an over-center pressure upon the toggle pin **116** and the toggle links **113** and **114**. On the respective arm rest parts **15** and **16** are stop brackets **120** serving to prevent the back rest from outward movement beyond a position adequate enough to free the bed spring member and mattress from the back of the furniture piece. The pull link **115** will abut the stop bracket **120** to thereby limit the outward movement of the toggle mechanism and the back rest beyond its forward position. After the mattress **26** and the bed spring members **23** and **22** have been pulled out, the back rest **21** can be lowered to its original vertical position and the fabric cover **28** brought forwardly, as shown in Fig. 6, over the front board **27**. This fabric can be folded under the bed when the bed is in use and thereafter when the mattress and bed spring members are returned by a slight push, as illustrated in Fig. 5, into the sofa parts. The back rest would be pulled out prior to this return of the mattress and bed spring members. The front board **27** is preferably cushioned and covered with fabric, as shown in the sectional views. A slight pressure on the front board **27** causes the rollers **82** to ride up over the downwardly bend ends **86** and **88** of the respective to ride up over the downwardly bent ends **96** and **88** of the respective tracks **83** and **84** and the counterbalancing spring mechanism will automatically return the mattress and the bed spring members to their retracted positions within the sofa parts.

It will now be apparent that there has been provided a combined sofa and bed which has the simplest form of operation to convert the sofa into a full size bed or a full size bed to a sofa.

It shall also be apparent that the mattress will not have to be completely doubled up when stored in the sofa parts so that wear and tear upon the mattress is minimized.

It should also be apparent that the bed is so constructed that the adjacent frame pieces of the respective bed spring members are lowered so as to permit free and full spring action of the entire bed area. By merely detaching the screws which hold the brace boards to the brackets of the arm rest members the furniture piece can be disassembled to allow its parts to be stored or the piece taken through a small doorway.

While various changes may be made in the detail construction, it shall be understood that such changes shall be within the spirit and scope of the present invention as defined by the appended claims.

What is claimed is:

1. A combined sofa and bed comprising side arm rest parts, bracing members securing said parts together in transversely spaced relationship, front and rear bed spring members hingedly connected together along their sides thereof, guide track means adapted to retain the bed spring members within the confines of the arm rest parts with the rear bed spring member extending upwardly along the rear of the arm rest parts and to guide the bed spring members in their forwardly extended positions forwardly of said arm rest parts, said guide track means including an upwardly and rearwardly inclined rear guide track and a rearward downwardly inclined forward guide track secured to each arm rest part, said rear and front bed spring members having guide rollers running respectively over the respective rear and forward guide tracks, means for supporting the guide rollers and the rear bed spring member when the bed spring members are extended to provide the bed, counter balancing spring means running along one of the transverse bracing members, said spring means including a tension spring anchored at one end to one end of the bracing member, a pulley mounted at one end of the bracing member adjacent said anchored end of the spring, a double pulley mounted on the other end of the transverse bracing member and pulley cables connected to the other end of the tension spring and running about said pulley and respectively anchored to the opposite sides of the front bed spring member, said forward guide track having downwardly bent front and rear ends cooperable with the guide rollers of the front bed spring member to hold the bed spring members in either of their extended or retracted positions, said front bed spring member having wheel support means on the front edge thereof.

2. A combined soft and bed as defined in claim 1, and said front bed spring member having depending brackets rigidly fixed respectively to the opposite ends of the member and a dropped frame piece connected between the lower ends of the depending brackets, said rear bed spring member having bracket arms pivotally connected to the respective opposite ends thereof for fore and aft movement with respect thereto and a frame piece rigidly connected to the lower ends of the depending pivotally connected brackets, and connecting links connected between the depending brackets of the front and rear bed spring members to cause the pivotally connected brackets and the frame piece connected therebetween to be held in the vertically-extending position as the bed spring members are extended or retracted from the sofa parts, and said bed spring members having spring assemblies overlying the dropped frame pieces.

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