Nov. 8, 1955 R. C. THOMPSON ET AL 2,722,691

LEVER OPERATED COVER TENSIONING MEANS FOR SOFA-BEDS

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Fig. 1

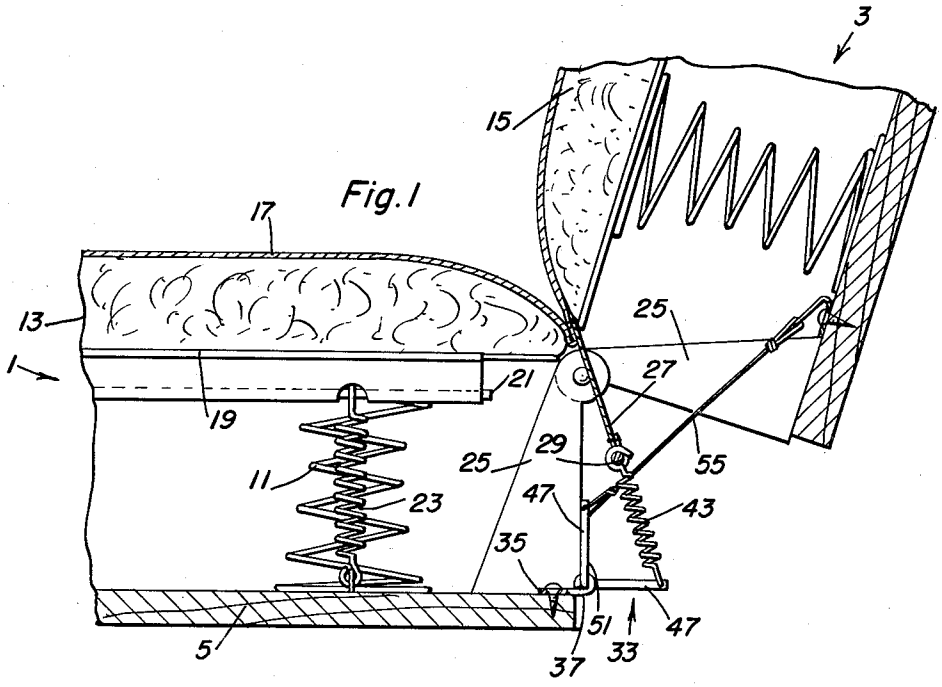


Fig. 2

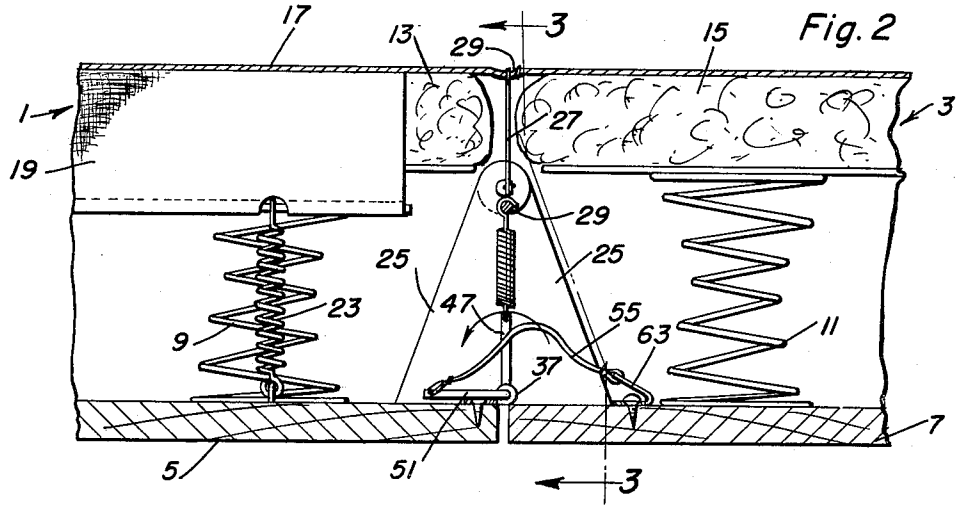
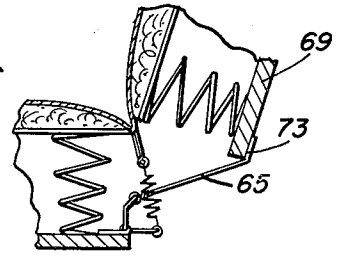


Fig. 6



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Fig. 3

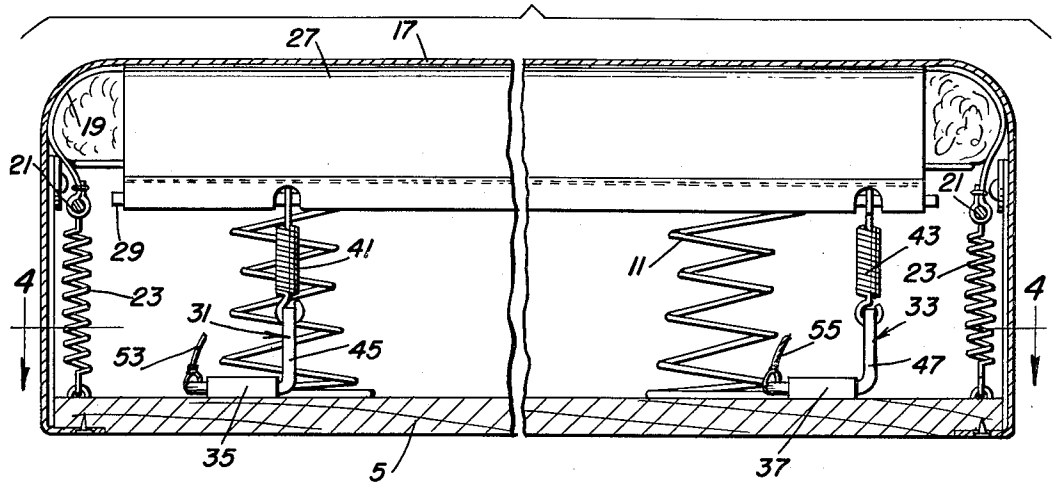


Fig. 4

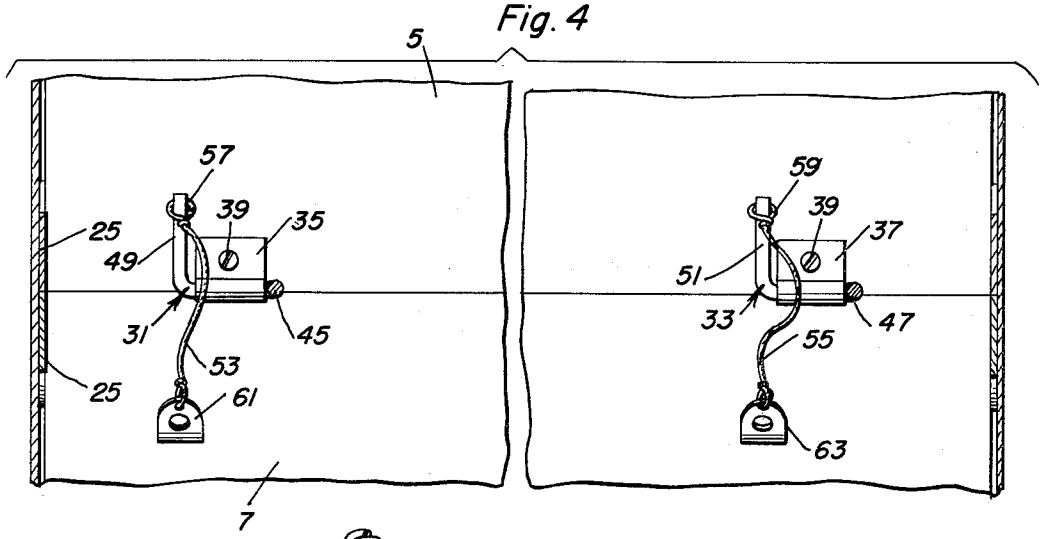
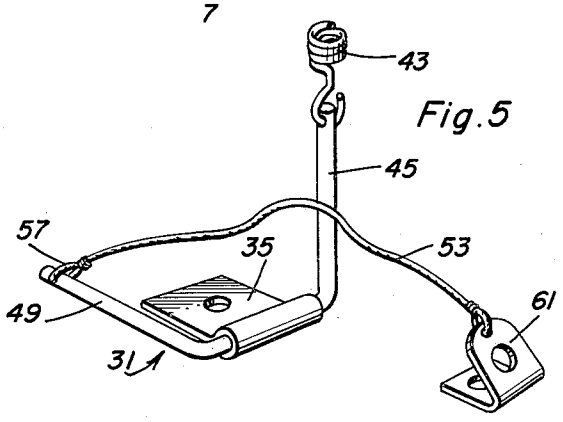


Fig. 5



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LEVER OPERATED COVER TENSIONING MEANS FOR SOFA-BEDS

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Application September 1, 1954, Serial No. 453,589

3 Claims. (Cl. 5—47)

Our invention relates to means for tensioning the cover of a sofa-bed between the seat and back cushions to take up slack in the cover.

Our invention is designed as an improvement over the tensioning devices of our U. S. Patent No. 2,588,058, dated March 4, 1952.

The primary object of our invention is to provide means for tensioning the cover by gradually increasing pull thereon effected by gradually increasing leverage exerted as an incident to swinging of the back portion upwardly from bed forming position and whereby to gradually tighten the cover in a manner preventing tearing thereof.

Another object is to accomplish the above by a simple arrangement of bellcranks, pull cords, and springs adapted for attachment to a conventional sofa-bed without modification of the latter.

Other and subordinate objects will presently appear when the following description and claims are read with reference to the accompanying drawings in which:

Figure 1 is a fragmentary view in vertical transverse section of a sofa-bed embodying our improved cover tensioning device with the back portion swung upwardly into sofa forming position and the covers tensioned;

Figure 2 is a similar view with the back portion swung downwardly into bed forming position and the tension on the covers relieved;

Figure 3 is a fragmentary view in vertical section taken on the line 3—3 of Figure 2;

Figure 4 is a view in horizontal section taken on the line 4—4 of Figure 3;

Figure 5 is an enlarged view in perspective of a bellcrank lever and parts connected thereto and forming part of the tensioning means, and

Figure 6 is a fragmentary view in vertical transverse section drawn to a smaller scale of a modified embodiment of our cover tensioning means.

Referring by numerals to the preferred embodiment of our invention illustrated in Figures 1 to 5 of the drawings, the numerals **1** and **3** designate the seat and back portions, respectively, of a conventional sofa-bed and comprising rigid bottom panels **5**, **7**, with springs **9**, **11** thereon supporting seat and back cushions **13**, **15** having a fabric cover **17**. The numeral **19** designates the usual packer strip for the seat cushion **13** having end rods **21** attached to the bottom panel **5** by springs **23**. The bottom panels **5**, **7** are hinged together by hinge members **25** for vertical swinging for raising and lowering of the back portion **3** from and into horizontal position to form a sofa and a bed, respectively, as shown in Figures 1 and 2.

According to our improvements the cover **17** is pulled downwardly between the seat and back cushions to maintain the same taut when the back portion **3** is swung upwardly into sofa forming position by means of the following.

A fabric strip **27** is stitched, or otherwise attached, as at **29**, to the cover **17** between the seat and back cushions **13**, **15** to extend transversely of said cover and depend between said cushions **13**, **15** with a rod **29** hemmed in its lower edge to also extend transversely of said seat and back cushions.

A pair of bellcranks **31**, **33** are mounted in bearing plates **35**, **37** secured by screws **39** to the rear edge of the bottom panel **5** of the seat portion **1** to rock in vertical planes transverse to the strip **27** and rod **29** and beneath opposite ends of said rod **29**.

A pair of contractile coil springs **41**, **43** connect corresponding arms **45**, **47** of the bellcranks **31**, **33** to said rod **29** and pull said arms **45**, **47** upwardly and forwardly into vertical position when the back portion **3** is swung downwardly into bed forming position and whereby the other arms **49**, **51** of said bellcranks swing downwardly and forwardly against the bearing plates **35**, **39** all as best shown in Figure 2. In this position of the bellcranks the strip **27** is slack and the cover **17** is relieved of tension between the seat and back cushions **13**, **15** and the bellcranks **31**, **33** are swung counterclockwise as shown by the arrow in Figure 2.

The back portion **3** is operatively connected to the other arms **49**, **51** of the bellcranks **31**, **33** to swing the same clockwise as shown in Figure 1 when said back portion **3** is swung upwardly into sofa forming position. For this purpose a pair of pull cords **53**, **55** are terminally connected at one end to said arms **49**, **51**, as at **57**, **59**, with their other ends connected by screw attached angle brackets **61**, **63** to the bottom panel **7** of the back portion **3**. The points of connection of the pull cords **53**, **55** to the bottom panel is such that when said back portion **3** is swung downwardly into bed forming position as shown in Figure 2 said cords are slack, whereas, when said back portion is swung upwardly into sofa forming position, the points of connection of said cords **53**, **55** to said bottom panel **7** swing upwardly to pull on the cords with a delayed action to correspondingly tension the cover **17**.

As will be noted because of the upward and rearward throw of the arms **49**, **51** and the downward and rearward throw of the arms **45**, **47** under the pull of cords **53**, **55** against arms **49**, **51** the bellcranks **31**, **33** act with gradually increasing leverage to stretch the springs **41**, **43** and apply gradually increasing tension to the strip **27** and cover **17** to prevent tearing the same and firmly tighten said cover.

In the modified embodiment the pull cords **65**, are attached directly to the bottom panel **69** of back portion **71** as at **73**. Otherwise the arrangement is the same as in the preferred embodiment.

The foregoing will, it is believed, suffice to impart a clear understanding of our invention without further explanation.

Manifestly, the invention is susceptible of modification without departing from the inventive concept and right is herein reserved to such modifications as fall within the scope of the appended claims.

What is claimed as new is as follows:

1. Tensioning means for the cover of the seat and back cushions of seat and back portions of a sofa-bed having bottom seat and back panels supporting said cushions, respectively, and hinged together for swinging of said back portion upwardly and downwardly into sofa and bed forming positions, respectively, said means comprising a pair of bellcranks each having a pair of arms, means pivotally mounting said bellcranks on the rear edge and at opposite sides of the bottom panel of the seat portion for vertical swinging movement, operating connections between the bottom panel of the back portion and corresponding arms of the bellcranks for swinging said bellcranks in one direction by upward swinging of said back portion, and pull connections between the other arms of the bellcranks and said cover, attached to said cover between said cushions.

2. Tensioning means according to claim 1, said operating connections comprising a pair of pull cords extending from the bottom panel of the back portion to said other arms.

3. Tensioning means according to claim 1, said pull connections comprising a flexible strip depending from and attached to said cover, a rod attached to said strip, and contractile springs connecting said corresponding arms to said rod.

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