Sept. 8, 1953 P. BILLET ET AL 2,651,056

ADJUSTABLE BACK OR HEADREST MECHANISM

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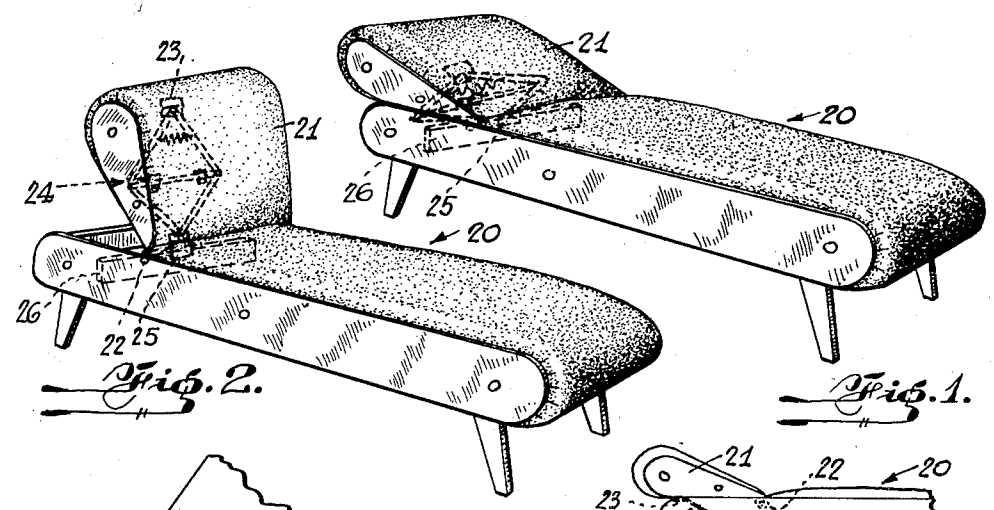


Fig. 2.

Fig. 1.

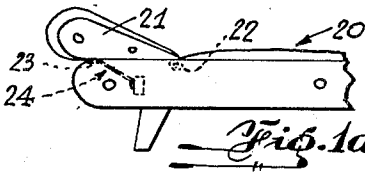


Fig. 1a.

Fig. 3.

Fig. 11.

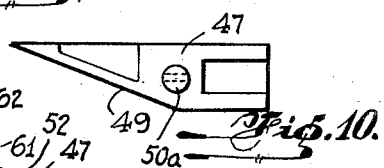


Fig. 10.

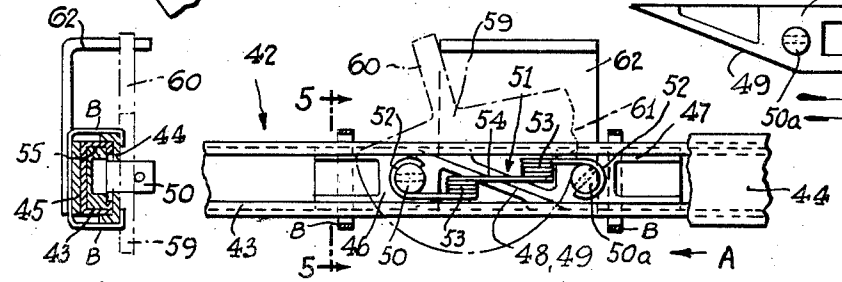


Fig. 5.

Fig. 4.

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ADJUSTABLE BACK OR HEADREST MECHANISM

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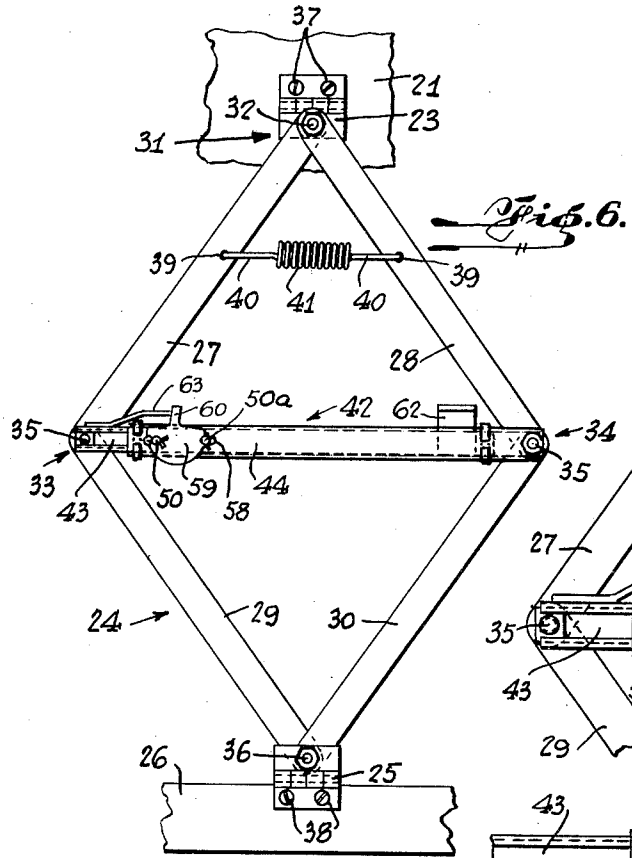


Fig. 6.

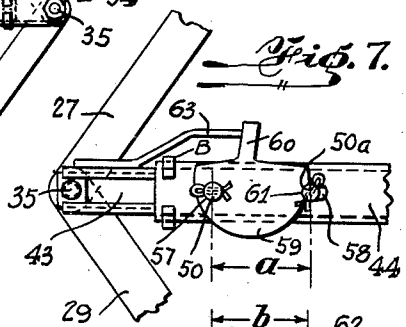


Fig. 7.

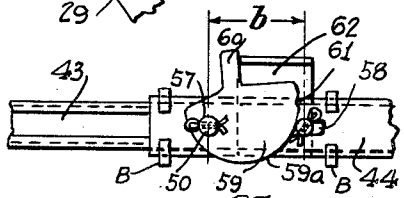


Fig. 9.

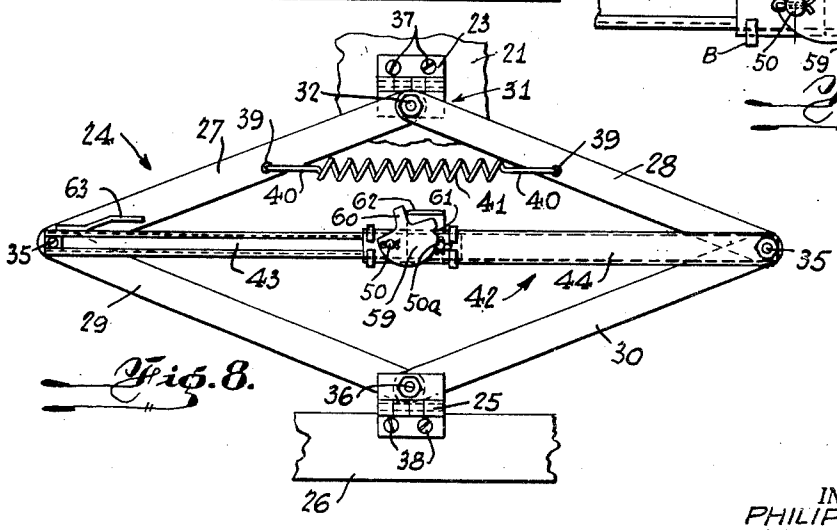


Fig. 8.

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ADJUSTABLE BACK OR HEADREST MECHANISM

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Application February 18, 1949, Serial No. 77,094

4 Claims. (Cl. 5—78)

1

This invention relates generally to position adjusting devices for relatively displaceable parts, and more particularly to articles of furniture or the like wherein it is desired to swingably raise and lower one part thereof relatively to another part thereof and more particularly to mechanism for maintaining the swingable part in a desired inclined position intermediate extreme upper and lower positions. The invention is particularly adapted for use in connection with couches, sofas, beds, seats, backrests, chairs, medical, physicians' or other tables, or the like. It is an object of this invention to provide a position adjusting mechanism.

It is a further object to provide said mechanism for a swingable part of an article of furniture or the like and for securing the said part at any angular position intermediate extreme upper and lower positions thereof.

It is a further object of the present invention to provide in an article of furniture or the like having one part thereof adapted to be swung to an inclined position relatively to another part thereof, mechanism for maintaining the said one part in a desired inclined position intermediate extreme upper and lower positions; the said mechanism comprising two longitudinally slidable members, means connected to the members and to the furniture parts, whereby raising of said one part will cause said means to relatively retract the members and lowering of said one part will cause said means to relatively extend the members, and means automatically maintaining the members against extending and thereby said one part against being lowered after said one part has been raised between the extreme upper and lower positions.

It is a further object of the present invention to provide a mechanism of the aforementioned type wherein it is first necessary to raise the swingable part to its extreme upper position and then lower it to its extreme lower position before the swingable part may be adjusted and maintained in any desired intermediate position.

These and many other objects and advantages of the invention will appear from the following disclosure thereof together with the attached drawings which illustrate a preferred form of embodiment thereof, and in which:

Fig. 1 shows a couch made in accordance with the invention, with the headrest in a diagonal or reclining position;

Fig. 1a is a diagrammatical side view of the front portion of the couch shown in Fig. 1;

Fig. 2 is a view similar to the one shown in Fig. 1, but showing the headrest in its raised or vertical position;

Fig. 3 is a partial detail view of the essential parts of the operating mechanism, allowing free movement so as to either lower or raise the headrest;

Fig. 4 is a view similar to Fig. 3, but with the mechanism in a locked position, preventing any downward movement of the headrest;

Fig. 5 is a sectional view on line 5—5 of Fig. 4;

Fig. 6 is an elevational view of the whole locking mechanism in its extended position;

Fig. 7 is an enlarged detail view of the cam-locking operation;

Fig. 8 is an elevational view of the whole locking mechanism in its contracted or downward position;

Fig. 9 is an enlarged detail view of the cam-releasing operation;

Fig. 10 is a full-size detail view of one of the wedges; and,

Fig. 11 is a top view of Fig. 10.

Referring now in detail to the drawings, numeral 20 represents a typical couch incorporating the invention. Although a couch is illustrated, it is to be understood, however, that the article may be any piece of furniture having a swinging part adapted to be adjusted. The couch 20 is provided with an adjustable back or headrest 21 conventionally hinged at 22. Secured to the headrest 21 by means of a hinge 23 is the operating mechanism 24. The bottom of this mechanism 24 is fastened by means of a hinge, brace or bracket 25 to a cross-tie 26.

Referring to Figs. 6 to 9 inclusive, the mechanism 24 consists in its main parts of four bars 27, 28, 29 and 30. The bars 27 and 28 are pivotally secured at 31 to the hinge 23 by means of a bolt 32. At 33 and 34, the bars 27 and 28 are pivotally joined with the lower bars 29 and 30, by means of bolts 35. The lower bars 29 and 30 are in turn pivotally joined at their lower ends to a hinge 25 by means of a bolt 36. The upper hinge 23 is secured to the headrest 21 by means of screws 37, while the lower hinge 25 is secured to a cross-tie member 26 by means of screws 38. The bars 27 and 28 have holes 39 near the centers thereof for the reception of ends 40 of a tension spring 41. This spring urges the bars 27 and 28 together and serves to counterbalance some of the weight of the back or headrest 21 supported on the mechanism 24. Thus, the headrest may be easily lifted to any desired inclination.

Connecting the joints 33 and 34 is a sliding

device 42. This sliding device consists of two telescopically arranged channel bars 43 and 44 (Fig. 5). Channel bar 43 is narrower and slidably fits within the channel bar 44. A rear strip 45 is spot-welded to the channel bar 43. Within the channel bar 43 is a cam arrangement (Figs. 3 and 4) comprising two locking wedges 46 and 47, having inclined faces 48 and 49, respectively. Wedges 46 and 47 are provided with projecting pins 50 and 50*a*, respectively. Around each pin is wound one end of a tension spring 51. The tension spring 51 consists of the two hooked end portions 52, the two coil portions 53 and the intermediate portion 54. The spring 51 will normally keep the inclined faces 48 and 49 engaged, thereby gripping the inside faces 55 of channel 43. The wedges 46 and 47 will then act as a lock (Fig. 4). When the wedges 46 and 47, however, are separated a small distance 56 (Fig. 3), the channel member 43 will be able to freely slide within the channel 44. Pins 50 and 50*a*, which are a part of the two locking wedges 46 and 47, protrude through the larger channel member 44. The members 46 and 47 securely slide within channel 43 (Fig. 5). Pin 50 snugly protrudes through a hole 57, while pin 50*a* protrudes through a slot 58. Swingably secured to pin 50 is a cam member 59 having a finger 60 and a notch 61 on its periphery 59*a*. On the right hand side of the mechanism 24 and secured to the backplate 45 is a release member 62, while secured at the left-hand side of the mechanism 24 to the top face of the channel member 43 is another member 63, which acts as a locking finger. This last-mentionad locking member 63 pushes against finger 60 of the cam 59, causing the latter's peripheral edge 59*a* to slide downwardly on the pin 50*a* until the pin 50*a* locks in the notch 61 of cam 59.

To fully understand the operation of the invention, it is essential to remember that the two wedges 46 and 47 slide in the smaller channel bar 43 and that the wedge members 46 and 47 are normally held in contact with each other by the spring 51. It is also to be remembered that wedge 46 is provided with pin 50, and wedge 47 is provided with pin 50*a*, which protrude respectively through opening 57 and slot 58, in the larger channel member 44. The opening 57 is a round hole sufficient in size to snugly accommodate pin 50, while slot 58 is an elongated opening, permitting slight relative movement between the two wedge members 46 and 47. It is also to be remembered that cam member 59, at certain times, keeps the wedge members 46 and 47 spaced apart, during which instances the wedge members do not cooperate to act as a stop. The operation is as follows:

Let it be assumed that the headrest 21 is in its lowermost position (Fig. 1) when the two channel members 43 and 44 are in their most extended position (Fig. 8). The finger 60 of the cam member 59 has contacted the release member 62 and the latter has tripped member 59. The pin 50*a* has moved out of the notch 61 in cam member 59, and wedges 47 and 46 are close together as shown in Fig. 4 and also in Fig. 9. In Fig. 9, the letter "*b*" indicates the distance between the pins 57 and 58 when the wedges are in this close position. As headrest 21 is being raised, the two channel members 43 and 44 telescope. The slot 58 will permit a slight longitudinal movement of pin 50*a* and thus allow separation of the telescoping of members 43, 44 and wedges 46 and 47 (against the action of

spring 51) during upward movement of the headrest. Raising of the headrest 21 will change the position of the mechanism from the one shown in Figs. 1 and 8 to the extreme position illustrated in Figs. 2 and 6. Between these two extreme positions, upward movement of headrest 21 causes movement of the larger channel member 44 (Fig. 4) in the direction of the arrow "A," and this movement of member 44 will cause pin 50, in the snug hole 57 to move away from the pin 50*a* in slot 58 and from wedge member 47; in other words, in its contracting movement, the two channels 43 and 44 are free to move. As soon as the upward movement of the headrest 21 is stopped or an attempt is made to lower the headrest 21, anywhere between the two extreme positions (upper and lower) of mechanism 24 (Figs. 6 and 8), spring 51 will come into full action and urge the wedge members 46 and 47 to ride up on their inclined surfaces 48, 49 and wedge against the inner face 55 of channel member 43 (Fig. 5). This will prevent any further downward movement of headrest 21. To unlock mechanism 24 and permit the headrest again to be freely lowered into the position shown in Fig. 1, it is essential first to raise the headrest 21 to its extreme upper position (Figs. 2 and 6) at which time the locking finger 63 will push against the cam finger 60 thereby swinging the cam member 59 around its fulcrum 50, until the notch 61 has come into engagement with the pin 50*a*. This will separate the wedge members 46 and 47 and allow the channel members 43 and 44 to extend until the headrest is in its lowermost position, in which latter position the headrest must be downwardly swung before it can be raised. In this lowermost position of the headrest, the release member 62 will push against the cam finger 60 from the opposite side, releasing the same from the locked notch 61-pin 50*a* position, allowing the headrest to be raised but permitting the wedge members again to exert their wedge action in the downward movement of the headrest 21.

The bands B seen in Figs. 4, 5, 7 and 9 are respectfully fixed to the channel member 44 and extends around the channel member 45, one of said bands B being fixed adjacent the end of the channel member 45 and engages over the channel member 44. These bands are provided in order to prevent lateral separation of the telescopic channel members.

From the foregoing description taken in connection with the accompanying drawings, it is apparent that improved, simple, practical and inexpensive adjustable headrests for the purpose intended are provided. It is apparent however, that immaterial changes and modifications may be made by skilled persons without departing from the true spirit and scope of the invention as outlined in the appended claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. A position adjusting device for relatively displaceable parts; comprising four members pivotally connected together at their opposite ends to provide a deformable quadrilateral support assembly having two pairs of diagonally disposed corners, fastening means mounted on each of one of said pairs of corners for connecting the latter to relatively displaceable parts, tensioning means extending between two of said members defining one of said one pair of corners for yieldably urging said two members together thereby

yieldably resisting deformation of said support assembly moving said one pair of corners towards each other, and a locking assembly extending diagonally across said quadrilateral support assembly between the corners of the other of said two pairs of corners, said locking assembly including two telescopic members pivotally connected at their opposite ends to said other pair of corners, wedging means carried by one of said telescopic members and engageable with the other of said telescopic members, resilient means normally effective to urge said wedging means into a condition preventing relative movement of said telescopic members in the direction spreading apart said other pair of corners, movable means carried by said one telescopic member and displaceable between an operative position in which said movable means acts on said wedging means against said resilient means to condition said wedging means to permit free relative movement of said telescopic members in either direction and an inoperative position permitting said resilient means to be effective, and first and second abutments carried by said other telescopic member at spaced locations and engageable with said movable means, said first abuttment being operative to displace said movable means to the operative position of the latter when said telescopic members are substantially telescoped and said second abutment being operative to displace said movable means to the inoperative position of the latter when said telescopic members are substantially extended relative to each other.

2. A position adjusting device for relatively displaceable parts as set forth in claim 1; wherein said one telescopic member includes an elongated channel member and said other telescopic member includes an elongated channel member slidable longitudinally within the first mentioned channel member, and said wedging means includes a pair of wedge shaped elements slidable in the channel of said other telescopic member, one of said wedge shaped elements being fixed

relative to the channel of said one telescopic member and the other of said wedge shaped elements being longitudinally movable relative to the latter, said resilient means being connected to said wedge shaped elements to normally urge the latter longitudinally together for laterally gripping said channel of the other telescopic member.

3. A position adjusting device for relatively displaceable parts as set forth in claim 2; wherein at least said other wedge shaped element has a pin extending therefrom and said movable means includes a cam member rockably mounted on said channel of the one telescopic member and formed with a cam edge engageable with said pin for moving said wedge shaped elements longitudinally apart.

4. A position adjusting device for relatively displaceable parts as set forth in claim 3; wherein said cam edge is formed with a notch adapted to receive said pin when said movable means is disposed in the operative position thereof to thereby retain said movable means in said operative position.

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