Oct. 4, 1960 A. C. ABAJIAN 2,954,567

SOFA-BED AND BED-SPRING CONSTRUCTIONS

Filed Dec. 15, 1954 2 Sheets-Sheet 1

FIG. 1.

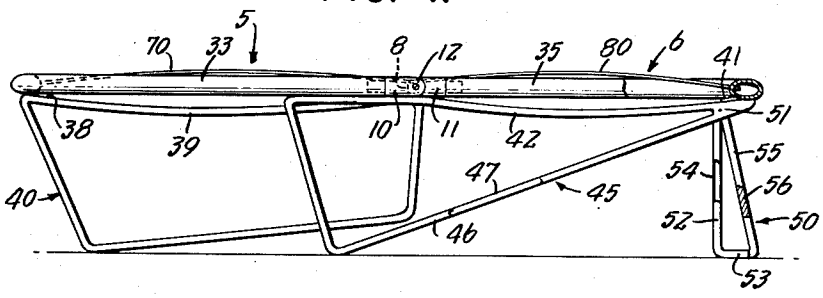


FIG. 3.

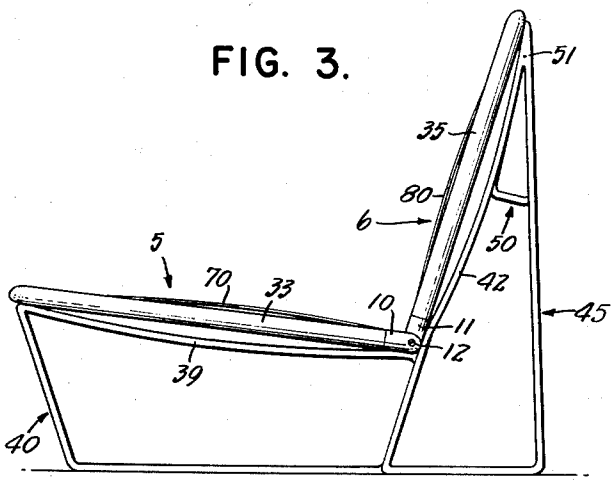


FIG. 7.

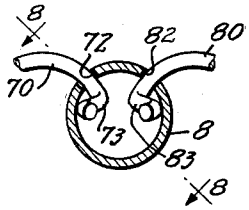


FIG. 4.

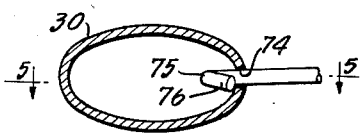


FIG. 6.

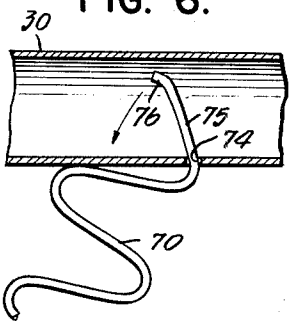


FIG. 5.

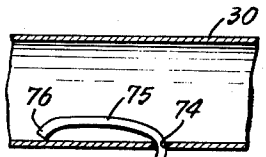




FIG. 8.

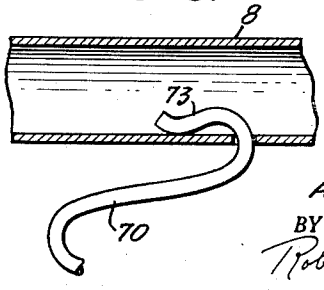


FIG. 9.



INVENTOR.
ARAM C. ABAJIAN
BY
Robert Irving Williams
ATTORNEY

Oct. 4, 1960 A. C. ABAJIAN 2,954,567

SOFA-BED AND BED-SPRING CONSTRUCTIONS

Filed Dec. 15, 1954 2 Sheets-Sheet 2

FIG. 2.

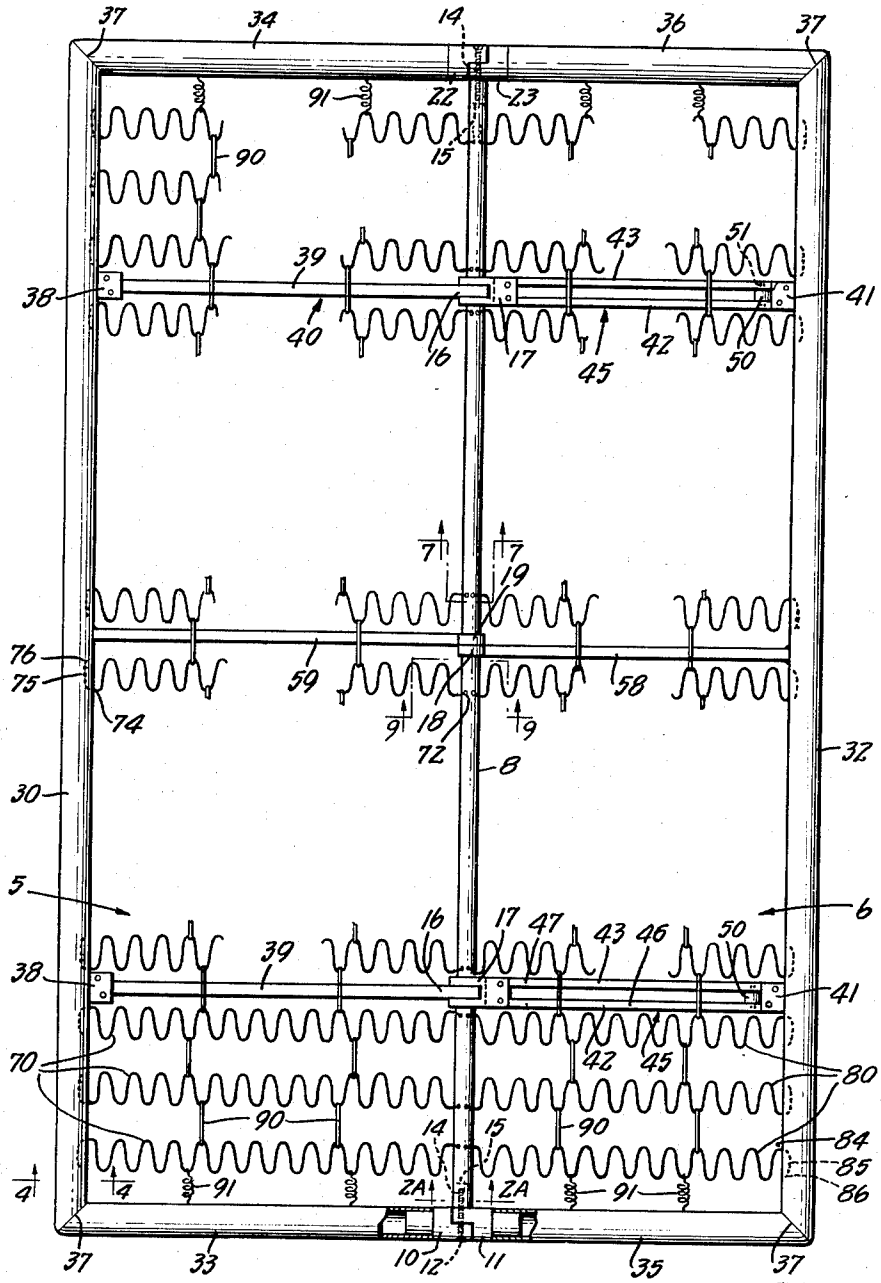
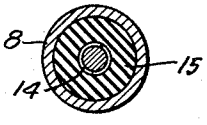


FIG. 2A.



INVENTOR.
ARAM C. ABAJIAN
BY
Robert Irving Williams
ATTORNEY

United States Patent Office 2,954,567
Patented Oct. 4, 1960

2,954,567

SOFA-BED AND BED-SPRING CONSTRUCTIONS

Aram Christian Abajian, Westhampton Beach, N.Y.
(110 East End Ave., New York, N.Y.)

Filed Dec. 15, 1954, Ser. No. 475,464

8 Claims. (Cl. 5—38)

This invention relates to spring-frame constructions for beds, sofa-beds, and the like.

Various relatively complicated and/or ineffective constructions have been suggested for overcoming the tendency of sofa-beds to resist movement from bed position to sofa position and from sofa position to bed position, and at the same time for preventing them from moving too rapidly from one position to the other. I have found that such tendencies can be overcome effectively and in an exceedingly simple manner by the utilization of a single set of springs to provide spring rests for the seat and/or the back portions and which serve the additional function of controlling the movement of the sections.

Moreover, spring-frames for sofa-beds and other beds have been constructed of laterally arched springs the end portions of which extend into tubular frame members having annular cross sections. These have been found to be disadvantageous because of the tendency of the bent-over end portions to move up as the arch of the springs is lowered by someone supported or resting thereon, or to move down when the arch of the springs is restored by the person getting up. This is not only noisy and annoying but provides an undesirable looseness of construction. This disadvantage is accentuated when the springs are arranged in half sections to provide the frame and back portions of a sofa-bed, because of the varying stress on the springs when in bed position and when in sofa position.

I have found that the disadvantages of such constructions can be overcome by forming the anchoring element at at least one end of each set of springs in a generally elliptical shape and extending the bent-over end portions of the springs thereinto thru the narrow side of the anchoring element so that the adjacent portions of the wide sides of the anchoring element will confine the bent-over end portions of the springs therebetween. An effective construction is provided when the bent-over portions at one end of the springs extend into an anchoring element having an interior major cross-sectional diameter of from about one and one-half inches to about two inches and an interior minor cross-sectional diameter at right angles thereto of from about one inch to about seven-eighths of an inch. This construction is particularly effective when the springs are from about one-eighth of an inch to about eleven-sixty-fourths of an inch in thickness.

The invention accordingly comprises articles of manufacture possessing the features, properties, and the relations of elements which will be exemplified in the article hereinafter described and the scope of the application of which will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description taken in connection with the accompanying drawings, in which:

Figure 1 is an end view of a bed-spring construction embodying the invention as used in a sofa-bed in bed position;

Fig. 2 is a top view thereof;

Fig. 2A is an enlarged cross-sectional detail taken on the line 2A—2A of Fig. 2;

Fig. 3 is a view similar to Fig. 1 showing the construction as used in sofa position;

Fig. 4 is an enlarged vertical sectional detail view along the lines 4—4 of Fig. 2;

Fig. 5 is a horizontal sectional detail view along the lines 5—5 of Fig. 4 on a slightly smaller scale;

Fig. 6 is a similar view showing the manner of insertion of a spring into the anchoring member of Figs. 4 and 5;

Fig. 7 is a vertical sectional detail view on the same scale as Fig. 4 along the lines 7—7 of Fig. 2;

Fig. 8 is a sectional detail taken on the line 8—8 of Fig. 7 on the same scale; and

Fig. 9 is an enlarged sectional detail taken on the line 9—9 of Fig. 2.

The invention is exemplified in a sofa-bed construction of the general type shown by my Patent 2,700,164 (Serial No. 302,659, filed August 8, 1952). In this embodiment, there is provided a pair of spring sections 5 and 6, the former being adapted to serve as the front or seat portion of th sofa-bed, and the latter as the rear or back portion. Hinge means are provided connecting these sections and comprising a central tubular anchoring element 8, end hinge members 10 and 11 pivoted on a pin 12 having a threaded end 14 extending, as shown in Fig. 2A, into a tough but yieldable rubber bushing 15 which is fitted tightly within the end of the tube 8, at least two portions 16 and corresponding members 17 all pivoted on the tube 8 at interior points of support, split annular members 18 and 19 rotatable on the tube 8, and end hinge members 22 and 23 which are similar to the members 10 and 11 and are similarly pivoted upon a pin 12. At left (Fig. 2) of the section 5 is an outer hollow anchoring element 30 which is generally elliptical in shape and has an interior minor axis of $\frac{15}{16}$ of an inch in extent and an interior major axis of one and ¾ inches in extent; and the section 6 has a similar outer anchoring element 32. The element 30 is connected with members 10 and 22, respectively, by end frame elements 33 and 34 of similar shape to the element 30, and the element 32 is connected to the members 11 and 23, respectively, by similarly-shaped end-frame elements 35 and 36. In the present instance, the elements 30 and 32 are welded to the end-frame elements on diagonals 37.

The element 30 carries lugs 38, and to the respective ones of these are secured the upper bars 39 of each of which 16 is a portion and which, in turn, form a part of each of two front supporting frame means 40 which are generally similar to those shown in my said patent, but are formed of bent hollow metal tubing which, as exemplified, is rectangular in shape with the upper bars 39 bowed downwardly, in order, for example, to permit the seat portion of the sofa of Fig. 3 to be depressed when sat upon. Similarly, the element 32 carries lugs 41, and to the respective ones of these and of the members 17 are secured the upper bars 42 and 43 of each of two rear supporting frame means 45 which are generally similar to those shown in my said patent, but are formed of pairs of bent hollow rectangular tubing 46 and 47, each pair being adapted to receive the tubing of one of the front frame means 40 between the members thereof, and the upper bars 42 and 43 of each pair being bowed (downwardly when in the bed position of Fig. 1 or rearwardly when in the sofa position of Fig. 3).

As in the construction of said patent, there are provided swingable legs for supporting the rear of the sofa-bed when in bed position. Such legs, as exemplified at 50, are of triangular form with a front portion 52 joining a rearwardly-extending bottom portion 53 at a right angle so that the portion 52 will provide a vertical support for the rear section of the sofa-bed, a construction

which tends to inhibit wide sliding or tripping action. These legs are weighted at their rear portions so as to swing readily into the position of Fig. 3. As exemplified, this weighting is accomplished by forming the front portion **52** and the bottom portion **53** of each leg of hollow rectangular metal tubing as shown at **54**, and the rear portion **55** of a solid metal rectangular rod, as shown at **56**, which is welded to the tubing so as to provide a relatively heavy rear support portion and a relatively light-weight front support portion.

Forming a continuation of one end, the split annular member **18** is a downwardly-bowed strip **58** which is welded to the element **32**, and forming a continuation of one end of the split annulus **19** is a downwardly bowed strip **59** which is welded to the element **30**. The free ends of the annuli are welded to their respective strips as indicated at **62** and **63**.

Thruout the section **5**, a multiplicity of round spring-steel strands **70** having a thickness of $^{11}/_{64}$ of an inch and extending horizontally back and forth in a generally zig-zag conformation extend from the element **8** to the element **30** and are upwardly bowed therebetween as shown in Fig. 1. The element **8** is formed at its upper left-hand side (Fig. 7) with holes **72** thru which the end portions **73** of the springs **70** extend as shown in Figs. 7 and 8, and the element **30** is formed in its inner narrow side with holes **74** thru which the end portions **75** of the springs **70** extend. These end portions **75** are bent inwardly toward the inner narrow side of the element **30** as shown at **76** in Fig. 5. As will be seen from Fig. 4, the end portions **75** of the springs are closely confined between the wide sides of the element **30** both at the point where they enter the element **30** and at the inwardly bent portion **76**. The distance along the major interior axis of the member **30** permits the springs to be inserted in the holes in the manner indicated in Fig. 6 in spite of the greater length of the portions **75** as contrasted with the portions **73**, and an increase in tension perpendicular to the anchoring element **30** serves to prevent accidental release of the springs.

Thruout the extent of the section **6** there is provided a multiplicity of springs **80** which are similar to the springs **70** except that they are somewhat shorter. The member **8** is formed at its upper right-hand portion (Fig. 7) with holes **82** at an angle of 86° with the holes **72**. The springs **80** are formed with inner edge portions **83** fitting in holes **82**. The member **32** is formed along its narrow portions with holes **84** similar to the holes **74** and thru these holes extend end portions **85** of the springs **80**. The ends of the end portions **85** are bent inwardly at **86** in the same manner that the end portions **75** are bent inwardly at **76**.

The various springs are held together by tie-clips **90**, and the end springs are joined to the end frame elements by coil springs **91**.

Since certain changes may be made in the above article and different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

Claims to certain of the subject matter herein disclosed are included in my copending application Serial No. 552,586, filed December 12, 1955, and now abandoned, which is a division of the present application.

I claim:

1. A sofa-bed comprising a pair of hinged spring sections, a tubular spring-anchoring element extending along the axis of the hinge, a generally elliptical hollow anchoring element at the far end of each section, transverse expansion-spring means in each section, said spring means being formed at one end with end-portions extending into the interior of said tubular spring-anchoring element and being wholly contained therein and bent over therein and being formed at the other end thereof with end portions each extending into the interior of one or the other of said elliptical anchoring elements and being wholly contained therein and bent over therein and extending therealong a distance greater than the length of any line extending transversely of the elliptical anchoring element within the same to provide end portions extending along one of the narrow sides of one or the other of said elliptical anchoring elements respectively and bent to run lengthwise of the interior of said hollow elliptical anchoring element and then bent toward said one of said narrow sides, said end portions having greater extents lengthwise of said hollow elliptical anchoring element than the interior extent of said hollow elliptical anchoring element on a line parallel to its minor axis where said end portions terminate whereby the interior of said hollow elliptical anchoring element provides a stop means for the ends of said end portions to limit turning movements of said spring means on the major axis of said hollow elliptical anchoring element, but of such extent relative to the major axis of the hollow elliptical anchoring element, as to permit introduction of the end portions therein and removal therefrom.

2. A device as set forth in claim 1 wherein the first mentioned anchoring element forms the hinge of said section.

3. A sofa-bed as set forth in claim 2 wherein the elliptical anchoring elements are connected with the first-mentioned anchoring element by means comprising end-frame elements of similar shape to that of the elliptical anchoring elements.

4. A sofa bed as in claim 2 wherein there is provided a spring rest for each section embodying the expansion spring means in that section, and wherein said expansion spring means for each section are anchored to said first-mentioned anchoring element above the axis of said hinge and at the side thereof toward the section in which they are embodied.

5. A sofa bed as in claim 4 wherein said spring rests are arched and wherein there is provided support means for each section comprising a downwardly bowed upper bar underneath the spring-rest of that section.

6. A bed-spring or the like comprising a multiplicity of arched spring strands bent forward and back along their length and having end portions at one of the sides of said bed-spring, and a hollow anchoring element at said side, said anchoring element being generally elliptical in shape and having holes in one of its narrow sides into which holes said spring strands extend and within which element said end portions are entirely contained, being bent over toward said narrow side and extending therealong a distance greater than the minor interior diameter of said elliptical anchoring element so as to be anchored therein, the portions of the wide sides of the anchoring element which overlie the end portions near said narrow side provide stop means serving to limit turning action of said end portions on the major axis of the anchoring element, said end portions being of such length and contour with respect to the major axis of the anchoring element that they may be inserted and removed thru said holes when in bent position, and means to secure the far portions of said strands.

7. In a folding article of furniture adapted for use in seating and reclining positions, a pair of hinged spring-rest sections, transverse expansion spring strands in each section, a hollow spring-anchoring element extending along the axis of the hinge and formed with two rows of holes, an anchoring element extending along the far side of each section, the spring strands of each section each being anchored to the anchoring element at the far side of its section and extending into said holes of one row and being bent over and anchored within the first-mentioned anchoring element, said rows of holes being disposed at an upper portion of said first-mentioned anchoring element and spaced from the center line there-

of toward the section of which the respective spring strand forms a part, and means to pivot at least one of the second-mentioned anchoring elements on the first-mentioned anchoring element, whereby said sections are urged toward seating position by said spring strands.

8. In or for a sofa-bed, a pair of hinged spring sections, a tubular spring-anchoring element extending along the axis of the hinge, anchoring elements at the far side of each section, a multiplicity of tensioned spring strands in each section and providing a spring-rest for the section, and means to pivot said second-mentioned anchoring elements on the first-mentioned anchoring element, the first-mentioned anchoring element being formed with rows of holes subtending an acute angle extending to each side of a longitudinal plane vertically bisecting the first-mentioned anchoring element when the sofa-bed is in bed position, and said strands extending thru said holes and being anchored within the first-mentioned anchoring element, the strands from the anchoring element on one side extending thru holes disposed at that side of the angle, and the strands from an anchoring element on the other side extending thru holes disposed on the other side of the angle, whereby said sections are urged to seating position by said spring strands.

References Cited in the file of this patent

UNITED STATES PATENTS

322,177	Goode	July 14, 1885
372,891	Brooks	Nov. 8, 1887
898,399	Albert	Sept. 8, 1908
1,430,248	Morse	Sept. 26, 1922
1,650,217	Jacobs	Nov. 22, 1927
1,879,724	Wolpert	Sept. 27, 1932
2,078,396	MacEwan	Apr. 27, 1937
2,214,078	Feldman	Sept. 10, 1940
2,227,855	Glass	Jan. 7, 1941
2,440,001	Blumensaadt	Apr. 20, 1948
2,454,964	Elder	Nov. 30, 1948
2,562,197	Martin	July 31, 1951
2,595,038	Woller	Apr. 29, 1952
2,611,138	Piliero	Sept. 23, 1952
2,700,164	Abajian	Jan. 25, 1955

FOREIGN PATENTS

19,918	Great Britain	Aug. 8, 1912
140,129	Australia	Feb. 1, 1951
506,067	Belgium	Oct. 15, 1951
511,320	Canada	Mar. 29, 1955