

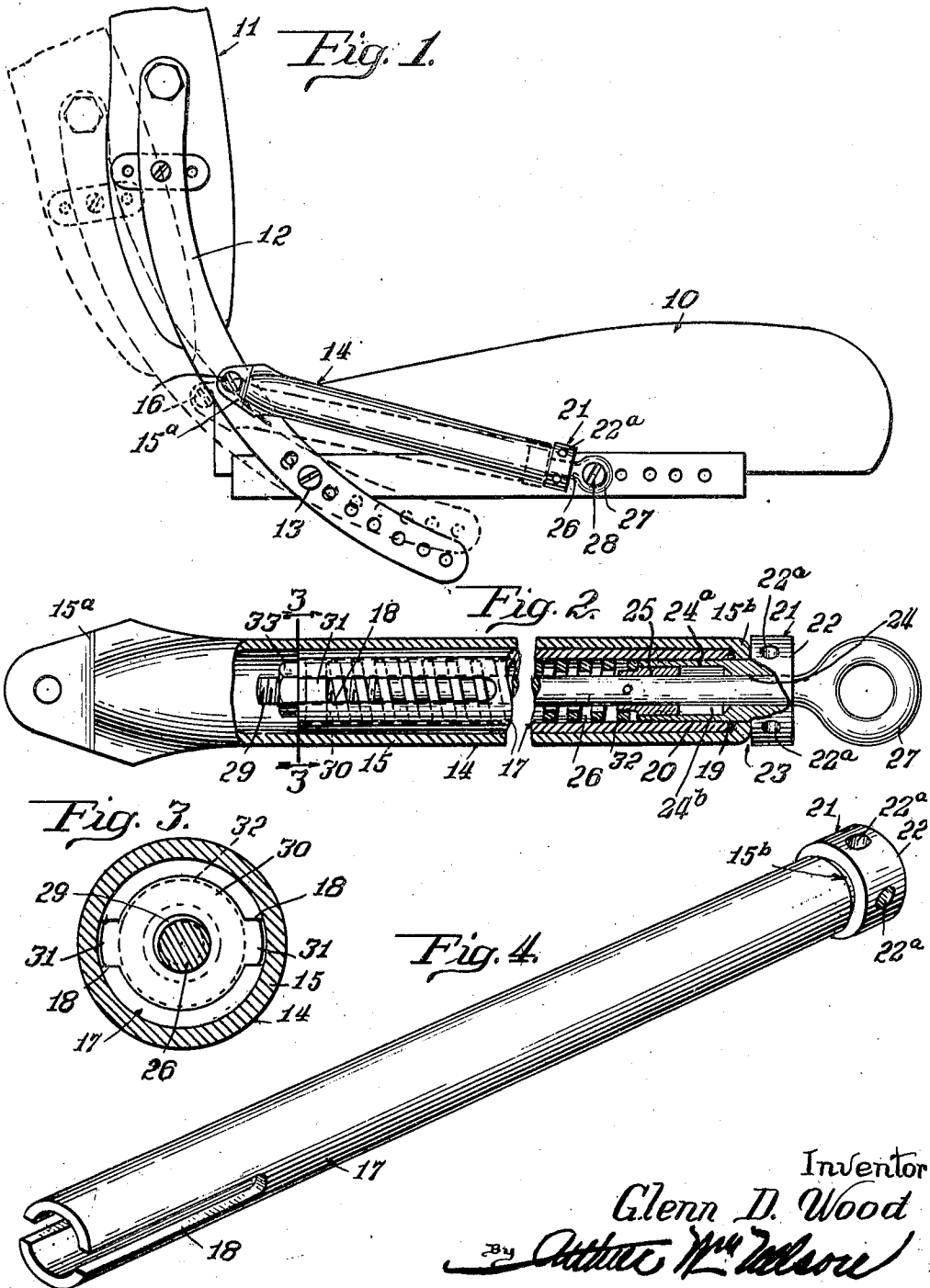
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BACK REST CUSHIONING DEVICE FOR CHAIRS

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Inventor
Glenn D. Wood
By *Arthur W. Nelson*
Attorney

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BACK REST CUSHIONING DEVICE FOR CHAIRS

Glenn D. Wood, Elkhart, Ind., assignor to Posture Research Corporation, Elkhart, Ind., a corporation of Indiana

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5 Claims. (Cl. 155—164)

This invention relates to improvements in back rest cushioning devices for chairs and it consists in the matters hereinafter described and more particularly pointed out in the appended claims.

The cushioning device with which the present invention is more especially concerned, is of the kind illustrated and described in my prior Patent 2,018,825 of October 29, 1935, and which device is therein shown as disposed between the seat of a chair and a back rest, which is mounted for a forward and a backward movement with respect to the seat.

One of the objects of the present invention is to provide a device of this kind whereby the tension of the cushioning element, embodied in the device, may be more easily adjusted.

A further object of the invention is to provide a device of this kind having certain of its parts swivelly connected together so that they cannot become separated while making an adjustment of the cushioning element of the device.

Again, it is an object of the invention to provide a device of this kind wherein certain threading operations, necessary in the same as heretofore constructed, may be eliminated so that the device is more simple and less costly to make and this without sacrificing the efficiency of the operation thereof.

The above mentioned objects of the invention, as well as others, together with the advantages thereof will more fully appear as the specification proceeds.

In the drawing:

Fig. 1 is a view in side elevation of the seat and the back rest of a chair of the kind mentioned, with one of the improved cushioning devices arranged therebetween to cushion the back and forth swinging movement of the back rest with respect to the seat.

Fig. 2 is a longitudinal sectional view through the improved cushioning device, on a somewhat enlarged scale, when the device is removed from its position in the chair.

Fig. 3 is a transverse sectional view through the improved cushioning device, as taken on the line 3—3 of Fig. 2 and on a scale somewhat enlarged over that of Fig. 2.

Fig. 4 is a perspective view of a certain spring housing element embodied in the improved cushioning device and which will be more fully referred to later.

Referring now in detail to that embodiment of the invention illustrated in the drawing, 10 indicates the seat of an office chair and 11 indicates the back rest for the chair. Both the seat and

the back rest may be upholstered and while this is preferable, it is not essential.

The back rest is disposed above the back of the seat and between the upper end portions of a pair of supporting arms 12. While only one of such arms appears in Fig. 1, it is of course to be understood that there is one of such arms at each side of the chair. The lower end of each arm 12 is pivotally connected as at 13 to the seat and whereby the back rest is capable of a back and forth swinging movement with respect to the seat.

To cushion the backward swinging movement of the back rest from its normal at rest position and to return it to that position after a backward movement of the back rest, I provide a device 14 between each arm 12 and the seat 10. Said device is in the nature of a yielding telescopic brace or link and best appears in Fig. 2.

Each device embodies a tubular member 15 that is flattened at one end to form an ear 15a through which a bolt or screw 16 extends to pivotally connect this end of the device as a whole to the associated back rest supporting arm 12.

In the other end of the tubular member 15 is located a tubular spring housing 17 (see Figs. 2 and 4) and in that end of the housing facing the ear 15a is a pair of longitudinally extending, diametrically opposite slots 18 that open through said end of the housing. The other end of said housing receives and is welded as at 19 to the body 20 of a bushing 21 that has a head 22 of a diameter approximating that of the tubular member 15. The head 22 is spaced from the associated end of the housing so as to provide an annular groove 23 (see Fig. 2) therebetween and into which the end portion 15b of the tubular member 15 is upset. The structure just mentioned provides a swivelling connection between the tubular member 15 and the tubular housing 17, so that a relative turning movement is possible therebetween without a relative longitudinal movement or separation. The body 20 of the bushing is provided with axial bore portions 24 and 24a respectively of different diameters and the meeting ends of said bore portions form an annular stop shoulder 24b. The head of the bushing has radial recesses 22a therein, into which any simple device may be inserted for turning the bushing relatively to the tubular member 15.

A part of a rod or stem 26 has sliding engagement in the bore portion 24 and a sleeve 25 is fixed to said stem or rod at a point thereon so as to have a sliding engagement in the bore por-

tion 24a. That end of the stem or rod 25 outside of the bushing head is made as an eye 27 through which a screw or bolt 28 extends to operatively connect this end of the device as a whole to the seat 10 of the chair. The purpose of the sleeve 25 is to engage the shoulder 24b in the body of the bushing and limit the outward movement of the stem or rod 26 relative to the tubular member 15 when the device as a whole is in its extended position, as will later appear. The stem or rod 26 is longer than the housing 17 so that the inner end of the stem or rod extends beyond the inner end of the housing and the inner end of the stem or rod is threaded as at 29 in Fig. 2.

An abutment member 30 has a threaded engagement on the part 29 of the stem or rod 26 and has a fairly snug fit in the housing 17. Said abutment member is in the form of a relatively thick washer and has radial projections 31 that engage in the slots 18 in the housing 17. Because of the engagement of said projections in said slots, said abutment member cannot turn with respect to the housing but it can move longitudinally of the stem and said housing, when said housing is turned as will soon appear. Thus a sliding splined connection is afforded between the housing and the abutment member 30 associated therewith.

A resilient means in the form of an expansion spring 32 surrounds a part of the rod 26 and engages at its ends with said abutment 30 and the body 20 of the bushing 21. If desired, a lock nut 33 may be provided on the threaded end of said rod outwardly of the abutment thereon. Preferably the spring is made of rectangular cross sectional stock as shown.

Assume that there is a cushioning device operatively secured at its ends, one to each back rest supporting arm 12 and to the seat 10 respectively. When the occupant of the seat leans back against the back rest, a force is exerted, tending to swing the back rest 11 rearwardly against the action of the springs 32—32 of both cushioning devices 14—14. In this backward movement of the back rest, the devices 14—14 will tend to elongate, thereby placing the springs 32—32 under compression, until the sleeves 25 of both cushioning devices engage their associated bushing shoulders 24b which, of course, limits the backward movement of said back rest. When the occupant leans or moves forwardly on the seat, the pressure against the back rest is eased or released and the springs 32—32 expand and shorten the devices to return the back rest to its normal position, when the sleeves 25 again occupy the position shown in Fig. 2.

By inserting the end of a simple implement, such as a nail, in one of the recesses 22a in the head 22 of each bushing, said bushings may be turned with respect to the tubular member 15. By reason of the sliding splined connection between the housing 17 of each device and the associated abutment member, when the bushing is turned in one direction, the abutment member 30 will move toward the associated bushing 21 so that the compression of the spring 32 therebetween is increased. When the bushing is turned in the other direction, the abutment member moves away from the bushing so that the spring expands, reducing the compression of the spring. Thus, the action of the springs 32 of both devices 14—14 associated with the chair may be quickly and easily adjusted to suit the occupant.

While in describing the invention, I have referred in detail to the form, arrangement and

construction of the parts employed, the same is to be considered only in the illustrative sense, and therefore I do not wish to be limited thereby except as may be specifically set forth in the appended claims.

I claim as my invention:

1. A cushioning device for use between the seat member of a chair and a back rest member mounted for a back and forth movement with respect to said seat member, said device embodying therein a part having means at one end adapted to be operatively connected to one of said members so as to be held against axial turning thereby and having a tubular portion at its other end, a tubular member disposed in said tubular portion, a bushing fixed to one end of said tubular member and forming therewith an assembly, a part of which is disposed outwardly beyond said other end of said tubular portion, means providing a swivelled connection between said other end of said tubular portion and said assembly part and whereby said tubular portion and said assembly may turn relatively without longitudinal separation, a stem slidable through said bushing and having a threaded part disposed in the other end of said tubular member and having a second part extending outwardly beyond said bushing and having means adapted to be operatively connected to the other of said first mentioned members to be held against axial turning thereby, resilient means in said tubular member and surrounding a part of said stem and engaged at one end with a part of said bushing, and an abutment member mounted on said threaded part of said stem and engaged with the other end of said resilient means, said tubular member and said abutment member having a sliding splined connection so that when said bushing is turned in one direction or the other, the abutment member is caused to move longitudinally on the stem toward or away from said bushing to compress said resilient means or to permit the same to expand.

2. A cushioning device for use between the seat member of a chair and a back rest member mounted for a back and forth movement with respect to said seat member, said device embodying therein a part having means at one end adapted to be operatively connected to one of said members so as to be held against axial turning thereby and having a tubular portion at its other end, a tubular member disposed in said tubular portion, a bushing fixed to one end of said tubular member and forming therewith an assembly, a part of which is disposed outwardly beyond said other end of said tubular portion, said tubular member being formed with longitudinal slots in its other end, means providing a swivelled connection between said other end of said tubular portion and said assembly part and whereby said tubular member and said assembly part may turn relatively without longitudinal separation, a stem slidable through said bushing and having a threaded part disposed at least in part in said tubular member and a second part extending outwardly from the bushing and having means adapted to be operatively connected to the other of said first mentioned members to be held against axial turning thereby, resilient means in said tubular member and engaged at one end with a part of said bushing, and an abutment member mounted on said threaded part of said stem and having portions disposed in said slots of said tubular member and engaging with the other end of said resilient means so that when

said bushing is turned in one direction or the other, the abutment member is caused to move longitudinally on said threaded part of the stem toward and away from the bushing to compress said resilient means or to permit it to expand.

3. A cushioning device for use between the seat member of a chair and a back rest member mounted for a back and forth movement with respect to said seat member, said device embodying therein a part having means at one end adapted to be operatively connected to one of said members so as to be held against axial turning thereby and having a tubular portion at its other end, a tubular member disposed in said tubular portion, a bushing fixed to one end of said tubular member and forming therewith an assembly, a part of which is disposed outwardly beyond the other end of said tubular portion, said tubular member and said bushing being constructed to coact in defining an annular groove in said assembly and into which an end part of said tubular portion is upset to provide a swivelling connection between said tubular portion and said assembly, said tubular member being formed with longitudinal slots in its other end, a stem having a sliding bearing engagement in said bushing and having a part disposed in said tubular member and a second part extending outwardly from said bushing and having means adapted to be operatively connected to the other of said first mentioned members to be held against axial turning thereby, said stem part in said tubular member being threaded, resilient means in said tubular member and engaged at one end with a part of said bushing, an abutment member mounted on the threaded part of said stem and engaging the other end of said resilient means and having parts slidably engaged in said slots so that when said bushing is turned in one direction or the other, the abutment member is caused to move longitudinally on the stem toward or away from said bushing to compress said resilient means or to permit the same to expand.

4. A cushioning device for use between the seat member of a chair and a back rest member mounted for a back and forth movement with respect to said seat member, said device embodying therein a part having means at one end adapted to be operatively connected to one of said members so as to be held against axial turning thereby and having a tubular portion at its other end, a tubular member disposed in said tubular portion, a bushing fixed to one end of said tubular member and forming therewith an assembly, a part of which is disposed outwardly beyond said other end of said tubular portion, means providing a swivelled connection between said other end of said tubular portion and said assembly part and whereby said tubular portion and said assembly may turn relatively without longitudinal separation, a stem slidable through said bushing and having a threaded part in said tubular portion and having a second part extending

outwardly beyond said bushing having means adapted to be operatively connected to the other of said first mentioned members to be held against axial turning thereby, coacting means between said stem and bushing respectively for limiting the movement of the stem in one direction through said bushing, resilient means in said tubular member and surrounding a part of said stem and engaged at one end with a portion of said bushing, an abutment member mounted on the thread part of said stem and engaged with the other end of said resilient means, said tubular member and said abutment member having a sliding splined connection so that when said bushing is turned in one direction or the other, the abutment member is caused to move longitudinally of the stem toward or away from said bushing to compress said resilient means or to permit the same to expand.

5. A cushioning device for use between the seat member of a chair and a back rest member mounted for a back and forth movement with respect to said seat member, said device embodying therein a part having means at one end adapted to be operatively connected to one of said members so as to be held against axial turning thereby and having a tubular portion at its other end, a tubular member disposed in said tubular portion, a bushing fixed to one end of said tubular member and forming therewith an assembly, a part of which is disposed outwardly beyond said other end of said tubular portion, means providing a swivelled connection between said other end of said tubular portion and said assembly part and whereby said tubular portion and said assembly may turn relatively without longitudinal separation, said bushing having a bore therein with a shoulder at one end thereof, a stem slidable through the bushing and having a threaded part in said tubular portion and having a part extending outwardly beyond the bushing and adapted to be operatively connected to the other of the first mentioned members to be held against axial turning thereby, means providing a shoulder on the stem and disposed in the bore in said bushing and adapted for engagement with the shoulder at one end of said bore for limiting movement of the stem through the bushing in one direction, resilient means in said tubular member and surrounding a part of said stem and engaged at one end with a portion of said bushing, and an abutment member mounted on said threaded part of the stem and engaged with the other end of said resilient means, said tubular member and said abutment member having a sliding splined connection so that when said bushing is turned in one direction or the other, the abutment member is caused to move longitudinally of the stem toward or away from the bushing to compress said resilient means or to permit the same to expand.

GLENN D. WOOD.