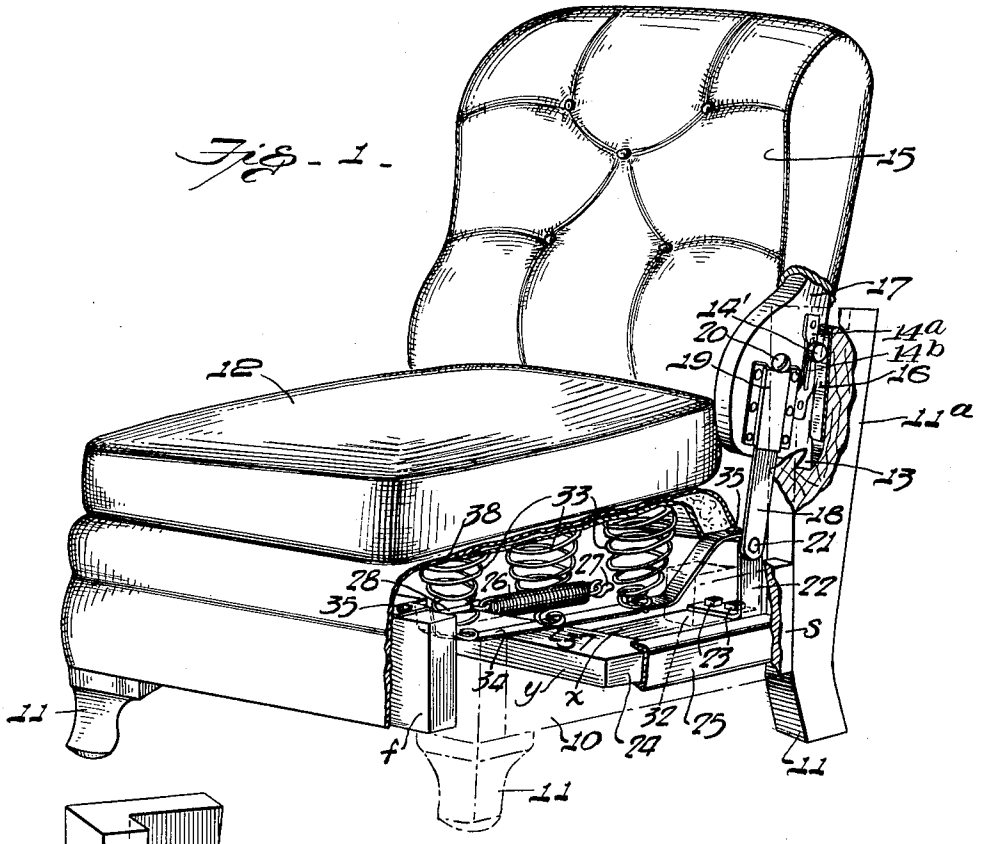
May 22, 1934. P. H. KELLY 1,960,156

RECLINING CHAIR

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Fig. 1.



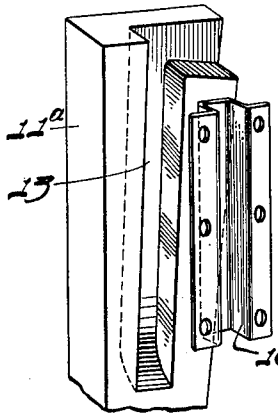


Fig. 5.

Fig. 2.

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Fig. 3.

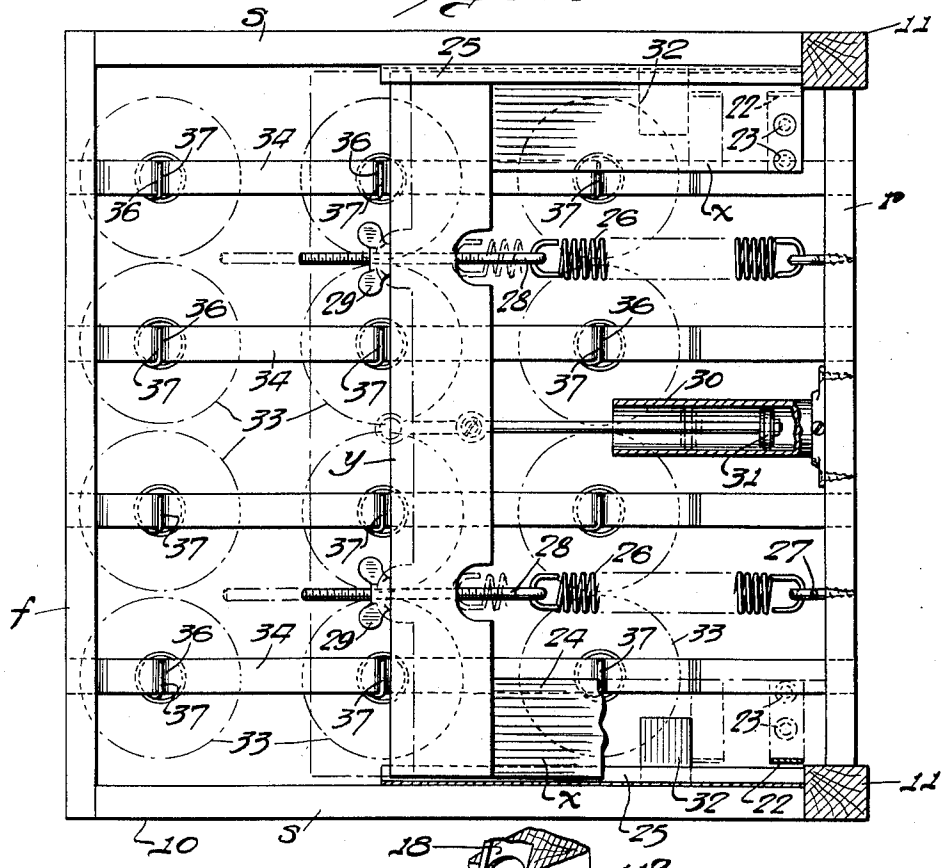


Fig. 4.

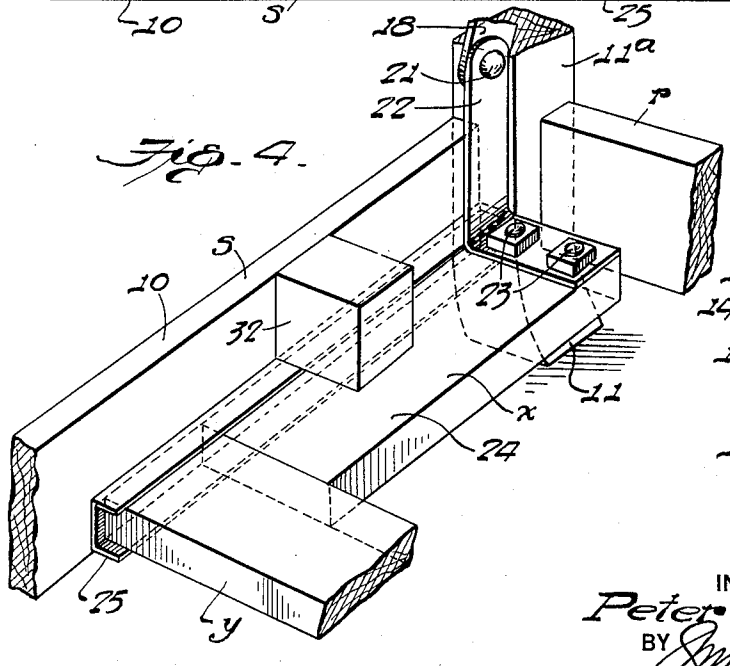
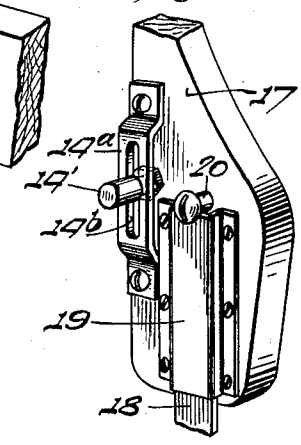


Fig. 6.



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1,960,156

RECLINING CHAIR

Peter H. Kelly, Clinton, Iowa

Application November 9, 1932, Serial No. 641,884

1 Claim. (Cl. 155—164)

The present invention relates to chair construction and more particularly to chairs having reclining backs.

An object of the invention is the provision of a chair structure having a reclining back actuated to reclining position by the weight or pressure of the back of the person thereagainst.

Another object of the invention is the provision of a tiltable back for chairs actuated by the pressure or weight of the person thereagainst, the operating mechanism of which is adjustable to suit the weight of the particular person seated in the chair so that said back may respond readily and also properly support the back of such person in a reclined position, said operating mechanism also being self compensating to offer increasing resistance to and support for the back of the occupant of the chair as the angularity of back of the chair relative to the seat is increased to extreme reclining position.

Another object of the invention is to provide a reclining chair, of which the back may be readily attached or detached for convenience of storage and shipment.

Another object of the invention is the provision of a reclining chair wherein the lower portion of the back is maintained in a close relation to the rear edge of the seat while the back is being tilted to a reclining position.

Another object of the invention is the provision of a chair having a back mounted thereon in such a manner as to assume a reclining position when pressure is exerted thereagainst by the back of a person seated in the chair, which back is entirely independent of the seat frame of the chair, and which back is so mounted on the chair frame as to be readily detachable therefrom and replaceable therein with celerity.

A still further object of the invention is the provision of a chair of which the seat is stationary and embodying spring-supporting means for such seat which will not interfere with the operation of the means for controlling the tilting movement of the back of the chair.

With the above and other objects in view, the invention resides in the sundry novel features of and arrangement of parts hereinafter described in detail and set forth in the accompanying claim.

In the drawings which show a preferred embodiment of the invention:

Figure 1 is a perspective view of a chair embodying the invention, parts of one side of the chair being broken away to illustrate details of construction;

Figure 2 is a vertical sectional view of the chair as shown in Fig. 1;

Figure 3 is a bottom plan view of the seat portion of the chair, illustrating the manner in which the seat springs are supported in position, and also illustrating the means for controlling the tiltable back of the chair;

Figure 4 is a fragmentary perspective view of one corner portion of the chair showing a portion of the chair frame and a portion of the spring-controlled slide member mounted thereon and associated with the tiltable back;

Figure 5 is a detail view showing one of the parts for mounting the chair back in the frame; and

Figure 6 is a detail view showing the parts which cooperate with the part shown in Figure 5 for mounting the chair back in the frame.

Referring to the drawings, 10 represents a rectangular chair frame comprising side, back and front members supported in the usual manner by suitable legs 11. The rear legs have extensions 11*a*, projecting upwardly to any desired height above the frame 10 and which are shown as terminating a short distance above the seat cushion 12 which rests upon the frame 10. The opposing inner faces of the extensions 11*a* are grooved, as at 13, from their upper ends to points adjacent the side members of the frame 10. A trunnion 14' projects from each side of the chair back 15 at points nearer to the lower end than to the upper end of the latter, each of which trunnions rides in one of the grooves 13. Preferably, and as shown in Figure 5, a metallic lining 16 is mounted in each of the grooves 13 and is held in place therein by screws or other suitable fastening means.

The back member 15 of the chair may be constructed in any suitable manner, but is shown as comprising a pair of side members 17, each of which is widened adjacent its lower end to provide a relatively broad surface, and the trunnions 14', for supporting the back in position are carried by said widened portions. The trunnions 14' are positioned considerably below the transverse center of the back in order that the back member may rock on an axis nearer to its lower end than to its upper end.

As shown in detail in Figure 6, the ends of the trunnions which are secured to the side members 17 of the seat back are shown as vertically adjustable on said side members in order that the axis on which the back member of the chair rocks may be changed relatively to the lower end of said back. As there shown, a plate 14^a, longitudinally slotted as at 14^b, is secured adjacent each of its ends, as by screws, to the inner side of each of the side members of the seat back, with its slotted portion bent out of the plane of its end portions. Each of the trunnions 14' has a portion of a width slightly smaller than the width of the slot 14^b in the plate 14^a, which portion extends into one of said slots and terminates in an externally screw threaded portion. A nut mounted on such screw

threaded portion serves to clamp the plate 14^a between said nut and the shoulder formed on the trunnion 14' by the reduced portion of the latter. By inserting a wrench into the space between the plates 14^a and the side members 17 of the seat back, the nuts may be partially unscrewed from the screw threaded portions of the trunnions to permit adjustment of the trunnions 14' longitudinally of the slots of said plates, whereupon the nuts may be tightened to secure the trunnions in adjusted position in the plates 14^a.

The back member 15 is further supported in position by lever arms or links 18 which normally are disposed in a substantially vertical position, and of which the lower end portions are supported by the spring controlled slide to be described later. To provide for convenient removal of the back from the chair and its operating mechanism, the upper portions of the arms or links 18 are slidable in guideways 19 of which the upper ends are closed in any suitable manner, but which are here shown as closed or obstructed by screws 20, against which the upper ends of the arms or links 18 abut or engage. The front face of the back 15 is inclined or curved forwardly and then rearwardly adjacent the rear edge of the seat cushion and the rear edge of the seat cushion is so formed as to always contact with a portion of said inclined curved portion of the back.

The lower end of each of the arms or links 18 is pivoted, as at 21, to the upstanding arm of an angle iron bracket 22, the other arm of which is secured by bolts or other suitable means 23 to a frame 24 slidably mounted in guideways 25 which extend longitudinally of the side members of the chair frame adjacent the lower edges of the latter and below the seat-supporting springs. The guideways 25 are preferably formed by channel irons secured to the side rails *s* of the chair frame 10 adjacent the lower edges of the latter. The frame 24 is entirely independent of the seat member and its movement is not affected in any way by the pressure or weight of a person upon the seat 12 of the chair. The frame 24 comprises side members *x*, and a crosshead *y* connecting said side members at or adjacent the forward ends of the latter.

Tension springs 26 connect the crosshead *y* with the back member *r* of the chair frame 10, each of the springs having one of its ends connected, as by a screw eye 27, to the back member *r* of the chair frame and its other end connected to an eyebolt 28 which extends through an opening in the crosshead *y*. Wing nuts 29, mounted on the threaded shanks of the eyebolts, abut against the outer surface of the cross head *y*, thus serving to adjust the tension of the springs. It is preferred to provide two springs 26 and to arrange them at substantially equal distances from the side members *x* of the frame 24.

When a person seated in the chair leans backwardly, the back member 15 will, under the pressure exerted thereagainst, tilt backwardly on its trunnions 14' against the resistance of the springs 26, which resistance may be adjusted from time to time by adjusting the wing nuts 29 on the shanks of the eyebolts 28. When the back member 15 is tilted on its trunnions 14' to an inclined position, the lower ends of arms or links 18 will be moved forwardly, and, since their lower ends are pivotally connected at 21 to the upper ends of the brackets 22, the latter will be moved in an horizontal direction against the tension of springs 26. The weight of the back being supported by engagement of the upper ends of the links 18 against the stops or pins 20, allows trunnions 14' to move downwardly in the slots 13. As the angle of inclination of the back becomes greater, more of the weight of the person occupying the chair is transferred from the seat to the back, but the horizontal movement of pivots 21 due to the tilting of the back and the downward movement of trunnions 14' causes the springs 26 to be extended to a greater degree, thereby counterbalancing the increased weight thrown on the back, and providing the necessary support for the back at any position of the latter. Since the tension of said springs is adjustable, various degrees of support of the back in reclined position required for the comfortable accommodation of persons of differing weight and stature may be provided. Further, if the springs 26 lose their initial tension, said tension may be readily renewed as required by adjusting the wing nuts 29 on the shanks of the eyebolts 28.

In order that inclination of back may be increased or decreased at will while the chair is occupied, without discomfort of occupant and without catching of garments between the back and the seat of the chair, it is essential that this joint remain closed and that a minimum of movement between back and seat occur at this point. This is accomplished by the combination of the movement produced by the rocking of the back on the vertically sliding trunnions and the movement of the curved surface of the back against the rear edge of the seat cushion. There accordingly will be no separation between the lower end of the back and the rear edge of the seat cushion during the tilting movements of the back but the close relation of seat and back will always be maintained. The distance that the frame 24 will be moved forwardly depends upon the degree of pressure exerted upon the upper part of the back member 15 against the resistance of the springs 26. If sufficient pressure is exerted upon the back member 15 the latter may be moved to approximately a horizontal position and the trunnions 14' will be disposed in the lower parts of the slots or grooves 13.

In order that the springs 26 may restore the back 15 to its normal position with a slow gradual upward movement, a dashpot 30 is mounted on the end rail *r* of the chair frame, and working in said dashpot is a piston 31 connected to the crosshead *y* of the sliding frame 24. Means are provided for limiting the distance that the frame 24 may move forwardly and consequently the degree to which position the back 15 may tilt. Such means are shown as abutments 32 secured to the side rails *s* of the chair frame and in the path of forward movement of the angle iron brackets 22. These stop members may be provided by the manufacturer and fixed in position.

The upper ends of the grooves 13 extend preferably to the upper ends of the extensions $11a$, or if the extensions $11a$ are carried to a height further than shown, they may be provided with lateral grooves through which the trunnions 14 may pass to permit the back member 15 to be removed entirely from the chair. It is obvious that when this is done, the upper ends of the supporting links 18 will be withdrawn from the guides 19.

The seat portion of the chair is constructed preferably of a plurality of coil springs 33 arranged in rows; each row being supported in position by a strip of metal 34 extending longitudinally of the chair from its front member *f* of the frame to the rear member *r* thereof, said strip

having its ends overlying the upper edges of said front and rear members of the frame and secured thereto by screws, nails or other suitable fastening means 35. The strips may have depressions in their under sides to form grooves 36 to receive the inturned lower ends 37 of the coil springs and thus secure the springs in position on the strips. A suitable covering 38 is secured in any preferred manner to the frame 10 of the chair over the upper ends of the springs.

It is to be understood that the invention is not limited to the embodiment shown in the accompanying drawings and as described above, but includes such equivalents thereof as fall within the scope of the following claim.

What I claim as new and desire to secure by Letters Patent is:

In a chair comprising a seat frame, front legs and rear legs supporting said seat frame, said rear legs extending upwardly above said seat frame, a second frame slidable forwardly and rearwardly in said seat frame, and a back between the upwardly extending portions of said rear legs and having its lower end hingedly connected to said second frame, vertically adjustable fulcrum means between said back and the upwardly extending portions of said rear legs and on which said back member is tiltable relatively to said rear legs, comprising a pair of plates secured, respectively, to and extending longitudinally of the opposite side edges of the back with their intermediate portions offset laterally from said edges, each of said plates having a substantially vertical slot in its offset portion, a pair of pins each having a reduced screw-threaded end projecting through one of said slots and its other end slidable in a substantially vertical groove in the inner side of one of the rear legs, and nuts mounted, respectively, on the threaded end portions of said pins between said plates and the side edges of the back.

PETER H. KELLY.