Aug. 17, 1937. A. D. RUSSELL 2,090,376

ADJUSTABLE BACK FOR SEATS AND CHAIRS

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Fig. 1

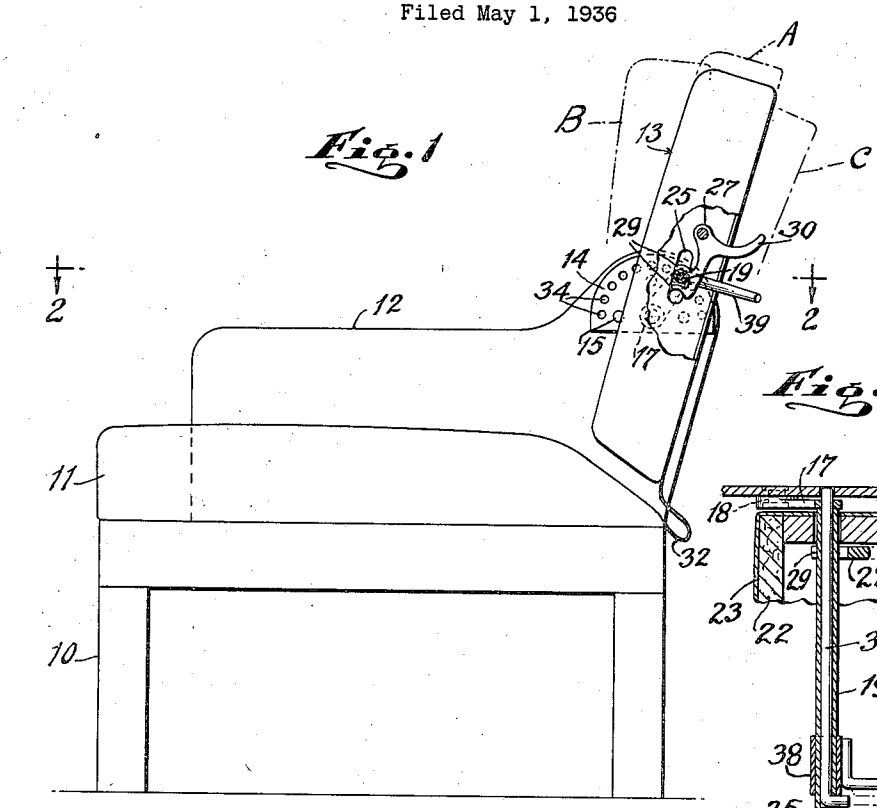


Fig. 3

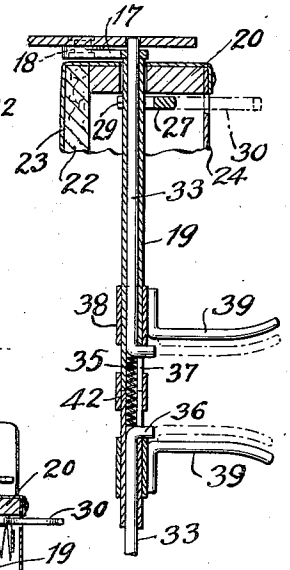
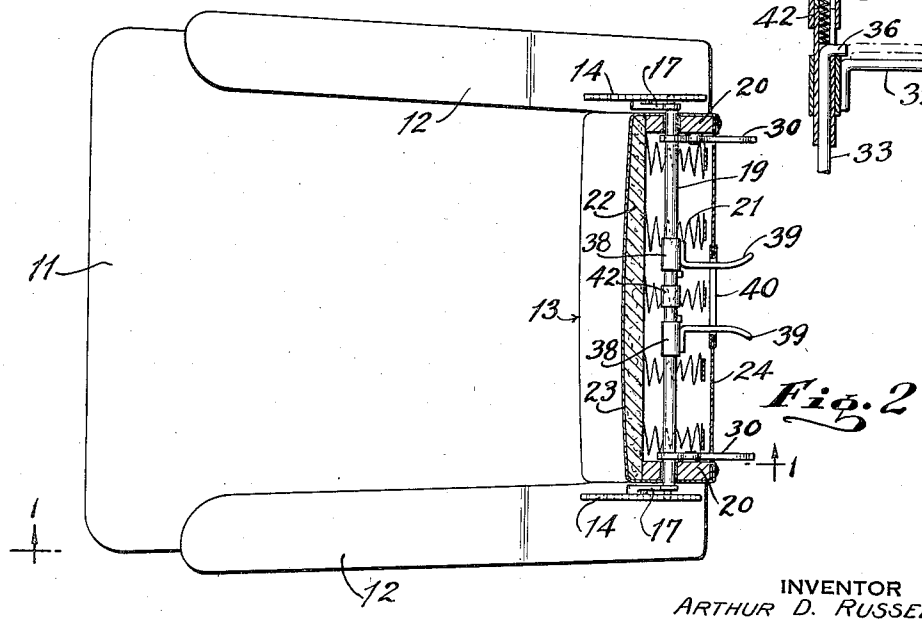


Fig. 2



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ADJUSTABLE BACK FOR SEATS AND CHAIRS

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7 Claims. (Cl. 155—156)

The present invention relates to improvements in seats and chairs and has for an object to provide a seat-back or chair-back capable of a variety of adjustments.

The invention is particularly useful in upholstered arm chairs but is also applicable to other forms of chairs and seats such, for instance, as the seats of automobiles.

Heretofore in chairs provided with a tiltable back it has been customary to hinge the back at or near its lower extremity. In contrast to this my invention provides a back which is pivoted on a horizontal axis disposed materially above the lower end of the back. In fact, the axis is preferably located substantially midway between the ends of the back. Thus, when the occupant of the chair or seat leans against the back the latter will adapt itself automatically and give support to the shoulders and to the small of the occupant's back.

A further object of my invention is to provide means for adjusting the back vertically without interfering with its automatic tilting adjustment.

A further object of the invention is to provide for moving the back bodily forward or rearward so as virtually to lengthen or shorten the seat.

It is, therefore, within the purview of my invention to provide a chair or seat with a back capable of vertical adjustment as well as adjustment in a horizontal direction, and which at the same time will pivot on an axis intermediate its ends. Because of these various adjustments of which my improved chair is capable it may be used as a measuring stick for a custom built chair having a fixed back, whereby the dimensions of the seat as well as the height and slope of the back that will suit the occupant may be determined.

Other objects and advantages of my invention will appear in the following description of a preferred embodiment and thereafter the novelty and scope of the invention will be pointed out in the claims.

In the accompanying drawing;

Figure 1 is a view in side elevation of an upholstered arm chair embodying my invention, one of the arms being removed and a portion of the back being broken away to reveal details of the chair back mounting, the view thus being virtually a section taken on the irregular line 1—1 of Fig. 2;

Fig. 2 is a plan view of the chair with the back shown in section, the section being taken on the line 2—2 of Fig. 1; and

Fig. 3 is a fragmental detail view in section taken along the axis on which the chair back is pivoted.

In the drawing, I have shown an arm chair comprising a chair frame 10 having a seat 11 and arms 12 between which is mounted the back 13. At the inner side of each arm and at a material elevation above the chair seat 11, is a metal plate 14 secured to the arm by rivets or screws 15. A crank shaft is pivotally mounted in these plates 14. This crank shaft comprises a pair of arms 17 pivoted on studs 18 secured to the plates. A tubular shaft 19 connects the free ends of the arms 17 and on this tubular shaft the chair back 13 is pivotally mounted.

As shown in Fig. 2, the chair back comprises a frame, the side members of which are indicated at 20. Within this frame are mounted the usual springs 21 which support a front cushion 22 suitably enclosed in a cover 23 which passes about the frame of the chair back. The usual fabric cover 24 is provided for the rear face of the chair back.

The tubular shaft 19 passes through slots 25 formed in the side frame members 20. These slots are vertically elongated, as clearly shown in Fig. 1, to permit of vertical adjustment of the back 13 with respect to the shaft 19. The chair back is held at the desired vertical adjustment by means of a pair of levers 27 pivoted to the side frame member 20. One arm of each lever is formed with a pair of fingers 29, while the other arm 30 of the lever projects rearwardly through a suitable opening formed in the back cover 24. In Fig. 1, the back 13 is shown in an intermediate position with the shaft 19 disposed between the two fingers 29. In other words, the chair back is supported by engagement of the upper fingers 29 with the top of the shaft 19. If it be desired to raise the chair back the levers 27 are swung out of engagement with the shaft 19 and then after the back has been raised to the position shown in broken lines at A, in Fig. 1, the levers 27 are swung back to their normal operative position with the lower fingers 29 resting upon the shaft 19. It will be observed that these fingers are curved so as to partly embrace the shaft and maintain the levers in proper adjusted position in engagement with the shaft. The chair back may be lowered sufficiently to permit the top of the slots 25 to rest upon the shaft 19. In any of these positions, the chair back may be tilted on the shaft as a pivot. The projecting arms 30 of the levers 27 provide convenient means for securing the chair back at desired vertical adjust-

ment. As shown in Fig. 1, the rear cover 24 is provided with an extension 32 which is secured to the seat or the chair frame and in which there is sufficient slack to permit limited tilting of the back with respect to the chair.

In order to secure the shaft 19 against revolution about the studs 18, I provide a pair of rods 33 projecting, respectively, from opposite ends of the tubular shaft 19 and adapted to engage in any opposed pair of apertures 34 formed in the plates 14. The apertures in the plates 14 are arranged in arcuate series concentric with the studs 18. The rods 33 are pressed outwardly by a spring 35 at the center of the tubular shaft 19 so as to hold them in engagement with the apertures. Each rod is formed with a right angled extension 36 at its inner end which passes outwardly through a slot 37 formed in the shaft 19. Mounted to slide on the shaft 19 are two sleeves 38 adapted, respectively, to engage the projecting extensions 36 of the rods 33. These sleeves are provided with handles 39 which pass through an opening 40 in the rear cover 24. By pressing the handles 39 together to the position shown in broken lines in Fig. 3, the rods 33 may be withdrawn from the apertures 34 and then the shaft 19 may be swung bodily about the studs 18 to any desired position. In this way, the chair back may be advanced as indicated in broken lines B, or, withdrawn as indicated in broken lines C, in Fig. 1, so as virtually to reduce or increase the effective length of the seat 11. The shaft 19 may be made of two sections into which the rods are introduced, after which the sections are suitably coupled together by a sleeve 42. If desired they may be brazed or welded to the coupling sleeve. The latter serves as a stop to limit inward movement of the rods 33.

It will thus be seen that my invention provides a chair with a back having a pivot disposed intermediate its upper and lower ends and about which the back is free to tilt and that the pivot may be swung through an arc to advance or withdraw the chair back while the chair back itself is also adjustable vertically with respect to the pivot. The friction between the chair back and the arms 12 will normally hold the chair back in set position unless tilted by pressure of the occupant thereagainst so that the extension 32 is not absolutely necessary although it may be advisable to use it in order to limit the extent to which the chair back may be tilted.

While I have described a preferred embodiment of my invention and have shown the invention as applied to an arm chair it will be understood that this is to be taken as illustrative and not limitative and that I reserve the right to make various changes in construction, form and arrangement of parts without departing from the spirit of my invention as set forth in the following claims. As explained above, the invention is applicable to seats as well as chairs and in the following claims the word "chair" will be understood to include seats of any kind to which the invention is applicable.

I claim:

1. A chair comprising a seat, a back, a pair of supports connected to the seat and disposed respectively at opposite sides of the back, a shaft providing a pivotal support for the back, means for securing the shaft at different points on said pair of supports, said back having means whereby the back may be vertically adjusted with respect to the shaft, and means for pivotally supporting the back on the shaft at such adjustments.

2. A chair comprising a seat, a pair of arms disposed respectively at opposite sides of the seat, a back frictionally held between the arms, means carried by the arms providing a pivotal mounting for the back at an elevation materially above the seat, said back having means whereby the back may be shifted vertically to different adjustments with respect to the pivotal mounting, and means for pivotally supporting the back on the mounting at such vertically adjusted positions.

3. A chair comprising a seat, a pair of plates mounted above and respectively at opposite sides of the seat, a crank-shaft pivoted at opposite ends in said plates, a chair back mounted to tilt on said crank-shaft, cooperating means on said crank-shaft and said plates for securing the crank-shaft at desired angular adjustment with respect to the seat, and means for securing the back at different vertical adjustments with respect to the crank shaft.

4. A chair comprising a seat, a back including a pair of side frame members formed with a pair of vertically elongated slots, a pair of supports mounted above and respectively on opposite sides of the seat, a shaft carried by said supports and passing through the slots to provide a pivotal axis for the back, a lever pivoted on each frame member adjacent the slot therein, each lever having fingers adapted respectively to bear upon the shaft and support the back at different elevations.

5. A chair comprising a seat, a back including a pair of side frame members formed with a pair of vertically elongated slots, a pair of plates mounted above and respectively on opposite sides of the seat, a crank-shaft pivoted to said plates respectively and passing through the slots to provide a pivotal axis for the back, a lever pivoted on each frame member adjacent the slot therein, each lever having fingers adapted respectively to bear upon the shaft and support the back at different elevations, and means for securing the crank-shaft at desired angular adjustment with respect to the seat.

6. A chair comprising a seat, a pair of plates mounted above and respectively on opposite sides of said seat, a crank-shaft comprising a pair of crank arms pivoted to the plates respectively and a tubular member connecting the ends of the crank arms, a back pivotally mounted on said member, each plate being formed with an arcuate series of holes, and a pair of rods in said tubular member adapted to engage any opposed pair of said holes to maintain the crank-shaft at a desired angular adjustment.

7. A chair comprising a frame, a seat supported thereon, said frame having portions rising well above the seat at each side thereof, a shaft disposed well above and at the rear of the seat, means adjustably mounting said shaft on said portions whereby said shaft may be shifted forwardly and rearwardly with respect to the seat, and a back fulcrumed on said shaft and having means whereby the back may be shifted vertically with respect to the shaft and held fulcrumed thereon at various elevations with respect to the shaft.

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