Oct. 28, 1930. A. L. JOHNSON 1,779,738

CHAIR HINGE

Filed Nov. 10, 1927

Fig. 1.

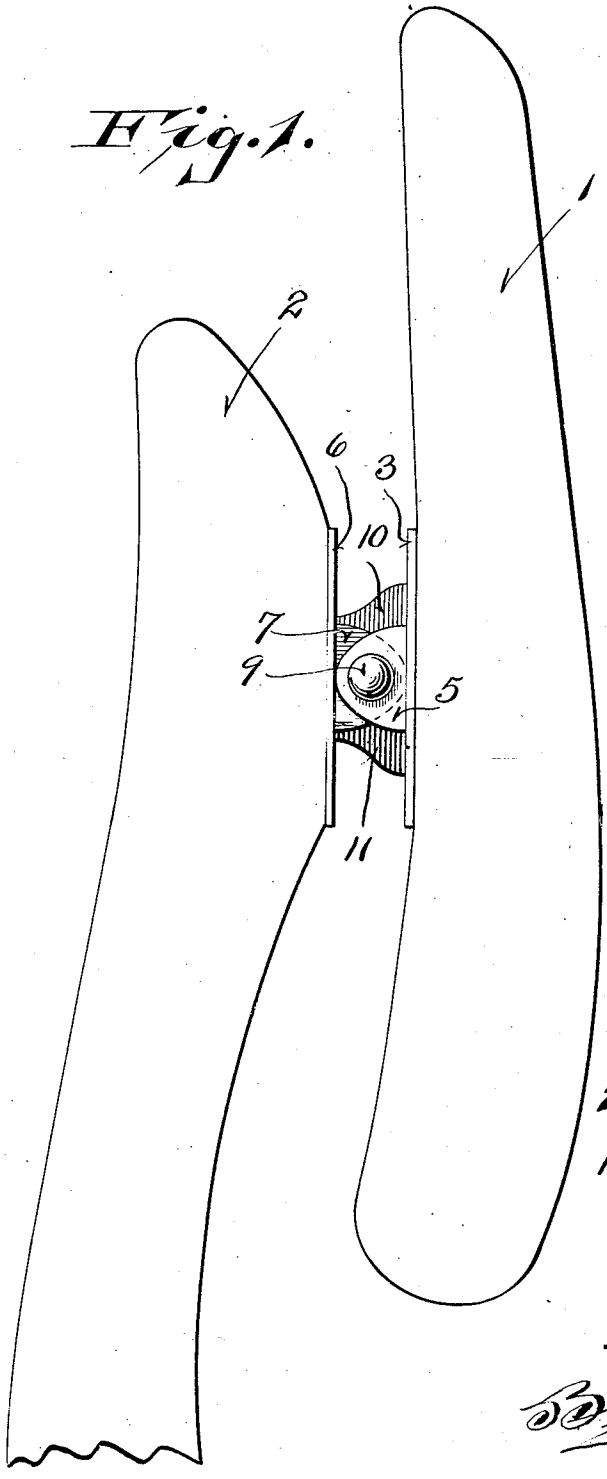


Fig. 2.

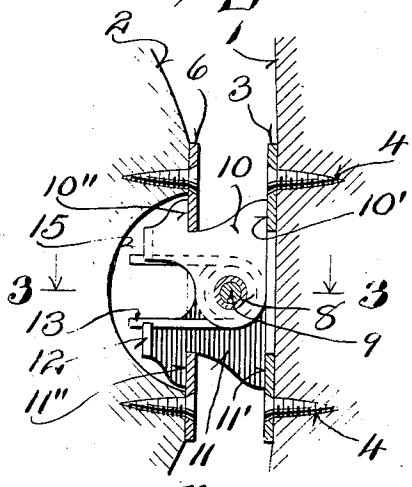
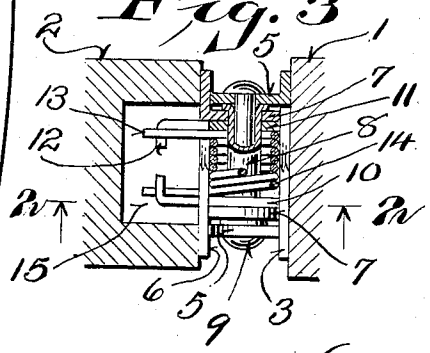


Fig. 3



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UNITED STATES PATENT OFFICE

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CHAIR HINGE

Application filed November 10, 1927. Serial No. 232,337.

This invention relates in general to hinges, and has more particular reference to a hinge construction adapted for use on a chair.

One of the important objects of my present invention is to provide a novel hinge constructed and arranged to normally tend to return to a neutral position after displacement in either direction and arranged so that when rocked in either direction, it will return to its normal central position in a minimum of time and without noise created by continued vibration or chattering of the parts, as they come to rest, means being provided to arrest the motion of the rocking parts immediately the neutral position is reached to thus prevent vibration back and forth past the neutral point.

Another important object of my present invention is to provide a hinge of compact size suitable for mounting in a restricted space.

Another important object of my present invention is to provide a two-way resilient hinge particularly adapted for use in mounting chair backs, such as the backs of stenographers' chairs in order to hold the chair back resiliently in a normal position and to permit of its displacement freely in either direction, but which will instantly restore the chair back to its normal position without any vibration or chattering whatsoever.

Still another important object of my present invention is to provide a hinge characterized by the fact that when the parts are relatively displaced from normal position and released, the rocking movement of the parts in returning to normal position is damped so that continued vibration and chattering of the parts is prevented, and the motion of the rocking parts is arrested immediately the hinge assumes its normal neutral position.

A further important object is to provide a simple, sturdy and reliable hinge of rugged, compact construction, which is easy and inexpensive to produce.

Numerous other advantages of my present invention will be apparent as it is more fully understood from the following disclosure which, taken in connection with the accompanying drawings, discloses a preferred embodiment of my invention.

Referring to the drawings:

Figure 1 is a side elevation of the upper portion of a chair having a hinge embodying my present invention;

Figure 2 is a sectional view through the hinge structure, such view corresponding to a section on the line 2—2 of Figure 3;

Figure 3 is a transverse sectional view through the hinge structure such view corresponding approximately to a section on the line 3—3 of Figure 2.

To illustrate my invention I have shown on the drawings a portion of a chair comprising a back rest 1 and a support 2. The back rest 1 may be of the type used on stenographers' chairs, for example, and is pivoted approximately at its center to the back support 2.

The pivoting is secured by means of a bracket 3 attached to the back rest and pivotally joined to a bracket attached to the back support. The bracket 3 (see Figures 2 and 3) consists of a plate having apertures through which screws 4 may pass and may enter the back support or back 1 of the chair. This plate 3 has a pair of inwardly turned ears 5. A similar plate 6 is attached to the back support 2 and is provided with a pair of outwardly turned ears 7. The ears 7 carry a sleeve 8 and a pintle pin 9 passes through the ears and through the sleeve 8.

It is to be noted particularly that rocking stops 10 and 11 are pivotally mounted upon the sleeve 8, as shown particularly in Figures 2 and 3. These rocking stops have shouldered portions 10′ and 11′ which contact with the plate 3 under normal conditions and also have shouldered portions 10″ and 11″ which contact with the plate 6, as shown in Figure 2. Further than this, each of the rocking stops is provided with an inwardly turned lug 12 against which the ends 13 of a coil spring 14 press. This coil spring is received between the plates 3 and 6 and loosely surrounds the rivet sleeve 8.

From the description and the drawings, it is apparent that the spring tends to open up and to swing its arms 13 apart. This action

forces the rocking lugs or stops 10 and 11 in opposite directions about the axis of the pivot pin and causes engagement of the shoulders 10′ and 11′, and 10″ and 11″ with their corresponding plates 3 and 6. If, however, the back of the chair is displaced, for example, assume that the upper portion is displaced rearwardly, the rocking lug or stop 10 is rocked about the pivot point, whereas the member 11 is not disturbed. When pressure is removed, the spring acting through the rocking member 10 urges the back into its neutral position, and when it arrives in this position, the shoulder 10″ contacts with the plate 6 and the back is not urged further. In addition to this, at this instant, the plate 3 contacts with the shoulder 11′ of the rocking stop or lug 11 and thus the back is restrained against rocking beyond its neutral position. The restraining force is applied not in a gradual manner but with practically full strength at the instant that the effect is needed, and thus vibration of the chair back or chattering is substantially eliminated. In other words, the chair back swings back to its neutral position and stops in this position without noticeable vibration. It does not vibrate back and forth before coming to rest.

It is obvious that if the back is displaced in the opposite direction from that described, the lug 11 will operate in identically the same manner as that described for lug 10. Upon release of the displacing pressure, the back will return to its neutral position and will instantly stop and remain resiliently supported without vibration or chattering.

The hinge also may be cheaply and easily assembled and may be readily applied to the chair without marring or injuring the support. Moreover, the hinge is compact and for this reason can be conveniently mounted within the confines of the single back support, which is usually provided in chairs of this general type. The hinge, also, is compact and neat in appearance and may be applied without detracting from the pleasing appearance of the chair.

It should be noted also that the plate 3 may be attached directly to the back and that the plate 6 may be similarly attached to the back support 2, the only additional change being that the back support 2 is provided with a cutout portion 15 which accommodates the ends of the rocking lugs or stops 10, as shown in Figure 2. Obviously, either the back support or the back could be provided with this cutout.

The reactive spring means which is located within the vertical marginal confines of the plates 3 and 6 of the hinge serves to hold the back rest in balanced substantially vertical position with respect to the central upright 2. This spring means exerts a yielding pressure on the spinal column of the person sitting in the chair, at points both above and below the axis 9 about which the chair back pivots so that in all sitting postures the spine will be held in normal position.

Although the invention has been described in considerable detail, such description is intended as illustrative rather than limiting as the invention may be variously embodied and as the scope of such invention is to be determined as claimed.

I claim:

1. In a hinge, the combination of a pair of members, a pivot, means pivotally connecting said members to said pivot whereby to permit relative rocking movement of the said members in either direction, a pair of rocking lugs mounted to said pivot, resilient means urging said rocking lugs in opposite directions about said pivot, said rocking lugs having each a shoulder adapted to engage one of said members and having each a second shoulder arranged to engage the other of said members whereby when said members are rotated relatively about said pivot in either direction, each lug engages one member only.

2. In a hinge, the combination of a pair of members, a pivot, means pivotally connecting said members to said pivot whereby to permit relative rocking movement of said members in either direction, a pair of rocking lugs mounted to said pivot, resilient means urging said rocking lugs in opposite directions about said pivot, said rocking lugs each having a shoulder engaging one of said members and having each a second shoulder engaging the other of said members whereby when said members are relatively rotated about said pivot in one direction, each lug engages one member only so that when the parts return to normal position, said second members may engage their corresponding members to arrest the return motion of the parts in neutral position.

3. In a hinge, the combination of a pair of members, a pivot, means pivotally connecting said members to said pivot whereby to permit relative rocking movement of the said members in either direction, a pair of rocking lugs mounted to said pivot, resilient means urging said rocking lugs in opposite directions about said pivot, said rocking lugs having each a shoulder adapted to engage one of said members and having each a second shoulder adapted to engage the other of said members whereby when said members are relatively rotated about said pivot in either direction, each member is engaged by one rocking lug only so that said members are urged to return to the neutral position and whereby when said members assume normal position, each member will be engaged by a shoulder of the rocking lug from which it was previously disengaged, so that the return motion of the parts may be arrested in the neutral position.

4. In a hinge, a pivot, a pair of plates having projecting lugs mounted to said pivot whereby the plates may be relatively rotated about the pivot, a pair of rocking members mounted to said pivot and having oppositely extending shoulders, one of said plates having an aperture through which a shoulder of each rocking member extends to normally engage said plate, said rocking members having feet normally abutting the other of said plates and resilient means tending to rock said members in opposite directions about said pivot.

5. In a hinge for connecting the back rest of a stenographer's chair to a single central upright, the combination of a plate adapted for connection to the central upright and arranged to extend within the vertical lateral confines thereof, a second plate adapted for attachment to the back rest and pivoted to the first mentioned plate about a horizontal axis and coiled spring means for normally urging said second mentioned plate toward a position substantially parallel to said first mentioned plate, when the same is displaced about said pivot in either direction from said neutral position.

6. In a hinge for connecting the back rest of a stenographer's chair to a single central upright, the combination of a plate adapted for connection to the central upright and arranged to extend within the lateral vertical confines thereof, a second plate arranged in a plane normally parallel therewith and adapted for attachment to the back rest and pivoted to the first mentioned plate by a single pivot pin and oppositely acting spring means located within the lateral confines of said plates and capable of urging the second plate toward a neutral position with respect to the first plate when the second plate is displaced from said neutral position in either direction.

7. In a hinge construction for connecting the back rest of a stenographer's chair to a relatively narrow central upright, a relatively narrow plate having its vertical marginal portions lying within the vertical lateral confines of the central upright, said vertical marginal portions of said plate having inwardly bent portions to provide opposed ears, said ears having registering perforations, a second plate having inwardly bent portions providing a pair of opposed ears formed with registering perforations, said plates being adapted to receive fastening means through the upright and through the back rest respectively, the ears of said two plates being arranged in overlapping relation and a horizontal pin passing through the perforations of said ears pivotally to interconnect the back rest to the central upright, and reactive resilient means disposed between said plates within the lateral confines of said inturned ears and constructed and arranged yieldingly to hold the back rest in balanced, substantially vertical position with respect to said central upright while at the same time permitting said back rest to shift about its pivot and yieldingly to exert pressure upon the back of the person sitting in the stenographer's chair so as to hold the back in normal position in various sitting postures.

In testimony that I claim the foregoing I have hereunto set my hand at Oak Park, in the county of Cook and State of Illinois.

ARTHUR L. JOHNSON.