Sept. 21, 1943. D. KRAKAUER ET AL 2,330,059

COUCH HINGE

Filed May 14, 1941

Fig. 1.

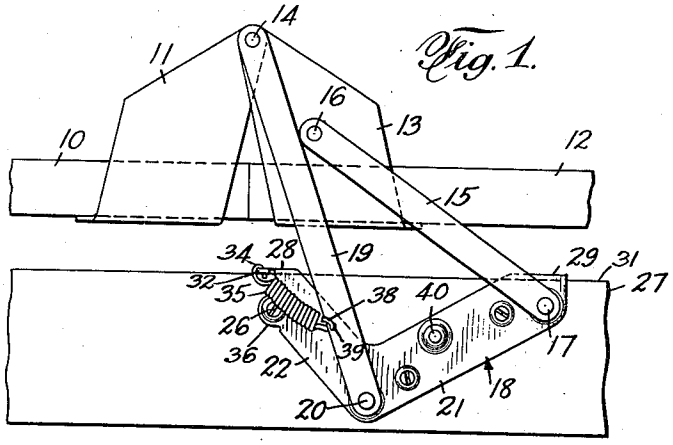


Fig. 2.

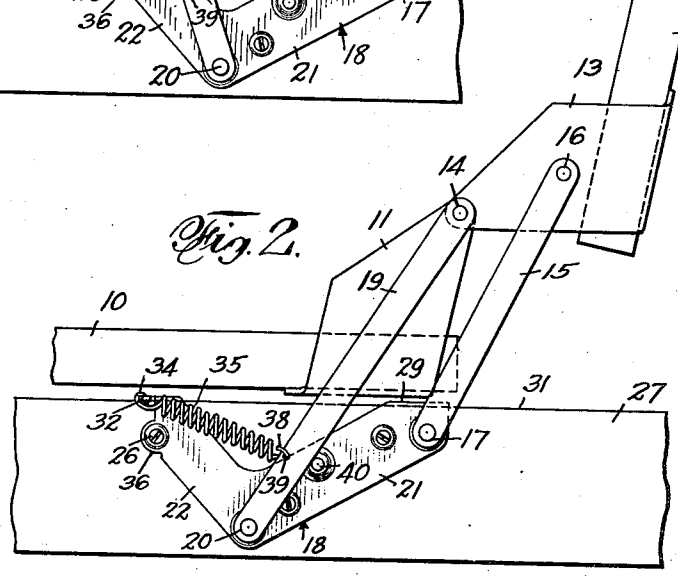
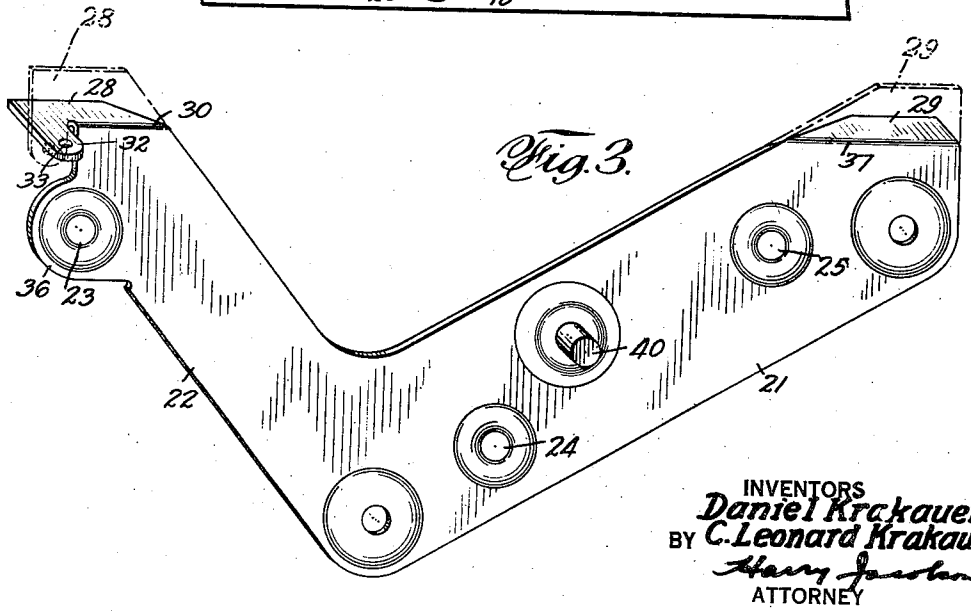


Fig. 3.



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COUCH HINGE

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5 Claims. (Cl. 5—47)

This invention relates to couch hinges of the type shown for example in our prior patent for Couch hinge, No. 2,224,825, dated December 10, 1940, and relates particularly to the support and control means for such hinges.

In couches in which such hinges are employed, the seat is hinged to the back by the hinge so that both the seat and back may be moved as a unit without relative movement of the parts of the hinge into an intermediate position wherein the back is in a horizontal bed-forming position and the seat is in a substantially upright position, whereafter the seat is swung into a horizontal bed-forming position coplanar with the back while the back remains stationary. Locking means are provided on the hinge to control the seat and back in their various positions, and springs have also been employed partly to overcome the weights of the parts and to enable the user to move them without undue exertion. The springs heretofore used for the purpose mentioned have been excessively long and of heavy wire and inefficiently arranged and supported.

The present invention therefore contemplates the provision of a one-piece hinge supporting member to which the control bars of the hinge are pivoted, and which is made of a minimum amount of material, while so constructed as to transfer the greater parts of the weights of the seat and back to the couch frame, thus relieving the fastening means for the hinge support from the strains produced by such weights; the support is further designed to carry the control spring of the hinge and to maintain it in the proper position to act most effectively thereby making it possible to use a comparatively short spring of comparatively light wire.

The invention further contemplates the provision of a support member provided with support flanges spaced apart a maximum distance and thereby arranged to most effectively support the weight of the back and seat in their various positions while using a minimum amount of material, one of the flanges being also provided with means for holding one end of the control spring.

The various objects of the invention will be clear from the description which follows, and from the drawing in which,

Fig. 1 is a front elevation of our improved support applied to a couch hinge and secured in place to the frame of a couch showing the seat and back in their bed-forming positions.

Fig. 2 is a similar view of the same showing the back and seat in their normal or seat-forming positions.

Fig. 3 is an enlarged perspective view of the improved support member.

In the practical embodiment of the invention shown by way of example, the seat 10 is secured to one member 11 of the hinge while the back 12 is secured to the other hinge member 13, the hinge members 11 and 13 being hinged together by the pivot 14. The control and back support bar 15 is pivoted at its upper end 16 to the hinge member 13 and at its lower end 17 is pivoted to and adjacent an end of the support member 18. The other control bar 19 is pivoted at its upper end to the hinge pivot 14 and at its lower end is pivoted to the support 18 by the pivot 20 arranged at the outer corner of the support where the outer edges of the legs meet, thereby permitting said bar 19 to be made of a maximum length.

Said support is preferably made of substantially L-shaped form having a wider and lower leg 21 and a narrower and shorter leg 22. The support member 18 is formed from a single piece of sheet metal, being provided with suitable spaced screw holes as 23, 24 and 25 through which suitable screws or bolts as 26 are passed into the couch frame 27 to fix the support member in place. Said screws, however, are merely a secondary means for supporting the weight of the seat and back, the major portion of said weight being transferred to the couch frame 27 by means of the coplanar flanges 28 and 29 formed at the upper extremities of the respective legs 22 and 21. It will be noted that the screw holes 23, 24 and 25 are spaced apart substantially and so arranged that they are readily accessible to secure the support in place when attached to the hinge after the hinge has been secured to the seat and back as is obvious from Fig. 1, there being no obstruction of the screw holes by the bars 19 and 15.

The flange 28 is bent at right angles to the plane of the leg 22 at the free end of said leg about the edge 30 from the dash-dot line position of the blank therefor as shown in Fig. 3. Said flange rests on the edge 31 of the frame part 27. Projecting inwardly of the frame and coplanar with said flange is the lug 32 provided with the perforation or opening 33 through which one end 34 of the spring 35 is passed to hold said spring end in place. It will be noted that the lug 32 is bent from the material above the substantially semi-circular projection 36 provided in the under edge of the leg 22, whereby a sub-

stantial saving of material is effected. Similarly, the flange 29 is bent about the line 37 from the upper extremity of the leg 22 into coplanar alignment with the flange 28.

It will thus be seen that the flanges 28 and 29 are spaced apart a maximum distance, with the use of a minimum amount of material, nevertheless, thus forming a comparatively wide base for distributing the weight of the seat 10 and back 12 over a comparatively wide area of the couch frame 27 and thereby adequately transferring the weight of the seat and back regardless of their various positions to the couch frame and substantially relieving the screws 26 of such weight. It will be noted that in the bed-forming position of the parts shown in Fig. 1, the hinge pivot 14 is arranged approximately over the flange 28. In the seat-forming position, the pivot 14 is approximately over the flange 29, whereby the greater parts of the weights of the seat and back are transferred substantially directly to the flanges and therethrough to the couch frame.

The end 38 of the spring 35 is secured to the bar 19 by the passage of said end through a suitable opening as 39 in said bar above the pivot 20 and between and below the flanges. In the position of the parts shown in Fig. 2 wherein the seat and back are in their normal or seat-forming positions, the spring 35 is extended and is arranged with its longitudinal axis at substantially right angles to the longitudinal axis of the bar 19, whereby said spring exerts a substantially maximum pull upon the bar. It will be noted that the end 38 of the spring is lower than the end 34 thereof which makes it possible to arrange the spring in the desirable position above described. It will also be noted that the weight of the seat part 10 is sufficient to maintain the parts normally in the position shown in Fig. 2 against the action of the spring 35.

It will further be understood that a set of parts consisting of a support 18, spring 35, hinge members 11, 13, and control bars 15 and 19 is arranged at each end of the couch, and though the above description is given with respect only to one set of such parts, two such sets are customarily used. The weight of the seat 10 maintains the bar 19 against the stop pin 40. Said pin projects from the leg 21 and is suitably secured thereto as by forming a head at one end of the pin and upsetting the projecting end of said pin.

It will further be understood that the springs 35 are of insufficient strength to cause any movement of the parts out of the position of Fig. 2 without the exertion of additional force upon the said parts in the required direction as by raising the seat 10 aided by the action of the spring. By reason of the arrangement of the spring 35, said spring may be made of comparatively light wire and may be comparatively short, but need not be of great strength as required by the springs heretofore used for similar purposes.

To move the parts into the bed-forming position thereof shown in Fig. 1, the entire hinge, together with the parts 10 and 12 are retained in their respective relative positions because of the locking of the hinge members 11 and 13 together by means well known in the art and hence which need not be shown nor described. Said parts 10 and 12 are consequently moved as a unit until the back 12 is horizontal and the seat 10 is substantially upright, said parts pivoting about the upper end 14 of the bar 19, while the back 12, hinge member 13, bars 15, 19 move into the position shown in Fig. 1. Such movement of the parts as a unit is well known and is fully described in our above-mentioned prior patent, to which reference is hereby made. The movement is aided by the spring 35 so that comparatively little force need be exerted by the user to move the parts to what we will term the "intermediate" position between the seat-forming position of Fig. 2, and the bed-forming position of Fig. 1. During such movement, the bar 15 swings about its pivot 17 and causes the pivot 14 to move toward the left as viewed in Fig. 2, also causing the bar 19 to move toward the left. The spring 35 thereby contracts and during the major part of the movement of the bar 19, is arranged in a position and exerts a force at substantially right angles to said bar 19, whereby the spring exerts a maximum force thereon. At the end of the movement into the intermediate position of the parts, the spring is fully contracted to the position shown in Fig. 1. The hinge may then be unlocked and the seat 10, together with the hinge part 11 moved from the intermediate or upright position thereof into the bed-forming position shown in Fig. 1. To move the parts back from the bed-forming position of Fig. 1, to the seat-forming position of Fig. 2, the seat 10 and its hinge member 11 are first raised into the intermediate position being automatically locked therein, and then the seat and back are moved as a unit into the position of Fig. 2, thereby extending the springs 35 which, during such movement, aid in controlling the movement and prevent the seat from dropping out of the grasp of the operator.

It will be seen that we have provided a simple, but highly efficient seat support which, while made of a single piece using a minimum amount of material, is highly effective because of the spacing of its flanges and the arrangement of the spring-holding parts thereof and because of its shape, permitting the control springs to be made of comparatively light wire and comparatively weak as compared to the springs heretofore used for that purpose.

While we have shown and described a certain specific embodiment of our invention, we do not wish to be understood as limiting ourselves thereto, but desire to claim the invention as broadly as may be permitted by the state of the prior art and the terms of the appended claims.

We claim:

1. In a couch hinge having a control bar pivoted at one end thereof to the hinge at the hinge pivot, a one-piece L-shaped hinge support, means pivoting the other end of the bar to the support, one leg of the support being wider and longer than the other, said support having a flange bent from the free end of each of the legs, the flanges being coplanar, a perforated lug extending from the flange of the smaller leg, and a spring connecting said lug and the control bar and extending at right angles to the bar during the major part of the movement of the bar when the hinge is moved as a unit from a position in which the spring is extended to a position in which the spring is contracted.

2. In a couch, a frame, a movable seat, a movable back, a hinge movable bodily as a unit from one position to another and secured to and pivotally connecting the seat and the back, an L-shaped support having outstanding spaced coplanar supporting flanges resting on the edge of

the frame, a bar pivoted at its upper end to the hinge and at its lower end to the support and transferring thereto the weight of the hinge, said bar swinging about its lower end on the bodily movement of the hinge, a spring-holding lug extending from one of the flanges, and a coil spring secured at one end to the lug and connected at its other end to a point on the bar below the flanges and assuming a position at substantially right angles to the bar on swinging movement of the bar sufficient to extend the spring.

3. In a couch hinge having a pair of hinge members hinged together by a pivot, one of the members being adapted to be secured to a couch seat and the other being adapted to be secured to a couch back, an L-shaped hinge support adapted to be secured to a couch frame, a pair of coplanar flanges one at each end of the support, a bar pivoted at one end to said other hinge member and pivoted at its other end to the support adjacent one flange, a second bar pivoted at one end to the hinge pivot and pivoted at its other end to and adjacent a corner of the support, whereby movement of the hinge pivot swings said second bar about its said other end, and an extensible spring secured at one end to the other flange and secured at its other end to the second bar at a point sufficiently below the flanges to arrange the spring at right angles to the second bar during the major part of the swinging movement of the second bar.

4. In a couch hinge, a pair of hinge members, a pivot hingedly connecting said members, an L-shaped hinge support having a pair of substantially perpendicular arms, a pair of spaced coplanar flanges one bent from the outer end of each arm of the support, the outermost common corner of the arms being arranged lowermost and between the flanges and horizontally and vertically spaced from the flanges when the flanges are in a horizontal plane, a control bar pivoted at one end to the support at a point thereof between the flanges and pivoted at its other end to the hinge pivot, and an extensible and contractible spring secured at one end to a projection of said one flange and at its other end to a point of said bar below the flanges and above said aforementioned one end of said bar, said spring being substantially perpendicular to the bar during the major part of the rotational movement of the bar about its said one end as a pivot.

5. In a couch hinge, a one-piece L-shaped support, one leg of the support being longer and wider than the other, a first flange bent from the free end of one leg and adapted to rest on the edge of a couch frame, a second flange coplanar with the first flange and spaced therefrom and bent from the end of the other leg, a substantially semi-circular perforated projection extending from the outer edge of the smaller leg below the flange, the material of said smaller leg above said projection being bent integrally with the flange and into coplanar relation thereto to form a spring-holding projection, a pivot for a bar at the outer corner of said support and a pivot for a second bar below said second flange.

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