March 1, 1938. D. HANAUER 2,109,697

SEATING FURNITURE CONSTRUCTION

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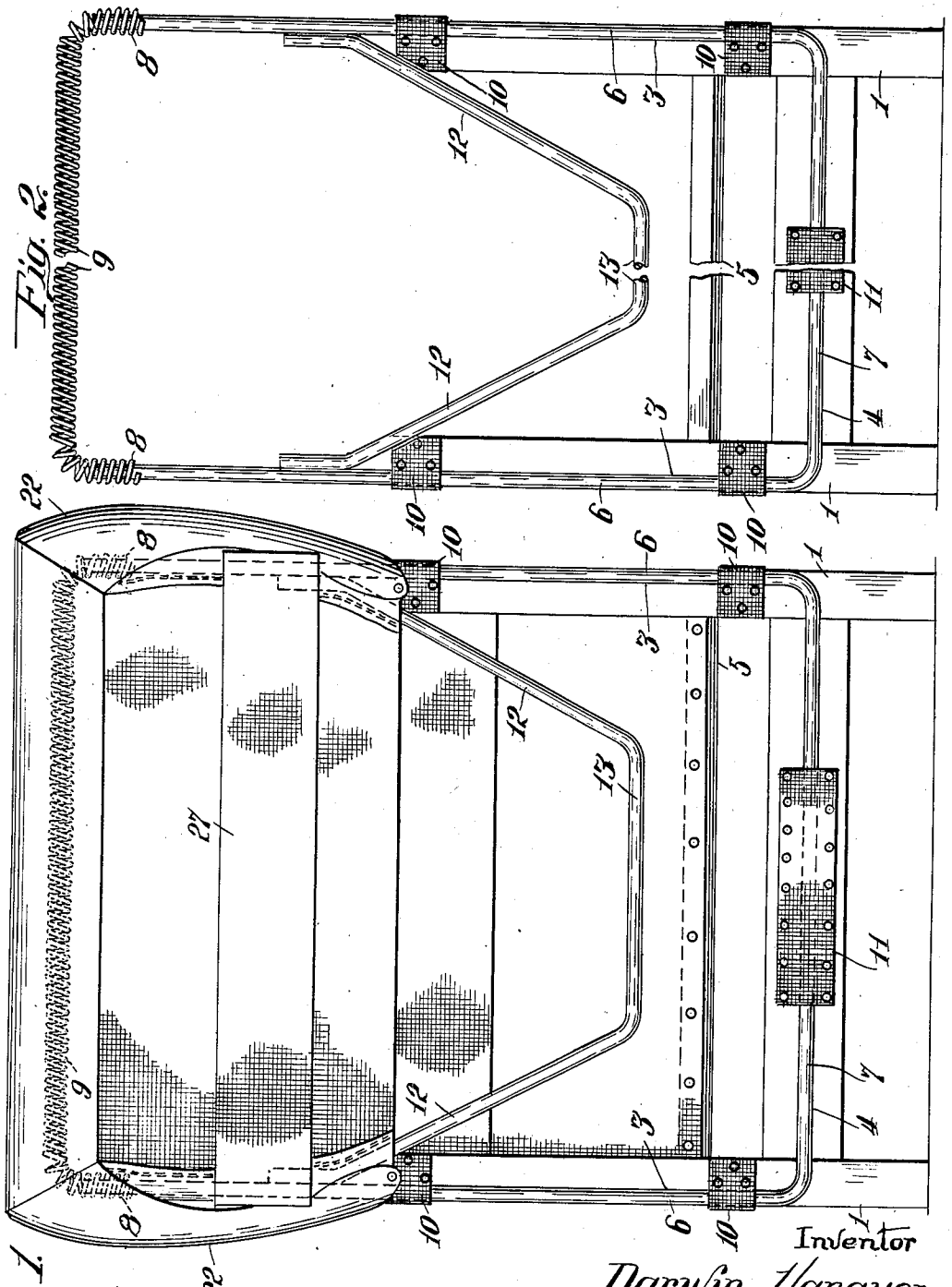


Fig. 2.

Fig. 1.

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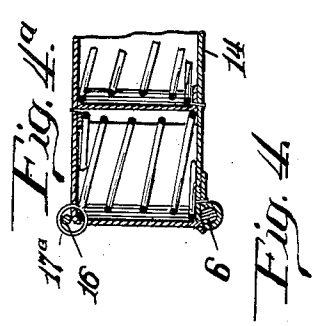


Fig. 4a

Fig. 4

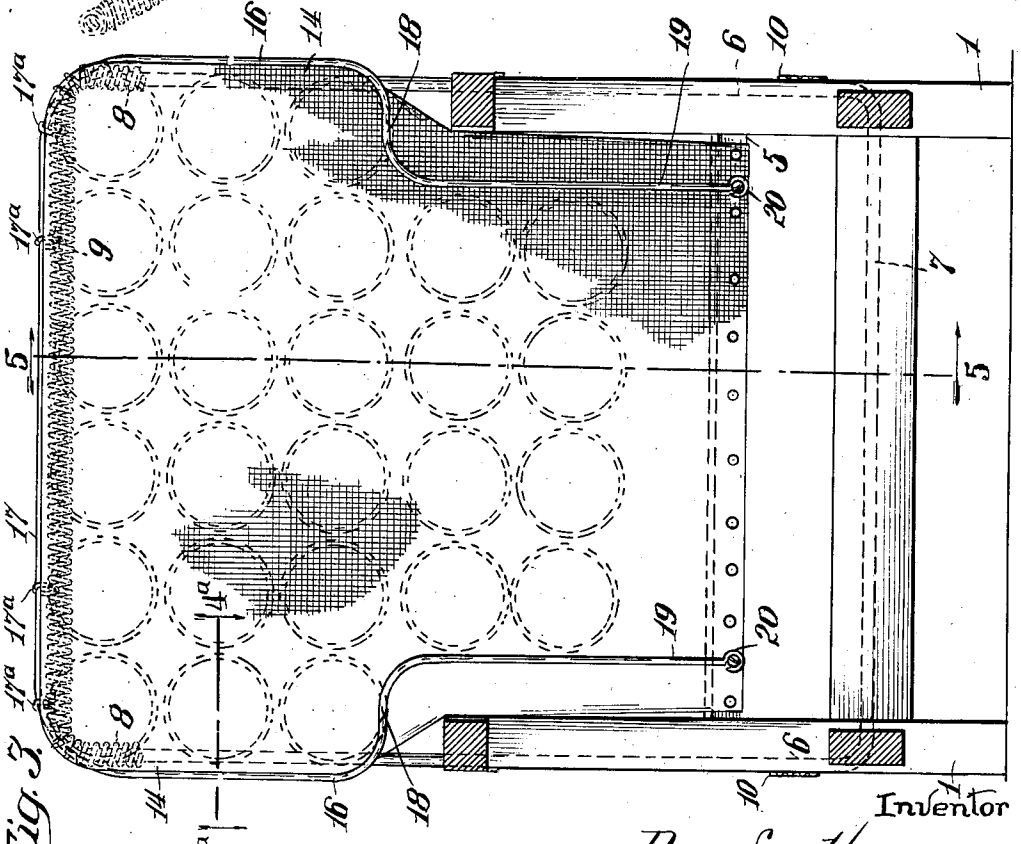


Fig. 3

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Fig. 6.

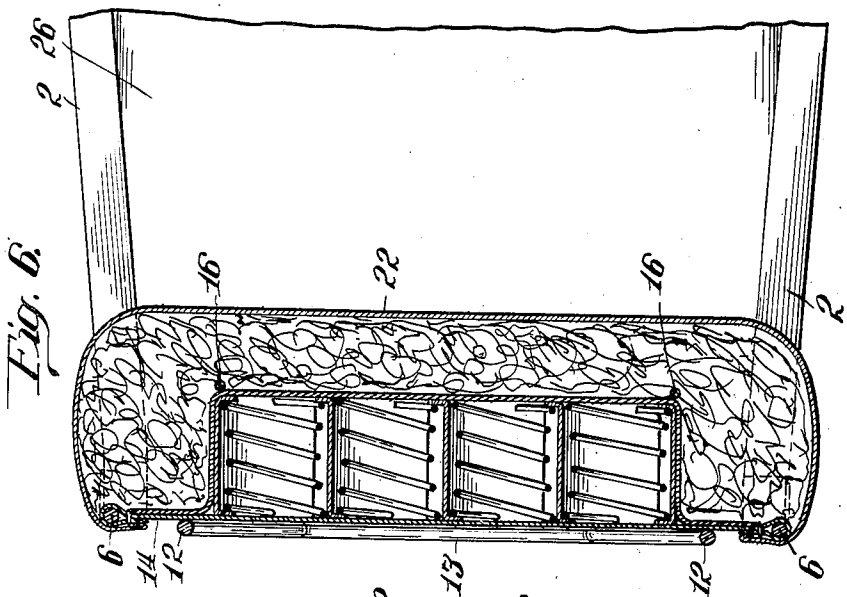


Fig. 7.

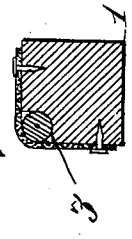


Fig. 5.

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Fig. 9.

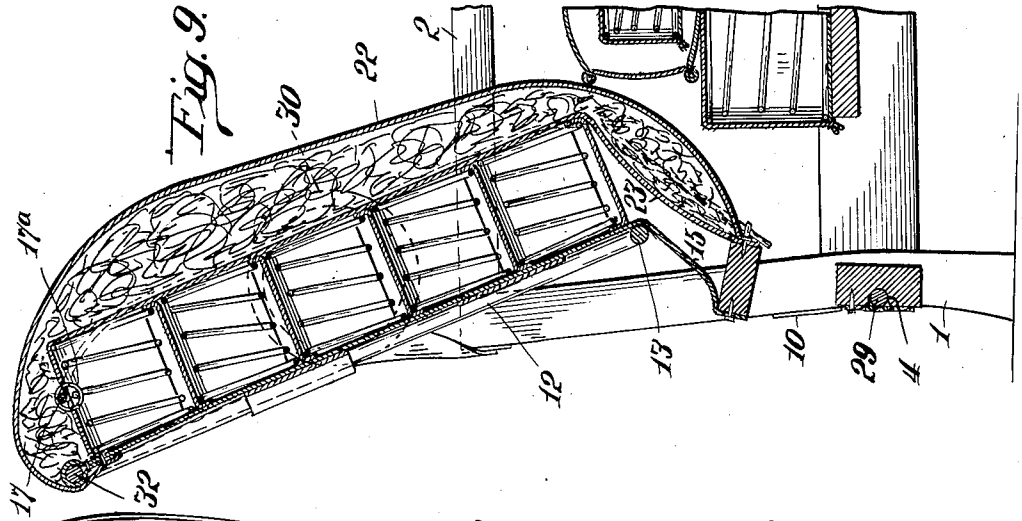
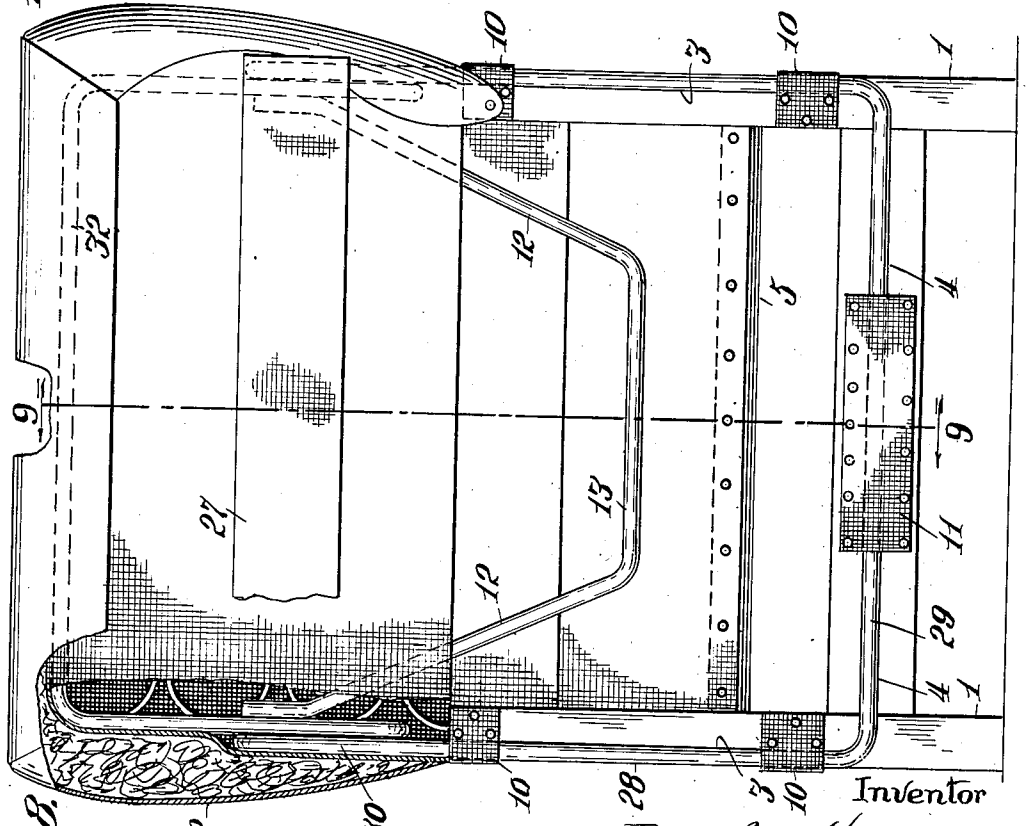


Fig. 8.



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Fig. 11.

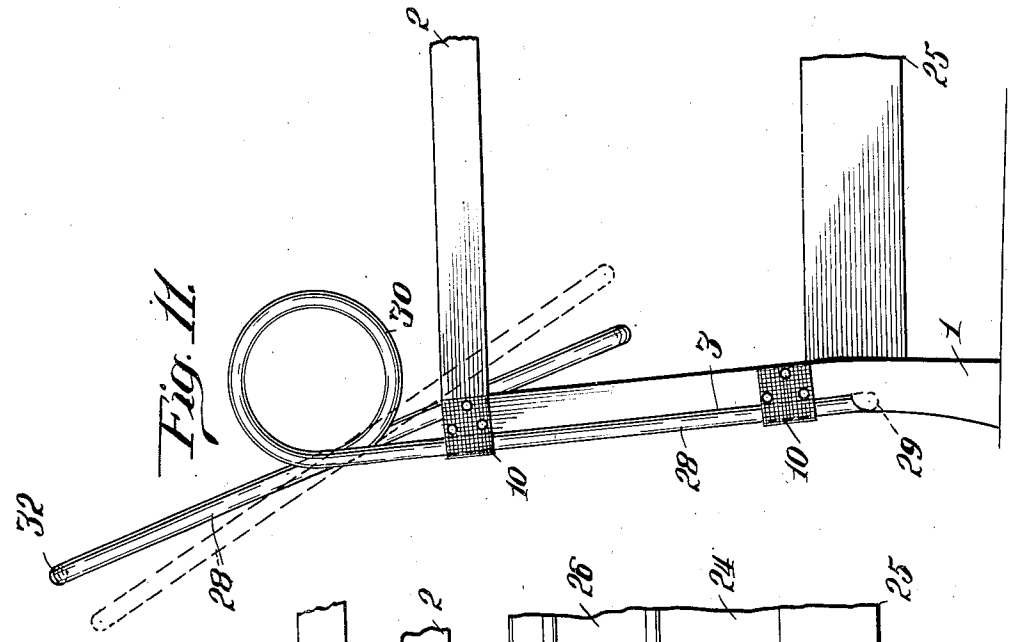


Fig. 12.

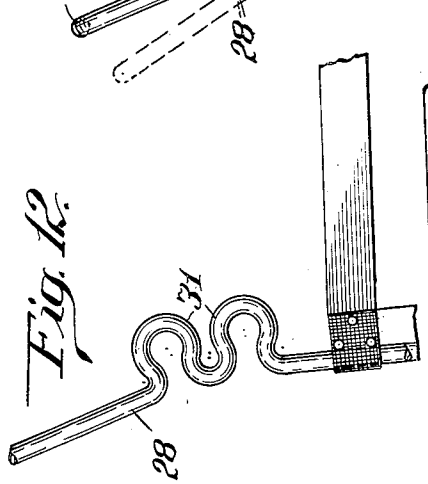


Fig. 10.

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Patented Mar. 1, 1938 2,109,697

UNITED STATES PATENT OFFICE

2,109,697

SEATING FURNITURE CONSTRUCTION

Darwin Hanauer, La Grange, Ill., assignor to Nachman Spring-Filled Corporation, Chicago, Ill., a corporation of Illinois

Application July 20, 1935, Serial No. 32,316

3 Claims. (Cl. 155—50)

The present invention relates to improvements in upholstered furniture and more particularly to back constructions of seating furniture units such as chairs and the like.

The main object of the invention is to provide what may be termed an attachment for furniture frames made of wood or other materials to which upholstery units, such as spring assemblies, are secured, said attachment constituting a yielding or spring back adapted to be secured to the chair frame and to carry a spring-filled cushion for cooperation with said attachment to provide a back support which will conform itself readily and easily to the contour of the back and shoulders of the occupant of the chair and which will swing backwardly to a limited degree under the influence of pressure exerted against the cushion whereby greater comfort is secured.

A further object of the invention is to provide an attachment of the type referred to which is constructed and arranged to cause the lower end portion of the cushion secured thereto to be moved slightly forwardly against the small of the back of the occupant of the chair as the upper end portion of said cushion swings rearwardly in response to pressure exerted against the same by the shoulders of the occupant of the chair for purposes of securing greater comfort to the said occupant.

Other objects of the invention will be understood from or pointed out in the following specification.

A suitable embodiment of the invention is illustrated in the accompanying drawings, wherein

Fig. 1 is a rear elevation of a chair constructed in accordance with the invention.

Fig. 2 is a view similar to Fig. 1 wherein the cushion of Fig. 1 is omitted, the structure of Fig. 2 being shown partly broken away.

Fig. 3 is a sectional view taken on the line 3—3 of Fig. 5 showing a front view of the spring assembly of the cushion and illustrating the manner in which said spring assembly is secured in place.

Fig. 4 is a side elevation of the chair frame (the upholstery being omitted) illustrating the manner in which the attachment of this invention operates.

Fig. 5 is a vertical sectional view of the chair showing the padding and cover fabric of the upholstery units, taken on the line 5—5 of Fig. 3.

Fig. 6 is a sectional view taken on the line 6—6 of Fig. 5.

Fig. 7 is a detail sectional view on an enlarged scale on the line 7—7 of Fig. 5.

Fig. 8 is a view similar to Fig. 1 showing another or modified embodiment of the invention.

Fig. 9 is a vertical sectional view of the same on the line 9—9 of Fig. 8.

Fig. 10 is a fragmentary side elevation partly broken away of the structure shown in Figs. 8 and 9.

Fig. 11 is a view similar to Fig. 4 showing the operation of the flexible frame member of Figs. 8 to 10 inclusive.

Fig. 12 is a fragmentary detail side elevation showing a modified form of construction of the side arms of the flexible frame member.

Referring first to Figs. 2 and 4, it will be noted that the wood frame of a chair includes a pair of rear side rails (1) which are cut off flush with the upper faces of the arms (2) thereof. As shown in Fig. 7, the corners of said rails (1) are rabbeted as at (3) along their outer rear corners, said rabbets terminating at their lower ends in arcuate grooves which connect the said rabbets (3) with a horizontal groove in the rear cross piece (4) which connects the said side rails (1) with each other below a rail (5)—(Fig. 5).

Secured in said rabbets (3) and said grooves is the U-shaped frame composed of suitable spring rod and which comprises the side arms (6) and the lower middle portion (7), the said side arms (6) being extended an appreciable distance above the upper ends of said side rails (1).

Said upper end portions of said side rails (1) connect telescopically with the end portions (8) of a helical spring (9) which spans the upper ends of said side arms (6). The said side arms (6) are secured firmly within the rabbets (3) by means of strips (10) of webbing or in any other suitable manner. The lower middle portion (7) of said U-shaped member is similarly secured within the groove of the cross piece (4) by means of a strip (11) of webbing or in any other suitable manner.

Secured by welding or otherwise to the side arms (6) of said U-shaped frame is a depending frame member having a pair of opposed side arms (12) extending downwardly from their points of connection with the side arms (6) and converging toward each other, said side arms being integral with the middle portion (13) which is parallel with the middle portion (7) of the U-shaped frame and with the cross rail (5) from which it is spaced an appreciable distance. Normally, the U-shaped frame and the said frame member (12—13) are disposed in a substantially vertical plane, said side arms (6) of the U-shaped frame being capable of being flexed from the up-

per edge portion of the fastening means or web (10) to their upper extremities under the influence of pressure exerted against the same as will be pointed out hereinafter.

Referring now to Figs. 3, 5, and 6, it will be noted that the said side arms (6) of the U-shaped frame and the helical spring (9) which spans the upper end portions thereof are secured to the fabric rear wall (14) of a spring assembly for upholstery such, for example as is illustrated in Letters Patent to L. A. Suekoff No. 1,411,227. The attachment of said fabric wall (14) to the spring (9) and the upper end portions of the side arms (6) of the U-shaped frame member is effected in any suitable manner, but in such a manner as to maintain said wall (14) relatively taut. In the instance illustrated, it will be noted by reference to Fig. 3 that the spring assembly contains a plurality of horizontally disposed rows of six springs each in the upper portion of the said spring assembly and that in this instance there are three of said rows of six springs each. Below the said rows of six springs each are two rows of four springs each, the outermost springs of the six row type being omitted to provide substantially free portions constituting fabric flanges aligned and integral with the said wall (14) of said spring assembly and with the front wall thereof and which are secured along their side edges to the portions of the side arms of the member (12) disposed between the upper ends of the side rails (1) and the points of connection of the upper side edge portions of the wall (14) with the side arms (6). It will be noted that said side arms of the member (12) overlap the inner upper corners of the side rails (1), the latter being cut away along said corners to permit movement of said frame member (12) responsively to flexing of the side arms (6). The portion of the wall (14) of the spring assembly disposed below the horizontal plane of the lowermost point of its connection with the said frame member (12) is secured along its lower edge portion (15) with the cross rail (5) of the chair frame and the lower edge portion of an extension of the front wall of said spring assembly is also secured to the middle portion (13) of the frame member (12) in any suitable manner.

Secured to the side edge portion along the front corners of the spring assembly, is an inverted U-shaped wire frame shown mainly in dotted lines in Fig. 5 and which also is shown clearly in Fig. 3. The upper end portions of the side arms (16) of said last-mentioned frame which is composed of a very much lighter wire or rod than the U-shaped frame (6—7) and the frame member (12—13) are bent so that the upper middle portion (17) thereof spans the upper wall of the spring assembly substantially midway between the front and the rear walls of the same. The said middle portion (17) is secured by suitable stitching or hognose rings, (17—a) to the upper row of springs of said spring assembly. The lower end portions of the arms (16) of said member (16—17) are bent inwardly in ogee curve formations (18) shown in Fig. 3, at a point in substantial alignment with the lowermost portions of the springs of the lowermost row of six of the latter and so that the lowermost end portions (19) of said arms (16) become disposed substantially in alignment with the vertical planes of the outermost portions of the springs of the assembly disposed below the first-mentioned rows of six each thereof. The lower extremities of said side arms (16—19) are bent to provide loops (20) which are secured to the front edge of the cross rail (5) by means of screws or other suitable fastening devices. The said member (16—19) constitutes a yielding and resilient supporting member for that portion of the spring assembly having the rear wall (14), which would be apt to sag under the influence of weight of padding (21) carried by the same and disposed between the upper and front wall of the said spring assembly and the cover fabric (22) for said padding. The lower edge of the latter is secured also to the front edge of the cross rail (5) in opposed relation to the fabric flange (23) constituting, preferably, an extension of the front wall of the spring assembly as described above.

The above-described structure will be used in connection with any desired or selected type of seat construction which, in the instance illustrated, comprises a spring assembly (24) disposed upon suitable supports secured to side rails (25) of the chair frame and upon which a loose spring-filled cushion (26) is adapted to be supported.

Preferably, the rear wall (14) of the first-mentioned spring assembly is reinforced by a strip (27) of webbing which also is secured to the upper end portions of the side arms (6) of the U-shaped frame (6—7) and along the area of the spring assembly which normally is subjected to the greatest degree of pressure exerted by the upper back portion of the occupant of the chair.

As illustrated in Fig. 4, the upper end portion of the U-shaped frame above the fastening means (10) will flex rearwardly in bowed form under the influence of pressure exerted against the chair back by an occupant of the chair and, obviously under the influence of such pressure the rear wall (14) of the spring assembly will be bowed and cause the said upper end portions of said side arms (6) to flex toward each other, the spring (9) being also bowed responsively to such pressure.

As said U-shaped frame (6—7) is flexed as shown in Fig. 4 the lower end portion of the frame member (12—13) will be caused to move inwardly and in so doing the same will push the lower edge portion of the back upholstery against the small of the back of the chair occupant and this contributes very materially to the comfort of the occupant of the chair. Obviously, the said frame member (12—13) is also resilient.

The resiliency of the side arms (6) of the U-shaped frame member (6—7) is increased proportionately to the length of the portions of said arms disposed above the uppermost edge of the securing devices (10) at the upper ends of the side rails (1). Hence, if a greater degree of resiliency is desired the last-mentioned securing means (10) may be disposed at a lower elevation.

However, a greater degree of flexibility of the flexible frame member may be secured by modifying the shape of the side arm portions thereof disposed above the uppermost point of connection of the same with the side-rails (1) as illustrated in Figs. 8 to 12 inclusive.

As shown in Figs. 8 to 11 inclusive, the resilient frame member consists of side rails or arms (28) connected with the lower cross member (29) which are secured to the chair frame in the same manner as the lower end portion of the frame member (6—7) of Figs. 1 to 7 inclusive. The

upper end portions of the side arms or rails (28) are formed to include the helical loops (30) or, as shown in Fig. 12 are bent to corrugated contour as shown at (31). In either case the length of wire contained in the said upper end portions of said side arms is increased to a very appreciable extent with the result that pressure exerted against the upper extremities of said side rails or arms will cause a rearward swing thereof proportionate to the total length of wire disposed between said extremities and the uppermost points of attachment of said rails or arms with the side rails (1), assuming, of course, that the wire of which said flexible frame member of Figs. 8 to 12 is composed is identical with that of which the frame member (6—7) of Figs. 1 to 7 is made and that pressures exerted to flex said respective frame members is equal.

In the structures of Figs. 8 to 12 inclusive, the upper extremities of the side rails (28) may be integral with or connected with a cross rail (32) of wire or rod in place of the helical spring (9) of Figs. 1 to 7 inclusive, if desired as the greater resiliency of said rails (28) renders less necessary that said cross-rail (32) shall be more flexible than said side rails. Obviously, the cross rail may be composed of a more flexible material than the side rail or arm (28).

While resilient frame members are herein illustrated and described as composed of round wire or rod, it will be obvious of course, that the cross-sectional shape of said material may be varied as desired without departing from the invention.

I claim as my invention:

1. A chair comprising a seat frame, a pair of rigid side rails projecting upwardly from the rear corners of said frame, a pair of resilient side rail members secured to and projecting above said side rails, a resilient elongatable top rail member spanning the upper extremities of said resilient members and connecting them, a substantially U-shaped resilient member having divergent arms, the upper end portions of which are rigidly connected with said resilient side rails between the ends of the latter and a web constituting the rear wall of a conventional springfilled cushion secured along side and top edge portions to said resilient side rails and said top rail member and having its lower end portion bearing against said U-shaped member, the lower end portion of the latter projecting forwardly of the rigid side rails.

2. A chair comprising a seat frame, a pair of rigid side rails projecting upwardly from the rear corners of said frame, a pair of resilient side rail members secured to and projecting above said side rails, a resilient elongatable top rail member spanning the upper extremities of said resilient members and connecting them, a substantially U-shaped resilient member having divergent arms the upper end portions of which are rigidly connected with said resilient side rails between the ends of the latter and a web constituting the rear wall of a conventional springfilled cushion secured along side and top edge portions to said resilient side rails and said top rail member and having a narrowed lower end portion bearing against said U-shaped member, the lower end portion of the latter projecting forwardly of the rigid side rails.

3. A back for a seating furniture unit comprising a pair of resilient side rail members, a resilient elongatable top cross-rail member secured at its ends to the upper ends of the side rail members, a substantially U-shaped resilient member having divergent arms rigidly secured at their upper end portions to the side rail members between the ends of the latter, the lower end portion of said U-shaped member being disposed to oppose the small of the back of the chair occupant and projecting forwardly of a plane common to the side rails, and a cushion member including a fabric web secured along side and top edge portions to said side and top rail members and maintained normally taut by the latter and having a lower end portion opposed to and bearing against said U-shaped member.

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