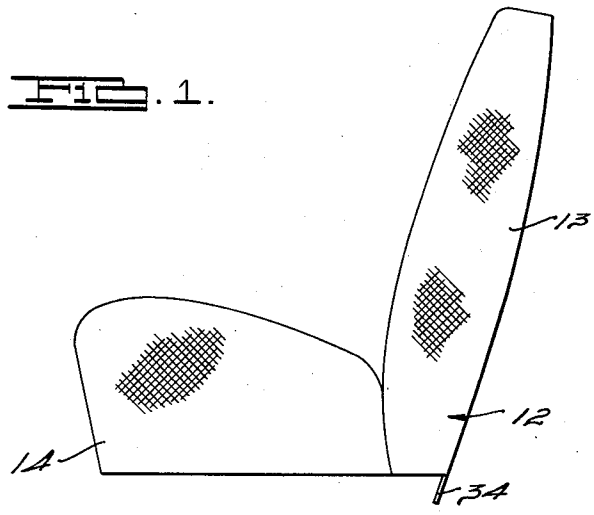
Jan. 25, 1938. C. H. MENGE 2,106,644

FRAME AND SEAT

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Fig. 1.



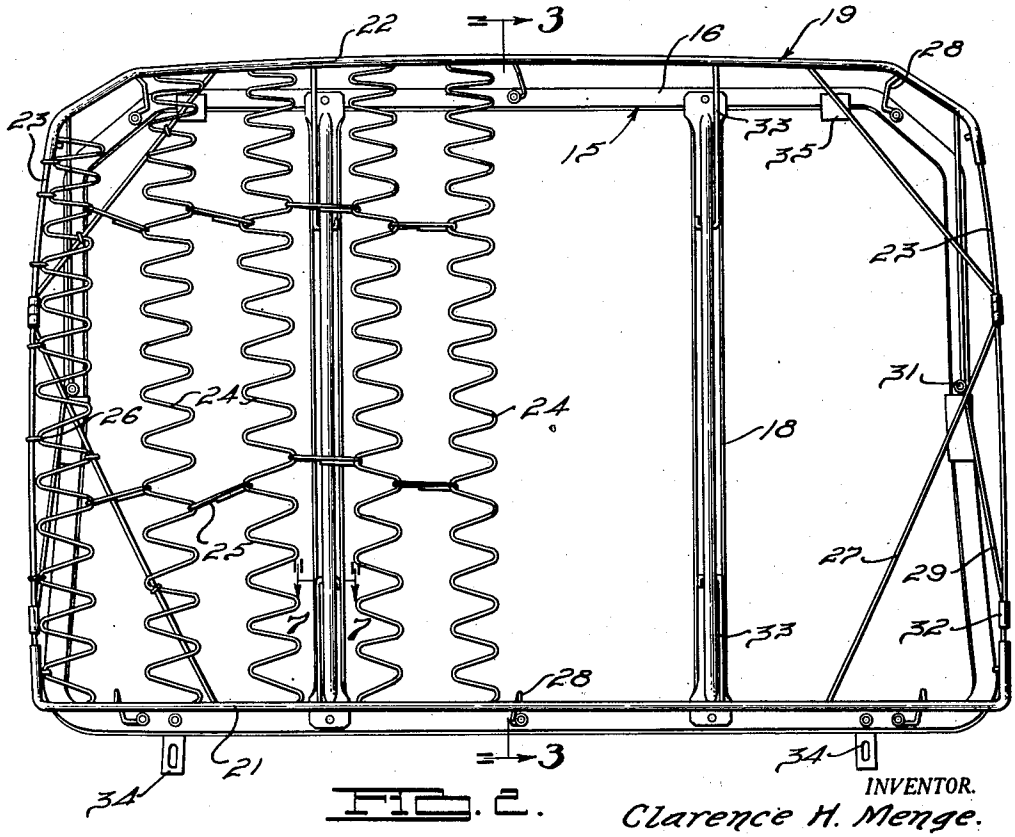


Fig. 2.

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Fig. 3.

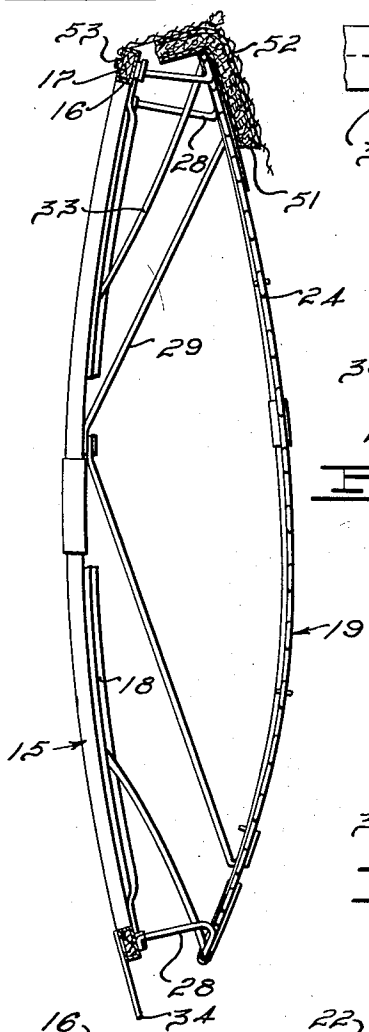
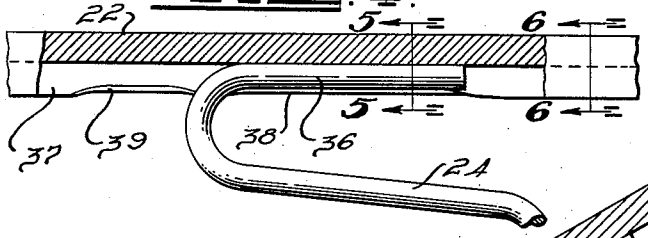


Fig. 4.



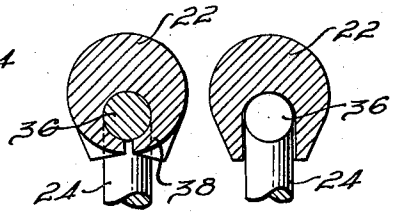
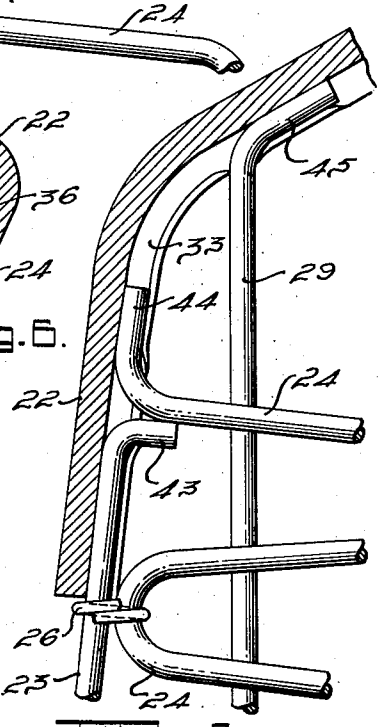


Fig. 5. Fig. 6.



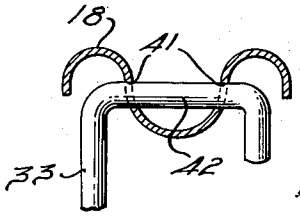


Fig. 7. Fig. 8.

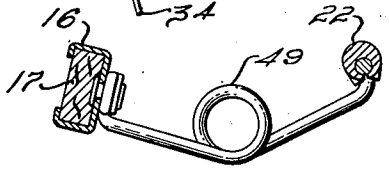


Fig. 10.

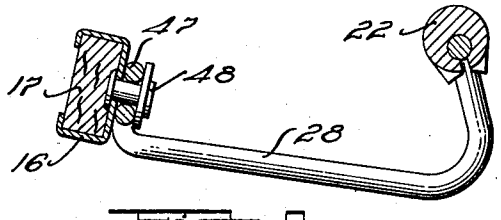


Fig. 9.



Fig. 11.

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UNITED STATES PATENT OFFICE

2,106,644

FRAME AND SEAT

Clarence H. Menge, Detroit, Mich., assignor to The Murray Corporation of America, a corporation of Delaware

Application May 27, 1935, Serial No. 23,587

10 Claims. (Cl. 155—179)

My invention relates to seats, and particularly to a frame for a seat which is of new and novel construction.

Heretofore, seats were constructed of a plurality of coil springs which were secured in frame elements and cross-connected to retain the springs in predetermined relation to each other and the frame. A large number of the coil springs were required as well as a considerable number of tying elements for positioning the springs and thick padding was required to prevent the springs from working through the upholstery material.

In practicing my present invention, I employ a zig-zag type of wire as illustrated and described in the co-pending application of Karl Kaden, Serial Number 586,838, filed January 15, 1932. This spring is made of wire bent back and forth and curved longitudinally of its length on an arc which is materially greater than the arc of the bolster on which the spring is to be employed. When the ends of the spring are uncoiled and secured, the tendency of the spring is to return to its normal set position on the greater arc and thereby resists a downward displacement. The lateral formation of the wire is such as to permit a flexion between the zig-zag portions so that the ends of the spring may be anchored and still retain a desired flexibility.

A frame is formed for receiving the wire made up of grooved sections in which a laterally disposed end of the spring unit is placed and secured through the deforming of the metal defining the groove to retain the unit against longitudinal, as well as lateral, displacement. The ends of the section are joined by a flexible wire element which is retained in the groove of the section to provide flexibility at the side edges of the frame so formed. This frame is supported from the base frame of the seat portion or seat back by rigid members, by jack springs, by coil springs or by sections of the zig-zag spring. For seat backs, the rigid wire elements may be employed for spacing the spring frame from the base frame, while in seat construction at least the front edges of the frames are joined by coil, jack, or zig-zag springs to provide flexibility to the front edge of the seat. When desirable, such springs may be employed on the back frame element.

The frame thus constructed is exceedingly rigid, is noiseless, since none of the metal parts can rub on one another, is fool-proof, since none of the elements can become shifted during use. Since a flat surface is provided by the springs, there is no tendency of the upholstering being torn and forced out of shape as occurs on the coil spring type of seat frame unit.

Accordingly, the main objects of the invention are; to provide a seat frame unit composed of a base and spring frame elements which are secured together in spaced relation; to secure a base and spring frame elements of a seat frame unit together by elements joining the edges of the frame element; to form the border of the spring frame element of two spaced sections having inwardly presenting grooves which are spanned by flat spring elements; to complete the border by joining the sections at the sides by additional spring elements to provide complete flexibility laterally of the frame; to brace the flexible side elements of the border against inward movement; to support the two frame elements rigidly or by spring elements at their marginal edges; to secure the zig-zag spring units in the spring frame by disposing ends thereof in the grooves of the border sections and retaining the ends against lateral and longitudinal movements by deforming the metal defining the groove; and, in general, to provide a seat or back frame which is completely resilient, which is made up of spaced frame elements, which is simple in construction and economical of manufacture.

Other objects and features of novelty of my invention will be either specifically pointed out or will become apparent when referring, for a better understanding of my invention, to the following description taken in conjunction with the accompanying drawings wherein:

Figure 1 is a side view, in elevation, of a seat embodying features of my invention;

Figure 2 is a plan view of a seat back frame, with parts broken away, of the seat illustrated in Figure 1;

Figure 3 is a sectional view of the structure illustrated in Figure 2, taken on the line 3—3 thereof;

Figure 4 is a broken enlarged view, partly in section, of a portion of the structure illustrated in Figure 2;

Figure 5 is an enlarged sectional view of the structure illustrated in Figure 4, taken on the line 5—5 thereof;

Figure 6 is an enlarged sectional view of the structure illustrated in Figure 4, taken on the line 6—6 thereof;

Figure 7 is an enlarged sectional view of the structure illustrated in Figure 2, taken on the line 7—7 thereof;

Figure 8 is an enlarged broken view, partly in

section, of a portion of the structure illustrated in Figure 2;

Figure 9 is an enlarged view of the top bracing element of the structure illustrated in Figure 3;

Figure 10 is a view of a structure similar to that illustrated in Figure 9, showing a modified form thereof; and

Figure 11 is a view of a structure similar to that illustrated in Figure 10, showing a further modified form thereof.

In Fig. 1, I have illustrated a seat 12 comprising a seat back 13 and a seat portion 14 having resilient form frames embodying features of my invention. In Figs. 2 and 3, I have illustrated the form frame 15 of the seat back 13 which is constructed similarly to the frame for the seat portion 14. The description and modifications referred to throughout the specification will apply to the seat back frame form, as well as to the seat portion frame form, with slight modifications.

The frame 15 illustrated in Figs. 2 and 3, comprises a base frame 16 which is illustrated in section in Figs. 9, 10 and 11 as comprising an inverted channel element having inturned flanges to secure a tacking member 17 which may be made of wood, fiber, paper, or similar tack receiving substance well known in the art. The base frame 16 thus constructed is shaped in the form of the seat back or the seat portion, as the case may be. Suitable bracing elements 18 of a cross section to be found in Fig. 7, which provide strength combined with light weight, may be disposed between the central portions of the frame, as illustrated, for bracing the sides thereof. Two such elements 18 are employed in the base frame 16 illustrated in Figs. 2 and 3.

The top frame 19 comprises heavy grooved wires 21 and 22 which are disposed at the bottom and top of the frame illustrated in Figs. 2 and 3, or at the front and back of the seat portion of the frame. The grooves of the wires 21 and 22 receive and support light resilient wires 23 at each side to form the complete border for the frame. Spanning the heavy wires 21 and 22 are a plurality of zig-zag spring units 24 which are illustrated, described and claimed in the above mentioned co-pending application of Karl Kaden. The unit 24 is made of spring wire which is bent back and forth in zig-zag form and curved on an arc of materially greater curvature than that of the bolster of the seat back 13 or seat portion 14. The units are secured to the bolster desired when the ends are disposed in the grooves in the heavy wires 21 and 22, as will be explained more clearly hereinafter. A plurality of spacing clips 25 are provided throughout the top of the frame for retaining the units 24 against lateral displacement. Suitable clips 26 are utilized for retaining the units 24 positioned relative to the resilient wires 23 at the sides of the top frame 19. Angular bracing wires 27 may be employed for bracing the resilient side wires 23 against inward or outward movement.

The frames 16 and 19, thus constructed, are retained spaced from each other by suitable wire supporting elements 28 as illustrated in Fig. 9 or by other means which will be referred to more specifically hereinafter. The sides of the frame are supported by angularly disposed bracing wires 29 which are fixed to the base frame 16 near a central point by a rivet 31 and extended to be received in the groove of the top or rear wire 22 and retained on the wire 23 by a suitable clip 32. This end of the wire 29 may be retained in the groove of the wire 21 the same as on the element 22. At the points where the braces 18 are employed, wires 33 are utilized as a bracing and supporting means having one end engaged in the slot of the wires 21 and 22 while the other end is anchored to the brace 18 in a manner which will be explained more fully hereinafter. The bottom frame 16 is provided with suitable clips 34 which are employed to anchor the seat back to a framing of a vehicle body after the top of the frame is fixed through the engagement of the plate 35 on projecting tongues on the support for the seat.

For effecting the connection between the elements 21 and 22 and the various bracing and supporting elements and the spring units, I have illustrated in the enlarged view of Figs. 4 to 9, inclusive, various sections of the frame form 15 as illustrated in Figs. 2 and 3. In Fig. 4 it will be noted that the terminal end 36 of the spring unit 24 is disposed parallel to the grooved border wire 22 to be embedded in the groove 37 thereof. The metal walls of the groove are then flanged over at 38 and 39 to anchor the terminal end of the unit 24 against outward and lateral movement. Since there is little tendency of the spring to pull inwardly and the loading of the spring will tend to cause an outward movement, the crimping of the metal in this manner very substantially retains the units 24 in position. In Figs. 5 and 6, I have illustrated a section of the grooved border wire 22 before and after a crimping operation. In Fig. 6 the portions of the wire 22 forming the channel, extend outwardly from the wire forming the unit 24 and are flanged about the wire of the unit 24, as illustrated in Fig. 5, to completely anchor the end therein. It is to be understood that this method of anchoring is employed at all points when elements are engaged and supported in the groove 37 of the wires 21 and 22.

In Fig. 7, I have illustrated the method of securing the end of the bracing element 33 to the cross brace 18. Apertures 41 are provided in the sides of the extended portion of the cross brace 18 and an angularly extended portion 42 of the element 33 is inserted therethrough. The opposite end of the wire is engaged in the groove 37 of the elements 21 and 22 in the manner referred to in regard to the structure illustrated in Figs. 4, 5 and 6.

In Fig. 8, I have illustrated the engagement of the side wires 23 in the ends of the groove 37 of the elements 22 and retain the wires against lateral movement by having the ends thereof extend laterally at 43, as illustrated. The ends of the first and last units 24 are extended at 44 and retained in the groove 37, as illustrated. The supporting wire 29 is likewise illustrated as being angularly disposed at the end and engaged and supported against lateral and longitudinal movement by the crimping over of the sides of the groove 37, as illustrated in Figs. 5 and 6.

By the use of the grooved border wires 21 and 22, it will be noted that all of the bracing elements as well as the spring unit 24 are supported and retained through the disposition of the ends in the grooves and the crimping of the metal forming the side walls over the elements. By having the ends of the elements angularly disposed and crimping the material each side of the element, the element is prevented from moving laterally of the border wires 21 and 22 and is prevented from pulling out therefrom through the crimping of the metal around the portion

extending within the channel. A very simple and light unit is constructed in this manner with a material saving of labor and material. The back element, as illustrated in Figs. 2 and 3, will weigh approximately one-third less than a similar unit constructed of coil springs.

In Fig. 9, I have illustrated the bracing element 28 as comprising a wire which is rigidly secured at the top end to the border wire 22 and provided with an eye 47 on the lower end which is retained on the channel of the base frame 16 by a rivet 48. Spring means may also be employed for retaining the base and top frames 16 and 19 spaced from each other. This is especially desirable in the frame for the seat portion where resiliency is desired at the front end of the portion. In Fig. 10, I have illustrated a jack spring 49 which has a turn or two of wire at the central portion and the terminal ends fastened in the same manner as the bracing element 28 illustrated in Fig. 9. In Fig. 11, I have illustrated a coil spring 51 which is disposed between the two frames 16 and 19 and secured in a similar manner to the elements 28 and 49 of Figs. 9 and 10, respectively. By the use of the springs of Figs. 10 and 11, further resiliency is provided to the unit frame.

As pointed out hereinabove, when a frame for a seat portion 14 is constructed, it is desirable to have spring elements separating the base and top frames, especially at the front end, to provide greater resiliency to the front end of the top frame 19. In view of the fact that the spring units 24 have an inherent set on an arc of materially less radius than the radius of the bolster on which it is employed, the extending of the ends of the units when secured in the wires 21 and 22, provides a stress which causes the central portion of the unit to resist a downward movement so that proper resiliency is always provided and the spring will immediately assume the shape of the bolster when the load is removed therefrom. Through the proper selection of the size of the wire, the proper resiliency to the seat or back is obtained. When the rigid elements 21 and 22 at the sides of the frame are joined by the flexible wires 23, further resiliency is provided to the border and frame.

The seat thus constructed is a material advancement in the art in view of the elimination of cross bracing and other means required to retain coil springs in vertical relation. The noise and squeaks of the springs are eliminated and there is no tendency of elements of the seat to protrude one above the other to project through the covering, as occurs with the coil type of spring. The reduction in the amount of material employed reduces the cost of the seat and the simplified method of securing and forming the seat frames likewise reduces its cost.

While I have referred to the border elements 21 and 22 as being grooved wires, it is to be understood that rolled sections of metal having U-shaped cross sections, and the like, could also be employed. In a similar manner, the base frame 16 could embody a rolled groove for receiving and retaining a bead on the trim material in place of the tacking strip 17, as is well known in the art.

While I have described and illustrated but a single embodiment of my invention, it will be apparent to those skilled in the art that various changes, omissions, additions and substitutions may be made therein without departing from the spirit and scope of my invention, as set forth in the accompanying claims.

I claim as my invention:

1. A seat construction including, in combination, oppositely disposed border elements having inwardly presented grooves, oppositely disposed resilient border elements joining the grooved border elements to form a complete frame, and spring units spanning said grooved border elements and secured in said grooves.

2. A seat construction including, in combination, oppositely disposed border elements having inwardly presented grooves, oppositely disposed resilient border elements joining the grooved border elements to form a complete frame, spring units spanning said grooved border elements and secured in said grooves, and bracing means for said resilient border elements for preventing lateral movement relative to each other.

3. In combination, a resilient border element for a spring frame including oppositely disposed border elements having inwardly presented grooves, oppositely disposed resilient border elements secured in the grooves and extending between the ends of said elements to form a complete resilient border element for the frame, and longitudinally disposed spring units inherently curved on an arc of less radius than the bolster upon which the units are to be employed, and means for securing the ends of said units in said grooves to retain the units extended across the border elements.

4. In combination, a resilient border element for a spring frame including oppositely disposed border elements having inwardly presented grooves, oppositely disposed resilient border elements secured in the grooves and extending between the ends of said elements to form a complete resilient border element for the frame, longitudinally disposed spring units inherently curved on an arc of less radius than the bolster upon which the units are to be employed, means for securing the ends of said units in said grooves to retain the units extended across the border elements, and means for interlocking said springs against lateral movement relative to each other.

5. In combination, a resilient border element for a spring frame including oppositely disposed border elements having inwardly presented grooves, oppositely disposed resilient border elements secured in the grooves and extending between the ends of said elements to form a complete resilient border element for the frame, longitudinally disposed spring units inherently curved on an arc of less radius than the bolster upon which the units are to be employed, means for securing the ends of said units in said grooves to retain the units extended across the border elements, means for interlocking said springs against lateral movement relative to each other, and bracing means opposing the lateral movement of the resilient border elements toward or away from each other.

6. In combination, a resilient border element for a spring frame including oppositely disposed border elements having inwardly presented grooves, oppositely disposed resilient border elements secured in the grooves and extending between the ends of said elements to form a complete resilient border element for the frame, longitudinally disposed spring units inherently curved on an arc of less radius than the bolster upon which the units are to be employed, means for securing the ends of said units in said grooves to retain the units extended across the border elements, means for interlocking said springs

against lateral movement relative to each other, bracing means opposing the lateral movement of the resilient border elements toward or away from each other, and spring means retained by said grooved border elements and secured to a support.

7. A resilient border element for a spring frame including oppositely disposed border elements having inwardly presented grooves, oppositely disposed resilient border elements secured in the grooves and extending between the ends of said elements to form a complete resilient border element for the frame, and bracing means opposing the lateral movement of the resilient border elements toward or away from each other.

8. In combination, a resilient border element for a spring frame including oppositely disposed border elements having inwardly presented grooves, oppositely disposed resilient border elements secured in the grooves and extending between the ends of said elements to form a complete resilient border element for the frame, longitudinally disposed spring units inherently curved on an arc of less radius than the bolster upon which the units are to be employed, means for securing the ends of said units in said grooves to retain the units extended across the border elements, means for interlocking said springs against lateral movement relative to each other, and spring means retained by said grooved border elements and secured to a support.

9. In a seat construction, a resilient border frame including, front and rear border frame elements each having a groove therein, resilient frame members having their ends secured in the grooves in said border frame elements and extending between the ends thereof to form a complete resilient border frame, and arcuately disposed sinuous springs having their ends locked in the grooves in said border frame elements to provide a resilient support within said border frame.

10. In a seat construction, a resilient border frame including front and rear border frame elements each having a groove therein, resilient frame members having their ends secured in said grooves and extending between the ends of said border frame elements to form a complete resilient border frame and resilient sinuous arcuately disposed spring elements extending across said border frame and having their ends locked in the grooves in said border frame members.

CLARENCE H. MENGE.