June 19, 1934. F. X. NEMMER ET AL 1,963,670

SPRING CUSHION FOR FURNITURE

Filed Aug. 25, 1932 3 Sheets-Sheet 1

Fig. 1.

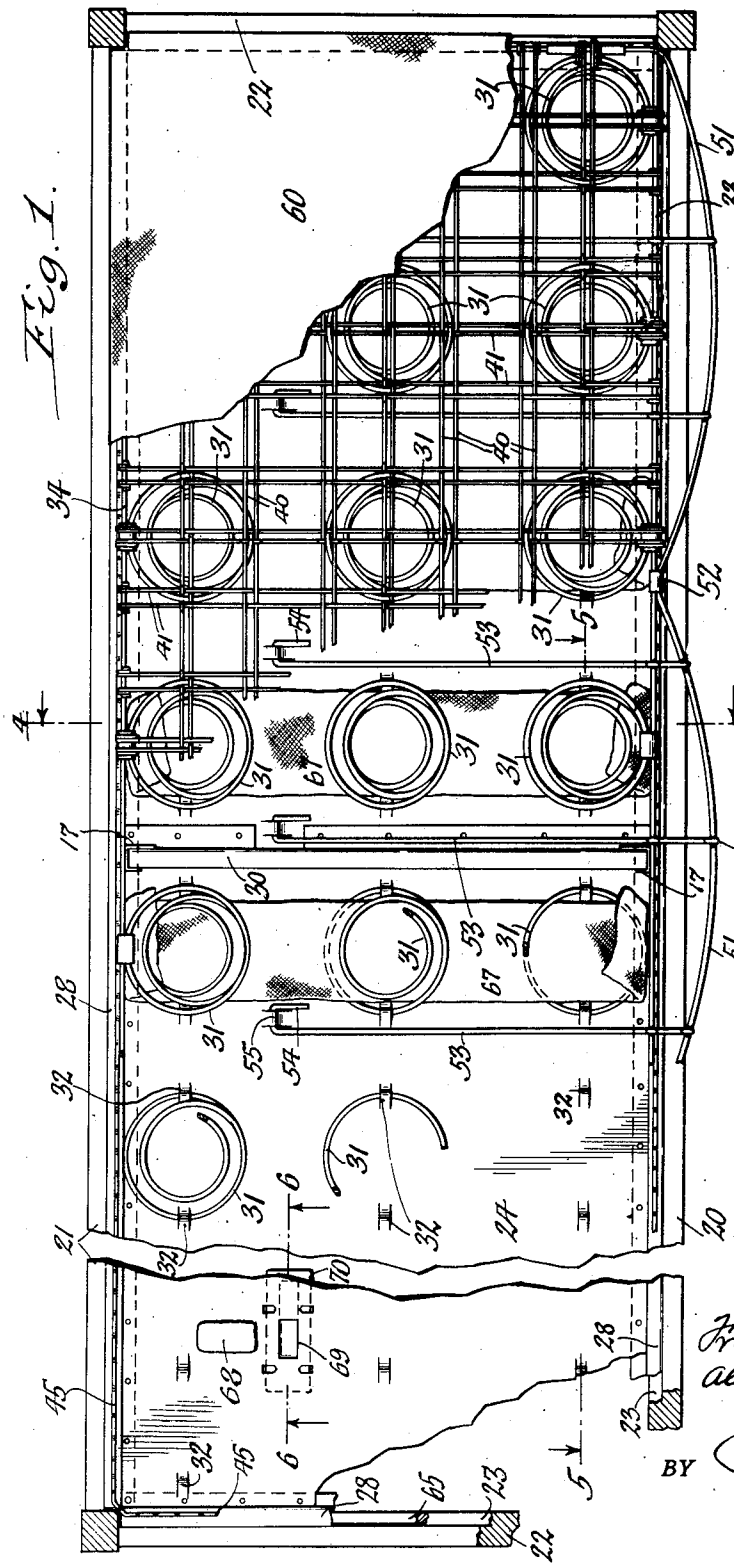


Fig. 3.

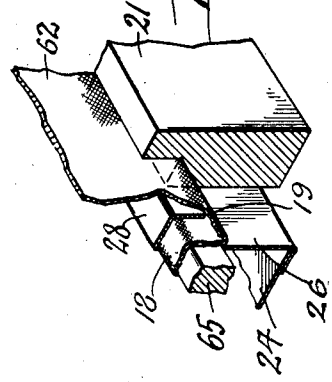
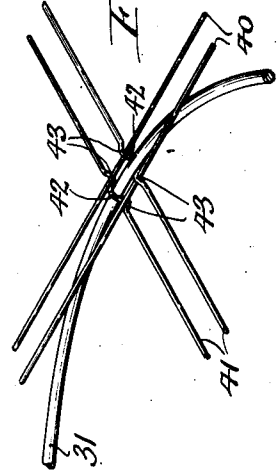


Fig. 2.



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SPRING CUSHION FOR FURNITURE

Filed Aug. 25, 1932 3 Sheets-Sheet 2

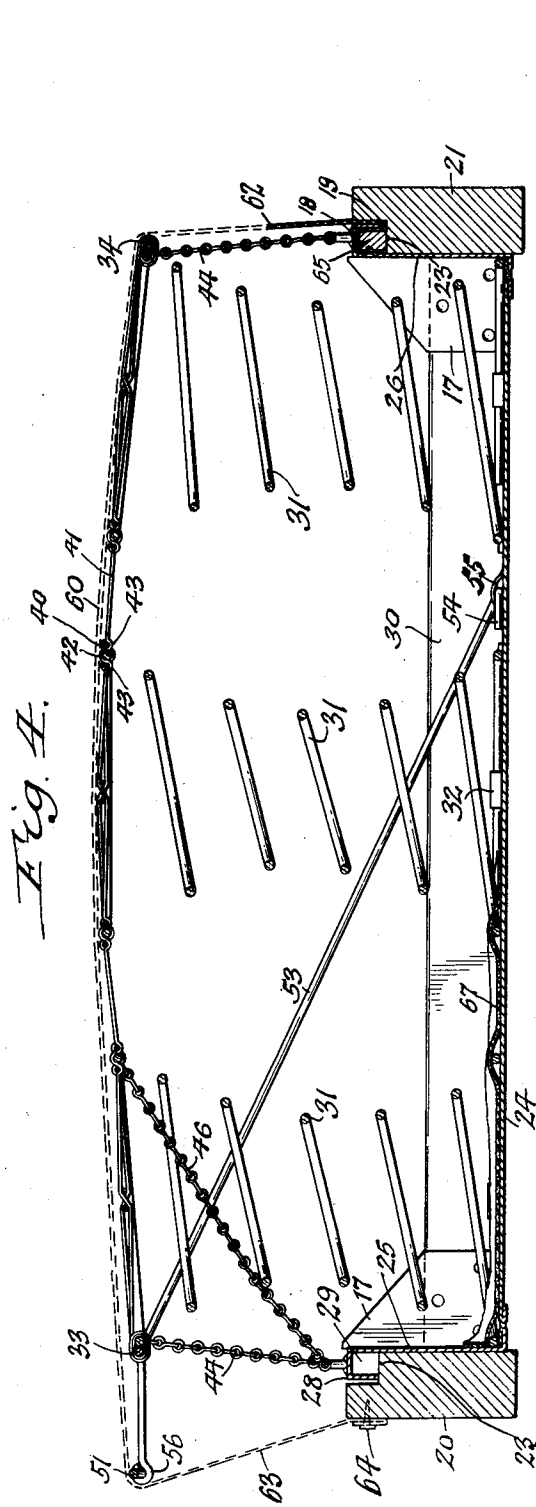


Fig. 4.

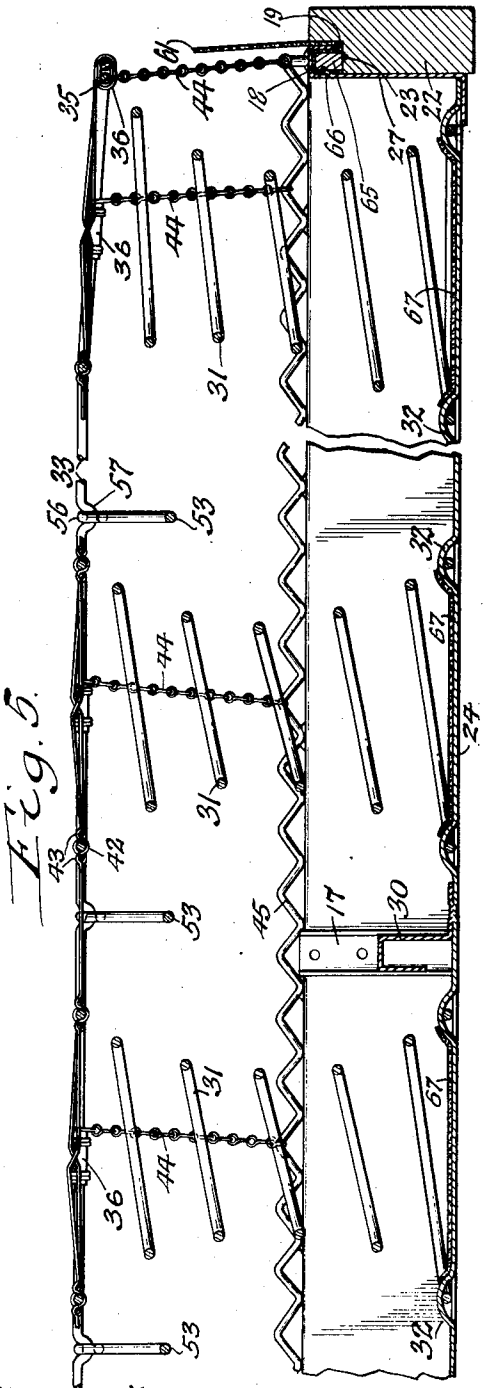


Fig. 5.

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SPRING CUSHION FOR FURNITURE

Filed Aug. 25, 1932 3 Sheets-Sheet 3

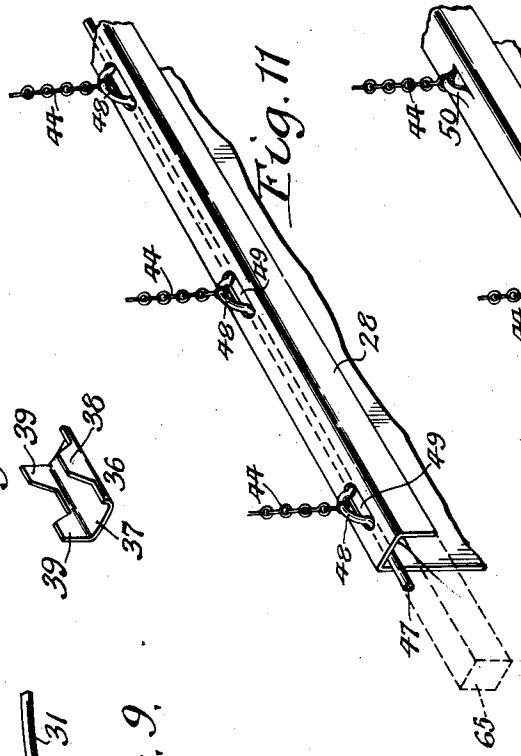


Fig. 11.

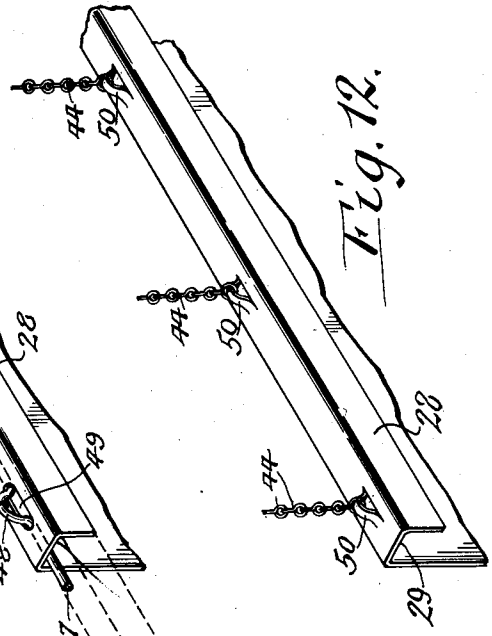


Fig. 12.

Fig. 10.

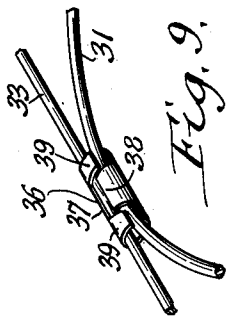


Fig. 9.

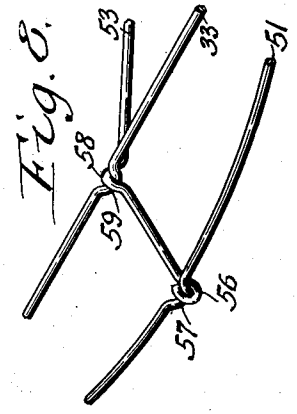


Fig. 8.

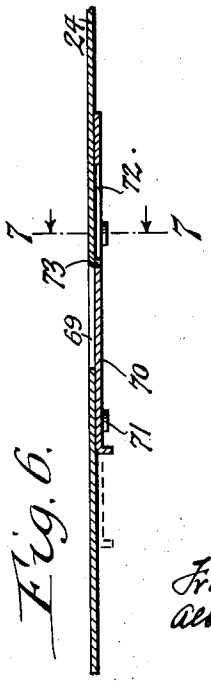


Fig. 6.

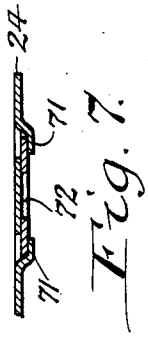


Fig. 7.

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Patented June 19, 1934

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UNITED STATES PATENT OFFICE

1,963,670

SPRING CUSHION FOR FURNITURE

Frank X. Nemmer and Albert W. Nemmer,
Cheektowaga, N. Y.

Application August 25, 1932, Serial No. 630,436

1 Claim. (Cl. 155—179)

This invention relates to a spring cushion for use in furniture such as chairs, davenports, lounges, vehicles and the like.

One of the objects of this invention is the provision of an improved base for the cushion which consists essentially of a bottom and side walls formed of sheet metal and thus furnishes a strong and durable support for the structure mounted thereon.

Another object of this invention is to provide improved means for mounting this base on the furniture frame and securing the fabric covering of the cushion to the side and rear parts of the base.

A further object of this invention is to provide simple and efficient stop means for connecting the springs with the base and holding the springs in an upright position and limiting the expansion of the same.

A still further object of this invention is to provide superior means for securing the retaining frame to the upper ends of the springs.

Additional objects of this invention are to improve the means for securing the shape bars to the front edge of the retaining frame; also to provide improved means for preventing fore and aft swaying of the cushion; also to improve the means for securing spacing wires to each other and to the upper ends of the springs for the purpose of preventing the latter from shifting sidewise relative to each other; also to provide an improved brace for rendering the base more rigid; also to provide simple means for introducing an agent for exterminating moths and the like into the interior of the cushion; also to so organize the cushion that the same operates as a pump for forcing through the fabric the air laden with fumes for exterminating moths and the like; and also to provide practical and inexpensive means for preventing metallic contact between adjacent convolutions of the springs and thus avoid unpleasant sounds when the cushion is used.

In the accompanying drawings:—

Figure 1 is a fragmentary top plan view of a davenport embodying these improvements.

Figure 2 is a fragmentary perspective view showing the means for interlocking the spacing wires and the upper ends of a spring.

Figure 3 is a fragmentary perspective view showing the manner of securing an edge of the cushion covering to a side wall of the base.

Figure 4 is a vertical transverse section, on an enlarged scale, taken on line 4—4 Fig. 1.

Figures 5 and 6 are fragmentary vertical longitudinal sections, on an enlarged scale, taken on lines 5—5 and 6—6 Fig. 1, respectively.

Figure 7 is a vertical cross section taken on line 7—7 Fig. 6.

Figure 8 is a fragmentary perspective view showing the manner of connecting one of the stay rods with the front part of the retaining frame and the adjacent shape bar.

Figure 9 is a similar view of the means for connecting a spring with the adjacent part of the retaining frame.

Figure 10 is a perspective view of a clip used for connecting the upper end of a spring with a rod or bar of the retaining frame.

Figures 11 and 12 are fragmentary perspective views showing modified forms of the stop means for limiting the expansion of the springs.

In the following description similar characters of reference indicate like parts in the several figures of the drawings:—

In its general organization this cushion for furniture comprises a base which is adapted to be mounted on the frame of a chair, davenport, lounge or other piece of furniture, a resilient means mounted on this base, and a covering extending over the resilient means and attached at its margin to the base and a part of the furniture frame.

Although the furniture frame may be variously constructed to suit the particular character of the piece of furniture which is to be manufactured and receive the cushion embodying the present invention, the furniture frame which is shown in the drawings as an example of one suitable for this purpose is of rectangular or oblong form and comprises front and rear longitudinal bars or rails 20, 21 and transverse end bars or rails 22 connecting the corresponding ends of the front and rear bars.

These furniture bars may be constructed of any suitable material but wood is preferably used for this purpose and each of these bars is provided with a rabbet on its upper inner corner so as to form an upwardly facing shoulder 23 thereon.

The base of the spring cushion is constructed in the form of a rectangular box or pan which opens upwardly and comprises a horizontal bottom 24, upright longitudinal side walls 25, 26 extending upwardly from the front and rear edges of the bottom, and upright transverse end walls 27 extending upwardly from the transverse edges of the bottom and connecting with the corresponding ends of the longitudinal walls 25, 26. The bottom and walls of this base are pref-

erably constructed of sheet metal such as sheet steel which is stamped or formed into suitable shape, but if desired other metals or materials may be employed for this purpose.

This box-shaped base is arranged within the furniture frame so that the bottom extends completely across the space within this frame and the upright walls of the base engage with the inner sides of the bars thereof.

Various means may be employed for supporting this base on the furniture frame together with the parts mounted on the base, but such support is preferably effected by providing the upper edge of each of the upright walls of the base with a flange 28 which extends laterally outward and downward from the upper edge of each base wall so that the same has the form of a hook and produces a downwardly opening channel or groove 29 on the underside of this flange, as shown in Figs. 3, 4, 5, 11 and 12. When mounting this base on the furniture frame the lower edge of the flanges 28 rest on the shoulders 23 of the rabbets on the several frame bars, and the tops of these flanges are flush with the upper sides of the frame bars, as shown in Figs. 4 and 5.

When the base is of oblong form and of considerable length, as is usually the case when a piece of furniture receiving this spring cushion consists of a davenport, lounge or similar article of furniture, then the bottom of the base is reinforced or strengthened at one or more points intermediate of its length so as to increase its rigidity and durability. In the drawings a single reinforcement or strengthening device is shown for this purpose and this comprises a transverse reinforcing bar or brace 30 constructed of sheet metal so as to be of hollow form, and secured on its underside to the upper side of the bottom 24, while its opposite ends are secured by means of brackets 17 to the adjacent parts of the inner sides of the front and rear walls of the base, as shown in Figs. 1, 4 and 5.

This means of mounting the base of the cushioning device on the furniture frame avoids the necessity of actually fastening the base to the furniture frame but instead permits the base to be merely lowered into the furniture frame when assembling the parts and lifted therefrom when dismembering the parts, thereby permitting the spring cushion of which the base forms an element to be manufactured as complete units which are operative without depending upon any connection with the furniture frame for this purpose. Obviously such construction permits of manufacturing the frames and the spring cushions wholly independently of each other and then assembling the same easily and expeditiously for completing the construction of the respective piece of furniture.

Within the base is arranged the resilient means which provide the yielding support forming part of the cushion, and these yielding means include a plurality of upright helical springs 31 each of which is preferably of double conical form with the large ends of the cones at the lower and upper ends of the spring, such as are now in common use in upholstery, mattresses and the like. Each of these springs is made of resilient wire and rests with its lowermost convolution on the upper side of the base bottom. The means for fastening each of these springs in the bottom of the base preferably consist of a plurality of attaching loops 32 which are struck up from the bottom of the base and receive the lowermost convolution of the respective spring, as shown in Figs. 1, 4 and 5.

These springs may be disposed within the base in any suitable manner but preferably are arranged in the form of a plurality of longitudinal rows, the springs of which are so spaced that they also form a plurality of transverse rows. Those springs of the entire group which are arranged on the border of the group are placed close to the upright walls of the base so as to afford the maximum resilient support on the marginal part of the cushion.

Above the group of springs and adjacent to the marginal parts of the outermost springs of this group a top retaining frame is provided which preferably consists of wire and comprises front and rear longitudinal rods 33, 34 which are fastened to the outer parts of the uppermost convolutions of the springs at the front and rear end of the cushion, and transverse rods 35 connecting the corresponding ends of the longitudinal rods 33, 34 and fastened to the outermost parts of the uppermost convolutions of the springs arranged at opposite ends of the cushion.

The connection between the rods of the top retaining frame and each of said springs is preferably effected by means of a clip 36 which is made of sheet metal and which has an elongated body 37 of considerable area which is adapted to engage with one side of the uppermost convolution of a spring and the corresponding side of the adjacent top retaining frame rod, a single lip 38 arranged on one longitudinal edge of the clip body 37 between the ends thereof and adapted to be wrapped around one of the members which is to be connected by the clip, and two lips 39 arranged on the opposite edge of the clip body adjacent to opposite ends thereof and adapted to be wound or wrapped around the other one of the members which is to be connected, as best shown in Figs. 9 and 10.

This form of clip is very simple and inexpensive in construction and can be readily applied to the wires which are to be connected without producing a bulky formation thereon, inasmuch as the central lip 38 on one edge of the clip is located between the end lips 39 on the opposite edge of the clip body after the clip has been applied to the respective parts which are to be connected, as shown in Fig. 9.

In order to retain the upper ends of the several springs in their proper relative position and prevent the same from becoming displaced staying or retaining means are provided which preferably comprise a plurality of longitudinal stay wires 40 which are connected with the uppermost convolutions of the several springs and the transverse rods 35 of the top retaining frame, and a plurality of transverse stay wires 41 which are connected with the uppermost convolutions of the several springs and the front and rear longitudinal rods 33 and 34 of the top retaining frame.

The ends of these stay wires are preferably connected with the respective top frame rods by twisting these ends around said rods, and the longitudinal wires and transverse wires of these spring staying means are interwoven with each other so as to form a connection between the same and prevent displacement of these wires relatively to each other. These stay wires are also arranged in pairs, and adjacent to the uppermost convolution of each of the springs one pair of these stay wires is so constructed that the same is interlocked with another pair of stay wires arranged at right angles thereto, and also

interlocked with the uppermost convolution of the respective spring.

This formation of connecting two pairs of angularly disposed stay wires with each other and with a spring is best shown in Figures 1, 2, 4 and 5 and is constructed as follows:—

Each member of one pair of stay wires is provided with a central crimp 42 which is bent in one direction, and two side crimps 43 which are bent in the opposite direction, and the crimps of one of these stay wires extend in a direction opposite to the corresponding crimps on the companion stay wire. In connecting these last-mentioned wires to a convolution of one of the springs 31 the central crimp 42 of one of these wires is engaged with the upper side of a part of the spring 31, and a central crimp 42 of the companion stay wire is engaged with the underside of the respective part of said spring, and each of the two adjacent stay wires which are arranged at right angles to the first-mentioned pair of stay wires engages its upper side with the underside of one of the crimps 43 and engages its underside with the upper side of the crimp 43 in the companion stay wire, as shown in Fig. 2. It follows that the two pairs of stay wires at right angles to each other are interwoven with each other and therefore interlocked and are also connected with the adjacent part of a cushion spring in a manner which reliably holds these stay wires against sliding one upon another, and also holding the respective spring against displacement relative to other springs, thereby distributing and maintaining a uniform resilience in the cushion over the entire area of the same, which not only provides a uniform cushioning effect but also increases the durability and life of the cushion as a whole.

Stop means are provided for limiting the expansion of the several springs but permitting compression of the same, which stop means or limiting means in the preferred form of our invention, and as shown in Figs. 1, 4 and 5, are constructed as follows:—

The numeral 44 represents a plurality of upright stop lines or flexible members which are preferably constructed in the form of chains and are connected at their upper ends at intervals with the several bars or rods of the top retaining frame, while their lower ends are connected with the upper edge of the walls of the base. The last-mentioned connection is preferably effected through the medium of corrugated or crimped wires 45 which are secured lengthwise to the upper side of the flanges 28 on the base walls so as to form a plurality of upwardly projecting loops, to one or the other of which the lower end of an adjacent stop line or chain 44 may be secured. By this means the lower end of each stop line or chain 44 may be attached to whatever loop of the crimped wire 45 is most convenient to suit the particular location of the respective stop line or chain with reference to the other parts of the cushioning device and thereby avoids the necessity of exercising any particular care in locating the fastening means, whereby the lower ends of these stop lines 44 are connected with the base. This manner of fastening the stop lines to the base is also very simple and economical when compared with means heretofore employed for this purpose, inasmuch as it permits of assembling the parts more expeditiously.

The numeral 46 represents additional stop lines or chains which are inclined and connected at their upper rear ends with the inner parts of the front springs at the top thereof, while their lower front ends are connected with one or another of the loops of the crimped wire 45 on the front part of the base in the same manner in which this is done with reference to the stop lines or chains 44. The lines or chains 46 in addition to limiting the expansion of the springs also assist in preventing backward swaying of the upper ends of the springs and the top frame.

The modified form of the means shown in Fig. 11 for connecting the limiting lines 44 with the base consists of an attaching rod 47 engaging with the top of a flange 28 of the base and provided at intervals with crimps or loops 48 which project upwardly through openings 49 in the top of the flange 28, and connected with the lower ends of the chains 44.

If desired, the top of the flange 28 of the base may be provided at intervals with loops 50 which are struck up out of the stock of this flange and connected with the lower ends of the limiting lines or chains 44.

For the purpose of imparting an ornamental appearance to the front of the davenport, lounge or chair the spring cushion is provided on its upper front part with one or more shape bars or rods 51, which, as shown in Fig. 1, are curved forwardly and connected by means of clips 52 or otherwise with the front rod or bar 33 of the top retaining frame. This shape bar is adapted to overhang the front bar 20 of the furniture frame and the covering of the cushion is adapted to be draped around the same in a manner as will be presently described.

Means are provided for preventing the upper part of the cushion from swaying unduly back and forth while in use, which means comprise a plurality of anti-swaying rods 53 which are arranged transversely in the space between the base and the top retaining frame of the cushion. Each of these anti-swaying bars is arranged at an angle and pivotally connected at its rear lower end with the bottom of the base by means of a pivot hook 54 arranged at the rear end of the respective anti-swaying bar, and engaging with a pivot loop 55 which is struck up from the adjacent part of the base bottom, as shown in Figs. 1 and 4. At its front end each of the stays or anti-swaying bars 53 is provided with an eye 56 which is bent around a downwardly projecting crimp 57 on one of the shape bars 51 so as to not only connect these parts but also interlock them and prevent the anti-swaying bar from slipping lengthwise on the shape bar, thereby insuring against displacement of these parts relatively to each other and maintaining the front part of the cushion in its proper shape. The intermediate part of each of the anti-swaying bars is provided with a laterally projecting crimp or loop 58 which interlocks with a crimp or loop 59 on the adjacent part of the front rod or bar 33 of the top frame, as best shown in Fig. 8, thereby forming an interlocking connection between this anti-swaying bar and the top frame which permits the rod 33 and the bar 52 to turn relatively to each other, but prevents the same from becoming displaced either in aft or fore of the cushion and also lengthwise of the cushion relative to one another.

A covering extends over the top of the resilient means of the cushion, which covering preferably consists of any suitable flexible fabric or textile material similar to that now commonly in use for upholstery work. This covering com-

prises an upper substantially horizontal sheet 60 which rests on the top of the springs, the top retaining frame, the shape bars and the stay wires connected therewith; end flaps 61 extending downwardly from opposite transverse edges of this top sheet along the corresponding outer parts of the cushion and connected at their lower ends with the transverse flanges of the base; a rear flap 62 extending downwardly from the rear edge of the top sheet 60 along the rear part of the cushion and connected at its lower edge with the rear part of the base; and a front flap 63 extending downwardly from the edge of the top sheet 60 along the front side of the resilient means and connected at its lower edge with the front side of the front furniture bar 20 by means of tacks 64, as shown in Fig. 4, or by any other suitable means.

The connection between the transverse walls and the rear wall of the base and the lower edges of the transverse end flaps and the rear longitudinal flap of the covering is preferably effected by utilizing the channel-shaped flanges on the corresponding parts of the base for this purpose. This is accomplished by folding the lower edge portions of the rear flap and end flaps of the covering around the lower edges of the corresponding hook-shaped flanges of the respective walls of the base, as shown at 19 in Figs. 3, 4 and 5, and then doubling the lower edge portions of these flaps so that they engage with the concave or inner side of these flanges, as shown at 18 in the same figures, and then clamping these doubled portions of the covering flaps in these channels by means of clamping bars or strips 65, which latter are pushed upwardly into the inner sides of the doubled portions of these flaps and press the same tightly against the concave inner sides of these flanges, as shown in Figs. 3, 4 and 5.

These clamping strips are so proportioned that the same produce a wedge action upon those portions of the covering flaps which are arranged within the wall flanges and exert a grip against the same which will hold these flaps frictionally within these flanges and prevent disconnection of these parts while in use. When this spring cushion device is assembled with the furniture frame the underside of the several clamping strips 65 engage with the shoulders or shelves 23 which are formed on the furniture frame bars or rails for the reception of this cushion, thereby confining these clamping strips within the channel-shaped flanges of the base walls and insuring a firm connection of the covering flaps with the respective parts of the base.

Additional means may be provided for preventing a separation of the clamping strips from the base flanges, such as the punch marks or spurs 66 which are preferably struck out of the stock of the base walls in line with the channels of the hooks, and engaging these spurs or indentations with the inner sides of the clamping bar 65, as shown in Figs. 4 and 5, thereby positively preventing separation of these clamping strips under all circumstances, particularly when transporting the spring cushions from one place to another while assembling the same with the furniture frames.

It has been found in practice when using springs of the character shown in the drawings in upholstery that the lowermost metallic convolutions of the springs when engaged by the next upper convolutions of these springs, and upon compressing the latter, a metallic noise is liable to be produced which is objectionable. In order to avoid metallic engagement of the lower convolutions of the springs silencing means are provided which in their preferred form consist of strips 67 of burlap or similar woven or flexible material placed upon the bottom of the base and between the lowermost convolutions of the springs and the next upper convolutions of the same, as shown in Figs. 1, 4 and 5. The presence of these silencing strips between the respective convolutions of the springs prevents the latter from coming into metallic engagement with each other as the cushion is compressed and insures quiet working of the springs at all times, and thereby avoids the annoyance which some persons experience when using spring cushions in which such silencing means are not present.

In the present spring cushion the space between the base and the covering is practically closed when this cushion is mounted on the furniture frame ready for use. It therefore follows that when the springs are compressed by a person sitting on the cushion and the springs are again permitted to expand when the load is removed therefrom, a pumping action is produced which has the effect of expelling air from within the cushion to the exterior thereof and also drawing air from the exterior of the cushion to the interior thereof. This pumping action is advantageously utilized in the present case by placing an exterminating element within the space enclosed by the tight base of the spring cushion and the relatively tight covering which is secured over the same and to the furniture frame.

Such an exterminating element may consist of a cake 68 of volatile material of any suitable character, having the capacity of destroying moths or the like which usually infest the edible constituents in the fabric of which some parts of the upholstery upon the cushion or adjacent thereto are manufactured. The fumes or vapors given off from this exterminator or germicide 68 become mingled with the air within the spring cushion and as the latter is alternately compressed and expanded the insecticide-laden air is forced back and forth through the fabric of the upholstery associated with the spring cushion, and thereby either destroys the moths or the like which usually attack such upholstery or stupefies the same so that they are practically harmless, and in in any event renders the edible parts of the upholstery unattractive so that the same are not likely to be inhabited by moths or other destructive insects or vermin.

The moth exterminator or insecticide may be introduced into the space within the spring cushion in any suitable manner but preferably by providing the bottom 24 of the base at some accessible place with an opening 69 through which the moth exterminator, such as the moth destroying agent 68, may be introduced into the cushion and deposited upon the top of the base bottom, as shown in Fig. 1, and after this exterminator has been introduced into the cushion the opening 69 may be closed so as to render the interior of the cushion practically air-tight by means of a horizontally movable slide 70 which is guided in ways 71 on the underside of the base bottom and provided with an opening 72 which is adapted to move into and out of register with the opening 69 in the base bottom.

In order to avoid complete separation of the slide 70 from the bottom of the base, stop means are provided consisting of a stop lug 73 depending from the underside of the bottom 24 and adapted to engage either end of the opening 72

in the slide for the purpose of arresting its movement at either extreme of its complete stroke when opening or closing the same.

As a whole this spring cushion is comparatively simple in construction, it has no parts which are liable to get out of order, thereby insuring maintenance of the same in a satisfactory and operative condition for an indefinite time, and the same is also capable of being manufactured at low cost, thereby effecting a considerable economy in the use of furniture of this character.

We claim as our invention:—

A spring cushion for furniture comprising a base having a bottom, side walls rising from said base, and downwardly turned flanges at the upper ends of said walls, springs mounted at their lower ends on said bottom, retaining means connecting said flanges with the tops of said springs including openings formed in said flanges, a rod having horizontal parts arranged underneath each of said flanges and provided with loops projecting upwardly through said openings, and flexible retaining lines connected at their lower ends with said loops and connected at their upper ends with the tops of said springs, and bars arranged below said flanges and rods and operating to hold the latter in place.

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