Sept. 11, 1951 W. K. McINERNEY ET AL 2,567,520

TENSION REGULATION COIL SPRING

Filed Oct. 11, 1948 2 Sheets-Sheet 1

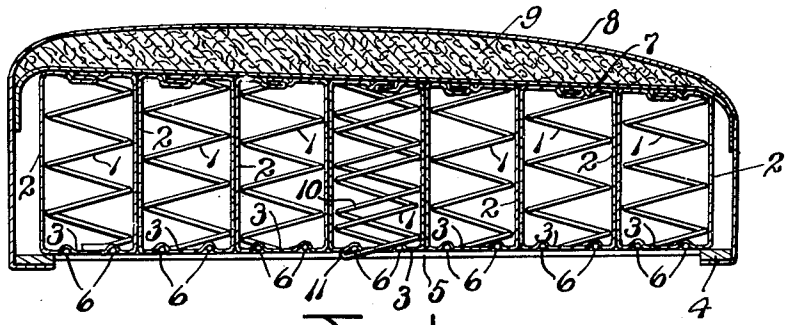


FIG. 1.

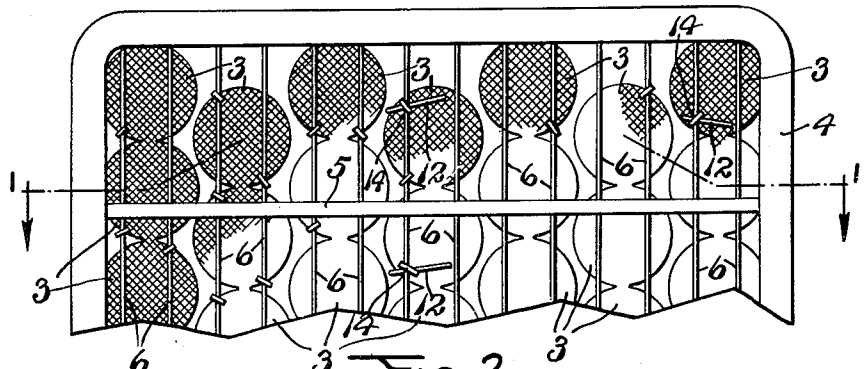


FIG. 2.

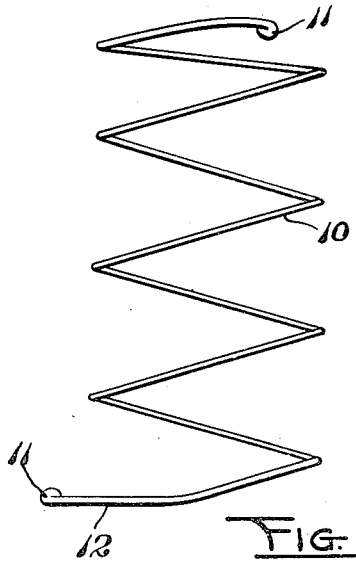


FIG. 4.

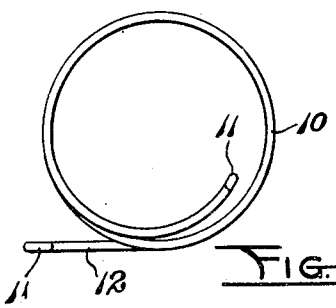


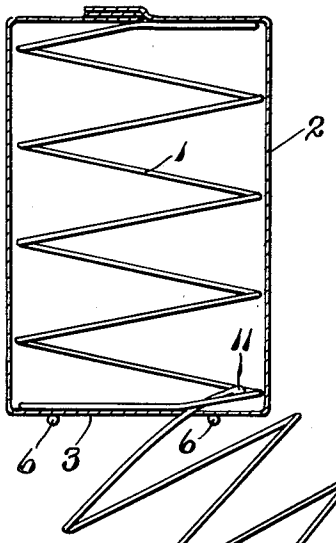
FIG. 3.

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Filed Oct. 11, 1948 2 Sheets-Sheet 2



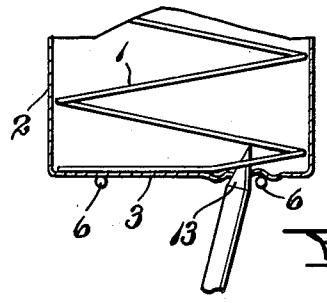


FIG. 5.

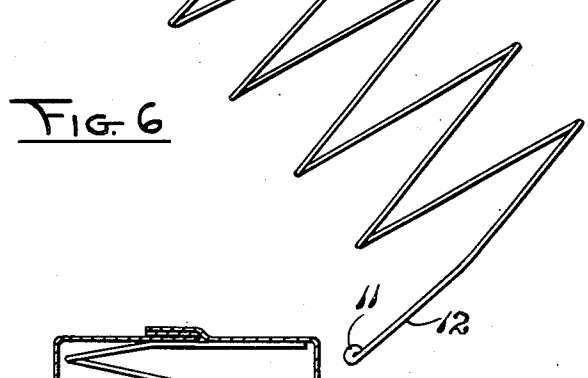


FIG. 6

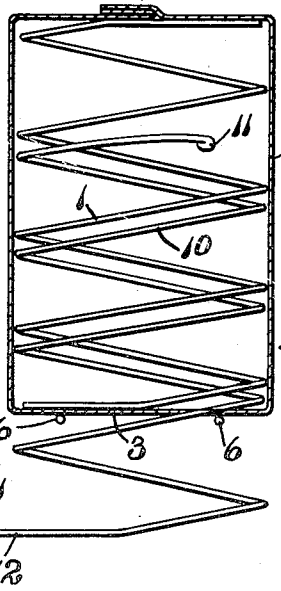


FIG. 7.

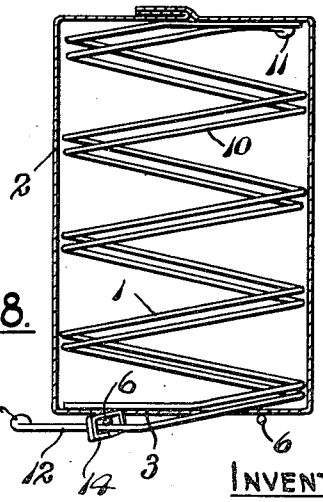


FIG. 8.

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Patented Sept. 11, 1951

2,567,520

UNITED STATES PATENT OFFICE

2,567,520

TENSION REGULATION COIL SPRING

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Application October 11, 1948, Serial No. 53,933

4 Claims. (Cl. 155—179)

1

This invention is directed to and concerned with the reinforcement or regulation of the tension of coiled cushion springs such as are used in automobile seats, various articles of furniture and the like. Such springs at different portions of the seat are subjected to varying service, and where the heaviest service takes place, the springs may require reinforcement initially, or after they have been in use for a period of time.

It is an object and purpose of the present invention to provide a simple and novel structure and method of reinforcing any of the spring coils which may need it in cushion spring structures of the general type noted, and which may be applied to fully completed seats and other cushion spring structures so that if after a period of use reinforcement or regulation of the spring tension is needed it may be very quickly done.

An understanding of the invention may be had from the following description taken in connection with the accompanying drawing, in which,

Fig. 1 is a vertical section, substantially on the plane of line 1—1 of Fig. 2, through a cushion spring upholstered seat to which our invention is applicable, showing the use of the invention in connection with one of the springs located at such section through the seat.

Fig. 2 is a fragmentary under plan view of the cushion spring seat, our invention used with a plurality of the coiled springs thereof.

Fig. 3 is an under plan view of the spring shown in Fig. 4.

Fig. 4 is an enlarged elevation of the additional coiled cushion spring which is used with our invention.

Fig. 5 is a fragmentary enlarged vertical section through one of the fabric pockets which contain a cushion coiled spring, showing the initial step of providing a passage for the entrance of the reinforcing additional coiled spring of our invention into the pocket.

Fig. 6 is an enlarged vertical section through a spring containing pocket showing the first step of entering the reinforcing additional spring into the pocket at the bottom thereof.

Fig. 7 is a section similar to Fig. 6, illustrating the winding or screwing of the additional spring upwardly in said spring containing pocket, and

Fig. 8 is a similar section showing the completion of the installation of the auxiliary additional spring and the manner of securing it at its lower end.

Like reference characters refer to like parts in the different figures of the drawings.

At one environment where our invention is used, an automobile seat cushion is shown in Figs. 1 and 2 in which a plurality of vertically positioned coiled cushion springs 1 are located within fabric pockets having sides 2 which take a cylindrical form to contain the springs 1, and which are closed at their upper and lower ends, the lower end being shown at 3, through which end the auxiliary reinforcing or regulating spring is inserted. Such pocket enclosed springs 1 are mounted above a supporting frame which includes an outer, generally rectangular, open horizontal frame 4 transversely of which at spaced intervals flat and comparatively thin metal strips or bars 5 are secured extending across from one side to the other of the outer frame 4, and longitudinally of which a plurality of pairs of parallel wires 6 extend from one end to the other of the frame 4 and are secured at their ends. In practice the spring containing pockets of fabric are provided in a plurality of connected rows of pockets, a connected row of the spring containing pockets being located above each pair of spaced wires 6, with the bottoms 3 of the pockets resting thereon and with suitable connections for securing the pockets and the springs 1 to said wires.

2

When thus mounted the seat is completed by a suitable fabric covering 7 over the upper ends of the assembled springs and their containing pockets, with an outer cover 8 of fabric secured to the under frame 4 and extending upwardly at its sides and ends and over upholstering padding 9 which is located above the fabric 7 as shown in Fig. 1. Such spring structure for automobile seats and other similar structures is old and well known and provides an environment for the utilization of our invention. The vertically positioned coiled springs 1 are subject to pressure from above in varying amounts, some springs being under pressure for long lengths of time and others seldom or ever subjected thereto, so that the springs which sustain the heaviest service may lose tension to a greater or less degree and fail to perform the service which they are designed to give. And at times some of the vertically positioned springs 1 may be broken or otherwise damaged so as to be more or less defective.

With our invention, auxiliary or additional cushion coiled springs 10 are used selectively with such of the springs 1 as have lost or diminished in their strength, or have been rendered defective in any other manner, so as to add to such strength that such defective springs may have, or in some cases, serve the purpose that the

springs 1 initially served. Said additional coiled cushion springs 10 may be of wire having substantially the same properties and dimensions as the wire of the spring 1 though not necessarily limited thereto. The end of the upper coil of the spring 10 is blunted by turning it back upon itself as indicated at 11. The lower coil of the spring terminates in a lateral extension 12 which, at its free end is similarly blunted, at 11 so that no sharp points of wire are present.

In installing the additional auxiliary springs the bottoms 3 of the selected pockets have strands of the fiber from which the fabric is made parted by use of a pointed tool 13, as shown in Fig. 5, so that the upper end of the auxiliary spring 10 may be inserted through the opening provided. The auxiliary spring is then turned about its longitudinal axis, and in effect screwed to place in connection with the coils of the spring 1 in the selected pockets, as shown in Fig. 7. This continues until the upper coil of the additional spring comes against the top of the selected pocket and with the terminal lower extension 12 crossing underneath one of the wires 6 against which the lower end of the fabric pocket bears. Such extension 12 is then secured to the wire 6 underneath which it is located (Fig. 8) by a staple 14 or other equivalent fastening.

When thus inserted in selected spring containing pockets of a cushion spring structure, the additional springs adds their force or tension to whatever may remain of the force or tension of the springs 1 within the pockets supplied with the additional springs, or may serve as substitutes for such springs 1 if their force or tension has been substantially destroyed. Thus at portions of the seat where the greatest service of the springs 1 is required, a loss of tension or force of such springs is taken care of by the additional or auxiliary springs. Such additional or auxiliary springs are used only where needed, and are not used in those pockets where the springs 1 still retain their force or tension and do no require any reinforcement or assistance to perform their service.

The invention is very practical and useful and the method of installing them is easily performed. The invention may be used with new cushion seat structures or the like at the places where the heavier service upon the springs takes place, or may be used after the spring structures have been in use for sufficient time that the original springs 1 require reinforcement. Of course, the strength of the auxiliary springs is a matter of choice and may be varied if desired for different places of use. The invention is defined in the appended claims.

We claim:

1. In a structure as described, a vertical generally cylindrical pocket closed at the top and bottom, a coiled cushion compression spring located lengthwise of and within the pocket, means for supporting the pocket at its lower end, a second coiled compression cushion spring located within the pocket helically wound with the coils of the first cushion spring and extending the length thereof. said second coiled cushion spring at its lower end portion passing through the bottom of the pocket and having a terminal portion in conjunction with the pocket supporting means, and means for securing said lower terminal portion to said supporting means.

2. The elements of claim 1 in which the upper end of the second coiled spring within the pocket is turned back upon itself to form a blunt non-piercing end.

3. In a spring structure as described, a plurality of vertical fabric pockets having closed upper and lower ends, a vertically positioned coiled cushion compression spring within each pocket, supporting means underneath the lower end of each pocket, additional coiled compression springs located within selected pockets of the vertical pockets helically wound with the first cushion springs therein and extending the lengths of associated pockets, each additional spring at its lower end portion passing through the bottom of its associated pocket and having a terminal portion in conjunction with the supporting means for the pocket, and means for securing said terminal portion to said supporting means.

4. In a cushion spring construction, a vertically positioned pocket of fabric material having generally circular walls and upper and lower closed generally horizontal top and bottom, a coiled cushion compression spring within the pocket extending the length thereof, a second coiled cushion compression spring within tne pocket extending the length thereof and having its longitudinal axis substantially coincident with the longitudinal axis of the first spring, said second coiled cushion spring having a lower end terminal portion passing through the bottom of the pocket and terminating in a laterally extending generally horizontal arm, a horizontal supporting member located underneath the bottom of said pocket and against which it rests, said terminal arm crossing said supporting member and means for fastening said arm and supporting member together.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
198,833	Barmore	Jan. 1, 1878
683,344	Sim	Sept. 24, 1901
1,192,510	Fischmann	July 25, 1916
1,254,314	D'Arcy	Jan. 22, 1918
1,333,801	Fitzgerald	Mar. 16, 1920
1,544,237	Karr	June 20, 1925
1,544,415	Suekoff	June 30, 1925
1,931,744	Taylor	Oct. 24, 1933
2,241,039	Mattison	May 6, 1941
2,247,543	Bernstein	July 1, 1941