Aug. 1, 1933. J. T. ATWOOD 1,920,176

SPRING CUSHION

Filed April 9, 1931

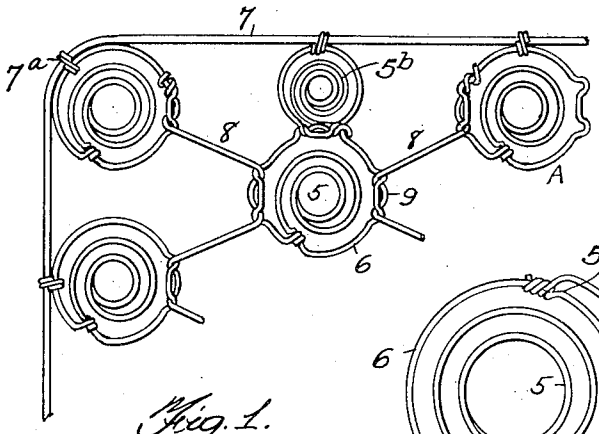


Fig. 1.

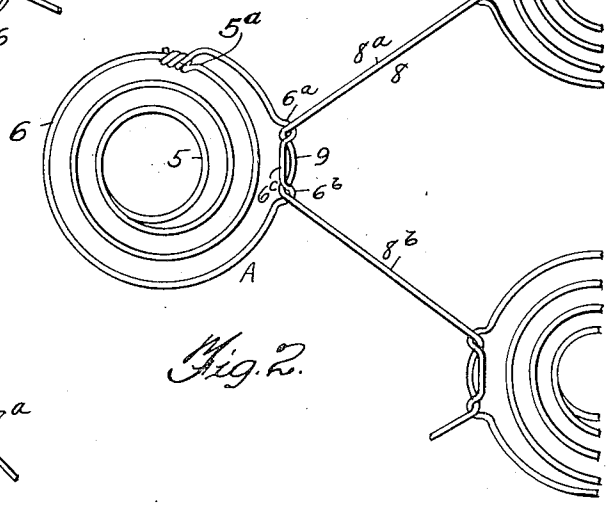


Fig. 2.

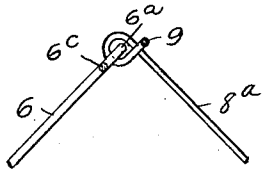


Fig. 3.

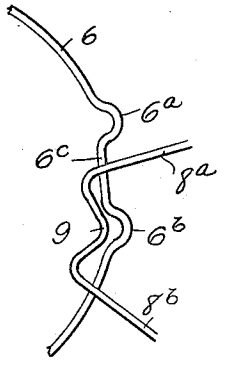


Fig. 4.

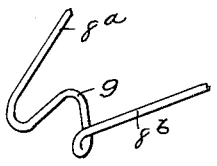


Fig. 5.

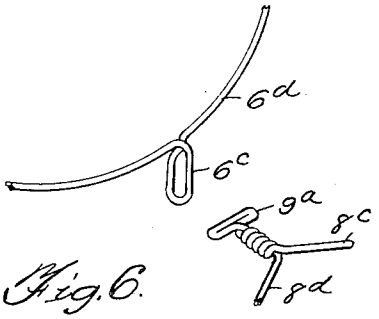


Fig. 6.

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SPRING CUSHION

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Application April 9, 1931. Serial No. 528,922

1 Claim. (Cl. 5—274.)

The present invention has for its object to provide an improved type of construction for spring cushions by virtue of which certain important advantages, hereafter set forth, are achieved.

Spring cushions of the type to which this invention is applicable have a wide range of usefulness. They are employed as automobile seat bottoms and backs, for mattress fillers, for bed springs, for theatre seats, in the manufacture of furniture of various kinds and in fact in any relation where a cushioning spring mat is called for.

In the accompanying drawing.

Figure 1 is a plan view of a portion of a spring mat or cushion constructed in accordance with the invention.

Figure 2 is a partial plan view showing the parts in locked position.

Figure 3 is a transverse sectional view showing the parts moved to positions of angularity with respect to each other and above the horizontal, preparatory to disconnecting the latch wire from the associated spring.

Figure 4 is a view like Fig. 2 but with the parts moved to disconnected position,

Figure 5 is a detail perspective view of one of the hooks of the latch wire, and

Figure 6 is a detailed perspective view of a modified form of the invention.

Cushioning mats of the character to which this invention relates have commonly employed a group of helical springs A comprising centers 5 and ends 6. Many different ways have been resorted to, in the past, for connecting these spring elements to each other and to suitable border wires, such as 7. It will be observed that in accordance with usual practice, the springs are disposed in rows and that the springs of one row are in staggered relation to the springs of adjoining rows. It is with respect to the means for connecting the end members 6 of adjacent springs, to each other, that this invention is principally concerned.

In accomplishing this object I provide zig-zag latch wires 8. The points of bend of the latch wires are bent to form hooks 9. The end members 6 of the springs are bowed outwardly at two spaced points 6^a and 6^b and when the parts are in connected position the runs 8^a and 8^b of the latch wires upon each side of the several hooks 9, lead to the outwardly bowed portions 6^a and 6^b and are connected by portions which bend downwardly to engage in said bowed portions and then upwardly to form the upwardly pointed hook 9.

With the parts in the position just described perfect flexibility is had. The springs and latch wires may flex in all directions but the latch wire can not be accidentally disengaged from the ends 6 of the springs under lateral movement of the two parts 9 and 6^c because when the ends 6 and runs 8^a and 8^b of the latch wires lie in their normal positions; that is when they lie in substantially horizontal alignment, the points of the hooks 9 project materially above the portions 6^c and prevent more than a limited lateral movement of the hooks inwardly of or across the ends 6.

To effect a disengagement of the hooks 9 of the latch wires from the spring ends it is only necessary to kink or thrust the spring ends and latch wires upwardly above the horizontal until they lie in the position, substantially as illustrated in Fig. 3. At this time, the hooks may be moved bodily endwise of the parts 6^c or in a direction longitudinally of the latch wires until the points of the hooks align with one of the bowed portions 6^a or 6^b as the case may be (see Fig. 4) and the presence of the bowed portion or recess permits effecting the complete disengagement of the hook from the spring end. The reason that the parts can not be moved from the position of Fig. 2 to the position of Fig. 4, until the parts have been moved to the abnormal position of Fig. 3, is that as long as the parts occupy the position of Fig. 2 the downward bends at the juncture of the runs 8^a, 8^b with hook 9 lie in the bowed portions 6^a, 6^b and can not move rearwardly out of said portions because hook 9 extends upwardly in front of the portion 6^c and would strike and be stopped by said portion 6^c to prevent such rearward movement. However, movement of the parts to the position of Fig. 3 moves the point of the hook to such position that the hook may be moved longitudinally of part 6^c and to the position of Fig. 4. It is to be particularly noted that there is no actual bending of any of the elements in this operation and that the connection is a "quick detachable" one, which may be made or broken as often as desired without injury to the parts and with the bare hands. This renders it possible for unskilled labor to quickly connect up a row of these springs and, as hereinafter set forth, makes it practicable to ship the elements in knocked-down form away from the factory to be assembled at the point of use.

From the foregoing description it will be seen that the basic idea inherent in the present invention is the provision of a connection between

adjacent springs which may be fastened or unfastened only by moving the parts to an abnormal position (preferably one materially above the horizontal) and to a position which could not ordinarily be assumed accidentally by the parts in use. It is of course understood that when used in seats, cushions, furniture and in fact in practically all relations, the springs are covered by suitable fabric and padding which tends to hold the tops of the springs and the latch wires, as a composite whole, in the same general plane, and the presence of these outer coverings prevents the kinking of the spring ends and latch wires upwardly to disengaging position.

In addition, the various spring ends and latch wires are under tension and this too tends to maintain them in the same general plane and to resist upward kinking to disengaging position. It is therefore to be understood that the invention is not limited to the particular hook construction that I have illustrated but is intended to include any type of connection in which engagement of the parts is effected by twisting the spring ends (or the intermediate connecting elements between said springs, such as the latch wires shown,) to an abnormal position and to a position which the elements can not assume of themselves, under use.

As indicative of the fact that fastening in this manner may be effected in more than one way, I have illustrated in Fig. 6 a fragment of a spring end 6^d which is bent to form an elongated loop 6^e. The zig-zag latch wire in this case is bent to form the runs 8^e and 8^d corresponding to the runs 8^a and 8^b, and in place of the hook 9 there is provided a T-head 9^a. By twisting the spring end and the latch wire in opposite directions, these elements are brought to a position wherein the T-head 9^a may be passed through the loop 6^e and when the parts are released the T-head will lie cross-wise of the loop and disengagement of the parts will be prevented.

Highly important advantages from the manufacturing and commercial standpoints flow from the present invention. I am aware of the fact that it has heretofore been proposed to provide spring structures of this general character with connecting elements in the nature of hooks. However, hooks which can be connected by a direct lateral movement can also be accidentally disconnected in the same way. Upon the other hand, where the connecting elements have been positively engaged with the springs, as for example, by twisting the latch wires into engagement with the springs, many of the important advantages of the present construction have been absent. That is to say, structures wherein the parts are positively and permanently united must be made in the factory. One of the principal advantages of the present construction is that the parts may be shipped in knocked-down form and readily assembled by unskilled labor at the place of use. One of the most serious problems which confronts the manufacturer of devices of this sort, is the question of packaging and shipping the same. Where these springs are made up in complete form at the factory they are very bulky in proportion to their weight and relatively few springs may be placed in a railroad car.

A construction which permits the shipment of the elements required in knocked-down form, renders it possible to place many times as many springs in a railroad car or vessel as would be the case with known constructions.

This will open up a very large export trade for the industries of this country from which the American manufacturer is now substantially shut out because of the great space consumed by the completely assembled articles. Of course, when the present day structures are shipped they are compressed as much as possible, but even so, the resultant packages are bulky, cumbersome and space-wasting. Furthermore, the attempt to compress them to save space sometimes results in objectionable tangling among the springs and associated parts.

Another advantage which may be mentioned is that in many cases tariff rates are considerably lower upon structures which are shipped in non-assembled form than upon the completely manufactured articles in assembled form.

Many of the constructions heretofore employed have used metal clips and bars for engaging and holding the springs in place. Elements of that sort not only cost a great deal more than the construction of the present invention, but they are noisy and squeaky in use. A further advantage inherent in the provision of the latch wires full hinged to the end members of the springs and freely disconnectible therefrom, is that the structure is rendered very easy of repair since any individual spring may be readily taken out and another substituted therefor by merely disengaging the proper hooks 9 and putting in the new spring in place of the old.

Furthermore, the latch wires themselves constitute, in effect, spring elements, and being under tension they so reinforce and support the springs 5, that fewer springs may be used than is the case with known constructions. This not only saves material but, which is of more importance, reduces weight and this is an end toward which most of the industries in which these cushions are used, are striving. This is particularly true of the automobile industry.

Still another advantage inherent in the present invention is the fact that the free hinging of the latch wires to the spring ends, to permit these parts to yield readily in all directions, produces cushions having individual fields. By this is meant, that a person lying upon one side of a mattress will not draw down the other side of the mattress whereon a light person may be sleeping, in the manner that would be the case if the parts were more or less rigidly connected by a positive inter-twisting of the zig-zag wires into engagement with the spring ends.

I have made mention of a border wire 7. I wish to make it clear that the invention is not limited to any particular way of connecting the spring ends to the border wire. This may be done by separate wrappings or rings of wire 7^a or the border wire may be positively twisted into engagement with the spring ends, and in fact any suitable way may be employed for connecting the border wire and spring ends. The beginning of the second convolution of the several springs is preferably kinked, as indicated at 5^a, to prevent slipping of the terminal end of the spring under the pull imparted to it by the latch wires. Additional springs 5^b may be employed as connecting means between the border wires 7 and the ends 6 of those springs 5 which do not lie directly along side the border wires.

From the foregoing description, it will be apparent that the present invention embodies marked improvements over known structures not only from the standpoint of better action in use and freedom from accidental disengagement of the parts under use, but that it presents very

unusual advantages from the manufacturing and commercial standpoints for the reasons already described. It is to be understood that the invention is not limited to the particular construction shown, but that it includes within its purview whatever changes fairly come within either the terms or the spirit of the claim appended to the patent as issued.

Having described my invention, what I claim is:

A cushion of the character described comprising a plurality of springs arranged in rows and in staggered formation, latch wires extending along and between said rows and bent to zig-zag formation, said latch wires at their point of bending being bent downwardly, inwardly and upwardly, the central portions of said bent portions constituting upwardly directed hooks, the end members of the springs being provided with pairs of outwardly bowed portions spaced apart a distance equal to the distance between said downwardly bent portions of the latch wires, said downwardly bent portions lying, when the parts are in assembled position in said outwardly bowed portions of the spring ends and said hook like portions extending upwardly above the level of the portions of the spring ends which lie between said outwardly bowed portions, the relative dimensions of the said outwardly bowed portions of the end members of the springs and the said hook like portions being such that when the said end members and latch wires are flexed to positions of angularity with respect to each other, above the horizontal, to a degree sufficient to move the hook like portion below the plane of the outwardly bowed portions, the said hook like member and outwardly bowed portions may be moved in opposite directions and in the direction of the general length of the latch wire to permit disengagement of the spring and latch wire by the movement of the hook like portion through one of said bowed portions.

JOHN T. ATWOOD.