No. 793,853. PATENTED JULY 4, 1905.

W. R. SMITH.

CUSHION SPRING.

APPLICATION FILED JULY 28, 1904.

2 SHEETS—SHEET 1.

Fig. 1.

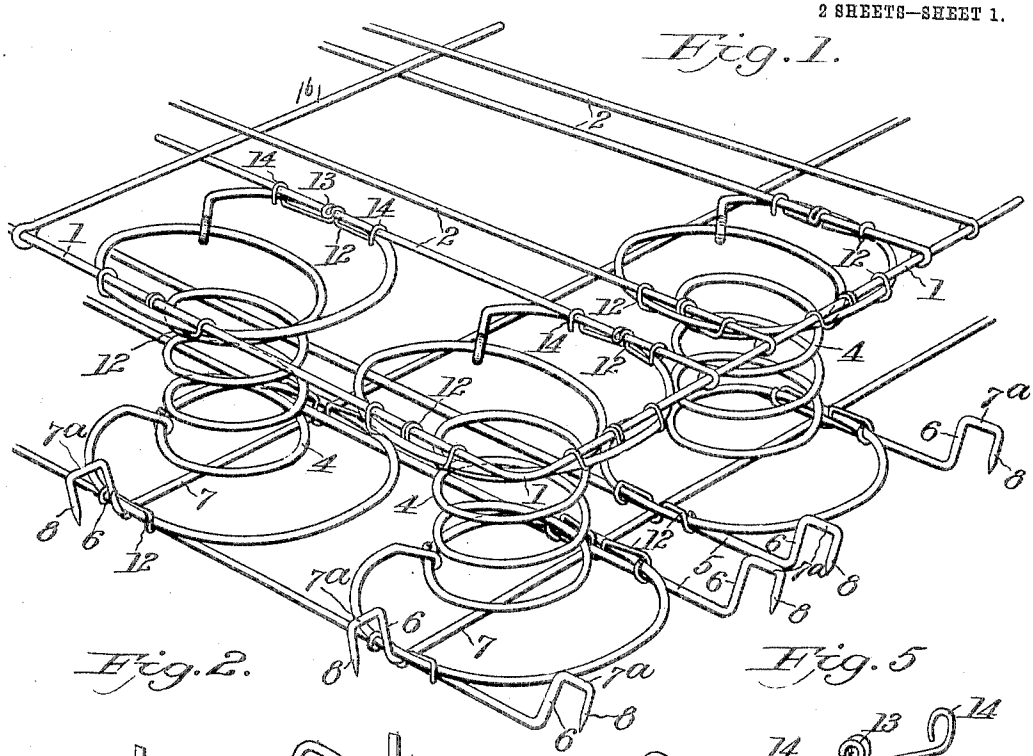


Fig. 2.

Fig. 5

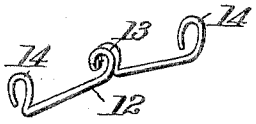


Fig. 7.



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2 SHEETS—SHEET 2.

Fig. 3.

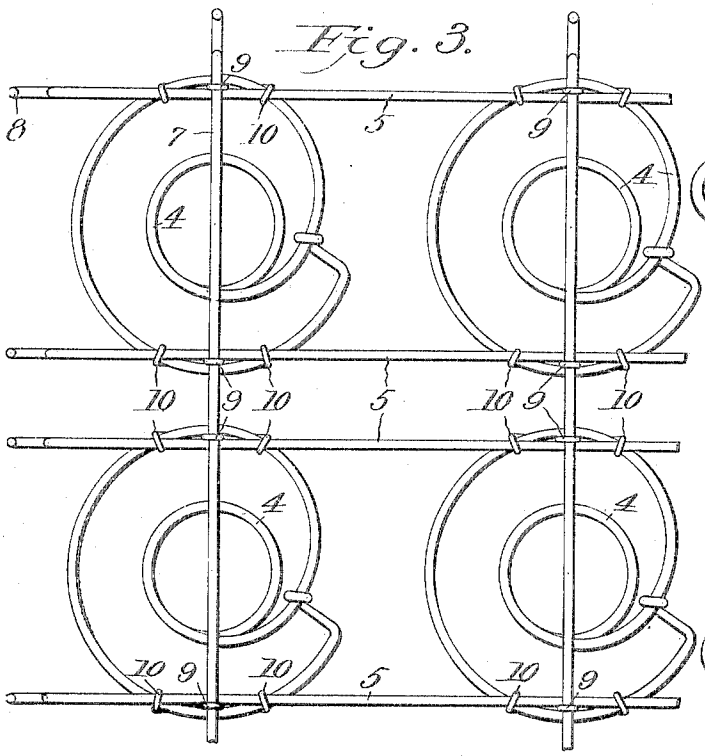


Fig. 4.

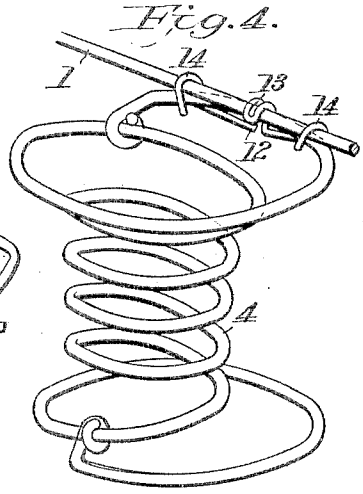


Fig. 6.

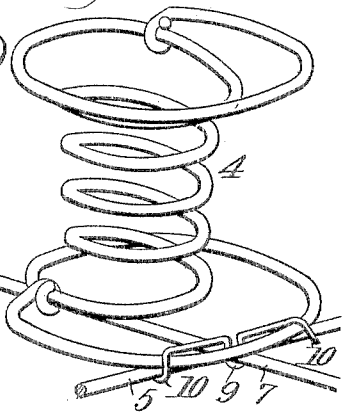


Fig. 8.

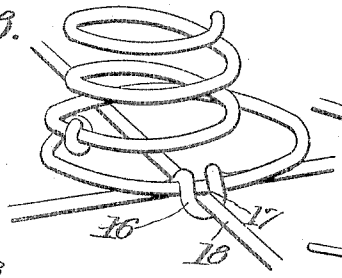
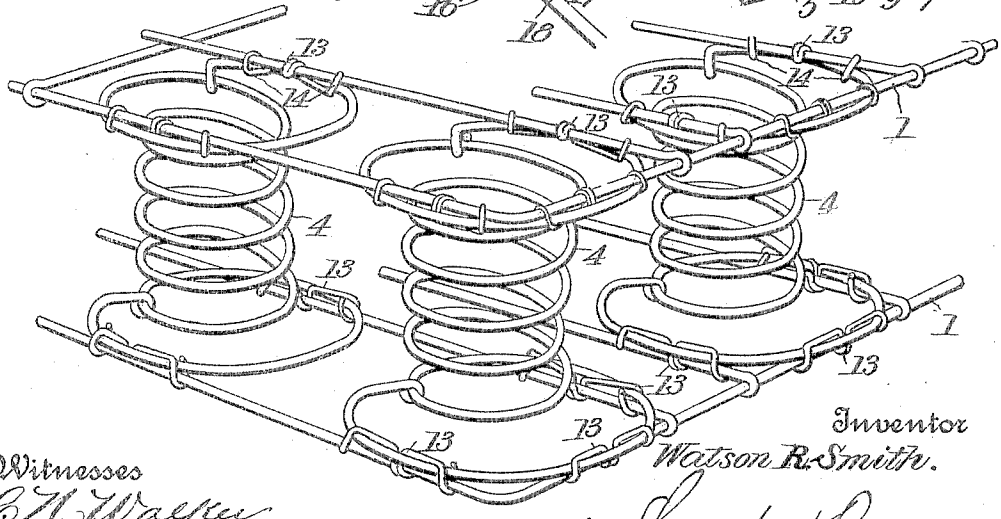


Fig. 9.



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No. 793,853. Patented July 4, 1905.

UNITED STATES PATENT OFFICE.

WATSON R. SMITH, OF JACKSON, MICHIGAN.

CUSHION-SPRING.

SPECIFICATION forming part of Letters Patent No. 793,853, dated July 4, 1905.

Application filed July 28, 1904. Serial No. 218,581.

To all whom it may concern:

Be it known that I, WATSON R. SMITH, a citizen of the United States, residing in the city of Jackson, in the county of Jackson and State of Michigan, have invented certain new and useful Improvements in Cushion-Springs, of which the following is a specification.

My invention relates to cushion-work for chairs, beds, or the like, and has for one of its objects to provide a light, inexpensive, rigid, durable, and efficient cushion.

Another object of the invention resides in an arrangement of a number of convolute or other springs within a frame and associating the springs with stays and support-wires in such manner that they may be firmly connected therewith through the instrumentality of peculiarly-formed fastening-clips.

Another object of the invention is to produce peculiarly-formed connecting-clips the bends of which are so formed with relation to the body portion of the same as to render it a comparatively easy matter to manufacture them.

A still further object is to provide clips of such form and arrangement that they may be sprung into engagement with the work.

It is still further designed to arrange a number of convolute or other springs within an edge wire without necessarily employing a lower edge wire.

In most couch, chair, and other construction in which open springwork is involved a single-cone spring is quite frequently employed in preference to a double-cone spring, for the reason that the latter is large at the top and bottom and small in the center, resulting in the center, when the cushion is compressed, going through the larger base or bottom portion, the effectiveness of the spring being thereby affected. However, in my improved construction I have arranged to prevent the center portion of a double-cone spring passing through the larger portion thereof, enabling me to employ the double-cone spring without affecting the effectiveness thereof in open cushion-work. In other words, a still further object of my invention resides in the support of double-cone or other springs in open cushion springwork for chairs, beds, or the like.

With these and other objects in view the present invention consists in the combination and arrangement of parts, as will be hereinafter more fully described, shown in the accompanying drawings, and more particularly pointed out in the appended claims, it being understood that changes in the form, proportion, size, and minor details may be made within the scope of the claims without departing from the spirit or sacrificing any of the advantages of the present invention.

In the drawings, Figure 1 is a detail perspective view of a portion of a bed or chair cushion embodying my invention. Fig. 2 is a top plan view of a portion of the top of my improved cushion. Fig. 3 is an inverted plan view of a portion of the cushion. Fig. 4 is a detail perspective view of a double-cone spring, illustrating the manner in which the springs are secured to the stay-wires and the surrounding edge wire or frame. Fig. 5 is a detail perspective view of the clips employed for securing the spring to the stay-wires and to the edge wire or frame. Fig. 6 is a detail perspective view of a double-cone spring, illustrating the manner in which the bottom of the springs are secured to the supporting-wires. Fig. 7 is a detail perspective view of the clip employed for joining the springs to the support-wires. Fig. 8 is a detail perspective view of a modified form of means for supporting the springs; and Fig. 9 is a detail perspective view of a portion of a bed or chair spring-cushion, illustrating the springs arranged within an upper and lower edge wire, the form of connecting-clip being the same as that shown in Fig. 5.

Referring now more particularly to the accompanying drawings, the reference character 1 designates an edge or frame wire whose free ends are abutted and held in proper relation by means of one of the clips hereinafter described. This frame or edge wire 1 has a series of pairs of stay-wires 2, secured thereto in any suitable manner and arranged, preferably, transversely thereof.

Arranged within the frame or edge wire 1

is a number of double-cone or other springs 4, whose base portions are designed to rest upon transverse and longitudinal support-wires in such manner as to prevent the center or smaller portion of the double-cone springs passing through the enlarged base portion thereof. The drawings will disclose that the transverse support-wires 5 are preferably arranged in pairs and that these pairs of transverse support-wires are disposed directly beneath the pairs of transverse stay-wires 2. By such arrangement the upper convolution of each of the outermost springs is connected directly to the frame or edge wire 1 by means of clips hereinafter described.

Disposed longitudinally of the cushion and passing immediately beneath the corresponding rows of springs are a series of support-wires 7. These longitudinal support-wires are connected at their points of intersection with the transverse support-wire 5, the means of connection being hereinafter set forth, and all of the support-wires have their free ends bent upwardly, as at 6, then outward, as at 7ª, and downwardly, as at 8, terminating in pointed ends, whereby they may be driven in or otherwise secured to a wooden framework. (Not shown.)

As has been premised in the foregoing, the springs are connected to the support-wires by means of clips. The clips for this purpose are of peculiar form, each consisting of a single piece of wire or other suitable material bent to form an open member or hook 9 intermediate its ends, the throat of the member or hook being so formed as to render it possible for a longitudinal stay-wire to be sprung into engagement therewith, the free ends of the clips being bent downwardly in the same direction as the open member or hook 9 and then bent upwardly and inwardly toward the body portion of the clip, forming a means or hook 10, to be sprung into engagement with an intersecting transverse supporting-wire 5 and the lower convolution of the corresponding spring. It will thus be seen that the ends of each clip are sprung not only into engagement with a transverse support-wire, but also sprung into engagement with the lower convolution of the corresponding spring, the open member or hook portion 10 extending downwardly between the inner side of the said convolution and the said transverse support-wire and beneath the latter, the longitudinal supporting-wire passing beneath the transverse supporting-wire and through the open looped portions 10 of each clip, the longitudinal support-wires being arranged through and beneath the center of corresponding rows of springs, thereby preventing the center or smaller portion of the springs being passed through the bottom thereof when the cushion is compressed. It will now be understood that corresponding pairs of transverse supporting-wires pass beneath corresponding rows of springs and along the outer edges thereof, while the longitudinal stay-wires pass beneath the transverse supporting-wires and in such relation to the corresponding rows of springs as to firmly support the latter and insure against the possibility of the middle or smaller portions of the springs passing through the lower and larger open portion thereof upon pressure being brought to bear upon the cushion. The transverse stay-wires 2, which are arranged in pairs, as hereinbefore stated, are secured to the upper convolutions of the springs at points directly above the connections of the lower convolutions of the springs with the support-wires. However, the clips for securing the tops of the springs to the cushion are of a slightly different formation, unless it be desired to construct and arrange the stay-wires at the top of the cushion in the same manner as the support-wires are arranged at the bottom thereof. In the cushion shown in the accompanying drawings it will be seen that longitudinal stays are not arranged to correspond with the longitudinal supporting-wires, and therefore the clip for the top of the cushion differs only to the extent that the intermediate portion 13 is doubled upon itself and bent upwardly over and sprung around the transverse stay-wires and the upper convolution of the adjacent spring, the free ends of the clips, however, being formed in exactly the same manner as the first-mentioned clips and designed to be sprung not only into engagement with the stays, but also the upper convolutions of the springs, as indicated by the reference character 14. The portion 13 of the upper clips is arranged to pass between the inner sides of the upper convolutions and the stay-wires, and the arm portions of these clips are inclined or directed from the hook 13 at an angle of about forty-five degrees, as clearly shown in the accompanying drawings. My reason for constructing both forms of clips in such manner as to have the springs, the supporting, and the stay wires all sprung into engagement therewith is to produce a highly-rigid connection, a great advantage derived from such engagement being that the parts can be fitted together before the parts are finally tightened for use, it being simply necessary to assemble the parts, which can be done by simply springing the clips into their proper positions and then or at some other time using necessary tools or machines for the purpose of tightening or otherwise producing the desired final rigidity of the cushion.

It will be noted that the outermost rows of springs are engaged by three clips, the third clip engaging the frame or edge wire 1 in the same manner as the other clips engage the stay-wires and springs.

Longitudinal stay-wires are not absolutely essential in the present construction of cushion; but in practice I find that the use of one

longitudinal stay-wire 16 aids greatly in attaining rigidity, especially when the stay is arranged longitudinally along the middle of the upper part of the cushion and arranged alternately above and below adjacent transverse stays, as clearly shown in the drawings, the said stay being connected to the ends of the frame or edge wire in any suitable manner.

My peculiar arrangement possesses all of the desirable features of a spring-cushion for beds, chairs, and the like, and in practice I have found that whenever pressure is applied to the cushion the pressure of the edge wire and transverse stay-wires is directly upon the edge of the springs, and therefore there is absolutely no tendency of the edge wire turning upon the springs, stay, or supporting-wires. Another advantage derived is that when pressure is applied to any portion of the cushion it is distributed over the portion of the cushion surrounding that upon which the pressure is directly applied, and therefore the further the cushion is depressed the larger the area over which the pressure is distributed, and consequently the greater will be the resistance of the cushion. A still further advantage resides in the fact that by reason of the clips being sprung into engagement with the springs, stay, and support-wires the different elements are held in place even before the clips are tightened, thus rendering it much easier and more speedy to place the different elements in position for final adjustment. A still further advantage resides in the fact that I am enabled to employ double-cone springs in a cushion without the employment of slats for the support of the springs, which latter is a rather expensive arrangement. Moreover, when the springs are mounted upon slats it is the custom to tie the springs together at their tops, all of which I eliminate. I gain an advantage, too, over the old method of supporting the springs upon webbing, necessitating the tying of the springs at their tops, this old method being insecure. In other words, it has been demonstrated that I can use support-wires formed in such manner as to be driven or otherwise secured in the framing of a couch, chair, bed, or vehicle-seat frame, my peculiar arrangement of the supporting-wires and their connection with the clips associated therewith serving to bind the construction together rigidly. I am also enabled to make any irregularly-shaped construction to fit any shaped frame or seat desired. Furthermore, I am enabled to locate any particular spring forming part of my arrangement.

In Fig. 8 of the drawings I have illustrated a modified form of means for supporting the springs. In other words, in this modified form it will be seen that I eliminate the separate-clip feature in that I bend or otherwise provide the transverse supporting-wires with integral offset hooks 16, the said support-wires being arranged in pairs and beneath the lower convolutions of the springs, excepting at the points of formation of the hook 16, which is directed upwardly, over, and downwardly beneath the lower convolutions and upon the opposite side of the body portion of the stay-wire, the hook 16 being disposed to form a throat, way, or the like 17 for the reception and support of the longitudinal supporting-wire 18, as clearly shown in the drawings. Fig. 9 illustrates a portion of a cushion embodying upper and lower edge wires forming a frame and the transverse support-wires arranged the same and immediately beneath the transverse stay-wire, the same form of clip being used throughout the arrangement.

I claim—

1. In a spring-cushion, the combination with an edge wire, of stay-wires connected in pairs to opposite sides of the edge wire, transverse support-wires arranged beneath the stay-wires, the transverse support-wires being arranged in pairs, a series of springs disposed upon corresponding pairs of transverse support-wires, longitudinal support-wires intersecting the transverse support-wires, clips constructed and arranged to secure corresponding transverse and longitudinal support-wires and the lower convolutions of the springs together, clips associated with the transverse stay-wires and the corresponding upper convolutions of the springs, and a longitudinal stay-wire associated with the upper part of the cushion and arranged alternately above and below adjacent transverse stays.

2. A clip for spring-cushion work, consisting of a single piece of wire bent intermediate its ends to form a hook, each free end of the wire being bent to form a hook, the portions of the wire between the intermediate and end hooks converging from the said intermediate hook, whereby the back of the intermediate hook is disposed in advance of the backs of the end hooks, all of the hooks lying in common plane.

In testimony whereof I affix my signature in presence of two witnesses.

WATSON R. SMITH.

Witnesses:
HENRY E. EDWARDS,
SUE KNICKERBOCKER.