Nov. 12, 1929. W. E. NATTRESS ET AL 1,735,354

SPRING TIE

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Fig. 1.

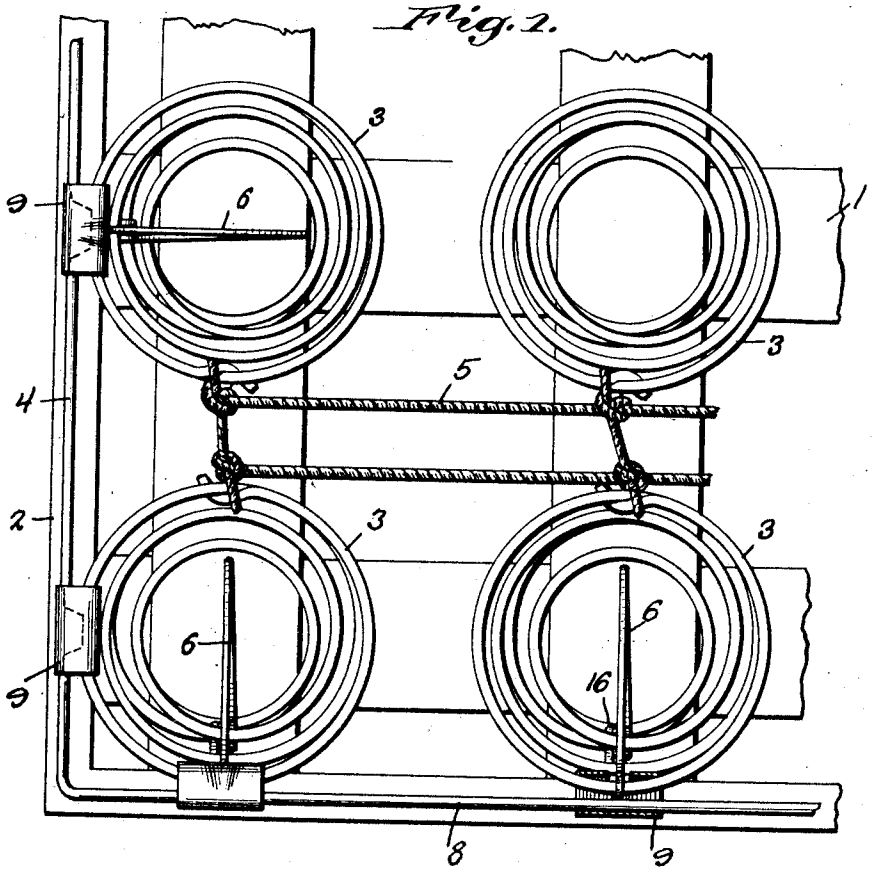


Fig. 9.

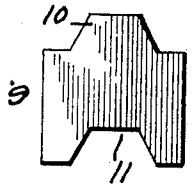
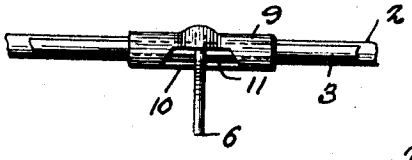


Fig. 7.



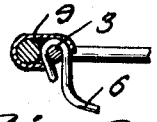


Fig. 8.

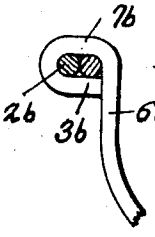


Fig. 10.

Witnesses
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SPRING TIE

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Fig. 2.

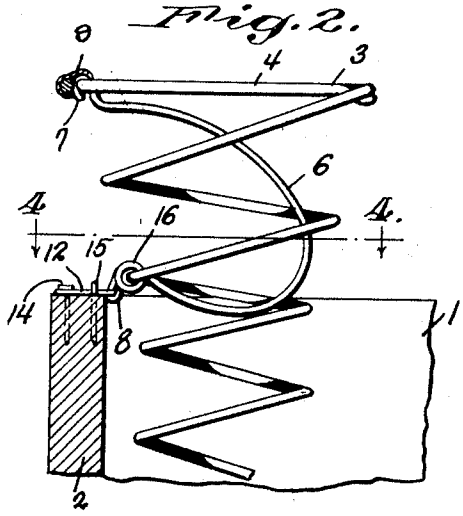


Fig. 3.

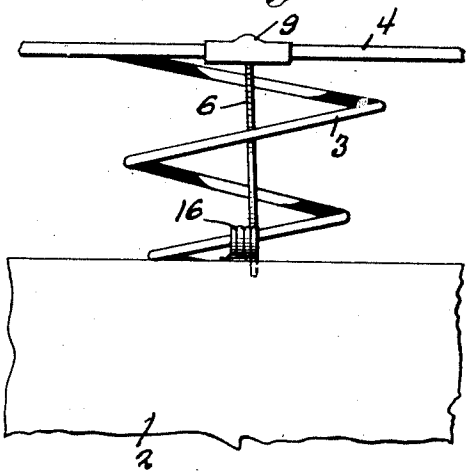


Fig. 4.

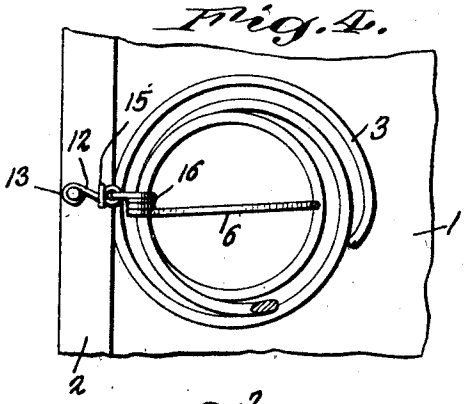


Fig. 5.

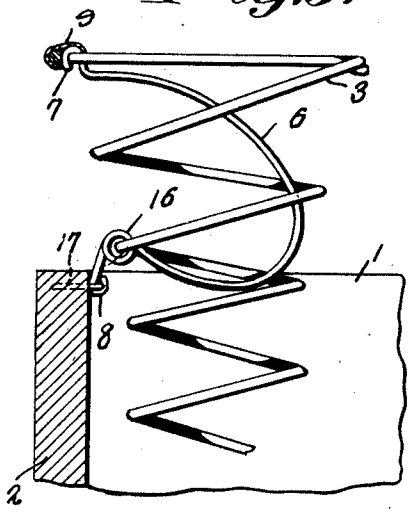
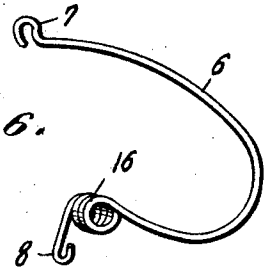


Fig. 6.



Witnesses

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Patented Nov. 12, 1929 1,735,354

UNITED STATES PATENT OFFICE

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SPRING TIE

Application filed September 2, 1927. Serial No. 217,278.

This invention relates to a spring structure and tie element thereof and has for its primary object the provision of a structure that will positively eliminate the defects experienced at the present time with spring structures now on the market and which will not only cure such defects, but will materially add to the durability of the article to which the structure is connected.

An object of the invention is the novel manner of arranging and connecting the component parts of the spring structure so as to not only facilitate assemblage but assure the strengthening of the spring structure at those points of greatest stress.

Another object of the invention is the provision of metallic ties located at the points of greatest strain to strengthen the same and besides eliminate the necessity of the use of twine ties which have the disadvantage that the same will fray out and break after relatively short use.

Another object of the invention is the novel manner of constructing and associating the spring tie with the coil spring so as to add its resiliency to that of the coil spring and besides form a support for an intermediate portion of the coil spring.

A feature of the invention is the relative arrangement and cooperative action of the tie and associated coil spring so that full play is obtained and greater resiliency accomplished.

Another feature of our invention is the use in a spring structure of a twine tie and a metallic tie, the former so positioned as to be subject to very little strain thereby assuring the proper life thereof and the latter positioned to take up the greatest strain and provide a direct connection between the edge wire, the coil spring and the frame.

Besides the above our invention is distinguished in the novel manner of inter-connecting the component parts so as to materially reduce the time of assemblage and which may be manufactured at a relatively low cost, thereby producing an article, the production cost of which is less than inferior structures heretofore marketed.

With these and other objects in view, the invention will be better understood from the following detailed description, taken in connection with the accompanying drawings, wherein:

Figure 1 is a fragmentary portion of a spring structure constructed in accordance with my invention,

Figure 2 is a side elevation of one of the metallic ties arranged in applied position,

Figure 3 is a view looking at right angles to Figure 2,

Figure 4 is a sectional view on the line 4—4 of Figure 2,

Figure 5 is a side elevation of a slight modification of the invention,

Figure 6 is a perspective view of the metallic tie detached, and

Figures 7, 8 and 9 are detailed views of the clip construction and associated parts,

Figure 10 is a view of a slight modification.

Again referring to the drawings illustrating one of the many constructions of our invention and more particularly to Figure 1, it will be noted that the spring structure consists primarily of a supporting frame 1, including the side rail 2, a plurality of sets of coil springs 3, an edge wire 4, a twine tie 5 and a plurality of yieldable metallic ties 6.

The twine tie 5 knotted about companion sets of coil springs is applied in the usual manner but it will be noted that the twine tie assumes a position to be fully protected against wear or undue strain. In other words the sole purpose of this twine tie is to interconnect companion sets of coil springs and to act in conjunction with our improved metallic tie to materially reduce production cost of the spring structure.

The inner coil springs are inter-connected solely by the twine tie with the outer coils also connected together by the twine tie, but considerably reinforced through the use of our improved metallic ties which are capable of adding considerable resiliency to the associated coil springs. Of course, it will be understood that the twine tie may be dispensed with entirely relying upon the proper placing of metallic ties to effect the proper connection between the various coil springs and the supporting frame.

Our improved metallic tie is of bow shaped formation so as to have the required degree of resiliency and this tie is so mounted as to be arranged within the convolutions of the associated coil spring so that the resiliency thereof may be added to the resiliency of the coil spring so that jointly they may produce the required resiliency and besides produce a more substantial construction. The ends of the spring tie are looped as shown at 7 and 8 so that the loop extremity 7 may be effectively engaged around the top convolution of the associated coil spring near the edge wire 4 which connection may be materially reinforced through the use of a clip 9, that is stamped from sheet metal to have a tongue 10 interfitting with a slot 11 for effectively holding the loop extremity 7 in place and connecting the coil spring to the edge wire 4. The loop extremity 8 may be connected in any suitable manner to the supporting frame 1 but for the purpose of illustration, we have shown two devices for accomplishing this desired result, but we wish it to be understood that various other devices or elements may be utilized for providing a direct connection between the metallic tie and the supporting frame. With relation to the first form we have shown a fastening element 12 having an eye 13 formed at each extremity, one to receive a fastener 14 and the other to have a flexible connection with the loop extremity 8. A staple 15 engaging the fastener element prevents displacement thereof in the use of the spring tie. For the purpose of bringing about a more effective engagement between the spring tie and the coil spring and to materially increase the resiliency the spring tie is provided with a coil spring section 16 looped about an intermediate portion of the associated coil spring so as to provide an interlocking engagement between the spring tie and the associated coil spring while at the same time adding to the resiliency of the spring tie.

In Figure 5 we have shown the looped end 8 of the spring tie directly connected to a staple 17 that is driven directly into the side rail of the supporting frame, thereby reducing the number of operations.

It will now be appreciated that we have designed a spring structure and a novel type of tie that will materially add to the resiliency of the spring structure and will greatly increase the durability thereof due to the fact that the spring tie is so designed as to provide a direct connection between the coil springs and the edge wire and between the coil springs and the supporting frame. A very important feature in this connection is the fact that an intermediate portion of the coil spring is engaged thereby strengthening the spring at this point against lateral displacement. This inter-connection between the spring tie and the coil spring positively assures a joint resilient action in the required direction and positively prevents dislocation of the parts.

In Figure 10 we have illustrated the tie 6^b provided with a looped extremity 7^b of a size to effectively embrace the edge wire 2^b and the coil spring 3^b.

In concluding, we wish to lay stress upon the fact that the spring tie is so designed that full play is obtained between the edge wire and the side rail 2, to accomplish a full resilient action and positively prevent frictional engagement between the side rail and the tie structure. We also wish to lay stress upon the fact that the spring tie is so designed as to be completely protected by the coil spring connected thereto with the spring tie functioning to protect and reinforce the coil springs. Thus the two elements jointly function to produce results not heretofore obtained in this particular industry.

It is of course, to be understood that the spring tie may be designed in various other manners than illustrated and associated with the coil springs in other relations and besides may be connected to the supporting frame through the use of various other types of fasteners, and therefore, we do not desire to be limited in protection in any manner whatsoever except as set forth in the following claims.

What we claim is:

1. In combination with an edge wire and a coil spring a tie having looped extremities one of which engages said wire, a clip for securing the looped extremity to the edge wire, a fastener associated with the remaining looped end of the tie, said tie having a yieldable connection with a portion of said spring.

2. A spring structure comprising a support, an edge wire, a coil spring connected at its lower end to the support, a clip connecting the upper end of the coil spring to the edge wire, and a spring tie connected at its lower end to the support and having a bowed portion arranged within the coil spring, the bowed portion of the spring being connected at its lower end to an intermediate convolution of the coil spring and at its upper end to the upper end of the coil spring, and the connection between the upper ends of the coil spring and bowed portion being within the clip.

In testimony whereof we affix our signatures.

WILLIAM E. NATTRESS.
CARSON D. STOUT.