May 15, 1934. F. BURCH 1,959,048

SPRING UNIT AND METHOD OF MAKING THE SAME

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Fig. 1.

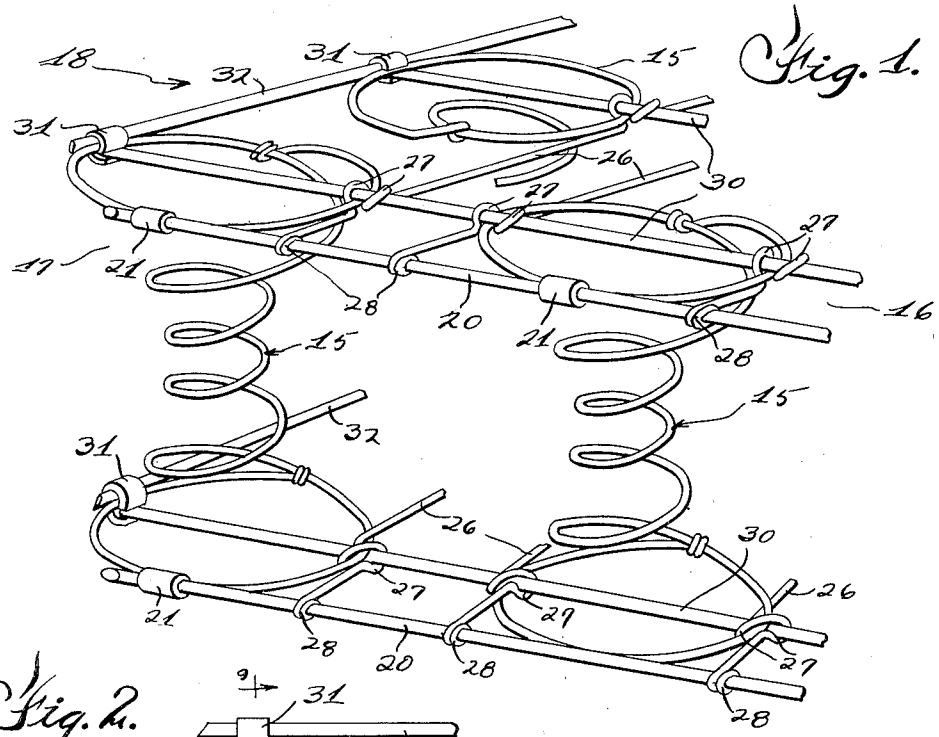
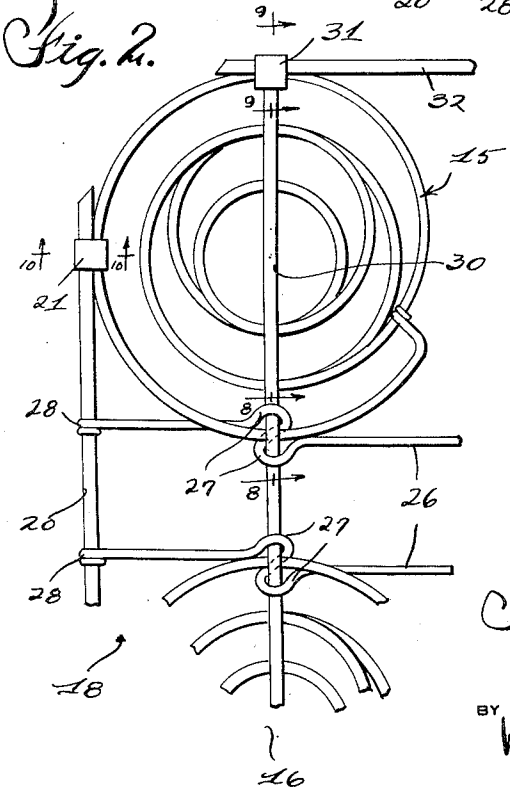


Fig. 2.



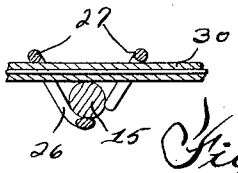


Fig. 8.

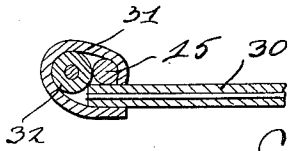


Fig. 9.

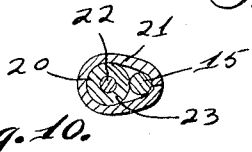


Fig. 10.

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Fig. 3.

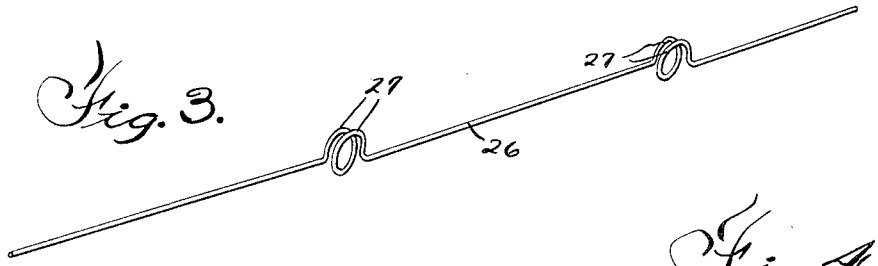


Fig. 4.

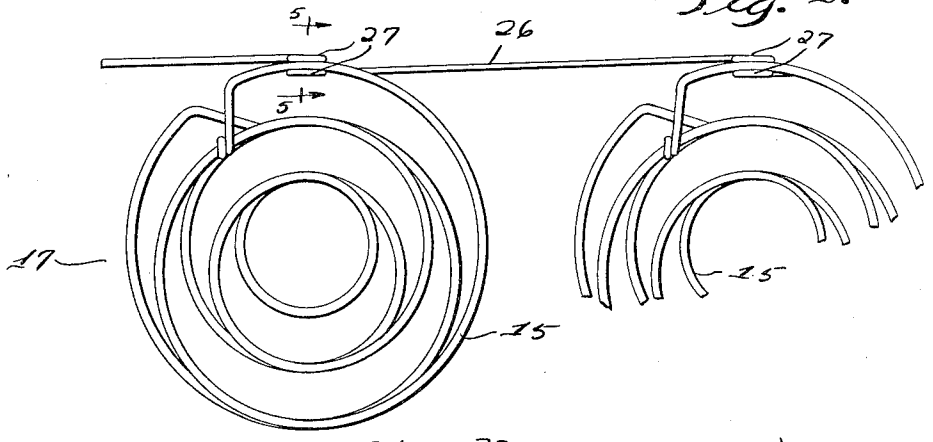


Fig. 5.

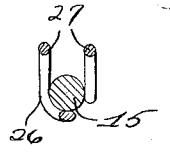


Fig. 6.

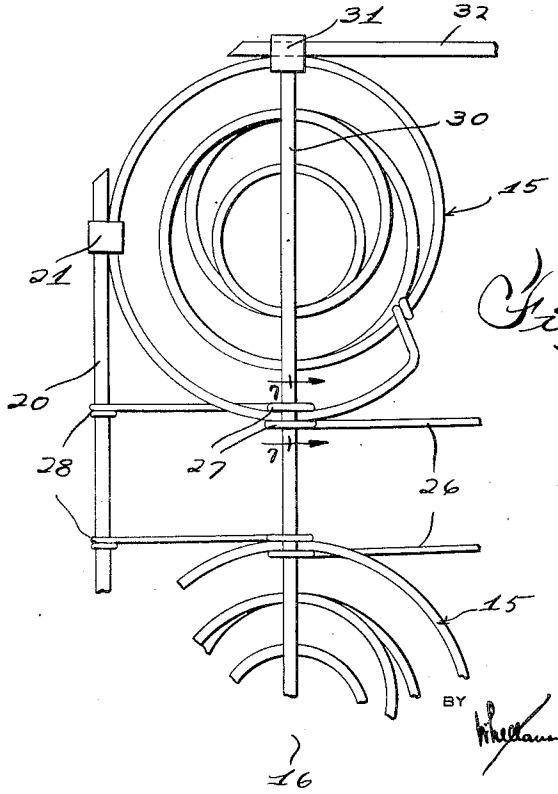
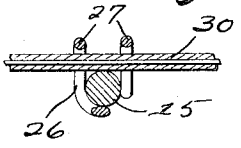


Fig. 7.



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Patented May 15, 1934

1,959,048

UNITED STATES PATENT OFFICE

1,959,048

SPRING UNIT AND METHOD OF MAKING THE SAME

Fred Burch, Milford, Mich.

Application August 18, 1930, Serial No. 476,181

9 Claims. (Cl. 5—277)

This invention relates to a spring unit and has particular reference to a method for fixing the individual springs of the unit against movement within the unit and to the structure produced by this method.

One of the primary objects of this invention is to provide a construction of the above mentioned character in which the individual springs forming a part of the unit will be firmly held in predetermined positions within the unit.

A further object of this invention is to provide an improved method of assembling a spring unit, which method may be economically carried out on a commercial scale.

Other objects and advantages of this invention will become more apparent as the following description proceeds, particularly when reference is had to the accompanying drawings wherein:

Figure 1 is a perspective view of a spring unit constructed in accordance with the teachings of this invention;

Figure 2 is a fragmentary plan view of the unit shown in Figure 1;

Figure 3 is a detail perspective view of one of the elements forming a part of the structure shown in Figure 1;

Figure 4 is a semi-diagrammatic plan view showing one step in the method of forming the spring unit;

Figure 5 is a sectional view taken substantially on the line 5—5 of Figure 4;

Figure 6 is a semi-diagrammatic plan view showing a further step in the method of forming the unit;

Figure 7 is a sectional view taken substantially on the line 7—7 of Figure 6;

Figure 8 is a sectional view taken substantially on the line 8—8 of Figure 2;

Figure 9 is a sectional view taken substantially on the line 9—9 of Figure 2; and

Figure 10 is a sectional view taken substantially on the line 10—10 of Figure 2.

Referring then particularly to the drawings wherein like reference characters designate corresponding parts throughout all views, there is shown in Figure 1 a plurality of coil springs 15 arranged in longitudinal rows 16 and transverse rows 17 to form a spring unit designated generally by the reference character 18. It is to be understood that any number of rows of springs may be assembled in a single unit, dependent upon the size of the unit desired, and it is to be further understood that the terms "longitudinal" and "transverse" are used in their relative sense only and are not indicative of the longer and shorter dimensions of the spring unit.

In assembling the spring unit the coil springs are first arranged in rows as above described and are temporarily held in position in these rows by any suitable form (not shown). Side border members 20 are then fixed to the tops and bottoms of the coil springs in the outer longitudinal rows by means of clips 21 which, as illustrated in Figure 10 of the drawings, may conveniently be strip metal members which are clamped around the border members and the end convolutions of the coil springs. The border members 20 may be formed of lengths of oil-tempered wire 22 covered by a suitable fiber covering 23 to form what is known as artificial reeds. These border members will thus maintain their flexibility and will not be permanently deformed by bending.

With the coil spring members in position within the spring unit and the side border members 20 fixed to the sides of the outermost longitudinal rows of coil springs, the next step in the method is to form the tie members 26. These tie members are preferably formed of lengths of wire coiled at a plurality of spaced points intermediate their ends to form pairs of adjacent convolutions or coils 27, there being one pair of convolutions formed in each tie member for each coil spring in each transverse row. The tie members are positioned at the top and bottom of the spring unit and the ends of these tie members are then coiled about the side border members 20, as indicated by the reference character 28, to fix the tie members adjacent the sides of the transverse rows of coil springs. Thus each tie member is fixed to extend transversely of the spring unit and is provided with a pair of convolutions which lies adjacent the top or bottom of each coil spring in each transverse row.

With the tie members in position as above described, these members are pressed upwardly or downwardly dependent upon whether they are at the bottom or top of the spring unit to engage the end convolutions of the coil springs between the convolutions 27 in the manner clearly illustrated in Figure 4 of the drawings. The tie members are then permitted to return to their original positions, with the result that the end convolutions of the coil springs will be embraced by the convolutions 27 of the tie members, these latter convolutions projecting beyond the convolutions of the coil spring in the manner clearly illustrated in Figure 5 of the drawings.

With the coils of the tie members engaged with the convolutions of the coil springs, additional tie

or anchor members 30, which are preferably in the form of artificial reeds similar to the side border members 20, are threaded longitudinally of the spring unit and through the coiled portions 27 of the tie members 26. The ends of these tie members 30 are preferably fastened by clips 31 to end border members 32, the clips 31 serving also to fasten the end border members to the end convolutions of the springs in the outermost transverse rows, as clearly illustrated in Figures 1 and 9 of the drawings.

With the anchor members threaded through the coiled portions of the tie members, it will be noted that the end convolutions of the coil springs will be positioned between the anchor members and the tie members in the manner clearly illustrated in Figure 6 of the drawings. The coils 27 of the tie members are then spread apart by any suitable tool (not shown) to substantially the position shown in Figure 2 of the drawings, with the result that these coils will draw the end convolutions of the coil springs into firm engagement with the anchor members and will also bitingly engage the anchor members. Thus with the coils 27 spread apart the end convolutions of the coil springs 15 will be fixedly connected to the anchor members 30 and the tie members 26.

From the above it will be apparent that the invention provides a spring unit in which coil springs are fixedly held in position within the spring unit. The invention provides tie members having coiled portions arranged to embrace the end convolutions of the coil springs and provides anchor members which extend through the coiled portions of the tie members and which cooperate with these coiled portions, when the latter are spread apart, to clamp the end convolutions of the coil springs in position. It will be noted that the method consists of a plurality of simple steps which may be economically carried out on a commercial scale, and it will be found that the spring unit produced by the method will be sturdily constructed and capable of withstanding any normal use to which it may be subjected.

While the invention has been described with considerable detail, it is to be understood that the description is for the purpose of illustration only and that the right is reserved to make such changes in the details of construction and the steps of the method as will fall within the purview of the attached claims.

What I claim as my invention is:

1. In a spring unit, a coil spring, a tie member for said coil spring having convolutions intermediate its ends providing adjacent spiral coils embracing a convolution of said coil spring, and a second tie member angularly arranged relative to said first mentioned tie member and threaded through the convolutions thereof, the second tie member cooperating with the coils of said first mentioned tie member to embrace the convolutions of said coil spring and the convolutions of said first mentioned tie member being spread to clampingly engage said second mentioned tie member.

2. In a spring unit, a row of coil springs, a tie member adjacent one side of said row of coil springs, said tie member having coiled portions at spaced points throughout its length embracing convolutions of said coil springs, and anchor members extending transversely of said row of coil springs and through the coils of said tie member, the coils of said tie member being spread to engage the said anchor members whereby the tie member and anchor members cooperate to clamp the embraced convolutions of said coil springs.

3. In a spring unit, a row of coil springs, a tie member at each side of said row of coil springs, each of said tie members being provided with a pair of convolutions adjacent each coil spring, each pair of convolutions of each tie member embracing a portion of the end convolution of each adjacent coil spring, and additional tie members angularly arranged relative to said first mentioned tie members and engaging the convolutions thereof, the convolutions of said first mentioned tie members being spread to engage said additional tie members and said additional tie members cooperating with the first mentioned tie members to clamp the embraced portions of said coil springs.

4. Those steps in the method of assembling a spring unit which consist in forming a pair of adjacent coils in a tie member, clampingly engaging said pair of coils with a convolution of a coil spring, inserting a second tie member through the coils of said first mentioned tie member and effecting relative displacement between the coils of said first mentioned tie member and the second mentioned tie member whereby said tie members cooperate with each other to clamp the engaged convolution of the coil spring.

5. Those steps in the method of fixing a coil spring in position in a spring unit which consist in forming a pair of adjacent coils in a tie member intermediate the ends thereof, fixing said tie member adjacent its ends to said spring unit with the coils thereof adjacent the said coil spring, positioning the end convolution of the coil spring between the coils of said tie member, threading a second tie member through the coils of said first mentioned tie member in such a manner that the two tie members embrace a portion of the end convolution of the coil spring, and spreading the coils of said first mentioned tie member to cause the same to grip the said second mentioned tie member and to cause said tie members to clamp the embraced portion of the convolution of the coil spring.

6. The method of forming a spring unit which consists in positioning a plurality of coil springs in longitudinal and transverse rows, fixing side border members to the end convolutions of the outermost longitudinal rows of said coil springs, forming tie members with pairs of coils at spaced points intermediate their ends, fixing the ends of said tie members to the said border members with each pair of coils in each tie member adjacent the side of one of said coil springs in each transverse row, engaging each pair of coils in each tie member with the end convolution of the coil spring to which it is adjacent, threading additional tie members through the coiled portions of the first mentioned tie members, and spreading the coils of the first mentioned tie members to cause the same to clampingly engage the second mentioned tie members and to draw the end convolutions of the coil springs into firm engagement with the second mentioned tie members.

7. In a spring unit, a coil spring, a tie member for said coil spring having convolutions intermediate its ends providing connected adjacent coils embracing a convolution of said coil spring with the connecting portion between said adjacent coils disposed on one side of the embraced portion of the convolution of the coil spring, and a second tie member extending through the coils of said first mentioned tie member and disposed on the side of the portion

of the convolution of the coil spring embraced by said coils opposite from the side thereof on which the connecting portion between said coils is disposed, the coils of said first mentioned tie member being spread to clampingly engage the second mentioned tie member and to cooperate therewith to rigidly clamp the engaged portion of the convolution of said coil spring.

8. The method of anchoring a coil spring in a spring unit which consists in forming a tie member with a pair of coils at a point intermediate its ends, engaging said pair of coils with the end convolution of the coil spring, threading an additional tie member through the coiled portion of the first mentioned tie member, and spreading the coils of the first mentioned tie member to cause the same to clampingly engage the second mentioned tie member and to draw the end convolution of the coil spring engaged thereby into firm engagement with the second mentioned tie member.

9. The method of anchoring a coil spring within a spring unit which consists in forming a tie member with a pair of coils intermediate its ends disposed on an axis angularly arranged relative to the longitudinal axis of the tie member, engaging the pair of coils in the tie member with a portion of one of the convolutions of the coil spring, threading a second tie member axially through the coils of the first mentioned tie member, and spreading the coils of the first mentioned tie member to cause the same to clampingly engage the second mentioned tie member and to draw the engaged convolution of the coil spring into firm engagement with the second mentioned tie member.

FRED BURCH.