No. 611,131. Patented Sept. 20, 1898.

J. P. LEGGETT.

MANUFACTURE OF SPRING BOTTOMS.

(Application filed Dec. 4, 1897.)

(No Model.) 3 Sheets—Sheet 1.

FIG. 1.

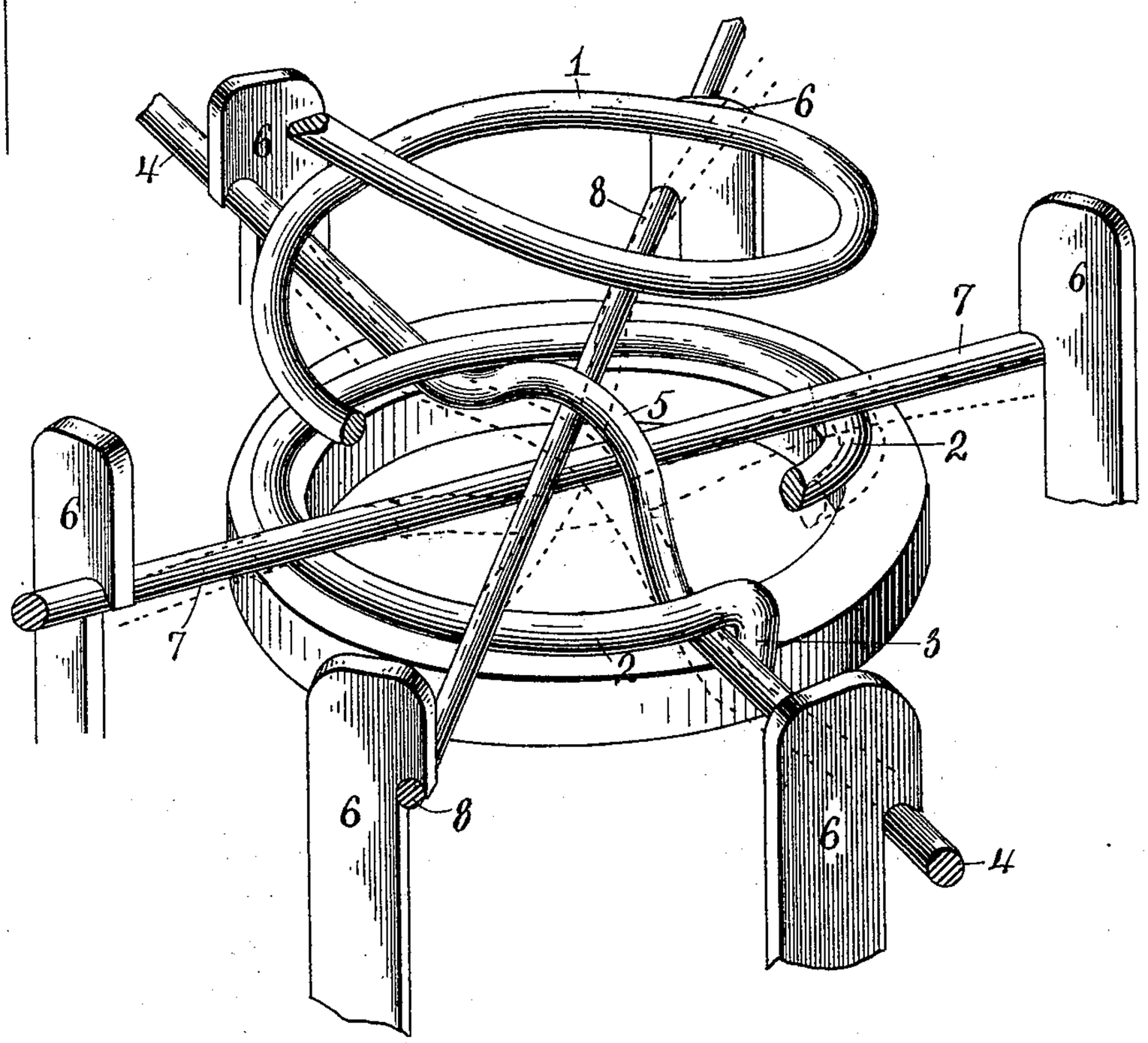

FIG. 3.

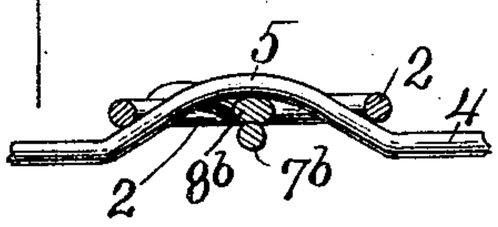

FIG. 2.

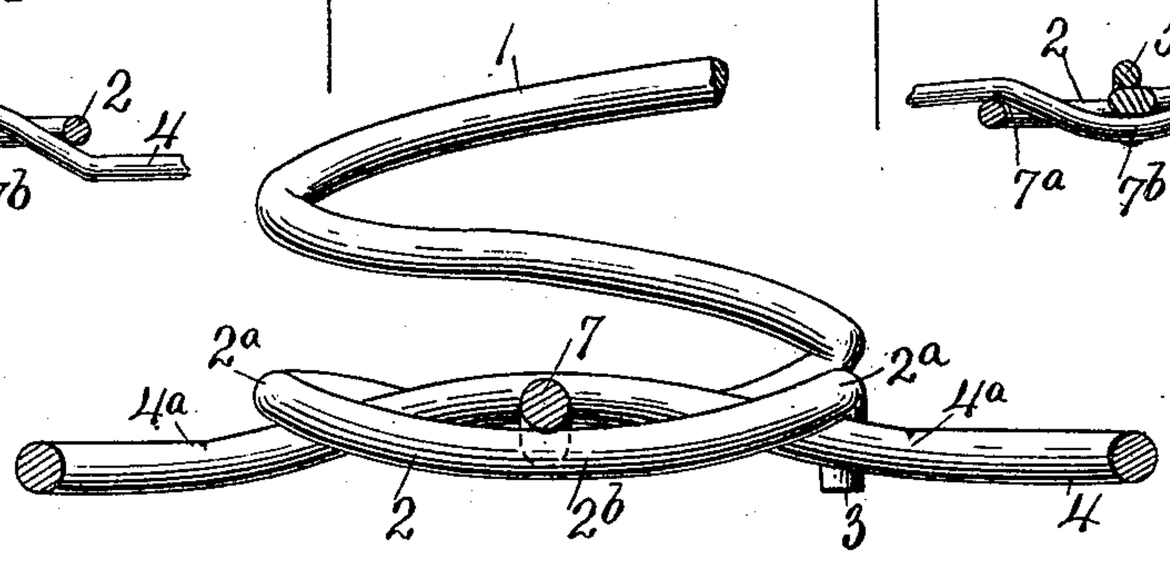

FIG. 4.

FIG. 5.

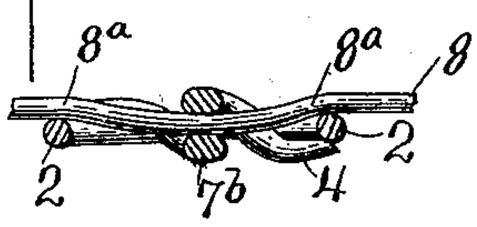

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FIG. 6.

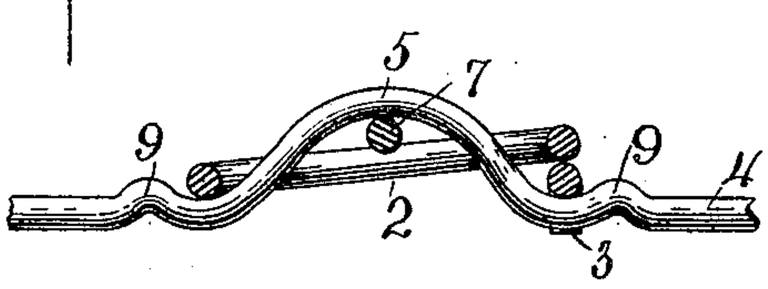

FIG. 7.

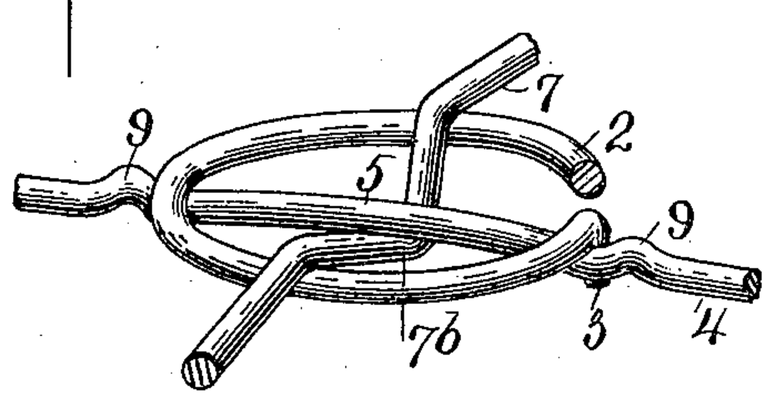

FIG. 8.

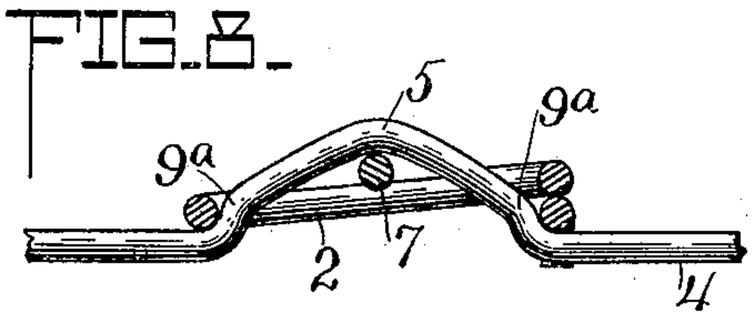

FIG. 10.

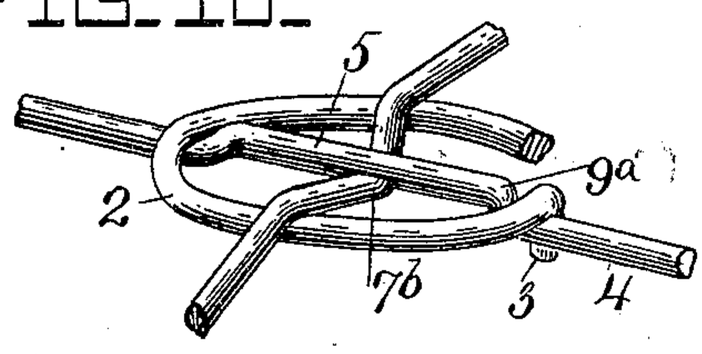

FIG. 9.

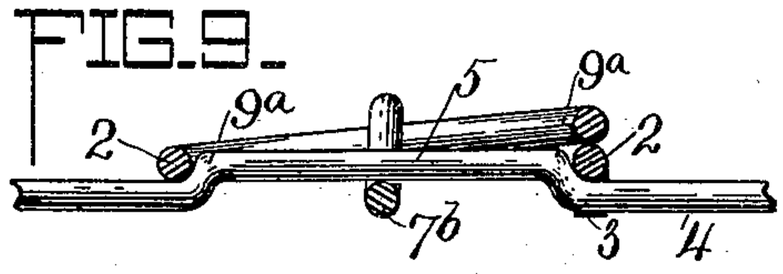

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FIG. 11.

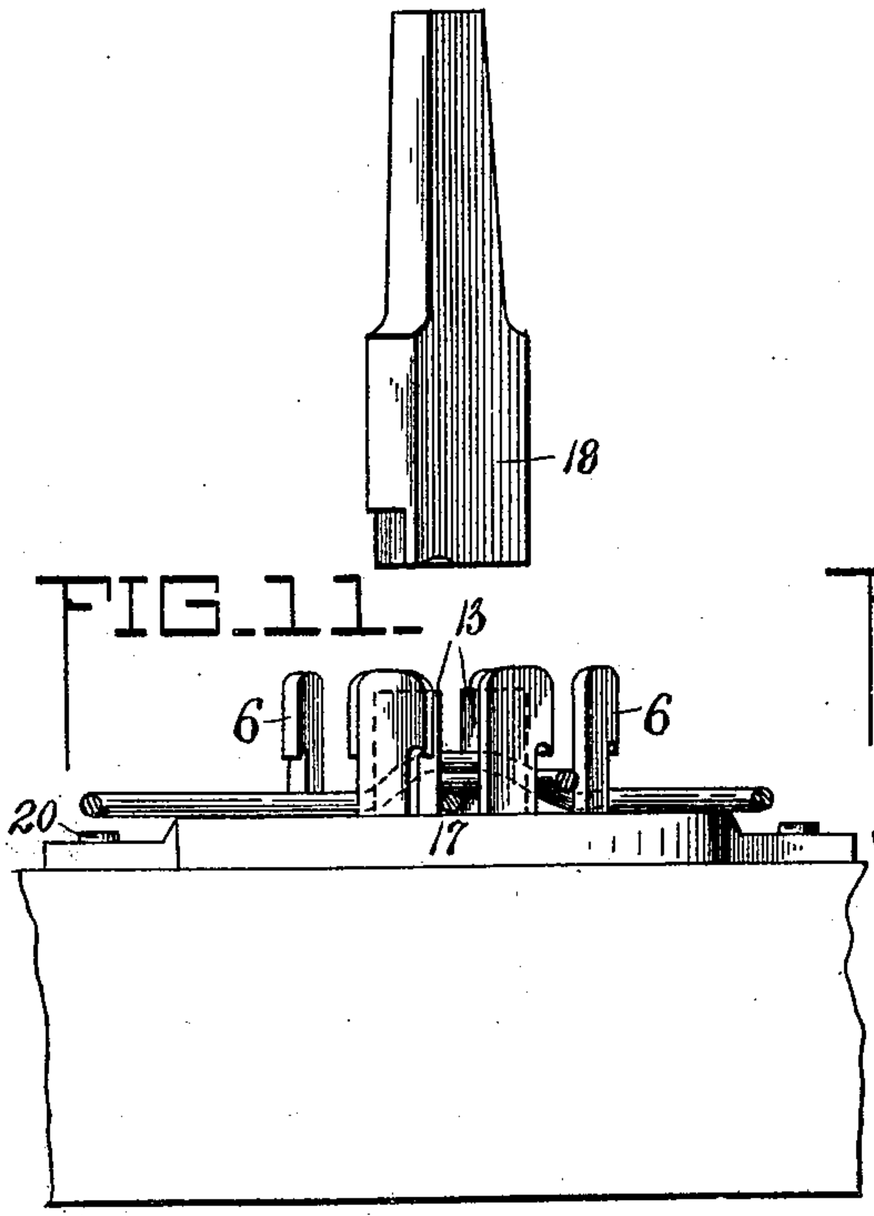


FIG. 12.

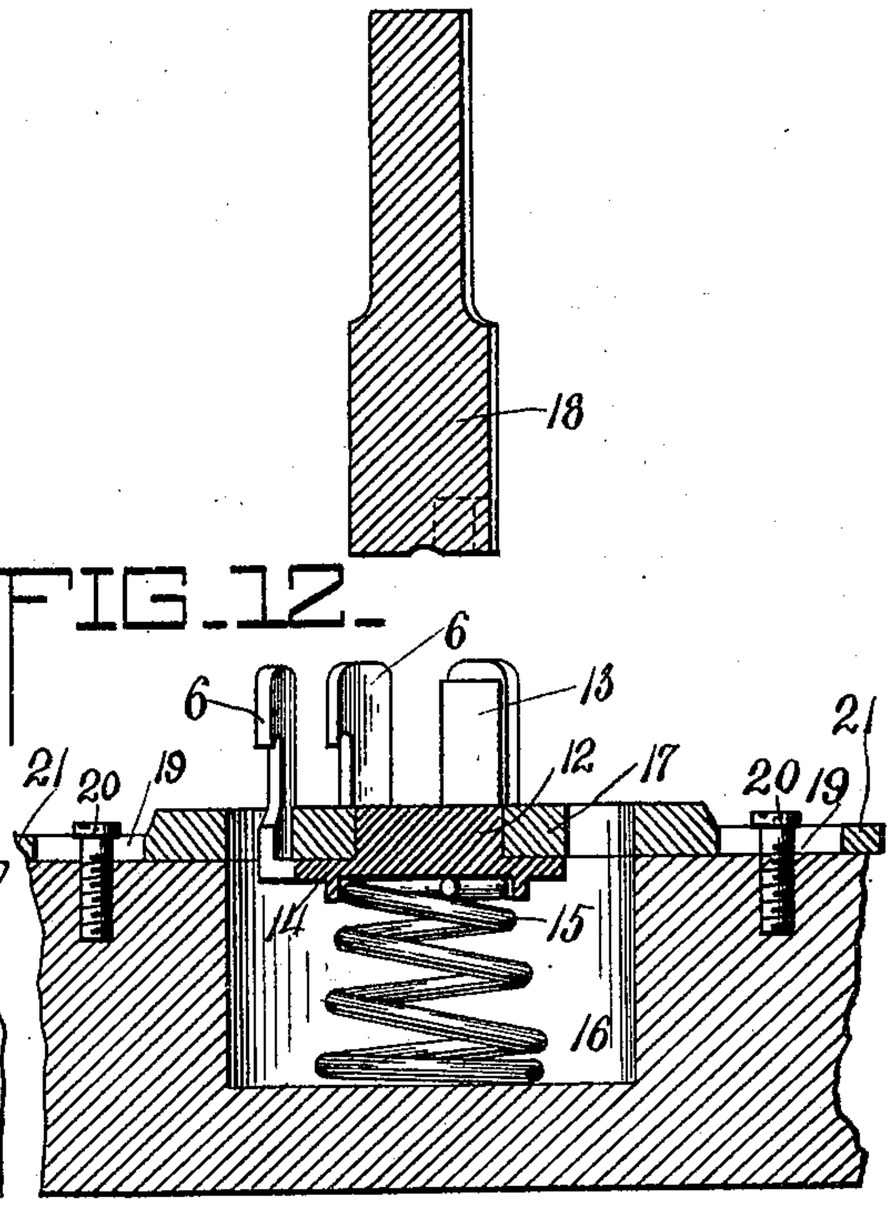


FIG. 13.

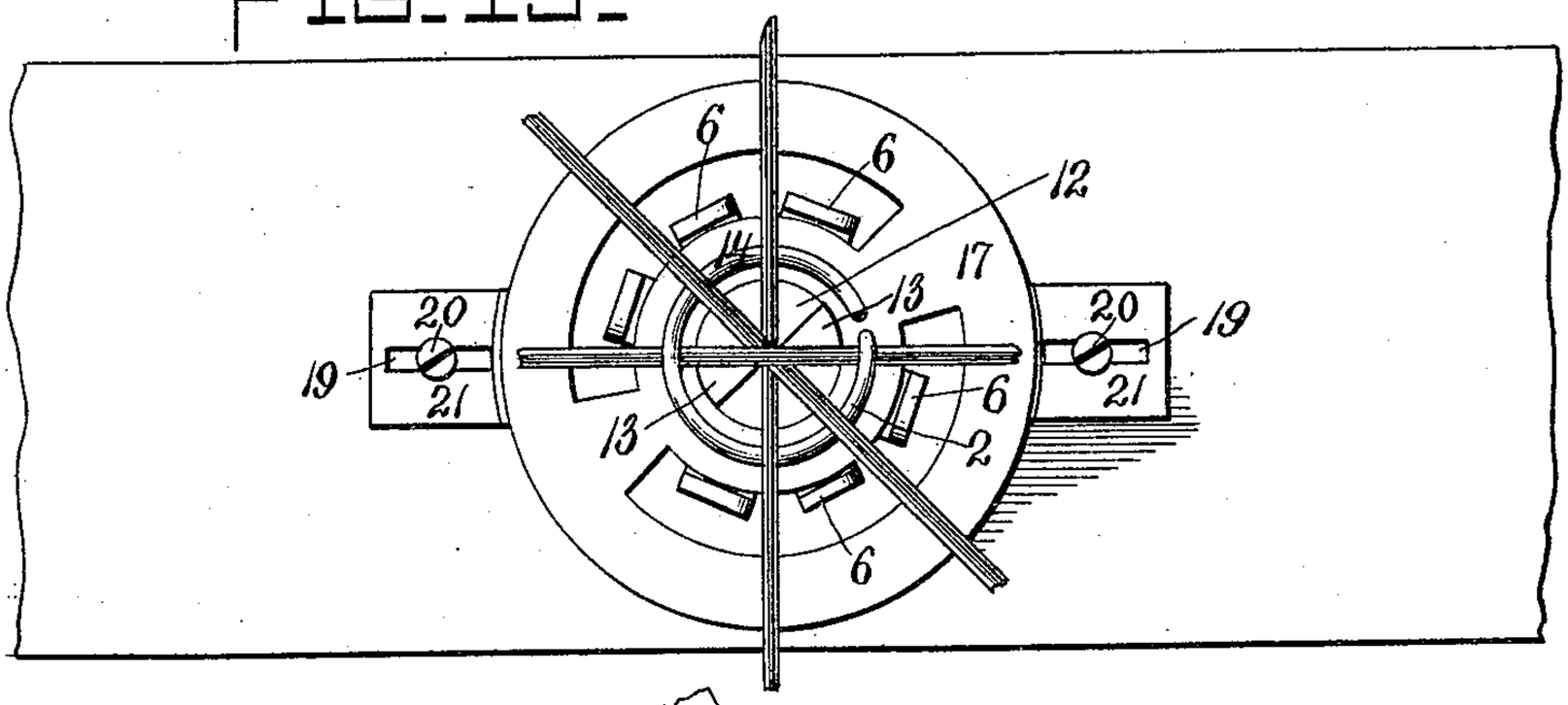
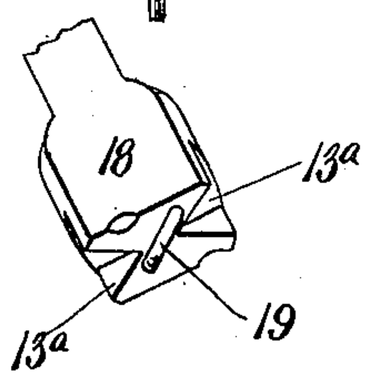


FIG. 14.



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UNITED STATES PATENT OFFICE.

JOSEPH P. LEGGETT, OF CARTHAGE, MISSOURI.

MANUFACTURE OF SPRING-BOTTOMS.

SPECIFICATION forming part of Letters Patent No. 611,131, dated September 20, 1898.

Application filed December 4, 1897. Serial No. 660,780. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH P. LEGGETT, a citizen of the United States, and a resident of Carthage, in the county of Jasper and State of Missouri, have invented certain new and useful Improvements in the Manufacture of Spring-Bottoms, of which the following is a specification.

The invention relates to the manufacture of nested springs for forming the bottoms of beds, chairs, or other articles of furniture; and the objects of my invention are to improve the articles of manufacture, as well as the manner of making it, whereby a better construction may be more conveniently and cheaply produced.

My invention will be fully understood upon reference to the accompanying drawings, in which—

Figure 1 is a perspective view illustrating that part of my present improvement which relates to the improvement in the art of attaching springs to their securing-wires. Fig. 2 is a fragmentary view of a spring and the wires interwoven therewith. Figs. 3, 4, and 5 are sections through the attaching-coil of a spring and the interlocking wires, taken, respectively, in the planes of the arched wire, the straight wire, and the diagonal brace-wire, each of said views showing the positions of and the effect upon the wires resulting from compression of the arch. Figs. 6 and 7 are perspective views illustrating a form of attachment employing supplemental kinks or shoulders and showing the positions of the parts before and after compression. Figs. 8 and 9 are similar views showing the use of internal shoulders or kinks. Fig. 10 is a perspective view of the parts shown in Fig. 9. Figs. 11, 12, and 13 are respectively a side elevation, a vertical axial section, and a plan of one of the machine elements employed for making the connections of the springs to their retaining-wires. Fig. 14 is a perspective view of the tool employed for making the compression.

Referring to Figs. 1 to 5, 1 represents a volute or coil spring provided with an attaching-coil 2, which terminates in a downwardly-projecting end 3.

4 is one of the series of parallel arched wires forming one of the main wires of attachment, and which wires are provided with a previously-formed arch 5 at each point along their length where it is desired to locate a spring.

In assembling the parts previously to interlocking them the arched wires 4 are arranged so that their arches will rest upon suitable platens or anvils upon which they may be subsequently compressed. The springs are then placed over the arches. The transverse straight wires 7 are then put in place, so that they pass above the attaching-coils 2 and beneath the arches 5. Diagonal bracing-wires 8, if used, are then introduced in a manner similar to the wires 7. Securing-hooks 6 are then brought into engagement with all the wires on opposite sides of the anvil or platen. A suitable tool is then applied to the arch 5 and vertical pressure put upon it sufficient to compress the arch and force its sides outwardly against the attaching-coil until said coil assumes the position on the arch shown by Fig. 2 and in dotted lines in Fig. 1. When the coil is in this position, it cannot be moved relatively upon the arch, as would be the case if it rested upon flat portions of the wire 4 or at the ends of the arch 4^a. By the act of compression the straight wires 7 and 8 are deflected, as shown in Figs. 4 and 5, and each is kinked at the point where it crosses the attaching-coil. The kinks of the wire 7 may be seen at 8^a in Fig. 5. A further effect of compression is to kink the wires 7 and 8 until they form locking-links 7^b and 8^b where they cross the arch, this fact securing them against longitudinal displacement. A further effect of the compression is to permanently deflect the attaching-coil 2, so as to form depressions 2^b where it passes beneath the wire 7 and upward bends 2^a where it passes over the arched wire 4. This secures the spring firmly against turning upon the interlocking wires with which it is interwoven. A further advantage resulting from compression of the wires and attachment of the springs in the manner described is that each kink, deflection, or seat which is formed in the parts results from pressure of the intersecting parts and necessarily occurs precisely where it is desired, and the parts are made to fit together in a manner which it is impossible to equal when the wires are bent previous to interweaving

them with the coils. Moreover, the interlocking arrangement which I employ cannot possibly be accomplished by previously bending the parts into the forms which they assume under compression, as above described. When it is desired to more fully compress the arch to reduce it to a substantial straight form—as, for instance, when a greater depression of the wire 7 is desired—I may provide for holding the attaching-coil against displacement on the wire 4 by forming said wire with supplemental kinks or shoulders 9, as shown in Fig. 6, which after compression will assume the position on the outside of the attaching-coil shown in Fig. 7, the coil being expanded by the compression action, as shown in dotted lines in Fig. 1; or these shoulders may be on the inside of the attaching-coil, as shown at 9^a in Fig. 8, and they will assume the relation to the attaching-coil after compression shown in Figs. 9 and 10.

Referring now to Fig. 12, which illustrates one of the series of devices which go to make up the attaching-machine, 12 is a vertically-yielding anvil upon which compression of the arch takes place. 13 are horns projecting vertically from this anvil and so located as to leave intersecting wire-channels between them and at the same time permit a limited rotation of the anvil without displacing the wires, as will be understood upon reference to the plan view, Fig. 13. 6 represents the engaging means for holding the wires straight while compression is taking place. These are in the form of hooks, which are connected by a base-plate 14 with the anvil 12, so as to be depressible with said anvil, and the whole is held normally in elevation by means of a spring 15, located in the well 16. By the limited rotation of the anvil referred to the retaining-hooks are moved into and out of engagement with the wires. 17 is a fixed seat surrounding the anvil and upon which the attaching-coil of the spring rests. 18 represents the compressing-tool, which has in its head sockets 13^a to receive the horns 13 and a slight depression 19, which receives the arch when compression is taking place. 20 represents screws which engage in slots 19 of a bed-plate 21, so as to secure the compressing device in place, while at the same time permitting its longitudinal adjustment.

The operation of this device is as follows: The arched wires are placed in position and the compressing device adjusted, so that an arch projects in the wire-passage of each anvil. Springs are then placed in position over the arches, being centered by the projecting horns 13 and allowed to rest upon the fixed seat 17. The straight main wire and bracing-wire, if the latter is used, are then interwoven in the manner hereinbefore described. The anvil, with the securing-hooks, is then rotated to bring a hook into engagement with each wire as it projects beyond the fixed seat 17. Compression is then imposed upon the arch through the medium of the tool 13, the anvil 12 yielding as the tool is depressed. The arch is spread, as before described, the straight wire dipped and kinked, and the attaching-coil supported in fixed position on the seat 17. Where the coil rests upon the arched wire, it receives an upward bend, and where the straight wire passes over the coil said coil is forced down to the fixed seat. By this means I am enabled to produce the peculiar bends which I have heretofore described and which are the object of my invention.

In order that the spring may assume a vertical position after the interlocking wires and the attaching-coils have been pressed into final shape, I prefer to bevel the ends of the springs by giving the attaching-coil an angular set with relation to the axis of the spring, so that when said coil is finally bent to conform with the attaching-wires the bending will cause the spring to assume a vertical position rather than lean to one side, which would be the effect if the attaching-coil were made symmetrical with the rest of the spring in the first instance.

An important advantage of using diagonal wires in the form of securing-bottom that I employ is that each wire is firmly interlocked to the main wires at the location of each spring, and a very much more rigid structure is thereby secured than has heretofore been obtainable. The locking-points are brought so close together by this means that the stiffness of the bracing-wire itself comes into account in adding rigidity to the structure, which would not be the case if the wire was of any considerable length between securing-points. Moreover, engagement of the bracing-wire at the center of the spring and at two points where it crosses the attaching-coil further assists in preventing lateral or sidewise movement thereof.

I do not herein claim the machine for forming my new and improved connection, as the same forms the subject-matter of my copending application, Serial No. 660,781, filed of even date herewith.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. As an improvement in spring-bottoms for furniture, the combination of the volute spring and the cross bottom wires engaging on opposite sides of the coil of said spring; one of said wires being arched and kinked to form shoulders, and having its arch pressed down and the shoulders thereby brought into retaining engagement with the coil, and the other wire being deflected by pressure of the arch-wire to form retaining-kinks engaging the coil, substantially as explained.

2. As a new article of manufacture, a spring-bottom comprising volute springs, wires provided with arches projecting centrally into the respective springs and interlocking wires woven into the arched wires and attaching-coils of the springs; said arches and through

them the interlocking wires and attaching-coils being pressed down beyond the limit of permanent set until the arches are expanded against the attaching-coils, and interlocking wires are kinked to form retaining-seats therein at points of intersection between the wires and coils and the coils are pressed into conformity with both sets of wires; substantially as described.

3. As a new article of manufacture, a spring-bottom comprising volute springs, wires formed with arches projecting centrally into the attaching-coils of the respective springs and with shoulders located to engage the outer sides of the attaching-coil and interlocking wires interwoven with the attaching-coils and arches; said arches being pressed down until the engaging shoulders project on the outer sides of the attaching-coil and the interlocking wires are deflected to form seats engaging with the attaching-coils, substantially as herein explained.

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