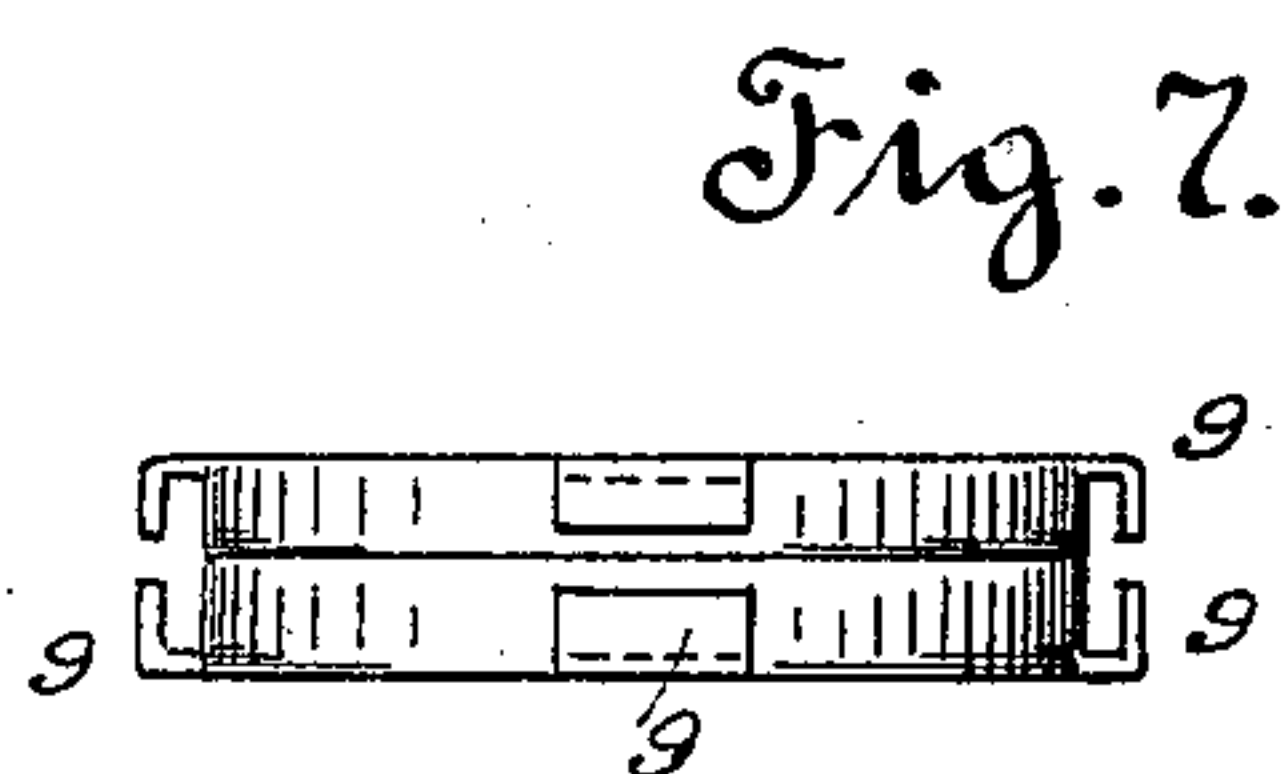
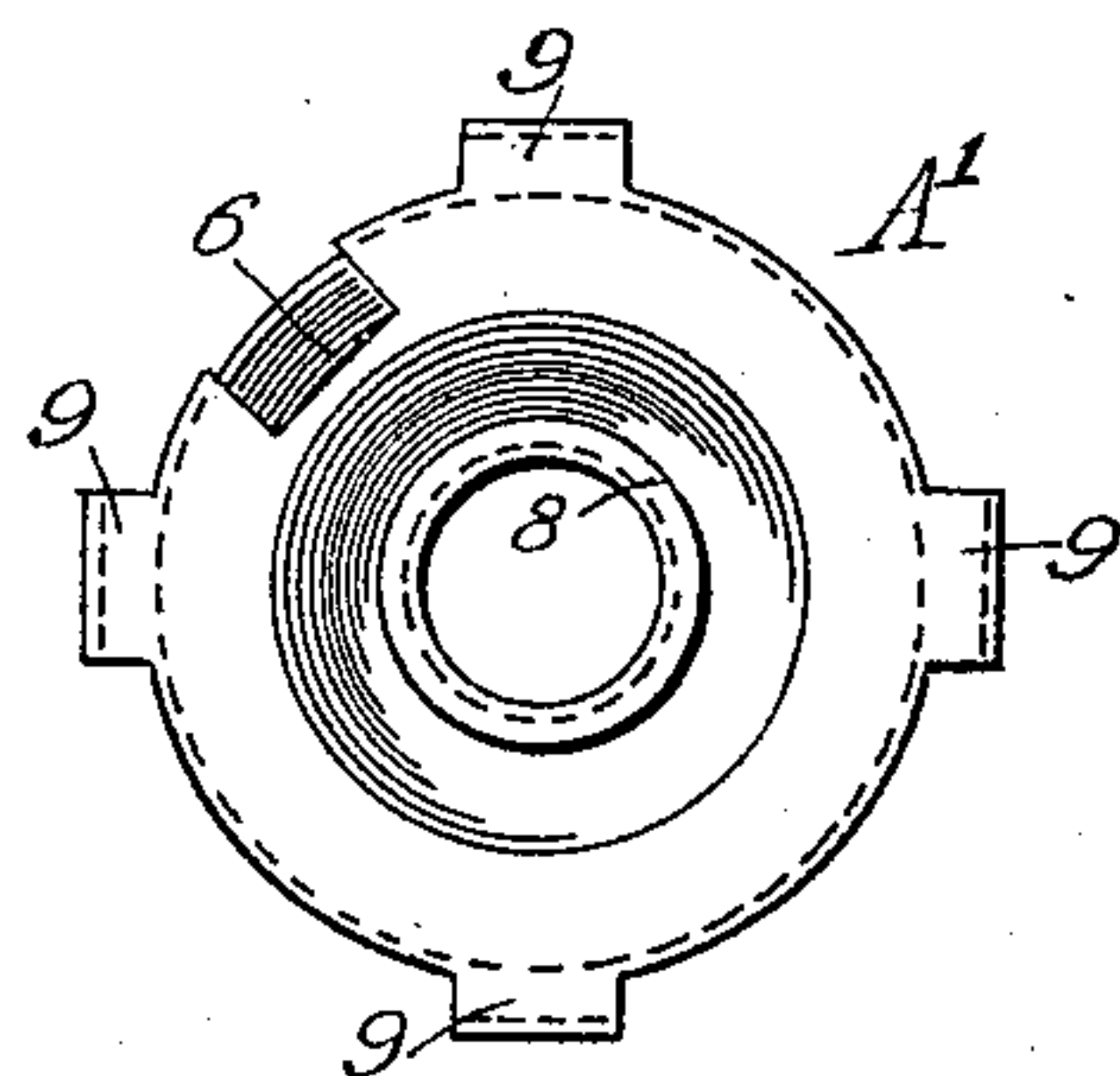
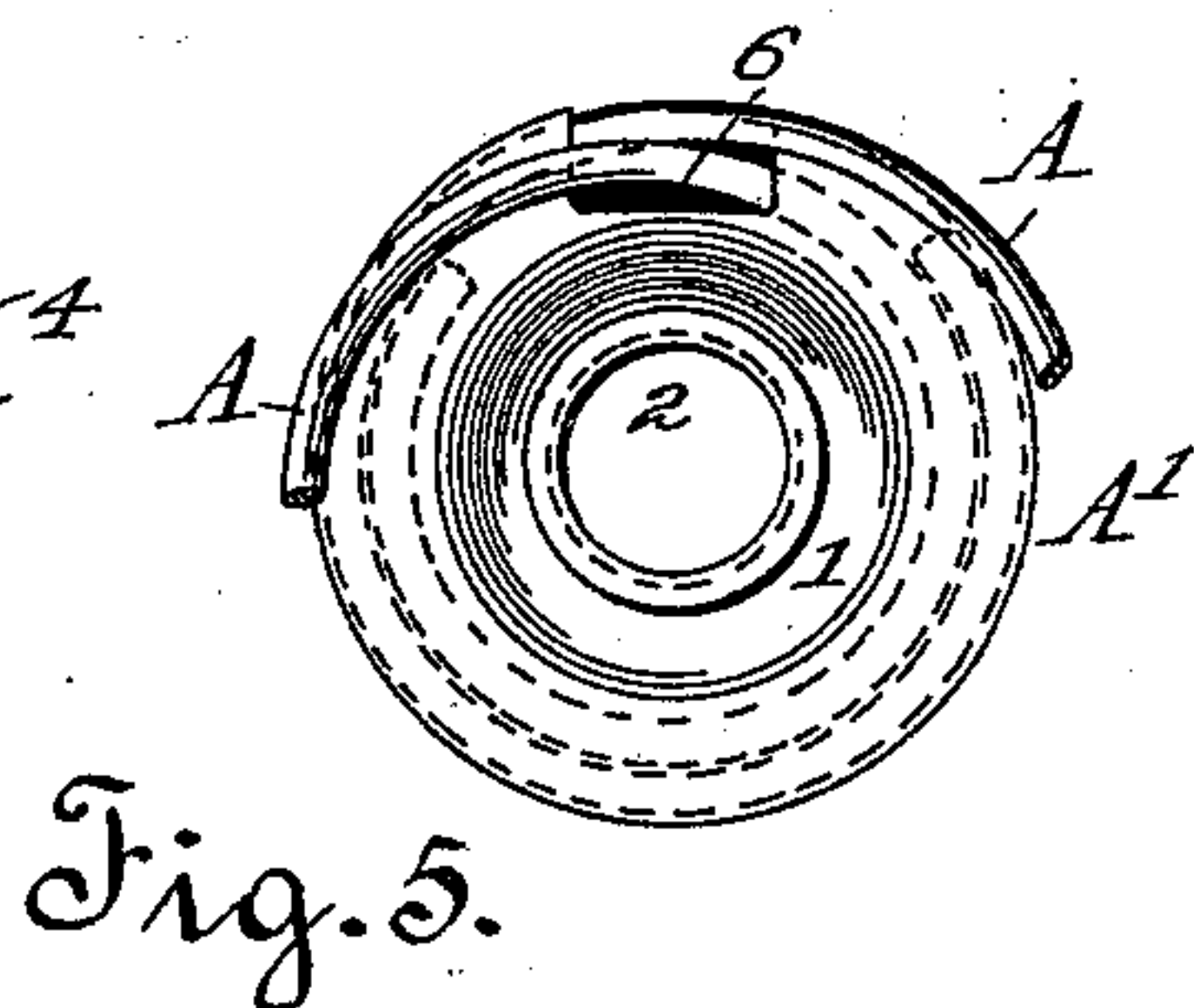
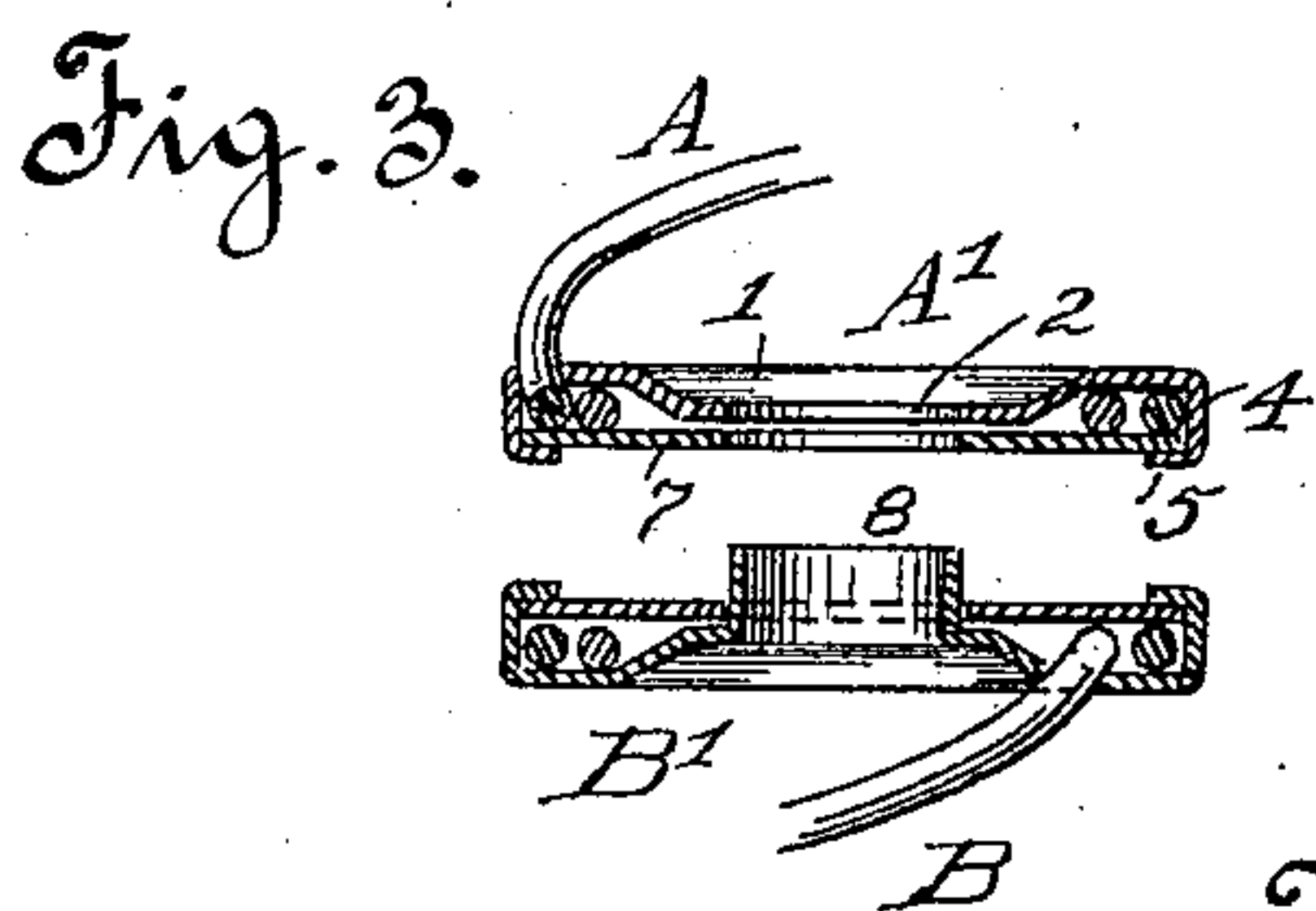
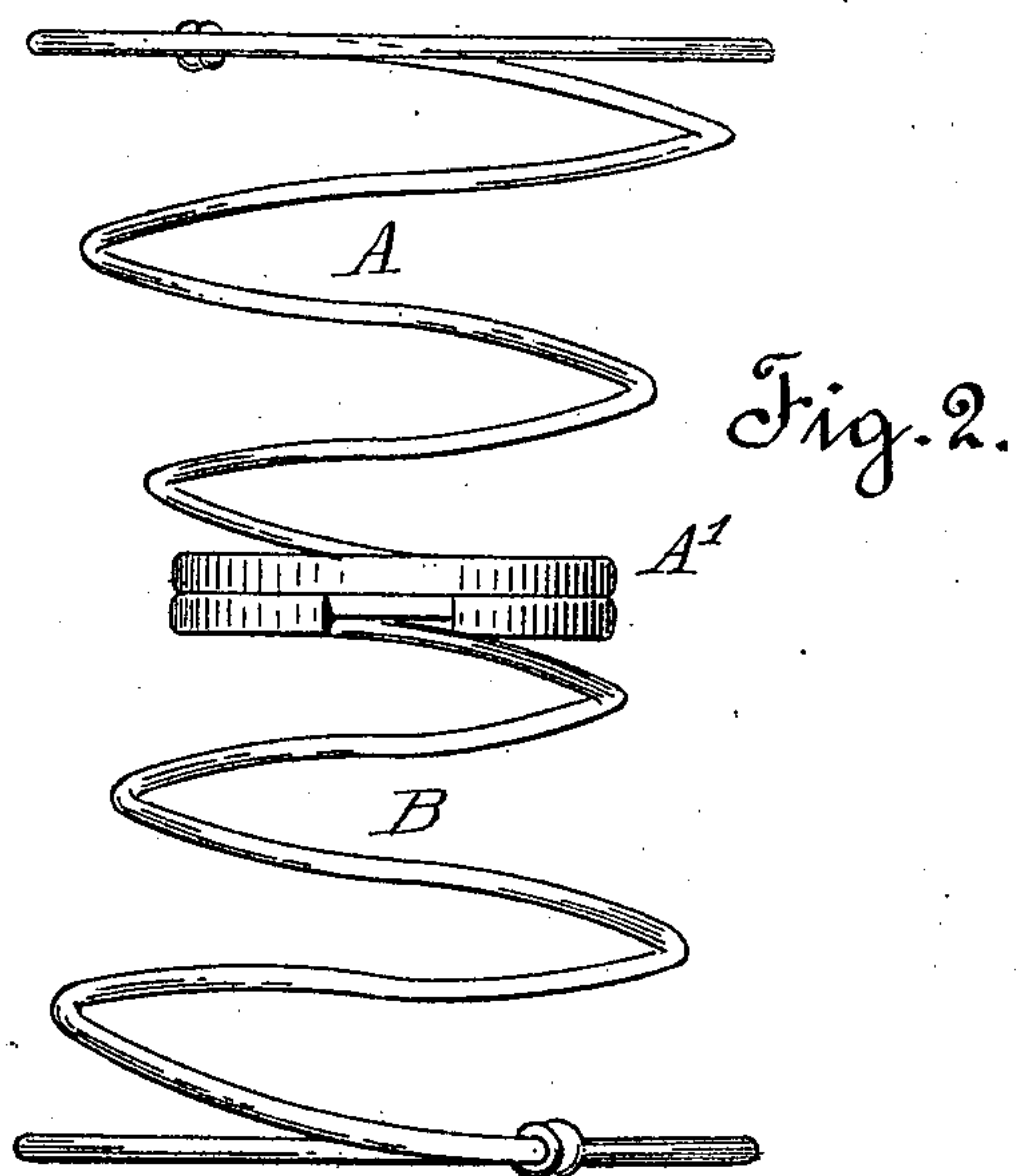
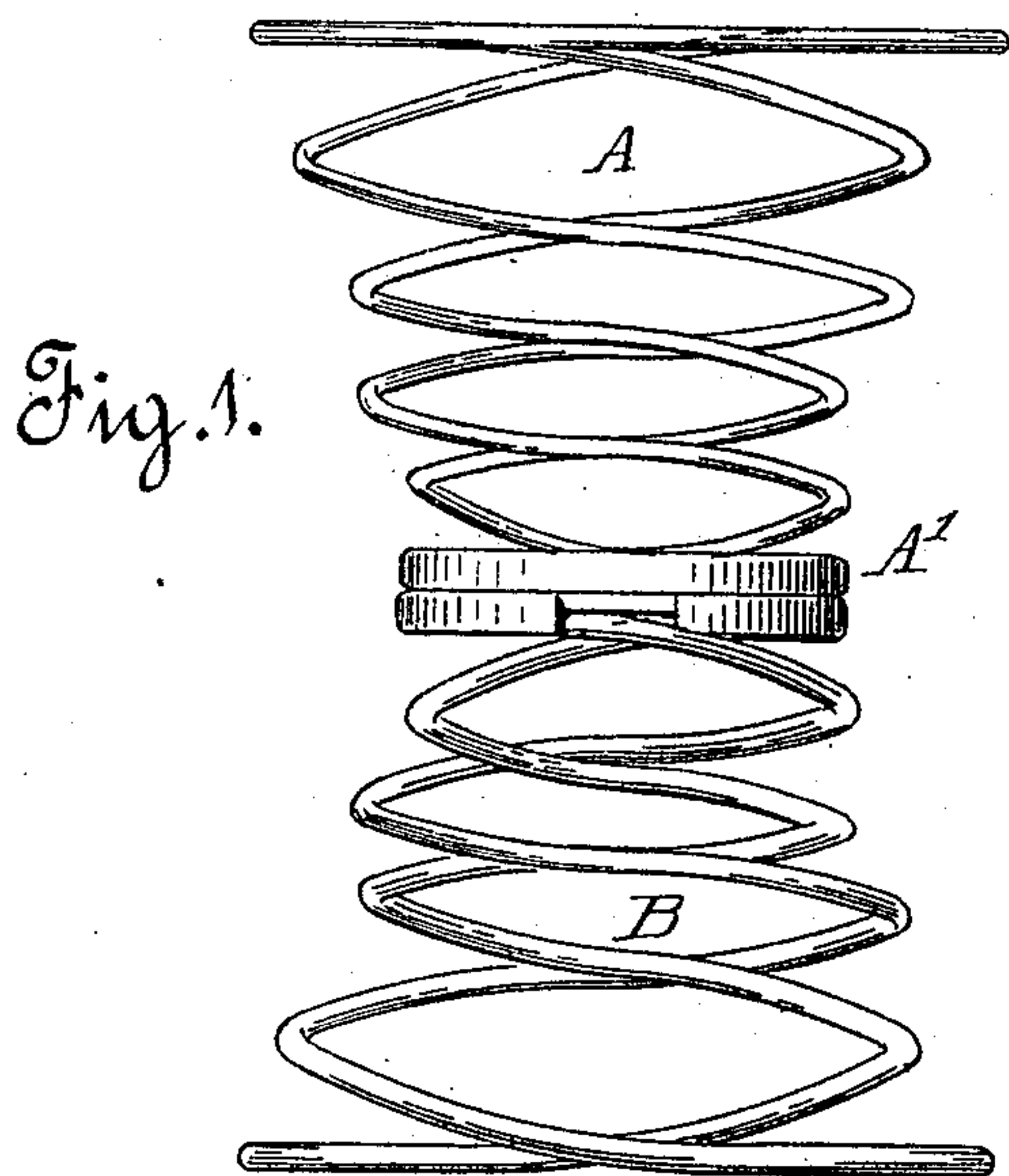


(No Model.)

H. O. CHASE.  
SPRING.

No. 582,412.

Patented May 11, 1897.



Witnesses.

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# UNITED STATES PATENT OFFICE.

HARRISON OTIS CHASE, OF SAN FRANCISCO, CALIFORNIA.

## SPRING.

SPECIFICATION forming part of Letters Patent No. 582,412, dated May 11, 1897.

Application filed September 1, 1896. Serial No. 604,523. (No model.)

*To all whom it may concern:*

Be it known that I, HARRISON OTIS CHASE, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Springs; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to coiled springs for various uses, including the support of bed-bottoms, seats, and other structures where an elastic support is necessary or desirable.

The object of my invention is to produce a spring composed of two coiled members connected together for use and which possesses particular advantages over a coil formed of a single member. The coils, being separately made in conical shape, can be nested for transportation, thus saving considerable room, and then assembled and secured together. The coils secured together are so braced and supported as to retain for a longer time the symmetrical shape given them in manufacture, and hence give a more permanent and even support to the structure which rests upon them. Further, the coils, being separate, can be made from wire of different gages, which renders the spring self-adjusting to different weights.

The construction in which I prefer to embody my invention, so as to insure these advantages among others, is fully hereinafter described, and is shown in the accompanying drawings, in which—

Figure 1 is a side elevation of a double spring composed of two members, each having two coils and secured together at the center, showing one embodiment of my invention. Fig. 2 is a similar elevation showing a spring composed of two members, each having a single coil and connected at the center in the same manner as shown in Fig. 1. Fig. 3 is a cross-section at the junction of the two springs of Fig. 1, but with the connecting devices separated. Fig. 4 is a similar view with the connecting devices secured together. Fig. 5 is a plan view of Fig. 4. Fig. 6 represents a modification in the connecting devices. Fig. 7 is a side view of the same.

My springs are in all cases composed of two coiled members A and B, secured together at their free ends, either directly or by means

of a separate connecting and securing device. Figs. 1 and 2 show different ways of composing the springs, the difference between them lying in the fact that in Fig. 1 each member A or B has a double coil, while the same members in Fig. 2 have single coils. By having each spring formed of two members in the cone shape shown the members separately manufactured can be nested for shipment, and thus save considerable room in transportation. When ready for use for a bed, seat, or any other structure to be made elastic, the two members are assembled and so secured together at their smaller diameters.

A' is a plate stamped or otherwise formed out of sheet metal into circular form. It is made with a depression 1, surrounding a central opening 2, and is provided with an up-turned rim 4 and flange 5. An opening 6 is formed at one side of the plate, which opening extends through the rim 4. The end of a single coil, Fig. 2, or both ends of a double coil, Figs. 1 and 3, extend through this opening (the latter in opposite directions) and lie beneath the plate in the space between the rim 4, the depressed portion of the plate, and a flanged washer 7, having a central opening, and which, in connection with the plate A', forms a receptacle for the wire. This plate forms the female part of the connection. The corresponding male part B' is similarly constructed to receive the coil or coils of the other member B of the spring, but is provided with a central rivet, stud, or eyelet 8, which enters the opening 2 and is turned down over its edge, Fig. 4, securing the two members firmly together and forming an inclosure for all the coils at that point. It also stiffens the complete spring against side and torsional strains and so tends to keep it symmetrical and perpendicular—that is to say, in its proper shape. For these reasons the effective life of the spring is prolonged and the structure or surface supported elastically by it is kept level and even for a much longer time than by the use of ordinary non-reinforced coils.

These springs may be used separately, either singly or in numbers, or, if desired, a number of them can be connected together, especially where a structure of considerable extent is to be supported. To provide for



this, I may provide integral lugs 9, formed integrally with the plates A' and B' and projecting from their edges, as shown in Figs. 6 and 7. These lugs are adapted to receive and  
 5 hold bands, strips, wires, or other connections which could be used to connect a series or number of springs to any desired extent, so that the whole elastic support will be tied and braced together in a simple and conven-  
 10 ient way.

By making each spring of two coiled members I am able to use wire of different gages for the upper and lower part, as illustrated in Fig. 1. As there shown the coil B, which  
 15 is supposed to be the lower coil, is of heavier wire than the upper coil A. By these means I provide a light and easy spring at the point where the weight is directly applied, combined with a heavier base-spring of greater  
 20 resistance. The whole spring therefore acts more uniformly under different weights and is really self-adjusting to all of such weights from the partial compression of the light spring to the complete compression of the  
 25 combined springs.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A spring composed of two independent  
 30 coiled members of differential tension relatively to each other in combination with a separate fastening device for connecting such coils together.

2. A spring composed of two independent  
 35 coils each composed of wire of a gage different from the gage of the wire composing the other, and connected together, substantially as described.

3. A spring composed of two separate coils  
 40 in combination with plates for inclosing and holding the ends of said coils, and means for securing said plates together, substantially as described.

4. A spring composed of two separate coils

of differential tension relatively to each other 45 in combination with plates for inclosing the ends of said coils, and means for securing said plates together, substantially as described.

5. A spring composed of two separate coils in combination with sheet-metal plates hav- 50 ing upturned rims and flanges, and provided with openings to admit the ends of the coils, and means for securing said plates together, substantially as described.

6. A spring composed of two separate coils, 55 in combination with a fastening device, consisting of a female member having upturned rim and flange and a central opening, and a male member having upturned rim and flange and a central hollow rivet, said members being 60 secured together, substantially as described.

7. In combination with two coiled members of a spring, a fastening device for connecting the same together, composed of separate plates each having an upturned rim and flange, to 65 partly inclose the ends of one of the said coils, a washer to complete the inclosure, and means for securing said plates together, substantially as described.

8. In combination with a coil-spring, a de- 70 vice for holding and securing the end thereof, consisting of a plate, having an upturned flanged rim and a central opening, a side opening, through which the coil extends, and a washer, all forming a complete inclosure for 75 the end of the coil, substantially as described.

9. In combination with a coil-spring composed of two members, secured together by connected plates secured to the ends of said members, lugs projecting from said connected 80 plates, substantially as described and shown.

In testimony whereof I have affixed my signature, in presence of two witnesses, this 25th day of August, 1896.

HARRISON OTIS CHASE.

Witnesses:

L. W. SEELY,

J. S. WALKER.