No. 871,589. PATENTED NOV. 19, 1907.

W. K. HITCHCOCK.

SPRING STRUCTURE.

APPLICATION FILED APR. 18, 1907.

Fig. 2.

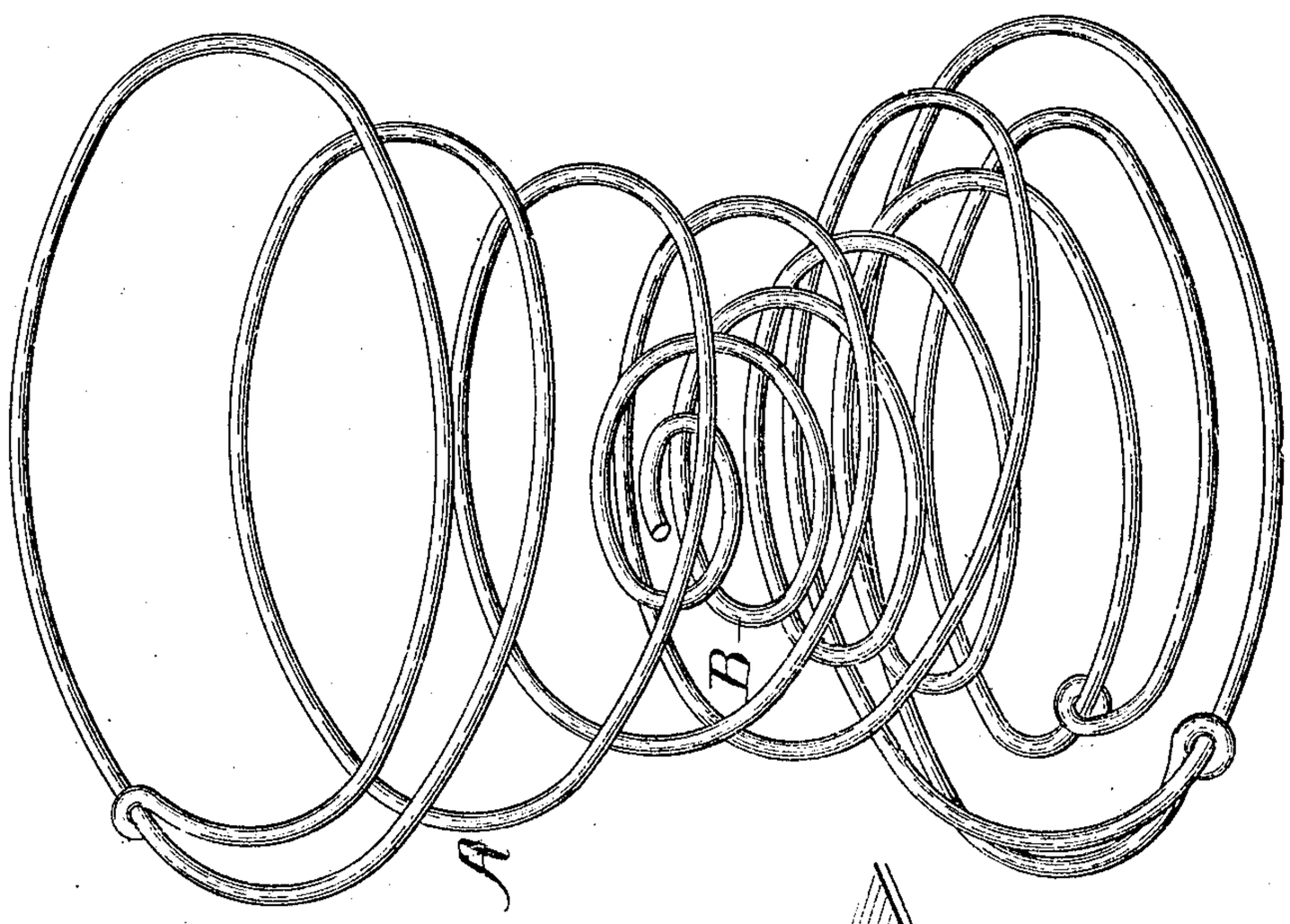
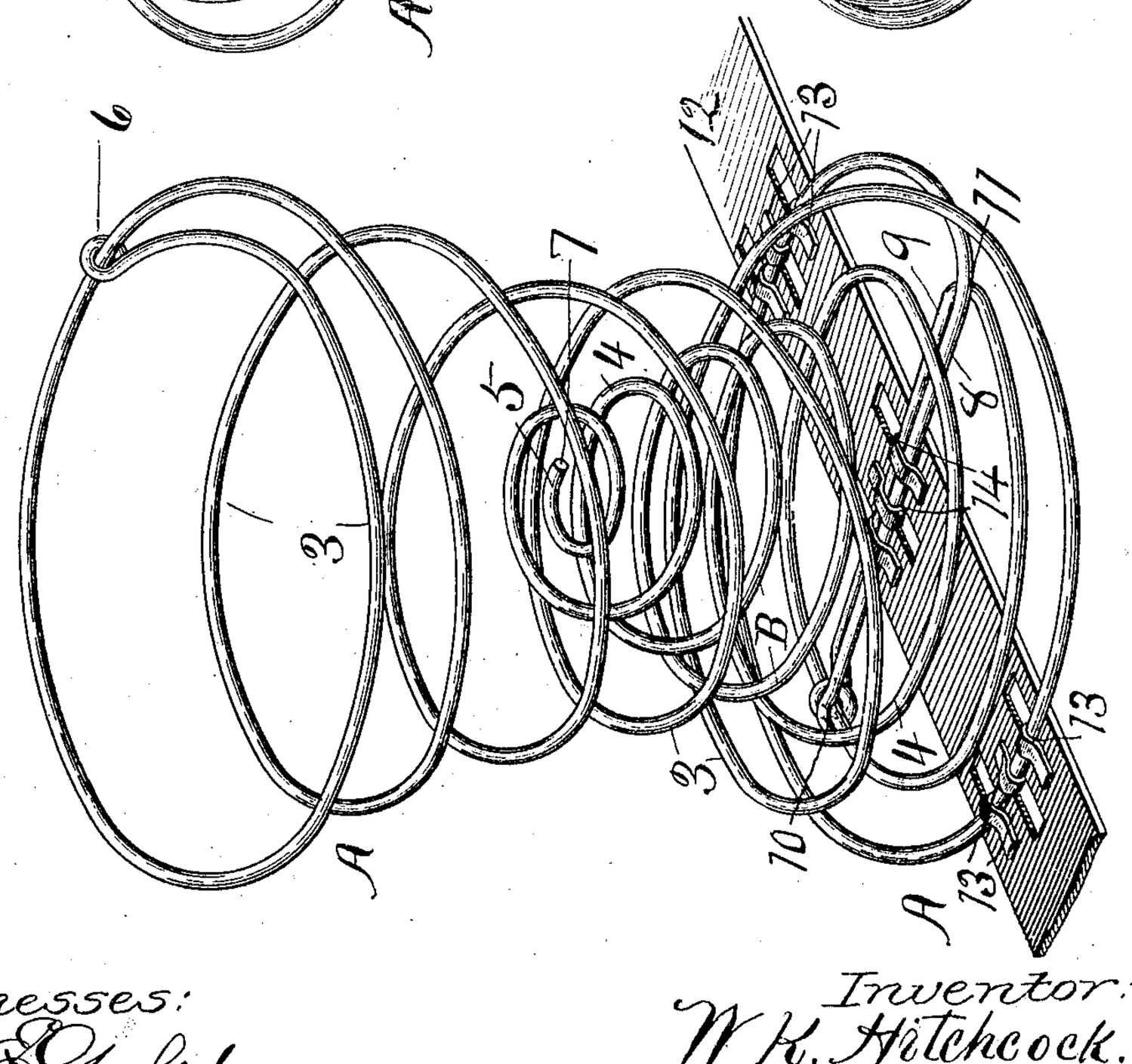


Fig. 1.



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UNITED STATES PATENT OFFICE.

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SPRING STRUCTURE.

No. 871,589. Specification of Letters Patent. Patented Nov. 19, 1907.

Application filed April 18, 1907. Serial No. 368,906.

To all whom it may concern:

Be it known that I, WILBUR K. HITCHCOCK, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Spring Structures, of which the following is a specification.

This invention relates to springs and more especially to that type or form of springs used in the manufacture of bed-bottoms, lounges, seat and other structures of a like character, as will be hereinafter set forth.

In the drawing, Figure 1 is a perspective view of a spring structure embodying the improved features; and Fig. 2 is a similar view embodying a modification.

The illustration shows a dual structure, combining a double helical spring A, and a conical or single helical spring B, inclosed by the former. The double helical spring is of the usual form, the coils or rounds 3 gradually diminishing in diameter from both ends to the center. The conical spring is located in the lower part of the inclosing helical spring and extends from the lower end to approximately the middle thereof, as shown. The coils 4 of the conical spring diminish in diameter from the outer end inward to the terminal conical free end coil 5. The difference in the diameter of the coils of the two springs is such that in compression the outside spring has a free movement without coming in contact with the coils of the inner spring.

As shown in Fig. 1, the double spring structure is composed of a single piece of wire, 6 representing the terminal end of the wire as applied to the helical part of the spring structure, and 7 the terminal end as applied to the conical part. In this one piece structure the junction of the springs is formed by bending the inside part of two bottom coils into straight parallel transverse rods 8 and 9, which are looped around the bottom coil of the conical part, as at 10 (Fig. 1) and then branch apart in opposite directions from the junction ends 11. It will be seen that the wire of which the compound spring is formed is directed at 9 from the terminus of the basal coil of the inner spring substantially diametrically across the base of that spring, then wrapped at 10 about the opposite side of said basal coil, directed back parallel to itself at 8, across the basal coil of the inner spring just behind the terminus thereof, adjacent 11, and finally merges into the terminus of the basal coil of the outer spring. In their working position, the springs are ordinarily seated on a holding plate 12 and are secured thereto by a number of clips 13 turned up out of the plate and clamped down over the base coils alternately in opposite directions in preventing lateral displacement. The straight parallel rod parts 8 and 9 are secured to the plate 12 and retained in their proper relative position by the clips 14.

Fig. 2 is a modification in that, the two springs are made separate and not integral as shown in Fig. 1. The functions are however the same, the difference merely relating to convenience in construction.

In operation, the initial pressure of the weight or load is first received by the inclosing helical spring until compressed enough to bring the inclosed spring into action as an auxiliary in strengthening and stiffening the helical spring and offering an increased resistance to the load to be carried and relieving the outside spring of a part of the load, thus increasing the durability of the spring structure and regulating the resilient action thereof in accordance with the load carried. The outside spring has both an independent and a joint action with reference to the inside spring.

Having thus described my invention, what I claim is—

1. A compound spiral spring formed of one piece of wire and consisting of an outer and longer spring and an inner and shorter spring, said wire being directed from the terminus of the basal coil of the inner spring substantially diametrically across the base of said spring, then wrapped about the opposite side of said basal coil and directed back parallel to itself to the terminus of the basal coil of the larger spring.

2. A compound spiral spring formed of one piece of wire and consisting of an outer and longer spring and an inner and shorter spring, said wire being directed from the terminus of the basal coil of the inner spring substantially diametrically across the base of said spring, then wrapped about the opposite side of said basal coil and directed back parallel to itself across said basal coil just behind the terminus thereof, and finally merging into the terminus of the basal coil of the outer spring.

3. In a spring structure, the combination with a support, of a compound spiral spring formed of one piece of wire and consisting of an outer and longer spring and an inner and shorter spring, said wire being directed from the terminus of the basal coil of the inner spring substantially diametrically across the base thereof, and then returned parallel to itself to the terminus of the basal coil of the outer spring, and fastening devices embracing such parallel portions and entering the support.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILBUR K. HITCHCOCK.

Witnesses:
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