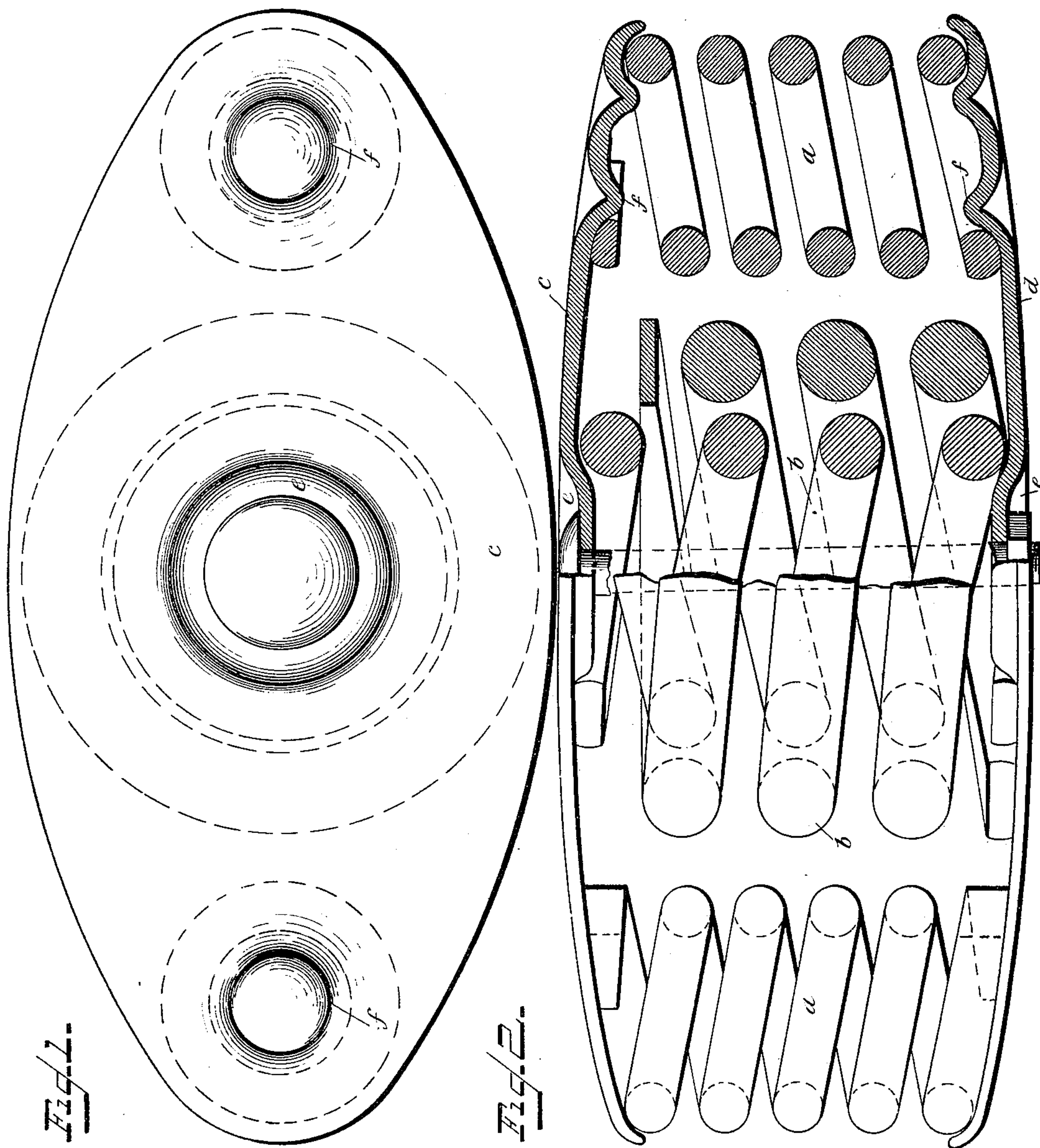


(No Model.)

C. T. SCHOEN.  
CAR SPRING.

No. 403,558.

Patented May 21, 1889.



WITNESSES.  
*F. L. Ouraud*  
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# UNITED STATES PATENT OFFICE.

CHARLES T. SCHOEN, OF PHILADELPHIA, PENNSYLVANIA.

## CAR-SPRING.

SPECIFICATION forming part of Letters Patent No. 403,558, dated May 21, 1889.

Application filed February 6, 1889. Serial No. 298,843. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES T. SCHOEN, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a certain new and useful Improvement in Car-Springs, of which the following is a full, clear, and exact description.

The object of this invention is to make the caps used in spiral springs for cars an elastic medium co-operating with the spiral springs in forming a resilient body to sustain the load.

To this end the invention consists in making the caps of wrought spring-steel, elliptical, curved, or convex in shape.

Heretofore, so far as I am aware, the caps for car-springs have been made of cast-iron, malleable iron, and lately of wrought-iron or low-carbon steel; but their only purpose has been to group the spirals together and to confine them in position. In one instance such caps have been made convex, and the stated object of so making them is to prevent the concaving or buckling of the caps as they are drawn tight about the spirals by means of the connecting-bolts. Such caps have been manufactured in the first instance as convex in shape and of wrought or sheet metal; but they are not in and of themselves sufficiently elastic to serve as springs or even as elastic auxiliaries to the spirals. They are designed to be applied to the spirals in their convex shape and then drawn down flat or into a right line by means of the bolts used for connecting or binding them and the spirals together.

In the accompanying drawings, illustrating my invention, in the two figures of which like parts are similarly designated, Figure 1 is a top plan view, and Fig. 2 a side view, half in section.

The spirals *a a* and *b b* may be of usual construction and arrangement, except as hereinafter specified. The caps *c* and *d* will be adapted in outline to the kind and number of spirals to be grouped to form a spring. The caps are provided with a cavity, *e*, to

receive the head and nut, respectively, of the connecting-bolt, and also to form an internal projection to act as centering devices for the central spirals. Other projections, *f*, are made in the caps to receive and center the other spirals. The projections may be continuous, as shown, or they may consist of a number of detached teats.

These caps are made of spring metal, elliptical, convex, or otherwise curved in shape, substantially as shown. I prefer to employ in their construction a high-carbon steel capable of being tempered, such metal being used also in making the spirals.

With a spring constructed of a number of spirals arranged between these spring-caps substantially in the manner shown the initial pressure of the load will come upon the caps in the first instance, and as the pressure increases the caps will yield. Of course the pressure is transmitted immediately and directly by and from the caps to the spirals, and thus the two kinds of springs become mutually tributary. Upon the removal of the load the spring-caps resume their curved or normal condition.

The cost of springs constructed with these spring-caps is practically the same as springs supplied with the ordinary non-elastic plates, inasmuch as the spiral springs need not be so large or of such large rods as before. The movement of the combined spring is softer and slower than is a spring composed wholly of spirals and ordinary inelastic caps. The power of the spiral springs is retained, and added to it is the soft movement of the caps. The projections or cavities *e* may subserve the additional purpose of stiffening the caps, but without impairing their elasticity.

I have shown my invention as embodied in a car-spring; but it is obvious that it may be utilized in other classes of springs.

What I claim is—

1. A cap for springs, which is itself a spring and constructed curved, convex, or elliptical in longitudinal section, substantially as described.

2. A cap for springs, which is itself a

spring and convex, curved, or elliptical in shape, substantially as described.

3. A spring composed of a suitable number of spiral springs, and caps which are  
5 themselves springs, arranged at opposite ends of the spiral springs and made curved, convex, or elliptical in shape, substantially as described.

In testimony whereof I have hereunto set my hand this 5th day of February, A. D. 1889.

CHARLES T. SCHOEN.

Witnesses:

WM. H. LEWIS,

WILLIAM H. HALLOWELL.