

P. G. GARDINER.

Car Spring.

No. 98,050.

Patented Dec. 21, 1869.

Fig. 6.

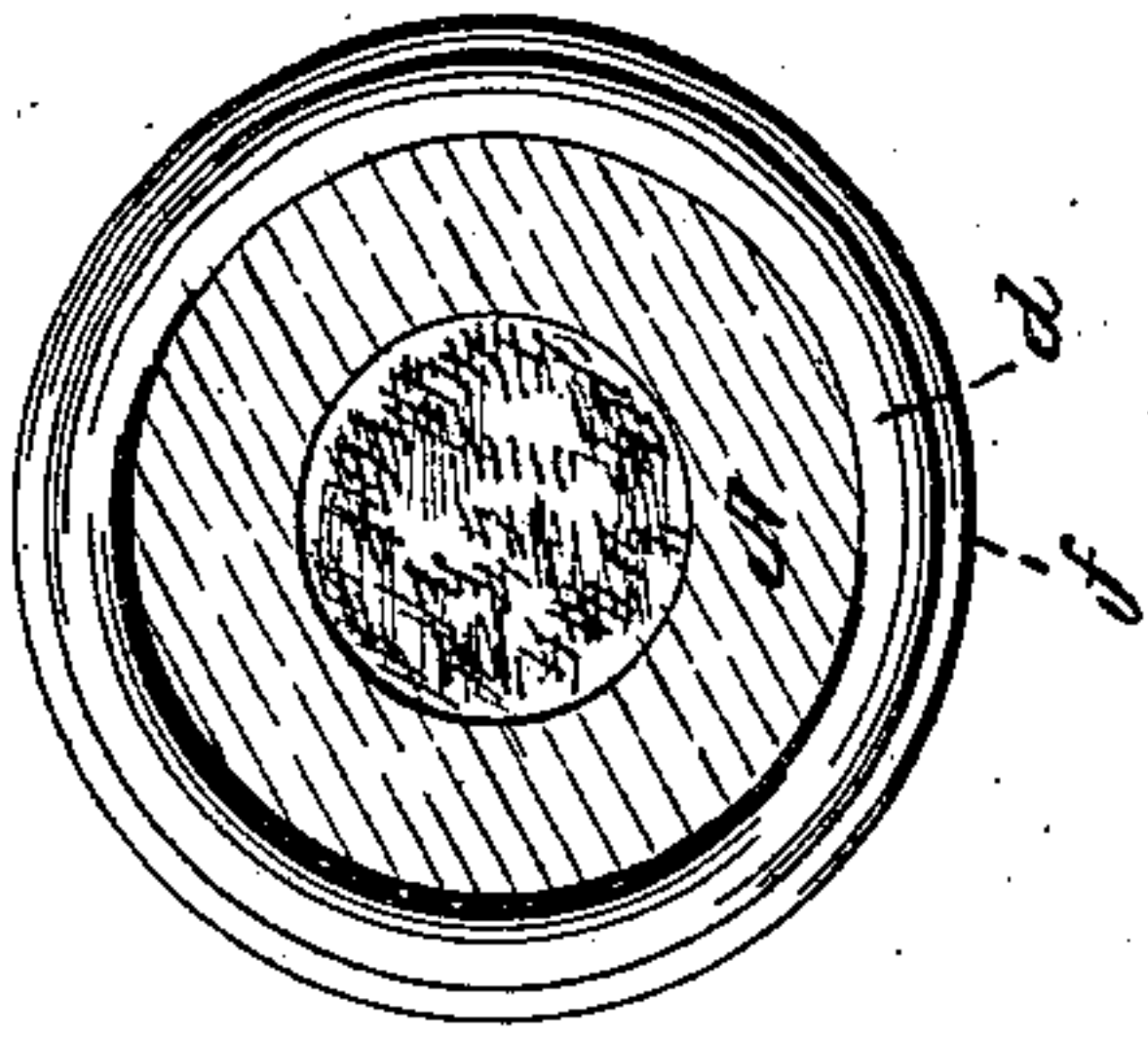


Fig. 4.

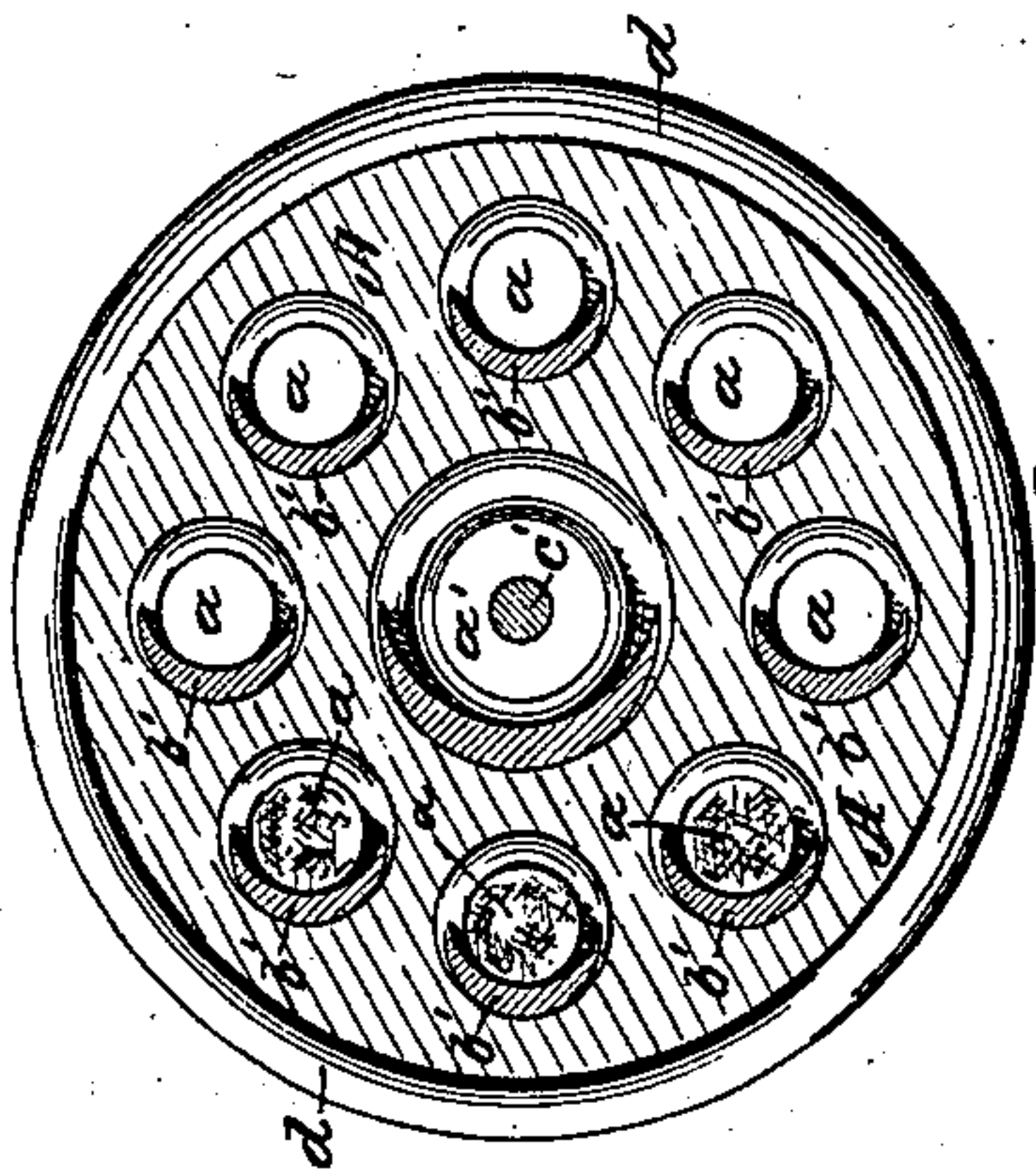


Fig. 2.

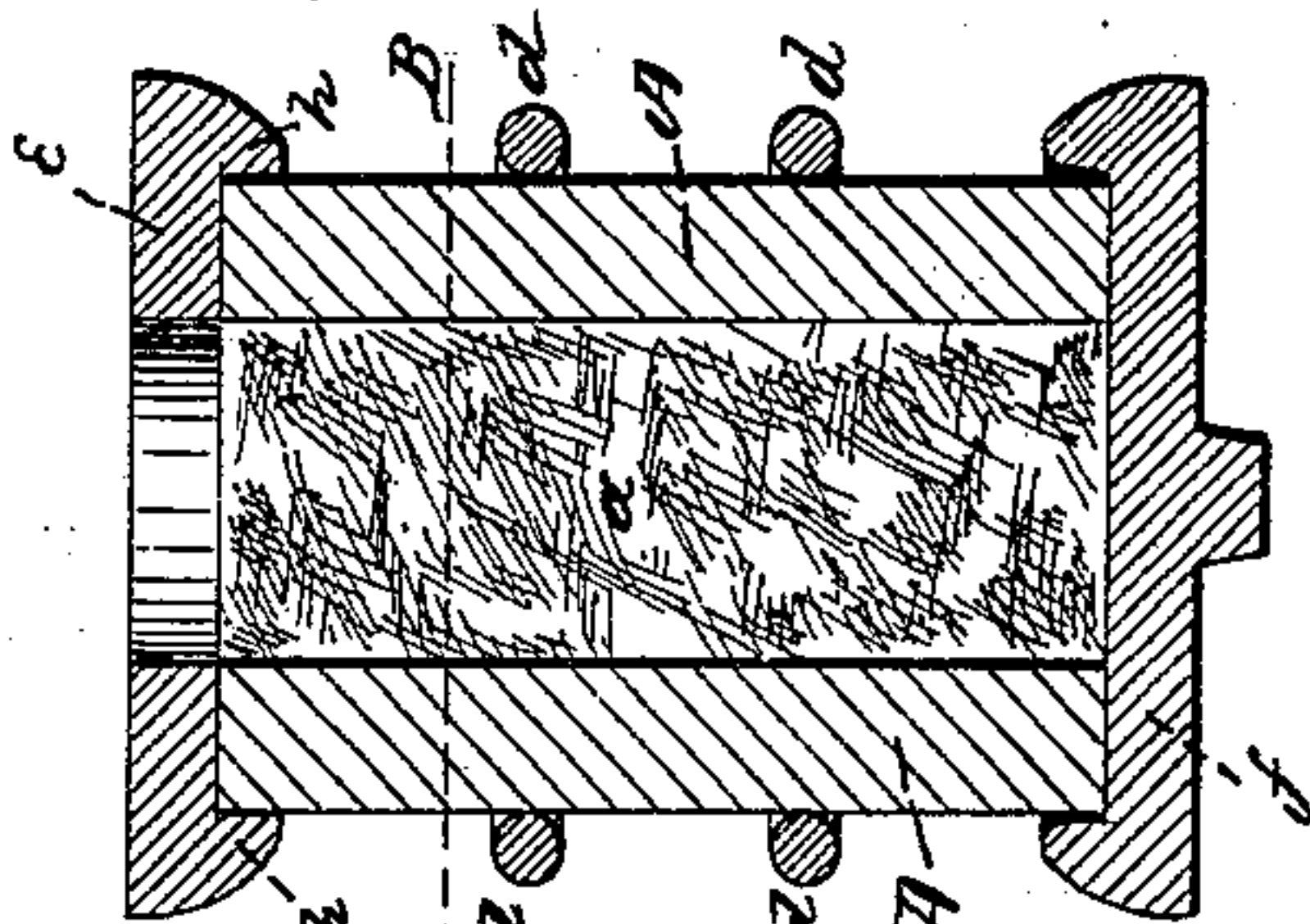
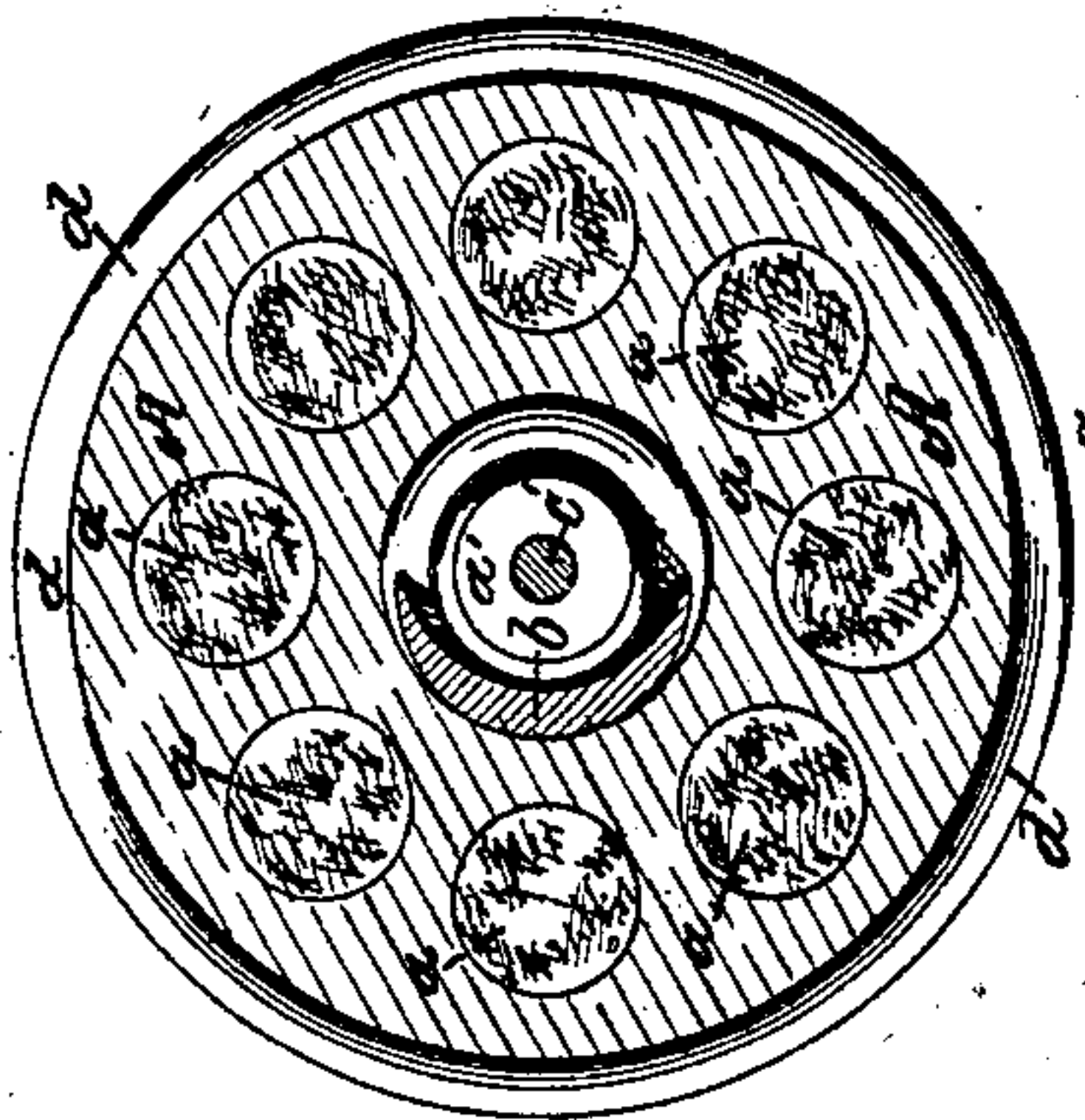


Fig. 5.

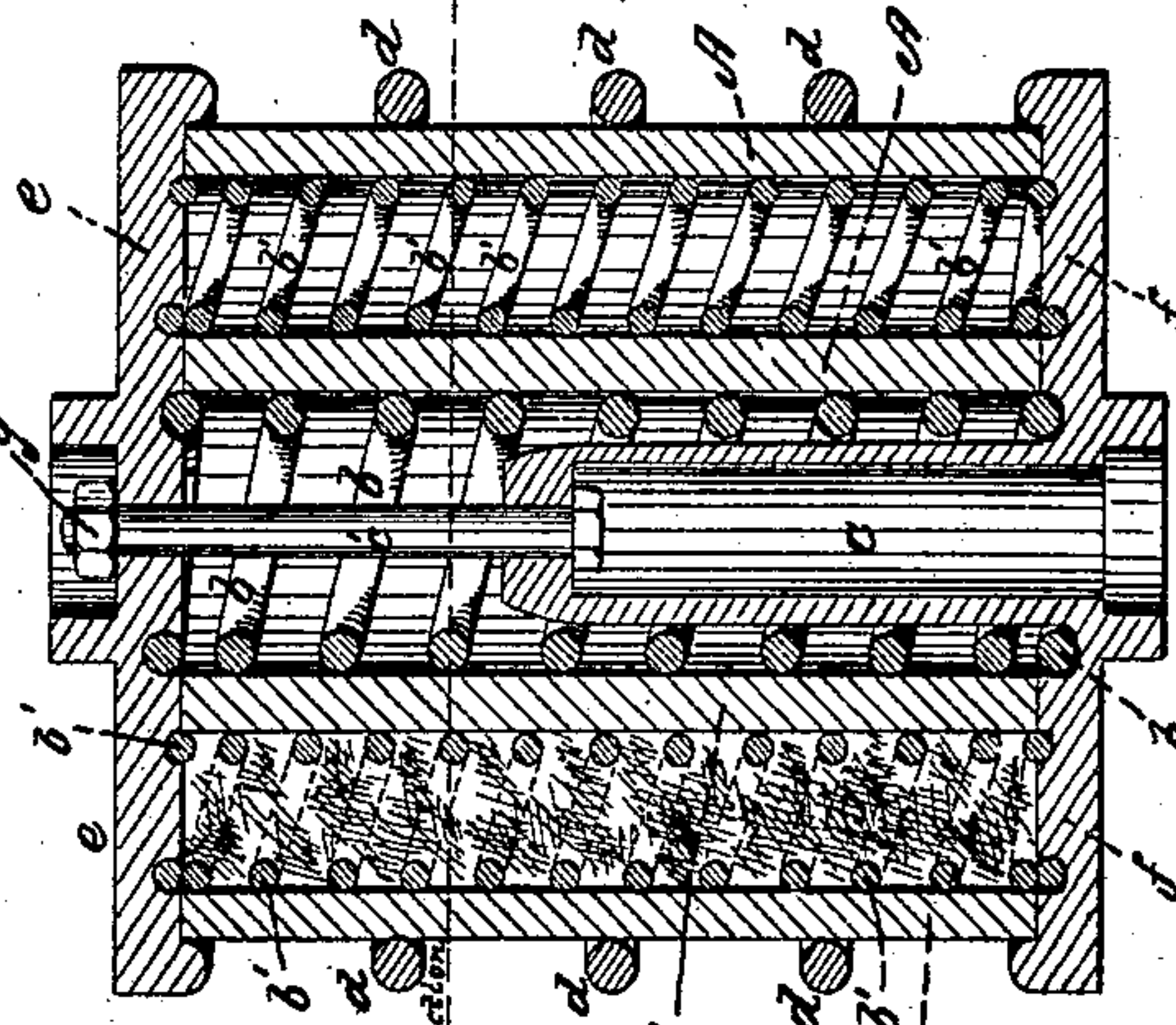


Fig. 3.

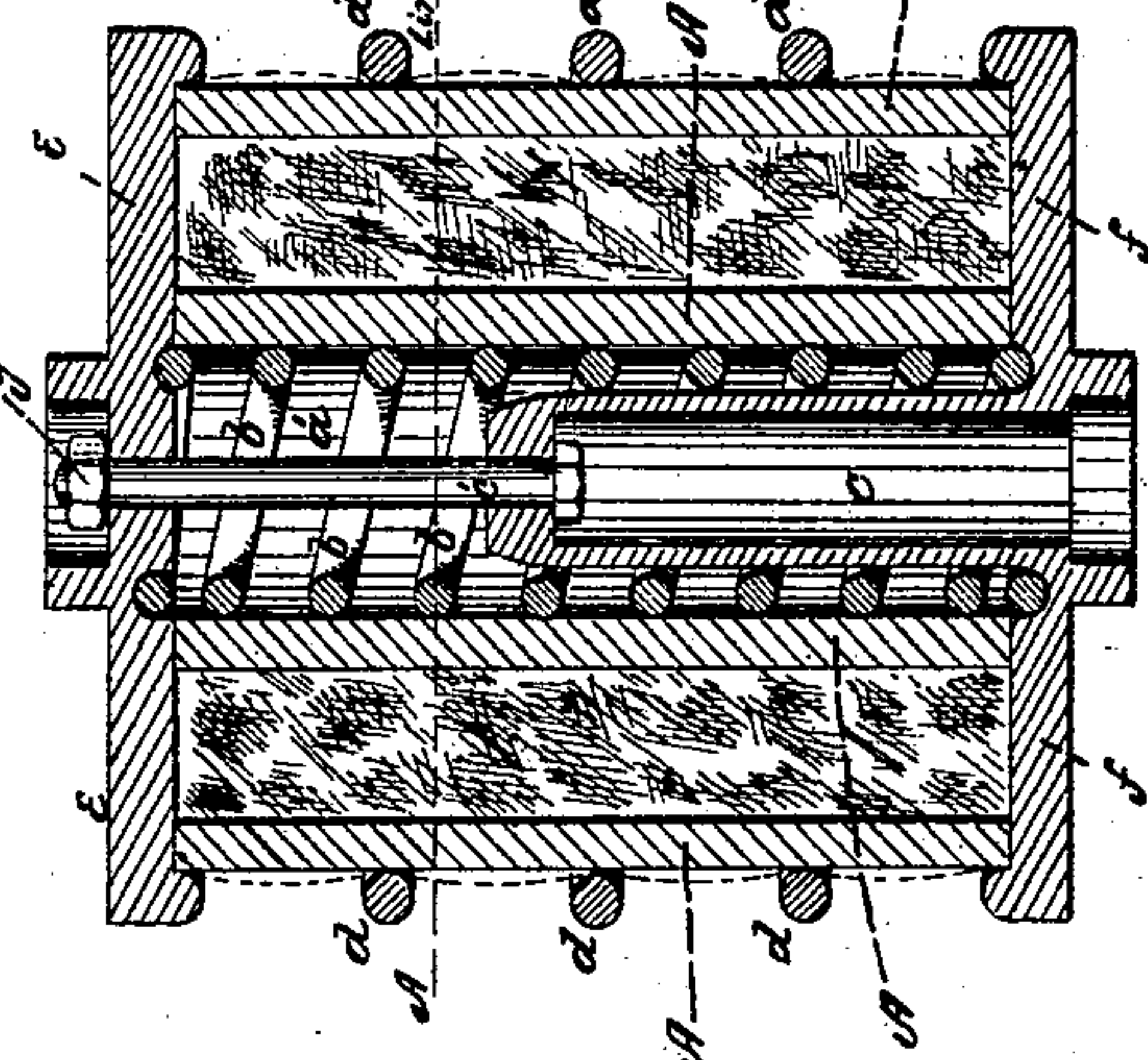


Fig. 1.

Witnesses:
C. P. Wagner
Samuel A. Stodder

Inventor:
P. G. Gardiner

United States Patent Office.

PERRY G. GARDINER, OF NEW YORK, N. Y.

Letters Patent No. 98,050, dated December 21, 1869.

IMPROVEMENT IN CAR-SPRINGS.

The Schedule referred to in these Letters Patent and making part of the same

To all whom it may concern:

Be it known that I, PERRY G. GARDINER, of the city and State of New York, have invented new and useful Improvements in Railway - Car Springs, and that the following is a full, true, and exact description of my said improvements, reference being had to the drawings accompanying and making part of this specification.

The nature of my improvements consists—

First, in the combination of a cellular India-rubber cylinder, with a coiled spiral steel spring upon the exterior surface, or, in place of this spiral spring, a series of iron rings, embracing the cylinder at equal distances apart, and having the cells of the rubber cylinder filled with a packing of cork, cotton, or other elastic or fibrous material, or with or without steel spiral springs, and having also a central cell, containing a spiral spring, through which passes a central compound-stud or bolt, having, at the top, a screw and nut, by which the cap and sole or base of the spring are secured to the rubber cylinder, and the spring set, or the parts secured in place, to form the complete spring; and,

Secondly, in the combination of a perforated rubber cylinder, with or without rings to support it, and a central cell, packed with fibrous or elastic material; and also,

Thirdly, in the dovetail lip or rim to the cap of the spring.

The figures in the drawings will be referred to and described in detail in the following description.

In all the figures similar letters represent similar parts.

Figure 1 of the drawings represents a vertical cross-section of the spring, through the centre, and

Figure 2, a horizontal section of the same at the line A B in fig. 1.

A A is an India-rubber cylinder, pierced with circular cells *a a* from top to bottom, the central cell *a'* being of larger diameter than that of those surrounding it.

These cells *a a* should be of equal size, and at equal distances apart and from the centre of the rubber cylinder. In the figure they are represented as eight in number, in addition to the central cell *a'*, but the precise number here represented is not essential.

b is a spiral steel spring in the central cell *a'*, extending from top to bottom of the spring.

c c' are the central stud and bolt.

d d are iron rings, embracing the rubber closely at right angles to the axis of the spring, and at equal distances from each other.

The manner in which the central stud and bolt are united, and hold together the top plate *e* and base or

sole *f* of the spring, by means of the screw and nut *g* at the head, is shown in fig. 1.

The cells *a a* are closely packed with cotton, or other fibrous elastic material, and for this purpose an apparatus which I call a spring-packer should be used, which encloses the India-rubber cylinder and rings, and holds them rigidly in place, while the packing is being pressed into the cells.

Figures 3 and 4 represent, in similar sections of figs. 1 and 2, a substantially similar spring, varying from that just described only by the insertion of steel spiral springs *b'* in the cells *a a*, part of which is filled with packing, and part is without the packing.

When the spring is constructed as represented in figs. 1 and 2, the cap and base or sole of the spring are made to compress the rubber between them, by the screwing on the nut *g*, which causes the rubber cylinder to bulge, as represented by the dotted lines between the rings *d* in fig. 1, whereby the rings are held securely in their place.

When the spring is under the weight of the car, the further bulging of the rubber holds the rings so that they cannot slip or be shaken out of their proper positions.

In place of the rings *d*, a spiral spring may be substituted, extending from the cap to the base, and closely embracing the rubber cylinder, so as to answer the same purpose of compression as the rings, and operates also by its elastic force in a vertical direction.

When the rings *d* are used, the packing should be performed with cap and base on the spring, and the cap is perforated with holes, to correspond with the cells, and through which the packing is forced.

The holes in the cap, when the packing is completed, should be stopped with plugs of cork, driven in so as to touch the surface of the packing, and the outside of the plugs cut off even with the surface of the cap.

Figures 5 and 6 represent a rubber cylinder, A, with rings *d*, with only one central cell, *a*, filled with packing.

No bolt is used with this form of spring.

The cap *e* has its rim projecting over the upper edge of the rubber, in a dovetail form, as shown at *h*, which, when the spring is compressed by the weight, and the rubber bulges under the pressure, grips and holds the rubber so that it will not spring out from the cap.

In the compound spring, as herein described, my invention does not consist in any of the parts described in detail, but my invention consists in the combination and arrangement as described.

A great saving is made in the amount of rubber re-

quired in this construction of the spring, and, consequently, a great reduction in the expense of the spring, while the power and elastic action of the spring are greatly enhanced.

What I claim, therefore, as my invention and improvement, and for which I desire Letters Patent, is—

1. The combination of the perforated cellular India-rubber cylinder, surrounded and compressed by the rings, or exterior spiral spring, with the packing of the cells with cotton, or other similar fibrous material, with or without spiral springs in the cells, and with a central spiral in a central cell, through which the bolt passes, constructed, arranged, and operating substantially as described.

2. The combination of rubber cylinder with its equidistant perforation, surrounding a central perforation, packed as aforesaid, without the exterior spiral or rings.

3. The dovetailed lip or rim on the cap, in combination with the rubber cylinder and packing, constructed and operating in the manner and for the purposes described.

P. G. GARDINER.

Witnesses:

S. A. STODDER,
GEO. W. FOX.