

A. H. KING.
Improvement in Car Springs.

No. 123,999.

Patented Feb. 27, 1872.

Fig. 1.

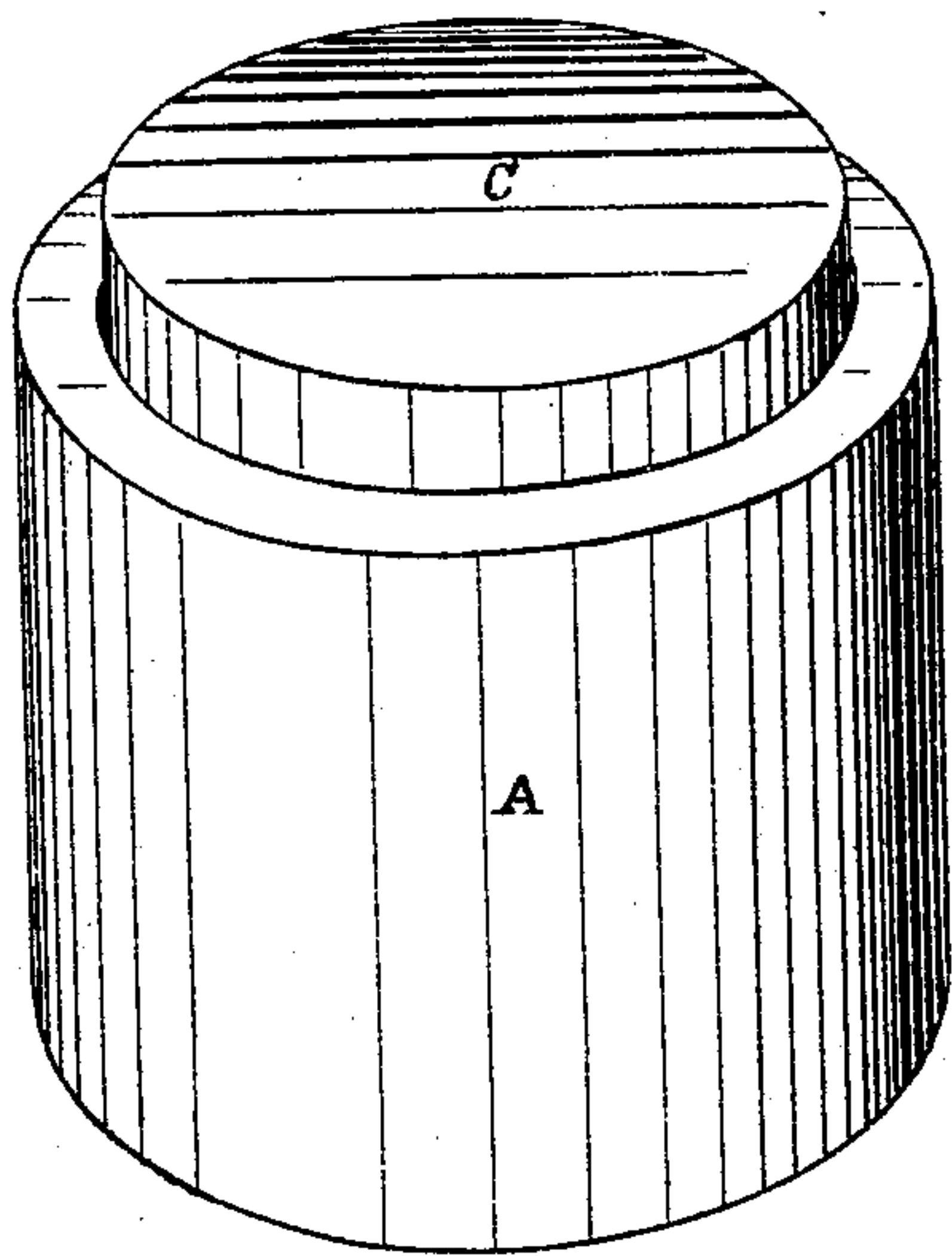


Fig. 2.

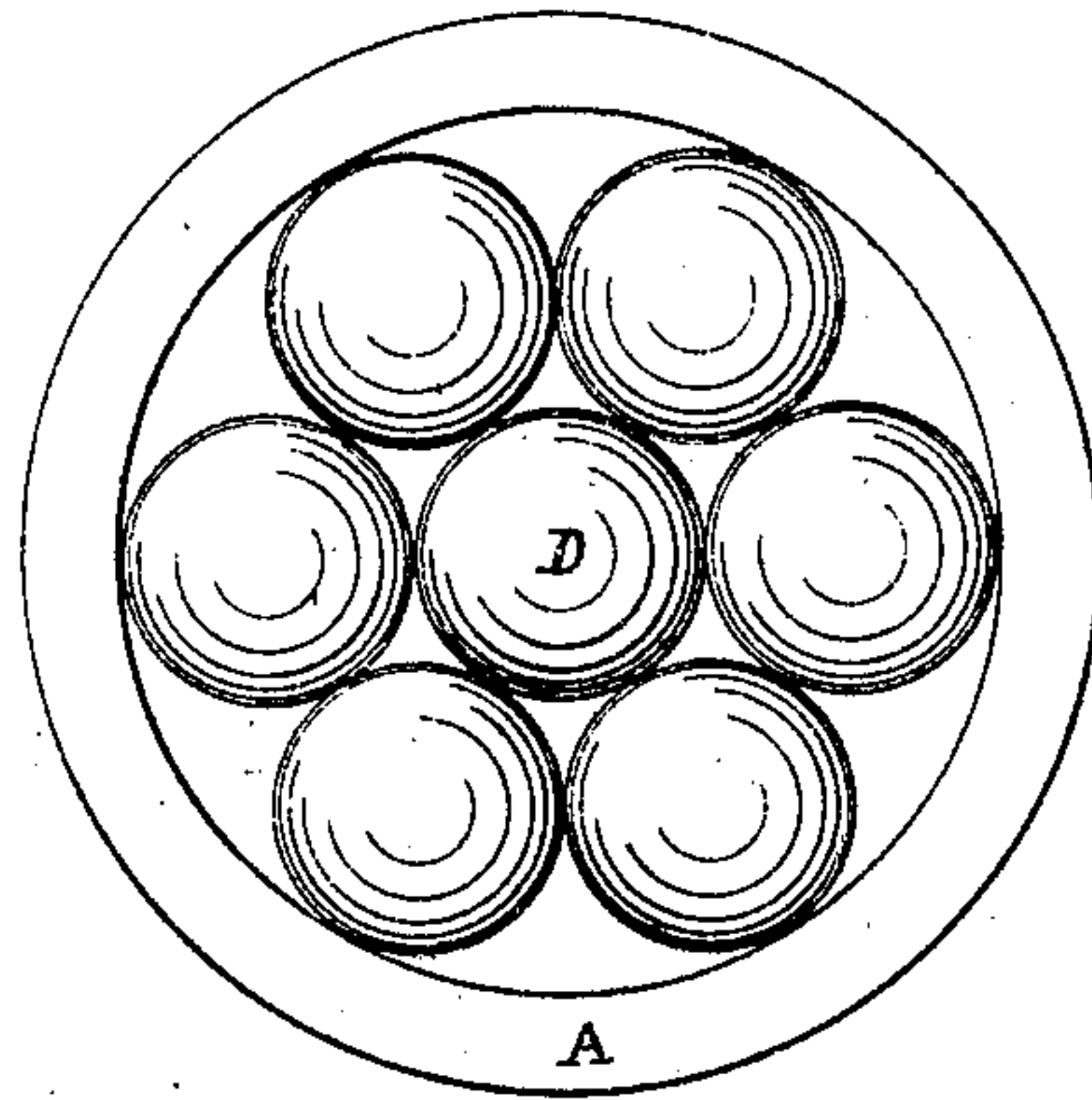


Fig. 3.

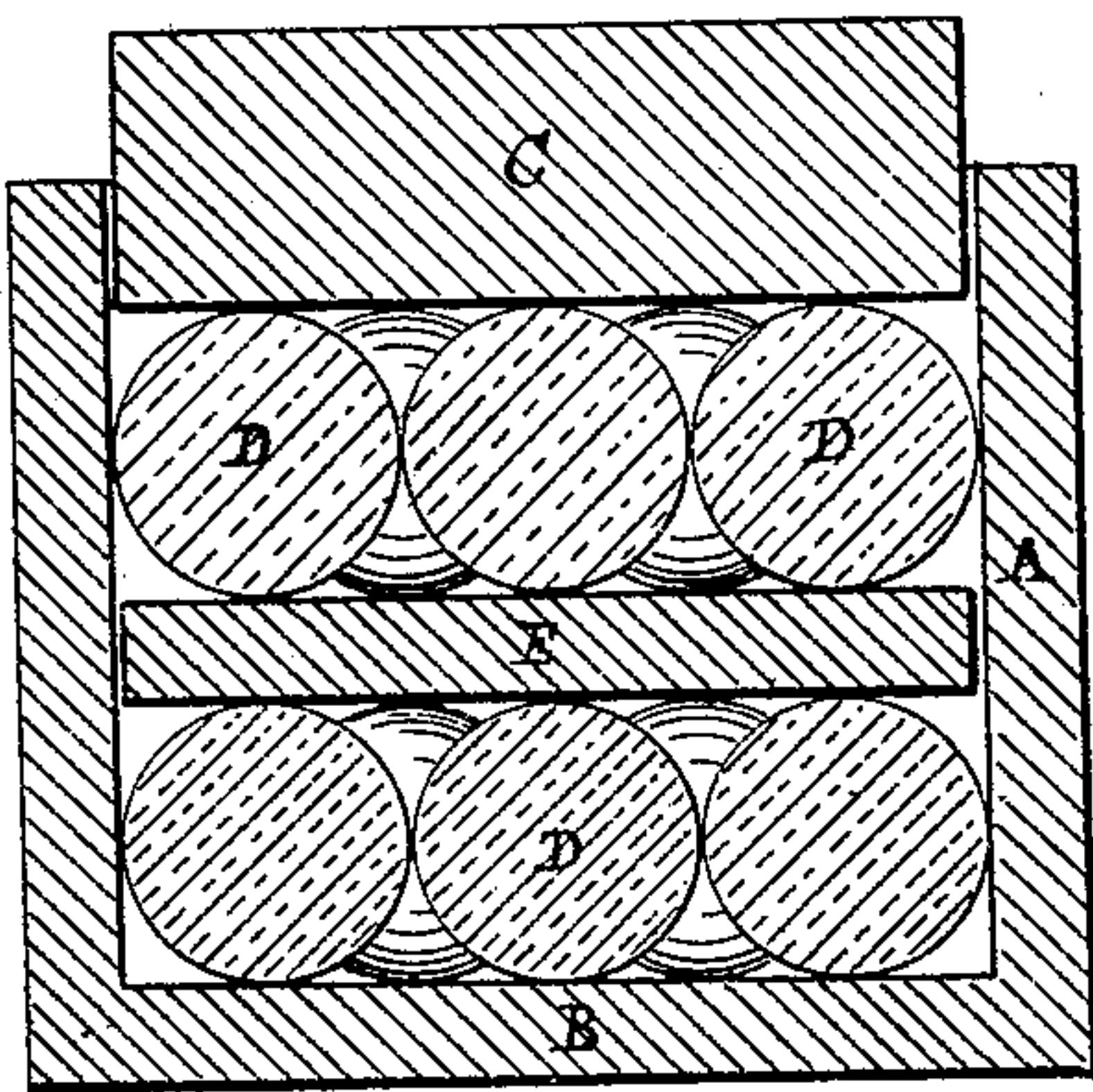
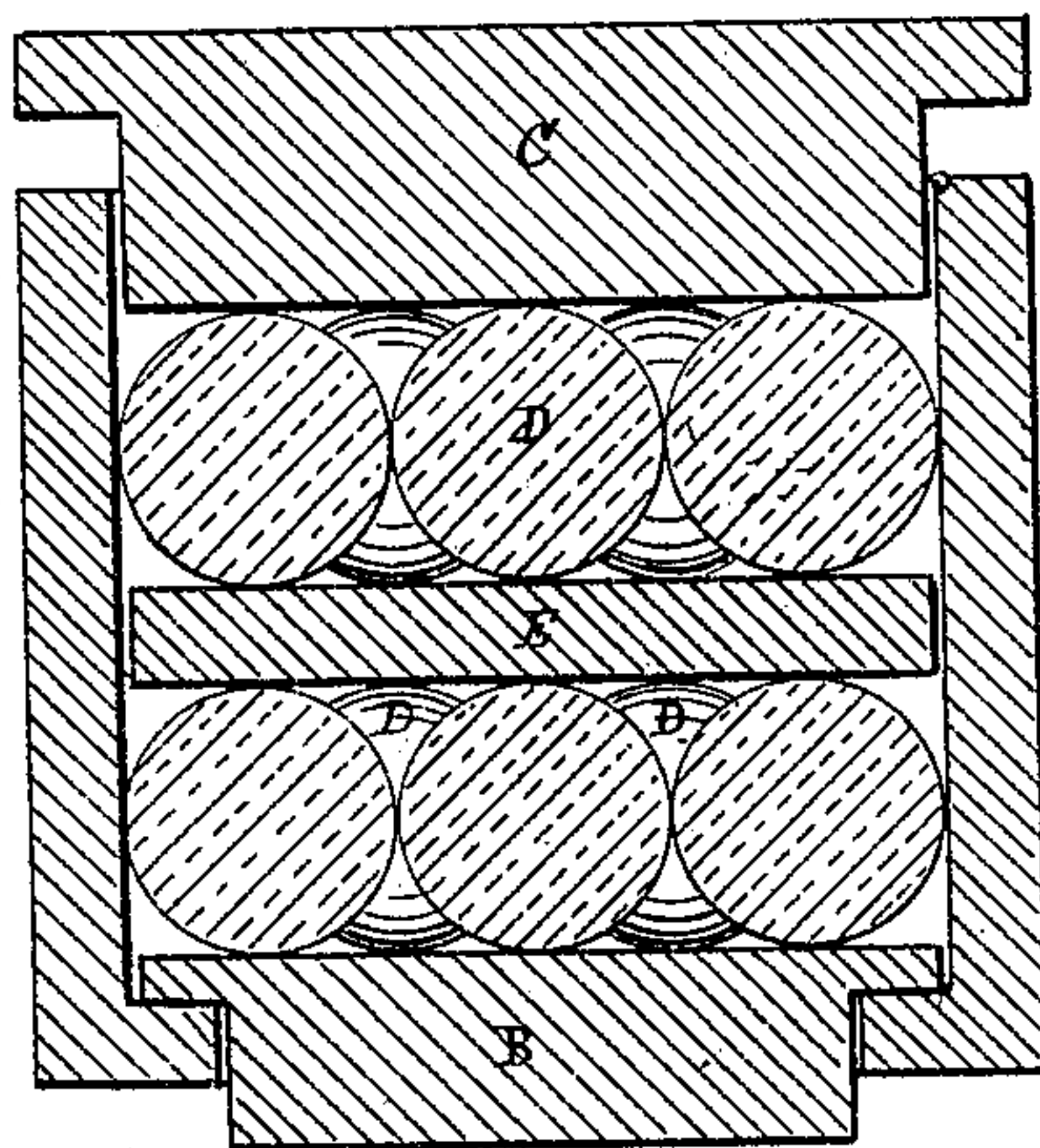


Fig. 4.



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ALBERT H. KING, OF RAHWAY, NEW JERSEY.

IMPROVEMENT IN CAR-SPRINGS.

Specification forming part of Letters Patent No. 123,999, dated February 27, 1872.

To all whom it may concern:

Be it known that I, ALBERT H. KING, of Rahway, in the county of Union and State of New Jersey, have invented a certain new and useful Car-Spring.

My invention relates to that general class of springs which depend for elastic force upon vulcanized rubber or caoutchouc; and consists in combining within a chamber and between suitable base and crown plates a requisite number of solid spheroidal masses of elastic vulcanized rubber; and I do hereby declare that the following specification, taken in connection with the drawing furnished and forming a part of the same, is a clear, true, and exact description of a car-spring embodying my invention.

Referring to the drawing, Figure 1 represents one of my car-springs in perspective. Fig. 2 represents the same in top views with crown-plate removed. Fig. 3 represents the same in vertical section. Fig. 4 represents in vertical section a similar spring provided with a movable base-plate.

A denotes the spring-chamber. In this instance it is represented as cylindrical. Equally good results may be attained if it be made square, rectangular, or in any form between the latter and the cylindrical. B denotes the base-plate. It may be incapable of independent movement, and form a part of the chamber, as shown in Fig. 3; or it may be made separately therefrom, and capable of movement within the cylinder, as shown in Fig. 4. C denotes the crown-plate or follower. It is fitted to enter freely the interior of the chamber, and may or not be provided with a projecting lip or flange. D denotes the spheroidal elastic masses of vulcanized rubber. They are molded to the requisite form in a manner well known. As exhibited in the drawing, the chamber A contains fourteen of these spheroids, two series, seven in each, with a separating plate, E, interposed between the series. When a light spring is required good results may be attained by the use of a single spheroidal mass within a suitable chamber, the inside vertical walls of which are adjacent to the horizontal periphery of the spheroid, and interposed directly between the base and crown-plate. For a spring in which greater range of action is requisite, several series of single spheroidal masses may be employed within a longer chamber, with or

without the interposition of the separating plates. For a spring which is not to be subjected to great strain in carrying heavy weights a single series of two or more solid spheroidal masses, arranged side by side, may be employed within a chamber the vertical walls of which should be closely adjacent to the exterior peripheries of the spheroids lying next to the walls. Should a greater range of action be required and suited for carrying the same weight, two or more series, each consisting of several solid spheroidal masses, may be employed without the interposition of separating-plates between the series. A spring composed of two or more series of several solid spheroids each, with interposed separating-plates between the series, will meet the general and varied requirements of ordinary rail service. There exists in a solid spheroidal mass of elastic vulcanized rubber or caoutchouc a constant tendency to maintain its true form. If subjected to a lateral as well as vertical pressure its expansive tendencies are always in all directions toward its entire periphery from the center. When confined within certain limits by adjacent walls of a chamber, or by contact with other masses of a similar form and character, and interposed between movable plates to which pressure is applied, each spheroidal mass contributes of its force in a comparatively-equal degree, and as the pressure is increased the elastic force of the several masses is combined to resist it. That portion of each spheroid above and below its horizontal axial line constitutes what may be properly considered a combined mass of elliptical springs, radiating from each end of its vertical axis toward the periphery at the horizontal axial line, and therefore approximate results will be attained if the spheroidal masses be cut in two at their horizontal axial lines. Practice and experiment has demonstrated that a spring composed of rubber or caoutchouc in a solid spheroidal mass, and arranged substantially as herein shown and described by me, for sustaining a given weight and exercising a desired degree of elastic force while loaded, can be produced by using from twenty-five to fifty per cent. less rubber or caoutchouc than is requisite for practically constructing a spring in any of the methods heretofore practiced and known to me, and which would be capable of meeting equal require-

ments. I am aware that chambers have been filled with irregular masses of rubber or caoutchouc and other substances of a non-elastic character, but such springs have never proven to be of practical value. After long service, should the spheroids become flattened to any observable extent, they may be slightly turned in position, and other portions thereof presented for the contact of the adjacent surfaces. By judicious management of this character such springs will prove to be capable of long and continued service with a uniform degree of efficiency.

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

1. A mass of solid vulcanized elastic rubber or caoutchouc, spheroidal in form, substantially as described, in combination with a chamber for receiving the same, the interior vertical walls of which are adjacent to the periphery of the mass when in position at the horizontal line of its axis, a base-plate and a crown-plate, one or both of which are capable of independ-

ent vertical movement within the chamber, as and for the purposes specified.

2. The combination of two or more solid masses of elastic vulcanized India rubber or caoutchouc, spheroidal in form, substantially as described, with a chamber, a base-plate, and a crown-plate, one or both of which are capable of an independent vertical movement within the chamber, as and for the purposes specified.

3. A car-spring, composed of two or more solid spheroidal masses of elastic vulcanized India rubber or caoutchouc, substantially as described, arranged in two or more horizontal series, one above the other, with separating plates between the series, confined within a chamber, and interposed between a base and a crown-plate, as and for the purposes specified.

ALBERT H. KING.

Witnesses:

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