P. G. GARDINER.

Car Spring.

No. 13,905. Patented Dec. 11, 1855.

Fig. 2.

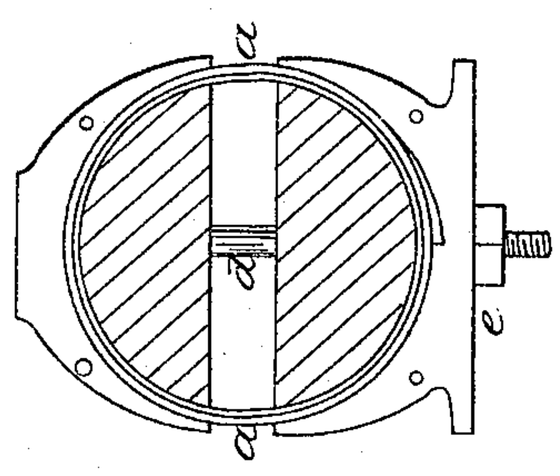



Fig. 3.

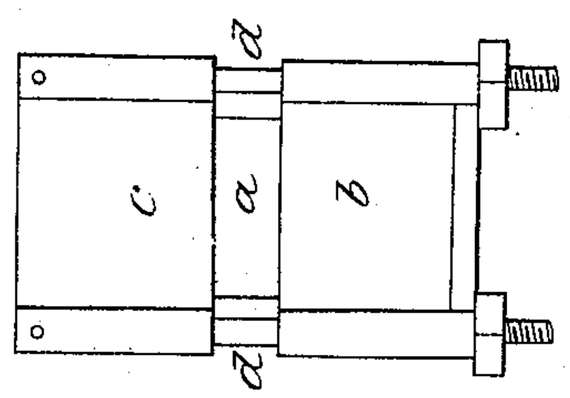
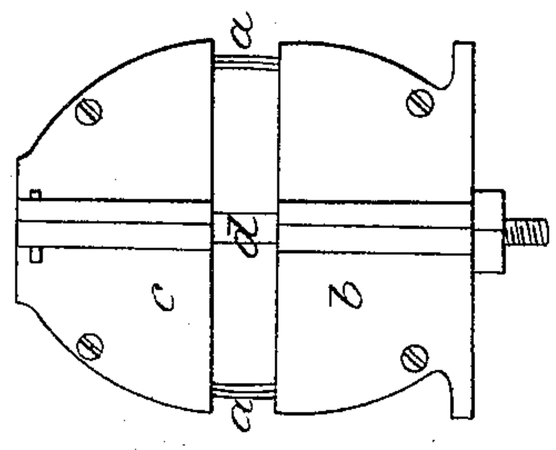



Fig. 1.



# UNITED STATES PATENT OFFICE.

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

## RAILROAD-CAR SPRING.

Specification of Letters Patent No. 13,905, dated December 11, 1855.

*To all whom it may concern:*

Be it known that I, P. G. GARDINER, of the city, county, and State of New York, have invented a new and Improved Car-Spring; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, Figure 1 being a side view of said spring entire; Fig. 2, a side view, with the front casing removed, and Fig. 3, an edge view of said spring.

Similar letters indicate like parts in all the figures.

The nature of my invention consists in producing a car spring by the combination of a coiled plate spring *a*, with a segmental base *b*, and a movable segmental cap *c*, in such a manner that when the spring is compressed between said base and cap, every portion of its entire length will act with equal and uniform force to sustain any weight or pressure that may be brought to bear upon the said movable cap.

The base and cap of my improved car spring may be connected to each other by means of the screw bolts *d*, *d*, working in guides secured to the sides of said base and cap, as represented in the drawings, or the said base and cap may be combined by any other means that may be thought advisable. I shall sometimes combine two narrow springs placed side by side, instead of one broad one, with a base and cap, and connect the base and cap in that case, by a single bolt passing between said narrow springs.

When the spring plate *a*, is allowed to elevate the cap *c*, it assumes an oval shape; and when the cap is forced down so far as to be brought in contact with the base, the spring plate is brought into a circular form.

To prevent the severe friction that would be caused by the outer end of the plate *a*, being forced between the central portion of said plate and the inner face of the base, an offset *e*, may be formed in the said inner surface of the base for the outer end of the plate to strike against, which will cause the plate to coil inward from said point.

I am aware that a coiled plate spring has been used in various ways, but I cannot find that it has ever been used in combination with a segmental base and a segmental movable cap in such a manner that the expansion of the said spring into an oval form, would elevate the said cap and produce an elastic bearing which will increase in strength and stiffness as the said spring is forced into a circular form. This arrangement enables plates of any desired thinness to be safely used in the construction of springs for the support of locomotives or railroad cars; and a spring can be constructed in this manner that will possess a greater degree of strength and elasticity, in proportion to its size and weight than it is possible to construct by any other arrangement of parts. These springs will also cost considerably less than any other spring possessing the same amount of strength and elasticity. I do not believe that any other arrangement of springs will enable the thinnest elastic plates to be put into such a shape as to form a spring that can be used under locomotives and railroad cars.

What I claim as my invention and desire to secure by Letters Patent, is—

My improved car spring, composed of a coiled plate spring combined with a segmental base and a movable segmental cap, substantially as herein set forth.

The above specification of my new and improved car-spring, signed and witnessed this 25th day of July 1855.

P. G. GARDINER.

Witnesses:

Z. C. ROBBINS,

FRANK SMITH.