(No Model.)

L. PFINGST.

CAR SPRING.

No. 485,652. Patented Nov. 8, 1892.

Fig. 1.

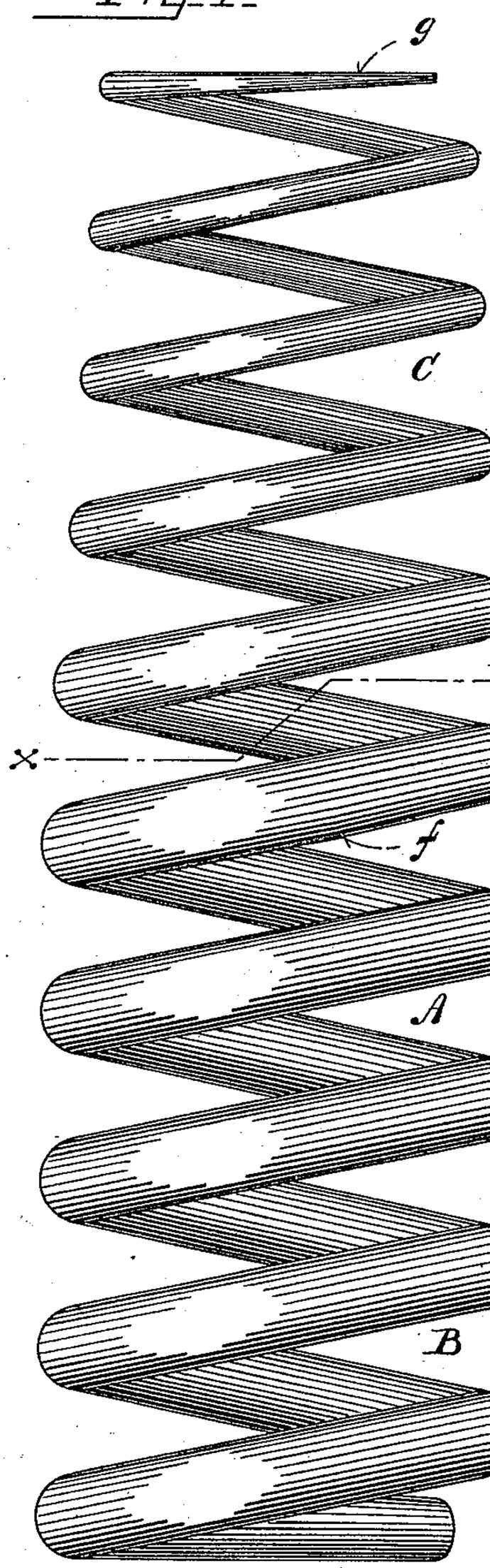


Fig. 4.

Fig. 3.

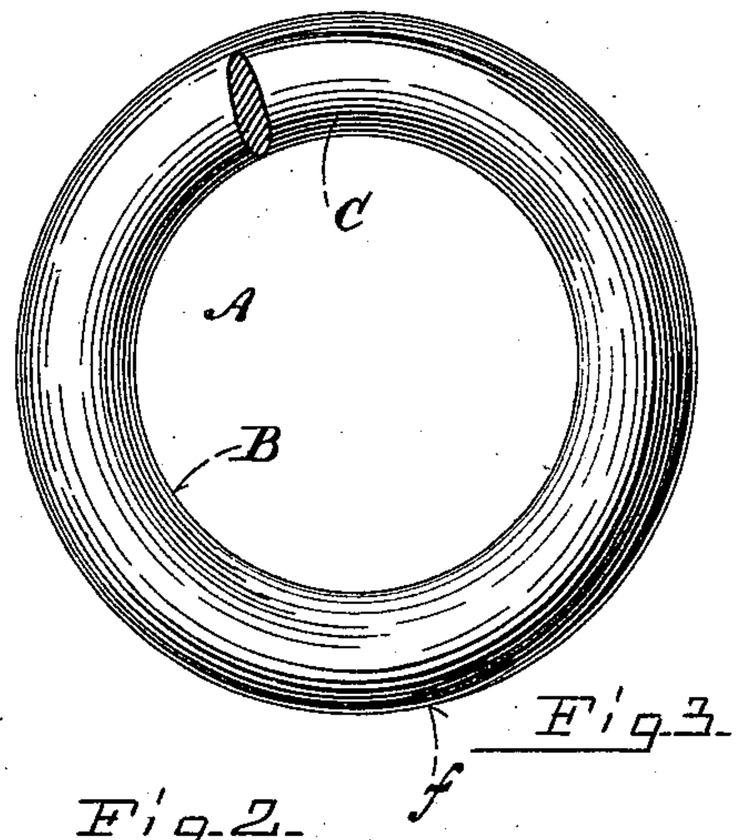
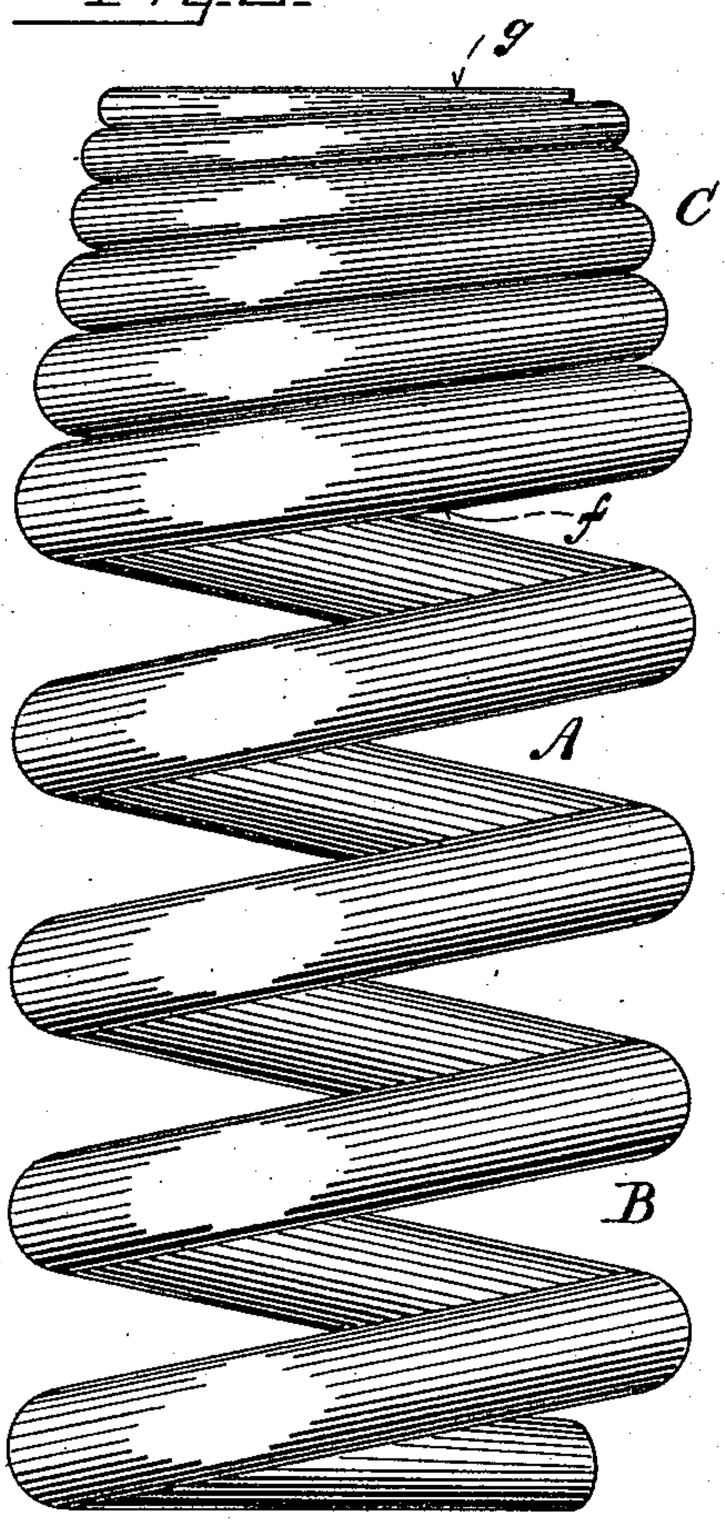


Fig. 2.



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UNITED STATES PATENT OFFICE.

LOUIS PFINGST, OF BOSTON, MASSACHUSETTS.

CAR-SPRING.

SPECIFICATION forming part of Letters Patent No. 485,652, dated November 8, 1892.

Application filed May 23, 1892. Serial No. 434,044. (No model.)

To all whom it may concern:

Be it known that I, LOUIS PFINGST, of Boston, in the county of Suffolk, State of Massachusetts, have invented certain new and useful Improvements in Car-Springs, of which the following is a description sufficiently full, clear, and exact to enable any person skilled in the art or science to which said invention appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is an elevation of my improved car-spring; Fig. 2, a like view showing the spring partly compressed; Fig. 3, a cross-section taken on line *x x* in Fig. 1, and Fig. 4 a plan view of the rod from which the spring is wound.

Like letters of reference indicate corresponding parts in the different figures of the drawings.

My invention relates to a supporting-spring for railway-cars and similar vehicles, it being designed especially as an improvement on the spring shown and described in my United States Letters Patent No. 462,958, dated November 10, 1891, granted to me for an improvement in car-springs, the object being particularly to render the spring correspondingly sensitive as the load on the vehicle varies.

In the drawings, A represents the spring considered as a whole. In forming the spring I employ a rod circular in cross-section and of equal diameter from one end *d* to a predetermined point *f*, preferably at or adjacent the longitudinal center of the rod. From said point *f* the rod tapers gradually and continuously throughout, its diameter decreasing to the opposite end *g*, at which point it is of the smallest diameter. That portion *h* of the rod from the end *d* to the middle point *f* of the same diameter throughout forms the base B when wound, and the taper portion *i* forms the top C. The rod is wound on a mandrel of equal diameter throughout. This forms a coil of equal interior diameter, the exterior diameter of the top C of the coil gradually decreasing from the base portion to its end, as best shown in Fig. 2. In this form of spring the top C is much stiffer than in the form described in the Letters Patent above referred to, and when the load is applied to it the coils compress successively, beginning at the top, its expansive properties being much the same in effect as a conical spring, but the graduated stiffness being attained by tapering the bar, as described. Under a light load the top C serves to cushion, while the base B resists compression; but before the top has been strained near its limit said base will begin to compress, cushioning any increase of load, the top coils assuming the closed position shown in Fig. 2. The base, moreover, being of equal diameter and the upper portion being tapered, as described, the oscillation of the vehicle-body is greatly reduced.

It will be understood that the portions of the rod composing the base and top may be varied in length in relation to each other in any manner desired.

Having thus explained my invention, what I claim is—

A spring comprising a spirally-wound rod, that portion of the rod forming the lower portion of the spring being of one size throughout and wound with its interior and exterior diameters, respectively, equal throughout, and that portion of the rod forming the upper portion of the spring being tapered from its point of connection with the lower portion continuously throughout, the interior diameter of the spiral coils of both upper and lower portions being uniform throughout the entire spring and the exterior diameter of the lower portion being greater than that of the upper portion.

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