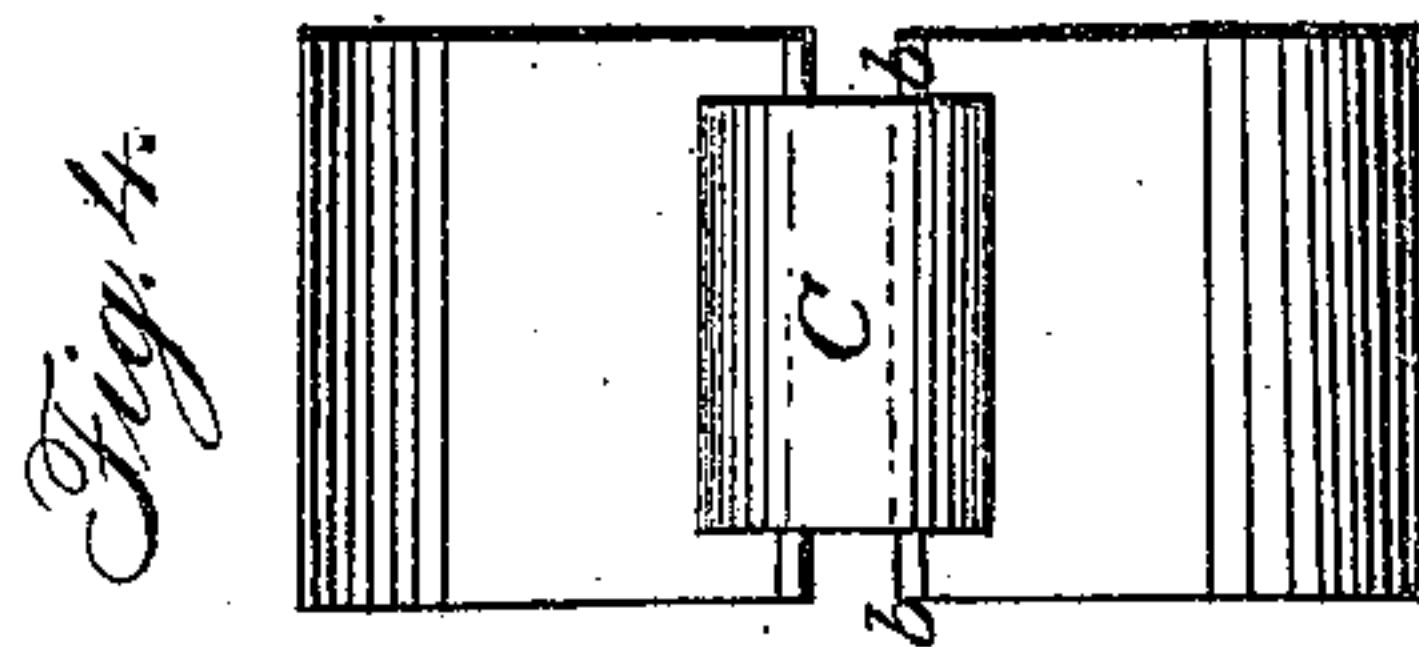
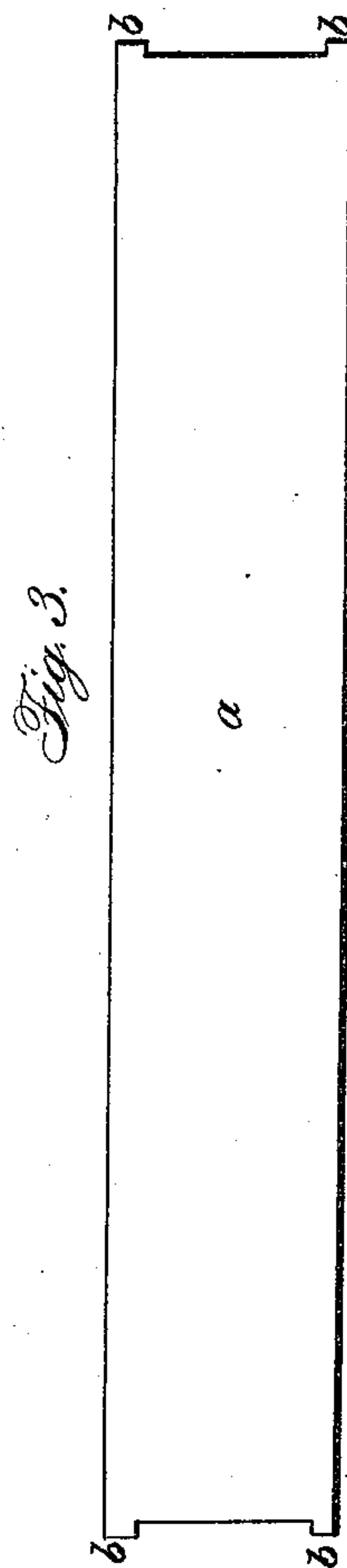
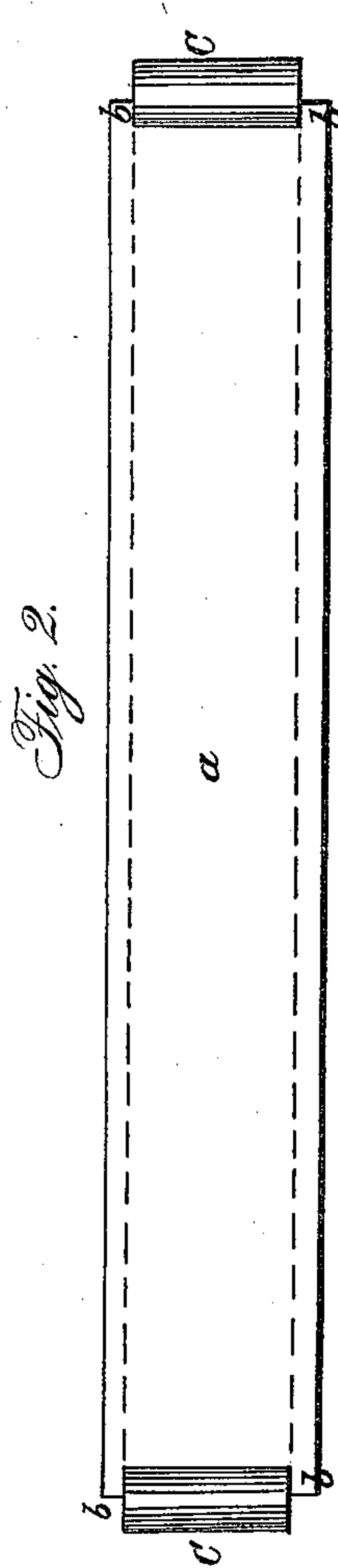
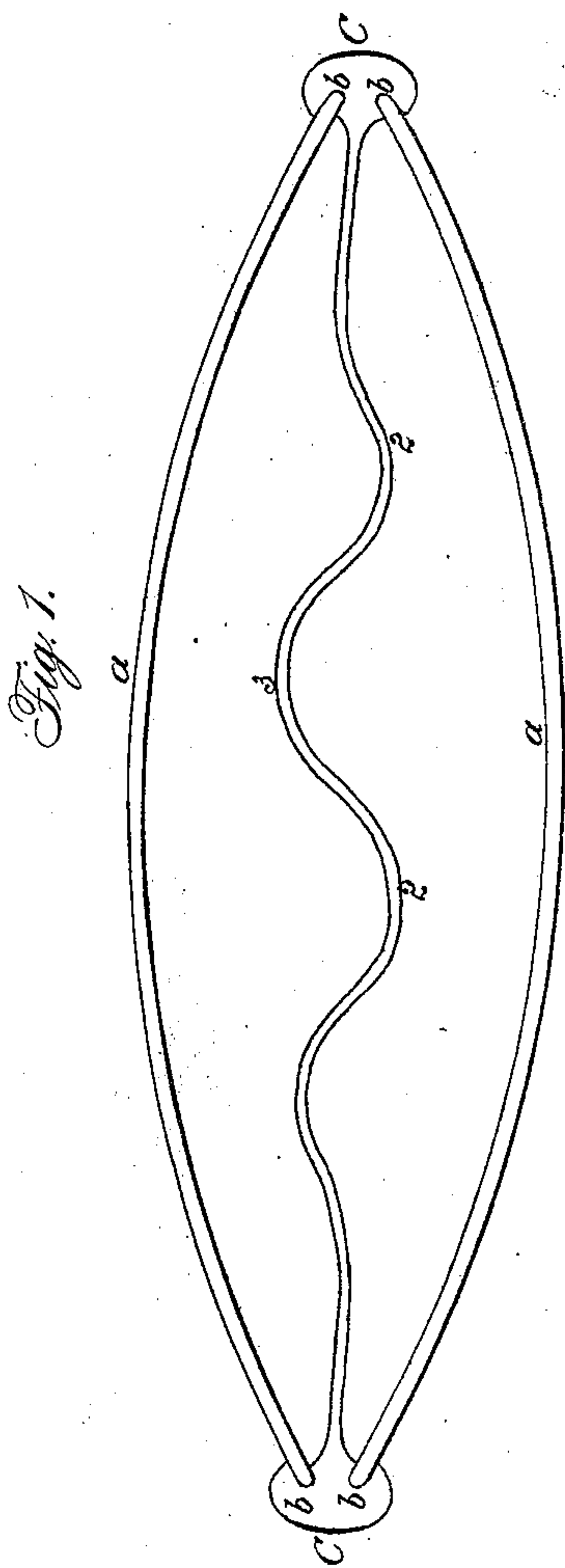


P. G. GARDINER.

Carriage-Spring.

No. 23,766.

Patented Apr. 26, 1859.



Witnesses:

J. B. Tappan
Geo. W. Fox

Inventor:

P. G. Gardiner

UNITED STATES PATENT OFFICE.

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

SPRING FOR RAILROAD-CARS AND CARRIAGES.

Specification forming part of Letters Patent No. 23,766, dated April 26, 1859; Reissued June 12, 1860, No. 981.

To all whom it may concern:

Be it known that I, PERRY G. GARDINER, of the city, county, and State of New York, mechanical engineer, have invented a new and Improved Steel Spring Suitable for Railroad-Cars, Carriages, and other Similar Purposes, and that the following is a full and exact description thereof, reference being had to the drawings accompanying and making part of this specification.

Figure I, of the drawings is a side or longitudinal elevation of the spring. Fig. II, is a top view and also of the under surface of the spring, the two surfaces being alike. Fig. III, is a surface view of the steel plate or blade which forms the top and bottom piece of the spring. Fig. IV, is an end view or elevation of the spring.

In all the figures the same letters represent the same parts.

This invention produces a compound steel spring, consisting of two blades and one elastic tension bar, running the whole length of the spring, and having at either extremity a cap, or upset, with two grooves across the inner faces of the caps to receive the blades. It unites the greatest simplicity of construction and the least amount of metal, with the requisite strength and elastic action. It is easily and cheaply made, not likely to get out of order, easily replaced or repaired, and compared with most railway and carriage springs of very light weight; and has neither screws, bolts, pins, or hinges.

The nature of the invention consists in the manner of confining the two curved exterior blades of the spring in the heads of an intermediate elastic tension bar, their bearings being upon their ends which slip into grooves in the opposite sides of the caps at either end of the tension bar and without screws, pins, bolts, hinges or socket joints to hold them together; the blades and tension bar being so proportioned that when in place in the spring the two bent blades slightly act or press in opposite directions upon the tension bar between them; and when the load is upon the spring all the parts act together, but do not allow the blades of the spring at any time to become straight, or as it is technically called to find bottom.

The means by which this object is accomplished are as follows: The two exterior blades *a, a*, of the spring are of the shape shown in Fig. III, having at the four corners ears or projections *b, b*, so as to leave upon their ends between the ears, a recess which is rounded off so as to have a curved edge. These blades are bent into an elongated curve, each curve being similar, and the two blades being uniform in size and weight. The tension bar *C* (Fig. I) is a steel blade or plate properly tempered and bent except near the ends into a succession of curves or corrugations, and this bar should have a little more thickness at the center than toward the ends, to which it should gradually and uniformly taper. This tension bar has at either extremity an enlargement in the form of a cap or knob *c, c*, projecting on either side of the whole width of the blade of which the tension bar is formed, the width of which bar is a trifle less than the width of the two exterior plates *a, a*. These knobs or caps *c, c*, are curved or grooved in their inner faces to receive and fit the ends of the exterior plates between the ears *b, b*. The exterior plates being bent at first so as to spread a little more than when fitted to the tension bar, upon being bent so as to shorten the distance between the two ends, and placed over the grooves and released from the bending tool, immediately spring into the grooves as seen in Fig. I and the spring is complete. The two exterior blades *a, a*, are very slightly tapered from the middle toward either end so as to have a somewhat greater thickness at the central parts.

What I claim as my invention in the foregoing is,

The construction of a spring, by confining the ends of the exterior blades in bearings in the ends or heads of a tension bar, without rivets, bolts, hinges, pins or screws, arranged and operating in the manner and for the purposes described.

P. G. GARDINER.

Witnesses:

J. B. STAPLES,
GEO. W. FOX.