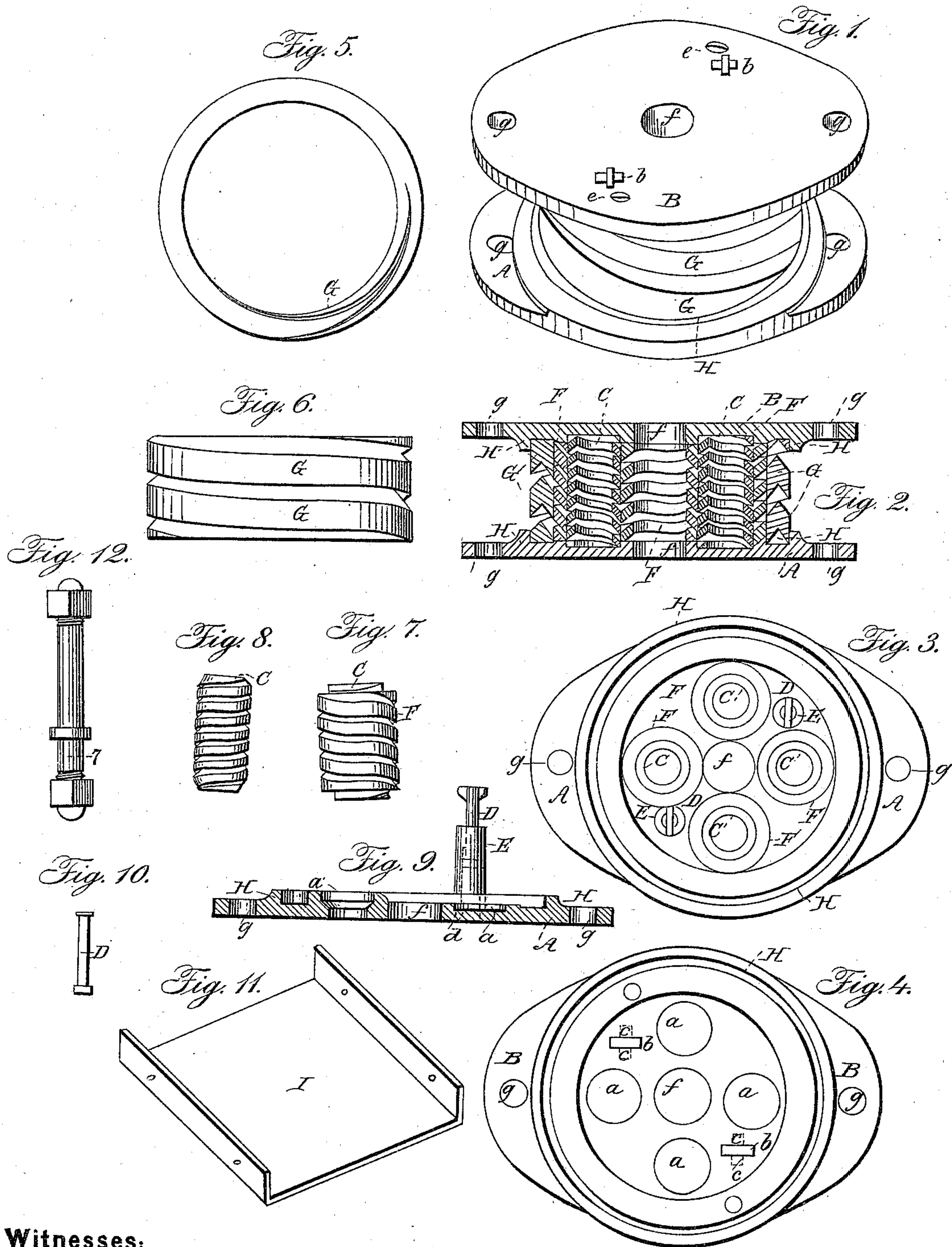


G. A. RIEDEL.
Car Spring.

No. 42,402.

Patented Apr. 19, 1864.



Witnesses:

Stephen White
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UNITED STATES PATENT OFFICE.

G. ADOLPH RIEDEL, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN CAR-SPRINGS.

Specification forming part of Letters Patent No. 42,402, dated April 19, 1864.

To all whom it may concern:

Be it known that I, G. ADOLPH RIEDEL, of the city and county of Philadelphia, and State of Pennsylvania, have invented a new and useful Improvement in Car-Springs; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a perspective view of the spring. Fig. 2 is a vertical section of the same. Fig. 3 is a top view with the cap-plate B detached. Fig. 4 is a view of the cap-plate B inverted. Fig. 5 is a top view of the combining-spring G. Fig. 6 is a side elevation of the same. Fig. 7 is a side elevation of a spring, C, and a spring, F, in combination. Fig. 8 is a side elevation of a spring, C, with conical ends. Fig. 9 is a vertical section of the bottom plate, B, and a side elevation of one of the tubes E and a bottom or clamp, D, in connection. Fig. 10 is a modified form of one of the clamps D. Fig. 11 is a perspective view of the plate I. Fig. 12 is a view of one of the bolts for confining the spring to the car.

Like letters in all the figures represent the same parts.

The nature of my invention consists in a peculiar construction and arrangement of a nest or series of springs for cars and other purposes, which will be understood by the following description.

A and B are metallic plates, which I usually construct of cast or wrought iron. They have recesses *a a a*, in which the ends of the spring C are inserted for the purpose of holding the said springs in their position. The said plates are confined against the ends of the springs by means of the buttons or clamps D D, the stem and head of which fit and slide in the tubes E E. The buttons or catch parts of the clamps are passed through the slots *b b* of the plate B, and are turned at right angles thereto, and catch on the face of the plate or in the recesses *c*, which are represented in Fig. 4. The tubes E E have heads *d d*, which are counter-sunk in the plate A. For the particular construction and combination of the clamps D D and tubes E E see Fig. 9.

In place of the buttons on the clamps, washers may be used, the ends of the clamps being riveted against them, as represented in Fig. 10.

The springs F, which surround the springs C, are shorter than the latter, as their ends are not required to be sunk in the plates A B, but bear against the inner faces of the same. I construct the springs straight on their peripheries for the purpose of causing them to slide easily against each other, and to favor their tendency of moving in line when being compressed.

I construct the springs C and the springs F of wire, which has two acute angles, and which in the formation of the springs constitute the extreme parts of the top and bottom edges of the folds thereof, the perpendicular sides of the folds being parallel, and also their top and bottom edges being parallel to each other, as shown in the drawings, so that when the springs are compressed to their maximum degree their folds will lay flat together and their perpendicular sides will be straight with each other—that is to say, the inner and outer peripheries of the springs will be of straight cylindrical form, like those of a solid cylinder which is turned straight forward from end to end. The object of constructing the springs of wire which has acute angles, as described, is that by having an increased depth to the folds much stronger springs are produced than can be made of wire of any other form, and having the inner and outer peripheries of the springs of straight cylindrical form is to cause them to slide easily against each other, and the springs F to slide easily against the spring G, which I will hereinafter describe.

I have represented but four pairs of springs in the drawings merely for illustration, but in practice I have a much greater number, so that the outer springs, F, nearly touch each other.

The springs are represented as concentric with the plates A B; but I do not confine myself to this form of arrangement, as they may be arranged in the form of a parallelogram, or in any other form, without changing the result.

G is a spring, which surrounds the springs above described, and its inner periphery slightly touches the outer periphery of the springs F, so that the latter are thereby kept in their lateral position. The said spring G has a V-depression in the under side of its folds and a corresponding elevation on their upper side, so that when the spring is com-

pressed the elevations will fit in the depressions, and thus the spring will be kept in its perpendicular position so as to maintain its strength, as well as to be a support to the springs F, on which it impinges. Great strength is also given to this peculiar form of the spring. The screws *e*, which confine the spring G to the plates A and B, may be dispensed with, if desired.

I construct all the springs above described with their inner and outer peripheries straight and parallel with each other, so as to cause them to slide easily against each other and maintain their perpendicular position.

In Figs. 8 and 9 a modification of one of the springs C and the plates A and B is represented, the ends of the spring for a short distance being of conical form and the recess *a'* of corresponding form, as represented.

In the series of springs I have represented but one spring, F, surrounding a spring, C, but it will readily be seen that any number may in succession be arranged so as to produce an increased action in the combination; and so, also, in relation to the spring G, any desirable number may be used by forming them of different sizes so that the outer periphery of one will fit the inner periphery of the next succeeding one.

The collars H, which surround the spring G, may be cast to the plates A and B, when the said plates are made of cast-iron, or they may be made separate, either of cast or wrought iron, and confined by means of screws or rivets.

I design the springs not only for sustaining the weight of the cars, but also to be used as bumpers, and for other purposes. When used as bumpers, they may be fastened to the plate I, which is represented in Fig. 11, the said plate being bolted on the front end of the frame of the car.

The center holes, *f*, in the plates A and B, are for the purpose of holding the whole spring perpendicular to the car, there being a stationary pin or bolt connected with the latter, on which the said holes fit.

The operation of the spring is as follows: There is a spring connected with each pedestal of a car, the plates A and B coming between the pedestal and car frame, and being confined or secured to the same by means of screw-bolts or pins, which pass through the holes *g g g g* of the plates, and as the weight of the car is distributed on all the springs, as the

springs in each series yield, they all support each other laterally in consequence of their sides being straight and perpendicular.

Instead of confining the plates A and B each separately by means of independent bolts, one of the plates may be secured at each end by bolts of the form represented in Fig. 12, the end one being secured in the frame of the car and the other end playing freely in a hole of the pedestal, or vice versa.

Having thus fully described the construction and operation of the improvement in car-springs as invented by me, what I claim therein as new, and desire to secure by Letters Patent, is—

1. Constructing the plates A and B with the circular recesses *a a a a* or with conical holes *a'*, for the purpose of receiving the ends of the springs C, substantially in the manner and for the purpose set forth.

2. Combining the springs F with the springs C and the plates A B, substantially as described and shown.

3. Surrounding the springs F with the springs G, for the purpose of giving greater strength to the rest of springs, and also to preserve their perpendicular position, substantially as described.

4. Constructing the springs C and the springs F of wire which has two acute angles, which in the formation of the springs constitute the extreme top and bottom parts of the folds thereof, the top and bottom edges of the folds being parallel, and their perpendicular sides also parallel to each other, substantially as described, and for the purposes above set forth.

5. Constructing the top and bottom edges of the folds of the spring G with a V-depression in one edge and a corresponding elevation in the other, substantially in the manner and for the purpose set forth.

6. The buttons or clamps D, in combination with the tubes E, when arranged and operating in relation to the plates A and B, substantially as set forth.

In testimony that the above is my invention I have hereunto set my hand and seal this 10th day of February, 1864.

G. ADOLPH RIEDEL. [L. S.]

Witnesses:

CHAS. E. PANCOAST,
STEPHEN USTICK.