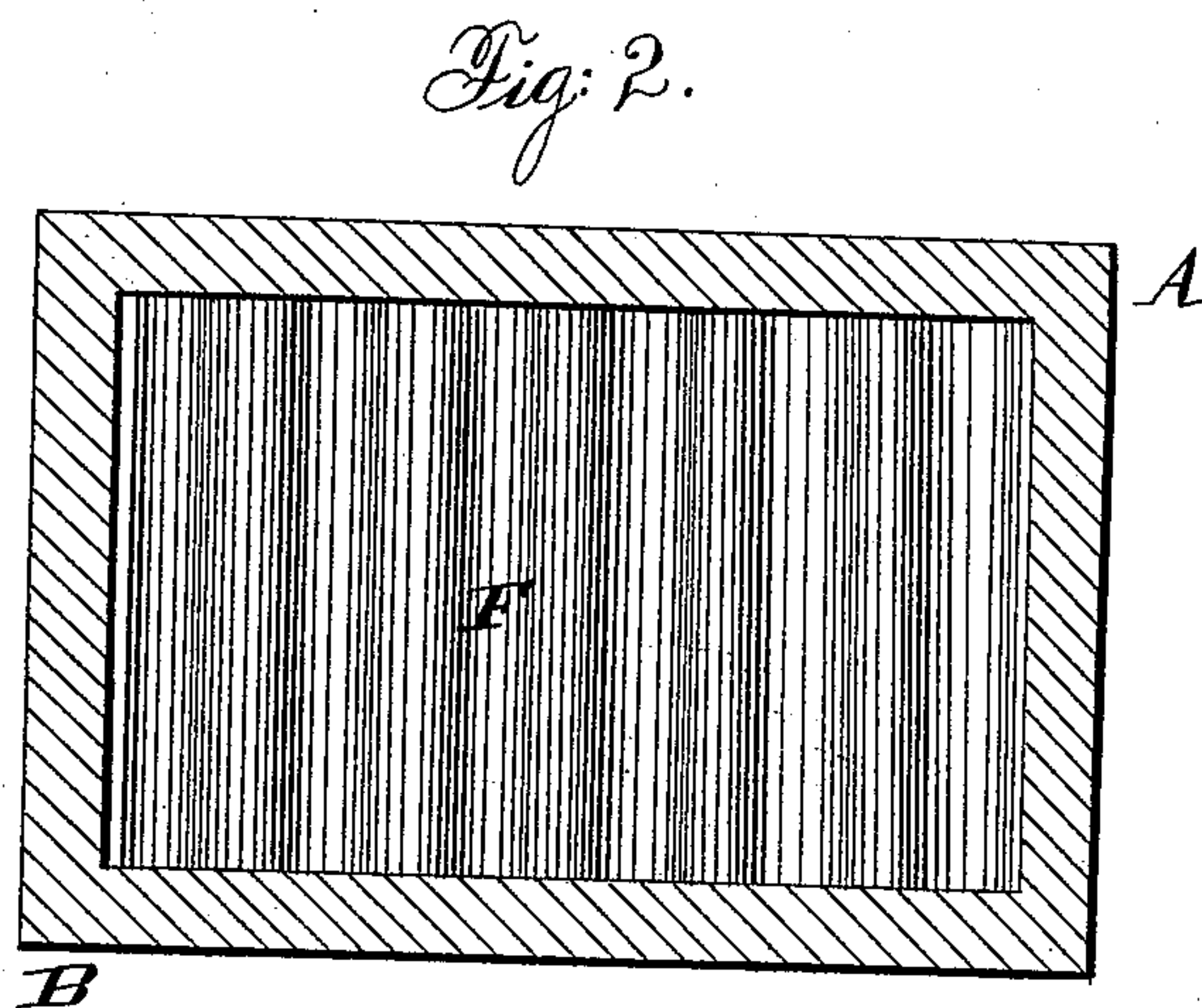
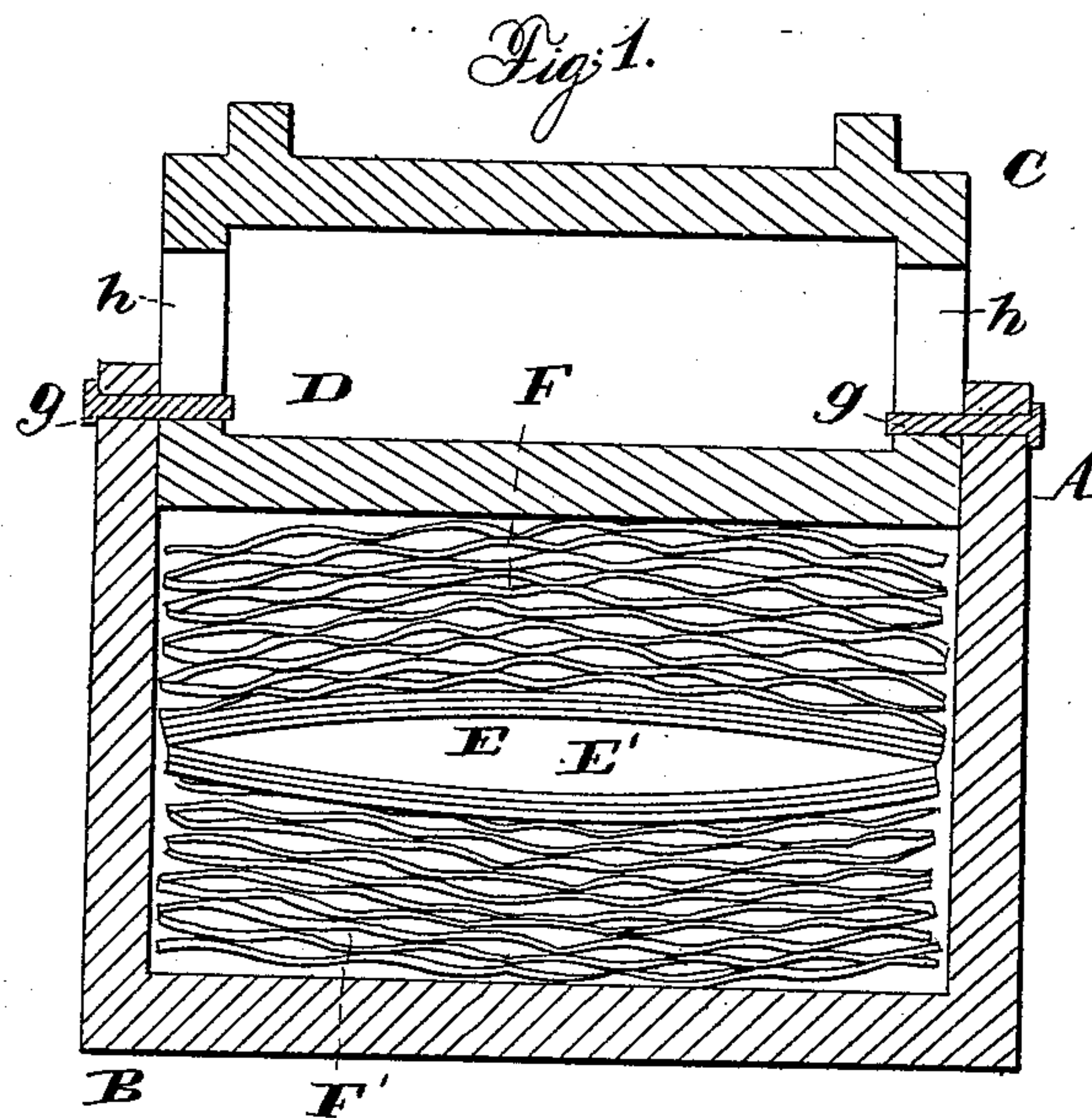


H. N. BLACK.

Car Spring.

No. 50,415.

Patented Oct. 10, 1865.



Witnesses.

Bruf Morrison
Jas Huns move

Inventor:

Horatio N. Black.

UNITED STATES PATENT OFFICE.

HORATIO N. BLACK, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO
HIMSELF, WM. L. BOYER, AND HENRY K. BOYER, OF SAME PLACE.

IMPROVED CAR-SPRING.

Specification forming part of Letters Patent No. 50,415, dated October 10, 1865.

To all whom it may concern:

Be it known that I, HORATIO N. BLACK, of the city of Philadelphia, in the State of Pennsylvania, have invented a new and useful Improvement in Springs for Railroad-Cars; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a vertical longitudinal section of one of the said improved springs; and Fig. 2, a top or plan view of the same, having the piston or bearer removed therefrom, like letters of reference indicating the same parts when in both figures.

The object of my invention is the production of a simple, durable, and effective metallic spring for railroad-cars.

It consists, substantially, as hereinafter described and set forth, in the combination and arrangement, within a metallic box provided with a suitable piston or bearer, of two series of plain flat iron or steel plates and of two series of corrugated iron or steel plates, each series being regularly curved, fitted together concentrically, and applied in the box so that the two series of the said plain plates will together form what is called a "full elliptic spring," each set of the said plain plates having its concave side opposite to that of the other, while the two sets of the said corrugated plates are respectively placed concentrically upon or in contact with the two convex sides of the two said series of plain plates, the former being arranged so that the convexities of one plate shall bear against the convexities of the next adjoining plate in its series, and thus together form a multitude of small, so-called "elliptic" springs, both above and below the two series of the plain plates, and act together in combination with the said plain plates, so as to produce increased elasticity and strength as a car-spring when the piston or bearer which rests upon the whole of them in the box is operated upon by the weight and motion of the car to which it may have been applied.

In the drawings, A B is the box; C D, the piston or bearer; E E', the two series of the plain iron or steel plates, and F F' the two series of the corrugated iron or steel plates.

The box A B is of cast-iron, rectangular in form, and open at its upper side. The piston or bearer C D is also of cast-iron, rectangular in form, and fits so as to slide accurately and easily in the open side of the box, as seen in Fig. 1. The plain plates E E' are of iron or spring-steel, and are each cut of the size of the area of the interior bottom of the box A B, and then bent into a uniform or regular curve, as seen in the same figure. The corrugated plates F F' are also of iron or spring-steel, and are each cut of the same width as the plain plates E E', corrugated in the form shown, then cut into lengths which equal the lengths of the plain plates E E', and, finally, curved to correspond with the latter concentrically, as seen in the same figure.

In arranging and combining the differently-formed plates in the box A B, I take a series of three or more of the plain plates E and place them together or concentrically, and in like manner I also place together the same number of the plain plates E', and then apply the two series together, with their concave sides next to each other, and place them upon a concentric series of twelve (more or less) of the corrugated plates F', each plate thereof being also placed concentrically with their small convexities in contact with each other, respectively, in the bottom of the box A B; and then I apply the series F of the corrugated plates in the same concentric manner upon the upper series, E, of the plain plates, and finally insert the piston C D into the open side of the box, so that it will rest directly upon the crown of the upper series, F, of the corrugated plates, as seen in the same figure, and then I insert two or more stay-bolts, *g g*, fixedly in appropriate holes previously made in the ends of the box, and so that they shall enter slots *h h*, previously made in the piston C D, and serve the purpose of preventing the said piston and box from separating, and yet allow a free up-and-down motion of the former in the latter.

The plates E E' and F F' are designed to be made of sufficient thickness and temper to support the weight intended to be put upon the spring in use; and it will be seen that a very durable and effective spring will be produced by the combination, and that should the weight upon it be so great as under the motion of the

car to close together the curves of the two sets of the plain spring-plates, and thus bring the whole of the different series of the plates into general straight lines, the corrugations in the plates F F' will still remain and continue to afford sufficient elasticity in the spring to prevent the sudden hard blows or poundings which occur in car having other elliptic springs when the latter are brought into straight parallel lines by the burden upon them. It will also be seen that this spring is simple and easy of construction, and not liable to get easily out of order in using it.

Having thus fully described my improved car-spring and pointed out its utility, what I claim as new, and desire to secure by Letters Patent, is—

A metallic spring for railroad-cars, consisting of the box A B, piston C D, plain plates E E', and the corrugated plates F F', arranged, combined, and operating together substantially as described and set forth.

HORATIO N. BLACK.

Witnesses:

BENJ. MORISON,
JAS. WINSMORE.