W. J. F. LIDDELL.

Car Spring.

No. 53,376. Patented Mar. 20, 1866.

Fig. 1.

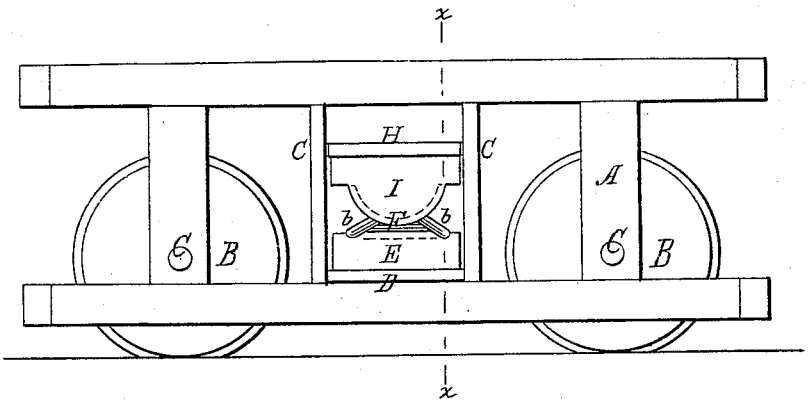


Fig. 2.

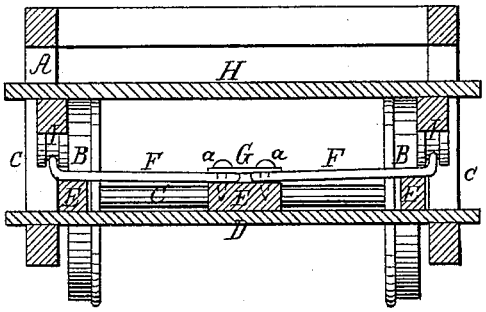


Fig. 3.

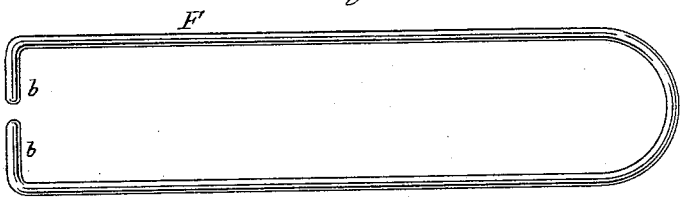
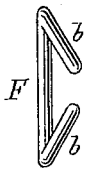


Fig 4.



Inventor:

W. J. F. Liddell
Per Munn & Co
Attorneys

Witnesses:

G. W. Bonnington
Wm Drewry

UNITED STATES PATENT OFFICE.

W. J. F. LIDDELL, OF ERIE, PENNSYLVANIA, ASSIGNOR TO HIMSELF AND JOHN P. ONDERDONK, OF BUFFALO, NEW YORK.

IMPROVED CAR-SPRING.

Specification forming part of Letters Patent No. **53,376**, dated March 20, 1866.

To all whom it may concern:

Be it known that I, W. J. F. LIDDELL, of Erie, in the county of Erie and State of Pennsylvania, have invented a new and Improved Spring for Railroad-Cars; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side view of a car-truck having my improved springs applied to it; Fig. 2, a transverse vertical section of the same, taken in the line *x x*, Fig. 1; Fig. 3, a detached plan or top view of my improved spring; Fig. 4, an end view of the same.

Similar letters of reference indicate corresponding parts.

This invention relates to a new and improved spring for railroad-cars in which elasticity is obtained by torsional action.

The invention consists in having the spring bent in U form, two springs being applied to each truck, and having the ends of the springs bent inward toward each other and inclined upward, the springs thus arranged being used in connection with semicircular pendent bearings attached to plates or bars on which the car-body rests, all being arranged in such a manner that the strength of the springs are automatically graduated to the weight of the load to which they may be subjected, as hereinafter set forth.

A represents a car-truck; B, the wheels, and C the axles, thereof. D is a plate or bar which is fitted transversely in the truck at about its center, and having three blocks, E E E′, secured upon it, the block E′ being at the center of the plate or bar D, and the blocks E near the ends thereof.

F F represent, springs which are constructed of rods of steel, or other suitable metal, bent in U form and secured at their inner semicircular ends by a plate, G, through which screws *a* pass into block E′. (See Fig. 2.) The outer ends of the springs F E are bent inward or toward each other, as shown at *b b*, and said ends *b b* are bent upward, as shown in Fig. 4.

H is a plate or bar, which is placed transversely in the truck directly over the plate or bar D, and is confined in position between suitable guides *c*. This plate or bar supports the car, or has pendent semicircular blocks I attached to it, one near each end, said blocks being grooved to receive the ends *b b* of the springs E F, the outer parts of which rest upon the blocks E E, the latter having grooves in their upper surfaces to receive the springs and prevent them from slipping laterally.

From the above description it will be seen that the semicircular blocks I, in consequence of bearing upon the inclined ends *b* of the springs F F, will bend or twist the springs as the plate or bar H, is forced down or depressed; and it will further be seen that the farther down the blocks I are forced the less leverage power they will have on the springs, as the points of contact of the blocks I gradually recede from the ends of *b* as the former are pressed or forced down; hence, the springs are automatically graduated to resist an increased weight or load, and the ends *b* are prevented from being twisted off from the main portions of the spring when the latter are subjected to a heavy load. The arrangement, also, is extremely simple and may be applied at a moderate cost.

I do not claim, broadly, a torsional spring for railroad-cars, for they have been previously used; but

I do claim as new and desire to secure by Letters Patent—

1. A torsional spring for railroad-cars, constructed or bent in double or U form, with the ends *b b* bent inward or toward each other, and inclined upward and applied in pairs to the truck, substantially as set forth.

2. The semicircular blocks I I, attached to the plate or bar H, in combination with the springs F F, substantially as and for the purpose specified.

3. The springs F F, semicircular blocks I I, and the blocks or bearings E E E′, all combined and arranged to operate substantially as and for the purpose set forth.

W. J. F. LIDDELL.

Witnesses:

GEO. W. GUNNISON,

A. D. BUSH.