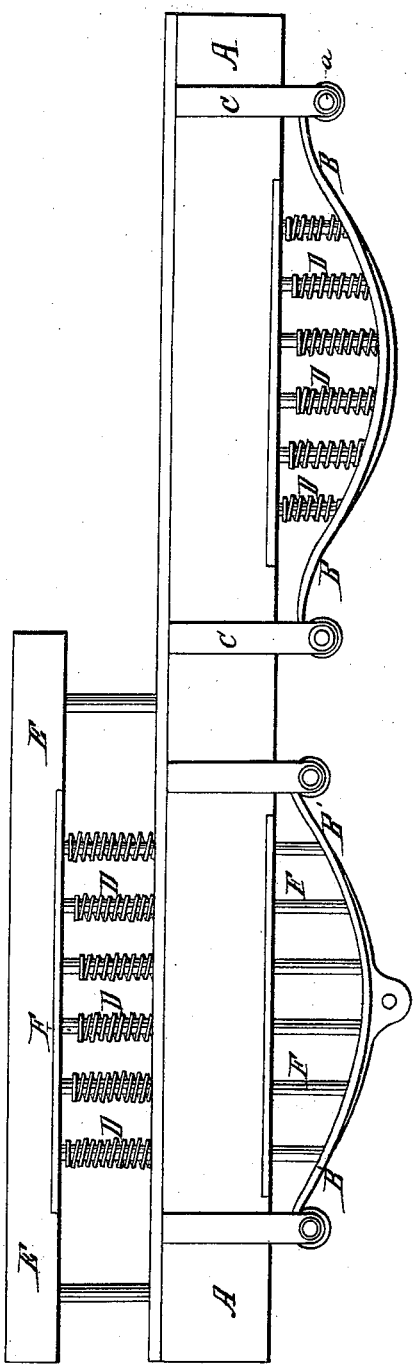
W. DUFF.

Carriage-Spring.

No. 1,928.

Patented Jan. 9, 1841.



UNITED STATES PATENT OFFICE.

WILLIAM DUFF, OF BALTIMORE, MARYLAND.

SPRING FOR RAILROAD-CARS, LOCOMOTIVES, AND OTHER VEHICLES.

Specification of Letters Patent No. 1,928, dated January 9, 1840.

To all whom it may concern:

Be it known that I, WILLIAM DUFF, of the city of Baltimore, in the State of Maryland, civil engineer, have invented certain Improvements in Springs for Railroad-Cars, Locomotives, and other Vehicles; and I do hereby declare that the following is a full and exact description thereof.

My invention consists in the particular manner in which I have combined and arranged the elastic spring made of steel plates, with any desired number of spiral springs, by which arrangement I attain a high degree of elasticity, and graduate the actions of the spring in accordance with the varying burden which it is to sustain.

In the accompanying drawing, I have represented two modifications of my spring; in one of which the elastic force of the spring is made to bear on the under side of the main frame alone; and in the other, the spiral springs are made to act above the main frame, between it and the frame of a car body, or other weight.

A, A, is one side of the main truck, car, or locomotive frame, and A, B, a steel spring which may consist of two, or more, plates, one placed upon the other, and combined in the ordinary way. The upper plate of these springs I usually bend around so as to form a scroll at each end, and through the middle of these scrolls I pass the bolts *a*, *a*. The straps C, C, in this case, I make fast to the frame, as the scrolls at the ends will, by their unwinding and winding, admit of the necessary elongation and contraction of the steel plate. The straps C, C, may, however, be made to swing, in the ordinary way, or the ends of the springs may be received within pockets.

D, D, D, are spiral springs of steel, which are coiled around rods of metal, the lower ends of which rods rest upon, and may be attached to, the upper steel plate, while their upper ends pass into, and slide within, holes made to receive them in the side piece A, of the main frame. The spiral springs are not in a state of tension when there is no load upon them but that of the car, or other vehicle, to which they are applied; nor do they, in fact, extend from the steel plate so as to come into contact with the under side of the frame, but terminate at different distances therefrom, so that the respective pairs are successively brought into action, as the steel spring is straightened by the action of the load. The two outer spirals may, for example, extend up to within half an inch of the bottom of the frame, the next pair to within an inch, and the next to within an inch and a half, more or less, according to circumstances. By this arrangement, the respective pairs will be brought into action accordingly as the load is increased, and at the same time each of the springs will continue to operate as a spring, which is not the case, or is so to a small extent only, in springs of other constructions, in which it has been attempted to graduate their action to the load.

In the second modification of my spring, represented in the drawing, B′, B′, is a steel spring similar to that above described, and it is represented as hung upon scrolled ends in the same way.

E, E, is the lower part of the frame of a car body, or other vehicle, between which and the main frame A, A, the spiral springs D, D, D, are situated, said springs being coiled around the rods F, F, F; the lower ends of which rest upon the steel spring, while said rods slide freely within holes made through the pieces A, and E, for that purpose. These springs are graduated so as to be brought successively into action, according to the weight of the load, in the manner already described. I have represented six spiral springs in each combination, but this number may be varied at pleasure.

Having thus, fully described the nature of my invention, and shown the manner in which the same is carried into practical operation, what I claim therein, and desire to secure by Letters Patent, is,

The manner in which I have combined the steel plate spring, as constructed with scrolled ends, or with the ends attached to vibrating bars, or to be received into pockets, with the spirial springs, which are so graduated in length as to be successively brought into action according to the bearing of the load, as herein described.

WILLIAM DUFF.

Witnesses:
THOMAS R. SCOTT,
JOHN BROWN.