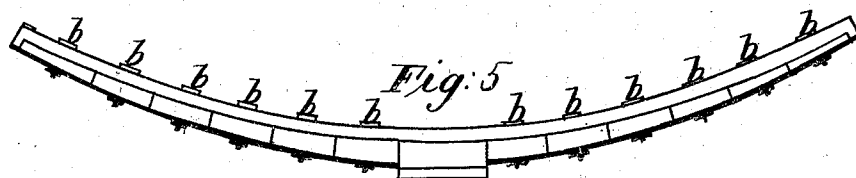
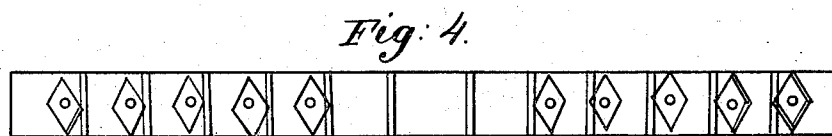
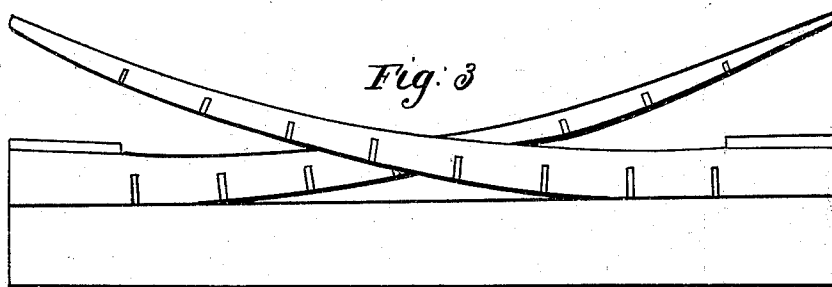
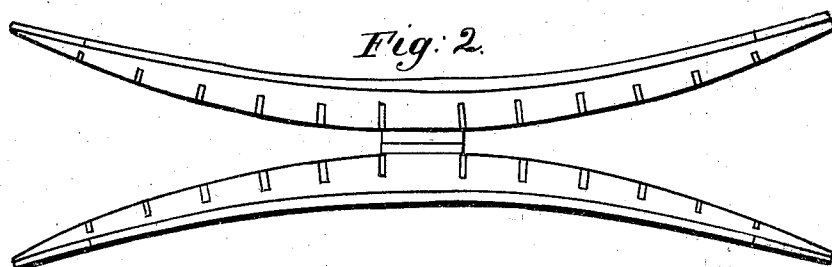
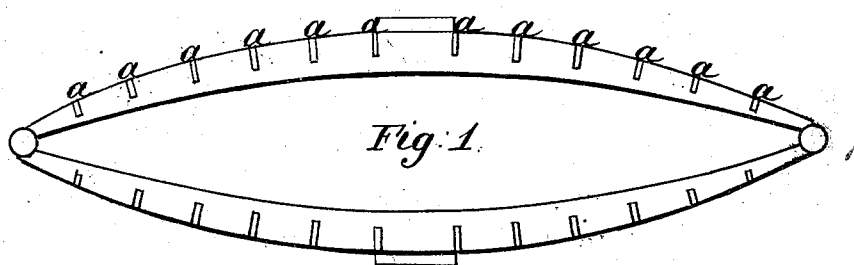


I. Bissell.
Carriage Spring
N^o 8,105. Patented May 20, 1851.



UNITED STATES PATENT OFFICE.

LEVI BISSELL, OF NEW YORK, N. Y.

CARRIAGE-SPRING.

Specification of Letters Patent No. 8,105, dated May 20, 1851.

To all whom it may concern:

Be it known that I, LEVI BISSELL, of the city, county, and State of New York, have invented a new and improved mode of constructing carriage-springs for railroad-cars, coaches, and other vehicles and for other purposes, which I call the "Excelsior spring;" 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 drawing, making a part of this specification, in which—

Figure 1, is an edge view in the form of a common elliptic spring; Fig. 2, represents what may be called an inverted elliptic spring; Fig. 3, is a different form to which my mode of construction is adapted; Fig. 4, is a view of the convex side of an elliptic spring, and Fig. 5, is a spring of a somewhat different construction, where the same principle is contained.

I propose to make my spring of wood using for the purpose good strong and seasoned hickory, oak, ash, or other strong wood; the spring is dressed to a proper size and of such a taper as when pressed upon, bends equally in its whole length. I then cut saw kerfs (see *a, a, &c.*) square across the spring at about two inches apart (more or less), cutting such kerfs about two thirds (more or less) through the spring; these saw kerfs are filled in with strips of metal, wood, or other hard substances, if for a rigid, and with elastic substances, for a more elastic spring; which are forced in sufficiently tight to bring the spring to a proper curve, or compass desired, in the unstrained spring. To prevent the parts of the spring between the strips from parting from the same, I put a rivet (see *b, b, &c.*) through each of them as represented in Figs. 4 and 5, and to prevent the strips from dropping out, if by any means they should become loose I let a corner of the bur on the ends of the rivet, extend a little over the strips.

When the spring is required to sustain a very heavy pressure, it may be necessary to strengthen it by a plate of steel or other metal to run the whole length of the spring,

to be securely riveted on the concave side of the spring as represented in Fig. 2.

The spring represented at Fig. 5, consists of a plate of steel or of other metal, set to the proper curve, on which is firmly riveted or bolted a succession of blocks of hard wood, or other hard substance, the blocks being so fitted to each other as to form close joints as represented at Fig. 5, or such blocks may be fitted so as to leave spaces to be filled with either hard or elastic substance as represented at Fig. 4.

It will be perceived, by reference to the foregoing description and drawings, that when force is applied to the spring, it will tend to close such kerfs, which will produce a strong pressure on the strips with which the kerfs are filled, such strips acting as braces to each other at that side of the spring, causing a lengthwise tension at the opposite side of the spring, and if made of wood, will be in the direction of the fiber, and that nothing short of a force sufficient to pull apart the fiber in a lengthwise tension, can cause it to give away. It will be seen also, that rigidity or elasticity may be given to the spring herein described, by filling into the kerfs substances of different qualities, whether hard or elastic; and it is the case, that such effect can be extended and increased by the degree of force with which these substances are put in, and by which the same spring may be made adjustable from extreme elasticity to one quite unyielding and rigid, and by substituting one material for another, or by driving in the substance filling the kerf, more or less, the same spring may be adapted to any given load, or purpose.

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

The construction of springs, whether of wood, or part wood and part metal, or other elastic or nonelastic substances, as adapted and applicable to carriage springs, and springs for other purposes, in the manner substantially as herein described.

LEVI BISSELL.

In the presence of—

I. S. SMITH,
E. G. HANDY.