W. P. HANSELL.

Car-Springs.

No. 148,695. Patented March 17, 1874.

fig. 1.

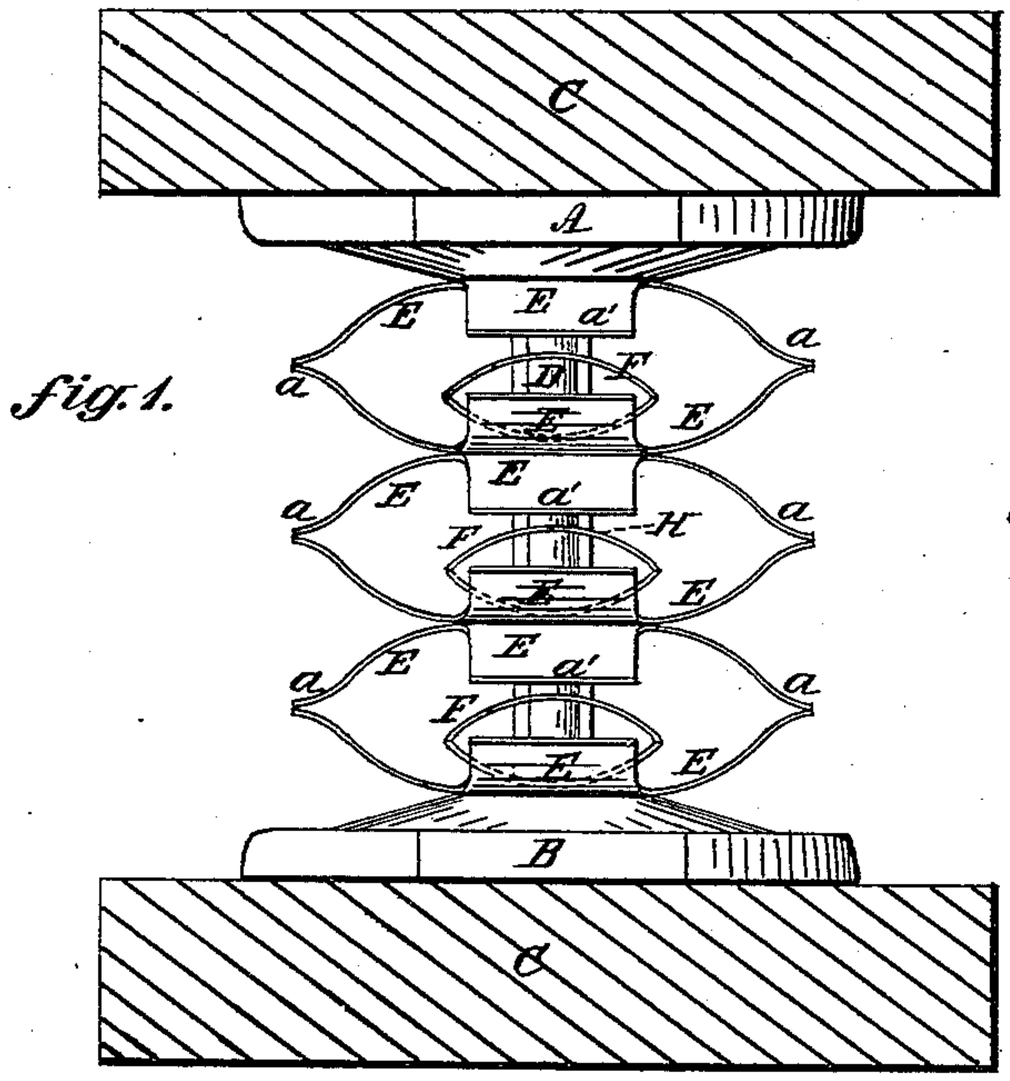


fig. 4.

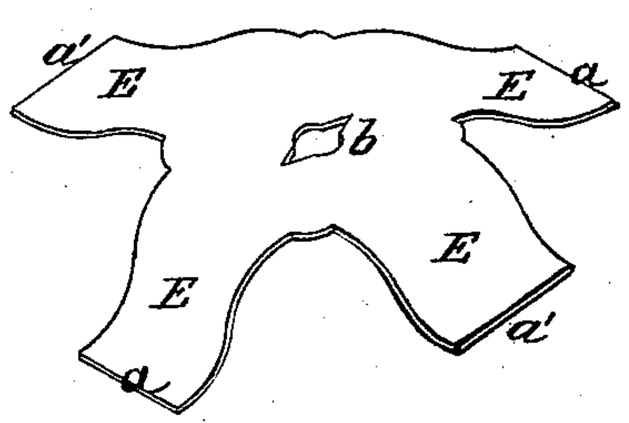


fig. 2.

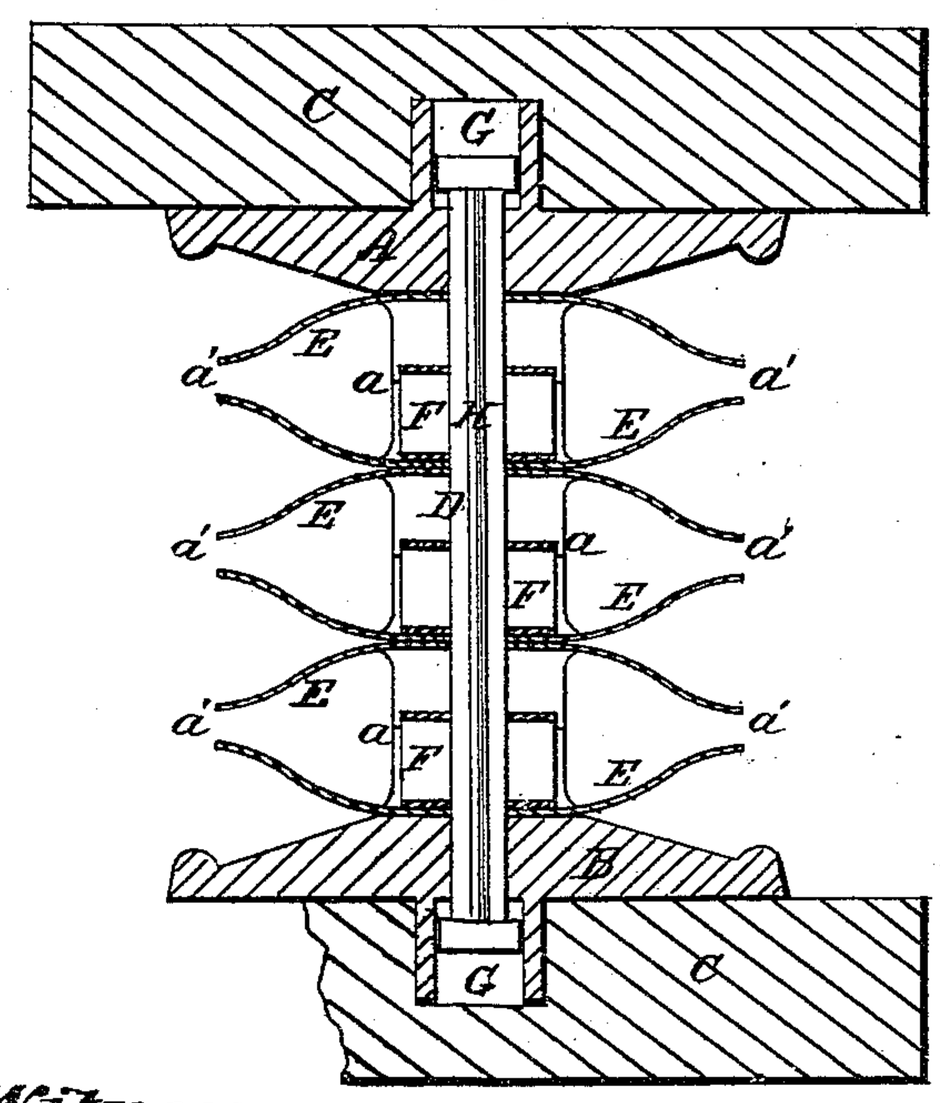
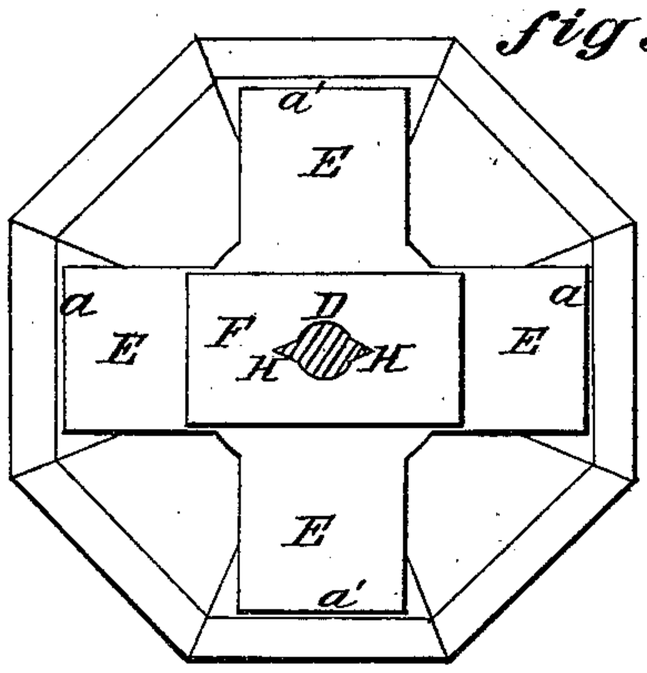


fig 3.



Witnesses:

J. H. Rutherford
T. C. Smith

Inventor:

Walter P. Hansell,

by Johnson and Johnson

his Attorneys.

UNITED STATES PATENT OFFICE.

WALTER P. HANSELL, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN CAR-SPRINGS.

Specification forming part of Letters Patent No. **148,695**, dated March 17, 1874; application filed February 24, 1874.

To all whom it may concern:

Be it known that I, WALTER P. HANSELL, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvement in Springs, of which the following is a specification:

My invention relates to springs adapted for railway-cars and other vehicles; and my said invention consists, first, of a leaf or elliptical spring, with four or more bearing-points, in pairs, of cross-plates, in which two of such bearing-points are employed to sustain the weight of the car and very light loads, while the other two cross-points of the same leaves are of less pitch in curve, and are held in reserve for action under medium loads, thereby making a double spring of each leaf and increasing the capacity and strength of each leaf twofold while diminishing its length; second, in the combination of compound elliptical springs having four or more bearing-points to each leaf, and each pair of bearings brought into action separately, with intermediate smaller elliptical springs, to sustain the weight of the load when the four bearing-points are brought into action under heavy burden, and preserve the elasticity of the cross-leaves upon their four bearing-points; third, in the combination of a compound elliptic or cross-spring with a central holding-rod formed with fins, to prevent the leaves from slipping round and to maintain the bearing-points always in their proper relation for contact while allowing free vertical play to the springs; fourth, in providing the top and bottom bolster-plates with hollow bosses, in combination with the central holding-rod for the springs, whereby the said rod is allowed vertical play within the bosses at both ends while being secured therein by rivet-heads.

In the accompanying drawings, Figure 1 represents an elevation of a spring embracing my invention, and as applied to the bolsters of a car; Fig. 2, a vertical section of the same; Fig. 3, a horizontal section; and Fig. 4, a view in perspective of one of the compound or cross-elliptical springs.

The top and bottom plates A and B are secured to the bolsters C of the car in the usual manner, and between these plates the springs are arranged upon a central holding-rod, D. These springs are composed of separate semi-elliptical plates, having each four or more leaves, E, which, in the example shown, are at right angles to each other, and constitute bearing-points *a*, for action upon each other. These bearing-plates E are not of the same pitch of curve, but two, *a'*, of each separate leaf, are of less deflection or curve than the other two, *a*, in order that they may be brought into action under greater weight, thereby making each single leaf a double spring in itself, its four bearings being integral with the single leaf. The curves of these leaves will be such as to give them broad bearing-points, and they are secured so that such points will be in position for action upon each other when the spring is compressed. By this construction the spring is made much shorter than the ordinary elliptic spring, while being much stronger, more durable, and more elastic under weight. These four plates also hold the spring more firm, and prevent its displacement under sudden concussions. Interposed between these springs are small elliptical springs, F, designed to be brought into action under heavy burdens, and to allow the four bearing-points to preserve much of their elasticity. The central rod D passes into hollow bosses G, formed upon the top and bottom plates A B of the bolsters, and the ends of the rod are rivet-headed, so as to hold it within these bosses and allow it free end play therein under the compression of the springs. It has fins or projections H, over which the springs fit to hold them from turning and to keep their acting points *a a'* always opposite and to match each other, the openings *b* in the springs corresponding to the cross-section of said holding-rod.

Any suitable number of these springs may be used, and they may be composed of two or more thicknesses of leaves riveted together. Two of the bearing-points, *a*, of each leaf, meet and sustain the car and light loads, and under increase of weight the two others, *a'*, are brought into action, and with heavy burden the four points meet upon the small interior springs F, and these still give spring to the car.

One of the chief advantages of my improved spring consists in constructing it of a series of

bearing-points from a single short plate, and these points brought successively into action under different degrees of weight, and occupying about half the space of the ordinary elliptic spring. These springs are also made separate, and do not require to be secured together at the points, thus avoiding much expense usual in such springs.

I claim—

1. An elliptical or bow spring having four or more bearing-points, in pairs, with the two opposite bearing-points, *a'*, of less pitch or curve than the others, *a*, substantially as and for the purpose described.

2. In combination with elliptical or bow springs having four or more bearing-points to be brought into action separately, the intermediate springs F, substantially as and for the purpose described.

3. The combination of the springs, having four or more bearing-points, matching in pairs, with the central holding-rod D, constructed with fins H, to maintain the said bearing-points in proper position for action.

4. The hollow bosses G, in combination with the central holding-rod D, to give free play to said rod at both ends, as described.

WALTER P. HANSELL.

Witnesses:
WM. J. LOGAN,
BIDDLE R. HANSELL.