No. 830,810. PATENTED SEPT. 11, 1906.

C. L. THOMAS.

VEHICLE SPRING.

APPLICATION FILED NOV. 21, 1905.

Fig. 3.

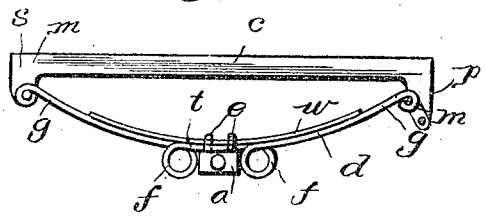


Fig. 1.

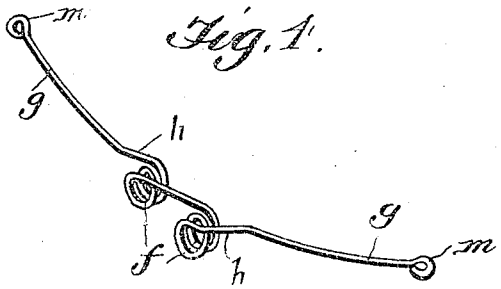
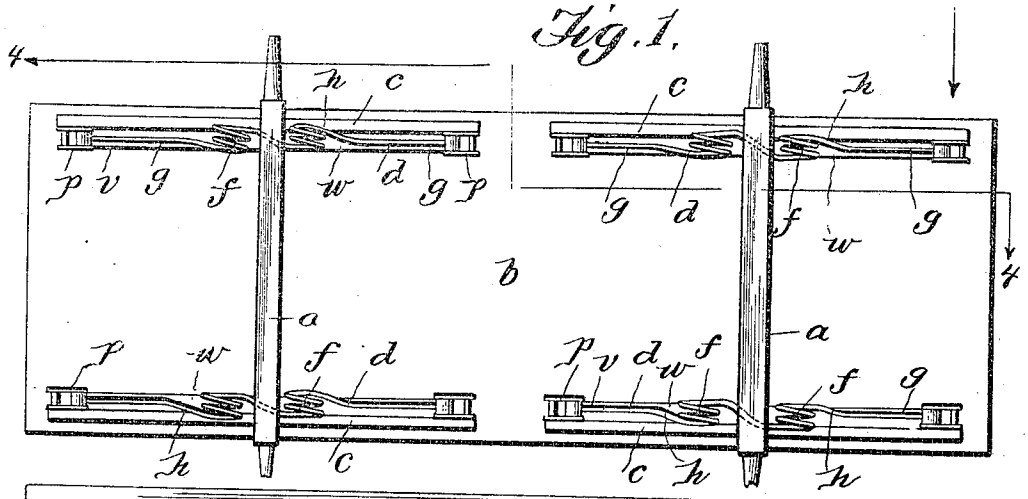


Fig. 1.



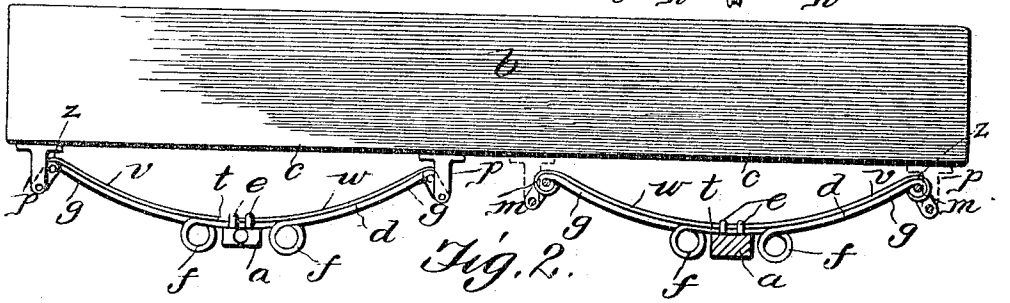


Fig. 2.

WITNESSES

R. A. Boswell

George M. Anderson

INVENTOR

Charles L. Thomas

by E. W. Anderson

his Attorney

UNITED STATES PATENT OFFICE.

CHARLES L. THOMAS, OF CANISTEO, NEW YORK.

VEHICLE-SPRING.

No. 830,810. Specification of Letters Patent. Patented Sept. 11, 1906.

Application filed November 21, 1905. Serial No. 288,462.

To all whom it may concern:

Be it known that I, CHARLES L. THOMAS, a citizen of the United States, and a resident of Canisteo, in the county of Steuben and State of New York, have made a certain new and useful Invention in Vehicle-Springs; and I declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it appertains to make and use the invention, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Figure 1 is a bottom plan view of my springs as applied. Fig. 2 is a side elevation of the same without the bar *c* and with parts broken away. Fig. 3 is a detail side view of a modified form of spring. Fig. 4 is a perspective detail view of the rod-spring.

The invention relates to vehicle-springs of elliptic character; and it consists in the novel construction and combination of parts, as hereinafter set forth.

In the accompanying drawings, illustrating the invention, the letter *a* designates an axle-bar, and *b* the body, of a vehicle, having a bar *c* extending along the body lengthwise, to which the spring *d* is connected. The spring *d* is carried by the axle, across which its middle portion *t* extends and to which it is secured by suitable clips and fastenings, as indicated at *e*.

The spring *d* is made of a single rod or length of spring-steel and is provided with oppositely-turned coils *f*, which project downward at the ends of its middle portion *t*, one in front and the other in rear of the axle, the outer ends of the coils being level with their inner ends and having the spring-arms *g*, each of which has one initial lateral bend *h* toward the central longitudinal plane of the axle, in which plane the arm extends upward and lengthwise, one arm *g* extending forward and the other rearward in an elliptical curve. The ends of these arms are provided with eyes or bearings *m* to engage shackles *p*, connected to the body-bar *c* or to the body itself.

In some cases it is preferred to use pivoted shackles at each end of the spring, while in others it is better to use but one shackle, the other end of the spring being connected directly to the body or body-bar by means of a fixed bearing *s*, which may be a single eye-bolt. The mode of connection is determined to suit the amount of play required by the spring, according to the character of the wagon.

In this spring the elliptic arms *g* are designed to lie in its vertical plane, in which the middle portion *t* also lies, so that the spring is laterally poised or equalized with reference to its middle attachment and end connections, and as its coils are immediately in front and in rear of the axle-bar its appearance is neat and trim.

In the heavier styles of vehicles, or when there is liability to much side sway, this rod-spring may be supplemented with a leaf-spring *w*, also secured to the axle by means of the clips and fastenings binding its middle portion. This leaf-spring is designed to overlie the rod-spring and to have its arms or branches *v* of similar curvature to those of said rod-spring, forming in this way an elastic bracing-bearing therefor. For this purpose an entire or partial elliptic leaf-spring may be used, the ends of this spring being curved to engage the shackles, as at *z*, when shackles are employed.

Having thus described the invention, what I claim, and desire to secure by Letters Patent, is—

1. A vehicle-spring of rod-steel consisting of a middle portion having oppositely-turned coils, in front and rear thereof terminating at the level of said middle portion, and elliptical curved arms or branches extending from such coils by lateral bends to the vertical plane of the middle portion, and thence in such vertical plane upward and lengthwise to their connection ends, substantially as specified.

2. A vehicle-spring consisting of a middle portion, coils at each side of said middle portion, outward-extending branches having connection with said coils, and a supplemental bracing leaf-spring for the rod-spring closely adjacent thereto, said outward-extending branches and middle portion having connection with the vehicle-body and the support, substantially as specified.

3. In a vehicle-spring, a middle portion, coils at each side of said middle portion, outward-extending branches having connection with said coils by lateral bends, said outward-extending branches and middle portion having connection with the vehicle-body and the support, substantially as specified.

4. In a vehicle rod-spring, a middle portion, coils at each side of said middle portion, outward-extending branches having connection with said coils by lateral bends, said out-

ward-extending branches and middle portion having connection with the vehicle-body and the support, and a supplemental leaf-spring connected to the rod-spring, substantially as specified.

5. In a vehicle rod-spring, a middle portion, coils at each side thereof, outward-extending branches having connection with said coils by lateral bends, a shackle connection between said outward-extending branches and the vehicle-body, said middle portion having connection with the supporting-axle, and a supplemental leaf-spring also connected to the shackle connection and to the supporting-axle, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES L. THOMAS.

Witnesses:
E. S. HOPKINS,
A. A. HOPKINS.