(No Model.)

O. A. TIMBERLAKE.

VEHICLE SPRING.

No. 602,591. Patented Apr. 19, 1898.

Fig. 1.

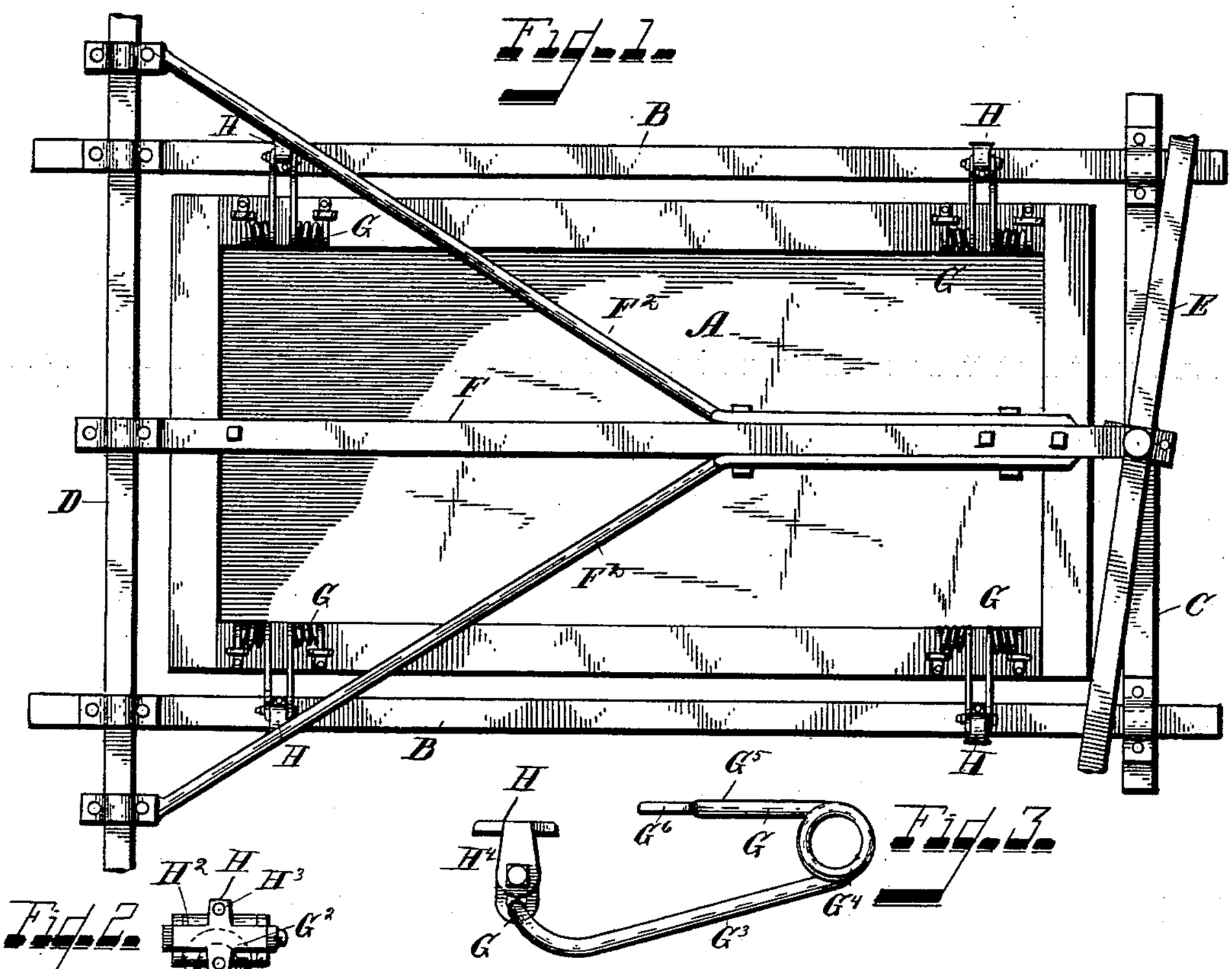


Fig. 3.

Fig. 2.

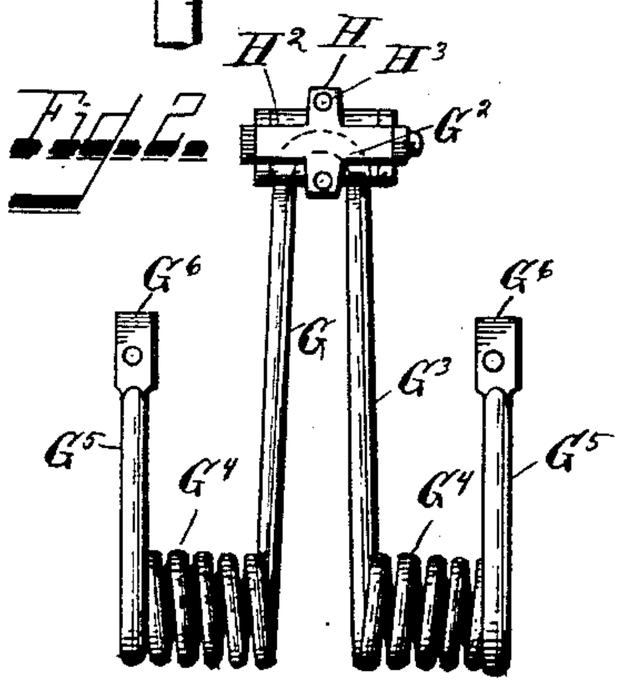


Fig. 4.

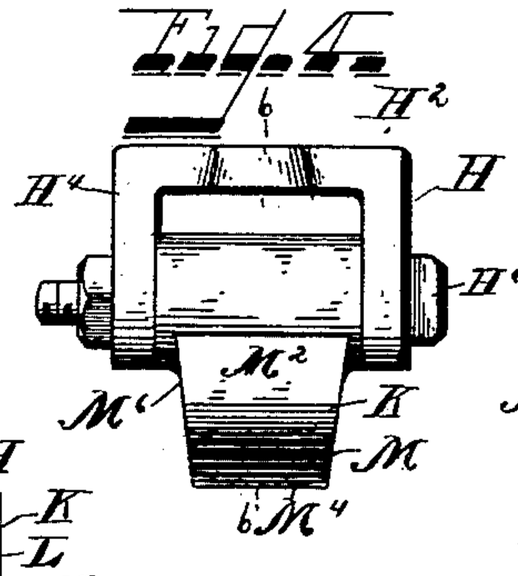


Fig. 5.

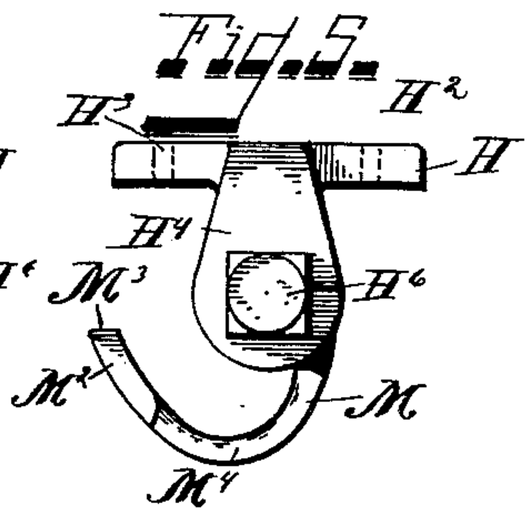


Fig. 6.

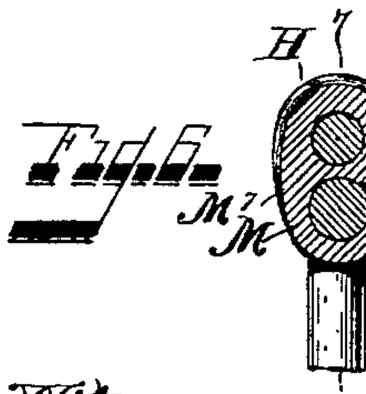
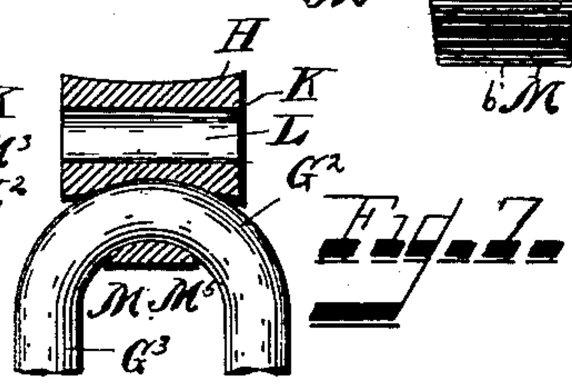


Fig. 7.



Witnesses

Wm. E. Jones.

H. Smith.

Inventor

Orville A. Timberlake,

per Wm. Hubbell Fisher,

Attorney

UNITED STATES PATENT OFFICE.

ORVILLE A. TIMBERLAKE, OF NORWOOD, OHIO.

VEHICLE-SPRING.

SPECIFICATION forming part of Letters Patent No. 602,591, dated April 19, 1898.

Application filed February 8, 1897. Serial No. 622,425. (No model.)

To all whom it may concern:

Be it known that I, ORVILLE A. TIMBERLAKE, a citizen of the United States, and a resident of the town of Norwood, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Vehicle-Springs, of which the following is a specification.

One feature of my invention relates to a novel and very useful conformation of spring.

Another feature of my invention relates to a novel and advantageous connection for uniting this spring to the rigid shackle.

The several features of my invention and the various advantages resulting from their use conjointly or otherwise will be apparent from the following description and claims.

My invention is primarily adapted for use in what are known as "side-bar" road-vehicles. I will therefore describe the same in its application to such vehicles, and such a description will suffice to indicate the mode of its application to other road-vehicles.

In the accompanying drawings, making part of this specification and in which similar letters of reference indicate corresponding parts, Figure 1 is a bottom view of a vehicle-body and its side-bar frame and of my invention symmetrically applied thereto for use. Fig. 2 is an enlarged detail top plan view of my improved spring and connection. Fig. 3 is a side view, on the same scale as Fig. 2, of this spring and connection. Fig. 4 is a view, on a still larger scale, of the improved connection, the open end of the connection being in front—that is, toward the beholder. Fig. 5 is a side view of the improved connection and on the same scale as Fig. 4. Figs. 6 and 7 are on a scale less than that of Figs. 4 and 5, but greater than that to which Figs. 2 and 3 are drawn. Fig. 6 is a vertical transverse section of the link and the adjacent end of the loop fitted therein, taken in the plane of the dotted line 6 6 of Fig. 4 and showing the link held within the lip, the latter being bent into place. Fig. 7 is a vertical section on the same scale as Fig. 6 and taken in a plane at right angles to the plane of the section of Fig. 6—to wit, this section, Fig. 7, is taken in the plane of the dotted line 7 7 of Fig. 6.

I will now proceed to describe my invention in detail.

A indicates a vehicle-body; B B, the side-bars of the frame. These side-bars are suitably connected together at or near each end. In the present illustrative instance the forward portions of the side-bars are connected by the bolster C, and the rear portions of the side-bars are connected by the rear axle D. The bolster is pivotally connected in any suitable manner to the front axle E. The customary reach F between bolster and rear axle and braces F^2 F^2 for the reach may be present.

The vehicle-body is respectively connected to the side-bars and is also elastically supported by my improved springs and their connections. The spring G itself is in one continuous piece of steel or other elastic material and has the loop G^2, the arms G^3 G^3 therefrom, the spirals G^4 G^4, and the outer arms G^5 G^5. Each of the latter is usually provided at its outer portion with an opening G^6 for enabling the arm to be readily secured to the vehicle-body. The width of the loop is sufficient to allow it (the loop) to readily enter and move within the connection hereinafter described. The arms G^3 are preferably parallel or nearly so. That end of each arm which is opposite where this arm joins the loop is continued into and forms a spiral spring G^4. This spring G^4 has the requisite number of turns to confer upon it the desired elasticity. At its outer end the coil of each spring joins with—*i. e.*, terminates in—the adjacent short arm G^5. The short arm G^5 where it has the perforation G^6 is preferably flattened (as is commonly done with all round iron connections) to enable it to lie better against the bottom or sill of the vehicle-body to which it (said rod) is to be attached. The spring thus provided with perforations is attached to the vehicle-body or to a cross-sill or cross-brace of the latter by means of clip-bars over the short arms and bolts through the perforations G^6, the clip-bars and these bolts being connected to the vehicle-body or sill or brace in the usual manner.

A portion of the arms G^3 G^3 and the loop G^2 extends out beyond the adjacent side of the vehicle-body.

To the adjacent side-bar, and usually to the under side thereof, I attach a shackle H of a well-known form—to wit, having a top H^2 clipped or otherwise secured to the under side of the side-bar. The arms H^4 H^4 of the shackle carry the customary bolt H^6. Upon the bolt H^6, I swing a link K of a novel and most advantageous construction. This link K has an eye L, through which the bolt H^6 is passed. From one side of the eye extends a projection M, which is curved down and around and up and out, terminating in the lip M^2. The outer or free end M^3 of the lip is preferably beveled substantially as shown. The inner surface of the bottom portion of the link has a curved conformation M^4, (see Fig. 7 and also the dotted lines in Fig. 4,) indicative of the central outline of such conformation. The inner surface of said bottom of the link has a concavely-curved conformation M^5, transversely to the curve M^4. (See Fig. 7.) This curve and the curved conformation of the inner side of the loop are made to substantially correspond. I intentionally thus provide these conformations of these parts to obtain a general side oscillation and flex of the spring relative to the rigid shackle and side-bar.

The shape and relative interengagement of the loop and link in a direction transverse to the one just specified are well indicated by the figure. I provide such conformation to further effectuate the objects of my invention.

In practice the shackle H is connected to the spring by placing the loop in the hollow of the link and then bending up the lip M^2 against the barrel of the eye L until the bevel M^3, like the flat of the foot, rests against the barrel of the eye, substantially as shown in Figs. 3 and 6. In order that the outer bent or curved part of the loop may be properly fitted to the eye while held within the link bent to place, the eye is recessed concavely from side to side (M^6) and from front to rear, (M^7,) substantially as shown in Fig. 6 and 7 by continuous line, and from front to rear, as shown in Fig. 6, this double conformation forming the recess M^6 M^7. The loop is thus uplifted into a neatly-fitting and secure position within the bent-up link, and it (the loop) is compactly joined to the link. It will not rattle. It is free to oscillate up and down and to a reasonable extent sidewise. Thus the vehicle-body is upheld on these springs, and the latter are upheld in turn by the running-gear of the vehicle.

The springs by their elasticity and capacity to flex in the desired directions and also by reason of their flexible union with the link itself connected to the shackle will provide not only against vertical thrust, but also against the lateral and end-length thrusts to which all road-vehicles are subject.

The connection between the loop G^2 of the spring and the link can be quickly and satisfactorily made.

In so far as the spring G is concerned there are other forms of connecting-links that might be successfully employed to hold the spring to the running-gear; but I prefer to use the especially-adapted link hereinbefore described. An inferior mode of connection would be to connect the loop G^2 direct to a rigid shackle. The employment of all the features of my invention presents a far more advantageous device.

It is due, however, to specify here that a coil-spring as I have constructed it—to wit, made of and from a single piece of steel first bent to a U shape, each end of which is thereafter coiled right and left, with the extreme ends left uncoiled and shaped to fasten to the body—is not only novel, but very economical of manufacture and furnishes by reason of its curved loop shaped substantially as described and united to the side-bar of the vehicle through the medium of a proper connection a novel and most useful swivel connection. The spring is left free for oscillation from front to rear, as well as for elongation from side to side.

What I claim as new and of my invention, and desire to secure by Letters Patent, is—

1. A coil-spring made from a single piece of steel, first bent to a U shape, each end of which is thereafter coiled right and left, and the extreme ends formed to fasten to the body, the end of the U-shaped portion, to wit: the junction of the branches of the portions G, being curved substantially as shown, and engaging a link adapted to receive this curved portion, and permit the arcal slide motion, a twist motion, and the direct movement resulting in the elongation of the spring, substantially as and for the purposes specified.

2. In a spring for vehicles, the combination of a spring having the outer arms G^5, a central U-shaped loop having the legs G^3, G^3, coils G^4, G^4, a coil between each leg G^3 and arm G^5, all integral, and a rigid shackle, and link K, having eye L, and the adjustable hook M having the lip M^3, and the concavo-convex conformation M^6, M^7 of the hook M, against which the loop rests, substantially as and for the purposes set forth.

3. In a spring for vehicles, the combination of a spring having the outer arms G^5, a central U-shaped loop having the legs G^3, G^3, coils G^4, G^4, a coil between each leg G^3 and arm G^5, all integral, and a rigid shackle, and link K, having eye L, and the adjustable hook M having the lip M^3, and the concavo-convex conformation M^6, M^7 of the hook M, against which the loop rests, and the recessed conformation M^4, M^5 in the eye, in which the loop plays, substantially as and for the purposes specified.

4. A spring having outer arms G^5 for at-

tachment to the vehicle-body, and coils G^4 respectively connected to these arms, and the loop G located between the coils and having its ends connected to the adjacent ends of the coils, and having the looped end curved substantially as shown, the entire spring being substantially integral, in combination with a link having an arcal eye with enlarged ends adapted to embrace the loop, the curved end of the loop lying in the link, the link being connected to the running-gear, substantially as and for the purposes specified.

ORVILLE A. TIMBERLAKE.

Attest:

WM. E. JONES,

K. SMITH.