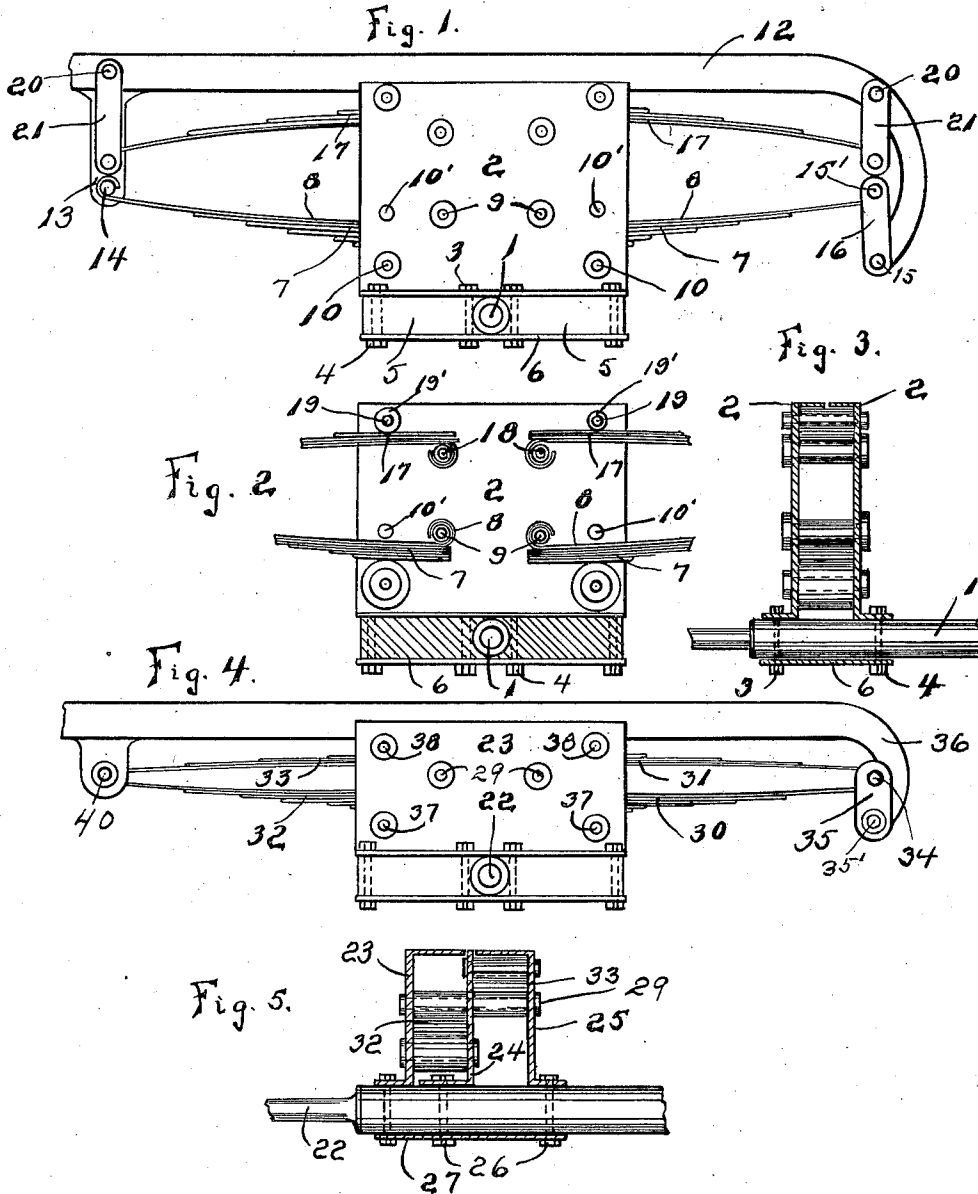


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VEHICLE SPRING.
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1,019,336.

Patented Mar. 5, 1912.



Witnesses
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UNITED STATES PATENT OFFICE.

DANIEL J. McCLUSKEY, OF SAN FRANCISCO, CALIFORNIA.

VEHICLE-SPRING.

1,019,336.

Specification of Letters Patent.

Patented Mar. 5, 1912.

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To all whom it may concern:

Be it known that I, DANIEL J. McCLUSKEY, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented a new and useful Vehicle-Spring, of which the following is a specification in such full and clear terms as will enable those skilled in the art to construct and use the same.

This invention relates to a vehicle spring, and its object is to produce a spring which will be equally as resilient on the upward throw of the vehicle body as on the downward throw thereof, and which will not be liable to breakage on the upward throw.

It will be understood by those skilled in the art that with the ordinary vehicle springs it is necessary to prevent the upward throw of the carriage body from breaking off the top leaf of the ordinary elliptic or semi-elliptic springs. This means usually consists of some kind of a shock absorber, or straps which are passed around the springs at a point where there are several leaves, thus bringing the throw on more than one leaf.

In the present invention provision is made for carrying the entire load on a set of springs which will operate in one direction only, while the upward throw, due to striking a rough place or a bump in the road is entirely taken up by a spring which operates upwardly and substantially independent of the main supporting spring.

In the drawings in which the same numeral of reference is applied to the same portion throughout the several views, Figure 1 is a side elevation of a set of the springs, Fig. 2 is a side elevation of a portion of the springs with one of the side plates removed to show the supporting bolts and fulcrums, Fig. 3 is a vertical sectional view adjacent the supporting axle, Fig. 4 is a slightly modified form of spring, and Fig. 5 is a vertical sectional view of the frame supporting the springs taken in a plane adjacent the supporting axle.

The numeral 1 represents the supporting axle of the vehicle which may be of any

desired form, said axle carrying a pair of oppositely placed plates 2, said plates being secured to the axle by means of bolts 3 and 4, the bolts passing through spacing blocks 5 of the same thickness as the depth of the axle to hold the plate 6 spaced away from the flanges of the plates supporting the springs.

The springs 7 comprise a plurality of leaves of such size and number as will most suitably support the load to be carried, the upper leaf 8 of said springs, of which there are two, one extending forwardly and the other rearwardly of the supporting axle, extends around pivot pins 9, there being one pin for each of the springs 7. The springs work freely on this pivot pin, and the plates supporting the springs permit the free motion thereof, but in front and to the rear respectively of each of the pivot pins is a fulcrum pin 10, said fulcrum pin being so placed as to support the spring 7 in the desired position with respect to the vehicle frame. These springs are free to move upwardly and out of contact with the fulcrum pins, but on any downward motion of the vehicle frame the fulcrum will cause the spring to be supported substantially as shown in Fig. 1, and permit a resilient motion of the vehicle body.

The vehicle frame 12 has a depending plate 13 provided with a pin 14 to secure the front end of the lower spring 7 thereto, while at the rear the frame is connected by means of a pin 15 with a link 16, said link being connected at 15' to the rear end of the spring 7. The above described springs support the entire load of the vehicle and give the necessary resiliency on any downward motion thereof, but do not carry any load on any upward motion of the frame of the vehicle above the no load line. The springs to relieve the upward motion of the vehicle are shown at 17, and they are pivoted by means of bolts 18 to the same plates which support the spring 7, fulcrums 19 being placed above said springs in the same manner as the fulcrums are placed below the springs 7. It will be noted that there are two of these springs the same as

the springs 7, one extending forwardly and the other rearwardly from the axle. These springs are connected at their outer ends with the frame of the machine by means of
 5 fixed pins 20 and depending links 21. In order that the pressure of the upper spring upon the lower spring may be adjusted, a bushing 19' may be placed on the pin 19, the result of this being that the spring 17
 10 will force the springs 7 downwardly more or less as may be desired. The result of this will be that the springs will be operating at stiffer portions thereof than would be the case if the bushings were not used,
 15 since these springs support the load in one direction only. Holes 10' for the insertion of pins are placed in the plates 2 in order to hold the spring 7 down should one of the upper springs break. The plates 2 are of
 20 such size and length as is deemed necessary to support any given load.

It will be understood by those skilled in the art that this spring may be applied to any vehicle.

25 In operation the entire load is carried by the springs 7 and all downward motions are given resiliency by said springs. On the upward motion of the vehicle frame, the upper springs come into play and should the
 30 vehicle frame rise above the no load line the lower springs will be lifted off their fulcrums and the upper springs will prevent the vehicle frame from rising too high from the axle. The essence of this invention lies
 35 in the provision of separately acting springs for the opposite vertical thrusts of the vehicle frame, that is to say, in such springs as are herein disclosed, each spring is especially adapted to resist only one motion, and
 40 it carries no load upon the opposite motion thereof above or below its no load line respectively.

Figs. 4 and 5 show a slightly modified form of the invention, the springs in this instance having their supporting ends at substantially the same level, and instead of being placed vertically one over the other, they are placed side by side. In this form of the
 45 invention the axle 22 has a Z bar 23 secured thereto, an angle plate 24 secured at the side of the Z-bar, a Z-bar 25 secured at the side of the angle bar, bolts 26 passing through said bars and through a plate 27 below the axle. Passing through the Z-bars, and the
 50 angle plate are pivot bolts 29, one for each pair of springs 30, 31, 32, and 33. The springs 32 and 30 carry the load and have their short leaves below the leaf which extends to the pivot 40 and link 35, said link
 55 35 being secured to the frame 36 by pin 35'. These two springs have fulcrums 37 below them, the same as in the other form of the invention and they are free to move up-

wardly in the same manner. The frame 36 is connected to the springs 32 and 33 at 40.
 65 Pivoted between the angle plate and the Z-bar are the two springs 31 and 33, said springs each having a fulcrum pin 38 above the same, and they have their ends connected with the link 35 and the pin 40, the same as
 70 the load supporting springs. The operation in this case is the same as in the first instance, save that the springs are placed substantially side by side, instead of one above the other.
 75

Should one of the lower springs be broken, one of the upper springs may be placed in its position and carry the entire load temporarily until repairs could be made.

In an emergency the upper springs might
 80 be used in the place of the lower springs should one of the latter break. It will be noted that the plates to which the springs are secured prevent any lateral movement of said springs.
 85

The no load line may be defined to be that line joining the ends of the load carrying springs, when there is no load supported thereby, regardless of the shape of said springs.
 90

Having thus described my invention what I claim as new and desire to secure by Letters Patent of the United States, is as follows:—

1. In a vehicle spring suspension, an axle, 95 a support carried thereby, a pair of oppositely placed pivoted and load carrying springs secured to said support, a fulcrum for each of said springs below the same, a pair of oppositely placed and oppositely acting
 100 springs pivoted to said support, a fulcrum for each of said latter springs above the same, and a frame secured to said springs, as set forth.

2. In a vehicle spring suspension, an axle, 105 a support secured thereto, a pair of oppositely placed pivoted load carrying springs one end of each pivoted to said support and the opposite end of said spring pivoted to the frame of the vehicle, and a pair of oppositely placed and oppositely acting springs
 110 pivoted in the same manner as the first mentioned springs adapted to prevent undue upward movements of the frame of said vehicle, as set forth.
 115

3. In a vehicle spring suspension, an axle, a support carried thereby, two springs pivoted to said support and extending in opposite directions therefrom, a fulcrum upon which each spring bears, and oppositely
 120 placed springs to prevent excessive upward motions of the first mentioned springs, as set forth.

4. In a vehicle spring suspension, an axle, a support therefor, a vehicle frame, two oppositely extending springs pivoted to said
 125

axle and connected with the vehicle frame,
an adjustable fulcrum for each of said
springs, and a pair of oppositely placed piv-
oted springs adapted to prevent excessive
5 upward motions of the first mentioned
springs, as set forth.

In testimony whereof I have hereunto set

my hand this 28 day of May A. D. 1910, in
the presence of the two subscribed witnesses.

DANIEL J. McCLUSKEY.

Witnesses:

C. P. GRIFFIN,

W. W. HEALEY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."
