

F. L. SMITH.
VEHICLE SPRING.

APPLICATION FILED JULY 28, 1903.

NO MODEL.

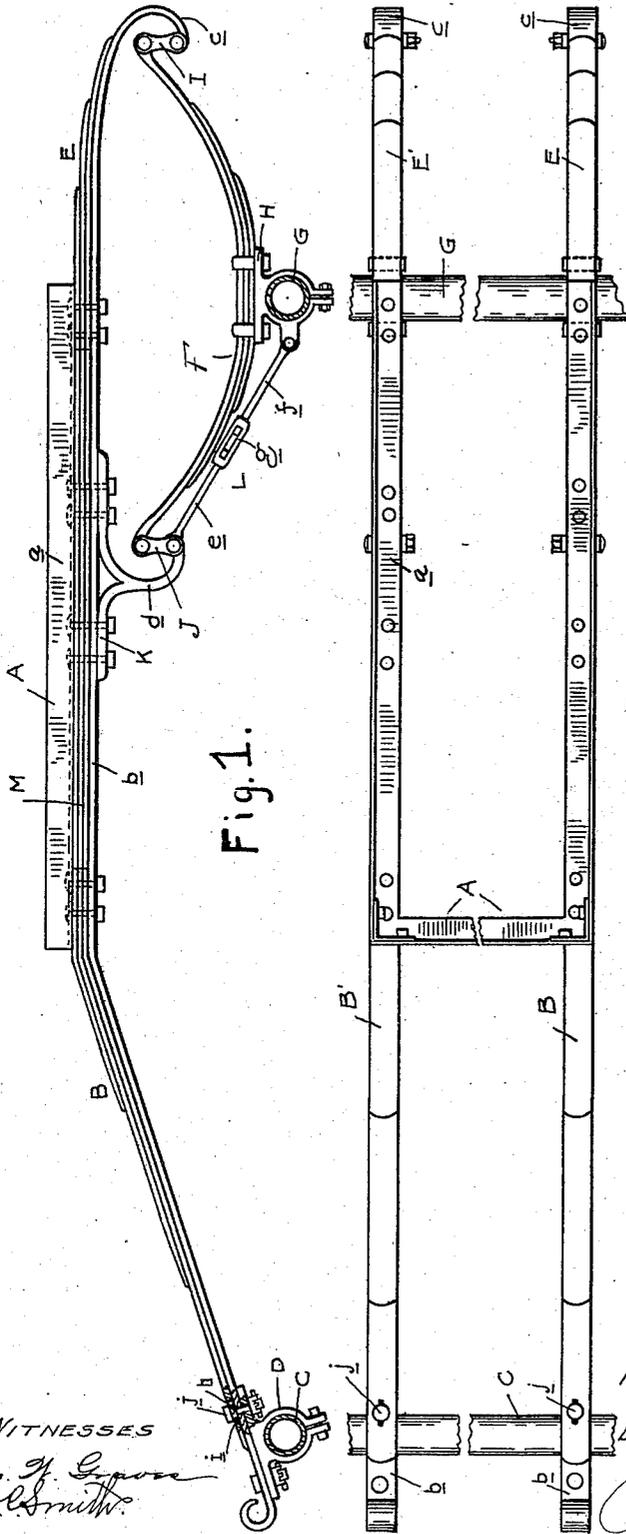


Fig. 1.

Fig. 2.

WITNESSES
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UNITED STATES PATENT OFFICE.

FREDERICK L. SMITH, OF DETROIT, MICHIGAN, ASSIGNOR TO OLDS MOTOR WORKS, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

VEHICLE-SPRING.

SPECIFICATION forming part of Letters Patent No. 743,402, dated November 3, 1903.

Application filed July 28, 1903. Serial No. 167,263. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK L. SMITH, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Vehicle-Springs, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to vehicle-springs more especially designed for use in connection with the running-gear of motor-vehicles.

More particularly the invention relates to that type of running-gear comprising a rigid central frame for supporting the vehicle-body and motor and downwardly-inclined spring-arms secured at their outer ends, respectively, to the forward and rear axles. Heretofore running-gears of this type have been constructed in which the spring-arms extending to the forward and rearward axles are similar in construction. Such a construction while well adapted for a certain class of motor-vehicles in which the weight is not excessive is not as satisfactory when used with other and heavier constructions.

It is the object of the present invention to reinforce the rear spring-arms, which carry the greater part of the load; and to this end the invention consists in the construction as hereinafter set forth.

In the drawings, Figure 1 is a side elevation of a spring, and Fig. 2 is a plan thereof.

A is a rigid frame adapted to support the motor and body of the vehicle. As shown, this frame is of substantially rectangular form. It may be of any suitable construction, and the motor and other mechanism (not shown) may be mounted thereon in any suitable manner.

B and B' are spring-arms extending forward and downward from the frame A, to which said arms are rigidly attached. The outer ends of the arms are secured to the forward axle C by suitable connections, such as the fittings D.

E and E' are spring-arms extending rearward from the frame A. These spring-arms, as well as the arms B and B', are preferably formed of leaf-springs, which are secured at their inner ends to the side bars *a* of the

frame A. The upper leaves of the two springs extend beneath the frame A only a sufficient distance to form a means of securing the arms in position, but the lower leaf *b* is common to both spring-arms B and E and extends continuously from one to the other beneath the frame A. The space between the ends of the upper leaves may be filled by a suitable block, such as M, which forms a support for the lower leaf upon the frame. The rear spring-arms E are also inclined slightly downward and at their outer ends are preferably provided with a return-bend *c*.

F is a downwardly-bowed spring, preferably a semi-elliptic leaf-spring, which is centrally secured to the rear axle G by any suitable means, such as the fitting H. The spring F is arranged in the same vertical plane as the spring E and at its rear end is connected to the return-bend end *c* of the spring E by means of a link I. The opposite end of the spring F is connected by a link J with a bracket K, which is secured to the lower leaf *b* of the springs and depends therefrom, having a downwardly-bent portion *d* for connecting with the link J.

With the construction as described it will be understood that the frame A is supported upon the axles through the medium of the spring-arms B and B' at the forward end and at the rear through the medium of both the downwardly-bowed springs F and the spring-arms E, thus combining the efficiency of both springs. The links I serve to suspend the outer ends of the arms E from the outer ends of the spring F, while the links J suspend the brackets K from the spring F, and thereby form an intermediate support for the frame A. The spring F not only assists in supporting the frame, but also forms a stronger connection for imparting the thrust of the driving-axle to the frame. As a whole the springs form an upwardly-bowed spring-reach which extends between the axles and centrally supports the mechanism and body of the vehicle.

In order to maintain a constant distance between the rear axle and the drive mechanism carried by the frame A, a pivotal link or distance-bar L may be arranged to extend between the said axle and the bracket K. This, as shown, is formed in two sections *e*

and *f*, threaded at their adjacent ends and connected by the turnbuckle *g*. The section *e* is pivoted to the bracket *K* at the point of attachment of the link *J*, and the section *f* is pivoted to the fitting *H*.

Greater rigidity may be given to the connection between the forward spring-arms *B* and the fittings *D* by extending the second leaf of the spring, as well as the lower leaf, above said fitting. A bolt *N* may be used for attaching the spring to the fitting, and this is provided with a head or shoulder *h*, which bears against the lower leaf and slidingly engages with a slot *i* in the second leaf. A second shoulder *j* on the bolt extends above said second leaf and serves to hold the two leaves together, while permitting of a slight independent longitudinal movement.

What I claim as my invention is—

1. In a vehicle-gear, an upward-bowed spring-reach having one end thereof connected to one of the axles and a downwardly-bowed spring supported upon the other axle being connected at its rear end with the end of said reach and at its opposite end connected to form an intermediate support for said reach.

2. In a vehicle-gear, a spring-reach consisting of a rigid central portion, spring-arms extending outward and downward from opposite ends of said rigid portion, one of said arms being connected at its free end with one of the axles, a downwardly-bowed spring centrally supported upon the opposite axle and connected at its outer end to the outer end of the opposite spring-arm and a bracket depending from said reach intermediate its ends and supported from the inner end of said downwardly-bowed spring.

3. In a vehicle-gear, a spring-reach comprising a rigid central portion, leaf-springs extending forward and rearward therefrom and downwardly inclined, one of said springs being supported at its outer end upon one of the axles, and the other spring being provided at its outer end with a rigid bend, a downwardly-bowed spring centrally secured to the other axle, a link connecting the outer end to said downwardly-bowed spring with the outer end of the leaf-spring, depending brackets at a point intermediate the ends of the reach and a link suspending this bracket from the inner end of said downwardly-bowed spring.

4. In a vehicle running-gear, the combination of a centrally rigid frame, pairs of parallel spring-arms extending forward and rearward from said frame and downwardly inclined, the forward pair being connected directly at their outer ends with the forward axle, a pair of downwardly-bowed leaf-springs centrally secured to the rear axle and arranged in the vertical planes of said rearwardly-extending spring-arms, depending brackets and links connecting the opposite ends of said downwardly-bowed springs respectively with said brackets and the outer ends of said spring-arms.

5. In a vehicle running-gear, a rigid frame, forwardly and rearwardly extending and downwardly-inclined spring-arms, each comprising a series of leaves secured at their inner ends to the opposite ends of said rigid frame and a lower leaf common to both spring-arms and a bracket secured to said lower leaf and depending therefrom, a supplemental spring connected at one end to said bracket and at its opposite end to the outer end of one of the spring-arms, said supplemental spring being centrally supported upon one of the axles and the opposite spring-arm being supported upon the opposite axle.

6. In a vehicle-spring, the combination with a central rigid portion, of a bracket depending therefrom, a spring portion extending outwardly and downwardly from said central portion, a downwardly-bowed spring beneath and in the plane of said rigid and spring portions, an axle upon which said downwardly-bowed spring is centrally supported, links suspending said bracket and the free end of said spring portion respectively from opposite ends of said downwardly-bowed spring, and a link or distance-bar between said axle and said bracket.

7. The combination with a vehicle-axle, of a leaf-spring supported thereon at one end, a bolt for securing said spring to the axle, having a shoulder bearing upon the lower leaf of said spring, a second leaf slotted to receive said shoulder, and a second shoulder on said bolt bearing on said second leaf.

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

FREDERICK L. SMITH.

Witnesses:

H. C. SMITH,
P. M. HULBERT.