

R. TJADER.  
SHOCK ABSORBER FOR VEHICLES.  
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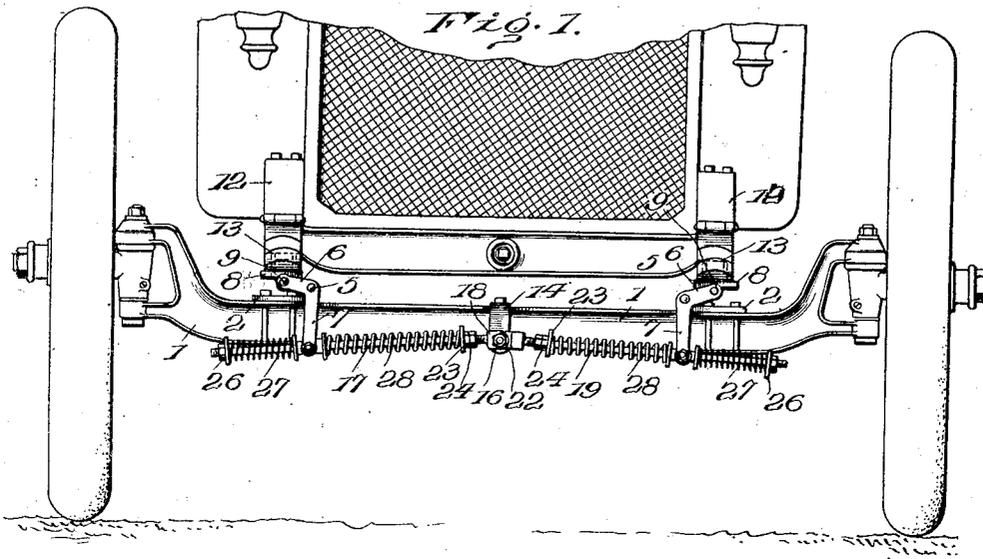


Fig. 2.

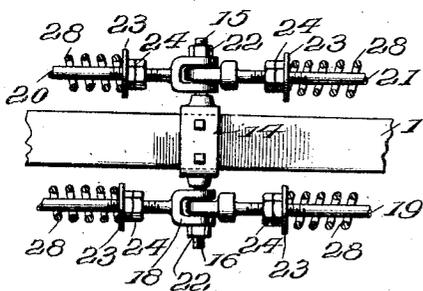


Fig. 3.

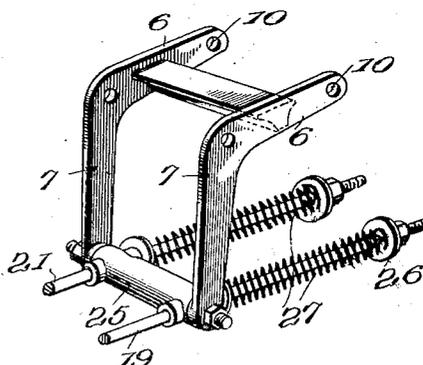


Fig. 4.

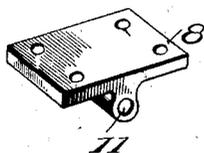
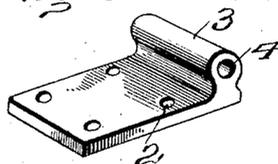


Fig. 5.



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# UNITED STATES PATENT OFFICE.

RICHARD TJADER, OF NEW YORK, N. Y.

SHOCK-ABSORBER FOR VEHICLES.

1,069,589.

Specification of Letters Patent.

Patented Aug. 5, 1913.

Application filed March 21, 1913. Serial No. 756,025.

*To all whom it may concern:*

Be it known that I, RICHARD TJADER, of New York city, New York, have invented a new and useful Improvement in Shock-Absorbers for Vehicles, which invention is fully set forth in the following specification.

This invention relates to shock-absorbers for vehicles such as automobiles, and has for its object to provide a device of this character which may be readily applied, not only to the vehicle when in course of construction, but also to vehicles already constructed, without any material alteration thereof.

15 A further object is to provide a shock-absorber which may be cheaply manufactured, but which shall, at the same time, be efficient in absorbing, not only the direct shock due to running over any unevenness in the road, but also to absorb or neutralize the "rebound" due to the yielding action of the springs when any sudden unevenness in the road is encountered.

25 With these objects in view, the invention consists, broadly stated, in a bell-crank lever pivoted to the axle of the vehicle, with one arm extending approximately in a horizontal direction, and the other one depending on one side of the axle, the weight of the body of the vehicle being imposed upon the horizontal arm of the bell-crank lever, while the lower or depending arm of the bell-crank lever is provided with yielding means acting on opposite sides thereof and in opposition to each other, one of said sets of means offering greater resistance to the movement of the bell-crank lever in one direction than does the other set of means in the opposite direction. Preferably, there are four of these bell-crank levers, one at each side of the machine on the front axle, and one at each side of the machine on the rear axle, and when desired, these bell-crank levers may be of a compound or double character, forming, as it were, a forked bell-crank lever which straddles the axle, and has suitable bearings in a plate bolted to the top of the axle. In the case of an automobile, the springs of the automobile may be, and preferably are, bolted to a block rocking in bearings at the outer ends of the bell-crank levers, so that the connection of the mechanism of the body of the vehicle

with the bell-crank levers, while very strong, is nevertheless flexible.

The yielding means acting on the depending arms of the bell-crank lever may be any suitable cushioning device, such as a coiled spring or a piston playing in a cylinder containing air or oil, or it may be any other well-known cushioning device.

The inventive idea involved may be embodied in a variety of mechanical structures, one of which, for the purpose of illustrating the invention, is shown in the accompanying drawings, in which—

Figure 1 is a front elevation of an automobile, with my shock-absorber applied thereto; Fig. 2 is a broken plan view of a detail; Fig. 3 is a perspective view of one of the bell-crank levers; Fig. 4 is a perspective view of a block through which the body of the vehicle is secured to the bell-crank lever; and Fig. 5 is a perspective view of the bearing plate for the bell-crank lever.

Referring to the drawings, 1 is an axle (here shown as the front axle of an automobile). 2, 2 (see Fig. 5), are bearing plates, secured as by bolts to the axle 1, and provided with an upturned lug 3 having a bearing 4 therein for the fulcrum pin 5 of a bell-crank lever having approximately horizontally-extending arms 6 and vertically-depending arms 7. Preferably, this bell-crank lever is of double or compound construction, as shown in Fig. 3, with a depending arm in front and one to the rear of the axle, so that the compound lever straddles the axle, as it were, though this compound construction is not essential.

A metal block 8 is pivoted between the two horizontal arms 6 of the compound bell-crank lever, by means of a pivot pin 9 passing through openings 10, 10, in the horizontal arms of the bell-crank lever, and through a bearing opening 11 in the block 8. Any suitable part of the body of the vehicle may be secured to this pivoted weight-receiving block, and as here shown the lower portion of the spring 12 is secured to the block by bolts 13.

A collar 14 is secured to the middle portion of the axle 1, and is provided with a rearwardly extending pin 15 and a forwardly extending similar pin 16. A rod 17 is provided with a forked end 18 pivoting

on the pin 16, while a corresponding rod 19 is pivoted on said pin 16 between the forks of the rod 17. The construction just described refers to that on the front of the axle, and is in every way similar to that on the rear of the axle, where rods 20 and 21 are pivoted on the pin 15, the several rods 17, 19, 20 and 21, being held in position by nuts 22. Each of these rods is screw-threaded, and is provided with a washer 23 and with adjusting nuts 24.

Between the depending arms 7 of the bell-crank lever, there is pivoted a block 25, through which the rods 19 and 21 loosely extend. These rods have on their extreme outer ends adjusting nuts and washers 26, forming abutments between which and the block 25 on each of said rods is a spring 27, while between the washers 23 and said block 25 is a much more powerful spring (one on each rod) 28.

In the normal operation of the device, the weight of the vehicle, such as an automobile, for example, is carried, through its springs 12, by the plates 8, and this tends to rock the bell-crank levers on their fulcrums 5 and to compress the springs 28. In traveling over the road, even slight unevenness will be readily taken up by the spring action or resistance, not only in the springs 12 of the vehicle, but the springs 28 of the shock-absorber. But upon striking any marked unevenness, the shock will be absorbed very largely by the springs 28 of the absorber, and the "rebound" or resultant reaction of the springs 28 and of the springs 12 will be checked or neutralized by the springs 27.

While I have here shown the bell-crank lever as a compound lever straddling the axle of the vehicle, such compound construction is not essential, since a simple bell-crank lever may be used if desired.

The springs 27 and 28 are shown merely as an illustration of any suitable yielding means, and as intimated above, any other suitable or desirable yielding or shock-absorbing devices may be substituted therefor.

One of the particular advantages of my shock-absorber as thus described is the facility with which it may be applied to structures such as automobiles after they are built, instead of being applied during the process of construction, it only being necessary to elevate the springs 12 of the automobile and insert the shock-absorber thereunder, and secure the springs of the automobile to the bearing blocks 4, as illustrated.

Changes may be made in the specific form, proportion and relative arrangement of the parts, without departing from the spirit of my invention, the essentials of the invention being the features defined in the claims which follow.

What I claim is:—

1. In a vehicle, an axle, a bell-crank lever pivoted thereto, means connecting the body of the vehicle to one arm of said lever, a rod pivoted to said axle and to the other arm of said lever, and sets of yielding means cooperating with the said rod and acting on the latter arm of said lever and in opposition to each other.

2. In a vehicle, an axle having a fulcrum-bearing thereon, a bell-crank lever turning on said fulcrum and having an approximately horizontal arm, means pivotally securing the body of the vehicle to said arm, a rod pivoted at one end to the axle and intermediate its ends to the depending arm of the bell-crank lever, a heavy coiled spring on said rod on one side of said depending lever arm, and a lighter spring on said rod on the other side of said lever arm.

3. In a vehicle, an axle, a compound bell-crank lever straddling said axle and fulcrumed thereon, a pair of rods pivoted at one end to said axle and pivotally connected to the depending arm of said bell-crank lever intermediate the ends of said rods, and coiled springs on said rods the springs thereon on one side of said lever arms being more powerful than those on the other side.

4. In a vehicle, an axle, a compound bell-crank lever, a bearing plate on which said lever is fulcrumed, means securing said plate to said axle, a block pivoted to said compound lever, means securing the body of the vehicle to said block, a pair of rods pivoted to the depending arms of said compound lever intermediate the ends of the rods and pivoted at one end of each of said rods to the axle, a strong spring on each of said rods on one side of said lever, and a lighter spring on the other side thereof.

5. In a vehicle, an axle, a bell-crank lever fulcrumed thereon, a block pivoted to said lever, means securing the body of the vehicle to said block, a rod pivoted to the depending arm of said lever intermediate the ends of the rod, said rod being pivoted at one of its ends to the axle, a strong spring on said rod on one side of said lever, and a lighter spring on the other side thereof.

6. In a vehicle, an axle, two rods pivoted to said axle intermediate its ends and extending laterally toward the ends of the axle, two bell-crank levers fulcrumed on said axle one adjacent to each end thereof, each of the depending arms of said bell-crank levers being pivotally and slidably connected respectively to one of said rods intermediate the ends of the rods, a strong spring on each of said rods on one side of the respective levers, and a lighter spring on the other side thereof, and means connecting the body of the vehicle with the approximately horizontal arms of the bell-crank levers.

7. In a vehicle, an axle, a bell-crank lever pivoted thereto, means connecting the body of the vehicle to one arm of said lever, a rod pivoted at one end to said axle and intermediate its ends to the other arm of said lever, and yielding means cooperating with said rod and arranged on each side of the last-named arm of said lever.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

RICHARD TJADER.

Witnesses:

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RALPH L. SCOTT.