J. M. LANSDEN, Jr.

SHOCK ABSORBER.

APPLICATION FILED JUNE 23, 1910.

1,066,738.

Patented July 8, 1913.

2 SHEETS—SHEET 1.

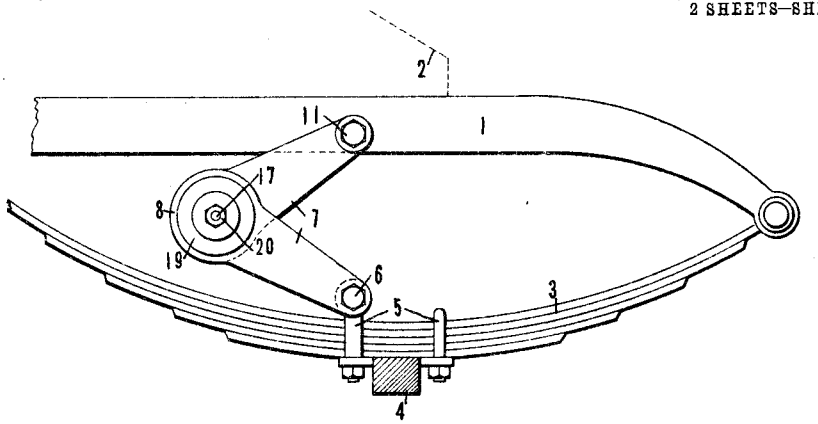


Fig. 1.

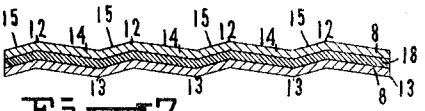


Fig. 7.

Fig. 5.



Fig. 6.

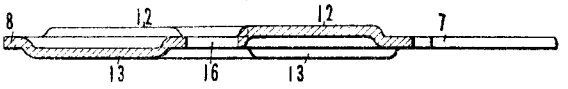
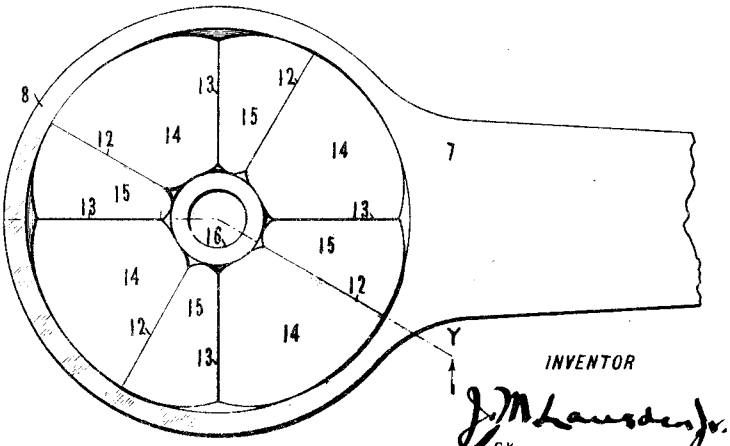


Fig. 4.



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2 SHEETS—SHEET 2.

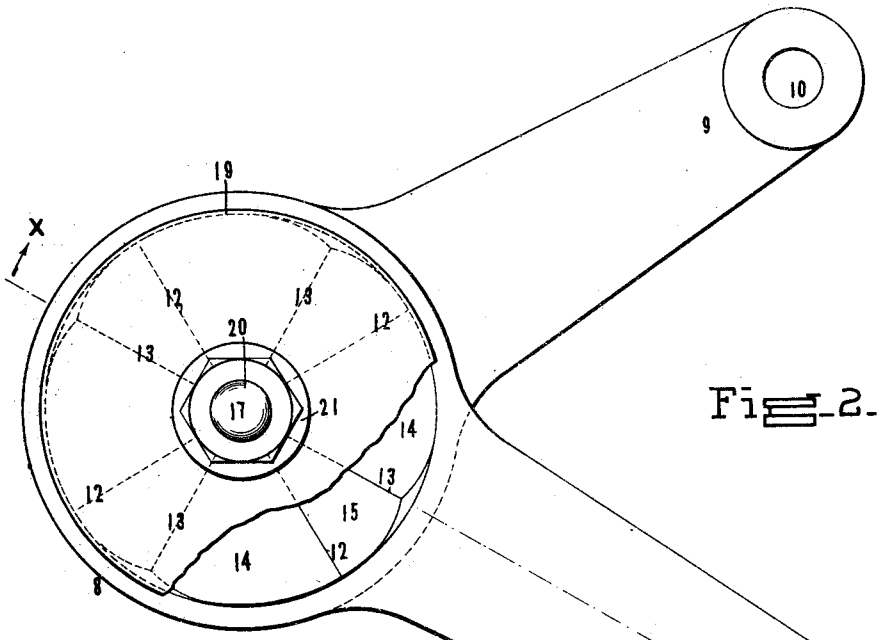


Fig. 2.

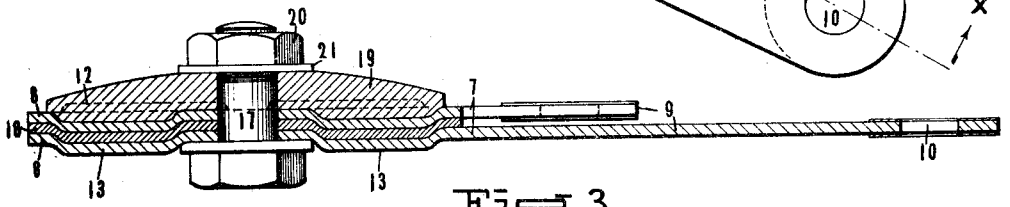


Fig. 3.

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UNITED STATES PATENT OFFICE.

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SHOCK-ABSORBER.

1,066,738. Specification of Letters Patent. Patented July 8, 1913.

Application filed June 23, 1910. Serial No. 568,437.

To all whom it may concern:

Be it known that I, JOHN M. LANSDEN, Jr., a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Shock-Absorbers, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to the mounting of vehicle bodies.

One of the objects thereof is to provide a simple and effective means for preventing excessive swaying or bounding of vehicle bodies.

Another object is to provide means adapted to effectively reduce the shock due to the sudden compression of vehicle springs when passing over any considerable inequality in the road and to more especially relieve against the intense recoil of the springs after such compression.

Another object is to provide means of the above type of cheap and durable construction and reliable action.

Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements and arrangement of parts which will be exemplified in the construction hereinafter set forth, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings wherein is shown the preferred embodiment of this invention, Figure 1 is a side elevation of the device in operative position upon the vehicle body. Fig. 2 is an enlarged view of the same, parts being broken away. Fig. 3 is a cross section taken on line *x*—*x* of Fig. 2. Fig. 4 is a side view of one of the cam members showing the disposition and form of the cam surfaces. Fig. 5 is an edge view of the member shown in Fig. 4. Fig. 6 is a cross section taken on line *y*—*y* of Fig. 4. Fig. 7 is a diagrammatic view showing the way the edges of the cam surfaces would appear if said edges were straightened out in a single plane.

Similar reference characters refer to similar parts throughout the several views of the drawings.

In order that certain features of this invention may be more readily understood, it may be noted that in connection with apparatus of the general nature of that with which this invention deals, if it be attempted to employ cam members having projections thereon, the sides of which are of equal length and angularity, these projections if designed to effectively control the action of the vehicle springs when said springs are compressed by the violent descent of the vehicle body thereupon, will not, in a satisfactory manner, provide against the sudden and intense upheaval of the vehicle body caused by the recoil of the springs. It has been found in practice that this recoil causes the vehicle body to lift above its normal position with respect to the axle, approximately one-half the distance it has previously descended below that normal. Consequently, as the two motions described are accomplished in about equal periods of time the upward throw is felt by occupants of the car to a considerably greater extent than the downward movement and the effects thereof upon the spring gear of the vehicle are also more harmful. It is accordingly here proposed, among other aims, to provide means adapted to effectively remedy this evil by substantially doubling the retarding effect of the device during the upward lift of the body above its normal position.

Referring now to the accompanying drawings, there is shown in Fig. 1 a portion of the vehicle frame 1, upon which is mounted the body, diagrammatically indicated at 2. Connected with the bar 1 is the spring 3 herein shown as of the semi-elliptic type, mounted upon the axle 4 and secured thereto by means of the clips 5. Pivotally secured to one of said clips, as by means of a bolt 6, is one of a pair of coacting cam members 7, which members are similarly formed, each comprising a circular disk-like portion or plate 8, from which projects, upon one side thereof, an arm 9 provided at its outer extremity with a hole or aperture 10 through which the bolts 6 and 11 are adapted to pass. These cam plates 8 with their integral arms 9 are die-pressed from sheet steel so as to provide upon one side thereof a plurality of radially disposed projections 12, in the present instance four in number and arranged at 90° apart. The sides of these projections form substantially plane faces which slope downwardly to meet the opposite faces of

the next adjacent projections, thereby forming between the said projections corresponding depressions 13. Each projection is formed with one of its faces 14 of a circumferential length equal to twice the circumferential length of the other side 15 thereof, or in other words, the angle formed between the crest of a projection and the bottom of the depression upon one side thereof is twice as great as the angle formed between the said crest and the bottom of the depression upon its other side. As a result the construction provides a plurality of alternating, relatively long inclined planes having disposed therebetween a plurality of relatively short inclined planes. This is clearly shown in diagrammatic form in Fig. 7. These plates 8 are so formed that where there is a projection on one side thereof, there occurs a corresponding depression upon the opposite side, and they are provided at their centers with perforations 16, through which passes a bolt 17. The said members 7 in their normal positions have their extensions 9 set at an angle of 60° to one another, in which position the depressions and projections upon their adjacent sides respectively interfit. While it is not necessary to the successful operation of the device, it is advantageous to interpose between the said plates another similarly formed disk or plate 18, composed of brass or like metal, which may be riveted or otherwise secured to one of the plates 8. With the parts in their normal position as shown in Fig. 2, the respective cam surfaces intermesh and are held in such position by means of a resilient member 19, disposed in contact with the exterior surface of one of the plates 8, said resilient member being held in position by means of a nut 20 and washers 21 provided upon the bolt 17. This resilient member is preferably composed of rubber but may be of any suitable material or in any form desired, so long as it exerts sufficient pressure upon the said cam members.

Having described the present embodiment of this invention the action thereof, which is to a large extent obvious, follows: Assuming the parts to be in the position indicated in the drawings and that the axle 4 is thrown upwardly as by reason of passing over an obstruction in the road, the bar 1 and body 2 are correspondingly lifted through the spring gear and if the upward thrust is sudden and violent, there is a tendency of the body to bound or oscillate with respect to the axle to a disagreeable degree. As the body and axle move toward one another however, one of the arms 9 is swung about the bolt 17 and the cam or inclined meeting surfaces of the projections 12, force the plates 8 apart. During this movement the projections of the respective plates move toward each other along the long inclined surfaces 14 and a relatively slow retarding action of the springs is accomplished. But upon the recoil of the springs, the arms 9 are swung farther apart, causing a rotary motion of the said members in the opposite direction and after the members have passed their normal position, which occurs at the same instant the vehicle body reaches its normal position relative to the axle, the continued rotation causes the projections of the respective members to travel toward each other along the short inclined surfaces 15, whereupon a relatively rapid retarding action is effected and the upward movement of the car body is stopped, without undue and disagreeable jolting of the occupants thereof.

It will accordingly be seen from the foregoing that this invention is one well adapted to accomplish all of the ends and objects hereinbefore set forth, in a practical and efficient manner; that the parts are readily interchangeable and of simple and cheap construction. It will be obvious that very little friction occurs between the steel and brass surfaces, so that wearing of these parts is reduced to a minimum.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense. It is also to be understood that the language used in the following claims is intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a device of the nature disclosed, the combination with a vehicle body, a vehicle axle, and a spring interposed between said axle and said body, of a pair of centrally pivoted disks, said disks having on their adjacent surfaces a plurality of radial sector-shaped projections formed with substantially plane sides, each of said projections being formed with a long side and a short side, said long and short sides of each projection being positioned so that the long side of one projection will meet the short side of the adjacent projection to form a depression between each pair of projections, of the same size and shape as the projections, resilient means mounted on the pivot of the disks to hold the disks with their projections intermeshing with each other, and means for mounting said disks so that upon move-

ment of the axle toward the body the disks will be caused to rotate with respect to each other and their respective projections will travel against each other along said long sides and upon movement of the axle and body away from one another the projections will travel against each other on their short sides.

2. In a device of the nature disclosed, the combination with a vehicle body, a vehicle axle, and a spring therebetween, of a pair of disk-shaped members having means connecting them with the axle and body respectively, a plurality of radially disposed sector shaped projections on the adjacent surfaces of said members, each projection being formed by two plane surfaces of different size disposed at different angles to the plane of the member on which it is mounted, each projection on the member being adapted to fit the depression formed between two projections on the other member, a pivot passing through said members adapted to permit them to turn relatively to each other, and resilient means associated with said pivot adapted to urge said members into contact, the position and arrangement of said parts being such as to cause greater resistance when the axle and body move in one direction than when moving in the opposite direction.

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

JOHN M. LANSDEN, JR.

Witnesses:
LEWIS B. BROWN,
FRED P. MILLER.