Feb. 20, 1923. 1,445,830

A. G. GIFFORD

AUTOMOBILE SNUBBER

Filed May 19, 1920 2 sheets-sheet 1

Fig. 1.

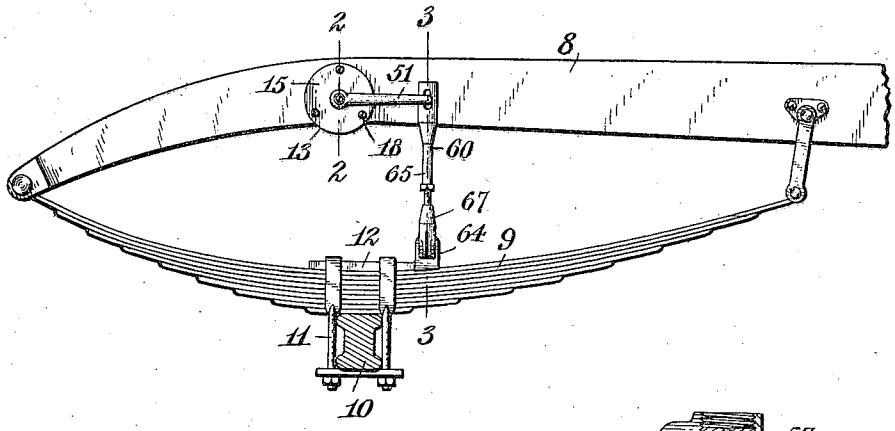
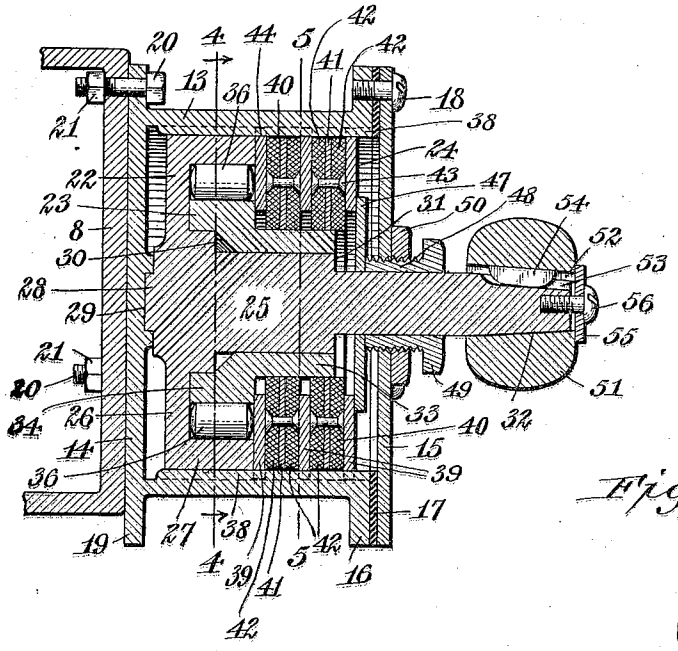


Fig. 2.



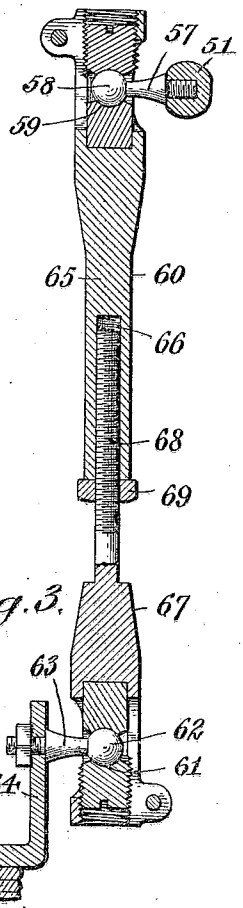


Fig. 3.

Witness:
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Fig. 4.

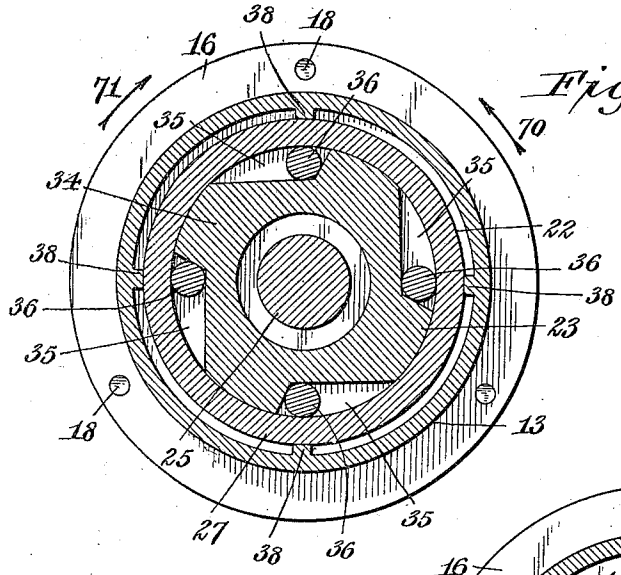


Fig. 5.

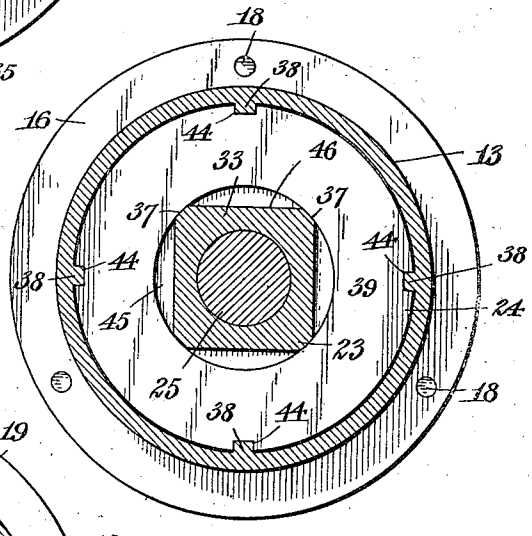


Fig. 6.

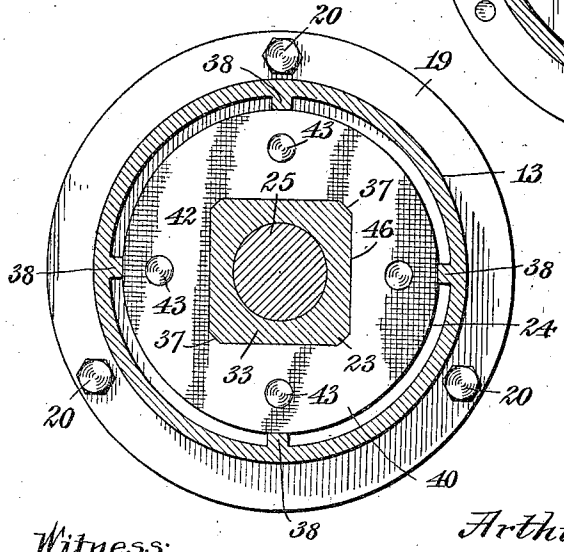
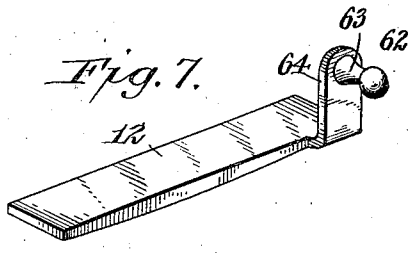


Fig. 7.



Witness:
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Patented Feb. 20, 1923. 1,445,830

UNITED STATES PATENT OFFICE.

ARTHUR G. GIFFORD, OF ROCHESTER, NEW YORK, ASSIGNOR OF ONE-HALF TO FRANK J. MANSFIELD, OF ROCHESTER, NEW YORK.

AUTOMOBILE SNUBBER.

Application filed May 19, 1920. Serial No. 382,528.

To all whom it may concern:

Be it known that I, ARTHUR G. GIFFORD, a citizen of the United States, residing at Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Automobile Snubbers, of which the following is a specification.

This invention relates to improvements in automobile snubbers, and it has for its object the provision of a simple and inexpensive device of this kind which will effectually guard against sudden rebound of the spring-mounted vehicle body after the spring has been depressed, thus absorbing sudden shocks and jars and rendering the vehicle easy riding under all road conditions.

With these and other objects in view to appear hereinafter, the invention consists in the novel features of construction and in the arrangement and combination of parts to be hereinafter described and more particularly pointed out in the subjoined claims.

In the drawings:—

Fig. 1 is a sectional elevation of a portion of the front end of an automobile or other vehicle, showing parts of my improved snubber attached, respectively, to the side bars of the chassis and one of the front springs, the ends of the spring being depressed.

Fig. 2 is an enlarged vertical section taken on line 2—2, Fig. 1, looking in the direction of the arrow crossing said line.

Fig. 3 is an enlarged vertical section taken on line 3—3, Fig. 1.

Fig. 4 is a transverse section taken on line 4—4, Fig. 2.

Fig. 5 is a transverse section taken on line 5—5, Fig. 2, looking to the right.

Fig. 6 is a transverse section taken on line 5—5, Fig. 2, looking to the left.

Fig. 7 is a detached perspective view of the connector bar clipped or otherwise fastened to the vehicle spring.

I have illustrated my invention applied to the chassis of an automobile or other vehicle, and while I have shown it in connection with one of the front springs, it is of course to be understood that a similar device will be used in connection with the other springs of the vehicle; but if desired, these snubbers may be applied to the rear springs only.

The chassis of the vehicle is designated by the numeral 8, and to the front portion of this chassis, shown in the drawings, the usual semi-elliptic spring 9 is fastened, any approved fastening means being utilized for this purpose.

10 designates the front axle of the vehicle to which the spring 9 is fastened by means of clips or U-bolts 11, and in preferred construction I apply to the top of the spring 9 a connector bar 12, which is adjustably fastened in place by the clips or U-bolts 11.

My improved snubber is preferably in the form of a cylindrical casing 13 closed at its rear end by a wall 14 and having its front end closed by means of a cover 15. Said cylindrical casing is provided at its outer end with an outstanding flange 16 between which and the marginal portion of the cover 15 a suitable washer or other packing medium 17 is interposed, the cover being fastened to the flange 16 of said casing by means of screws 18. The casing 13 also has an outstanding flange 19 at its rear end and through which and the side bar or member of the chassis 8, bolts 20 are passed, said bolts having nuts 21 applied thereto, which bear against the inner face of said side member.

Within said casing I employ what I term an "overrunning clutch" comprising two parts or members, an outer member 22 and an inner member 23, and between the two parts of said clutch and the cover 15, friction means 24 is interposed. The outer member 22 of the overrunning clutch comprises a spindle 25 arranged axially within the casing and extending outwardly through the cover 15 thereof, a web 26 formed on said spindle at the rear end thereof, and a circumferential flange 27 extending from the front of the marginal portion of said web, said flange having an exterior diameter somewhat less than the interior diameter of said casing so that the outer member 22 of the clutch may rotate freely. At the rear of the web 26, a boss 28 is formed, which is entered in a seat or bearing 29 formed in the rear wall 14 of the casing. The spindle is reduced in diameter a short distance in advance of the web 26 from which it projects to form an outwardly facing shoulder 30, and it is provided with a second reduced portion to provide a second outwardly facing shoulder 31 a short distance from the in-

ner surface of the cover 15. This spindle may therefore be termed a "stepped spindle," and all portions of it are cylindrical except the outer extremity, which is slightly tapered, as at 32, for the purpose to be described hereinafter.

The inner member 23 of the overrunning clutch is in the form of a sleeve 33 having at its inner end an enlargement 34 whose peripheral face is in contact with the inner peripheral surface of the flange 27 of the outer member 22. Said inner member 23 has an axial bore therethrough which is enlarged at its inner end and therefore fits the two portions of the spindle at opposite sides of the shoulder 30. Said enlargement 34 is provided with roller-receiving notches or pockets 35, each being gradually deepened toward one end. Within each of these peripheral notches, a clutch roller 36 is located, said rollers serving to lock the two parts of the overrunning clutch together when the outer member is rotated in one direction but being adapted to be retained within the enlarged portions of said notches when the outer member of said clutch is rotated in the opposite direction so as to permit said outer member to rotate independently of the inner member. The exterior of the sleeve 33 or, as it may be termed, of the smaller or reduced portion of the inner member, is substantially of rectangular formation in cross section, and more particularly as shown, it has four sides with the corners or angles cut away, as at 37.

The cylindrical wall of the casing is provided at regular intervals with internal beads or ribs 38, and said outer member 22 is preferably in movable contact with said beads or ribs, as best shown in Fig. 4. As these beads or ribs are of the same formation and size, the clutch is thereby positioned centrally within the casing. The friction means 24 comprises a plurality of metal disks 39 fitting freely within the casing 13, and composite disks 40 arranged between said metal disks, each composite disk 40 being formed of a thin metallic member 41 and two fiber, leather, or other friction members 42 applied to opposite sides of the metallic member 41 and riveted or otherwise fastened thereto, as at 43, said composite disks being interposed between and lying in contact with the metal disks 39. The metal disks 39 have peripheral notches 44 formed therein to receive the beads or ribs 38 of the casing and are thus held against rotating. Each of these metallic disks has an axial opening 45 so as to permit the disks to be slid into the casing and over the rectangular reduced portion of the inner member 23 of the clutch to permit said inner member to rotate within the openings of said metal disks. The composite disks 40 are of somewhat smaller diameter than the metal disks 39 and their peripheral edges lie in contact with the beads or ribs 38 of the casing, as best shown in Fig. 6. Said composite disks have axial openings 46 therein, which are substantially square in formation, and of a size to fit snugly over the substantially rectangular reduced portion of the inner member 23 of the clutch. These composite disks are therefore compelled to rotate with said inner member.

With a view of regulating the friction between the disks 39 and 40, I place a pressure disk 47 on the smallest portion of the spindle 25, with the marginal portion of said disk in contact with the outermost disk of the friction means. Bearing against the pressure disk 47 is a pressure bushing 48, which is rotatable on said spindle and is threaded through the cover 15 of the casing, said bushing having a polygonal or other flange 49 at its outer end so that a suitable tool may be applied thereto for rotating the bushing. A jam nut 50 is applied to the bushing and bears against the outer surface of the cover 15. It is therefore apparent that upon tightening the bushing within the cover, the desired pressure will be applied against the pressure disk 47, which in turn will force the disks 39, 40 of the friction means together in firm contact with each other, and the innermost disk of said friction means against the shouldered portion of the inner member 23 and the outer edge of the flange 27 of the outer member of the clutch.

To the tapered extremity 32 of the spindle an actuating lever 51 is secured, said actuating lever having a tapered bore and a key seat 52. Fitting in said key seat and in a key seat 53 in the spindle is a key 54 which compels the spindle to rotate when the actuating lever is moved.

In order to prevent accidental disengagement of said actuating lever from the spindle, a washer 55 is placed against the outer face of said lever so as to conceal the end of said spindle and the bore within said lever, and through this washer a screw 56 is passed, which is threaded into the spindle.

The outer end of said actuating lever has a stud 57 extending inwardly therefrom, said stud being threaded into or otherwise applied to said lever and having a ball 58 at its inner end fitted into a socket 59 at the upper end of an actuating rod 60. The actuating rod has a similar socket 61 at its lower end into which the ball 62 of a stud 63 fastened to an arm 64 on the connector bar 12 is held. Thus the actuating rod is connected at the top and bottom by universal joints, and in order that the device may be applied to different vehicles, said actuating rod is made adjustable and comprises an upper member 65 provided with a threaded bore 66 and a lower member 67

having a threaded upper end 68 adapted to be threaded into said bore 66. For the purpose of retaining said members in any adjusted position, or to keep the sockets thereof in proper spaced relation after said members are adjusted, a nut 69 is applied to the threaded portion of the lower member and bears against the lower end of said upper member. By the use of an adjustable actuating rod, the lower end of said rod may be connected to the under side of the spring, or if desired to the vehicle axle, and while I have shown the actuating lever 51 extending to the right in Fig. 1, the device may be so positioned that this lever will extend toward the left, in which case the connector bar 12 may be reversed on the spring to bring the arm 64 thereof in a plane forward of the axle.

While I have shown the casing of this device applied to one of the side members of the chassis, it is apparent that it may be applied to any other portion of the vehicle carried by the springs. It is also to be noted that although I have shown the exterior of the reduced portion of the inner clutch member substantially rectangular in formation so that the friction disks 40 will rotate therewith, it may be given any other noncircular shape and the openings in said friction disks may be correspondingly shaped, or said friction disks may be fastened onto said inner member in any other manner to compel said disks to rotate with said inner member.

The operation of the device is as follows:

When the springs are depressed the vehicle body will lower, and as the outer end of the actuating lever 51 is connected to a portion of the spring where the depressions or deflections thereof are very slight, if any, said actuating lever will swing upwardly due to the casing 13 moving downwardly with the vehicle body and will rotate certain parts of the device enclosed within said casing, the stud 57 at the outer end of said actuating lever serving as a pivot on which said lever will swing. This therefore causes the outer clutch member 22 to rotate within the casing in the direction of the arrow 71 in Fig. 4, which permits the clutch rollers 36 to remain in the deepened ends of the roller-receiving notches or pockets 35, and if not so positioned will cause said rollers to enter and be retained in said deepened ends, thus allowing the outer clutch member 22 to rotate on the inner clutch member 23. When the springs recover themselves to permit the vehicle body to move upwardly, the actuating lever 51 is swung downwardly, thus causing the outer clutch member 22 to rotate in the direction of the arrow 70 in Fig. 4. This compels the clutch rollers 36 to travel toward the smaller ends of the roller-receiving notches or pockets 35 and causes the inner clutch member to be locked to the outer clutch member so as to rotate therewith. The rotation of the inner member causes the friction disks 40 to rotate while in contact with the metal disks 39, due to said friction disks having noncircular axial openings in which the noncircular sleeve portion 33 of said inner member is retained, and the friction between these disks retards the upward movement of the spring-supported vehicle body and thus prevent sudden rebounding of the same. The body of the vehicle is therefore at all times assured of a gentle upward movement when traveling over uneven roads.

From the foregoing, it will be apparent that my improved snubber is designed to permit the spring-mounted vehicle body to lower as freely as the springs mounting them will permit, but the upward movement will be retarded and very gradual so as to eliminate all sudden rebounds or upthrows of the body, which is so undesirable and annoying, and therefore easy riding is assured under all road conditions.

Having thus described my invention, what I claim is:—

1. A snubber comprising a casing, an overrunning clutch within said casing having an outer part and an inner part with clutch means between said two parts, said outer part having an axial spindle extending therefrom, pressure means within said casing, and friction disks between the two parts of said clutch and said pressure means.

2. A snubber comprising a casing having a cover at one end, an overrunning clutch within said casing having an outer member, an inner member and clutch means between said members, said outer member having an axial spindle extending through said cover, pressure means within said casing, means without the casing for regulating the pressure of said pressure means, and friction elements between said pressure means and the two parts of said clutch.

3. A snubber comprising a casing having an internal projection, an overrunning clutch rotatable in said casing having an outer member, an inner member and clutch means between said members, said outer member having an axial spindle extending through said inner member, disks loosely surrounding a part of said inner member and having notches into which the internal projection of said casing fits, and friction disks interposed between said first-mentioned disks and non-rotatably mounted on a part of said inner member, and means regulable from the exterior of said casing for forcing all of said disks together and against parts of the inner and outer members of said clutch.

4. A snubber comprising a cylindrical casing closed at one end and open at the other, a cover applied to said open end, said casing having a plurality of longitudinal ribs on the inner surface of its cylindrical wall, an overrunning clutch rotatable within said casing and having an outer member provided with a web, a spindle extending axially from said web and through said cover and a flange projecting from the marginal portion of said web, and an inner member having a sleeve mounted on said spindle with an enlargement at one end of said sleeve provided with peripheral pockets gradually deepened toward one end, clutch rollers within said pockets, metallic disks within said casing loosely surrounding said inner member with one of said disks in contact with the edge of the flange of said outer member and also in contact with the enlargement of said inner member, said disks having peripheral notches into which the longitudinal ribs of said casing fit, friction disks between said metallic disks rotatable within the casing and applied to said inner member so as to rotate therewith, a pressure disk within said casing bearing against the outermost metallic disk, and a threaded bushing in said cover bearing against said pressure disk whereby the friction between said metallic and friction disks and between the innermost friction disk and the clutch members can be regulated.

5. A snubber comprising a casing having a cylindrical wall provided with internal longitudinal ribs, an overrunning clutch rotatable within said casing and having a flanged member provided with an axial spindle and a peripherally notched member within said flanged member having a substantially rectangular sleeve portion, rollers within the notches of said notched member, assembled metallic and friction disks arranged alternately within said casing, each metallic disk loosely surrounding the rectangular sleeve of said notched member and having peripheral notches receiving the longitudinal ribs of said cylindrical wall and said friction disks having rectangular openings in which the rectangular portion of said notched member fits, a pressure disk within said casing serving to exert pressure against the assembled disks, a bushing passed through one end of the casing and adjustable therein, said bushing bearing against said pressure disk, and means for retaining said bushing in adjusted position, said bushing having the spindle of the clutch extending therethrough.

In testimony whereof I affix my signature.

ARTHUR G. GIFFORD.