Dec. 21, 1926. 1,611,375

G. B. REID

SHOCK ABSORBER

Filed Sept. 25, 1924

Fig. 1

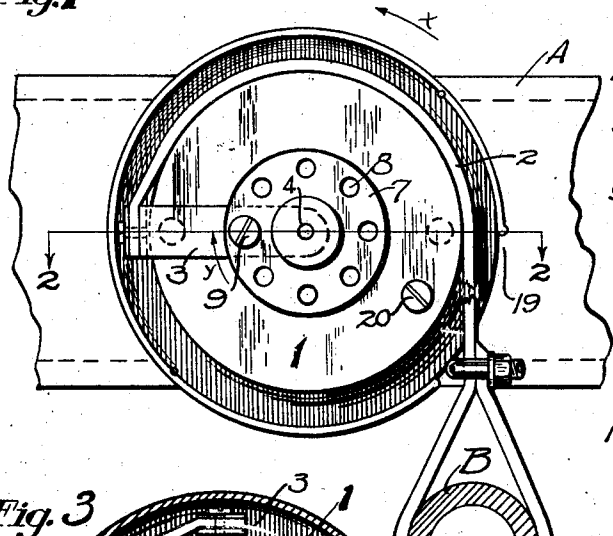


Fig. 2

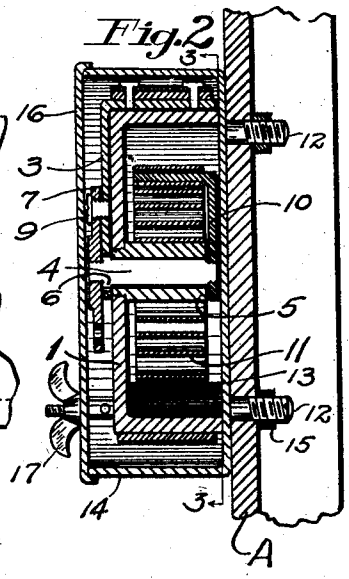


Fig. 3

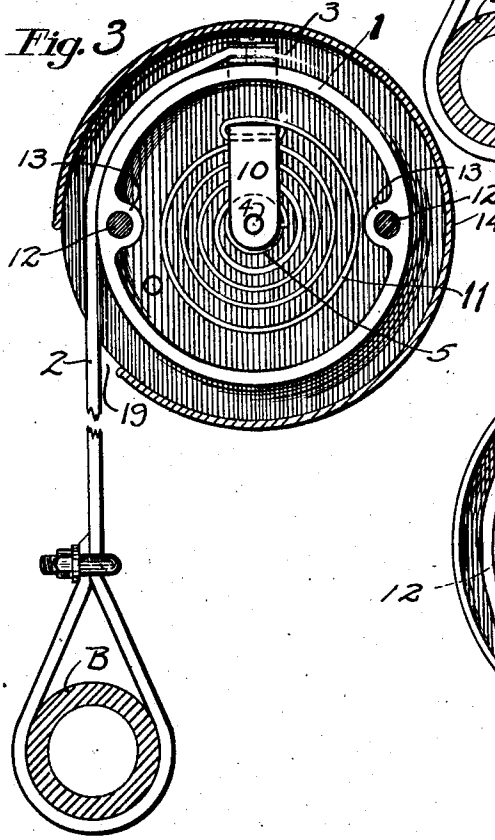
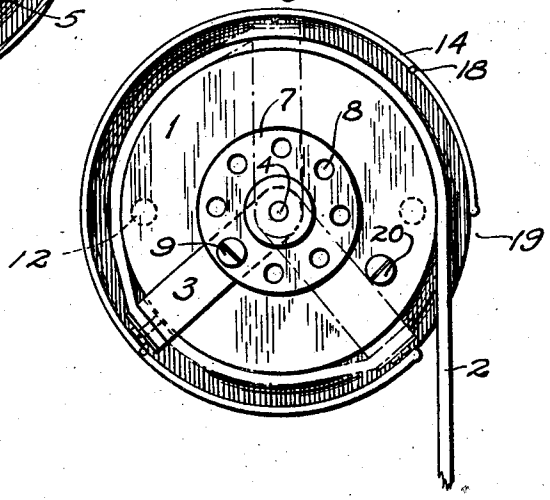


Fig. 4



Inventor

George B Reid

By Cornwall, Beadell & Jamieson Attys

Patented Dec. 21, 1926. 1,611,375

UNITED STATES PATENT OFFICE.

GEORGE B. REID, OF MONTESANO, WASHINGTON.

SHOCK ABSORBER.

Application filed September 25, 1924. Serial No. 739,934.

My invention relates to spring rebound dampers of the type illustrated in Patent No. 1,326,288, issued to me December 30, 1919, and consists in improvements upon the device there illustrated.

One object of my present invention is to provide take-up mechanism which may be tightly enclosed to prevent the admission of dust, water and other foreign matter to the mechanism.

Another object of my invention is to provide means for adjusting the resistance of the device to the rebound of the spring of the vehicle to which it is applied.

Another object of my invention is to positively limit the take-up movement of the device when the vehicle spring is compressed.

In addition to these particular objects, I desire to retain the advantages of the structure of my above-mentioned patent in which a single spring operating in a single plane acts quickly upon compression of the vehicle spring to resist the rebound of the spring. I also desire to provide a simple economical but efficient device for the purpose intended.

In the accompanying drawings which illustrate my invention—

Figure 1 is an end view of my device with a portion of its cover removed and indicating the frame and axle of the vehicle to which my device is applied, the parts being approximately in their normal position.

Figure 2 is a horizontal section on line 2—2 of Figure 1.

Figure 3 is a vertical section taken on line 3—3 of Figure 2 and illustrating the device as viewed from the opposite direction from that indicated in Figure 1.

Figure 4 corresponds to Figure 1 but shows the parts in their normal position and also indicates the position taken when the vehicle springs are compressed or expanded.

My invention comprises a friction drum 1 adapted to be secured to the vehicle frame A, and a flexible frictional member 2 adapted to be secured at one end to the vehicle axle B and to pass over the drum 1 and have its other end secured to take-up mechanism carried by the drum. It will be understood that the position of the parts may be reversed and that the drum may be secured to the vehicle axle while the outer end of the member 2 may be secured to the vehicle frame.

The take-up mechanism includes an L-shaped arm 3 spring-impelled in the direction of the arrow x. When the vehicle spring (not shown) compresses and frame A and axle B approach each other, arm 3 moves from the position shown in Figure 1 to that shown in Figure 4, drawing member 2 about the drum so that their cooperating contacting surface is increased. Obviously, separation of the vehicle frame and axle will be checked due to the friction created by the drawing of member 2 over drum 1 against the tension of the take-up mechanism.

A rotatable shaft 4 is journaled on the axis of drum 1, the latter being shown as provided with a hub 5 to afford a substantial bearing for shaft 4. Drum 1 is cylindrical in shape and is closed at one end through which shaft 4 projects and journals arm 3 on the shouldered portion 6 of its outer end.

Screwed onto the threaded outer end of shaft 4 is a disk 7 provided with a series of holes 8 arranged in a circle about the disk axis and each adapted to be aligned with a threaded hole in arm 3 which receives a screw 9 inserted in one of holes 8 which serves to lock the disk and arm together.

An L-shaped arm 10 is screwed onto the threaded inner end of shaft 4 and the outer end of the arm paralleling the shaft engages one end of a spiral spring 11, the other end of the spring being secured to hub 5. Both ends of shaft 4 are threaded in the same direction and spring 11 is so coiled that it tends to screw shaft 4 into disk 7 and arm 10 assuming these members to be held stationary. Obviously, the threads on the shaft may be either righthand or lefthand and ordinarily the devices on opposite sides of the vehicle will be rights and lefts with their shafts threaded accordingly.

By removing screw 9, disk 7, shaft 4 and arm 10, may be rotated to increase or decrease the tension of spring 11 and the holding screw 9 may be inserted through a different hole 8 in the disk after the adjustment is made.

The peripheral wall of drum 1 is apertured to receive attaching screws 12 which extend parallel with the axis of the drum through frame A and in the device illustrated, the drum wall is enlarged at 13 to provide room for the screw apertures.

It is desirable to exclude foreign matter from the interior of the drum and the open

end of drum 1 is closed by the bottom of a cup-shaped shield 14, the shield bottom being pressed tightly against the edge of the drum periphery by the tightening of nuts 15 on screws 12 when the device is applied to the vehicle frame. The open end of shield 15 is provided with a cover 16 clamped to the body of the shield by wing nuts 17 mounted on screws 18 extending from the body of the shield. The periphery of shield 14 is provided with a restricted opening 19, permitting the passage of member 2. The shield acts to prevent the admission of an undue amount of dirt, water, etc., to the exterior of the drum, although such matter cannot be completely excluded due to the presence of opening 19. However, the interior of the drum is effectively sealed against foreign matter due to the axial mounting of arms 3 and 10.

It will be noted that the head of a screw 20 projects into the plane in which arm 3 moves and limits the movement of the latter in the direction of the arrow x so that the arm will engage the bolt head when the vehicle springs compress to an abnormal extent and the initial expansion of the vehicle spring will be unchecked.

By means of the construction shown, it is possible to adjust the tension of the device by removal of shield cover 16 and without removing the device from the machine. The mounting of arms 3 and 10 on the axle shaft 4 reduces the opening required in the face of the drum and enables the interior of the latter to be closed effectively. The provision of a spiral spring acting in a single plane, together with the L-shaped arms, permits the device to operate in a small space and makes it possible to apply the device in spaces which prohibit the application of absorbers occupying greater space or having laterally projecting elements.

Obviously, various modifications can be made in the details of my invention without departing from the spirit thereof as expressed in the appended claims and I contemplate the exclusive use of such modifications of my invention as well as the particular form illustrated.

I claim:

1. In a rebound damper, a closed drum, a rotatable shaft journaled in said drum with a portion projecting outwardly thereof and filling the opening through which it projects, a spring anchor within said drum, a spring connected at one end to said anchor and at its opposite end to said shaft, and a flexible member slidable over the periphery of said drum with one end connected to the projecting portion of said shaft.

2. In a rebound damper, a drum, an axial hub in said drum, a rotatable shaft surrounded by said hub and projecting beyond each end of said hub and through one end of said drum, L-shaped arms fixed on opposite ends of said shaft with their outer ends parallel with said shaft and extending toward each other, the end of one arm being inside said drum and the end of the other arm being outside of said drum, a spiral spring having one end secured to said hub and its other end secured to the arm end inside of said drum, and a friction member secured to the arm end outside of said drum.

3. In a rebound damper, a closed drum, a rotatable shaft journaled in said drum with a portion projecting through an end of the drum and filling the opening through which it projects, a fixed hub surrounding said shaft, an arm within the drum fixed to said shaft, an arm without the drum fixed to the projecting portion of said shaft, a spring having one end secured to said first-mentioned arm and its other end secured to said hub, and a flexible friction member partially encircling said drum and secured to said second-mentioned arm.

4. In a rebound damper, a drum, a rotatable shaft journaled in said drum with a portion projecting through the end of the drum, a fixed hub surrounding said shaft, an arm within the drum fixed to said shaft, an arm extending radially from said shaft projecting portion, adjustable means holding said latter arm in desired angular position relative to said shaft, a spring having one end secured to said first-mentioned arm and its other end secured to said hub, and a flexible friction member partially encircling said drum and secured to said second mentioned arm.

5. In a rebound damper, a drum, a shaft therein and projecting through an end of the drum, a spring yieldingly rotating said shaft in one direction, an arm without said drum extending radially of said shaft, a disk fixed to the projecting end of said shaft and cooperating elements on said disk and arm for securing said arm to different circular points on said disk.

6. In a rebound damper, a closed drum, a shaft therein and projecting through an end of the drum and filling the opening through which it projects, individual arms secured to the ends of the shaft and located, respectively, within and without said drum, a spring in said drum yieldingly rotating the arm located in the drum in one direction, and a flexible member secured at the arm extending over said drum and adapted to be attached to a vehicle part tending to rotate said arm and shaft in the opposite direction.

7. In a rebound damper, a hollow cup-shaped friction drum, a removable plate extending across the open side of said drum, a flexible friction member slidably engaging the exterior periphery of said drum and having variable contact therewith, and yielding take-up mechanism operatively

connected to said member, the interior walls of said drum and plates forming a tightly closed chamber for said mechanism.

8. In a rebound damper, a friction drum, an arm pivoted on said drum, a flexible friction member extending over said drum and secured to said arm, tension mechanism for taking up slack in said member by rotating said arm, and a stop for limiting the rotation of said arm.

9. In a rebound damper, a hollow drum, a flexible friction member slidable thereon, yielding take-up mechanism in said drum including an adjusting element projecting through said drum, a cup-like shield and cover for closing the interior of said element, said cover being removable to permit access to said adjusting element without exposing the interior of said drum.

10. In a rebound damper, a hollow cup-shaped friction drum, a removable plate extending across the open side of said drum, a flexible friction member slidably engaging the exterior periphery of said drum and having variable contact therewith yielding take-up mechanism in said drum, and a rotatable shaft extending axially of said drum through the side wall thereof and through said plate and operatively connecting said mechanism and member, said drum and plate forming a tightly closed chamber for said mechanism.

11. In a rebound damper, a closed drum, a spring anchor therein, a shaft journaled in said drum and projecting therefrom and filling the opening through which it projects, an arm extending radially of said shaft, said shaft and arm being connected so as to rotate together, a spring in said drum connecting said shaft and anchor, and means for varying the tension on said spring.

12. In a rebound damper, a closed drum, a rotatable shaft therein, a spring anchor in said drum, a spring having its ends connected to said shaft and anchor respectively, means for adjusting the tension of said spring from the exterior of said drum, and a flexible member frictionally engaging the exterior periphery of said drum and having an end connected to said shaft so as to rotate the latter.

13. In a rebound damper, a cylindrical drum having closed ends and a closed periphery, a yielding mechanism in said drum, a mechanism adjusting element on the exterior of said drum, and a member having variable contact with the exterior periphery of said drum and connected to said mechanism.

14. In a rebound damper, a drum, a rotatable shaft in said drum and projecting therefrom, a spring anchor in said drum, an L-shaped arm mounted on said shaft within said drum with one part extending radially from said shaft and its other part extending parallel with said shaft over said anchor, a spring secured at its ends to said anchor and said latter mentioned arm part, respectively, a second L-shaped arm mounted on said shaft outside of said drum with a part extending radially of the shaft and a part extending parallel therewith over said drum, and a flexible member secured to said drum and frictionally engaging said drum.

In testimony whereof I hereunto affix my signature this 15th day of September, 1924.

GEORGE B. REID.