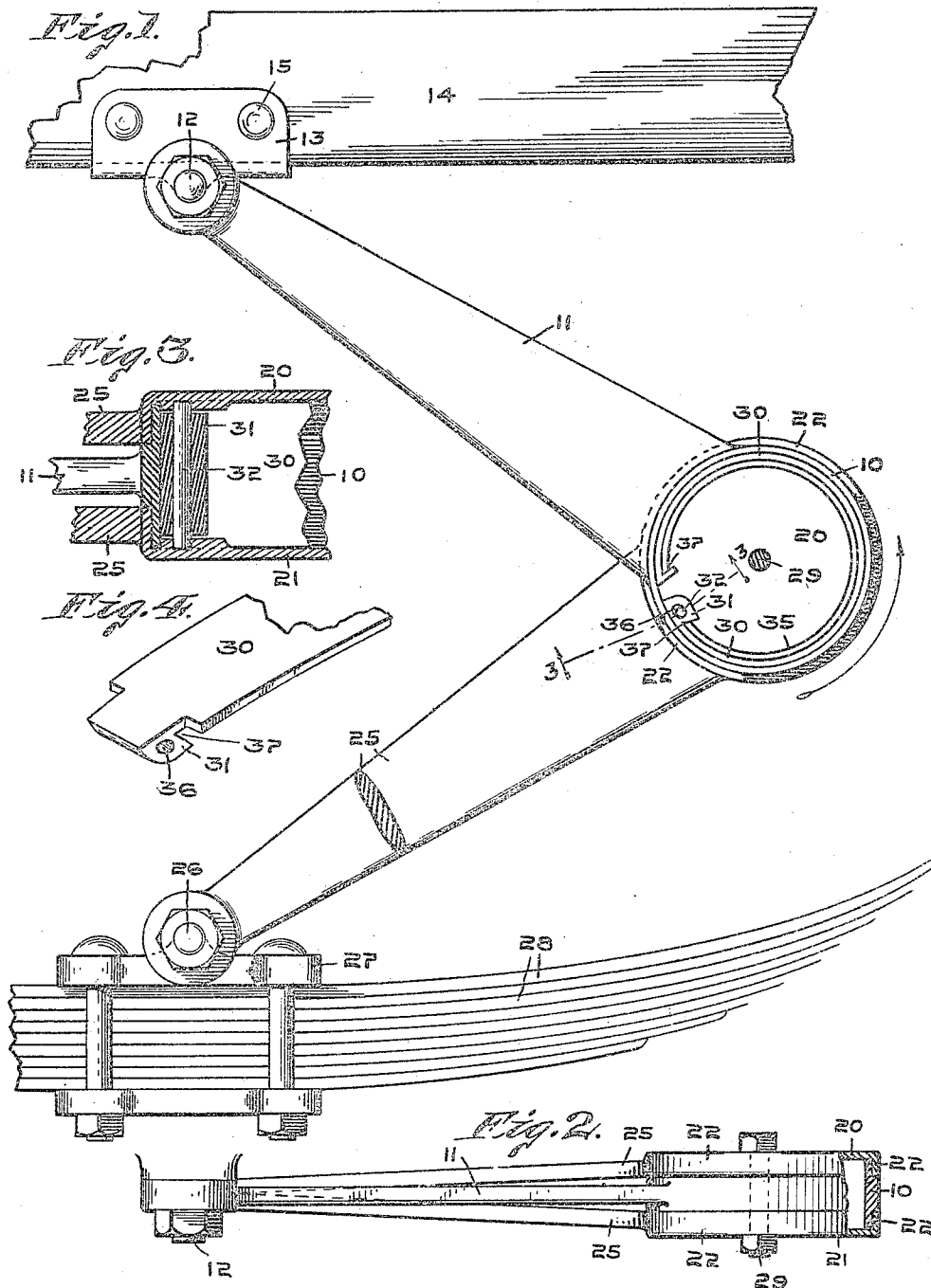


J. F. HERRMANN.
SHOCK ABSORBER.
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1,045,789.

Patented Nov. 26, 1912.



WITNESSES:
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UNITED STATES PATENT OFFICE.

JULIUS F. HERRMANN, OF INDIANAPOLIS, INDIANA.

SHOCK-ABSORBER.

1,045,789.

Specification of Letters Patent.

Patented Nov. 26, 1912.

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To all whom it may concern:

Be it known that I, JULIUS F. HERRMANN, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Shock-Absorbers, of which the following is a specification.

This invention relates to shock-absorbers which are particularly applicable to motor-cars and similar vehicles; and the object of the invention is to provide simple and efficient means whereby the rate of speed of the rebound of the vehicle-body, when the wheels are passing over abrupt irregularities in the road, is gradually reduced, thereby not only insuring the occupants more ease and comfort in travel, but also reducing the liability of breakage of the parts of the vehicle.

I accomplish the above object of the invention by means of a shock-absorber illustrated in the accompanying drawings, forming a part hereof, in which—

Figure 1 is a side elevation of the shock-absorber attached to the supporting frame and the running-gear of a vehicle, one of the companion arms of the lower portion of the shock-absorber being broken away to show the internal mechanism located within the drum of said absorber. Fig. 2 is a top or plan view of the shock-absorber. Fig. 3 is a fragmentary detail sectional view, on an enlarged scale, on the dotted line 3—3 in Fig. 1. Fig. 4 is a fragmentary detail perspective view of one end of the main friction-spring.

Referring to the drawings, the shock-absorber comprises a hollow drum 10 provided on its outer periphery with an integrally formed arm 11, the outer end of which engages a projecting bolt 12 which is formed integrally with a bearing-plate 13 secured by means of the rivets 15 to the base-rail 14. The outer peripheral ends of the drum 10 provide a bearing for the caps 20 and 21, which are provided with annularly extending flanges 22, the latter projecting over a portion of the outer periphery of the drum 10, and the caps 20 and 21 are each provided with an integrally formed arm 25 which extends to and jointly engages the bolt 26, formed integrally with the clip 27 which secures the several leaves of the spring 28. By this construction the drum 10 is supported at each end by the

caps 20 and 21, and insures an equal distribution of the strain throughout the device when weight is applied to the arm 11. Accidental displacement of the caps 20 and 21 from the ends of the drum 10 is prevented by means of the tie-bolt 29. Tension is applied to the device, for preventing rapid rebounding of the vehicle-body, by means of an open leaf spring 30, which is arranged concentrically within the drum 10, the expanding tendency of the material comprising said spring forcing said spring outwardly and tightly against the internal surface of said drum 10. One end of the spring 30 is enlarged, as at 31, and is anchored to the caps 20 and 21 by means of a transverse-pin 32 (see Fig. 3), and the opposite and free end of the spring 30 is preferably bent outwardly and backwardly to form a V-shaped notch 37. A similar notch 37 is formed at the rear of the enlargement 31, these notches being adapted to receive and secure the ends of an additional spring 35, if deemed necessary to assist the spring 30 in providing more tension. By mounting one end of the spring 30 on the pin 32, which pin is anchored to the caps 20 and 21, such mounting will cause said spring to move with the said caps and arms 25 in a direction opposite to that in which the drum 10 moves. Hence, when the vehicle-body descends, the movement of the drum 10 will be in the direction indicated by means of the long arrow in Fig. 1, while the movement of the caps 20 and 21, the lower companion arms 25 and the spring 30 will be in the opposite direction. This movement of the drum being in a direction in which the free end of the spring 30 projects has a tendency to decrease the diameter of said spring 30, so that a corresponding reduction in its tension exerting power against the internal surface of the drum 10 is secured.

The construction of the shock-absorber is such that while permitting a rapid descent of the vehicle-body, this movement will still be somewhat under the influence of the spring 30, and will not be as free as if no tension device were interposed between the vehicle-body and the spring 28, from the fact that the spring 30 still exerts a slight tension against the drum 10. On the rebound of the vehicle-body the movement between the drum 10 and the caps 20, 21 and the spring 30 is such as to cause the

spring 30 to be expanded and increase its exertion against the internal surface of the drum 10. This increased tension of the spring 30 will necessarily retard the upward movement, or rebound, of the vehicle-body, permitting said body to gradually return to its uppermost position as defined by the vehicle-spring 28. In order to free that portion of the spring 30 between the pin 32 and the adjacent wall of the drum 10, I lengthen the aperture 36 through which said pin 32 passes. The aperture 36 is cut on a line which extends tangentially to the radius of the drum 10, as shown, so that when the arm 11 moves downward and the arms 25 move upward, to reduce the diameter of the spring 30, the end of said spring carrying the enlargement 31 will be moved to reduce the pressure against the adjacent wall of the drum 10 on account of the peculiar arrangement of the aperture 36, and said spring 30 will be immediately forced outward against the adjacent surface of the drum 10 when the arms 11 and 25 are moved in the opposite direction, away from each other. The device is so simple and its operation so easily understood that further description is deemed unnecessary.

Having thus fully described my said invention, what I desire to secure by Letters Patent, is—

1. In an apparatus for cushioning the relative movements of a vehicle running-gear and body-frame, a hollow drum, an arm on said drum adapted to engage said frame, caps arranged on said drum, an arm carried by each cap adapted to engage said running-gear, a tension device, and means passing transversely through one end of said tension device and adapted to engage and be supported by and moving with said caps, to expand said tension device against said drum.

2. In an apparatus for cushioning the relative movements of a vehicle running-gear and body-frame, a hollow drum, an

arm on said drum adapted to engage said frame, caps arranged to ride the peripheral surface of said drum, an arm carried by each cap adapted to engage said running-gear, a tension device, and means passing through one end of said tension device and adapted to engage and be supported by and moving with said caps to increase and decrease the diameter of said tension device.

3. In an apparatus for cushioning the relative movements of a vehicle running-gear and body-frame, a hollow drum, caps arranged to move concentrically about the axis of said drum, arms on said caps and drum to engage both the frame and running-gear of the vehicle, yieldable means provided with a slot adapted to bear against the internal surface of said drum, means extending from one cap to the other and through the slot in said tension device to expand said device when moving the arms in a given direction.

4. In an apparatus for cushioning the relative movements of a vehicle running-gear and body-frame, a hollow drum, caps arranged to move concentrically about the axis of said drum, arms on said caps and drum to engage both the frame and running-gear of the vehicle, yieldable means provided with a slot and notches and adapted to bear against the internal surface of said drum, means extending from one cap to the other and through the slot in said tension device, and an auxiliary tension device arranged within and coöperatively engaging both notches in said first tension device.

In witness whereof, I have hereunto set my hand and seal at Indianapolis, Indiana, this 16th day of December, A. D. one thousand nine hundred and eleven.

JULIUS F. HERRMANN. [L.s.]

Witnesses:

F. W. WOERNER,
L. B. WOERNER.