

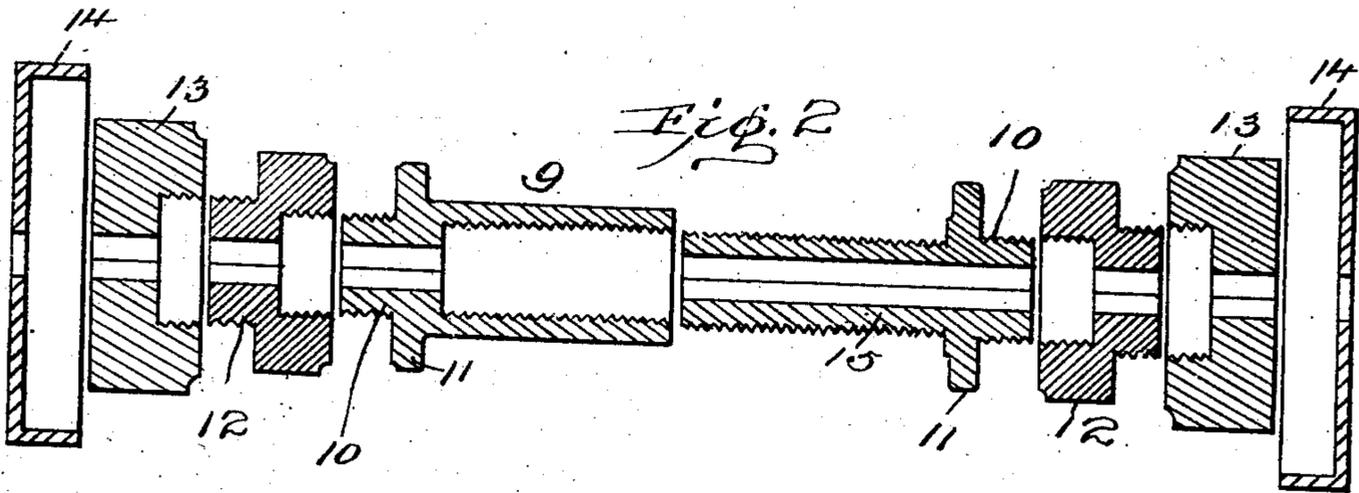
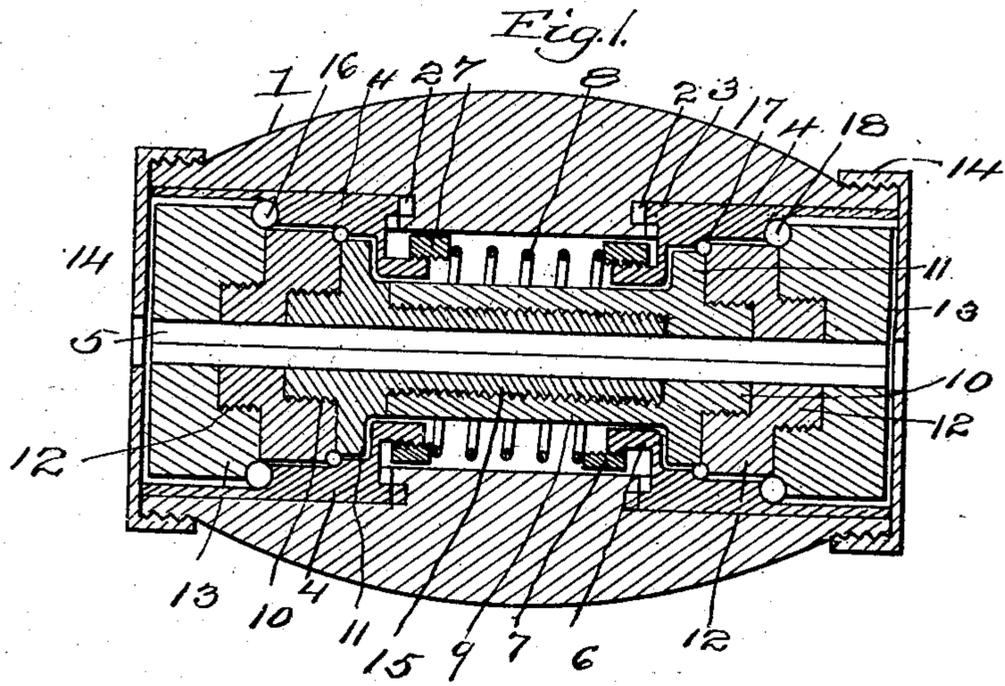
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PATENTED JAN. 1, 1907.

J. E. SAPP.

HUB.

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JAMES E. SAPP, OF BAINBRIDGE, GEORGIA.

HUB.

No. 840,379.

Specification of Letters Patent.

Patented Jan. 1, 1907.

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To all whom it may concern:

Be it known that I, JAMES E. SAPP, a citizen of the United States, residing at Bainbridge, in the county of Decatur and State of Georgia, have invented certain new and useful Improvements in Hubs; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in hubs.

The object of this invention is to produce a hub in which the axial thrust upon the spindle and hub of the vehicle will be reduced to a minimum.

A further object of this invention is to provide a hub which is provided with antifric-tion means for reducing the friction incident to the travel of the rotating parts around the stationary parts of the hub.

A further and most important object of this invention is to provide a hub having an elastic or flexible center located and arranged in such relation to the spindle that it will rotate with the hub portion and, furthermore, one that will be capable of yielding to great axial pressure and sudden jolts and thrusts, as well as carrying the radial pressure of the entire vehicle.

With these and other objects in view my invention consists in the features and details of construction and combinations of parts, as will be described in connection with the accompanying drawings and then more particularly pointed out in the claims.

In the drawings, Figure 1 represents a longitudinal vertical section, and Fig. 2 a like view of the complementary parts of the hub segregated.

Referring more in detail to the drawings, 1 represents the body portion of the hub arranged to receive the spokes of the wheel. This body portion is provided at suitable intervals on its interior periphery with slots or grooves 2, which slots or grooves are arranged to accommodate a lug or projection 3, extending away from the annulus 4, which annulus is arranged to entirely fill the periphery of the interior of the body portion 1 of the hub. The extensions 3 are provided on said annulus for the purpose of allowing said an-

nulus to rotate or travel with the remaining portion of the hub 1. The projections provided on said annulus are arranged to fit into the slot or groove 2, provided in the interior periphery of the hub, the said slots being of sufficient length to permit said annulus to slide longitudinally with respect to the spindle 5 and the hub portion 1. This annulus 4 has an elongated depressed portion 6, said portion being threaded and arranged to receive the ring 7, likewise provided with screw-threads. This ring is secured onto the depressed portion 6 of the annulus 4 and serves to hold fast one end of a spring or other flexible and expansible means whereby the axial and radial thrusts of the vehicle are offset. This flexible means consists in the present instance of a spiral spring 8 being coiled around but spaced from the sleeves surrounding the spindle, each end of said spring being fastened to a ring 7, screwed to said annulus 4.

A sleeve 9, provided with internal screw-threads, is adapted to accommodate sleeve 15. This sleeve 9 extends from the inner end of the hub to the outer portion of the same and is provided on its inner end with an extension 10, provided with screw-threads, and a flanged portion 11, which flanged portion is adapted to conform to the shape of the annulus 4. A cone or disk 12 is provided and arranged to be fitted onto the extension 10 of the sleeve, which cone or disk 12 snugly fits upon the screw-threaded portion of said sleeve 10 and lies flush with the groove formed in the flanged portion 11 of said sleeve 9. A similar disk 13 engages the screw-threaded portion of said disk 12, which disk completes the structure of one end of the hub, with the exception of a dust-guard 14, arranged to fit over the extreme end of the hub-body 1. The opposite end of the hub is provided with a similar sleeve 15, which sleeve is provided with external screw-threads arranged to engage the threaded sleeve 9. In this manner the two sleeves are held securely in their proper positions. The said sleeve 15 is likewise provided with a flanged and screw-threaded portion as well as the remaining parts similar to the parts of the opposite side of the hub which have just been described and are similarly numbered. The flanged portions of the sleeves 11 and 12, as well as the

disks 13, are each provided on their peripheral edges with concavities forming, substantially, a raceway for a plurality of ball-bearings 16. These balls are adapted to travel in the concavity or groove formed by the disk 13 and the flanges of the sleeves 11 and 12, the body portion of the hub revolving around these stationary parts having its annulus 4 provided with a curved shoulder 17, which forms the other concavity for the raceway in which the balls are designed to travel. The disks 12, which fit the extensions of the sleeves 11, as well as the disks 13, which are designed to be seated on said disks 12, are likewise provided in their exterior and interior periphery, respectively, with annular grooves or concavities forming a raceway for the balls 16. The said annulus 4 has its peripheral edge curved to accommodate the balls and to form a raceway therefor. In this manner it is obvious that with the sleeve portions and the complementary disks of the hub remaining stationary and the hub portion proper, together with its annulus 4, rotating about these sleeves the lateral strain of the vehicle will be taken up and to a very important extent offset. The provision of a spiral spring which is interposed between the longitudinal slidable annuli will effectually relieve the lateral or axial strain and thrust caused by the travel of the wheels over uneven highways and roads, inasmuch as the jolting of the vehicle from one side to the other is taken up by the flexible center, which acts as a backing for the ball-retaining cups at each end of the hub.

One of the principal results attained by providing a flexible center having metal threaded ends is that when the annuli 4 become worn by the constant rotation of the same around the ball-bearings the said annuli can be readily replaced with new ones at little expense. Furthermore, the provision of rings on the interior elongated portion of said annuli serves also as a means for securing the ends of the spiral spring forming the elastic center.

It will be seen that two of the parts of the hub-body 1 and the axial portions are separate and distinct and not in contact with each other, the same being spaced from each other, and the interposition of the ball-bearings at the above-described places insuring the retention of this space for the purpose of increasing the efficiency of the ball-bearings. The spring likewise being fastened to the rings on the elongated portion of the annuli is free from the sleeve and rotates about the same without contacting with them, so that there is no friction on this portion of the hub either against the hub portion proper or the sleeves.

Having thus fully described my invention,

what I claim as new, and desire to secure by Letters Patent, is—

1. In a vehicle-hub, the combination with a body portion and a spindle, of sleeves mounted upon said spindle and fixed thereon with respect to the rotating portion of said hub, cups fixed upon the body portion and rotatable therewith, antifriction means interposed between said cups and said sleeves, and means for offsetting axial thrust.

2. In a vehicle-hub, the combination with a body portion and a spindle, of integral, flexible means positioned centrally of said spindle and surrounding the same, for compensating for axial thrust, said axial-thrust-compensating means taking the pressure from the thrust throughout its entire length, and cups fixed to said body portion for receiving the ends of the thrust-compensating means.

3. In a vehicle-hub the combination with a body portion and a non-rotating spindle, of a plurality of annuli slidable within said body portion and surrounding said spindle and a spring for forcing said annuli in either direction, whereby any axial thrust is compensated for.

4. In a vehicle-hub the combination with a body portion having on its interior periphery a plurality of slots, of a plurality of rings within and arranged to rotate with said body portion, said rings having ribs arranged to slide in the slots of said body portion, and longitudinally thereof, means interposed between said rings for causing said longitudinal movement of said rings, whereby the lateral and axial thrust of the wheel is compensated for.

5. In a vehicle-hub the combination with a body portion and a spindle, rings within said body portion and arranged to rotate with respect to said spindle, of a plurality of sleeves mounted on said spindle, said sleeves being interlocked and spaced from said rings, means positioned circumferentially of said sleeves for producing a longitudinal, slidable movement of said rings, and means interposed between said sleeves and rings for reducing frictional resistance.

6. In a vehicle-hub the combination with a body portion being provided with a plurality of peripheral sockets of a plurality of rings within said body portion and arranged to fit said sockets said rings having an elongated flange provided with screw-threads, annuli arranged to engage the screw-threaded portion of said rings, and means interposed between said rings whereby the axial thrust will be taken up and offset by the longitudinal movement of said rings and said sockets.

7. In a vehicle-hub the combination with a body portion and a spindle, of a plurality of sleeves interlocking with said spindle and

fixed against rotation, a plurality of cones at
either end of said sleeves and arranged to en-
gage said sleeves, said cones having raceways
formed therein for ball-bearings, rings within
5 said body portion and arranged to travel
around the ball-bearings, said rings being
slidable longitudinally of the axis of the hub,
and annuli secured to said rings, and means

interposed between said rings for offsetting
the axial thrusts of the vehicle.

In testimony whereof I affix my signature ¹⁰
in presence of two witnesses.

JAMES E. SAPP.

Witnesses:

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T. B. MAXWELL.