

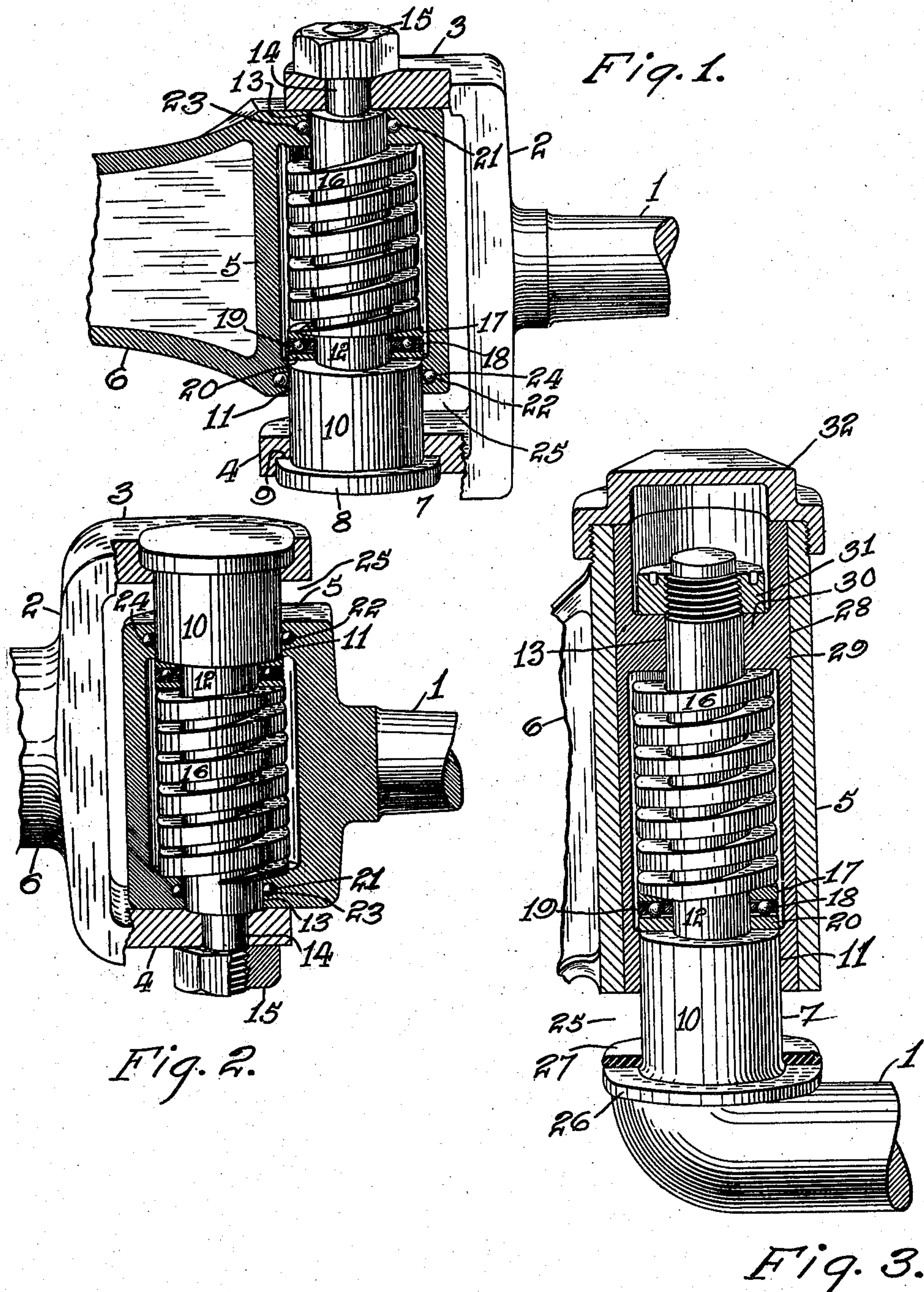
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J. D. ROURK & G. J. A. BADDETT.

VEHICLE.

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Witnesses  
Katie Frankfort  
M. M. Johnson

Inventors  
Joseph D. Rourk  
Godfrey J. A. Badgett  
By their Attorney  
O. B. Stickney



# UNITED STATES PATENT OFFICE.

JOSEPH D. ROURK AND GODFREY J. A. BADDETT, OF NEW YORK, N. Y.

## VEHICLE.

No. 840,588.

Specification of Letters Patent.

Patented Jan. 8, 1907.

Application filed August 20, 1906. Serial No. 331,354.

*To all whom it may concern:*

Be it known that we, JOSEPH D. ROURK, a citizen of the United States of America, residing in the borough of Brooklyn, city of New York, county of Kings, and State of New York, and GODFREY J. A. BADDETT, a subject of the King of Great Britain, residing in the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Vehicles, of which the following is a specification.

This invention relates to the hinged axles of vehicles, especially automobiles, in which usually the front wheels are mounted upon axles which are separately hinged to the ends of an axletree, which is secured to the body of the vehicle, the wheels being movable upon said hinges for the purpose of steering the vehicle.

The principal object of our invention is to provide improved means for hinging the axle to the axletree especially with a view to the location of means at the hinge to absorb the shocks to which the vehicle is subjected when in use.

We preferably form upon the end of the axletree a hollow boss and fork the end of the swinging axle to inclose said boss and pass a pintle through the fork and the boss, the pintle having at one end a relatively large shoulder, upon which the end of the boss has a turning fit, and a shock-absorbing spring coiling around the shank of the pintle within the boss, the diameter of the spring being about the same as the diameter of the shoulder, so that the spring may be readily inserted with the boss. We also aim to make the steering apparatus very sensitive and easily controllable, to this end providing sets of bearing-balls to run upon the shoulder and shank of the pintle, which has an excess of length to accommodate the relative movements of the axle and axletree longitudinally of the pintle.

Other objects and advantages will hereinafter appear.

In the accompanying drawings, Figure 1 is a perspective view, partly in section, of the preferred form of our invention in which a hollow boss is formed upon an axletree and a fork is formed upon a swinging axle. Fig. 2 illustrates a fork formed upon the axletree and a hollow boss formed upon the swinging axle.

Fig. 3 illustrates the pintle as integral with the swinging axle and projecting up therefrom, as well as other details hereinafter referred to.

Referring more particularly to Fig. 1, the wheel-axle, usually tapering and designated as 1, is formed at its inner end with a fork 2, between the upper and lower ends 3 4 whereof is confined a hollow boss or head 5, cast or provided upon the end of an axletree 6. The fork and hollow boss are hinged together by means of a pintle 7, having at its lower end a head 8, fitted in a seat 9 in the fork, a shoulder 10 extending up from said head and through a cylindrical opening 11 in the lower end of the boss 5. Up from said shoulder extends a shank 12, whose upper end is fitted in an opening 13 in the upper end of the boss 5. Above said boss the shank is reduced at 14 to pass through a hole in the part 3 of the fork, and a nut 15 is threaded upon the top projecting end of the pintle to draw the end of the shank 12 against the inner face of the part 3 of the fork and also to draw the head 8 down upon its seat 9, thereby securing rigidity of the fork. Coiled around the shank 12 within the boss 5 is a compression-spring 16, bearing at its top against the upper end of the boss and at its bottom against the shoulder 10. The shank 12 and shoulder 10 have an excess of length to accommodate the relative up-and-down movements of the axle and axletree as the spring 16 compresses and expands. Between the spring 16 and the shoulder 10 is preferably inserted a washer 17, and between the latter and the shoulder is confined a set of bearing-balls 18, which are confined in an annular cage 19 and run upon a hardened washer 20. Balls 21 are preferably arranged to run upon the periphery of the shank 12, and balls 22 run upon the periphery of the shoulder 10, said balls being confined in annular grooves or races 23 and 24, formed interiorly in the ends of the hollow boss 5, and not opposing the up-and-down movements of the boss and fork. The three sets of balls reduce the turning friction of the hinge, so that the steering of the vehicle is rendered very sensitive. The diameter of the spring 16 is about the same or a trifle smaller than that of the hole 11, so that it may be readily inserted



into and removed from the boss, and the shoulder 10 is made of sufficient diameter to fill the hole 11. If the sets of balls 21 and 22 are omitted, it will be understood that the shoulder and shank will be made to fit a trifle more closely in the bearings than if the balls are present, so as to avoid lateral play.

At Fig. 2 the boss 5 is formed upon the inner end of the axle 1, and the fork 2 is formed upon the end of the axletree 6. The pintle is of the same form and construction as seen at Fig. 1, but inverted, the space 25 for play of the boss within the fork being at the top instead of at the bottom, as at Fig. 1; but in other respects the figures correspond.

At Fig. 3 the axle 1 and pintle 7 are integral, a seat 26 being formed at their junction to receive an annular pad or washer 27. The hollow boss 5 is formed with a cylindrical bore 28 extending entirely therethrough, and a steel bushing 29 is driven into said boss. Said bushing is provided at one end with a cylindrical bearing 11 to fit upon the shoulder 10, and is hollowed out to receive the spring 16. Near its top the bushing is provided with a partition 30, against which bears the upper end of the spring. The bearing 13 is formed with a partition for the upper end of the pintle. The axle and boss may slide down upon the pintle until the boss strikes the pad 27 and are returned by the spring 16, a stop-nut 31 being threaded upon the tip of the pintle above the partition 30. A cap-nut 32 is threaded upon the top of the boss 5, a space being left within the cap for the up-and-down movements of the pintle.

Having thus described the invention, we claim—

1. The combination of an axletree, a swinging axle, a pintle connecting said members, said pintle having a shoulder and a shank, and one of said members having a hollow boss fitted at one end to turn upon said shoulder, and at the other end to turn upon said shank, and a shock-absorbing spring coiled about said pintle within said hollow boss and bearing against said shoulder and the opposite end of the boss; said shank and shoulder having an excess of length for accommodating the relative play of the axletree and axle longitudinally of said pintle.

2. The combination of an axletree, a swinging axle, one of said members having a hollow boss, and the other having a fork spanning said boss, a pintle connecting said members, said pintle having a head seated upon one end of said fork, and having a shoulder and a shank, said hollow boss fitted at one end to turn upon said shoulder, and at the other end to turn upon said shank, said shank having a reduced end passing through the other end of said fork, and provided with securing means,

and a shock-absorbing spring coiled about said pintle within said hollow boss and bearing against said shoulder and the opposite end of the boss; said shank and shoulder having an excess of length for accommodating the relative play of the axletree and axle longitudinally of said pintle.

3. The combination of an axletree, a swinging axle, a pintle connecting said members, said pintle having a shoulder and a shank, and one of said members having a hollow boss fitted at one end to turn upon said shoulder, and at the other end to turn upon said shank, a shock-absorbing spring coiled about said pintle within said hollow boss and bearing against said shoulder and the opposite end of the boss; said shank and shoulder having an excess of length for accommodating the relative play of the axletree and axle longitudinally of said pintle, a washer interposed between said spring and said shoulder, and a set of bearing-balls interposed between said washer and said shoulder.

4. The combination of an axletree, a swinging axle, one of said members having a hollow boss, and the other having a fork spanning said boss, a pintle connecting said members, said pintle having a head seated upon one end of said fork, and having a shoulder and a shank, said hollow boss fitted at one end to turn upon said shoulder, and at the other end to turn upon said shank, said shank having a reduced end passing through the other end of said fork, and provided with securing means, a shock-absorbing spring coiled about said pintle within said hollow boss and bearing against said shoulder and the opposite end of the boss; said shank and shoulder having an excess of length for accommodating the relative play of the axletree and axle longitudinally of said pintle, a set of bearing-balls running around the periphery of said shank, and a set of bearing-balls running around the periphery of said shoulder; means being provided upon said boss for confining said sets of balls.

5. The combination of an axletree, a swinging axle, one of said members having a hollow boss, and the other having a fork spanning said boss, a pintle connecting said members, said pintle having a head seated upon one end of said fork, and having a shoulder and a shank, said hollow boss fitted at one end to turn upon said shoulder, and at the other end to turn upon said shank, said shank having a reduced end passing through the other end of said fork, and provided with securing means, a shock-absorbing spring coiled about said pintle within said hollow boss and bearing against said shoulder and the opposite end of the boss; said shank and shoulder having an excess of length for accommodating the relative play of the axletree and axle longitudinally of said pintle.



nally of said pintle, a set of bearing-balls running around the periphery of said shank, a set of bearing-balls running around the periphery of said shoulder; means being provided upon said boss for confining said sets of balls, a washer interposed between said spring and said shoulder, and a set of bear-

ing-balls interposed between said washer and said shoulder.

JOSEPH D. ROURK.

GODFREY J. A. BADDETT.

Witnesses:

JAS. J. HUNT,

L. R. BOURN.