

W. W. ANNABLE.
TRICYCLE.
APPLICATION FILED FEB. 20, 1911.

1,006,518.

Patented Oct. 24, 1911.

2 SHEETS—SHEET 1.

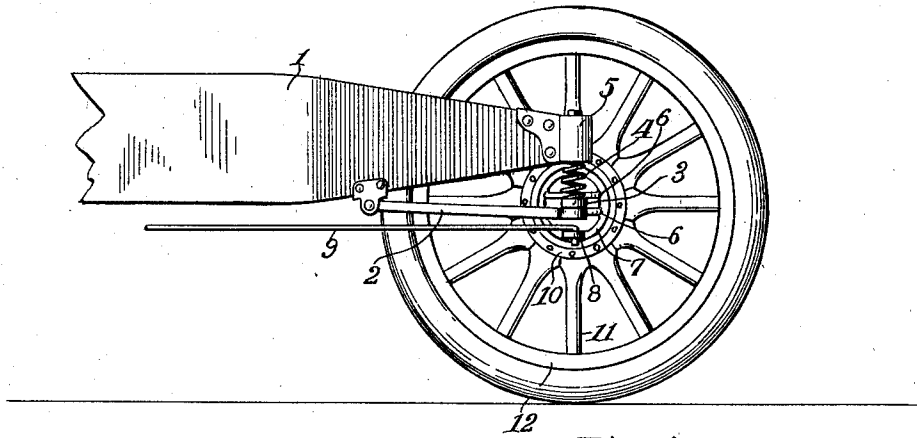


Fig. 1.

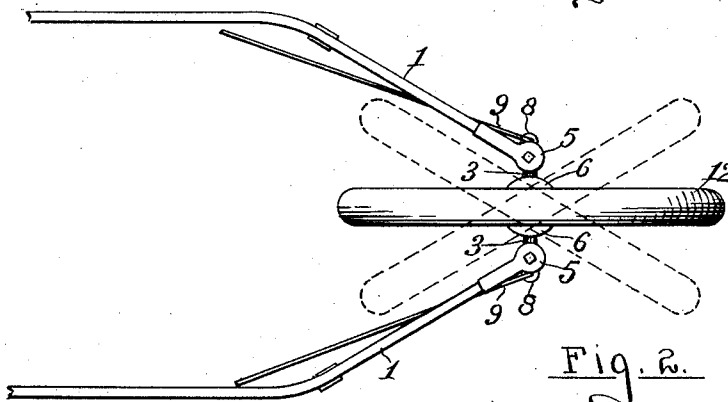


Fig. 2.

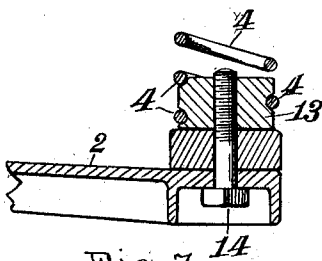


Fig. 7.

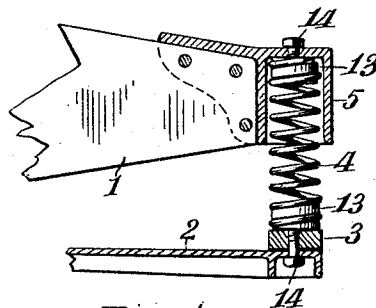


Fig. 6.

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2 SHEETS—SHEET 2.

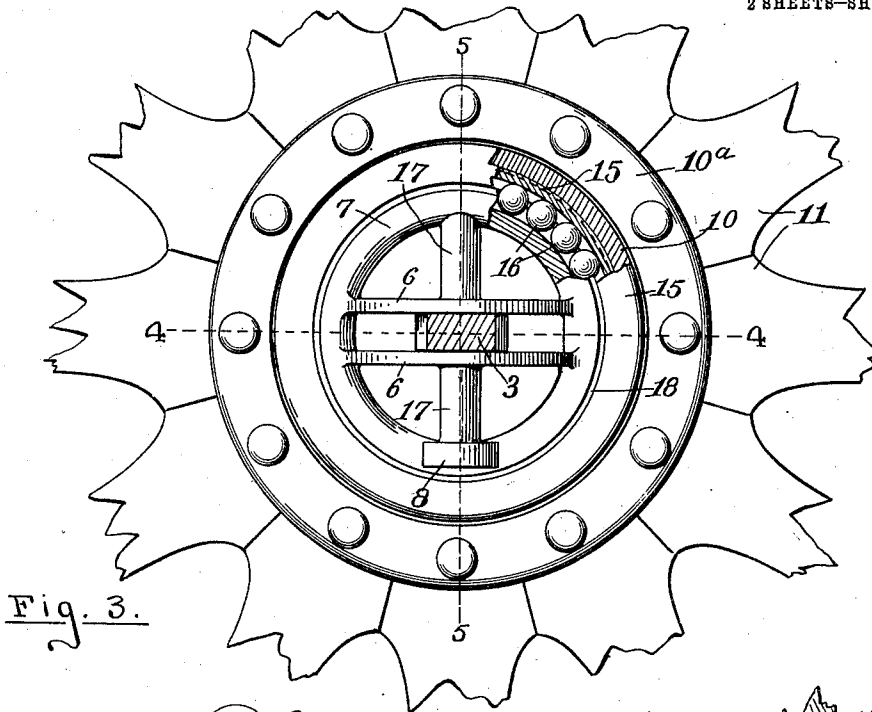


Fig. 3.

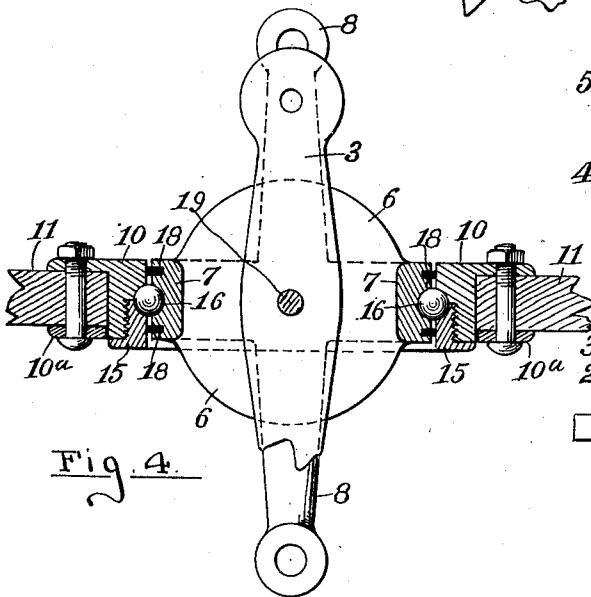


Fig. 4.

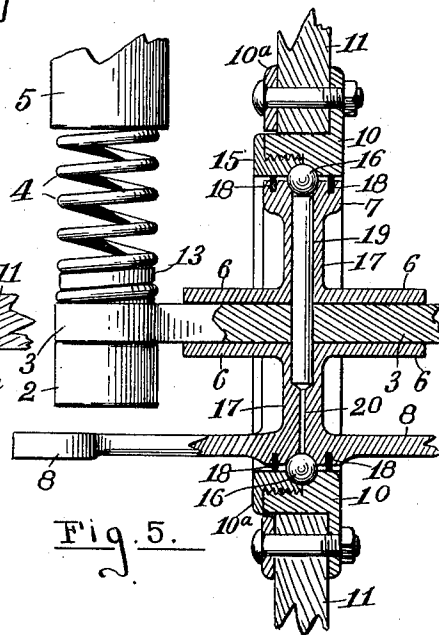


Fig. 5.

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UNITED STATES PATENT OFFICE.

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TRICYCLE.

1,006,518.

Specification of Letters Patent.

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Application filed February 20, 1911. Serial No. 609,638.

To all whom it may concern:

Be it known that I, WARREN W. ANNABLE, a citizen of the United States of America, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Tricycles; 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.

My invention relates to improvements in tricycles and more particularly to the steering wheel of the same and the parts connected therewith, and its object is to provide the same with improved means for journaling the wheel, improved spring supports for the same, improved steering mechanism, and to provide the device with various new and useful features hereinafter more fully described and particularly pointed out in the claims, reference being had to the accompanying drawings in which:—

Figure 1 is a side elevation of a device embodying my invention; Fig. 2 a plan view of the same; Fig. 3 an enlarged detail of the hub of the front wheel and parts connected therewith shown in elevation with a portion broken away; Fig. 4 a horizontal section on the line 4—4 of Fig. 3; Fig. 5 a vertical section on the line 5—5 of Fig. 3; Fig. 6 an enlarged detail of one of the springs and parts connected thereto; and Fig. 7 a sectional detail of the lower part of Fig. 6 further enlarged.

Like numbers refer to like parts in all of the figures.

1 represents a portion of the frame or sills of a tricycle the forward ends of the same being bent inward toward each other and spaced apart to embrace the steering wheel of a tricycle and are reduced in width and terminate in sockets 5 formed of a suitable casting and secured to the front end of the same.

2 represents a radius rod pivoted at the rear end to the side rail 1 and extending beneath the same to a point directly below the socket 5. Attached to the front ends of the radius rods and connecting the same, is a cross bar 3 having flat parallel upper and lower sides on which bar is mounted the front wheel. On each end of this cross bar and above the front end of the radius rod is

a coiled spring 4 extending upward within the socket 5. The ends of this spring are secured in place by plugs 13 inserted therein each having a spiral recess to receive the end of the spring and securely attach the same to the plug. A bolt 14 extends through the upper part of the socket 5 into the upper plug 13, and another bolt 14 extends through the radius rod 2, the end of the cross bar 3 and into the lower plug 13 to secure these various parts in place.

Surrounding the middle of the cross bar 3 is an inner ring 7 having its periphery provided with a ball race. Extending horizontally across this ring and engaging the flat upper and lower sides of the cross bar 3 are horizontally disposed disks 6 integral with the ring 7, and extending from the respective disks to the ring, are tubular members 17 to receive a pivot pin 19 on which the disks and ring are pivoted to turn about a vertical axis. Oppositely projecting from the lower part of this inner ring are rigid arms 8 to which are connected rods 9 by which the ring is adjusted about the said axis to guide the vehicle by turning the front wheel to the right or left as occasion requires, said rods 9 being operated by any convenient means, not shown.

The front wheel has the usual outer rim 12 provided with the usual pneumatic tire and radial spokes 11, the inner ends of which spokes are secured by suitable bolts between a flange fixed on an outer ring 10 surrounding the ring 7 and a separate flange 10^a. In the ring 10 is the outer ball race and a removable ring 15 to admit of inserting the balls therein. Between the ring 7 and the rotative ring 10 are inserted a series of balls 16 which provide a ball bearing between the rings 7 and 10. Between these rings and at each side of the balls is inserted a packing 18 to protect the balls from dust and to retain a lubricant therefor.

In operation, the springs 4 will yield to shocks due to unevenness of the road, the ball bearings will permit the wheel to rotate freely about the inner ring and at the same time hold the same in the same plane against any lateral strains. The disks 6 embrace the flat sides of cross bar 3 and thus serve to take the lateral strains upon the inner ring and dust and grit are effectually kept out of the ball races by the packings 18 and lubri-

cation retained therein, the whole forming a very compact, durable, and satisfactory device.

What I claim is:—

5 1. A tricycle comprising side rails, a cross bar, springs supported on the respective ends of the bar and supporting the side rails, radius rods each connected to the cross bar at the front end and pivoted to a side rail at the rear end, and a wheel rotative about the cross bar and supporting the same.

2. A tricycle comprising two side rails, a socket on the front end of each side rail, spiral springs inserted in said sockets, a cross bar connecting the lower ends of the springs and supporting the same, radius rods attached to the end of the bar at one end and pivoted to the respective rail at the other end, a ring surrounding the cross bar and pivoted to turn on a vertical axis, a wheel surrounding the ring and rotative thereon and means for adjusting the ring about said axis.

3. A tricycle comprising two side rails, sockets on the ends of the rails, coiled springs inserted in the sockets and extending downward, a cross bar supporting said springs, radius rods connecting the respective ends of the bar and the respective rails, spirally grooved plugs in the ends of the springs and screws inserted in the plugs to secure the same in place.

4. In a tricycle, a front cross bar having flat parallel upper and lower sides, an inner ring surrounding the bar and having a ball race in its periphery, disks extending horizontally across the interior of the ring and embracing the bar, a pivot pin extending

through the axis of the disks and through the bar, means for adjusting the ring and disks about the axis of the pin, an outer ring surrounding the inner ring, balls between the rings, spokes attached to the outer ring and a rim on the outer ends of the spokes concentric with the rings.

5. In a tricycle, a front cross bar having flat parallel upper and lower sides, a ring surrounding said bar, two parallel disks extending horizontally across the interior of the ring and embracing the bar, a radial tubular member extending from each disk to the ring, a pivot pin in said members and extending through the bar, a wheel rotative on the ring, and ball bearings between the ring and wheel.

6. In a tricycle, a front cross bar having flat parallel upper and lower sides, an inner ring surrounding the bar, disks extending across the interior of the ring and embracing the bar, a radial tubular member extending from each disk to the ring, a pivot pin in said member, an outer ring having one fixed and one separate flange, a removable ring in said outer ring, ball bearings between the rings, packing at each side of the bearings and between the rings, and a wheel concentric with the rings having its spokes secured at the inner ends between the flanges of the outer ring.

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

WARREN W. ANNABLE.

Witnesses:

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LUTHER V. MOULTON.