No. 642,704. Patented Feb. 6, 1900.

J. J. A. MILLER.

ROLLER BEARING CAR WHEEL.

(Application filed July 26, 1899.)

(No Model.)

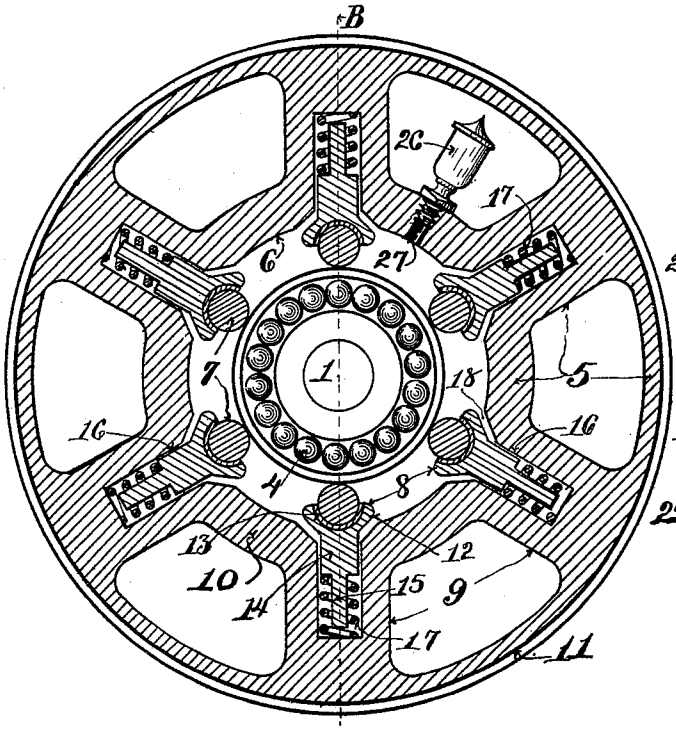

Fig 1.

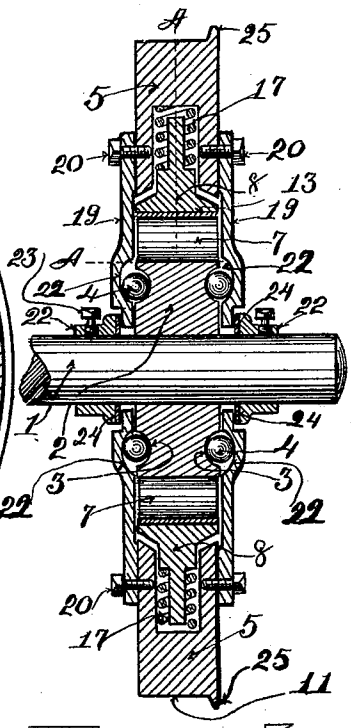

Fig 2.

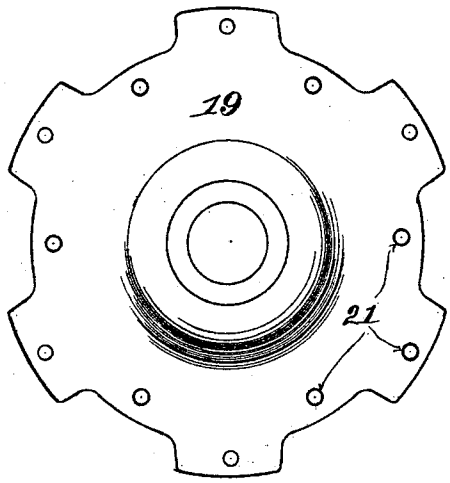

Fig 3.

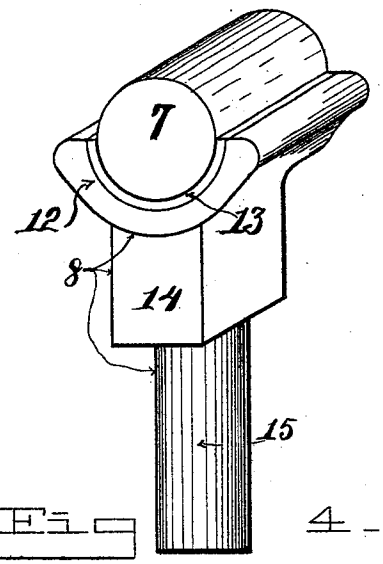

Fig 4.

Witnesses

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UNITED STATES PATENT OFFICE.

JOHN JACOB ADOLF MILLER, OF DENVER, COLORADO.

ROLLER-BEARING CAR-WHEEL.

SPECIFICATION forming part of Letters Patent No. 642,704, dated February 6, 1900.

Application filed July 26, 1899. Serial No. 725,156. (No model.)

To all whom it may concern:

Be it known that I, JOHN JACOB ADOLF MILLER, a citizen of the United States of America, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Roller-Bearing Car-Wheels; and I do 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, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in car-wheels; and the objects of my invention are, first, to provide an automatically-adjustable roller car-wheel, and, second, to provide an automatically-adjustable roller-bearing car-wheel having side bearings to take the lateral thrust of the wheel. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation, partially in section, showing the disk upon which the rim rolls in side elevation, with the outside plate removed, thus exposing the circle of balls that forms the side bearing of one side of the wheel, and showing the rim part in section on line A of Fig. 2 through the rollers to the top of the disk. Fig. 2 is a section of Fig. 1 on line B, but showing the rollers and balls and axle in elevation. Fig. 3 is a side elevation of the side plate, and Fig. 4 is a perspective view of one of the roller-bearing blocks.

Similar numerals of reference refer to similar parts throughout the several views.

Referring to the drawings, the numeral 1 designates a car-axle, and 2 designates a disk mounted, preferably, tight on said axle. This disk 2 is provided at its sides with circular grooves 3, which form a ball-raceway, which in turn forms a seat for a circle of balls 4. The rim 5 encircles concentrically the disk; but its internal periphery 6 is enough larger in diameter to allow a plurality of rollers 7 to be placed between it and the disk. The rollers are supported by bearing-blocks 8, which extend radially into the rim, preferably into spokes 9, which radiate from a ring portion 10, that forms the inner periphery of the rim, to the tread portion 11. These roller-bearing blocks comprise a semicircular portion 12, lined with babbitt or other suitable non-frictional material 13, in which the rollers 7 rest, a square or other polygonal-shaped portion 14, which depends from the semicircular portion, and a stem portion 15, preferably round, which extends from the square portion. The square portion fits slidably into square holes 16, which are formed radially in the spokes. These square holes hold the bearing-blocks and rollers axially in line with the axis of the disk and shaft, thus preventing the rollers from turning on the disk. The hole below the square portion may be square or round. In the holes around the stems I place expansion-springs 17, which bear between the bottoms of the holes and the shoulders of the bearing-block formed by the junction of the square and stem portions, the arrangement being similar to that shown in my Patent No. 629,011, dated July 18, 1899, except that they are arranged in the rim portion of the wheel instead of in the disk. The springs press the bearing-blocks against the rollers and the rollers against the periphery of the disk. The bearing-blocks are arranged with a little clearance space 18 under the head and a space below the stem to allow them backward movement in the holes. Consequently the rollers are held against the disk by the resilient tension of the springs.

I illustrate six rollers around the disk; but more or less can be used, if desired. To the opposite sides of the rim I secure a plate 19, preferably by bolts 20, which pass through holes 21. These plates extend close to the axle, a clearance-space being left around the axle to allow the plates and rim radial movement to and from the axis of the axle on the surface of the disk, which would result from the give in the springs under a heavy jar and load on the wheel. A raceway 22 for the ball-bearings is formed in the plates opposite to the raceway in the disk. The raceway in the plates is, however, made longer, so as to allow of the radial movement mentioned above. On the axle on each side of the wheel I place a collar 23. These collars are secured to the axle by set-screw 24, and they are placed against the central portion of the plates and act as abutments against its springing out under side pressure on the rim. Between the

collars and the plates a dust-washer 24 is placed. The tread portion contains a flange 25 at one side. While the rim portion could be formed solid or as a flange member between its tread and ring portions, I preferably form it into spokes in order to lighten it.

26 designates an oil-cup screwed into a hole 27, drilled in the ring portion of the rim between the spokes. Oil from it drops onto the tread of the disk and is spread out by the rollers and runs over the edges of the disk down onto the ball-bearings, thus lubricating all the bearings.

In practice the rim portion and rollers roll around the disk portion and axle, which are preferably held stationary; but the axle may be journaled in suitable boxes, if desired, in which case the disk would also rotate more or less from the momentum of the rim and friction of the rollers. The ball-bearings on the sides receive the side or lateral thrust of the rim, especially when rounding curves.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an automatically-adjustable roller-bearing car-wheel, the combination with the axle, of a disk mounted thereon, a ball-bearing at each side of said disk, a tread-rim surrounding said disk, a plurality of rollers arranged to run around the periphery of said disk and between it and said rim bearing-blocks adapted to form journals for said rollers, extending radially into said rim, a spring arranged between said bearing-blocks and rim adapted to hold said rollers resiliently against said disk, and a plate secured to each side of said rim and arranged and adapted to form a part of the ball-bearing at each side of said disk, substantially as described.

2. In an automatically-adjustable roller-bearing car-wheel, the combination with the axle, of a disk secured thereto, a rim surrounding said disk, a plurality of holes radiating into said rim, bearing-blocks fitting slidably into said holes and arranged to stand axially with said axle, rollers journaled in said bearing-blocks, an expansive spring in each of said holes arranged to exert a continuous pressure against said bearing-blocks and to hold said rollers resiliently against the periphery of said disk, and a plate secured to each side of said tread-rim and over the sides of said disk, substantially as described.

3. In an automatically-adjustable roller car-wheel the combination with the axle, of the disk and axle, with the tread-rim, the roller bearing on the periphery of said disk, the ball-bearings at the side of said disk, the side plates and the abutment-collars and dust-washers on said axle bearing against said side plates, substantially as described.

4. In an automatically-adjustable roller-bearing car-wheel, the combination with the axle and the disk, of the tread-rim concentrically surrounding said disk, the rollers journaled in said tread-rim and arranged and adapted to resiliently bear on and roll around the periphery of said disk, and a plate secured to each side of said tread-rim and extending over the side of said disk adapted to hold said disk and tread-rim in alinement and against independent lateral movement, substantially as described.

5. In an automatically-adjustable roller-bearing car-wheel, the combination with the axle and the disk, of the tread-rim concentrically surrounding said disk, the rollers journaled in said tread-rim and arranged and adapted to resiliently bear on and roll around the periphery of said disk, and a plate secured to each side of said tread-rim and extending over the side of said disk adapted to hold said disk and tread-rim in alinement and against independent lateral movement and a ball-bearing on each side of said disk formed partially between said disk and said plates, substantially as described.

6. In an automatically-adjustable roller-bearing car-wheel, the combination with the axle and the disk, of the tread-rim concentrically surrounding said disk, the rollers journaled in said tread-rim and arranged and adapted to resiliently bear on and roll around the periphery of said disk, and a plate secured to each side of said tread-rim and extending over the side of said disk adapted to hold said disk and tread-rim in alinement and against independent lateral movement, with a ball-bearing formed on each side of said disk, formed partially in said disk and partially in said plates, and a collar on each side of said disk secured to said axle and arranged to bear against said plates, substantially as described.

7. In an automatically-adjustable roller-bearing car-wheel, the combination with the axle and the disk, of the tread-rim concentrically surrounding said disk, the rollers journaled in said tread-rim and arranged and adapted to resiliently bear on and roll around the periphery of said disk, and a plate secured to each side of said tread-rim and extending over the side of said disk adapted to hold said disk and tread-rim in alinement and against independent lateral movement, with a ball-bearing formed on each side of said disk, formed partially in said disk and partially in said plates, a collar on each side of said disk secured to said axle and arranged to bear against said plates, and a dust-washer between said collars and said plates, substantially as described.

8. In a roller-bearing car-wheel, the combination with the axle, of a disk secured thereto, a tread-rim containing spokes mounted on rollers arranged to bear resiliently on the periphery of said disk, a circular row of balls on each side of said disk, a raceway for said balls to run in, plates secured to each side of said tread-rim and covering said disk, a raceway in each plate adapted to fit over said balls, a collar on said axle on the outside of each plate, and a friction-washer

or dust-guard between said collars and said plates, and means including an oil-cup secured to said tread-rim for oiling said roller and ball bearings, substantially as described.

9. In a roller-bearing car-wheel, the combination of the axle and the disk with the tread-rim, the rollers between said disk and tread-rim, the side plates, the ball-bearings between said disk and side plates and the abutment-collars on said axle, substantially as described.

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

JOHN JACOB ADOLF MILLER.

Witnesses:
MELVIN O. BEMUS,
MARGARET SINCLAIR.