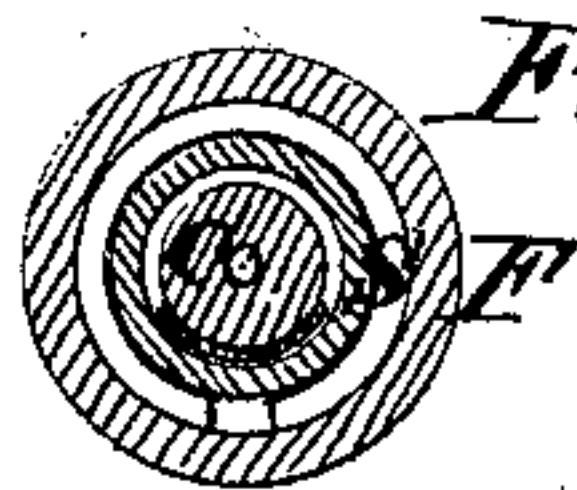
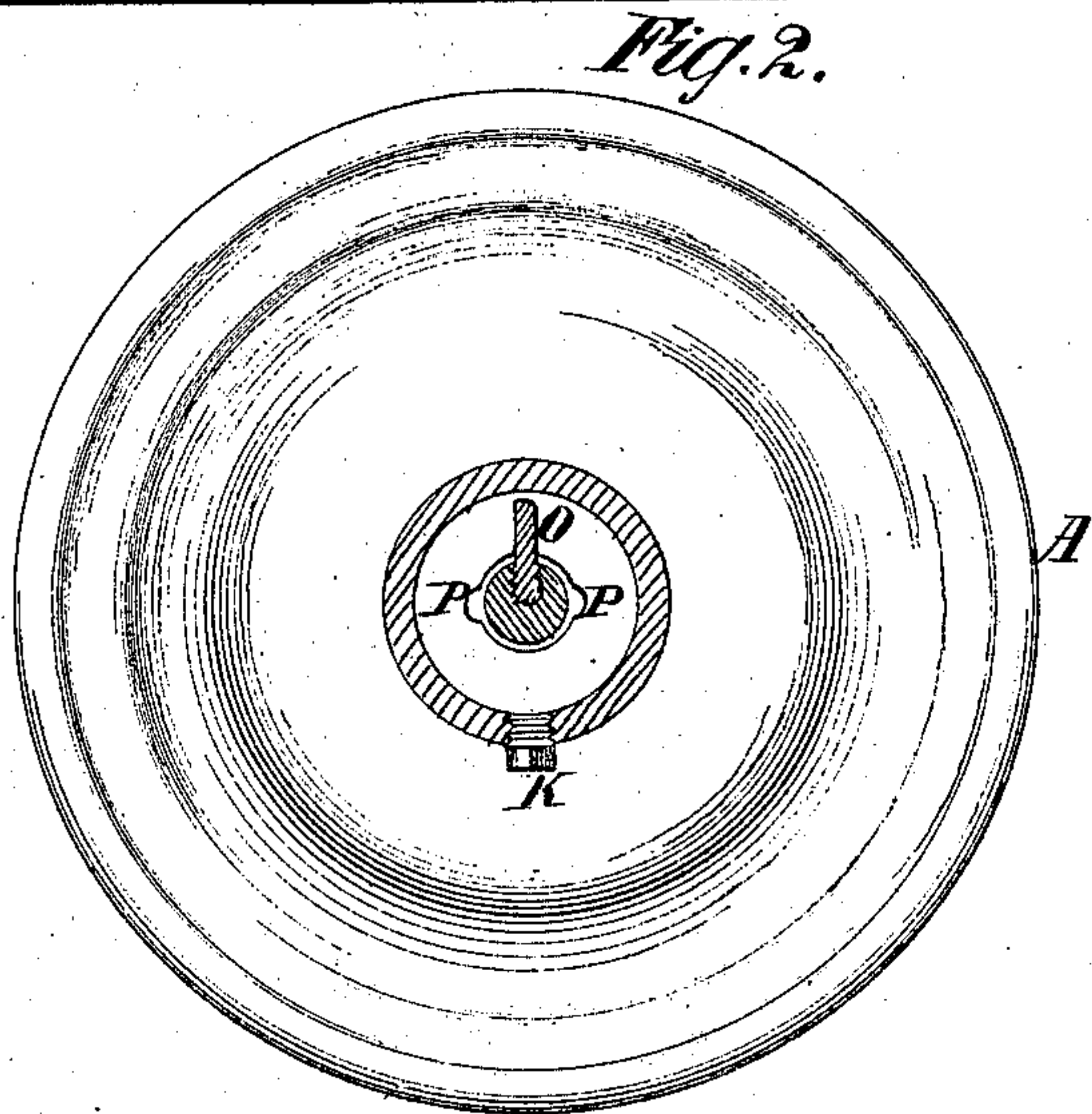
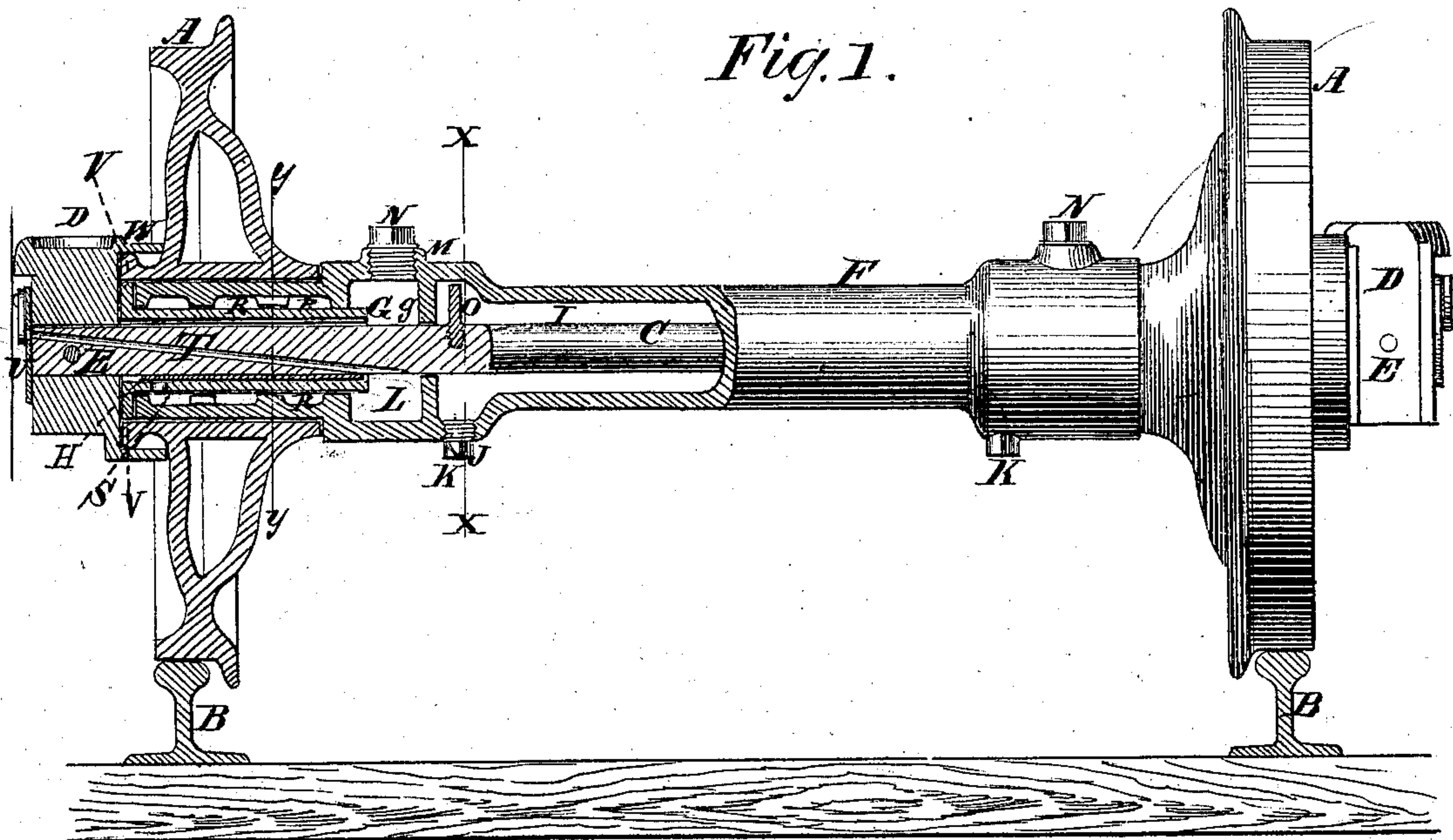


G. W. MILTIMORE.

Car-Axles.

No. 133,790.

Patented Dec. 10, 1872.



Witnesses:

John Becker.
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UNITED STATES PATENT OFFICE.

GEORGE W. MILTIMORE, OF JANESVILLE, WISCONSIN.

IMPROVEMENT IN CAR-AXLES.

Specification forming part of Letters Patent No. 133,790, dated December 10, 1872.

To all whom it may concern:

Be it known that I, GEORGE W. MILTIMORE, of Janesville, in the county of Rock and State of Wisconsin, have invented a new and useful Improvement in Railway-Car Axles, of which the following is a specification:

My invention has for its object, principally, to furnish a railway-car axle so constructed as to have less friction of the bearing-surfaces, to secure greater freedom from torsion occasioned by curves or irregularities of the track, and liable to less injury from the concussion and wear and tear than is incurred under the usual system, while it is likewise adapted to prevent access of dust, &c., to the bearings, and to have its several parts readily taken apart for any purpose. To this end it consists, first, in so combining a revolving sleeve with a solid and stationary axle, and forming annular and other oil-reservoir spaces and passages between them, as to maintain a circulation of oil when the car is in motion, whereby it is delivered in a cool, constant stream on the bearings; second, to the arrangement of oil and waste reservoirs in such relation to each other and the bearings that the oil is fed from the former to the latter in a small stream, and thence to the bearings by supplementary passages; third, to so arranging the waste-chamber that when the supply of oil in the reservoir proper is exhausted the bearings will continue to be lubricated as long as any oil remains in the waste-chamber, thus adapting the axle to make a good "run" without the aforementioned supply or circulation of the lubricant; fourth, to providing the oil-reservoir with two supply passages or apertures, one being formed in the sleeve, and designed to be utilized when the reservoir requires refilling at long intervals, or at the termination of a long run, while the other is formed in the ends of the solid axle, and communicates directly with the waste-chambers, so as to be utilized as conditions may require; fifth, to the construction of the bearing-blocks with reference to excluding dust from the friction-surfaces; sixth, to employment of a hardened bearing-plate and journal-boxes for taking the wear, the latter being removable so as to admit of renewal when necessary; seventh, to other features and details of construction, which will be hereinafter fully described.

In the accompanying drawing, Figure 1 represents, partly in vertical section, the axle as when ready for use, showing the car-wheels and rails of the track. Fig. 2 is a vertical cross-section looking to the left from the line *x x*. Fig. 3 is a cross-section taken on the line *y y*. Fig. 4 is a view of the journal-box detached. Fig. 5 represents a portion of the fixed axle with the journal or bearing plate attached.

Similar letters of reference indicate corresponding parts.

A A represent the wheels, and B B the rails of the track. C is the fixed axle, attached permanently to the car-truck by the bearers D D on its ends, which are in turn secured to the axle by steel pins E E. The springs or pedestals of the car rest on these bearers. This axle is a simple round bar of wrought-iron, not necessarily turned. Around the stationary axle C is a revolving sleeve or axle, F. G G are the journal-boxes, which are slipped on the ends of the axle C. The car-wheels are loosely mounted on the ends of the sleeve or axle F, and the wheels and the sleeve all revolve together around the stationary axle, except when one wheel is compelled to travel further than its mate in going round a curve, or when there is a difference in the diameter of the two wheels, (for car-wheels never wear exactly alike,) when one or both wheels turn on the sleeve to the same extent that one or both would be compelled to slip on the track had both wheels been solid on the axle, according to the usual mode. The weight of the car is supported by the stationary axle C, while the revolving sleeve or axle F and bearers D D support the wheels in a perpendicular position, and hold them to the rails or gage of the track. As the sleeve F revolves around the stationary axle, the bearing and wearing surface is between the sleeve and said axle. To provide for this wear, the steel journal-plates H are fastened to the under side of the axle, and the boxes G G are inserted in the ends of the sleeve. I is the reservoir for lubricating material. Oil is introduced into the reservoir through the aperture J, which is closed by a screw-plug, K. L is a waste-chamber, the waste being introduced through the aperture M, which is closed by the screw-plug N. O is an oil-feeder screwed into the axle.

Oil being introduced into the reservoir I, will be thrown by centrifugal force from the center, and will form a stratum on the wall of the chamber or reservoir by which it is confined, and will have a tendency to fly laterally in each direction toward the journals. The feeders O break the currents, and the waste in the chamber L absorbs sufficient oil for lubrication, as oil will pass from the feeders to the waste-chamber through the small apertures P P formed in the radial flange *g* of the sleeve F; thence it will be forced into the boxes G at the inner end, pass through the boxes to the outer end, when most of the oil will return to the oil or waste chamber through the opening S in boxes G, and the passages formed by the communicating grooves R. A very small amount is carried through and out of the box by the lateral motion of the solid axle through the sleeve, which lubricates the surface between the face of the bearers D and flange of the boxes G. The bearing between the wheel and sleeve is sufficiently lubricated by a portion of the oil after it has passed through and oiled the surfaces between the flange of the box G and the face of the bearing D. The oil will fall by its own gravity to the lower side of the axle, and lubricate the bearing-point or journal-plate H. A constant circulation is thus kept up and maintained by the centrifugal force and the gravity of the oil. Whenever the speed is insufficient—say less than ten miles per hour—to cause the oil to form a uniform stratum around the inner surface of the sleeve by reason of its revolution, the capillary attraction of the waste in the chamber L will supply the journal with sufficient oil. There will always be a slight revolving motion of one or both wheels on the sleeve. This motion will be equal to what the slip would be were the wheels rigid on the axle. Taken as a whole, this motion on the sleeve is trifling, and the wear occasioned is scarcely appreciable; but when the wheels are rigidly connected with the axle that much slip, and consequent twisting, of the axle is ruinous in the extreme.

T is an oil-passage in the stationary axle, by means of which oil may be introduced by the oiler at any time and discharged in direct contact with the waste in the chamber L. This passage is closed by the slide U over the end of the axle. V is a bead on the hub of the wheel, which is covered by the flanges W of the bearers. There is always a little waste of oil at the ends of the boxes G G. Usually there is no way to confine or prevent this waste oil from smearing the face

of the wheels. By this arrangement the waste oil is confined, and the wheels may be kept neat and tidy.

I do not confine myself to the precise form or arrangement of the parts described, as variations may be made in it without departing from my invention.

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

1. In combination with a hollow axle constructed as described, a solid axle provided with a diagonal oil-supply passage leading from its end into an oil-chamber, substantially as and for the purpose specified.

2. In combination with the axles C and E, a projecting arm or finger, O, operating to feed the oil to the bearing or friction surfaces, as specified.

3. The oil-chamber I and waste-chamber L, formed in the annular space between the solid axle and sleeve by a radial flange of the latter, and communicating by means of the apertures P therein, as set forth and shown.

4. In combination with the elements of the third claim, the openings M and J closed by plugs N and K, respectively, as and for the purpose specified.

5. The journal-plate H, in combination with the axle C and journal-box G, as and for the purpose described.

6. The journal-box G, in combination with the sleeve provided with the grooves R, whereby the latter are converted into passages adapted to conducting the lubricant, as set forth.

7. The combination of the bearers D, provided with the flanges W, with the bead V of the wheel-hub, all as and for the purpose set forth.

8. The combination of the bearers D, having flanges W, with the axle C, the wheel provided with a beaded hub, the journal-boxes G, and hollow axle or sleeve F, as set forth.

9. In a compound railway-car axle, the combination of an oil-supply chamber, a groove or passage between the hollow axle, and a journal-box having side aperture, whereby the oil maintains a constant circulation to and from the supply-chamber over and between the friction or bearing surfaces, as set forth.

10. A waste-chamber arranged between the oil-chamber and the journal-bearings, as and for the purpose specified.

GEORGE W. MILTIMORE.

Witnesses:

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