I. D. SPROULL & L. R. FAUGHT.

Car-Axle.

No. 220,441. Patented Oct. 7, 1879

FIG. 3.

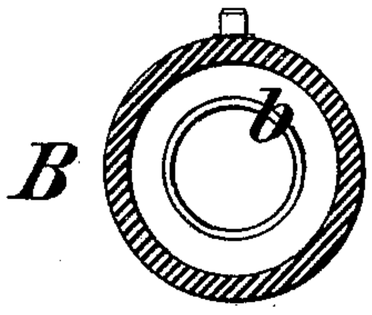


FIG. 4.

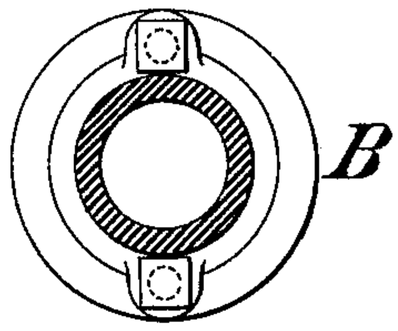


FIG. I.

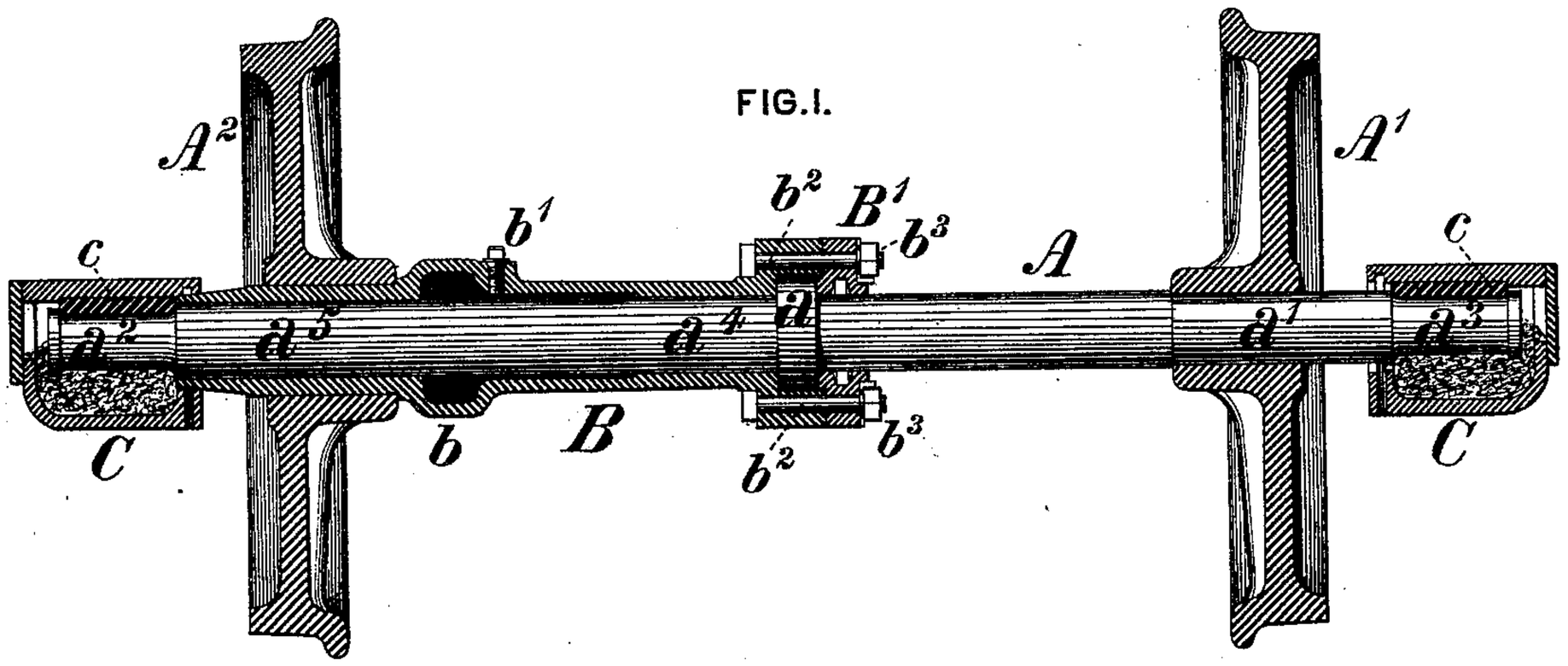


FIG. 2.

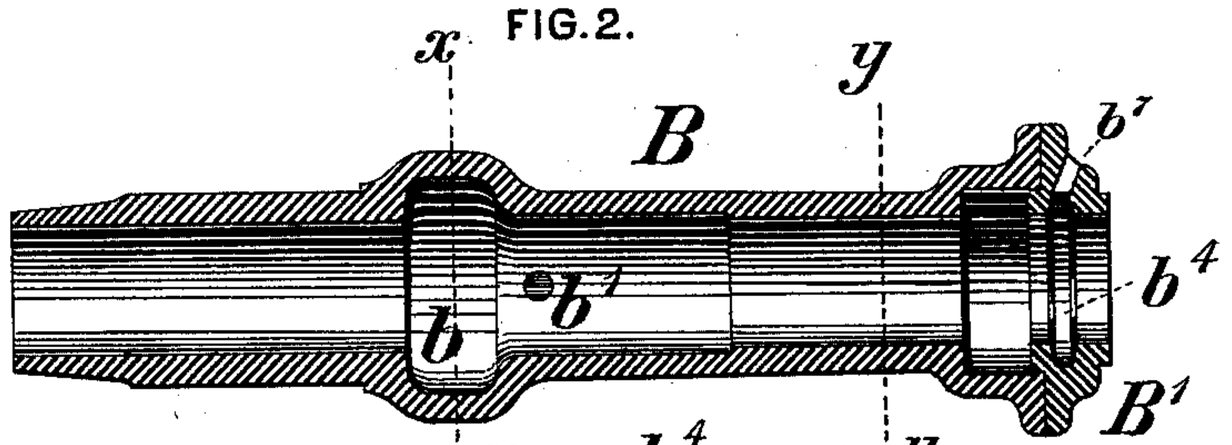


FIG. 5.

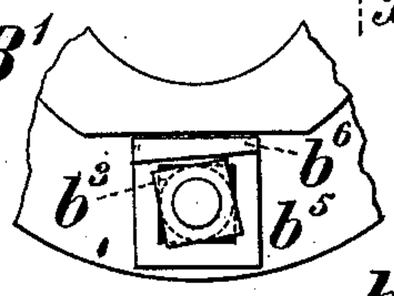
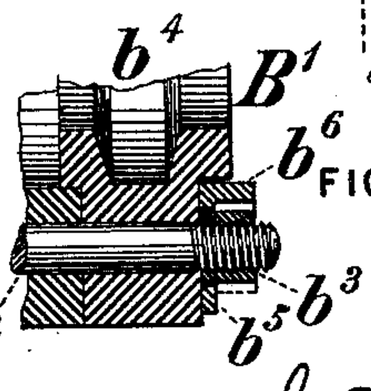


FIG. 6.



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UNITED STATES PATENT OFFICE.

ISAAC D. SPROULL, OF NEW YORK, N. Y., AND LUTHER R. FAUGHT, OF PHILADELPHIA, PA., SAID FAUGHT ASSIGNOR TO THE HARRISON PATENT CAR AXLE COMPANY.

IMPROVEMENT IN CAR-AXLES.

Specification forming part of Letters Patent No. **220,441**, dated October 7, 1879; application filed January 21, 1879.

To all whom it may concern:

Be it known that we, ISAAC D. SPROULL, of the city, county, and State of New York, and LUTHER R. FAUGHT, of the city and county of Philadelphia, in the State of Pennsylvania, have jointly invented certain new and useful Improvements in Railroad-Car Axles, of which improvements the following is a specification.

Our invention, which relates to that class of railroad-axles in which independent rotation of the wheels is permitted for the purpose of compensating for their unequal traverse in passing around curves, is an improvement upon that for which Letters Patent of the United States No. 160,095, for improvement in railway-car axles, were granted and issued to Samuel L. Harrison and Deborah I. Paxson and Joseph S. Paxson, assignees of one-half the right of said Harrison, under date of February 23, 1875; and its object is to reduce, as far as practicable, the cost of construction and application of the improvement of said Harrison to rolling-stock of the ordinary pattern, while insuring a firm connection of the undivided axle which carries one of the wheels with the encircling sleeve or tube to which the other wheel is secured, and providing improved facilities for lubricating the bearings of said sleeve upon the axle.

To these ends our improvements consist in the combination, with an undivided axle having a wheel secured upon a seat adjacent to one of its ends, a collar at or near its center, and bearings or journals between said collar and its opposite end, of a sleeve or tube encircling said axle between its collar and the journal farthest from the fixed wheel, said sleeve having a tapered end, which projects into the box of said journal, a wheel secured upon it adjacent to said tapered end, and a cap by which it is held in position longitudinally upon the axle, said cap having a recess for the reception of packing, and being provided with means for preventing its detachment from the sleeve when in use, all as hereinafter more fully set forth.

In the accompanying drawings, Figure 1 is a longitudinal central section through the sleeve, wheels, and boxes of our improvements, with the axle in elevation; Fig. 2, a longitudinal central section, on an enlarged scale, through the sleeve; Figs. 3 and 4, transverse sections, on a similar scale, through the same, at the lines *x x* and *y y* of Fig. 2, respectively; Fig. 5, a view, in elevation, of a portion of the cap, on a further enlarged scale, showing the device for locking the same to the sleeve; and Fig. 6, a longitudinal section through the same at the center of the bolt.

The axle A, which is undivided, is of the ordinary form and dimensions, saving that it has a collar, *a*, forged or shrunk upon it at or near its center, and between said collar and one of its end journals, a^2, is of substantially uniform diameter, instead of being reduced to form a wheel-seat, as is done at its opposite end. The portions of the axle adjacent, respectively, to the collar *a* and journal a^2 form center and end bearings, a^4 a^5, for a cast-metal sleeve or tube, B, one end of which bears against the collar *a* and is recessed, so as to completely surround the same, and the other end, which is of tapered or conical form, projects into the journal-box C. A suitable washer may be placed around the sleeve where it enters the box, to exclude dust and grit. A wheel, A^1, is pressed upon a wheel-seat, a^1, on the axle A, adjacent to one of its journals, a^3, and a wheel, A^2, similar in all particulars to the wheel A^1 except that its hub is of larger diameter, is pressed upon the sleeve B, adjacent to its outer end. An annular oil-reservoir, *b*, is formed upon the sleeve B, at such point between the wheel A^2 and the inner end of the sleeve as may be preferred, and the inner diameter of the sleeve B, from this reservoir to the end of the center bearing, a^4, is greater than the diameter of the axle, both to admit of free access of the oil to the inner bearing and to obviate the necessity of turning and boring the axle and sleeve to an exact fit between the center and end bearings. Oil is supplied to the reservoir *b* through an opening closed by a screw-plug, b^1. The sleeve B is maintained in its required longitudinal position by an annular cap, B′, abutting against

its inner end, and adjacent to the face of the collar *a* nearest to the wheel A[1], the sleeve being secured to said cap preferably by longitudinal bolts b^2, two or more, and nuts b^3. A recess, b^4, for the reception of packing is formed in the cap B′, and packing may be supplied thereto, without removing the cap from the axle, through an opening, b^7. In order to prevent the separation of the cap and sleeve by the nuts working loose when in use, a washer-plate, b^5, is provided for each of the bolts, said plate having a central opening, similar in form to and slightly greater in diameter than the nut, and an upturned flange, b^6, is formed on one side of the plate b^5, said flange resting, when the plate is in position upon the bolt, against a straight shoulder formed on the outer face of the cap B′. The nut b^3 is turned off cylindrically at bottom for a distance slightly greater than the thickness of the plate b^5 to a diameter equal to the distance across its flats, so that in one position the plate b^5 may be slipped over it and rest against the outer face of the cap B′, after which, by turning the nut slightly in the direction required to unscrew it, its angles will cover portions of the outer surface of the plate b^5, and one of them will bear against the flange b^6, thus preventing the displacement of the latter from the bolt, as the constant tendency of the nut is to change its relation to the plate only by unscrewing from the bolt, which action cannot take place by reason of the rotation of the plate being prevented by the bearing of its flange b^6 against the shoulder on the cap B′.

From the construction of our improvements it will be seen that the strength of the axle is unimpaired, and the cost of making it but very slightly increased over that of an axle of the usual form, and, further, the sleeve and axle are firmly connected together. No change is necessary in the ordinary wheels, boxes, and pedestals, except to increase the diameter of the inner opening of one box, and to make the diameter of the hub of one wheel greater than that of the other by twice the thickness of the sleeve B′ at its wheel-seat.

The oil-chamber provides ample lubrication to both the center and end bearing of the sleeve upon the axle, and any oil that may escape therefrom is conducted through the projecting end of the sleeve into the box of the axle-journal, and thus lubricates the same instead of being wasted, as would otherwise be the case.

We claim as our invention and desire to secure by Letters Patent—

1. The combination, with an axle having a collar at or near its center, and a bearing or bearings between said collar and one of its end journals, of an encircling sleeve or tube, which bears at one end against the collar of the axle, and projects at the other a short distance into its journal-box, leaving the greater part of said box occupied by one of the axle-journals, substantially as set forth.

2. The combination, with an axle and its journal-box, of the loose encircling sleeve or tube projecting into said journal-box, and having an oil-chamber adjacent to and communicating with the bearing of the projecting end of said sleeve on the axle, substantially as set forth.

3. The combination of the axle having a collar at or near its center, the encircling-sleeve carrying one of the wheels, and the cap constructed in two parts, one of which is provided with a packing-recess and an opening leading thereinto, through which packing may be inserted without removing the cap from the axle, substantially as set forth.

4. The combination of the sleeve, the cap having straight shoulders on its outer face, the connecting-bolts, the nuts, and the flanged locking-plates, substantially as set forth.

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LUTHER R. FAUGHT.

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