(No Model.)

2 Sheets—Sheet 1.

A. M. WRIGHT.

CAR AXLE.

No. 387,197. Patented July 31, 1888.

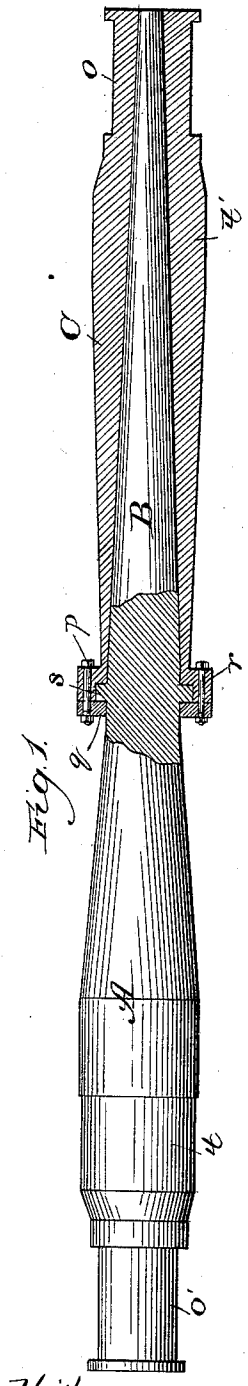


Fig. 1.

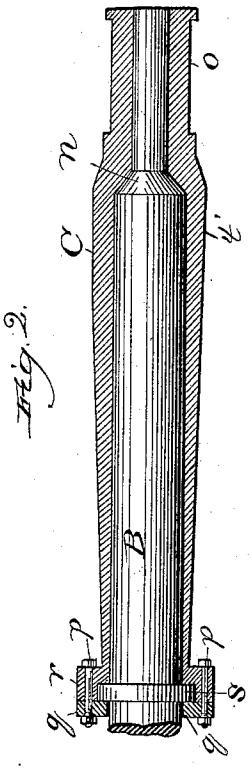


Fig. 2.

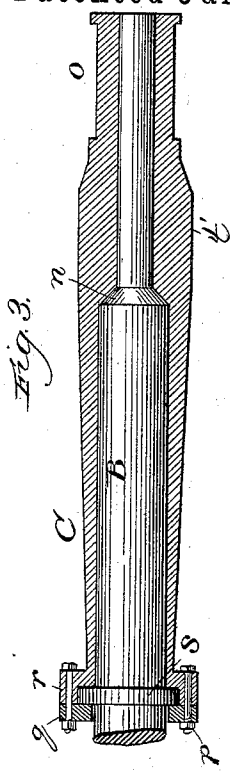


Fig. 3.

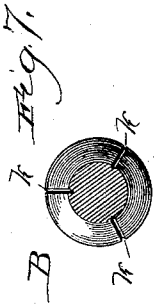


Fig. 7.

Fig. 1.

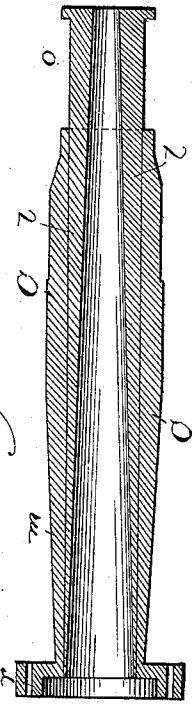


Fig. 4.

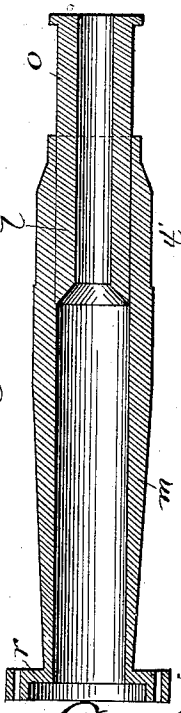


Fig. 5.

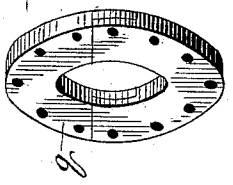


Fig. 6.

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By Dyrenforth & Dyrenforth
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(No Model.) 2 Sheets—Sheet 2.

A. M. WRIGHT.

CAR AXLE.

No. 387,197. Patented July 31, 1888.

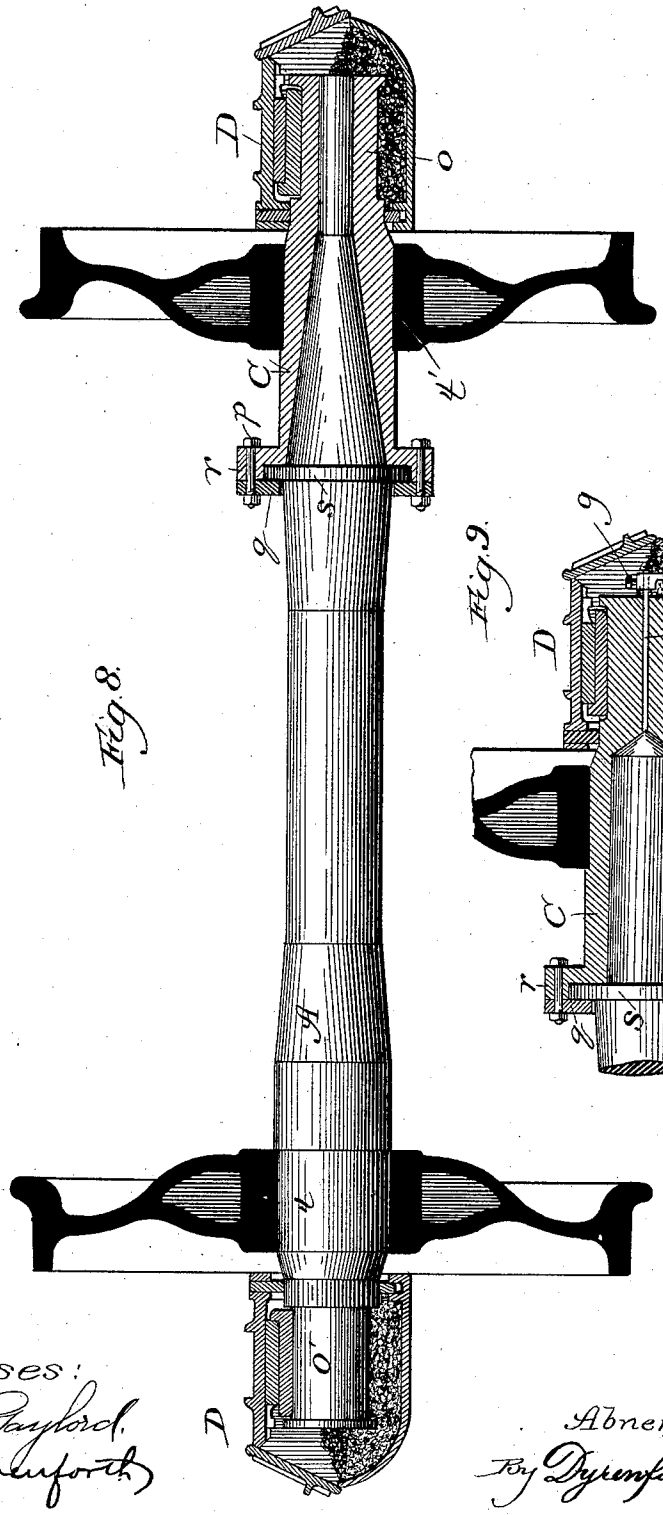


Fig. 8.

Fig. 9.

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UNITED STATES PATENT OFFICE.

ABNER M. WRIGHT, OF CHICAGO, ILLINOIS.

CAR-AXLE.

SPECIFICATION forming part of Letters Patent No. 387,197, dated July 31, 1888.

Application filed February 14, 1888. Serial No. 264,001. (No model.)

To all whom it may concern:

Be it known that I, ABNER M. WRIGHT, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Car-Axles, of which the following is a specification.

My invention relates to the construction of car-axles of the class adapted to afford to the wheels on opposite sides of the truck a rotary movement independent of each other, whereby in passing around curves the relative speed of revolution is automatically regulated to compensate for the difference in length of the parallel arcs traversed; and it is in the nature of an improvement upon certain features of the invention pertaining to railway rolling-gear for which Letters Patent of the United States No. 244,837 were granted to me on the 26th day of July, 1881.

In car-axles of the class above mentioned a principal difficulty encountered is in the matter of lubricating the parts carrying the loose wheel, and one of the objects of my present invention is to overcome this difficulty by providing a construction which will cause the parts named to be perfectly lubricated from the ordinary journal-box. Another object is to afford to the loose wheel a degree of strength and stability equal to that of the fixed wheel.

In the device represented in my former patent above referred to the loose wheel was mounted upon an elongated hub turning on the axle and abutting against the inner wall of the journal-box, and the lubricant worked its way from the journal-box into and through grooves formed in the inner surface of the hub. That construction will operate very well, but not perfectly. One difficulty is that a considerable quantity of the oil finds its way out between the end of the hub and the journal-box and does not enter the ducts. Another is that the great pressure of the box against the axle crushes the molecules of the oil in its passage to the hub and impairs the lubricating quality, and this difficulty will always exist where the loose wheel is carried by a hub turning upon the axle. It will also exist when the loose wheel is mounted on a supplementary axle having a journal entering the journal-box unless provision be made to admit fresh unused oil from the front of the journal-box into the interior of the supplementary axle, as hereinafter explained.

My present improvement comprises the following construction: A fixed and loose wheel are employed upon the same axle, the fixed wheel being rigid with the main axle and the loose wheel mounted upon a supplementary axle having its own journal in the journal-box extending beyond the bearing thereof. The supplementary axle is tubular and incloses the complement of the main axle, to which its inner end is firmly secured in such manner as to permit independent revolution, and the complement of the main axle preferably also enters the journal-box, the two being conterminous, or substantially so. The provision for admitting oil to the interior of the supplementary axle is at the outer end of the latter, whereby it is wholly beyond the bearing-surface of the journal.

In the drawings, Figure 1 is a view, partly in section, of a car-axle provided with my improvement. Figs. 2, 3, 4, 5, 8, and 9 are longitudinal sections of several modified forms in which my invention may be embodied; Fig. 6, a perspective view of a detail; and Fig. 7 a transverse section taken through that portion of the complement of the main axle having the smallest diameter in Figs. 2, 3, and 5.

The axle proper is of peculiar construction. The portion A (shown at the left of the center in Fig. 1) is of the usual form, and carries the so-called "fixed" wheel at the wheel-seat *t*. The portion B (shown to the right of the center in Fig. 1, as well as in the four following figures, and which, for convenience of reference, I designate the "complement" of the main axle) becomes only a part of the axle on that side, the part C, which I call the "supplementary" axle, serving to complete it. At the point on the axle A B to which the supplementary axle extends a flange, *s*, is formed, and the supplementary axle C has upon its inner end a flange, *r*, which fits against the side and over the top of the flange *s*. An annular metal plate, *q*, formed of two parts rabbeted together, as shown in Fig. 6, rests against the inner face of the flanges *s* and *r*, and is firmly secured to the latter by bolts *p*, clearing the

flange *s*. Thus the supplementary axle can turn freely upon the complement of the main axle, while at the same time it is firmly locked thereto. The external form of the supplementary axle corresponds with that of the part A of the main axle, whereby the combined weight of the parts B and C counterbalance the weight of the part A. The supplementary axle C carries the so-called "loose" wheel at the wheel-seat *t'*, corresponding with the wheel-seat *t* on the part A. The journal *o* at the terminus of the supplementary axle C enters the journal-box D in precisely the same manner as does the corresponding journal, *o'*, on the part A, and as car-axle journals do ordinarily. That the supplementary axle C shall have the journal *o* to enter the journal-box D and extend beyond the bearing thereof is an essential feature of my invention, and to insure the requisite strength and for the general purposes of the device I prefer in most cases to have the part B sufficiently long to extend into the journal *o*.

In Fig. 1 the supplementary axle C is represented as being formed in one piece and the part B as tapering uniformly from the center of the axle to the end. Figs. 2, 3, 4, 5, 8, and 9 show mechanical modifications of this construction, but all embodying the invention hereinbefore described. In Fig. 2 the part C is formed in one piece; but the part B, instead of tapering, as in Fig. 1, is of uniform diameter to the outer side of the wheel-seat *t'*, where an offset, *n*, is formed, and thenceforward to the end is of smaller uniform diameter, the internal configuration of the part C corresponding with this construction just as it corresponded with the tapering form in Fig. 1. In Fig. 3 the construction is similar to that shown in Fig. 2, except that the offset *n* is at the inner side, instead of at the outer side, of the wheel-seat. In Fig. 4 the supplementary axle C is formed in two parts, *m* and *l*, shrunk one upon the other, the part *m* being the exterior shell having the wheel-seat and flange *r* and the part *l* being the bearing prolonged entirely through the part *m*. In Fig. 5 the part C is composed of the two parts *m'* and *l'*, shrunk one upon the other, the part *l'* being analogous to the part *l* in Fig. 4, but extending into the interior of the part *m* only as far as the offset *n* in Fig. 3, instead of entirely through. In Fig. 8, which represents what I regard as the preferable construction, the supplementary axle C is shown shorter than in the other figures, and the mechanism for securing it to the part B is therefore not at the center of the axle, but at a point between the center and the wheel-seat. In this figure the complement B is shown as tapering from the flange *s* nearly to the journal-box and cylindrical from that point to the end. This form is somewhat easier to manufacture than those before described, and the comparative shortness of the supplementary axle tends to facilitate the lubrication.

If desired, the complementary part B may, as shown in Fig. 9, terminate a considerable distance short of the outer end of the supplementary axle C, and a slender stylus or spindle, *i*, tubular or solid, may extend the remainder of the distance through the supplementary axle and be fixed at its outer end within the journal-box—as, for instance, by entering a rigid support, *h*, in which it is held by a set-screw, *g*, so that the supplementary axle will revolve about it. For this construction the supplementary axle from its outer end to the point where the part B terminates is formed solid, and a hole is drilled through the solid part only slightly larger than the stylus or spindle. This construction, like the others described, serves by capillary attraction to convey the fresh unused oil from the front of the journal-box through the supplementary axle, lubricating in its progress those parts which are in frictional contact. Still other constructions as to matters of detail might be suggested.

It will be plain from the foregoing description that oil from the axle-box will tend to find its way between the parts B and C, and will find no escape before reaching the inner end of the supplementary part C, where it can pass out between the plate *q* and the axle. It is desirable to have the complementary part B provided with longitudinal grooves, as shown at *k* in Fig. 7, to facilitate the flow of oil, since it is designed to have the parts B and C fit together as closely as they may be made to do consistently with free independent revolution. Even without the grooves, however, the oil will find its way through the space intervening between these parts.

It will also be plain from the foregoing description that the advantage in point of lubrication is not the only one secured by means of my invention, but that it also permits fixed and loose wheels to be employed by means of a very simple construction, and causes an increase rather than a sacrifice of strength to the axle. Furthermore, since the suppplementary axle has its own bearing in the journal-box, the friction between the parts is greatly diminished and destruction of the molecules of oil thereby prevented.

What I claim as new, and desire to secure by Letters Patent, is—

1. A car-axle comprising, in combination, the main part A and complement B thereof, supplementary part C, incasing the part B and having a journal, *o*, to enter the journal-box and extend beyond the bearing thereof, and means at the inner end of the part C for securing the parts together, while permitting their independent revolution, substantially as described.

2. A car-axle for permitting independent revolution of the opposite wheels, comprising, in combination, the main part A and complement B thereof, provided with the flange *s*, supplementary part C, incasing the part B and having a journal, *o*, upon its outer end to enter the journal-box and extend beyond the bearing thereof, and the flange *r* upon its inner end,

annular plate *q*, and bolts securing the plate *q* to the flange *r*, substantially as described.

3. A car-axle comprising, in combination, the main part A and complement B thereof, supplementary part C, incasing the part B and having a journal, *o*, to enter the journal-box and extend beyond the bearing thereof, and open at its outer end to admit into its interior unused oil from the front portion of the journal-box, and means for securing the parts together, while permitting their independent revolution, substantially as described.

4. A car-axle comprising, in combination, the main part A, complement B thereof, tapering for a portion of its length and cylindrical thenceforward to its outer end, supplementary part C, incasing the part B and having a journal, *o*, to enter the journal-box and extend beyond the bearing thereof, and means at the inner end of the part C for securing the parts together, while permitting their independent revolution, substantially as described.

ABNER M. WRIGHT.

In presence of—
J. W. DYRENFORTH,
CHAS. E. GAYLORD.