(No Model.)

C. E. CANDEE.

WHEEL AND AXLE.

No. 366,454. Patented July 12, 1887.

Fig. 1.

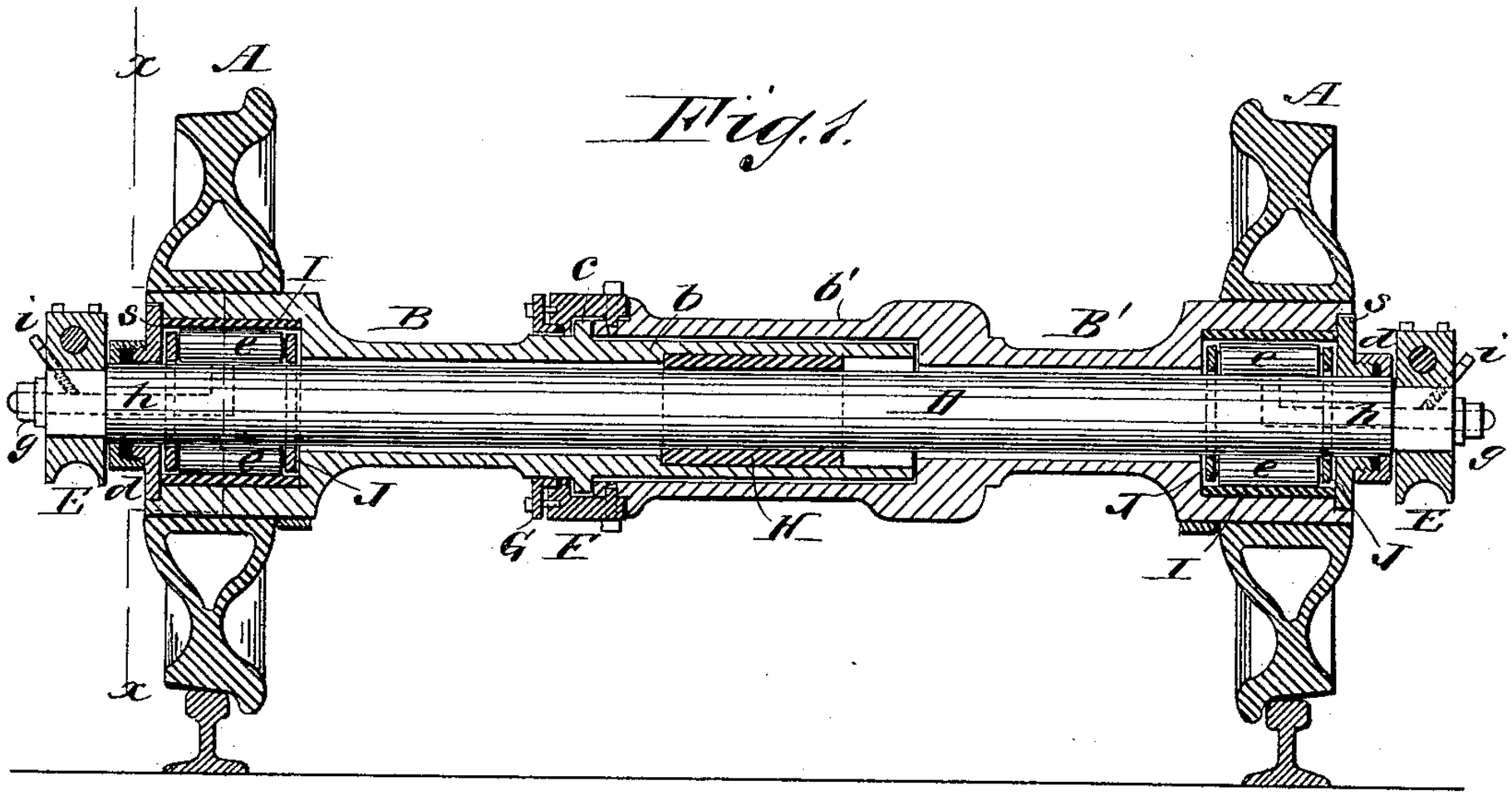


Fig. 2.

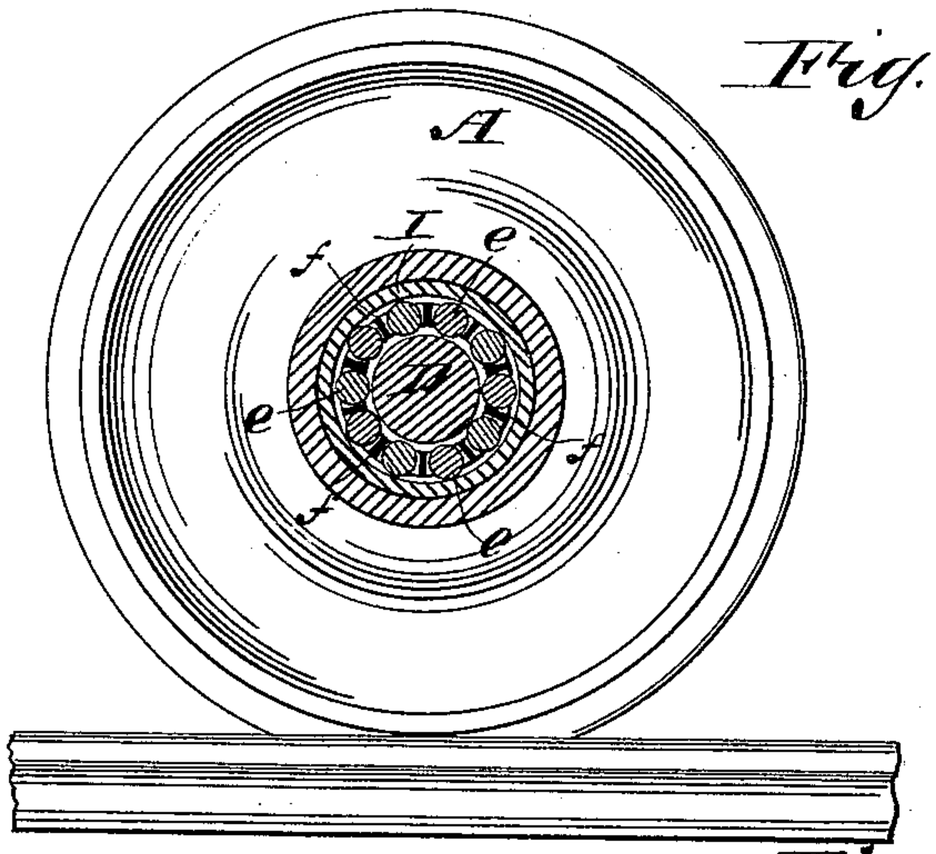


Fig. 3.

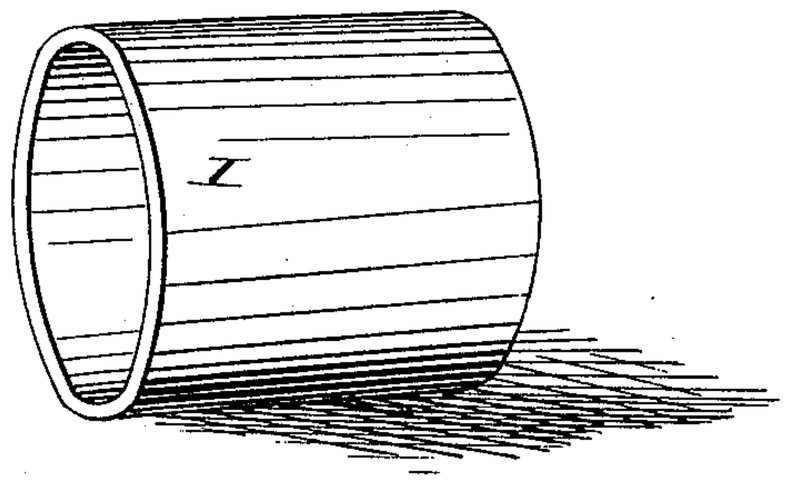


Fig. 4.

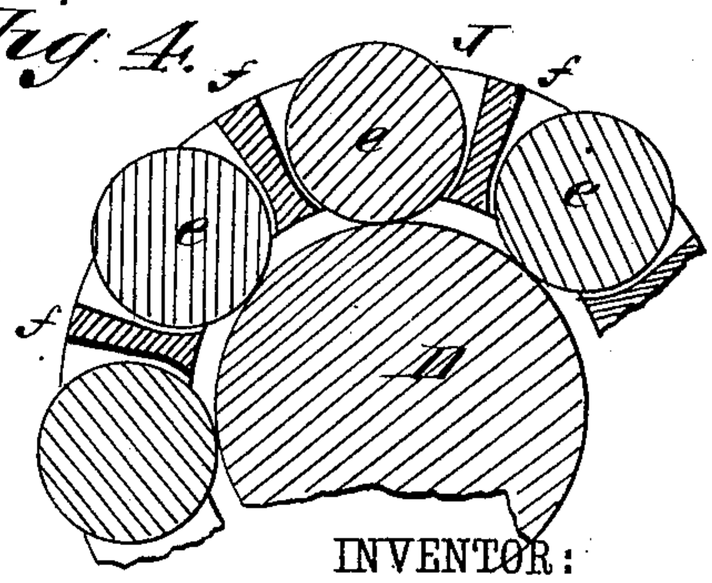
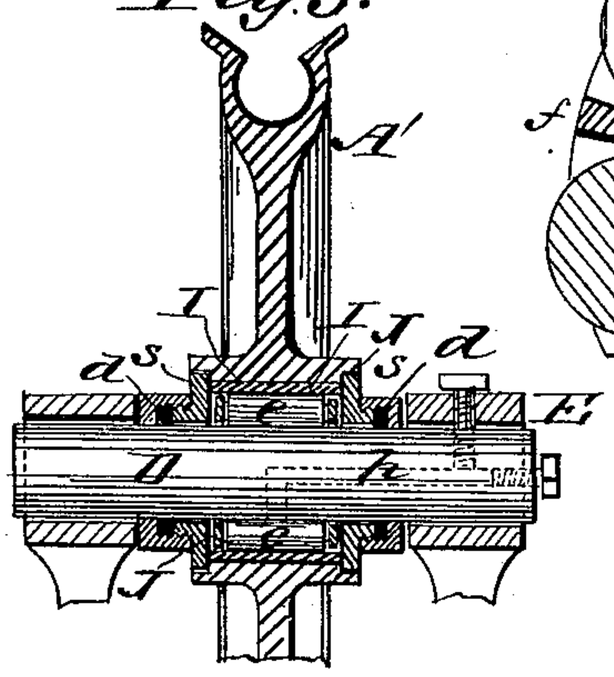


Fig. 5.



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WHEEL AND AXLE.

SPECIFICATION forming part of Letters Patent No. 366,454, dated July 12, 1887.

Application filed November 13, 1885. Serial No. 182,709. (No model.)

To all whom it may concern:

Be it known that I, CHARLES ERWIN CANDEE, of the city, county, and State of New York, have invented certain new and useful Improvements in Wheels and Axles, of which the following is a full, clear, and exact description.

This invention, which is mainly designed to be applied to the running-gear of railway-cars, but which is also applicable to other wheels and axles, or shafts and pulleys, and which in part relates to the journal boxes or bearings of axles and shafts fitted with anti-friction rollers, consists in a novel construction of a sleeve-like axle or shaft for use in connection with an inner fixed axle, the whole being arranged to admit of independent wheels or pulleys on the outer sleeve-like axle or shaft, rotating independently of, and, if necessary, in reverse directions to, each other.

It also consists in various details of construction, substantially as hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 represents a partly-sectional longitudinal elevation of a railway-car axle embodying my invention, with the wheels in their places and as arranged to run on the pair of rails of a railway-track. Fig. 2 is a sectional view of the same on the irregular line *x x* in Fig. 1. Fig. 3 is a view in perspective, upon a larger scale, of the chilled bushing in which the anti-friction rollers work; Fig. 4, a transverse section, in part, also on a larger scale, of the axle and its rollers, with roller-frame; and Fig. 5, a vertical transverse section of a cable-pulley having the roller-bearing applied.

Referring in the first instance, or more particularly so to the several figures of the drawings exclusive of Fig. 5, A A are a pair of railway-car wheels fast on a divided hollow axle, B B′, through which passes a fixed axle, D, that is sustained at its ends in boxes E.

The outer hollow axle or shaft, B B′, is of a sleeve-like construction in between the wheels, as at *b b′*, arranged to fit freely within and over the other, respectively, and the one or inner sleeve portion, *b*, having a flange, *c*, at the mouth end of the outer sleeve portion, *b′*, which flange is freely inclosed by an overlapping box, F, secured to the outer sleeve, and which, while free to rotate within the box, is restrained by the box and the mouth end of the outer sleeve from longitudinal play in direction of the length of the axle. The inner end of the sleeve *b* may also be arranged, as shown, to meet, or nearly so, the back end of the inner surface of the outer sleeve to assist in keeping the wheels on the axle at their proper distance apart. On the outer face of the overlapping box F is an adjustable gland, G, that may be used in connection with packing to exclude dust from entering between the sleeves. In this way the wheels A A, while virtually on the same axle, are independent of and free to turn independently of each other, and the divided axle B B′ is firmly supported by its respective or sleeve-like sections, and has, furthermore, an inner running support by means of a bushing or bearing, H, inserted in the inner sleeve, *b*, and arranged to run upon the inner fixed axle, D. This divided sleeve-like construction of the outer axle also may be applied to shafting for carrying and running independent pulleys for rotation at different velocities or in reverse directions.

The outer end of each sectional portion B B′ of the wheel-carrying axle is of enlarged dimensions where the wheel is fitted upon it, so as to form a pocket or recess open on the outer side of the wheel, and which is subsequently closed by a cap-plate, *s*, and packing-gland *d* around the fixed axle, for the purpose of retaining oil in the recess, or rather within a bearing-bushing, I, therein. The bushing is a chilled metal one, and may be firmly secured to its place within the recess by pressure applied to mechanically force it therein or otherwise. Said bushing constitutes a steady concentric wheel and axle or shaft bearing for a series of anti-friction rollers, *e e*, arranged around the fixed axle D, and which are dropped loosely to their places, free from pivot-support, within a double ring-frame, J, having bars *f* connecting the rings in order that the frame may serve to retain the rollers at an equal distance from each other, and by the bars *f*, being suitably shaped, from dropping through between them, but admitting of the rollers being

readily withdrawn on taking out the ring-frame from the chilled bushing. The rollers *e* take their outer bearing on or against the chilled bushing I and the inner bearing on the fixed axle D. The chilled-metal bushing reduces friction and adds to the durability of the bearing.

Nuts *g* are applied to the outer ends of the fixed axle to bind the whole together.

The fixed axle D has a longitudinal hole, *h*, made in it at its end or ends, bending upward or outward at its inner end, so as to form an angular supply-passage for oil to the bearing and along the fixed axle, and whereby the outer axle is made to run in oil, as it were. The oil is fed to this passage on withdrawing a screw-plug, *i*.

Substantially the same construction is shown in Fig. 5 as applied to a rope or cable pulley, A′, the hub of the wheel in this case being the outer shaft arranged to rotate around a fixed shaft, D, secured in suitable end boxes, E, and having a lubricating-passage, *h*. Cap-plates *s* and packing-glands *d* are applied to opposite ends of the hub of the wheel, and inclose between them the roller-frame J, the anti-friction rollers *e* of which have their inner bearing on the fixed shaft D and their outer bearing on the chilled-metal bushing I, which is secured within the wheel. It is also an advantage to make the bearings H I chilled ones; and the support of the sleeve *b* of the hollow shaft or shaft-section B, by the inserted chilled bushing H upon the shaft D, forms a most durable, smooth, and convenient hollow shaft-bearing. The means, too, for locking the two hollow shafts or shaft-sections B B′ together without restricting their independent rotation are both simple and effective.

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

1. The combination of the divided hollow axle or shaft B B′, adapted to carry independent wheels or pulleys, and constructed with elongated sleeves *b b′*, arranged to fit the one within the other, the bushing or bearing H, and the fixed axle or shaft D, substantially as specified.

2. The combination of the hollow divided axle B B′, constructed with sleeves *b b′*, arranged to fit the one within the other, and having enlarged recessed outer ends, and the inner one, *b*, of which is provided with a flange, *c*, the overlapping box F, and adjustable gland G, the intermediate bearing or bushing, H, the inner fixed axle or shaft, D, the roller-bearing frames J, with their rollers *e*, and the wheels A A, secured on the exterior of the recessed outer ends of the divided hollow shaft or axle B B′, substantially as specified.

3. In a divided hollow axle or shaft constructed with sleeves *b b′*, arranged to freely fit one within the other, and the inner one of which is provided with an exterior flange, *c*, the combination therewith of the overlapping box F, secured to the outer sleeve, substantially as shown and described.

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