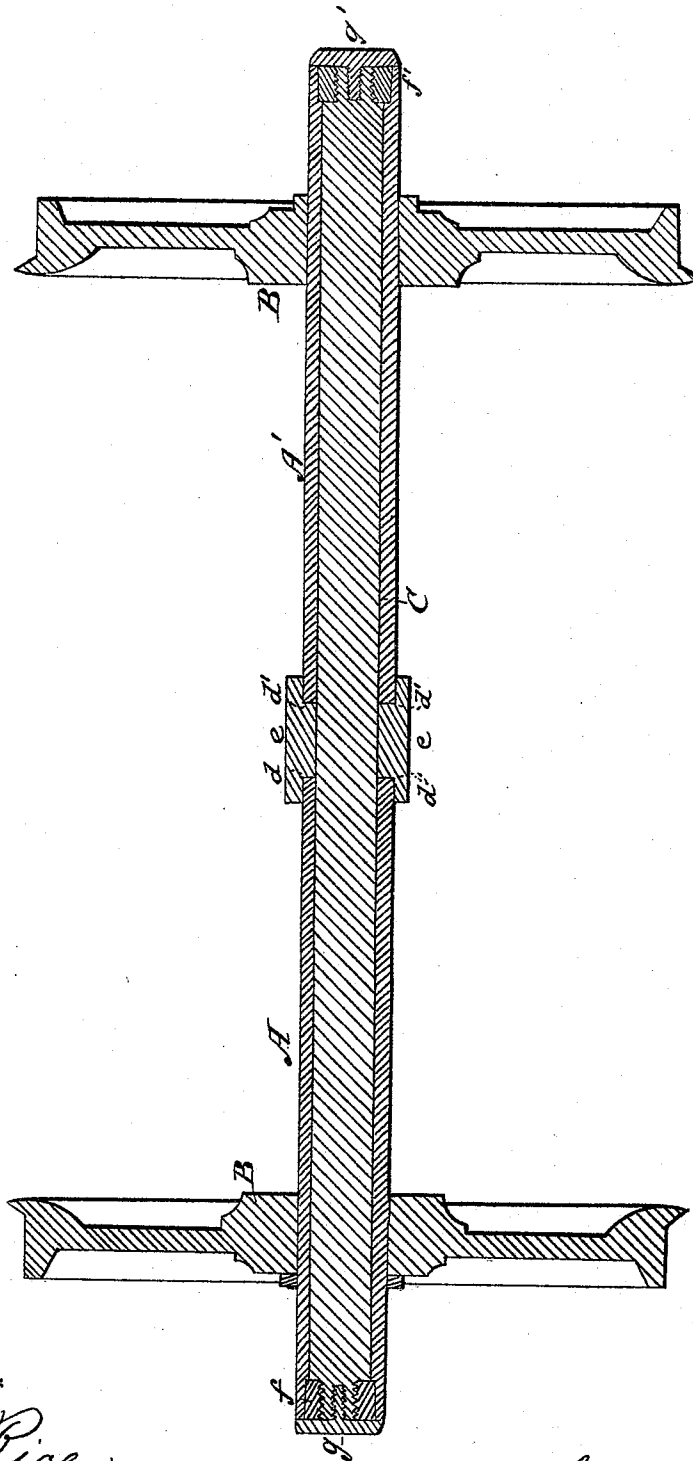


H. J. LOMBAERT.

Car-Axle.

No. 24,315.

Patented June 7, 1859.



Witnesses:

*Wm Rice*  
*Bruf Montin*

Inventor:

*Herman Lombaert*

# UNITED STATES PATENT OFFICE.

H. J. LOMBAERT, OF PHILADELPHIA, PENNSYLVANIA.

## COMPOUND RAILROAD-AXLE.

Specification of Letters Patent No. 24,315, dated June 7, 1859.

*To all whom it may concern:*

Be it known that I, H. J. LOMBAERT, of the city of Philadelphia, in the State of Pennsylvania, have invented a new and useful Improvement in Combination-Axles for Railway-Cars and Locomotives; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawing, making a part of this specification, and to the letters of reference marked thereon.

The object of my invention is to overcome, in a better manner, the retarding force of the wheels and torsion of their connecting axles, from the unequal travel of the said wheels, when there is either any slight difference in their diameters, or in the lengths of the respective rails upon which they move—as in rounding curves, &c.

It consists in the peculiar manner, hereinafter described, of combining together a divided, tubular axle, having the wheels fixed thereon, and a solid undivided center-piece or mandrel: whereby the two parts of the said tubular axle are secured together so as to rotate independently of, and out of contact with, each other, the outer ends of the said tubes projecting through the wheels so as to form their journals.

In the drawing, A and A', represent the two tubular parts of the axle; B and B' their respective wheels; and C, the solid center or mandrel. Each of the two parts of the axle (A and A') is a cylindrical tube, and is fixed perpendicularly, in the usual manner, in the center of its respective wheel so as to project on each side of the same and form on the outer side the usual journal for supporting the car, and, on the inner side, an elongation whose end enters into one of the annular grooves, *d* or *d'*, which are made in the ends of the collar, *e*, which is fixed in the middle of the mandrel, C. The said mandrel is a smoothly turned, cylindrical, solid piece which fits and also receives the two tubular parts (A and A') over its ends, and has its central enlargement or collar (*e*) constructed and fixed thereon so as to produce, around between it and the mandrel proper, the annular grooves (*d* and *d'*), before mentioned, for the reception of the inner ends of the said tubes (A and A') substantially as shown in the drawings—and also for the reception of one or more inter-

mediating collars, when the same may be required as hereinafter explained—the outer ends of the mandrel (C) being each flush, or nearly so, with the outer ends of the respective parts (A and A') of the axle, when the same are applied thereon as described, and also reduced in diameter at these parts so as to receive thereon the screw-nuts or collars (*f* and *f'*)—the inner side of each outer end of the two tubular parts (A and A') being also cut away sufficiently to admit of the said nuts being made a little larger in their diameters than the mandrel (C), and inserted therein for the purpose of securing the said two parts (A and A') of the axle in their proper positions around on the said mandrel, as shown in the drawing; and, to prevent the said nuts (*f* and *f'*) from unscrewing by the frictional action of the ends of the rotating axle thereagainst, a jam screw-bolt, *g* or *g'*, is fitted into the respective ends of the mandrel (C) so that it can be brought up firmly against the said nuts (*f* and *f'*) substantially as shown in the drawing.

It will readily be perceived that as, in this combination axle, the wheels are secured upon the tubular parts (A and A') which project so as to form the journals upon which the car bears for support, the said wheels must rotate thereon independently of each other; and so, the axle be protected from any torsional strain—and, consequently, the car from any retarding force of the wheels arising from the unequal travel to which such wheels are subjected from any inequality in their diameters, and especially from curves in the railway. It will also be perceived that when there is no inequality in the travel of the wheels—supposing them to be of equal diameters and the road-way straight—there will be no friction produced between the curved sides and inner ends of the two parts (A and A') of the axle, and the surface of the mandrel (C), for the obvious reason that in such case they will not move upon each other; and that, when the inequality of their travel produces such movements—the parts being accurately and smoothly fitted together, as intended, and the journals being formed of the tubes instead of the mandrel—the small amount of friction arising from the combination, bears no proportion, scarcely, to the retarding force which would result were the wheels

rigidly fixed together, as in the common mode of constructing car and locomotive axles.

Another important advantage peculiar to the mode herein described of constructing a combination axle is, that it affords a ready mode of adjusting the wheels to tracks of different widths; as all that is required, is the insertion of a collar or collars in the grooves ( $d$  and  $d'$ ) in the middle, and of collars of corresponding thicknesses, between the shoulders of the jam screw-bolts and the screw nuts on the ends of the mandrel, to produce an increase in the distance between the wheels B and B'. Besides, a combination axle constructed in the manner described herein is as practical and strong, (if not stronger), for railway purposes, as the common single axle.

I am aware that the two wheels have been secured upon respective tubes slipped over an undivided axle so as to rotate thereon independently of each other—the said axle projecting through the tubes on the outer side of the wheels so as to form their journals; and also, that the wheels have been made to rotate upon the shaft, independently of each other, by fixing one wheel upon a tube adapted to slip over and rotate

upon a reduced half of the length of the axle and leaving the end of the latter projecting for its journal, while the other wheel is fixed to the opposite end of the axle itself—as in Garret & Meakle's patent of September 28th 1858. I therefore do not claim either of the said modes of constructing an axle for cars or locomotives; but,

Having herein fully described the construction and operation of my improved combination axle and pointed out its superior utility, what I claim as new therein and of my invention, and desire to secure by Letters Patent is—

The divided, tubular-axle (A and A') and the solid, undivided, center-piece or mandrel (C), when the same are constructed and combined together with each other and with the wheels (B and B'), so that the two said tubular parts (A and A') shall project through their respective wheels and form their journals, and also rotate out of contact and independently of each other—substantially in the manner and for the purposes set forth and described.

HERMAN J. LOMBAERT.

Witnesses:

WM. RICE,

RICHD. J. HUGHES.