



# UNITED STATES PATENT OFFICE.

SAMUEL S. HICKOK, OF METHUEN, MASSACHUSETTS.

## IMPROVEMENT IN DIVIDED AXLES FOR RAILWAY CARS.

Specification forming part of Letters Patent No. 130,047, dated July 30, 1872.

Specification describing certain Improvements in Divided Axles for Railway Cars, invented by SAMUEL S. HICKOK, of Methuen, in the county of Essex and Commonwealth of Massachusetts.

This invention relates to divided car-axles, so called, or those in which one-half the axle and its wheel revolves independently of the other, in order, in following a curve in the track, that one wheel may lag, and thereby prevent slipping upon the rail of the wheel nearest the center of the circle described by the track.

The drawing accompanying this specification represents in Figure 1 a side elevation, and in Fig. 2 a longitudinal section of a divided car-axle constructed in accordance with my improvements, Fig. 3 being a section of one of the coupling-sleeves, to be hereinafter explained.

In the drawing, A A' represent a portion of the two halves of a divided railway car-axle, each of which is formed with an integral enlargement or head, *a* or *a'*, upon its inner end, one of such heads, or that marked *a'*, being of considerably greater length than the other, *a*. B B' represent two cylindrical tubular caps, each formed with an outstanding lip or collar, *b*, through which suitable bolts are passed in order to confine the caps B B' securely together, and prevent an endwise separation or play of the same, or of the axles confined within them. The bore of the cap B' is straight throughout, and substantially of uniform diameter, the latter being of such size as to easily receive the axle, and allow it to rotate freely therein. The bore of the opposite cap B is of irregular diameter—that is to say, it is formed with a short portion, *c*, to tightly receive the axle, and with an enlarged portion or chamber, *d*, to receive both the heads *a a'*, as shown in Figs. 2 and 3 of the drawing; the object of thus inserting the heads of both axles within one cap being to obtain great longitudinal rigidity and strength, which would not result were each head received in its own cap, as in this case the bolts of the flanges *b b* must be depended upon entirely.

The important features to be secured in divided car-axles are, first, to obtain great longitudinal stiffness and strength; and, second, to prevent any possibility of endwise

movement or play of the two, in order to sleeve the housings and boxes of the car from the great thrusts and injury which would otherwise result to them. By my method of "breaking joints"—that is, to insert a portion of one axle within the cap of the opposite axle—I obtain, in a very simple, effective, and inexpensive manner, the requisite longitudinal strength, and the power of resisting endwise separation of the axles.

I am aware that various inventions exist relating to divided car-axles; but in all prior to mine of which I have any knowledge the abutting ends of both axles and sleeves—provided sleeves are employed—coincide, thus throwing the entire strain and labor upon the bolts and flanges of such sleeves, which, while possessing sufficient strength to resist the endwise strain or liability to separation of the semi-axles, are inadequate to resist the longitudinal strain and thrusts upon the latter. By my method of "breaking joints"—that is, to insert a portion of one-half of the axle within the cap of the other—I obtain, in a very simple, inexpensive, and effective manner, the requisite longitudinal strength and stiffness, and the power of resisting endwise separation of the two portions of the axle.

One of the semi-axles, A or A', before described and its head must rotate loosely within the cap or caps which receive it, and I prefer, for several reasons, that it should be the latter, A'.

*a*<sup>2</sup> in the drawing represents an orifice, through which lubricating material may be introduced to the interior of the caps and about the axle, and this orifice is to be tapped out to form a female screw, into which a cork, *b*, is screwed. The lightness of the cork constitutes a means of enabling it to retain its place and preventing dislodgment by the jar and concussions of the car.

The inner face of each nut, *e'*, which is screwed upon the bolts which confine the two caps in place, is made concave, and a washer of rubber or leather or other soft or elastic substance is introduced between the two, with or without an interposed metallic ring, the purpose of the washer being to prevent loosening of the nut by the jar of the car; and the concavity of the nut being to

maintain the original form of the washer, and prevent crushing and misplacement of it.

*Claim.*

A car-axle divided transversely into two parts, whose enlarged or headed contiguous ends are combined with sleeves or tubular caps, one applied to each of said headed ends, and united together in the manner described, so that the en-

largement or head of one of the parts of the axle shall enter and be held in the sleeve or cap that contains the head of the opposite half of the axle, for the purpose stated.

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Witnesses:

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