(No Model.)

E. FIRTH.

VEHICLE AXLE.

No. 385,798. Patented July 10, 1888.

Fig. 1.

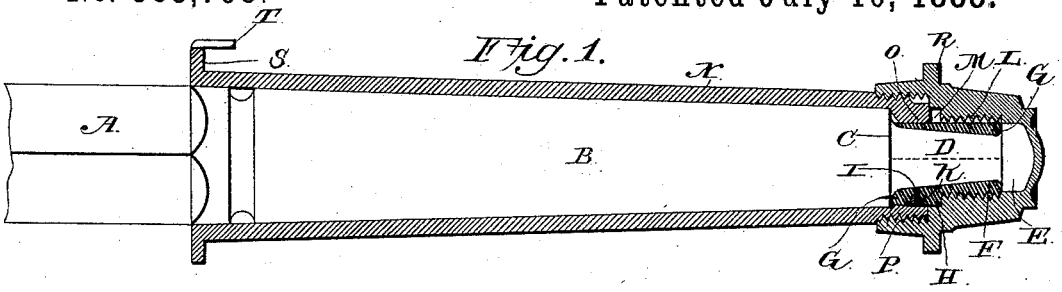


Fig. 2.

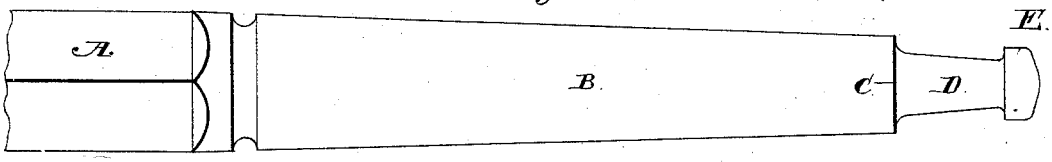


Fig. 3.

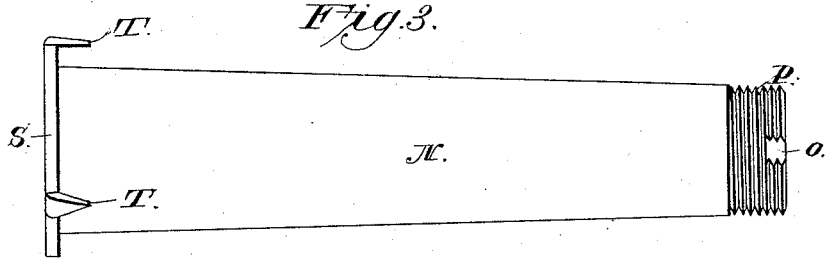


Fig. 4.

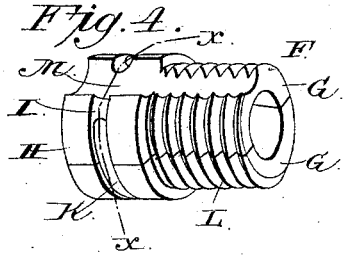
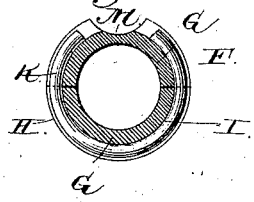


Fig. 5.



Witnesses,
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UNITED STATES PATENT OFFICE.

EDWIN FIRTH, OF TROY, NEW YORK.

VEHICLE-AXLE.

SPECIFICATION forming part of Letters Patent No. 385,798, dated July 10, 1888.

Application filed August 17, 1887. Serial No. 247,199. (No model.)

To all whom it may concern:

Be it known that I, EDWIN FIRTH, a citizen of the United States, residing at Troy, in the county of Rensselaer and State of New York, have invented a new and useful Improvement in Vehicle-Axles, of which the following is a specification.

My invention relates to an improvement in self-lubricating and self-adjusting axles for vehicles; and it consists in the peculiar construction and combination of devices, that will be more fully set forth hereinafter, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a longitudinal sectional view of my invention, showing the axle box and nut and sleeve in section and the axle-spindle in elevation. Fig. 2 is a side elevation of the axle-spindle with the box-nut and sleeve detached therefrom. Fig. 3 is a detached elevation of the box. Fig. 4 is a detached perspective view of the revolving thimble. Fig. 5 is a transverse sectional view of the same, taken on the line *x x* of Fig. 4.

A represents the axle proper, and B represents a spindle formed on the end of the axle. Heretofore it has been the practice to form a collar at the inner end of the spindle to prevent the axle-box from working inwardly thereon. This collar renders it necessary to turn down the spindle at the truss of the axle, in order to form the collar, thereby weakening the spindle and rendering it liable to break off at the collar. A very large majority of the axles in use break off at this point. In order to avoid this objection, I dispense entirely with the collar and taper the spindle throughout its entire length, starting from the base or inner end of the spindle, where the collar is usually formed, and by so doing avoid weakening the spindle, as the truss by this arrangement in a seven-eighths-inch axle is as thick as the truss of an inch-axle made in the ordinary manner, and yet the axle-box necessary to be employed on my spindle is no larger or thicker than the box used on an ordinary seven-eighths-inch axle. The outer end of the axle-spindle is turned down and reduced in diameter to form a shoulder, C, and an arm, D, the outer end of the said arm being provided with an integral head or flange, E, the diameter of which is considerably less than the diameter of the shoulder C.

F represents a sleeve or thimble, which is adapted to be swiveled on the arm D, and is made of two semi-cylindrical sections, G. The inner end of the sleeve or thimble is perfectly plane, as at H, and is of slightly less diameter than the shoulder C. This plane portion H has an annular peripheral groove, I, made in two sections, and adapted to receive a steel-wire retaining or clamping ring, K, which is illustrated in detail in Fig. 4. The reduced outer portion of the sleeve or thimble F is provided with screw-threads L. This part of my invention is an improvement upon the sleeve or thimble and washer described in Letters Patent of the United States, No. 265,376, granted to me June 28, 1887, in which the sleeve or thimble is formed of a single integral piece, and is secured on the end of the spindle by means of a washer, the latter being held in place by swaging the end of the spindle, which I have found in practice to be too expensive and laborious in operation. For instance, in order to swage the end of the spindle, it was necessary to heat the spindle, and this reheating tended to impair the quality of the steel spindle. Again, the spindle is oftentimes swaged too much, which would cause the thimble to bind and requiring the parts to be placed on a lathe and turned in order to make them run smooth. Therefore, in order to avoid these objections, I have provided a sectional thimble. By this improvement the axle is taken from the lathe to put on the thimble. The number of necessary operations is reduced and the axle made much cheaper. The expense is curtailed to a great extent.

M represents a channel, which is made longitudinally in one side of the exterior face of the thimble and extends throughout the length thereof, the said channel being somewhat wider at the plane portion of the thimble or sleeve than at its threaded portion, as shown.

N represents an axle-box, which is tapered throughout its entire length, is adapted to fit snugly on the spindle, and is provided at its front end, on its inner side, with an offset or swell, O, which is adapted to engage the channel of the thimble or sleeve, and thereby cause the said thimble or sleeve to rotate with the axle-box. The outer end of the axle-box is provided with screw-threads P, adapted to fit the interior threads of a cap-nut, R, such as

described in my before-mentioned Letters Patent, the said nut being further provided with the reduced central threaded opening to receive the threaded portion of the sleeve or thimble, thereby causing the axle-box, sleeve or thimble and the cap-nut to rotate together with the wheel on the spindle and prevent the possibility of the cap-nut coming off.

At the inner larger end of the axle-box is formed an annular flange, S, against which the inner end of the hub fits, and from the outer edge of the said flange projects a series of forward-extending prongs, studs, or lugs, T, which are adapted to be driven into the inner end of the hub when the box is fitted thereto, and thereby prevent the hub from working loose on the box and revolving independently thereon.

The operation of my invention is as follows: The sections of the tubular sleeve or thimble are first placed on the reduced arm D of the spindle and the steel clamping-ring K is fitted in the annular groove I in the collar or flange at the inner end of said sleeve or thimble, the function of the said clamping-ring being to secure the sections of the sleeve or thimble together on the arm D and prevent them from dropping therefrom when placing the axle-box and the cap-nut in position. The axle-box is then slipped onto the spindle, care being taken to direct the kink or indentation at the outer end of the box into the channel on the side of the sleeve or thimble, as described in my before-mentioned Letters Patent. The cap-nut is then screwed on the outer ends of the box and sleeve or thimble, as shown, and hereinbefore described, and cannot become accidentally detached therefrom, owing to the fact that it rotates, together with the sleeve or thimble and box, with the wheel, and consequently no friction is exerted on it by the wheel.

I am aware that it is old to form a safety-nut in two pieces held together by a clamping device; but this I disclaim. My invention does not pertain to a safety-nut. Safety-nuts swiveled on the ends of the axle-spindle are not practicable, and have never been used to my knowledge. My invention pertains to a thimble to be applied to the end of an axle-spindle, such as is described in my former patent, the present improvement relating more particularly to the formation of such thimble in sections.

Having thus described my invention, I claim—

1. In combination with the axle-spindle, the sleeve or thimble made in separable sections and swiveled on the outer end of the spindle, the axle-box fitted on the spindle and engaging the sleeve or thimble, and the cap-nut secured to the outer ends of the axle-box and also to the sleeve or thimble, substantially as described.

2. An axle having its spindle provided with a swiveled sleeve or thimble made of separable sections and provided with the annular peripheral groove, in combination with the clamping-ring adapted to fit in the said groove and bind the sections together, and the cap-nut R, engaging the sleeve or thimble, for the purpose set forth, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

EDWIN FIRTH.

Witnesses:

ALBERT TOMPKINS,

IRA TOMPKINS.