(No Model.)

A. PATERSON.

VEHICLE AXLE.

No. 380,344. Patented Apr. 3, 1888.

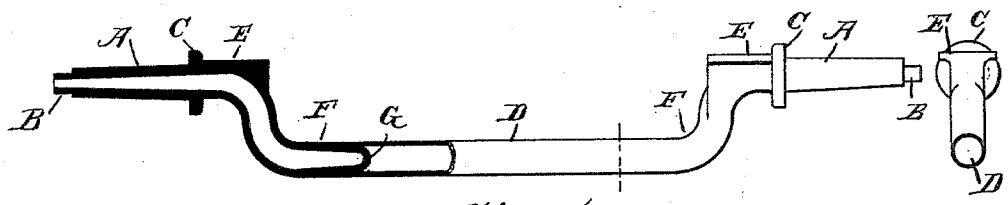

Fig. 1.

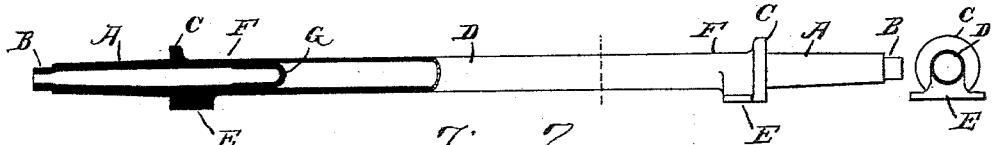

Fig. 2.

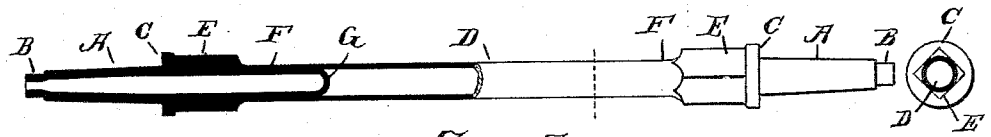

Fig. 3.

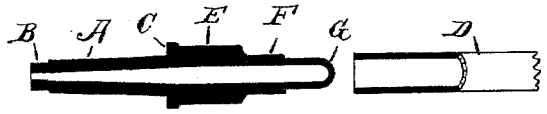

Fig. 4.

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UNITED STATES PATENT OFFICE.

ANDREW PATERSON, OF McKEESPORT, PENNSYLVANIA, ASSIGNOR TO THE NATIONAL TUBE WORKS COMPANY, OF BOSTON, MASSACHUSETTS.

VEHICLE-AXLE.

SPECIFICATION forming part of Letters Patent No. 380,344, dated April 3, 1888.

Application filed October 24, 1887. Serial No. 253,169. (No model.)

To all whom it may concern:

Be it known that I, ANDREW PATERSON, of McKeesport, Allegheny county, Pennsylvania, have invented certain new and useful Improvements in Vehicle-Axles, of which the following is a specification.

These improvements pertain to tubular axles for vehicles, and will be readily understood from the following description, taken in connection with the accompanying drawings, in which—

Figure 1 is a side elevation, half longitudinal section, of a crank vehicle-axle, illustrating my improvements, a projected vertical transverse section of the axle appearing at the right; Fig. 2, similar views of a straight axle with flanged beds; Fig. 3, similar views of a straight axle with squared beds, and Fig. 4 vertical longitudinal sections of a dissected left-hand end portion of the axle shown in Fig. 3.

In the drawings, A indicates the spindle portion of the axle, the same having the usual taper; B, the nipples at the outer ends of the spindle, adapted to receive axle-nuts or keepers to prevent the displacement of the wheels; C, collars at the inner termination of the tapering spindle; D, the straight central portion of the axle or parallel wrought tubing; E, the beds by which these axles are held in connection with the vehicle, these beds being located just within the collars C, these beds appearing in Figs. 1 and 2 as of the flanged type, while Figs. 3 and 4 represent the squared type, the character of the beds depending upon the special use for which the axle is intended or the special character of connection desired between the axle and the vehicle to which it is to be attached; F, the spindle-shanks extending from the inner ends of the spindles to the junctures with the central portion, D; and G, the end closures of the inner ends of the spindle-shanks.

The entire axle, with its collars and beds, is formed integrally of wrought-iron. The central portion, D, is hollow, being formed of comparatively light tubing. The other portions of the axle, comprising the shanks, spindles, and nipples, are hollow and with walls much heavier than the walls of the central portion, D. The collars and the beds are integrally formed at the juncture of spindle and spindle-shank, and serve also as re-enforces in strength for the axle at these points. The inner ends of the shanks are closed, as at G, and the cavity within the spindles and shanks may be utilized as oil-reservoirs, the usual oil-holes to be provided in the spindles to permit the oil to pass to the exterior of the spindles.

In making these axles the procedure is as follows: The end portions of the axles, including the nipples, the spindles, the collars, the beds, the spindle shanks, and the end closures, G, are cast of wrought-iron, each end piece with its component parts in one integral structure. Such end piece appears in section at the left of Fig. 4. The central straight portion, D, is formed of wrought-iron by usual tube-making process. The inner ends of the spindle-shanks have an exterior diameter corresponding with the interior diameter of the central portion, D, of the axle. This portion of the shank forms a tenon closely fitting within the end of the central portion, D, the length of the tenon being governed by the desired projection into the tube, and the shank at the tenon-shoulder is enlarged to a diameter corresponding to the outer diameter of the central portion, D, of the axle. Each axle is therefore in construction formed of three pieces. These three pieces are put together to form a complete axle, and when so placed the junctures between the shanks and the tubular central portion are welded. This welding may be performed by the process set forth in my patent, No. 367,438, of August 2, 1887, or otherwise.

I claim as my invention—

A vehicle-axle formed with a tubular central portion and with hollow end portions, comprising each a spindle, a nipple, a collar, a bed, and a spindle-shank, all formed of wrought-iron in one integral structure and constructed substantially in the manner as and for the purpose set forth.

ANDREW PATERSON.

Witnesses:
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F. R. FIELD.