

(No Model.)

A. PATERSON.

VEHICLE AXLE.

No. 396,762.

Patented Jan. 29, 1889.

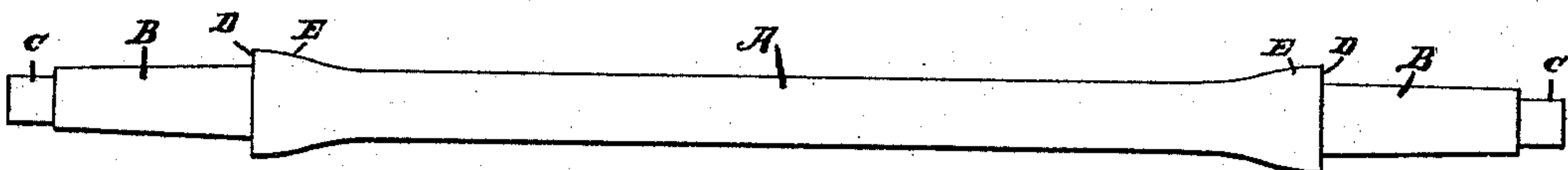


Fig. 1.

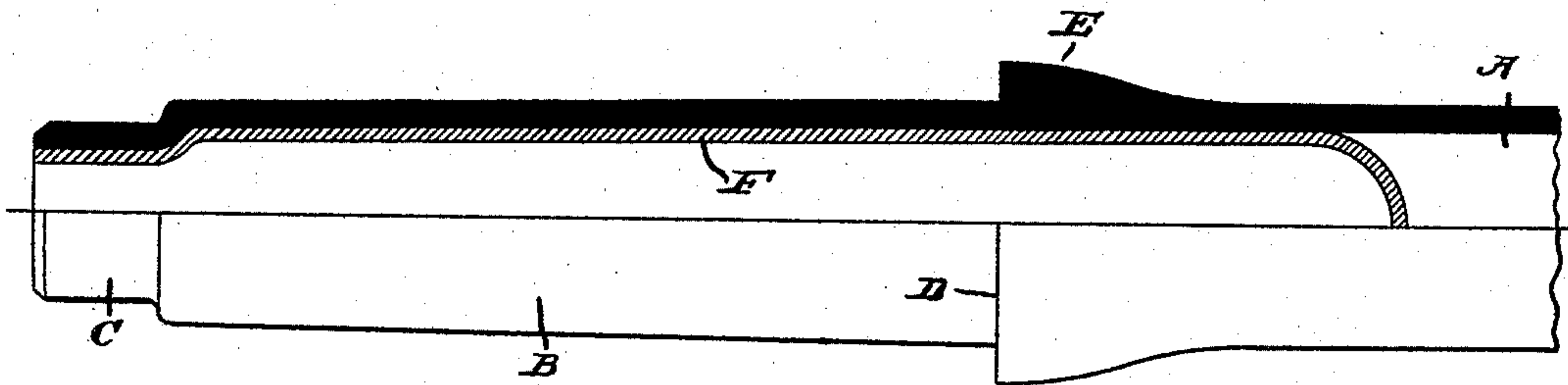


Fig. 2.

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Witnesses:
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UNITED STATES PATENT OFFICE.

ANDREW PATERSON, OF McKEESPORT, PENNSYLVANIA, ASSIGNOR TO THE
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VEHICLE-AXLE.

SPECIFICATION forming part of Letters Patent No. 396,762, dated January 29, 1889.

Application filed July 5, 1888. Serial No. 279,067. (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.

This invention pertains 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 of an axle embodying my improvements; and Fig. 2, a side elevation, part in vertical longitudinal section, of one end of the same upon an enlarged scale.

In the drawings, A indicates the body of the axle, the same being formed of metallic tubing integral with the end spindles, collars, and nipples; B, the spindles at the end thereof for the reception of the wheels, these spindles being illustrated as of the usual tapering form, instead of which a parallel form may obviously be employed; C, the nipples at the outer ends of the spindles for receiving the axle-nuts or other wheel-keeping devices; D, the collar-shoulders at the inner ends of the spindles; E, the collars which produce these shoulders, these collars being formed by a thickening of the metal of the tube at the part where the spindle joins the body of the axle; F, a bushing disposed within the end of the axle and projecting inwardly beyond the collar, and preferably having its inner end closed, whereby this bushing becomes adapted to serve as a chamber for lubricant, in the manner usual with tubular axles.

The collars E are formed by upsetting the metal of the tube and causing the upset portion to become exposed exterior to the tube, the upset portions sloping from the collar-shoulders inwardly, as shown, so as to gradually blend in size with the exterior of the body, thus producing with the least amount of material the greatest amount of collar-

shoulder and greatest amount of re-enforcement to the axle at the inner ends of the spindles.

The improved axle may be made by first putting the bushing in place, then subjecting the axle at the collar-points to a welding heat, then clamping the spindle portions up to the collar-shoulder point in a clamp neatly fitting the spindles, then clamping the axle-body at two points sufficiently distant from the spindle-clamps to allow a proper amount of metal for the upset between the clamps, then forcibly pressing the clamped spindle ends toward the inner clamps to cause the heated metal between the clamps to upset and expand, then smoothing between drop-dies or roller-dies, and finally finishing the axle in any usual or appropriate manner. The unbroken fibers of the metal thus extend from end to end of the axle, including and forming the collars. This is the distinguishing feature of my invention, which does not comprehend axles in which the collars are joined to the body by welds or by shrinking.

I claim as my invention—

As a new article of manufacture, an integrally-formed tubular wrought-metal axle having its bore or tube-cavity of uniform diameter or free from shoulders at the collar-points, and having the collars formed by exteriorly-exposed upsets presenting spindle-shoulders at right angles to the axis of the spindles and sloping from the collar-shoulders inwardly, so as to blend in size with the exterior of the body, the exterior diameter of the body at the point of initial engagement to form the collars corresponding with the exterior diameter of the spindles at the collar-shoulders.

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Witnesses:

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