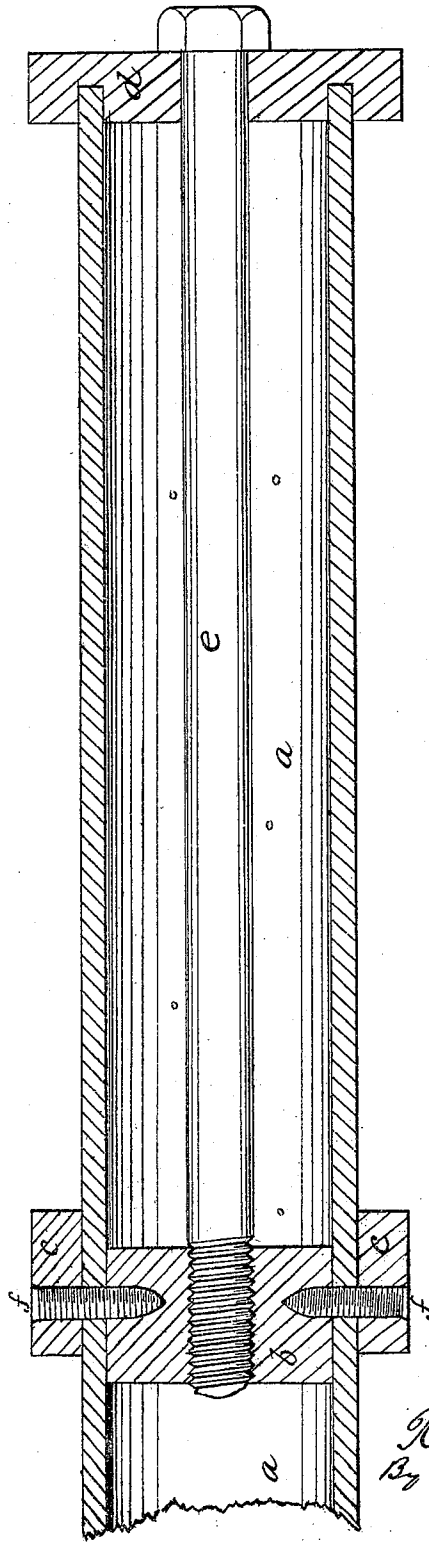


R. DANIELS.

Improvement in Axles for Vehicles.

No. 128,127.

Patented June 18, 1872.



Witnesses:
J. Quincy Smith,
H. A. Daniels

Inventor:
Reuben Daniels
By his attorney
J. C. Robbins

UNITED STATES PATENT OFFICE.

REUBEN DANIELS, OF WOODSTOCK, VERMONT, ASSIGNOR OF ONE-HALF OF HIS RIGHT TO Z. C. ROBBINS, OF WASHINGTON, D. C.

IMPROVEMENT IN AXLES FOR VEHICLES.

Specification forming part of Letters Patent No. 128,127, dated June 18, 1872.

To all whom it may concern:

Be it known that I, REUBEN DANIELS, of Woodstock, in the county of Windsor and State of Vermont, have invented a new and Improved Manufacture in the shape of a tubular metallic portion of an Axle for Wagons, &c.; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying sectional drawing, which forms a portion of this specification.

My improved tubular metallic portion of an axle for wagons, &c., is composed of a parallel-sided wrought-metal tube, *a*, of the proper length, having the end portions thereof combined with cylindric internal supporters *b* and external shoulder-bands *c* placed in such relative positions as to form internally-supported shoulders at the inner ends of the axle-journals, and, also, having the said internal supporters *b* combined with end-finishing and wheel-securing caps *d*, by means of screw-bolts *e*, substantially as shown in the accompanying drawing.

Said new and improved manufacture may be produced in the following manner, viz.: First, manufacture or procure the parallel-sided wrought-metal tube *a* of the proper length; then manufacture or procure the cylindric internal supporters *b*, the shoulder-bands *c*, and the connecting-bolts *e*; then heat the tube *a* to a state of redness, or thereabout, and while at that temperature insert therein the cylindric supporters *b*, and drive them to their proper positions within said tube; then, after allowing the tube to cool, heat the shoulder-rings *c* to a state of redness or thereabout, and, while at that temperature, drive them to their proper positions onto the tube *a*, said positions being such that they will be firmly supported by the internal supporters *b*. The screw-threads in the central aperture of the internal supporters *b* may be formed either before or after said supporters have been driven to their places within the tube *a*. The end-finishing caps *d* should be of such shape that they will give efficient support to the sides of the ends of the tube *a*, and also

of such a shape as will enable them to tightly close up said ends, and thereby form chambers within each axle-journal for the reception of the lubricating material, which will find its way to the exterior surfaces of said journals through a suitable number of apertures formed in the sides thereof. Should it be deemed necessary by the manufacturer of my improved tubular metallic portion of an axle for wagons, &c., the internal supporters *b* may be additionally secured within the tube *a* by screw-cut plugs *f f* passing inward through the shoulder-bands *c* and the sides of said tubes into said supporters, as shown in the drawing.

Parallel-sided journals for the wheels of vehicles are preferable to tapering journals, for the reason that the former permit the wheels to stand at right angles to the axles, and, consequently, enables them to run truer and steadier, and with a considerable saving of power, when passing over sandy or muddy roads.

I wish to have it distinctly understood that I do not intend to restrict myself to any precise proportions of the parts of my improved tubular metallic portion of an axle for wagons, &c., while I produce a manufacture substantially the same in principle as that herein represented and described.

My improved tubular metallic portion of an axle for wagons, &c., may be combined with any suitable stock and trimmings in the production of axles for various descriptions of vehicles.

I claim as my invention—

1. The combination of the cylindric internal supporters *b* with the tube *a* and the shoulder-bands *c*, substantially as and for the purpose herein set forth.
2. The combination of the end-finishing and wheel-securing caps *d* with the cylindric internal supporters *b*, and with the ends of the tube *a*, substantially as and for the purpose herein set forth.
3. As a new manufacture, a tubular metallic portion of an axle for wagons, &c., produced by the combination of the tube *a* with

the cylindric internal supporters *b*, the shoulder-bands *c*, and the end-finishing and wheel-securing caps *d*, substantially as herein set forth.

In testimony that the foregoing is a full and clear description of my new manufacture in the shape of a tubular metallic portion of an axle

for wagons, &c., I hereunto subscribe my name this 16th of April, 1872.

REUBEN DANIELS.

Witnesses:

A. C. BRADLEY,
W. H. FINCKEL.