A. E. SMITH.

AXLE FOR CARRIAGES.

No. 28,207. Patented May 8, 1860.

Fig. 1.

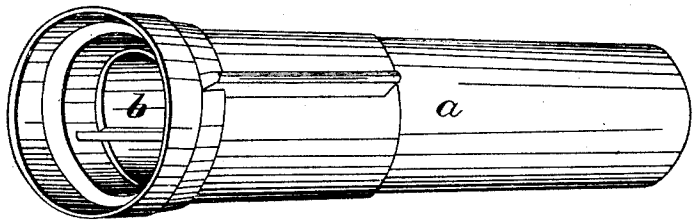
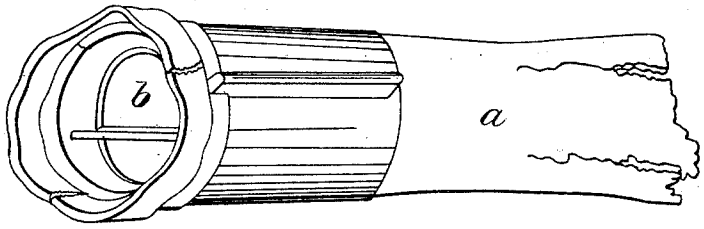


Fig. 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

ALFRED E. SMITH, OF BRONXVILLE, NEW YORK.

MAKING AXLE-BOXES.

Specification forming part of Letters Patent No. 28,207, dated May 8, 1860; Reissued April 27, 1869, No. 3,401.

To all whom it may concern:

Be it known that I, ALFRED E. SMITH, of Bronxville, Westchester county, State of New York, have invented certain new and useful Improvements in the Manufacture of Malleable-Iron Axle-Boxes for Wagons and other Purposes and Vehicles; and I do hereby declare the following to be a full description of the same.

The nature of my invention consists in a new and improved manufacture of malleable iron axle boxes for wagons, and other purposes, and vehicles, by making the external and internal surfaces of the box of a fine steel like hardness, and yet leave the body of the metal to retain its toughness or malleability to resist sudden fracture like ordinary chilled cast iron boxes. But to describe my invention more particularly, I will refer to the accompanying drawings forming a part of this specification, the same letters of reference, wherever they occur referring to like parts.

Figure 1, is a perspective view of the axle box. Fig. 2, is a perspective view of an axle box, fractured by hammering for the purpose of exhibiting the toughness of the body of the metal, notwithstanding its hardened surfaces, and as distinguishing it from chilled castiron axle boxes.

Letter *a*, represents the external, and *b*, the internal surfaces of the axlebox.

These boxes are cast, of any size and pattern desired. They are then annealed, or converted into what is technically called malleable iron boxes, by the common and well known processes for that purpose. In this state they are put in the lathe and turned or finished up to the exact dimensions required for use. They are then immersed for about fifteen minutes in a crucible or other suitable vessel, containing a compound of prusiate of potash and common salt at a red heat, after which they are taken from the bath, and plunged into a trough of cold water, when their surfaces become as hard as the finest tempered steel, resisting the scratch of the file, and yet retaining in the body of the metal the toughness and malleability of wrought iron nearly, while at the same time, preserving its accuracy of bore, or finished condition, except it be to polish it up with oil and emery to fit it for market.

It will be observable from this explanation of my new method of manufacturing axle boxes, that it differs from anything ever before known for making axle boxes, in the following important particulars: First, it is a cast iron box, and therefore can be made cheaply. Second, it is malleable, and therefore has the toughness and durability of wrought iron, but as being made by casting, at a much less cost than wrought iron. Third, it is worked or finished for use in its malleable condition, and therefore takes less power in the lathe work, and of course is cheaper work in labor, and wear of tools, than if worked or finished up from chilled cast iron axle boxes. Fourth, the surfaces of the boxes are hardened only, but to a much greater degree than chilled cast iron axle boxes would be, and therefore are superior as giving greater durability to the wear of the boxes. Fifth, the body of the metal is tough or malleable, and therefore differs from chilled cast iron axle boxes, inasmuch as the latter is still crude cast iron, and easily fractured, while the former has been converted into a metal of a compound quality, that is, having the toughness of malleable iron, yet with surfaces of the hardness of the highest tempered steel. Sixth, the box being made malleable is much lighter than chilled cast iron boxes can be made, and therefore is a great saving in metal, as well as obviating the necessity of cutting away so much wood of the center of the hub, to admit it, as is required by heavy chilled cast iron axle boxes.

Having now described my invention and its properties as an improved manufacture of axle boxes, I will proceed to set forth what I claim and desire to secure by Letters Patent of the United States.

I claim as my invention—

The new and useful improvement in the manufacture of malleable iron axle boxes, by means of the operations hereinbefore described and for the purpose of producing an article cheaper, more expeditiously and of a better, and more useful kind, than heretofore known.

ALFRED E. SMITH.

Witnesses:

R. G. WILLIAMS,

C. L. RANIK.