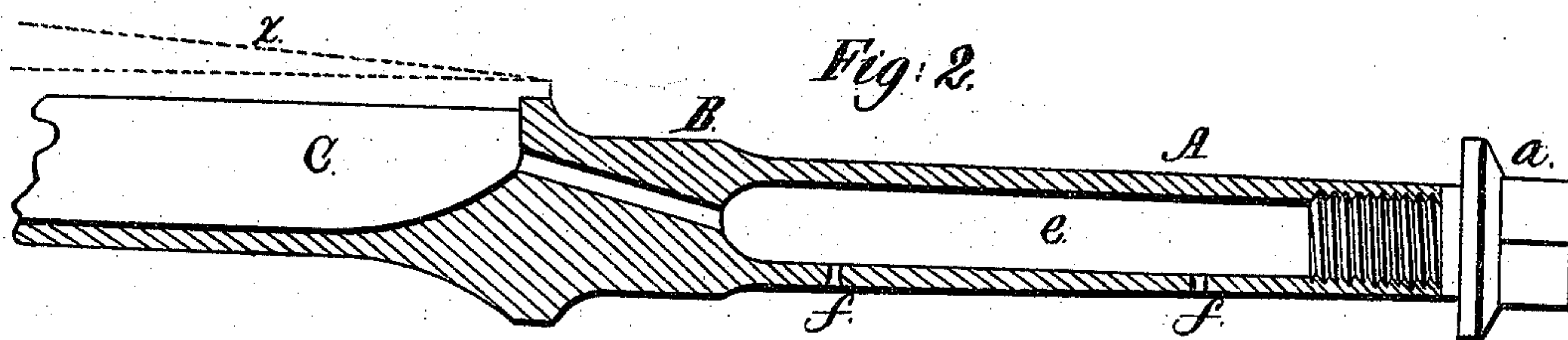
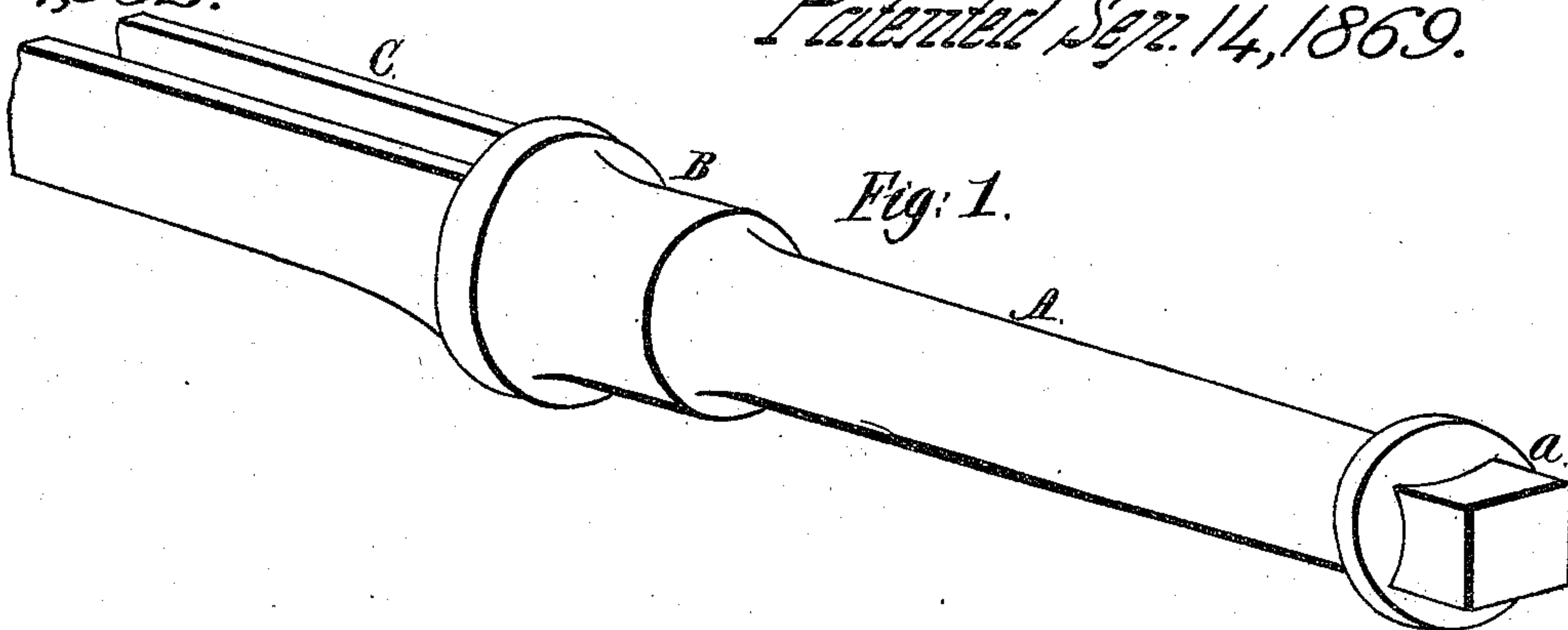


*J. B. Wilson.*

*Carriage Axle.*

*N<sup>o</sup> 94,932.*

*Patented Sept. 14, 1869.*



*Witnesses:*  
*Wm. A. Stul.*  
*Geo. B. Harding.*

*Inventor:*  
*J. B. Wilson*  
*by his Atty*  
*L. H. Howson*

# United States Patent Office.

JOSEPH B. WILSON, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO ELEANOR WILSON, OF SAME PLACE, AND HENRY M. RILE, OF WILMINGTON, DELAWARE.

*Letters Patent No. 94,932, dated September 14, 1869.*

## IMPROVEMENT IN CARRIAGE-AXLES.

The Schedule referred to in these Letters Patent and making part of the same.

*To all whom it may concern :*

Be it known that I, JOSEPH B. WILSON, of Philadelphia, Pennsylvania, have invented an Improvement in the Manufacture of Axles for Vehicles; and I do hereby declare the following to be a full, clear, and exact description of the same.

My invention consists of a hollow axle, cast in a mould, and afterwards so annealed and hardened that it shall be tough, malleable, and capable of resisting as great or greater strains as axles made of the best wrought-iron or steel, all of which is fully described hereafter.

In order to enable others skilled in the art to make and apply my invention, I will now proceed to describe the mode of carrying the same into effect, reference being had to the accompanying drawing, which forms a part of this specification, and in which—

Figure 1 is a perspective view of a portion of an axle made according to my invention, and

Figure 2, a sectional view of the same.

The axle shown in the drawing consists of three main portions: the hollow journal A, capped at its outer end by a screw-plug, *a*, the shoulder B, consisting of a solid mass of metal arranged at the point of greatest strain, and the central box-like portion C, into which a wooden stock, *x*, represented by red lines in fig. 2, is intended to be inserted.

The cavity *e*, in the interior of the journal, while it decreases the weight of the axle, is also used as a receptacle for lubricating-material, the latter being introduced either through a passage in the shoulder B, or from the end of the axle, after removing the cap *a*, and fed to the journal through small openings, *f f*, fig. 2.

In manufacturing the above axle, I first cast it in

a mould, using a hard, brittle, and comparatively cheap metal, the cavity *e* in the journal being formed by means of a suitable core.

After being cast, the axle is placed in an annealing-furnace, where it is suffered to remain for from eight to ten days, this portion of the operation rendering the axle tough, malleable, and capable of being bent without breaking.

For the purpose of hardening the surface of the axle, and of improving the quality of the metal, it is finally submitted to the action of a carbonizing-furnace for from three to five days.

I have found, by repeated experiments, that axles cast and treated in the above manner are fully as tough and able to resist as great or greater strains as axles made of the best wrought-iron or steel, while their cost is considerably less than one-half of that of either of the latter.

Although in describing my improvement, I have illustrated but one form of hollow axle, it will be evident that this form may be varied without departing from my invention.

I therefore claim as my invention, and desire to secure by Letters Patent, as a new article of manufacture—

A hollow axle, cast, annealed, and hardened, substantially as and for the purpose herein set forth.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

JOSEPH B. WILSON.

Witnesses:

JOHN WHITE,  
HARRY SMITH.