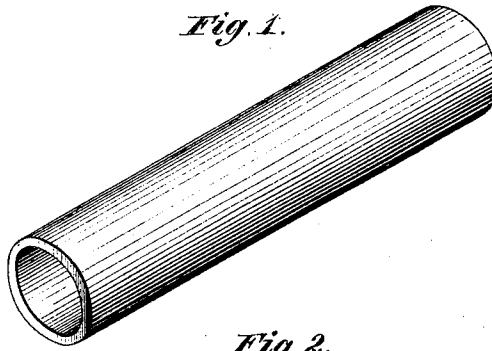


D. DALZELL.  
AXLE-BOXES.

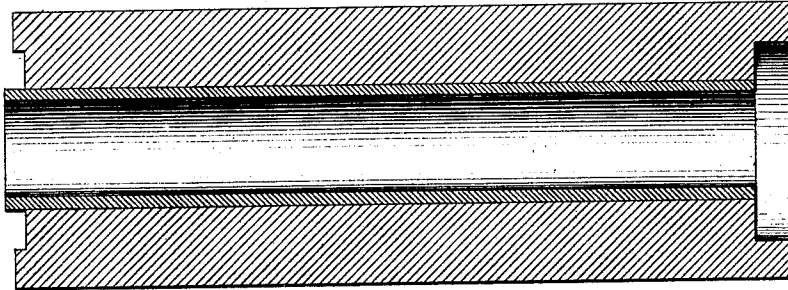
No. 175,943.

Patented April 11, 1876.

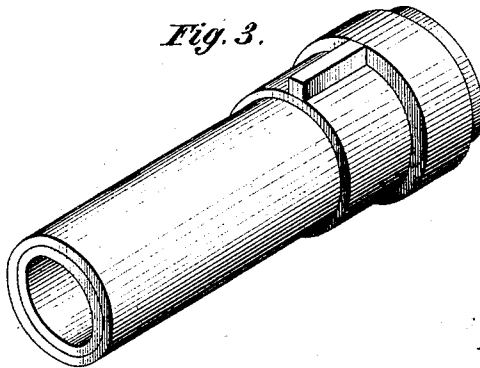
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



*Witnesses*

*Chas. H. Dorrice*  
*Geo. L. Pynington.*

*Inventor:*

*David Dalzell*

# UNITED STATES PATENT OFFICE.

DAVID DALZELL, OF SOUTH EGREMONT, MASSACHUSETTS.

## IMPROVEMENT IN AXLE-BOXES.

Specification forming part of Letters Patent No. **175,943**, dated April 11, 1876; application filed March 24, 1876.

*To all whom it may concern:*

Be it known that I, DAVID DALZELL, of South Egremont, county of Berkshire and State of Massachusetts, have invented a new and useful Improvement in Axle-Boxes for Carriages; and I hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawing, forming a part of this specification, in which—

Figure 1 is a perspective view of a box made of vulcanized paper. Fig. 2 is a longitudinal vertical section of a hub and box; and Fig. 3 is a perspective view of a modification, showing an ordinary box lined with the above-mentioned material.

The object of my invention is to produce an axle-box that will combine lightness and strength, and which will not heat and stick fast, as when iron or steel is employed.

This trouble and annoyance is entirely obviated in my invention, and which will be readily appreciated by those who have experienced the misfortune of a wheel sticking fast upon the road, and which occurs almost invariably beyond the reach of facilities for relief. It is also found in practice that a comparatively small quantity of oil is required in the use of this material, a saving of nearly one half being effected.

In the modification illustrated in Fig. 3 I have shown an ordinary box as lined with this material, which will be desirable in applying

my invention to heavy carriages; but for light vehicles this external box is dispensed with.

The box is secured within the hub in any well-known way—for example, by wedges or an adhesive composition; but I do not confine myself to any special means for effecting this; neither do I confine myself to any special form of box, as it is obvious that the material may be molded or turned into any well-known shape for this purpose.

This material is treated in any of the well-known methods for reducing paper-pulp and compressing it into form and incorporating any of the well-known gums, to effect a vulcanization of said material.

I am aware that it is not new to use prepared paper for this purpose, applied in a particular way, but I am not aware that vulcanized paper has heretofore been used.

Having fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. As a new article of manufacture, an axle-box made of vulcanized paper, substantially as set forth.

2. An axle made of vulcanized paper, in combination with an ordinary metal box, said vulcanized-paper box being arranged within the metal box, as shown and described.

DAVID DALZELL.

Witnesses:

CHAS. W. FORBES,  
THOMAS C. CONNOLLY.