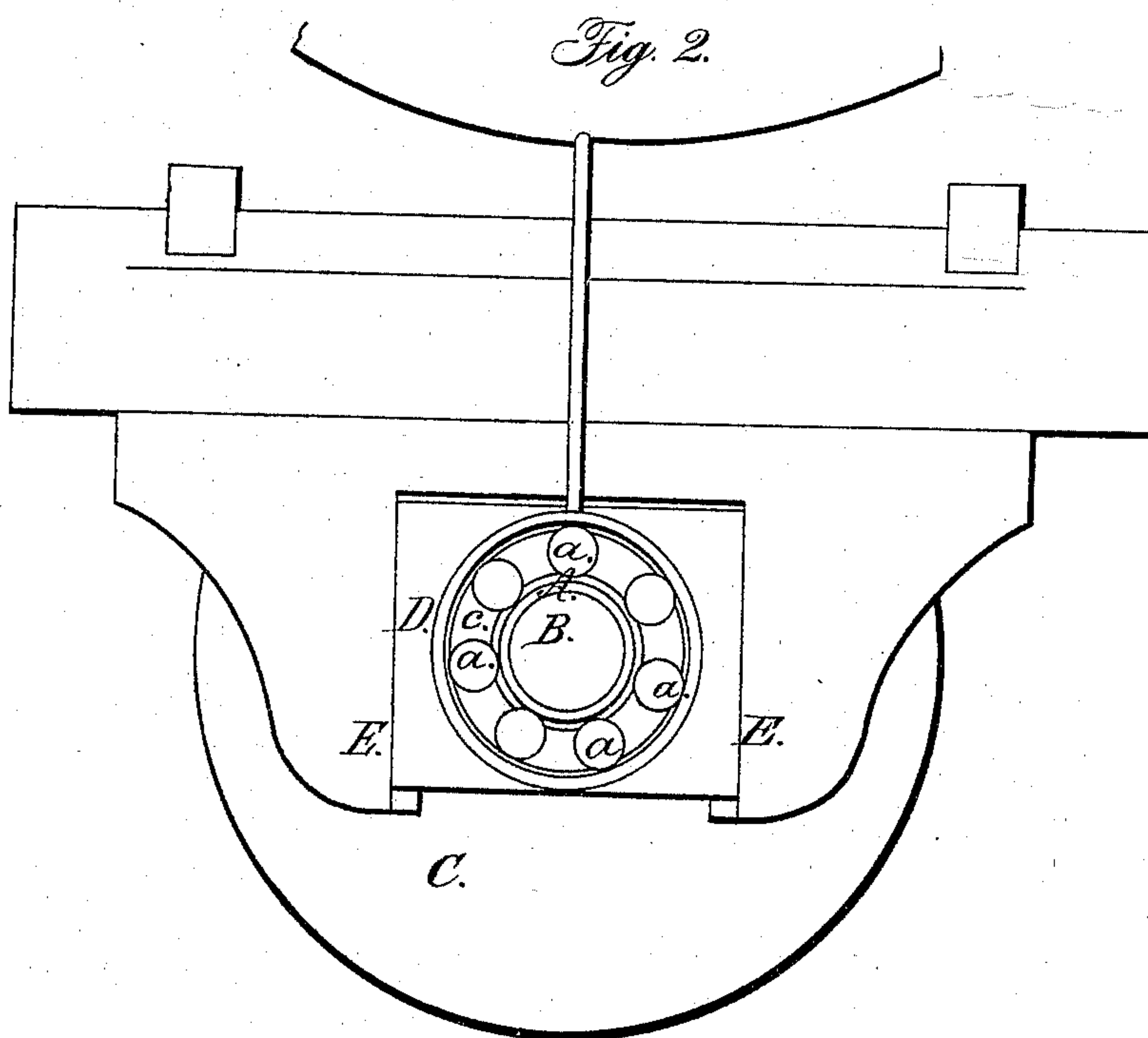
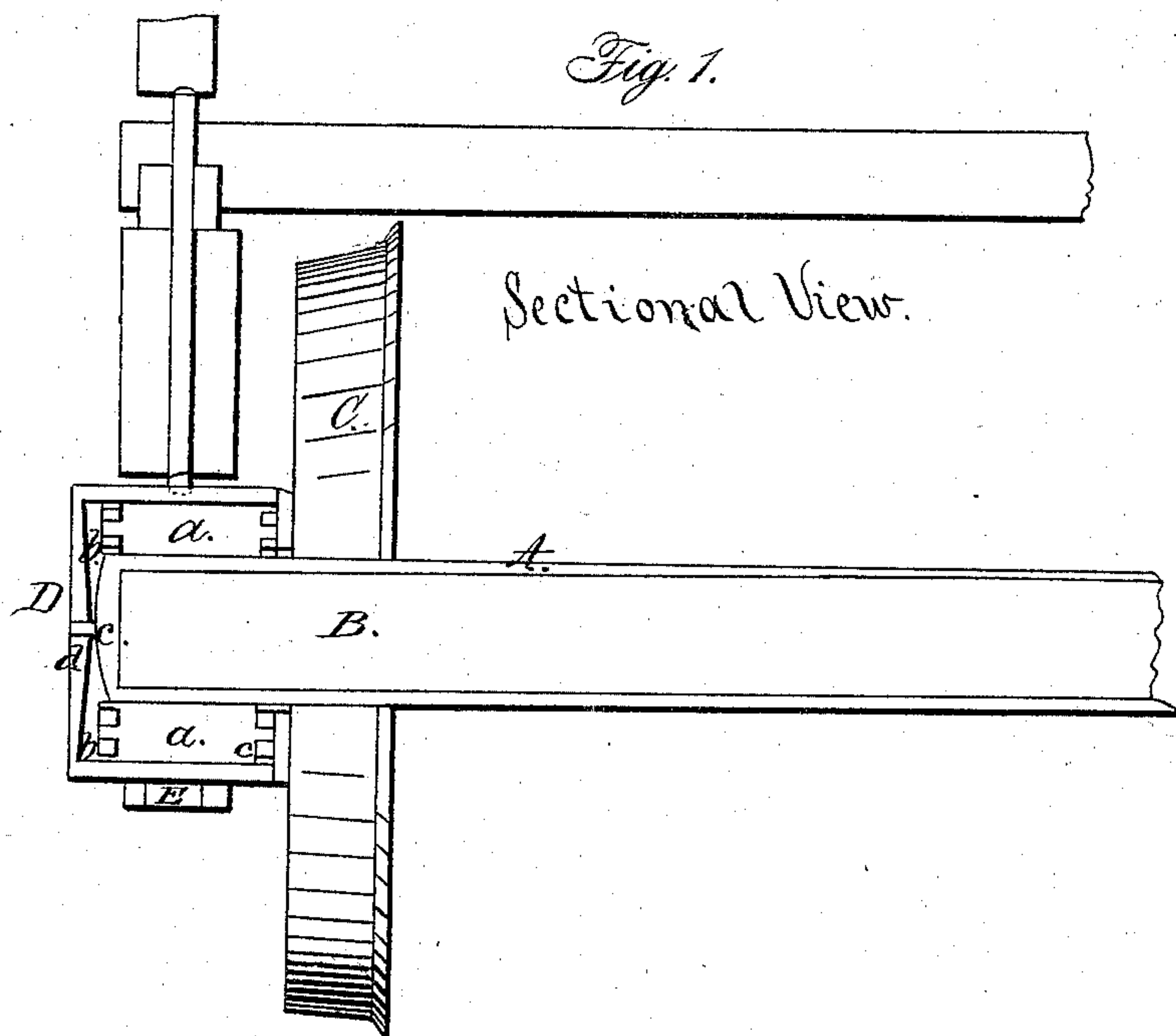


MILLER & BANCROFT.

### Car-Axle Box.

No. 3,377.

Patented Dec. 15, 1843.





# UNITED STATES PATENT OFFICE.

NATHL. MILLER, OF FRANKLIN, MASSACHUSETTS, AND EDWD. BANCROFT, OF PROVIDENCE, RHODE ISLAND.

## AXLE OF RAILROAD-CARS.

Specification of Letters Patent No. 3,377, dated December 15, 1843.

*To all whom it may concern:*

Be it known that we, NATHANIEL MILLER, of Franklin, in the county of Norfolk and State of Massachusetts, and EDWARD BANCROFT, of Providence, in the county of Providence and State of Rhode Island, have invented a certain new and useful Improvement in the Construction of Axles for Railway-Carriages, and that the following description, taken in connection with the accompanying drawings, constitutes a full and exact specification of the same.

Of the drawings above mentioned Figure 1 represents a vertical and longitudinal section of one of our improved axles and the bearings thereof as attached to a railway car. Fig. 2 is a vertical and transverse section of one of the ends or journals of the axle, together with the antifriction wheels upon which it revolves.

The axle A, Figs. 1 and 2, is a hollow cylinder or tube of wrought iron or other suitable metal; the interior bore of the said cylinder being of sufficient size to receive within it a solid cylinder B of hard wood, which is driven and keyed firmly into it, and is in length about equal to that of the tube, and in its diameter it is of such size that should the outer case or tube break at any time, the strength of the wood shall be sufficient to sustain the carriage and thereby prevent accidents consequent on the fracture of an axle of the ordinary kinds heretofore used.

The axle is of the usual length and the wheels C C are of the usual form and are fixed thereto in any convenient manner.

Each end of the axle extends beyond its wheel far enough to constitute a journal of the desired length for the antifriction box D, which consists of a hollow cylinder of cast iron or other suitable material and of such diameter as to admit of a series of antifriction rollers *a, a, a*, &c., between the exterior surface of the journal of the axle and the interior surface of the same box. The rollers *a, a, a*, &c., of each journal are supported or held in position by means of two rings *b, c* (there being one ring at each extremity of each of the said series of rollers as seen in Fig. 1,) each of the said rollers having small journals formed on each of its ends which are supported and revolve in corresponding bearings formed in the rings. As the journal of the axle

is surrounded by the series of rollers *a, a, a*, which are in contact therewith, and as these said rollers are also in contact with the interior cylindrical surface of the box D, each roller, when the journal revolves is brought up in regular succession to take its due share of the bearing. These rollers may also be used without the rings. The lateral or side motion of the car upon the axle, is prevented by an arrangement of the box and axle which brings the pressure on the center *c* of the metallic end *f* of the journal of the axle and the center of the inside head *d* of the box D both of which are hardened to resist wear. By this arrangement all the side pressure or lateral strain is removed from the shoulder of the axle, as well as from the ends of the rollers and brought to a point where the friction will be least. The surfaces (in apposition) of the ends of the axle and box are made convex or as seen in the drawing. The antifriction box D is sustained between guides E, E and by means of a spring, as the boxes of axles are usually supported.

It is well known that a certain amount of metal thrown into a tubular shape will resist a very increased strain in comparison to what it will when in a solid cylindrical form. Consequently less metal is requisite in the construction of the outer shell of the axle than is now necessary for the solid axle. Therefore an axle constructed in the above manner and mounted on antifriction rollers will bear a much greater strain and be less liable to fracture than a solid one.

We claim—

The above described method of constructing the axles of a railway carriage viz by means of an outer metallic shell or tube in combination with an inner cylindrical or other suitable and similar shaped wooden core fitted therein and acting therewith, substantially in the manner before set forth.

In testimony that the above is a correct specification of our said invention we have hereto set our signatures this twenty-third day of August of the year one thousand eight hundred and forty three.

NATHANIEL MILLER.  
EDWARD BANCROFT.

Witnesses:

JAMES T. RHODES,  
HENRY MARTIN.