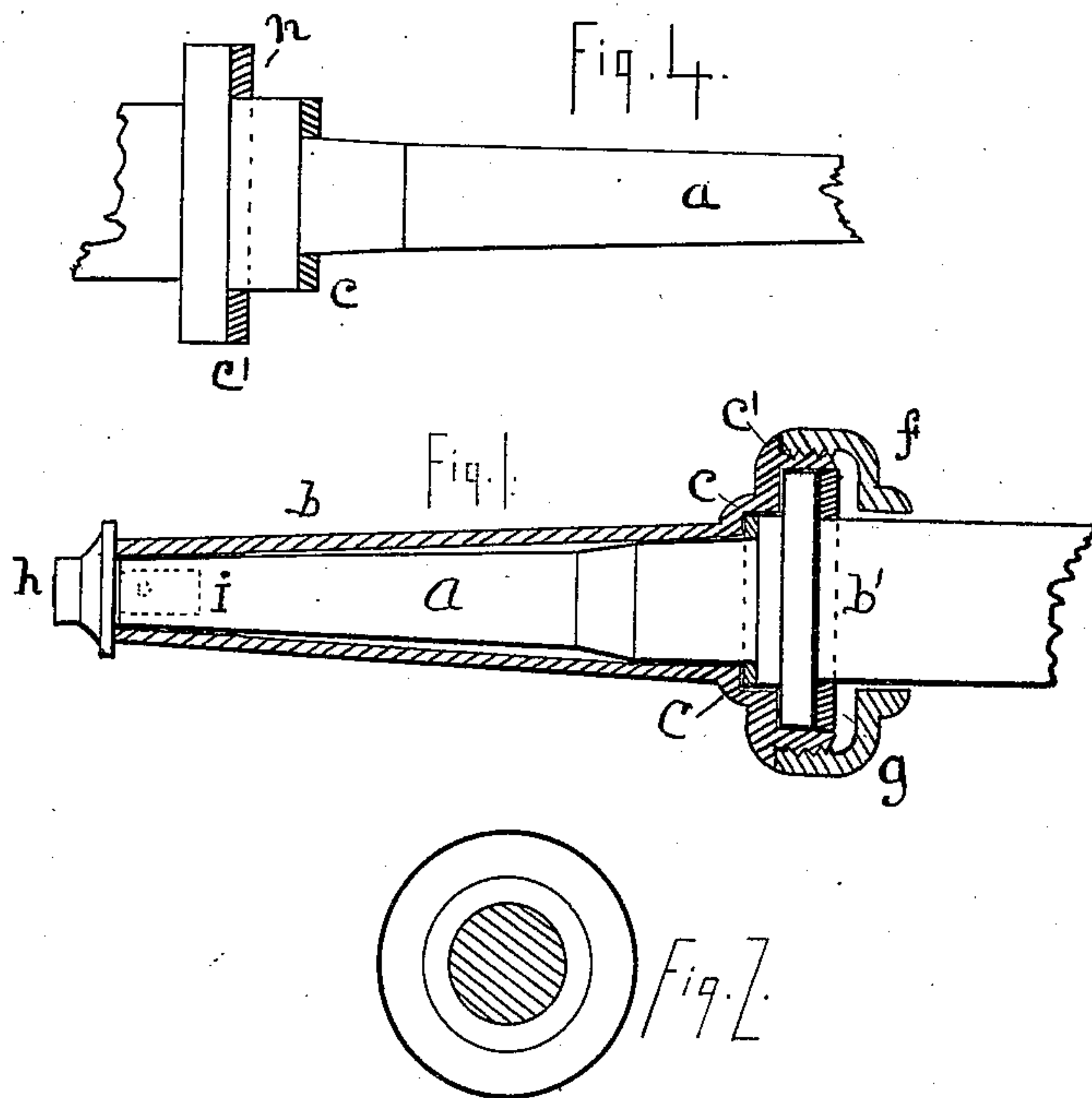


(No Model.)

B. F. HORTON.
AXLE FOR VEHICLES.

No. 306,754.

Patented Oct. 21, 1884.



WITNESSES.
L. P. Whaley.
J. P. Rankin.

B. F. Horton,
INVENTOR.

UNITED STATES PATENT OFFICE.

BENJAMIN F. HORTON, OF ITHACA, NEW YORK.

AXLE FOR VEHICLES.

SPECIFICATION forming part of Letters Patent No. 306,754, dated October 21, 1884.

Application filed June 9, 1884. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN F. HORTON, a citizen of the United States, and a resident of Ithaca, Tompkins county, New York, have invented an Improved Axle for Vehicles, of which the following is a specification, reference being had to the accompanying drawings.

My object is to make an axle and its hub-boxing little liable to wear, and to provide for the oiling of the same.

My axle has the fastening-screw preferably at the base or inner end of the boxing, but may have that screw at its outer end or at its point. Both forms are seen in the drawings. And my invention relates, mainly, to the prevention of the wear that takes place at the shoulder of the box. The outer end or point wears considerably; but most wagons having a "gather" to the wheels thrust the box against the base, shoulder, or inner bearing on the axle; hence the wear is the greatest at this place. To obviate this I make here two bearing surfaces or shoulders—one with a leather collar, and the other, without a leather collar, is a metallic bearing, and thus it is apparent that I enlarge the wearing-surfaces and give two kinds of material for the wear—leather and metal. One of the shoulders I prefer to make of bell-metal or other slow-wearing metal, and put it on the axle tightly. This, being adjustable, provides, by substituting a thicker metal collar, for the wear of the outer end of the box. The shoulders—two or three in number—may be made in one piece of bell-metal, fitted to put on and take off of the axle. My invention will be apparent as I describe it.

Figure 1 is a side sectional elevation of my axle and its box. Fig. 2 is a transverse section of the axle. Fig. 3 is an axle without the base fastening-screw and with an adjustable metallic shoulder-piece on the axle, with three bearing-shoulders—two with leather collars and one a metallic bearing. Fig. 4 shows a metallic collar or washer on the metallic bearing-shoulder.

In the drawings, *a* is the axle, and *b* is the axle-box. In most of the figures there are two shoulders, *c c'*; but Fig. 3 has a third shoulder, *c''*. In all the figures except Fig. 3 leather collars are back of the shoulders, between the

shoulders and the locking-nut *f*, which are marked *g*. The divided or step-like shoulders give the large shouldering spoken of and the large wearing-surfaces for the base of the box, this base end being fitted to the shapes of the axle that has been described. When this base locking-nut is used, a screw-cap, *h*, closes the front or outer end of the box, and this provides that the oil-cavity *i* in the end of the axle (indicated by dotted lines) shall both give oil to the axle or receive any surplus oil of the axle into the said cavity. When the other form of Fig. 3 is used, an escape and entrance hole must be used to make connection with the oil-chamber.

The divided step-shaped shouldering at the base of the box bearing on the axle can be made as seen in Fig. 3, where *k* is the iron base-collar that sustains the thrust of the wagon-wheel, and over this is put the bearing-piece *m*, made preferably of bell-metal, being constructed to fit closely the iron base-collar on the one side and the box on the other, there being leather collars on the divided shoulders, except one. By varying the thickness of this bell-metal shoulder-piece there is provision for the wear of the box and shoulders, a thicker one being substituted, or leather collars being put between the iron base-shoulder *k* and the metal piece *m*. When the step-shouldering is made as a part of the axle, as in Fig. 4, with a bell or other durable metal collar, *n*, on the metallic bearing-shoulder *c'*, and this wearing has loosened the wheel, there is a thicker metal collar put on this shoulder in place of the one too thin.

The especial advantage of leather collars on one or more shoulders is the absence of noise, while the metallic bearing-shoulder gives firmness to the wheel greater than leather.

The end bearings or surfaces of the base of the axle and box are the main ones sought as subject-matter of invention; yet it is clear that the sides of the steps are bearing-surfaces also. The other advantages, uses, and construction of my invention are apparent.

What I claim is—

1. In vehicle-axles, the separate and removable piece or rim *m*, provided with steps or enlargements expanding in succession to

ward its base, and fitted to and held in its place between the base-collar *k* and axle-box *b*, as set forth.

2. An axle made with a rim, *k*, at its base, 5 in combination with a metallic inside piece, *m*, the hub-box being fitted to the said piece, as shown and described.

3. An axle as a combined whole, consisting of the axle *a*, with base-knob *k*, to which is

fitted the separate piece *m*, with a hub-box 10 fitted to the metallic piece and to the axle, and the axle provided with an endwise-made oil-cavity, *i*, as shown and described.

BENJAMIN F. HORTON.

Witnesses:

P. J. PARTENHEIMER,
S. J. PARKER.