(No Model.)

A. JOHNSON.

VEHICLE AXLE.

No. 456,766. Patented July 28, 1891.

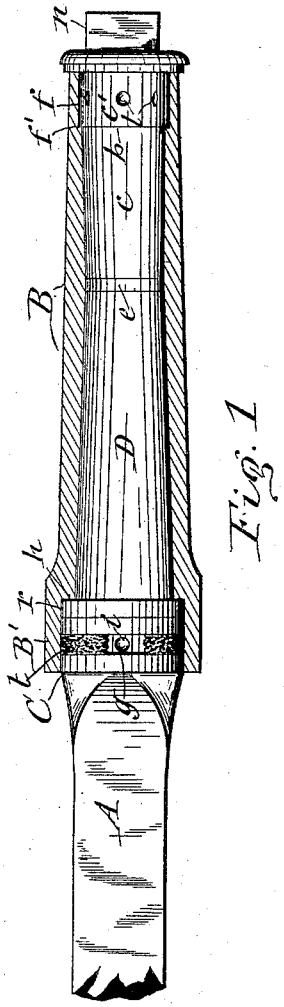

Fig. 1

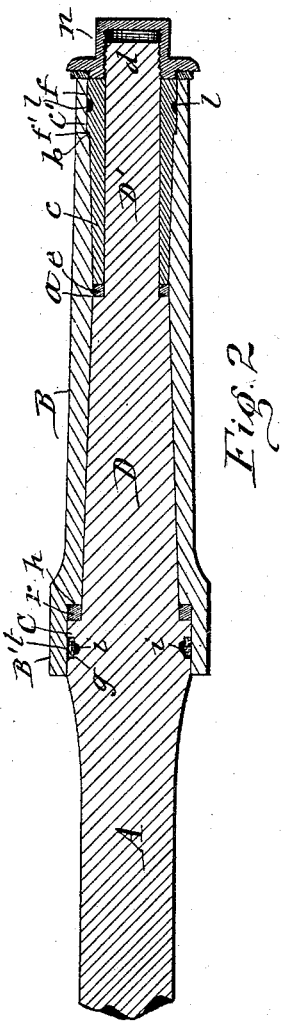

Fig. 2

WITNESSES:
J. J. Laass.
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INVENTOR:
Alexander Johnson
By Dull, Laass & Dull
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UNITED STATES PATENT OFFICE.

ALEXANDER JOHNSON, OF CAMILLUS, NEW YORK, ASSIGNOR OF ONE-HALF TO E. D. LARKIN, OF SAME PLACE.

VEHICLE-AXLE.

SPECIFICATION forming part of Letters Patent No. 456,766, dated July 28, 1891.

Application filed December 15, 1890. Serial No. 374,690. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER JOHNSON, of Camillus, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Vehicle-Axles, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to the class of vehicle-axles which are provided with longitudinally-adjustable inwardly-tapering journal-bearings on the outer end portions of the spindles for the purpose of taking up the wear between the journal-box and its bearings on the axle. Said axles have heretofore had the inwardly-tapering journal-bearing formed with a screw-threaded bore by which it was screwed onto a correspondingly-screw-threaded end portion of the spindle, and the journal-box was formed of two separate end portions tapered externally and internally. Such a construction has been found defective in several respects, viz: In case the journal-box becomes bound on the adjustable inwardly-tapering end portion of the spindle by reason of neglect of lubricating the same, or by becoming heated or gummed, the said end portion of the spindle being thus compelled to turn with the wheel, causes the former to be screwed up tighter on the spindle and become so tightly wedged in the journal-box and against the fixed portion of the spindle as to prevent the wheel from turning or twisting off the end portion of the spindle. Furthermore, it is exceedingly difficult to set the divided box accurately in the hub of the wheel. The box-sections, being tapered externally as well as internally, must of necessity be set separately into the hub from opposite ends thereof, and are therefore liable to be out of line with each other.

The object of this invention is to obviate the aforesaid defects and to generally improve the construction and operation of axles of the aforesaid class; and to that end the invention consists in the construction and combination of parts hereinafter fully described, and specifically set forth in the claims.

In the annexed drawings, Figure 1 is a side view of an axle-spindle and longitudinal section of the journal-box embodying my improvements, and Fig. 2 is a longitudinal section of the axle-spindle with the box mounted thereon.

Similar letters of reference indicate corresponding parts.

A represents one of the end portions of the axle, which is provided with the collar C, from which extends the spindle upon which the wheel of the vehicle is mounted. This spindle I form with the outwardly-tapering portion D, extending from the collar C part way the length of the spindle, and with the smooth cylindrical outer end portion D′, which terminates with the screw-threaded nipple *d*, as shown in Fig. 2 of the drawings. The cylindrical portion D′ is smaller in diameter than the adjacent end of the tapering portion D, and thus the shoulder *a* is formed at the junction of said spindle portions. On the cylindrical portion D′, I place a closely-fitting sleeve *c*, which is also cylindrical and smooth internally to allow it to slide rectilineally and also turn on said spindle portion without danger of becoming thereby bound in the box B, which is one of the defects of other axles of this class which have the outer end portion of the spindle screw-threaded and the thimble or sleeve correspondingly screw-threaded. In such axles the said thimble or sleeve is liable to turn with the box, and in turning on the screw-threaded portion of the spindle the said thimble or sleeve is caused to move inward and to become wedged tightly in the box. The exterior of the sleeve *c* is tapered toward its inner end, and preferably formed with a collar *c′* on its outer end and a shoulder *b* at the junction of said collar with the tapering portion of the sleeve.

B denotes the journal-box, which I form in one piece and with the usual longitudinally straight and slightly-tapering exterior, and is thus adapted to be set in the hub of the wheel as easily as any common journal-box. The interior of the box is tapered from opposite ends to the junction of the two spindle portions D D′ and to conform to the tapers of the spindle portion D and sleeve *c*, and is placed upon the same by withdrawing the sleeve *c* from the spindle, then sliding the box onto the spindle portion D, and then slipping the sleeve *c* onto the spindle portion D′;

or the said sleeve may be placed into the box and slipped onto the spindle portion D′ simultaneously with the sliding of the box onto the spindle portion D. Said sleeve and box are retained on the spindle by the usual nut *n*, applied to the nipple *d*. The sleeve *c* is made somewhat shorter than the spindle portion D′, and a ring *e*, of leather or other suitable material and of proper thickness, is placed between the inner end of the sleeve and the shoulder *a* to properly fit the sleeve to the interior of the box, which latter is also formed with a circumferential recess *f* in the outer end of its interior to closely embrace the collar *c*′ of the sleeve, and with a shoulder *f*′, by which it abuts against the shoulder *b* of the sleeve. Another ring *r*, of leather or other suitable material, is interposed between the inner edge of the collar C and shoulder *h* in the interior of the box B, for the purpose hereinafter explained. The inner end of the box is formed with an extension B′ over the collar C, and the latter is formed with a circumferential groove *g*, in which is inserted a packing-ring *t* for the purpose of excluding dust and grit from the interior of the main portion of the box and also for preventing the lubricant from escaping through the inner end of the box. I also prefer to form in the groove *g* indentations *i i* for the retention of sufficient lubricant for the packing-ring *t*. The collar *c*′ I also lubricate by providing the same with indentations *l l* for containing lubricant.

When the bearings of the box B become worn, so as to be too loose on the spindle, the box and sleeve *c* are to be removed from the spindle and thinner rings to be substituted for the rings *e* and *r*, and then the box and sleeve are to be replaced on the spindle and the nut *n* to be screwed up against the end of the sleeve *c*. By these means the box B becomes seated on larger portions of the spindle portion D and sleeve *c*, and is thus tightened sufficient to take up the wear.

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

1. The combination of the axle-spindle formed with the outwardly-tapered inner end portion D and smooth cylindrical outer end portion D′, terminated with the screw-threaded nipple *d*, the sleeve *c*, formed cylindrical and smooth internally and tapered externally toward its inner end, the box B, straight externally and tapered internally from opposite ends to the junction of the spindle portions D D′, and the nut *n* on the nipple *d*, substantially as described and shown.

2. The combination of the axle-spindle formed with the outwardly-tapered inner end portion D, smooth cylindrical outer end portion D′ smaller in diameter than the adjacent end of the portion D and terminated with the screw-threaded nipple *d*, the shoulder *a* at the junction of the said spindle portions, the ring *e*, seated on said shoulder, the sleeve *c*, formed cylindrical and smooth internally and tapered externally toward its inner end, the box B, tapered internally from opposite ends to the junction of the spindle portions D D′ and formed straight externally, and the nut *n* on the nipple *d*, all constructed and combined substantially as described and shown.

3. The combination of the axle-spindle formed with the collar C, the outwardly-tapered inner end portion D, cylindrical outer end portion D′, shoulder *a*, and nipple *d*, the sleeve *c*, formed cylindrical and smooth internally and with the collar *c*′ and shoulder *b* and inward taper externally, the rings *e* and *r*, respectively on the shoulders *a* and collar C, the box B, formed in one piece straight externally and having its interior tapered from opposite ends and formed with the recess *f* and shoulders *f*′ and *h*, and the nut *n* on the nipple *d*, substantially as described and shown.

In testimony whereof I have hereunto signed my name this 6th day of December, 1890.

ALEXANDER JOHNSON. [L. S.]

Witnesses:
J. J. LAASS,
MARK W. DEWEY.