

(No Model.)

J. A. RUMRILL.
AXLE SPINDLE AND BOX.

No. 567,515.

Patented Sept. 8, 1896.

Fig. 1

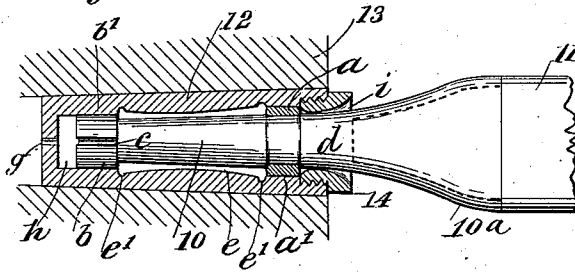


Fig. 2.

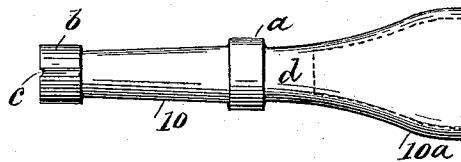


Fig. 3.

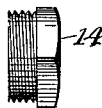
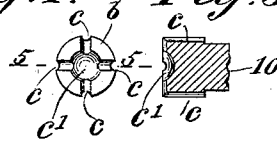


Fig. 4. Fig. 5.



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JOHN ALBERT RUMRILL, OF SALINA, KANSAS.

AXLE-SPINDLE AND BOX.

SPECIFICATION forming part of Letters Patent No. 567,515, dated September 8, 1896.

Application filed April 20, 1896. Serial No. 588,356. (No model.)

To all whom it may concern:

Be it known that I, JOHN ALBERT RUMRILL, of Salina, in the county of Saline and State of Kansas, have invented new and useful Improvements in Axle-Spindles and Boxes Therefor, of which the following is a full, clear, and exact description.

This invention relates to the spindles and boxes for vehicle-axles, and has for its object to provide improved features of construction for devices of the indicated character which will render the box and axle-spindles easy to lubricate at their points of contact and afford means for storing a quantity of the lubricating liquid within the box, convenient to the spindle-bearings, which said liquid will continue to automatically lubricate while it lasts.

The invention consists in the construction and combination of parts, as is hereinafter described, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a longitudinal sectional view of the improved spindle-box engaging a vehicle-hub, shown in part, and a side view of the improved axle-spindle in place within the box. Fig. 2 is a detached side view of the axle-spindle. Fig. 3 is a detached side view of a nut that in service loosely retains the spindle in the axle-box and has novel features of construction. Fig. 4 is an end view of the improved axle-spindle, and Fig. 5 is a longitudinal sectional view of the outer end portion of the axle-spindle on the line 5 5 in Fig. 4.

The spindle 10 may be formed integral with the axle 11, if the latter is of metal, or have an enlarged socketed stub end 10^a for reception of the correspondingly-shaped end of a wooden axle, as is indicated by dotted lines in Figs. 1 and 2, which parts are secured together by any suitable means. The spindle proper has a cylindrical journal *a* formed or secured on its body near the neck of the stub end 10^a and another cylindrical journal *b* of less diameter produced at its free end, said journal *b* having its body longitudinally grooved, as at *c*, for the free passage of lubricant from the outer end of the spindle, as will be further explained. The spindle-body that extends between the bearings *a* and *b* is preferably

given a slight taper toward the latter-mentioned bearing.

The neck *d* on the stub end 10^a should be nearly of an equal diameter with that of the spindle-body adjacent to the bearing *a*, so that the rear edge of the latter will form a shoulder which projects above the neck. At the front end of the spindle a depression *c'* is produced, which is intersected by the longitudinal grooves *c*, that extend around the front end of the spindle, as best shown in Figs. 4 and 5.

The axle-box 12 is cylindric and slightly tapered from its rear end to adapt it for ready insertion in a wheel-hub 13, wherein it is to be driven as usual. There are two bearings *a'* *b'* formed in the hollow box 12. Said bearings have such relative diameters across their bores and are so located in the box that the journals *a* and *b* will respectively have a proper running engagement with said bearings.

There is a chamber *e* produced in the axle-box between the bearings *a'* *b'*, having its defining-wall slightly contracted toward the longitudinal center of the chamber from said bearings, and at the inner shoulder of each bearing an annular groove *e'* is formed, as shown in Fig. 1. An oil-hole *g* of comparatively small diameter is produced in the outer closed end of the box 12. If the axle 11 is metallic, the stub end 10^a will be of a diameter no thicker than the neck *d*, and will permit the location thereon of an externally-threaded collar-nut 14, that will loosely fit said neck, it being understood that the complete axle, which in the process of manufacture is formed in two pieces, may have the slidable collar-nuts 14 placed thereon before the two axle-stubs are welded together. Preferably, however, the collar-nuts for both axle-stubs are slid on from the front ends of the spindles, provision to effect this consisting of the following-described construction: The journal *a* is made in the form of a separate ferrule, which will slide over the journal *b* when expanded by heat, and its subsequent contraction while cooling will cause said cylindric ferrule to become firmly seated in a shallow depression formed in the spindle to receive it, as indicated by section in Fig. 1.

The collar-nut 14 is preferably provided

with a coniform aperture to adapt it for sliding into place on the neck *d* of the stub end 10^a, the shape of which aperture will permit the formation of a crevice *i* at the outer end of said nut when in position on said stub end. The exterior threaded surface of the collar-nut extends from the inner end for a portion of its length, the remaining portion being rendered polygonal to facilitate its adjustment with a wrench or other tool.

There is an internal thread formed in the bore of the axle-box 12 at the end which projects rearward from the journal *a* for reception of the threaded portion of the collar-nut 14, the end of which has a loose contact with the rear shoulder on said journal, which will retain the spindle in running engagement with the axle-box.

In service the lubricating liquid is introduced from the spout of a can through the oil-hole *g* into the space *h* at the end of the box which intervenes the end wall of said box and the adjacent end of the spindle 10. From the oil-chamber *h* the lubricating-liquid flows through the channels or grooves *c* into the chamber *e*, and a sufficient quantity of the lubricant should be so introduced to serve for oiling the spindle and box a considerable length of time. The side wall of the chamber *e*, being contracted near the center of its length, insures the delivery of the lubricating liquid to the contacting surfaces of the journals *a b* and bearings *a' b'*, and if there are any impurities in the oil such residuum will be lodged in the annular grooves *e'*.

Any refuse matter from the journal *a* that is expelled at the rear end of the same will work out of the crevice *i* between the collar-

nut 14 and neck *d* of the axle stub end, so that the proper lubrication of the spindle and box bearings will be maintained while sufficient oil or other liquid lubricant remains in the chambers of the axle-box.

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

1. The combination with an axle-spindle, having an integral journal-bearing at its outer end, and a securable journal-bearing of increased diameter near its inner end, said journal-bearings having greater diameter than the intervening body of the spindle, of an axle-box having the wall across its outer end provided with an oil-hole, and internally threaded at its opposite end, and a collar-nut threaded to engage said internal thread when in place on the neck of the axle adjacent to the spindle, substantially as described.

2. The combination with an axle-spindle having a socketed stub end, and furnished with a longitudinally-grooved journal-bearing at its opposite end, and a securable journal-bearing in ferrule form engaging the spindle near the stub end, of an axle-box mainly closed by a cross-wall at its outer end, and having hollow bearings spaced by an annular chamber, which bearings engage the journal-bearings of the spindle, and a collar-nut on the neck of the stub end, externally threaded to engage an internal thread in the adjacent end of the axle-box, substantially as described.

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Witnesses:

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