(No Model.)

W. H. BUSTIN.

VEHICLE AXLE.

No. 522,402. Patented July 3, 1894.

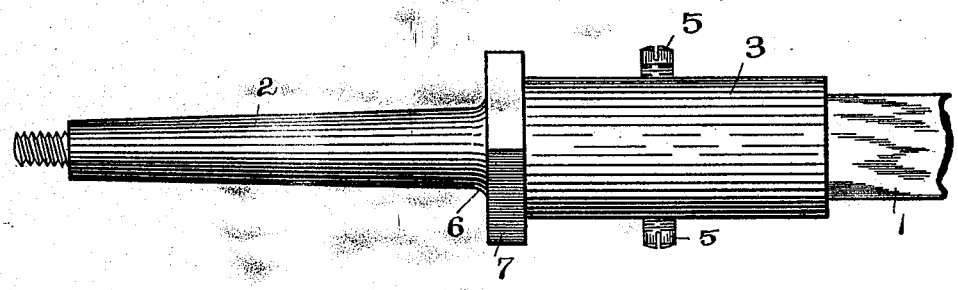

FIG. 1

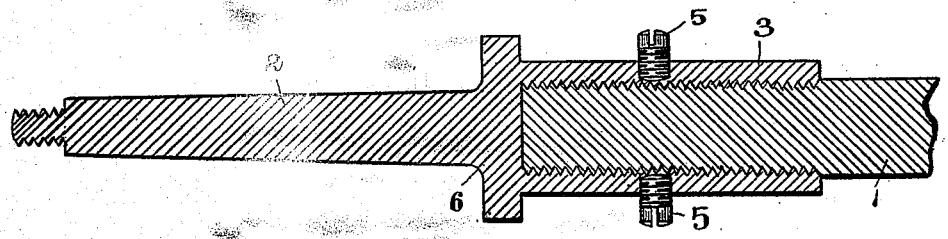

FIG. 2

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UNITED STATES PATENT OFFICE.

WILLIAM H. BUSTIN, OF WATERTOWN, MASSACHUSETTS, ASSIGNOR TO THE BUSTIN MANUFACTURING COMPANY, OF PORTLAND, MAINE.

VEHICLE-AXLE.

SPECIFICATION forming part of Letters Patent No. 522,402, dated July 3, 1894.

Application filed November 11, 1893. Serial No. 490,655. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. BUSTIN, a citizen of the United States, residing at Watertown, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Vehicle-Axles, of which the following is a specification, reference being had therein to the accompanying drawings.

Heretofore, detachable spindles for vehicle axles have been devised with the end in view of rendering more easy and expeditious the process of repairing or replacing an injured or broken spindle of a vehicle-axle.

My invention has for its object to provide an improved form of detachable or interchangeable spindle which shall be of simple, strong and serviceable construction, and free from liability to breakage of the spindle proper at the inner or supporting end thereof. The construction which I have contrived with these ends in view is strong and substantial, and free from the said liability to breakage at the point indicated; it also is of such a character that, when occasion requires, it may be readily and conveniently removed from its axle, to be repaired and replaced, or to have another substituted in lieu thereof.

Ordinarily, that is when detachable spindles are not employed, in the case of injury to the spindle of the axle of a vehicle, or of breakage of the same, it is necessary to disconnect the axle from the vehicle in order to permit of repairs, or the substitution or application of a new spindle. This involves considerable labor and expense, also loss of the use of the vehicle for the necessarily extended period of time during which the repairs are being effected, or while a new spindle is being joined to the axle.

My invention consists in a certain construction and combination of parts comprising an improved detachable spindle which is held in place on the end of an axle in novel and improved manner, thus not only permitting of its ready removal when required and the convenient substitution of a new spindle, and not only rendering it unnecessary to detach the axle from the vehicle, when it is required that repairs to an injured spindle shall be made, or that a new spindle shall be substituted for an injured or broken one, but reducing the labor and expense of repairing or replacing and also greatly reducing the amount of time required for such work and during which the vehicle cannot be used.

The invention also includes an improvement in the construction of the spindle which renders it less liable to break than heretofore. The invention will first be described with reference to the accompanying drawings, after which the characteristic features thereof will be particularly pointed out and clearly defined in the claims at the close of this specification.

In the drawings, Figure 1 is a view showing in side elevation one end of an axle, with its spindle, and illustrating one embodiment of my invention. Fig. 2 is a view showing the said parts in vertical longitudinal section.

At 1 in the drawings is shown the end of an axle, and at 2 a spindle. My improved manner of connecting the spindle with the axle is by means of a sleeve or box formed or connected with one of such parts, which sleeve or box receives and fits over the end of the other thereof. This sleeve or box is shown at 3 in the drawings. In the embodiment of my invention which is represented in the said figures, the spindle extends centrally from the said sleeve or box, which latter is somewhat greater in diameter than the former, and the said sleeve or box passes over the end of the axle. The interior of the sleeve or box and exterior of the end of the axle are screw-threaded so as to enable the sleeve or box to be screwed upon the end of the axle, undesired movement of the sleeve or box upon the end of the axle, after the former has been applied properly to the latter, being prevented by a screw or screws 5 passing through a threaded hole or holes in the side of the sleeve or box and taking bearing by the end or ends thereof against the thread of the end of the axle. The portion 7 of the sleeve or box is shown made polygonal to fit it for the reception of a tool by which the spindle and sleeve or box may be rotated in applying the same to an axle, or in effecting the removal thereof.

As will be apparent, the spindle shown in the drawings may be removed readily and conveniently from the axle without discon-

necting the latter from the vehicle, and as readily replaced, or may immediately have a new one substituted in lieu thereof.

Heretofore, when detachable spindles have been applied to vehicle axles, the connection of the former with the latter usually has been effected by forming the end of the vehicle axle hollow and making the spindle with an extension which has been passed into the hollow end of the axle and there secured. In many cases, the securing has been effected by screw threading the parts and screwing the extension of the spindle into the threaded socket provided therefore in the axle. This formation of a socket in the axle occasions a weakening of the axle which is obviated by my invention.

Ordinarily the rounded surface of the spindle of an axle meets at right angles, or approximately so, the shoulder which is formed on the axle at the inner end of the spindle. In consequence of the existence of this angle there always exists a liability of the spindle snapping off short at the point where it joins the said shoulder. This liability results from the properties of the metal of which the spindle and axle are composed, and the existence of an entrant angle at the junction of the spindle and said shoulder. To obviate such tendency to breakage, I so form the parts as to avoid forming the said entrant angle. Thus, I cause the radial or outwardly extending lines of the shoulder, and the longitudinal lines of the spindle, to gradually curve toward each other adjacent to and at the junction, as indicated at 6, so as that there is no break or angle whatever, only a slightly concave rounded surface. This completely avoids the weakening of the metal due to the formation of an entrant angle.

I claim as my invention—

1. The combination with the axle, of a spindle formed with a sleeve or box receiving and fitting onto the end of the axle, the sleeve or box and axle being threaded and screwed together, and screws passing transversely through the sleeve or box and engaging with the axle, substantially as described.

2. The combination with the axle, of a spindle having a sleeve or box receiving and fitting onto the end of the axle and formed at the junction of the spindle-stem and the said sleeve or box with a concave surface of gradual curve, whereby liability to break at the junction is obviated, the said sleeve or box and axle being threaded and screwed together, substantially as described.

3. The combination with the axle, of a spindle having a sleeve or box receiving and fitting onto the end of the axle and formed at the junction of the spindle-stem and the said sleeve or box with a concave surface of gradual curve, whereby liability to break at the junction is obviated, the said sleeve or box and axle being threaded and screwed together, and screws passing transversely through the sleeve or box and engaging with the axle, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM H. BUSTIN.

Witnesses:

WM. A. MACLEOD,

CHAS. F. RANDALL.