

No. 735,552.

PATENTED AUG. 4, 1903.

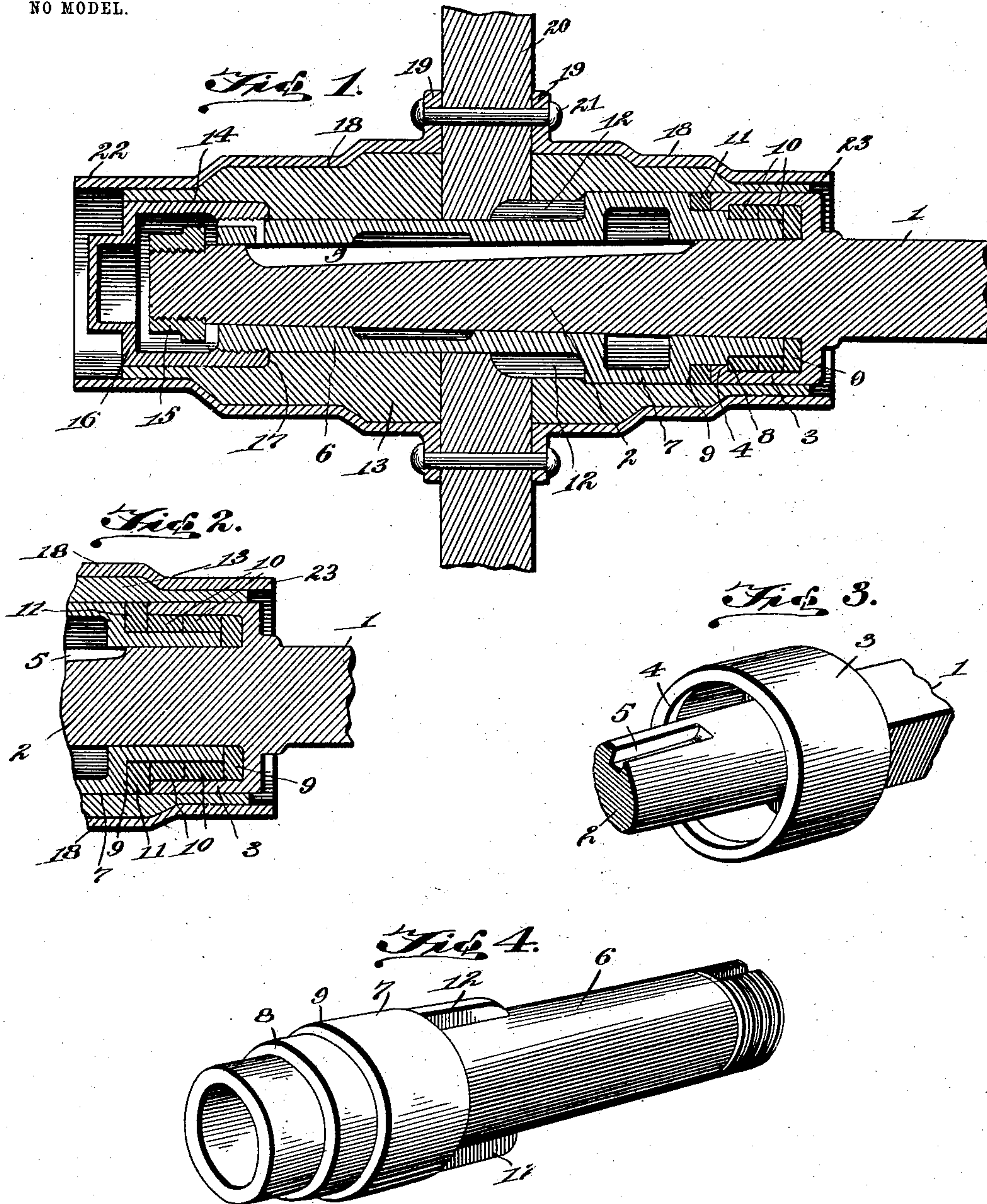
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VEHICLE HUB.

APPLICATION FILED JUNE 6, 1902.

NO MODEL.



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UNITED STATES PATENT OFFICE.

ISBON METZGER, OF WINFIELD, IOWA; OLIVER METZGAR AND SAMUEL METZGAR ADMINISTRATORS OF SAID ISBON METZGER, DECEASED.

VEHICLE-HUB.

SPECIFICATION forming part of Letters Patent No. 735,552, dated August 4, 1903.

Original application filed February 28, 1902, Serial No. 96,133. Divided and this application filed June 5, 1902. Serial No. 110,366. (No model.)

To all whom it may concern:

Be it known that I, ISBON METZGER, a citizen of the United States, residing at Winfield, in the county of Henry and State of Iowa, have invented a new and useful Vehicle-Hub, of which the following is a specification.

This invention relates to hub-bearings, and is a divisional part of my prior application filed February 28, 1902, Serial No. 96,133.

The object of the present invention is to provide certain new and useful improvements in hubs whereby the latter are materially strengthened and stiffened and is particularly designed to provide an improved construction and arrangement of hub-box and axle-spindle whereby the latter is braced and inward thrust of the hub is effectually taken up.

With these and other objects in view the present invention consists in the combination and arrangement of parts, as will be hereinafter more fully described, shown in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that changes in the form, proportion, size, and minor details may be made within the scope of the claims without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings, Figure 1 is a longitudinal sectional view of a hub and axle-spindle embodying the improvements of the present invention. Fig. 2 is a detail sectional view of the inner end portions of the hub and the spindle, showing a modified form of the device. Fig. 3 is a detail perspective view of the axle-spindle. Fig. 4 is a detail perspective view of the form of axle-box shown in Fig. 1.

Like characters of reference designate corresponding parts in all the figures of the drawings.

Referring to the accompanying drawings, 1 designates a portion of an axle having the usual tapered spindle 2. At the inner end of the spindle there is a cylindrical collar 3, which is projected toward the outer end of the spindle and is separated therefrom by an annular space sufficient to receive the inner end of an axle-box, as will be hereinafter explained. This collar has been shown integral

with the spindle or axle, but it will of course be understood that it may be shrunk, screwed, or driven thereon in order that it may be rigidly and durably connected to the spindle. At the outer end of the collar there is an integral inner annular flange 4. If desired, the top of the spindle may be provided with a longitudinal channel or gutter 5 to form an oil-receiving channel, but it is to be understood that this channel may be omitted without affecting the present invention.

An axle-box 6 is rotatably fitted upon the spindle in the usual manner and is provided near its inner end with an external annular enlargement 7, with the outer end portion of the enlargement regularly reduced to form a stepped series of shoulders, in the present case the series consisting of two shoulders 8 and 9, respectively. It will here be observed that the diameters of the members of the stepped series of shoulders increase from the inner end toward the outer end of the box. The inner end of the axle-box is projected into the cup or collar 3, with the smaller shoulder 8 embraced by the flange 4 of the cup in a working fit. The packing-ring 9^a embraces the inner end of the spindle and is fitted snugly in the space between the inner end of the axle-box and the back of the cup or collar 3, and one or more washers 10 embrace the inner end of the box and are held between the flange 4 and the shoulder 8 at one end and the packing-ring 9^a at the opposite end. A packing-ring 11 is fitted upon the reduced portion of the enlargement 7 and lies between the shoulder 9 and the outer end of the cup or collar 3. It will here be noted that the outer peripheries of the cup 3, the packing-ring 11, and the enlargement 7 are of equal diameters in order that all of these parts may lie flush with each other. The purpose of the flange 4 is to hold the packing-rings 9^a and 10 within the cup or collar when the box is withdrawn from the spindle. The usual longitudinal wings or ribs 12 extend inwardly from the enlargement 7.

As shown in Fig. 2, it will be seen that the intermediate shoulder 8 and the flange 4 may be omitted, in which arrangement the packing ring or rings 10 should bear directly

against the packing-ring 11, so as to prevent looseness of the packing-rings.

The hub proper is designated by the numeral 13 and is snugly fitted upon the axle-box and receives the wings 12 in suitable recesses in the bore of the hub, so as to interlock the hub and the box for simultaneous rotation. The outer end of the hub is projected beyond the outer end of the spindle, which latter also projects beyond the box, and this projected end of the hub is recessed, as at 14, to receive the hub-attaching nut 15, which is applied to the projected end of the spindle, so as to form a stop for engagement by the outer end of the box to limit outward thrust of the hub. A cap 16 is received within the recessed outer end of the hub and embraces the outer end of the box, to which it is detachably secured by a screw-threaded connection, the inner end of the cap-forming and annular shoulder 17 normally bearing against the back of the recess 14 to prevent outward endwise independent movement of the hub proper upon the axle-box. It will be understood that the cap 16 performs two functions, one of which is to form a reservoir for containing a suitable lubricant, and the other is to form a shouldered connection between the box and the hub to prevent outward endwise play of the hub upon the box. The inner end portion of the bore of the hub is of course enlarged to receive the enlargement 7 of the box, and the inner end of the hub embraces the collar or cup 3 in a working fit. The opposite half-sections of the hub are snugly embraced within metallic sheaths 18, the inner ends of which are provided with outwardly-directed flanges 19, that snugly embrace the spokes 20, and rivets or other suitable fastenings 21 pierce the flanges and the spokes, so as to hold the sheaths against endwise displacement and also to prevent endwise displacement or looseness of the spokes, whereby the sheaths and the spokes mutually cooperate to hold each other in place. The outer end of the outer sheath-section is projected beyond the cap 16 to form a hub-band 22 for protecting the cap against accidental displacement, while the outer end of the inner sheath-section is projected to form a hub-band 23, which projects slightly beyond the collar or cup 3.

From the foregoing description it will be observed that the inner end of the axle-box is reduced from the enlargement 7, so that it may be readily fitted into and withdrawn from the cup 3 without removing any fastenings and in particular without moving or interfering with the collar 3, and when the box is in place it is overlapped to a considerable extent by the collar 3, thereby to brace and materially stiffen the spindle, so as to guard against bending of the latter at its point of connection with the axle. In addition to embracing the axle-spindle the cup also forms a stop-shoulder to limit inward endwise play of the hub, this endwise play being taken up by

two sets of washers, one of which is disposed between the outer end of the collar and the enlargement of the box and the other between the back of the collar and the inner end of the intermediate shoulder of the box, whereby the hub is cushioned and foreign matter is effectually excluded from having access to the bearing from the inner end of the hub.

What I claim is—

1. The combination with a spindle having an outwardly-projected cylindrical cup at its inner end, and an axle-box having its inner end projected into the cup and of less diameter than the latter to provide an annular space between the box and the cup, said inner end of the box being provided with an external annular shoulder spaced from the inner end of the box and having a working fit within the cup, and said shoulder being provided with an external annular enlargement or shoulder spaced in front of the cup and having a diameter at least equal to that of the cup.

2. The combination with a spindle having a cylindrical outwardly-projected cup at its inner end, a packing-ring fitted in the back of the cup, and an axle-box having its inner end projected into the cup and bearing against the packing-ring, said inner end of the box being less in diameter than the cup to provide an annular space between the box and the cup, and also provided with an external annular shoulder spaced from the inner end of the box and having a working fit within the cup, said shoulder being provided with an external annular enlargement or shoulder spaced in front of the cup and having a diameter equal to that of the cup, packing-rings embracing the inner end of the box and filling the space between the washer at the back of the cup and the first-mentioned shoulder, and a packing-ring filling the space between the front end of the cup and the second-mentioned shoulder.

3. The combination with a spindle having a cylindrical outwardly-projected cup at its inner end, and an axle-box having its inner end within the cup and of less diameter than the latter to provide an annular space between the box and the cup, said inner end of the box being provided with an annular shoulder spaced from the inner extremity of the box and having a working fit within the cup near the outer end thereof, and one or more washers filling the annular space between the inner end of the box and the cup and also from the back of the latter to the shoulder on the box.

4. The combination with a spindle having an outwardly-projected cylindrical cup at its inner end, said cup being provided with an inner annular shoulder at its outer end, and a box having its inner end removably fitted into the cup and extended beyond the shoulder, there being an annular space between the box and the cup in rear of the shoulder, and one or more washers embracing the inner end of the box and filling said space, the shoul-

der forming a stop to prevent withdrawal of the washers with the box.

5 5. The combination with a spindle having an outwardly-projected cylindrical cup at its inner end, said cup being provided at its outer end with an inner annular shoulder, and an axle-box having its inner end projected into the cup in rear of the flange and of less diameter than the cup to provide an annular space
10 between the box and the cup, the box being provided with an annular shoulder spaced from the inner end of the box and having a working fit within the flange with its radial face flush with the rear face of the flange,
15 said shoulder also being provided with an external annular enlargement or shoulder disposed in front of the cup and at least equal in diameter to that of the cup, a washer embracing the first-mentioned annular shoulder

and filling the space between the front end 20 of the cup and the second-mentioned shoulder, and washers filling the annular space between the box and the cup and extending from the back of the cup to the rear face of the flange.

25 6. An axle-box provided at its inner end portion with a series of external annular shoulders decreasing successively in diameter toward the inner end of the axle-box, substantially as and for the purpose described. 30

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

ISBON METZGER.

Witnesses:

N. W. MCKAY,
J. E. CHANDLER.