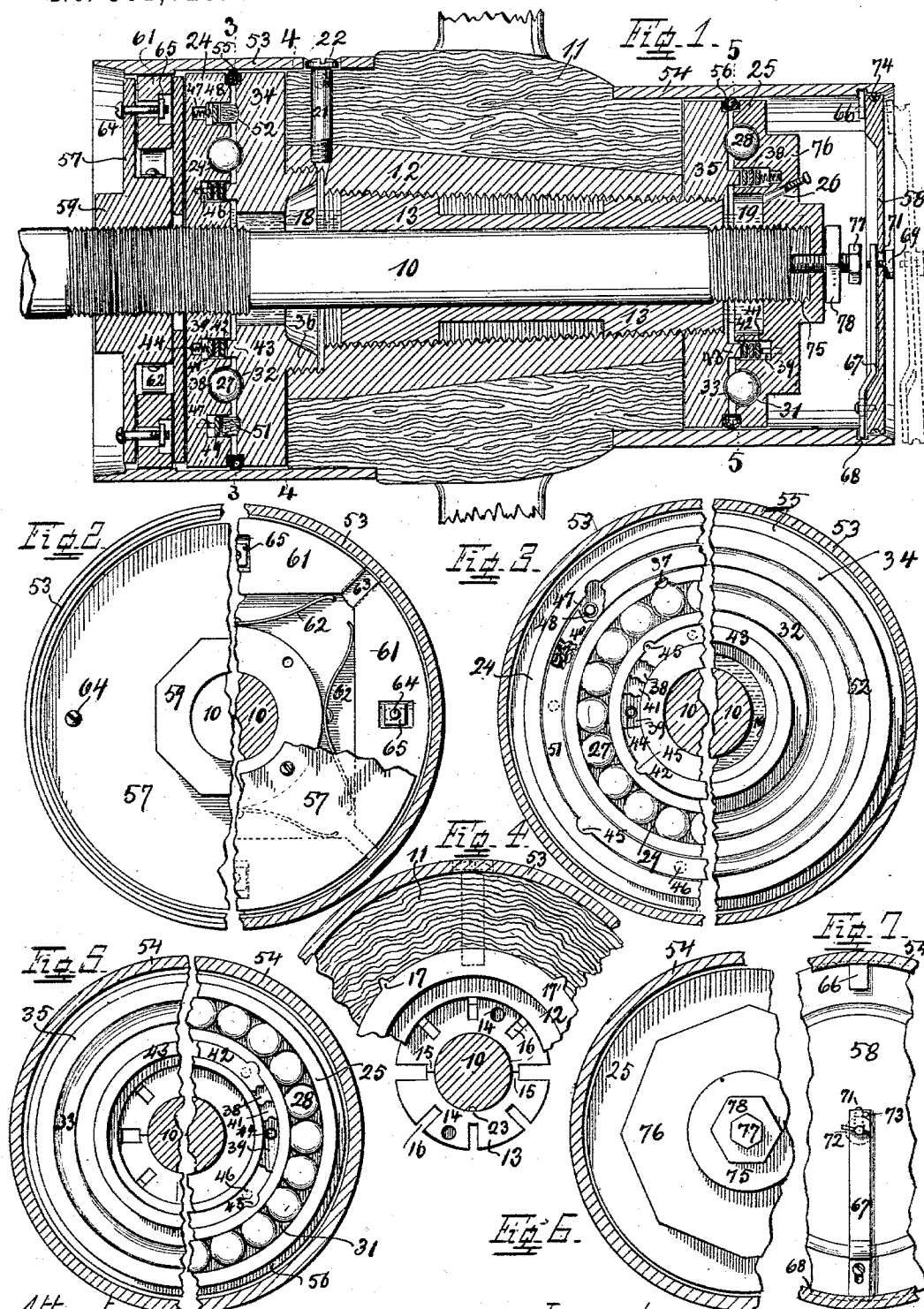


(No Model.)

A. J. THEIRING.
AXLE BEARING.

No. 561,626.

Patented June 9, 1896.



UNITED STATES PATENT OFFICE.

ANDREW J. THEIRING, OF CINCINNATI, OHIO.

AXLE-BEARING.

SPECIFICATION forming part of Letters Patent No. 561,626, dated June 9, 1896.

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To all whom it may concern:

Be it known that I, ANDREW J. THEIRING, a citizen of the United States, and a resident of Cincinnati, Hamilton county, State of Ohio, have invented certain new and useful Improvements in Axle-Bearings; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, attention being called to the accompanying drawings, with the reference-numerals marked thereon, which form a part of this specification.

15 This invention relates to improvements in axle-bearings and hubs for wheels for wagons and similar vehicles of the heavier kind.

The features of the invention consist of certain details of construction which are described in the following specification and particularly pointed out in the claims. They are also illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal section through the hub and all parts of the axle-bearing. Fig. 2 shows one-half of the outer and one-half of the inner surface of the dust-cap at the inner end of the hub. Fig. 3 is a vertical section on line 3 3 of Fig. 1, showing one-half of each of the opposing surfaces. Fig. 4 is part of an end view of the hub, showing it as it appears when all parts to the left of line 4 4 in Fig. 1 are removed. Fig. 5 shows one-half each of the opposing surfaces when the parts are separated on line 5 5 of Fig. 1. Fig. 6 shows part of the outer end of the hub with the outer dust-cap removed, and Fig. 7 shows part of the inside of the latter.

10 indicates the journal of the axle—that is, that part thereof about which the hub 11 turns. This latter is provided with the usual box 12, into the bore of which a sleeve 13 of soft metal is threaded and the bore of which latter closely fits the journal. Sleeve 13 is in two halves, and its outer threaded side is tapering, as shown. If at any time the axles begin to wear loose in sleeve 13, the latter is taken out by means of a spanner-wrench inserted at one end in holes 14, after which, sufficient metal having been removed at the contacting surfaces of joint 15, the two sleeve-sections are again screwed into box

12, a perfect fit around the axle being readily obtained by reason of the taper on their outside. Inasmuch as by frequent reductions at 15 the sections forming the sleeve lose their true semicircular shape, I weaken the metal thereof sufficiently by longitudinal cuts 16, whereby under the pressure of the wrench when being screwed home the metal bends transversely and lies snugly around the axle. Between its ends and on the outside a part of the metal of the sleeve may be removed to reduce the weight of the same. Box 12 is prevented from turning within the wooden hub by ribs 17. At both ends of the axle-bearing are oil-chambers 18 and 19, the oil being supplied through a duct 21, ordinarily closed by a screw-cap 22. The oil is supplied to the axle-journal by a channel 23 cut lengthwise into the same and passes through said channel as well as through cuts 16 into the front oil-chamber 19. Outwardly the oil-chambers are closed by two stationary disks 24 and 25, both screwed onto the axle and the latter one preferably provided with an air-vent 26 to permit the air to pass out when oil is poured in at 21, after which said vent is closed.

In order to reduce the friction between the ends of the revolving hub and the stationary disks 24 and 25, balls 27 and 28 are interposed, the balls being carried in grooves 29 and 31, and bear into shallow grooves 32 and 33 of disks 34 and 35, secured against the ends of the hub. For such purpose disk 34 is provided with an inwardly-projecting screw-threaded flange 36, which screws into the enlarged bore of box 12. Disk 35 screws onto the outwardly-projecting end of sleeve 13. Grooves 29 and 31 are of such depth as to receive the larger part of the balls, whereby they are prevented from dropping out whenever for any purpose the opposing disks are separated. To admit the balls to be placed within grooves 29 and 31, the width of the latter is sufficiently enlarged at one point to permit the balls to be introduced one by one, after which screws 37 are inserted at those points to close up the cut-out parts.

To prevent the oil in chambers 18 and 19 from passing up between disks 24 and 34 and 25 and 35, leather ring-washers 38 are provided, occupying grooves 39 in each of disks

24 and 25, which are protected on either side by metal rings 41 and 42, all three rings being held within grooves 39 by feathers 43, one on each of disks 34 and 35, and which feathers reach partly into grooves 39. Contact is maintained and wear taken up by springs 44, which at suitable distances occupy pockets recessed into the bottoms of grooves 39 and bear against rings 41. All three parts—that is, washers 38 with their rings on either side—are prevented from turning within grooves 39 by being sidewise enlarged at certain points, as at 45, at which points grooves 39 are also enlarged to receive the projecting parts of the rings. Screws 46, while not interfering with the adjustment of the rings, prevent them and springs 44 from jumping out of position whenever the opposing disks are separated. Disk 24 is provided with an additional groove 47 at the other side of the groove containing the balls, which groove is occupied by springs 48, similar to springs 44 in grooves 39, which, bearing against a ring 49, hold a wooden washer 51 against disk 34, the latter having a shallow groove 52 at the point of contact. Washer 51 and ring 49 are kept from turning and springs 48 are held in position in the same manner as was described for the parts occupying grooves 39. All the parts at the ends of the hub are covered by the inner and outer hub-bands 53 and 54, which project over and beyond them and are secured to the wooden part of the hub in the usual manner. Dust and water are kept from reaching any of the interior parts by washers 55 and 56, occupying recesses partly contained in disks 24 and 34 and 25 and 35 and occupying the space between them and the inside of the hub-band. The outer ends of the hub-bands are closed by dust-caps 57 and 58, of which the first one is held in place by being screwed onto the axle, being provided with a nut 59 on its outside for such purpose. Close contact is maintained and wear is taken up by adjustable packing, preferably of blocks of wood 61, moving between the inner and outer parts of the dust-cap and held against the inside of the hub-band by springs 62. Additional packing 63 is placed between the adjoining ends of blocks 61 to prevent these latter from dropping out whenever not held down by the hub-band. Screws 64 are provided, which, entering from the outside, pass through blocks 61, the opening through them being sufficiently elongated as not to interfere with their self-adjustment. An additional purpose of these screws 64 is also to aid in passing the hub-band over the dust-cap. With packing-blocks 61 held out to their fullest limit by springs 62 such could not be readily accomplished. They are therefore pressed inwardly to reduce the outer diameter of the dust-cap and held so by tightening temporarily said screws against nuts 65 until the dust-cap is in place, after which they are sufficiently loosened to permit the springs to act.

The outer dust-cap is held in place by a lug

66 and a sliding latch 67 when both are in engagement with a groove 68 in the inner surface of the hub-band. The manner of removal of this cap is illustrated by dotted lines in Fig. 1. Latch 67, which was held locked by the tightening of a nut 69, has been raised out of groove 68, the shank of the now loosened nut passing into a slot 71. A pin 72, when coming in contact with a stop 73, limits the operation of nut 69 and prevents its complete removal. Packing 74 is provided around the outer edge of this dust-cap to close the joint.

As will be seen, all parts of this hub and axle-bearing are renewable, and all wearing surfaces adjust themselves as they reduce by wear, which latter is greatly reduced by a perfect dust and water protected lubrication. The hub and with it the wheel may be adjusted laterally by simply changing the position of dust-cap 57 and disk 24, after which the hub is pushed in, to be followed by disk 25. This latter has for such purpose an interiorly-screw-threaded boss 75, whereby said disk is screwed onto the end of the axle, parts of its outside being formed into a nut 76 for such purpose. To prevent the disk from becoming loosened, a set-screw 77, passing through its center, is tightened against the end of the axle, said set-screw being in turn secured by a jam-nut 78.

As will be observed, some of the features shown and described may be used independently from the others, which applies particularly to the form of sleeve, form of ball-bearings, and dust-caps.

Having described my invention, I claim as new—

1. In an improved axle-bearing, the combination with box 12 of the hub, of the tapering sleeve 13 in two sections, screw-threaded into box 12 and bored to fit snugly around the axle and supporting the same, said sleeve being longitudinally adjustable both on the axle as well as within box 12, whereby as it wears away it may always be kept closely fitting the axle without affecting the position of the hub and wheel, to facilitate which longitudinal cuts 16 are provided on the outside of said sleeve-sections to weaken the metal to cause them to lie always closely around the axle.

2. In an improved axle-bearing, the combination with box 12 of the hub, of the adjustable tapering sleeve 13 screw-threaded into the former and bored to receive and fit the axle, disks 34 and 35, affixed to the ends of the hub, disks 24 and 25 affixed to the axle and one of the latter opposite each one of the former, and balls between the opposing surfaces of the disks.

3. In an improved axle-bearing the combination with box 12 of the hub, of the tapering sleeve 13 screw-threaded into the former and bored to receive the axle, disks 34 and 35 affixed to the ends of the hubs, disks 24 and 25, affixed to the latter and one of the latter opposite each one of the former, there being

grooves 29 and 31, in disks 24 and 25, balls contained therein and bearing against the opposite surfaces of disks 34 and 35, grooves 29 and 31 being of a depth to embrace the balls beyond their half whereby they are prevented from dropping out when the opposing disks are separated, said grooves being further enlarged at one place to permit the balls to be inserted one by one, and screws 37, to close up such enlarged places and to hold the balls in place.

4. In an improved axle-bearing, the combination with box 12 of the hub, of the adjustable tapering sleeve 13 screw-threaded into the former and bored to receive and fit the axle, disks 34 and 35, affixed to the ends of the hub, disks 24 and 25, affixed to the axle and one of the latter opposite each one of the former, there being circular grooves containing spring-pressed washers in one of the opposing surfaces of one disk and feathers projecting from the opposite surface of the other disk into said grooves, and balls between said opposing surfaces.

5. In an improved axle-bearing the combination of disks 34 and 35, affixed to the ends of the hub, disks 24 and 25, affixed to the axle, and one of the latter opposite each one of the former, balls between the opposing surfaces of the disks, there being circular grooves containing spring-pressed washers in one of the opposing surfaces of one disk and feathers projecting from the opposite surface of the other disk into said grooves.

6. In an improved axle-bearing, the combination with box 12 of the hub, of the adjustable tapering sleeve 13 screw-threaded into the former and bored to receive and fit the axle, disks 34 and 35 affixed to the ends of the hub, disks 24 and 25, affixed to the axle, and one of the latter opposite each one of the former, balls between the opposing surfaces of the disks, there being circular grooves containing spring-pressed washers in one of the opposing surfaces of one disk and feathers projecting from the opposite surface of the other disk into said grooves.

7. In an improved axle-bearing the combination of disks 24 and 25, affixed to the axle,

and having grooves 39 therein, leather washers 38, with metal rings on either side contained in said grooves, disks 34 and 35, affixed on the ends of the hub, opposite the disks first mentioned, feathers 43 projecting from these latter into grooves 39 of the former, balls between the opposing surfaces of said disks and springs 44 in grooves 39, holding the washers and metal rings against said feathers.

8. In an improved axle-bearing the combination of disks 34 and 35, affixed to the ends of the hub, disks 24 and 25, having screw-threaded bores whereby they are adjustably mounted on the axle and one of them opposite each one of disks 34 and 35, hub-bands at each end of the hub covering the disks thereat, there being antifriction devices between the opposing surfaces of each set of disks, disks 24 and 25 being adjustable on the axle determining between them the position of the hub of the wheel on the axle, disk 25 having on its outside a nut 76, for manipulation and being provided with a set-screw 77, and a lock-nut 78.

9. In an improved axle-bearing the combination with the hub and hub-bands, of antifriction and lubricating devices contained within the hub-band and a dust-cap 57, to close the space within the hub-band, being provided with a nut for attachment, supporting at its periphery centrifugally-acting spring-pressed packing and provided with screws 64 and nuts 65 for the purpose described.

10. In an improved axle-bearing the combination with the hub and hub-bands, and suitable antifriction and lubricating devices contained within the hub-bands, of a dust-cap 58 having lug 66 and latch 67 adapted to engage a groove within the interior of the hub-band and a nut 69 to operate the latch and hold it locked.

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

ANDREW J. THEIRING.

Witnesses:

C. SPENGEL,
ARTHUR KLINE.