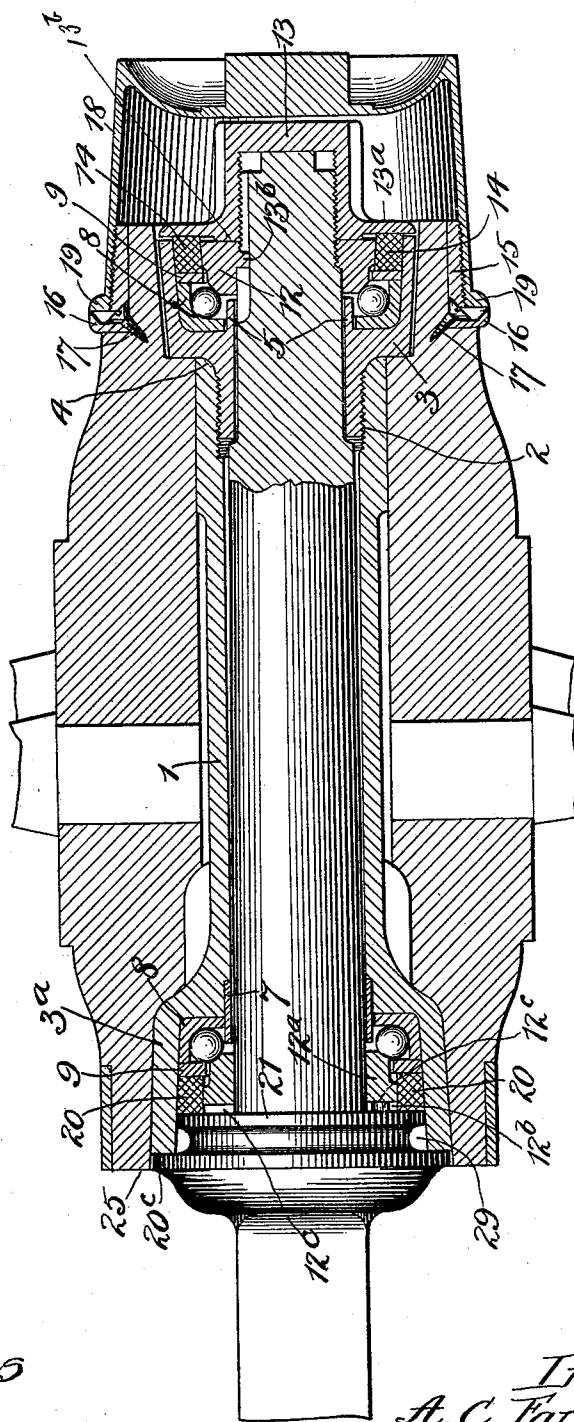


(No Model)

A. C. FARNSWORTH & C. E. ROBERTS.
JOURNAL BEARING.

No. 585,193.

Patented June 29, 1897.



Witnesses
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UNITED STATES PATENT OFFICE.

ANDREW C. FARNSWORTH, OF CHICAGO, AND CHARLES E. ROBERTS, OF
OAK PARK, ILLINOIS, ASSIGNORS TO THE IMPERIAL BALL BEARING
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JOURNAL-BEARING.

SPECIFICATION forming part of Letters Patent No. 585,193, dated June 29, 1897.

Original application filed January 4, 1895, Serial No. 533,802. Divided and this application filed February 10, 1896.
Serial No. 578,735. (No model.)

To all whom it may concern:

Be it known that we, ANDREW C. FARNSWORTH, residing at Chicago, and CHARLES E. ROBERTS, residing at Oak Park, in the county
5 of Cook, State of Illinois, citizens of the United States, have invented certain new and useful Improvements in Journal-Bearings, of which the following is a full, clear, and exact specification.

10 Our invention relates more particularly to antifriction-bearings for vehicles, and it is designed especially as an improvement on the invention of this character shown and described in United States Letters Patent No.
15 527,016, granted to us October 2, 1894, and to which patent reference may be had for an understanding of any features common to both devices not fully explained herein.

20 One of the objects of our present invention is to exclude dust and grit from the bearing at the outer end of the axle or journal and at the same time avoid bringing any part of the outer bearing-cone into close proximity to the ball-shell or to any solid part contacting there-
25 with, whereby damage to such cone or to the shell resulting from transverse shock will be avoided.

30 Another object of our invention is to provide improved and simple means for completely closing both ends of the hub, so far as entrance to the bearings is concerned, whereby the admission of grit or moisture will be absolutely prevented.

35 Another object of our invention is to improve the means for retaining the balls in their shells, whereby such balls may be more readily removed; and a yet further object of our invention is to so construct the end shell and the means for holding the balls therein that
40 such shell may be detached from the box and removed without dislodging the balls.

45 With these ends in view our invention consists in certain features of novelty in the construction, combination, and arrangement of parts by which the said objects and certain other objects hereinafter described are attained, all as more fully explained herein with reference to the accompanying drawing and particularly pointed out in the claims.

The said drawing is a longitudinal sectional view of a vehicle hub and axle embodying our improvements.

In our said prior invention the neck of the outer shell for the balls was provided with internal screw-threads and screwed upon the
55 outer side of the axle-box 1, but in practice it is found that in jamming the box into the hub and then screwing the neck over its end small particles of wood or splinters are roughed up and caught between the end of the
60 neck and the abutment-shoulder on the box, thus preventing the shell from reaching its proper place in the hub. In our present invention, therefore, we provide the neck 2 of
65 the shell 3 with screw-threads on its exterior and screw it into the outer end of the box 1, so that the rear or inner side of the shell 3 will come against the end of the box and form
an abutment for limiting the inward move-
70 ment of the threaded neck. By this means any particles of wood or splinters roughed up by driving the box 1 into the hub may be readily removed from the end of the box be-
75 fore the threaded neck is inserted. The end of the box is preferably flared or beveled, as shown at 4, whereby the end of the neck may be readily inserted.

The inner retaining-flange for the balls instead of being formed on the end of the box, as in our prior invention, is constituted by a
80 flange or ledge 5, which is carried by the shell itself and may be formed in any suitable manner, the shell at the opposite end of the box being provided with a similar collar or flange
85 7 for a like purpose, which, however, is preferably shrunk into the end of the box 1, as shown. The shells are provided with the usual races 8 for the balls, and against the
90 outer end or edge of each of these races rests the thin retaining-ring 9, as heretofore.

In our present invention, however, the shells 3 3^a instead of being cylindrical, as heretofore, are made slightly funnel shape and widening outwardly in their interior from
95 a point at the inner side of the retaining-ring 9, so that while the thin retaining-ring may be jammed firmly into the shell with sufficient pressure to remain in place under ordi-

nary conditions it may nevertheless be readily extracted by inserting a sharp-pointed or hook-shaped instrument under it. As a further safeguard against the dislodgment of the retaining-rings, however, packing-rings 14 20 are forced in against them respectively and securely jammed in place, the one, 20, by a shoulder or flange 21^a, and the other, 14, by a flange 13^a of the cap-nut 13.

10 The outer surfaces of the shells 3 3^a being also conical in form it will be seen that they will snugly and accurately settle into place in their sockets in the ends of the hub, and when the outer shell 3 is turned both shells 15 will sink into their places without danger of roughing up splinters at their inner edges and thus preventing them from entering to their proper places in the hub. It will also be seen that by the construction described 20 the outer shell 3 may be readily removed from the end of the hub without dislodging the balls, inasmuch as their inner retaining-flange 5 is entirely independent of the box 1 and is removed with the shell.

25 In our prior invention the outer bearing-cone 12 (marked 19 in said patent) was provided at its outer end with an enlarged flange of sufficient diameter to substantially fill the outer shell 3, (marked 26 in said patent;) but, 30 as before intimated, the close proximity of the edge of the flange of such cone to the shell or to any solid part thereof is objectionable for the reason that should the bearing become sufficiently loose to permit the shell to come in 35 contact with the cone under severe shock serious damage would result. In our present invention, therefore, we omit this extensive flange on the cone 12 and leave a considerable space between the circumference of the 40 cone and the edge of the shell 3 or 3^a. The packing-ring 14 at the outer end of the axle is located between the shell 3 and the cone 12, and it is of sufficient thickness horizontally to project outwardly or laterally slightly 45 beyond the end of the shell and beyond the outer face of the cone, so that the flange 13^a of the cap-nut will press normally and continually against it and will exert a constant tendency to expand it between the two parts 50 3 and 12 and against the ring 9, by which ring and parts it is confined, thus completely excluding the admission of dust and moisture to the bearing even should the same pass through the joints of cap 18. In order, how- 55 ever, that the cap-nut 13 may be continually in contact with the cone 12 for holding the latter up to its work, it is provided on its inner face with a shoulder 13^b, which bears against the cone, the outer edge of the flange 60 13^a being normally out of contact with the shell 3 and all parts save the packing-ring 14.

The cone 12^a at the inner end of the axle is preferably removable, and the packing-ring 20 is confined between the periphery of such 65 cone and the shell 3^a, and is held firmly against the retaining-ring 9 and expanded between the shell, the cone, and such ring by

the pressure of the shoulder 21, formed on the axle. This shoulder 21 is provided at a point within the shell 3^a, in which it accurately fits, with a dust-groove 29, and at the 70 outer edge of this groove is formed an enlarged flange 20^c, which overlaps the end of the shell 3^a and fits within a recess 25, formed in the end of the hub. By this means it will 75 be seen that in order for grit and moisture to enter the bearing it must first pass through the zigzag or tortuous interstice formed by the described parts and then work its way 80 past the packing-ring 20. Before it can do this, however, it will be arrested in the groove 29, which will carry it to the lower side, whence it will escape out of the hub rather 85 than enter the bearings, the packing-ring 20 being located at a point between such groove and the antifriction devices.

The outer bearing-cone 12 is provided in its bore with an inwardly-projecting lug or pin 13^b, engaging in a longitudinal slot in the 90 axle to prevent the cone from turning thereon, as in our prior patent, and the base of the cone 12^a is provided with a groove 12^b, extending from the bore or inner edge to the 95 outer edge, and in this groove fits a pin or lug 12^c, secured to the chamber 21. By this means the rotation of the inner cone 12^a is prevented.

The outer end of the hub is provided with a screw-threaded collar 15, having an abutment-shoulder 16 and being secured to the 100 hub by means of screws 17 or other suitable devices, and screwed upon this collar 15 is a cap 18, which completely incloses the cap-nut 13 and the end of the hub, whereby the end of the hub is hermetically sealed and the 105 parts of the bearing still further protected from the deteriorating influences of moisture and grit. The cap 18 is also provided with an abutment-shoulder 19, which abuts against the shoulder 16, as shown, the two shoulders 110 being convex in cross-section and the division between them being at the apex or extreme upper side of such convex form, whereby there will not be afforded any opportunity for moisture to collect between the 115 two shoulders. It will now be seen that the packing-rings 14 20 and the parts by which they are held, in conjunction with the flange 20^c and the cap 18, will completely close the hub and prevent the admission of grit and 120 moisture to the bearings.

This application is a division of our application, Serial No. 533,802, filed January 4, 1895, for United States Letters Patent.

Having thus described our invention, what 125 we claim as new, and desire to secure by Letters Patent, is—

1. In a journal-bearing, the combination with an axle and a box, of a shell on said box having a funnel-shaped or flared interior, 130 antifriction devices in said shell, means for retaining said antifriction devices on one side, a ring jammed into said shell for retaining said antifriction devices on the other side,

a bearing-cone for said antifriction devices, a packing-ring located between said shell and bearing-cone, and a nut secured on said axle and bearing upon both said cone and packing-ring, substantially as set forth.

2. In a journal-bearing, the combination with an axle and a box, of a shell on said box, antifriction devices in said shell, a removable ring for retaining said antifriction devices on one side, a cone upon which said antifriction devices bear, a packing-ring located between said cone and shell and bearing against said ring, and a nut secured on said axle and bearing against both said cone and packing-ring, substantially as set forth.

3. In a journal-bearing, the combination with an axle, antifriction devices, and a box,

of a shell on said box for containing said antifriction devices, a retaining-ring in said shell for retaining said antifriction devices in place, a cone upon which said antifriction devices bear, a packing-ring located in the space between and held in place by said cone, shell and ring, and projecting outward horizontally beyond the outer edge of said cone and shell, and a nut secured on said axle and having a flange overlapping and bearing upon said packing-ring, substantially as set forth.

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