

No. 672,660.

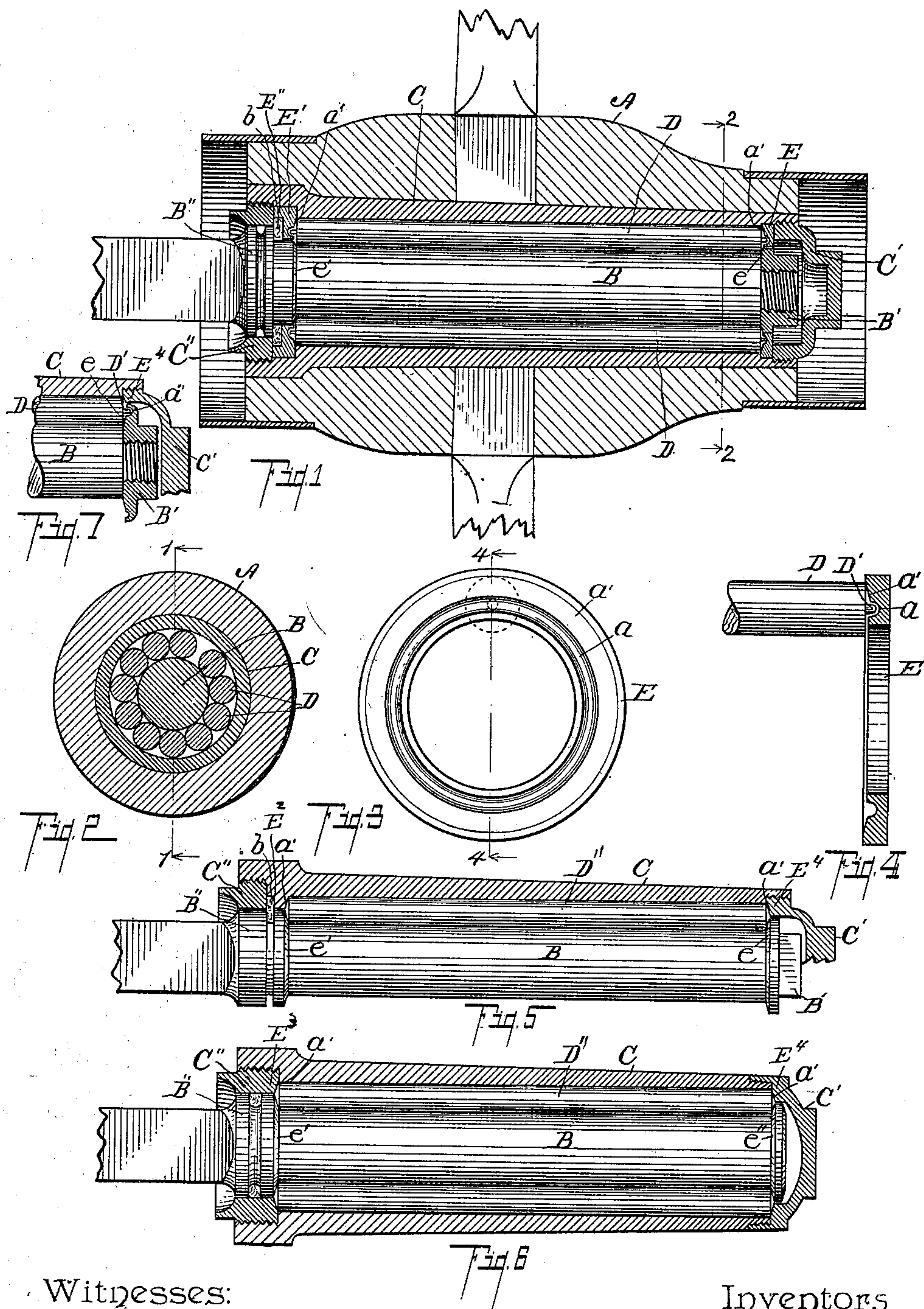
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W. S. WOOD & S. DOUGLASS.

ROLLER BEARING.

(Application filed July 31, 1900.)

(No Model.)



Witnesses:

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UNITED STATES PATENT OFFICE.

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ROLLER-BEARING.

SPECIFICATION forming part of Letters Patent No. 672,660, dated April 23, 1901.

Application filed July 31, 1900. Serial No. 25,378. (No model.)

To all whom it may concern:

Be it known that we, WALTER S. WOOD, residing in the city of Kalamazoo, and SAMUEL DOUGLASS, residing in the village of Schoolcraft, in the county of Kalamazoo and State of Michigan, citizens of the United States, have invented certain new and useful Improvements in Roller-Bearings, of which the following is a specification.

10 This invention relates to improvements in roller-bearings, and more particularly to roller-bearings for vehicles.

The objects of the invention are, first, to provide a roller-bearing for vehicles which
15 may be applied to wheels in common use and in much the same manner that ordinary axle-boxes are now applied, so that the wheel and axle will have the same general appearance as now; second, to provide in a roller-bearing
20 improved end bearings for the rollers, whereby the rollers serve to hold the wheel or boxing on the axle or shaft and prevent longitudinal displacement of either and which will also allow the shaft or axle to work in an inclined or vertical position as freely and with
25 as little friction as it would in a horizontal position; third, to provide improved means for retaining the rollers in position when the wheel or boxing is removed from the axle or
30 shaft; fourth, to provide improved end-bearing rings or collars for the rollers to bear against which may be readily detached from the boxing or axle for convenience in manufacture and repairing; fifth, to provide in a
35 roller-bearing improved means of excluding dust and dirt therefrom. Further objects will more definitely appear in the detailed description to follow. We accomplish these objects of our invention by the devices and
40 means described in this specification.

The invention is clearly defined, and pointed out in the claims.

A structure embodying the features of our invention is clearly illustrated in the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a longitudinal sectional elevation through a hub of an ordinary vehicle-wheel, taken on a line corresponding to line 1 of Fig. 2. Fig. 2 is a transverse sectional
50 elevation taken on line 2 2 of Fig. 1, showing

the relation of the rolls to the spindle, boxing, and hub. Fig. 3 is an enlarged detail elevation of the roll-retaining ring E. Fig. 4 is a transverse detail sectional elevation taken on
55 a line corresponding to line 4 4 of Fig. 3, with the end of one of the rollers in position. Figs. 5, 6, and 7 are detail longitudinal sectional elevations in which modifications of certain parts appear, which will be more fully referred
60 to hereinafter.

In the drawings all of the sectional views are taken looking in the direction of the little arrows at the ends of the section-lines, and similar letters of reference refer to similar
65 parts throughout the several views.

Referring to the lettered parts of the drawings, A is an ordinary hub of a vehicle-wheel. B is the axle.

C is the boxing, tapered on the outside substantially as those now in common use. A series of rollers D are interposed between the axle B and the boxing C. These rollers are square at their ends and provided with small projecting pins D' at the center of each end,
75 as particularly shown in Figs. 1 and 4.

Detachably secured to the boxing C at each end of the rollers are annular end-bearing rings E E'. These rings serve a double purpose—that of forming end bearings for the
80 rollers and of retaining the rollers in place in the boxing when it is desired to remove the wheel from the axle. A small groove *a* is formed on the inner face of each of these rings, (see Figs. 1, 3, and 4,) into which the
85 small pins D' on the ends of the rollers D project. These pins do not contact with the sides of the groove when said rollers are in their proper working position; but when the wheel is removed from the axle they will be
90 supported by the grooves *a*, and thus the rollers will be retained in the wheel in proper position to be replaced on the axle, while the possibility of any becoming misplaced or lost
95 is entirely obviated.

The inner faces of the annular end-bearing rings E E' are slightly beveled at *a'*, against which the ends of the rollers bear at their peripheries. This serves to retain the rollers in position and prevent longitudinal displacement of the same with a minimum of
100 friction. At the outer end of the boxing C

is a hollow nut or cap C', screw-threaded thereto and turned firmly against the annular ring E to hold the same in place. Nut C' also serves to protect the end of the boxing 5 and to exclude dust and dirt therefrom.

At the inner end of the boxing C is a ring C'', screw-threaded thereto and turned firmly against the bearing-ring E' at that end of the boxing for the purpose of retaining the same 10 in position. Ring C'' embraces the ordinary collar B'' of axle B quite closely, it being, preferably, only loose enough to revolve freely thereon. The ring E' at the inner end of boxing C is provided with a rearwardly-extending flange E'', against which ring C'' 15 bears. This leaves an annular space for a ring b, of felt or other suitable material; for the purpose of excluding dust and dirt from the bearing.

Arranged on the axle at each end of the rollers are collars e e', which also have their faces slightly beveled, the same as the annular rings E E'. These collars e e' are for the purpose of retaining the rollers in position on 20 the shaft or axle and prevent longitudinal displacement of the same. It is obvious that with the annular end-bearing rings E E', secured to the boxing, and the collars e e', secured to the axle or shaft, with the rollers interposed between said rings and collars, any longitudinal displacement of the boxing or the axle or shaft is prevented and all revolving parts are held in their proper relation 30 without the use of any other or additional means. It is also obvious that with the faces of said rings and collars slightly beveled the ends of the rollers will bear against the faces only at their peripheries, where there is practically no movement to cause friction at the 40 time of actual contact. Therefore the friction on the ends of the rollers is reduced to a minimum, and they will run as free in an inclined or vertical position as in a horizontal position. This feature is of great importance in roller-bearings for vehicles and for 45 use in other places where there is more or less end thrust on the bearings, which causes a great amount of friction and which our device practically obviates.

A nut B' is screw-threaded to the outer end of the axle. The beveled collar e at that end is preferably formed on said nut, although it might be otherwise produced. The collar e' at the inner end of the axle is preferably integral therewith, though it could be otherwise 55 produced.

In Fig. 5 we show a modification in which the ring E⁴, corresponding to the annular ring E in Fig. 4, is made integral with nut C' and the groove a' is omitted. The ring E² at the inner end of boxing C, corresponding to the ring E' in Fig. 1, is made integral with said boxing, and the groove a' is also omitted. The little pins D' are also omitted from the 65 ends of the rollers D''.

In Fig. 6 we show another modification in which the ring E³ at the inner end of the box-

ing C, corresponding to the annular ring E' in Fig. 1, is made integral with ring C''. Collar e'' at the outer end of the axle, corresponding to collar e in Figs. 1 and 5, is made integral with axle B. It is also obvious that cap or nut C' may be made integral with boxing C; but such a structure would be difficult and expensive to manufacture. 75

Fig. 7 illustrates still another modification, in which a groove a'', corresponding to the groove a in the annular rings E E', (shown in Fig. 1,) is formed in collar e of the nut C', which is made to project from the axle B 80 sufficiently for this purpose. Of course the groove a at the inner end of the axle would be formed in the collar e' at that end in the same manner, and is therefore not shown. It is obvious that this structure is perfectly practical and in many cases might be preferred, as it matters but little whether the rollers are retained in the boxing or around the axle when the wheel is separated from the axle, as the object in retaining them to either is to 90 preclude the liability of their becoming lost or misplaced.

It will be observed that with the annular rings E E' secured to the boxing at each end of the rollers the boxing thus forms an oil-receptacle capable of holding a considerable 95 quantity of oil, whereby all parts of the bearing are kept constantly and thoroughly lubricated. Oil may be supplied by removing the nuts C' and B'. Other means could be provided for admitting the oil. 100

It will be observed that our improved roller-bearing in its most approved form is practically dust-proof, which is a very important and desirable feature in all roller-bearings, 105 and especially those applied to vehicles.

We also desire to state that while we have shown our improved roller-bearings applied to an ordinary vehicle wheel or axle it may be adapted to wheels with metal hubs, bicycles, car-axles, and journal-bearings in general. 110

We also desire to state that while we have shown our improved roller-bearing in its most approved form we are aware that it may be greatly varied without departing from the essential features of our invention. 115

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is— 120

1. In a roller-bearing, the combination of the axle B; a beveled collar e', at the inner end of said axle; a removable beveled collar e at the outer end of said axle; a boxing C; rollers D fitting between said spindle and boxing, the ends of which are square with their peripheries; projecting pins D' on the ends of said rollers; inwardly-projecting beveled collars or rings E, E' at opposite ends of said boxing adapted to bear against the ends of 125 said rollers at their peripheries, to guide and retain them in place, there being annular grooves a' in said collars adapted to embrace the said projecting pins on the ends of the 130

rollers to retain the rollers in the boxing, when the boxing and axle are separated; a retaining nut or cap C', threaded to the outer end of said boxing; a retaining-ring C'' threaded to the inner end of said boxing; a ring of felt b contained within a suitable recess at the inner end of said boxing to exclude dirt at that point, all coacting substantially as described, for the purpose specified.

2. In a roller-bearing, the combination of the axle with the spindle B; beveled collars e, e', at opposite ends of the said spindle; a boxing C; inwardly-projecting collars E, E' at opposite ends of said boxing; rollers D fitting between the spindle and the boxing, the ends of which are square and adapted to bear against the beveled collars to be guided and retained in place thereby; projecting studs D' on the ends of said rollers; grooved retaining-rings arranged at opposite ends of said rollers to embrace the said projecting studs and support the rollers when the spindle and boxing are separated; a removable collar C'' fitting within the inner end of the boxing and embracing a collar on the axle; and a cap or nut fitting the outer end of the boxing and inclosing the bearing at that point, all coacting substantially as described for the purpose specified.

3. In a roller-bearing, the combination of the axle with the spindle B; beveled collars e, e', at opposite ends of said spindle; a boxing C; inwardly-projecting beveled collars E, E', at opposite ends of said boxing; rollers D fitting between the spindle and the boxing, the ends of which are square and adapted to bear against the beveled collars to be guided and retained in place thereby; a removable collar C'' fitting within the inner end of the boxing and embracing a collar on the axle; and a cap or nut fitting the outer end of the boxing and inclosing the bearing at that point, all coacting for the purpose specified.

4. In a roller-bearing, the combination of the axle with the spindle B; beveled collars e, e', at opposite ends of said spindle; a boxing C; inwardly-projecting beveled collars E, E', at opposite ends of said boxing; rollers D fitting between the spindle and the boxing, the ends of which are square and adapted to bear against the beveled collars to be guided and retained in place thereby, all coacting for the purpose specified.

5. In a roller-bearing, the combination of a spindle or journal having beveled collars at opposite ends; a journal-boxing; inwardly-projecting beveled collars at each end thereof; antifriction-rollers arranged between the journal and boxing, the ends of which rollers

are engaged by the said beveled collars whereby the journal is retained securely within the bearing and the alinement of the rollers around the journal preserved, as specified.

6. In a roller-bearing, the combination of a journal; a boxing therefor; rollers between said journal and boxing; an end-bearing ring at each end of said boxing adapted to bear against the ends of said rollers to prevent longitudinal displacement; a removable retaining-collar at the inner end of said boxing; a washer of felt in a suitable recess between said collar and end-bearing ring at the inner end of said boxing to prevent the ingress of dirt at that point, for the purpose specified.

7. In a roller-bearing, the combination of a spindle or journal; a boxing therefor; rollers between said journal and boxing; inwardly-projecting beveled collars secured to opposite ends of said boxing; outwardly-projecting beveled collars secured to said journal at opposite ends of said rollers, the ends of said rollers adapted to bear against both sets of said collars, for the purpose specified.

8. In a roller-bearing, the combination of a spindle or journal with a collar at its inner end and a removable collar at its outer end; a journal-boxing; an inwardly-projecting collar at each end of said boxing, each containing an annular groove; rollers fitting between said journal and journal-boxing and against the said collars, said rollers having pintles on their ends extending into the annular grooves of said collars, for the purpose specified.

9. In a roller-bearing the combination of a spindle or journal with a collar at its inner end, and a removable collar at its outer end; a journal-boxing; an inwardly-projecting collar at each end; rollers fitting between said journal and journal-boxing and against the said collars, for the purpose specified.

10. In a roller-bearing the combination of a journal and journal-boxing; rollers arranged between said journal and boxing; rings secured to the said boxing containing annular grooves; and pintles on the ends of said rollers extending into the said grooves whereby the rollers will be retained in the bearing when the journal and its boxing are separated, for the purpose specified.

In witness whereof we have hereunto set our hands and seals in the presence of two witnesses.

WALTER S. WOOD. [L. S.]
SAMUEL DOUGLASS. [L. S.]

Witnesses:

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