

(No Model.)

C. SPORNHAUER.
DUST GUARD FOR BALL BEARINGS.

No. 549,750.

Patented Nov. 12, 1895.

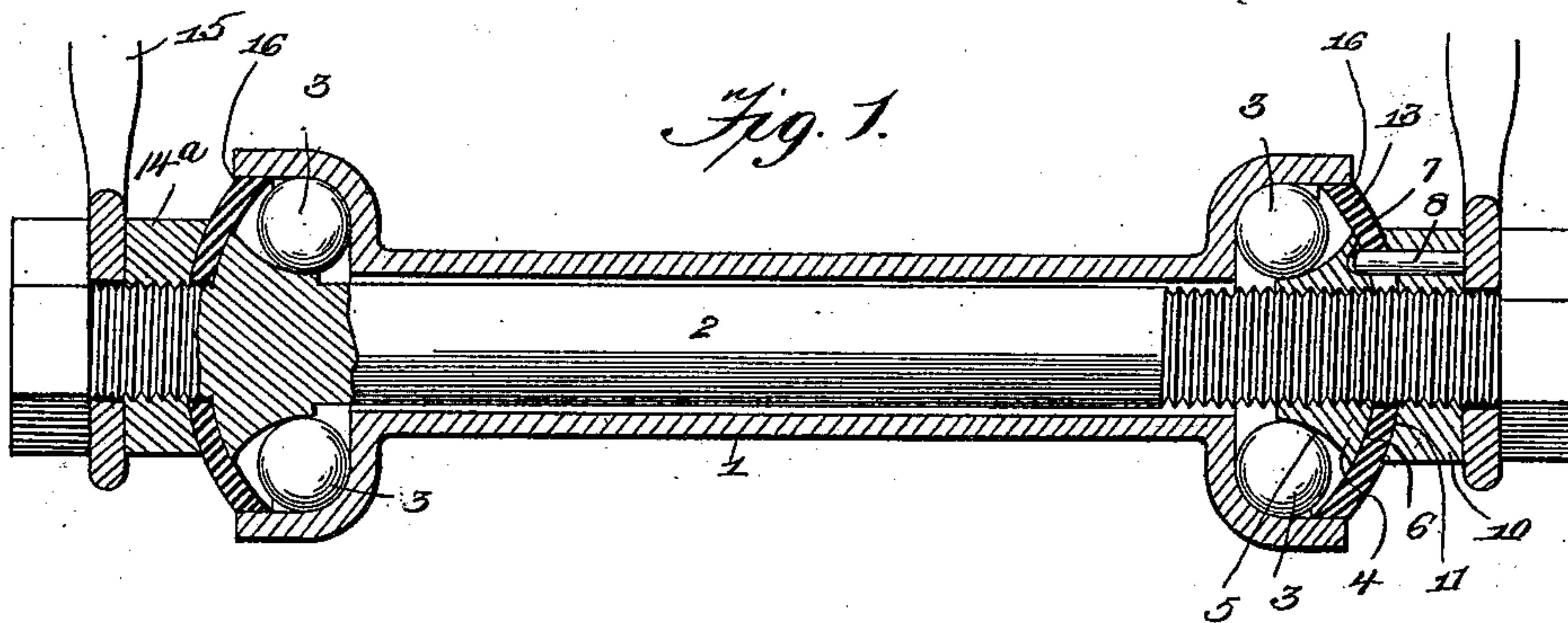


Fig. 2.

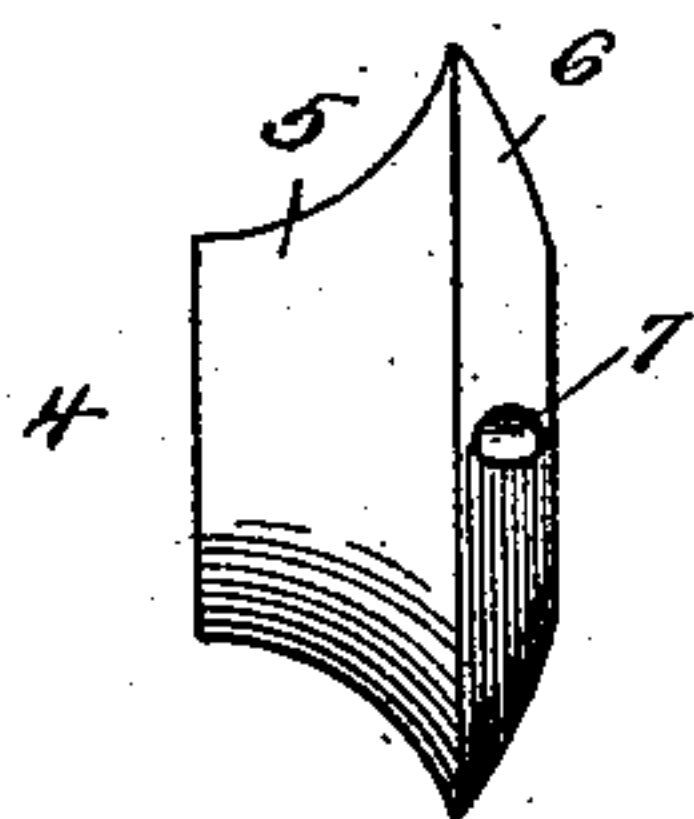


Fig. 3.

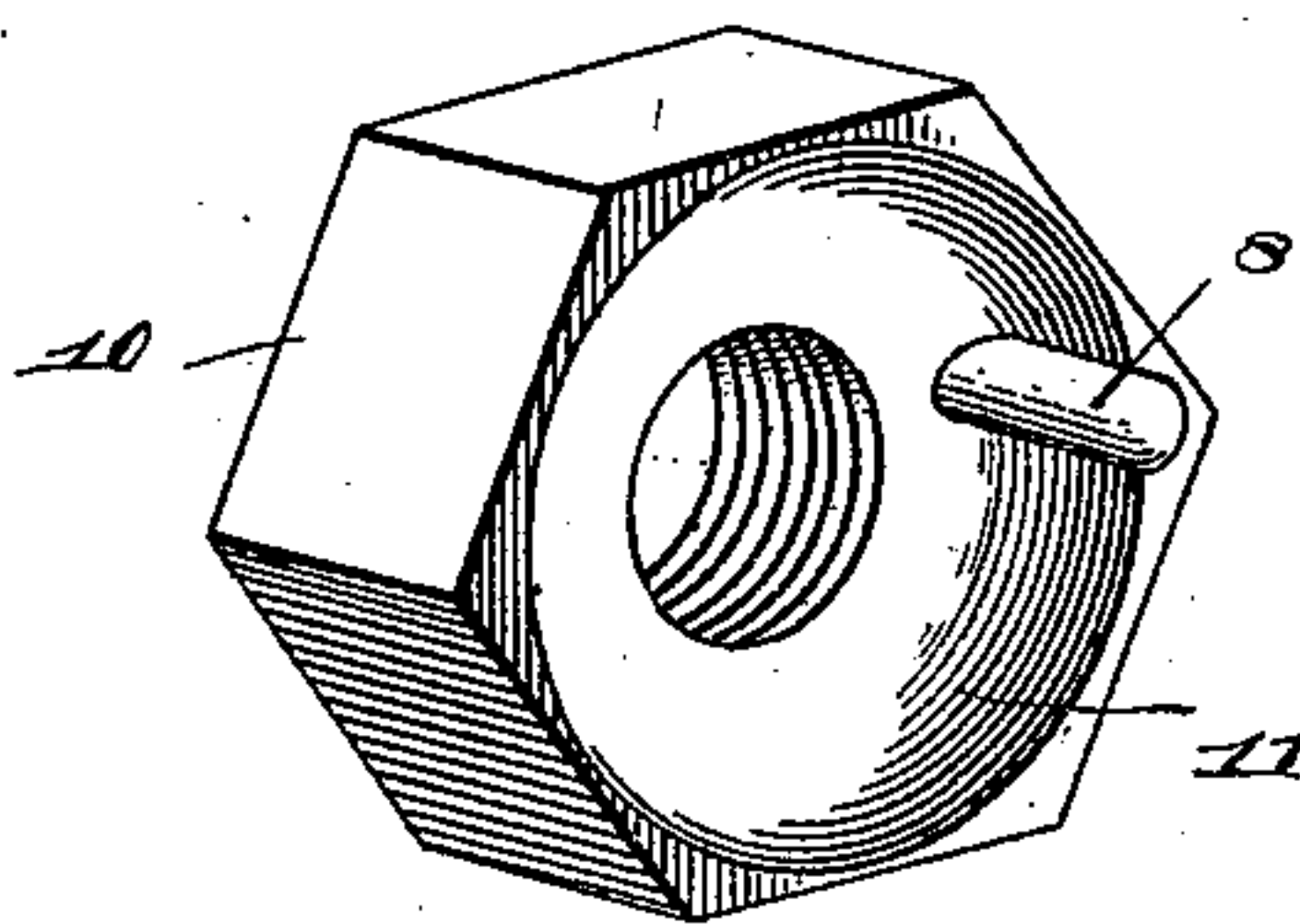
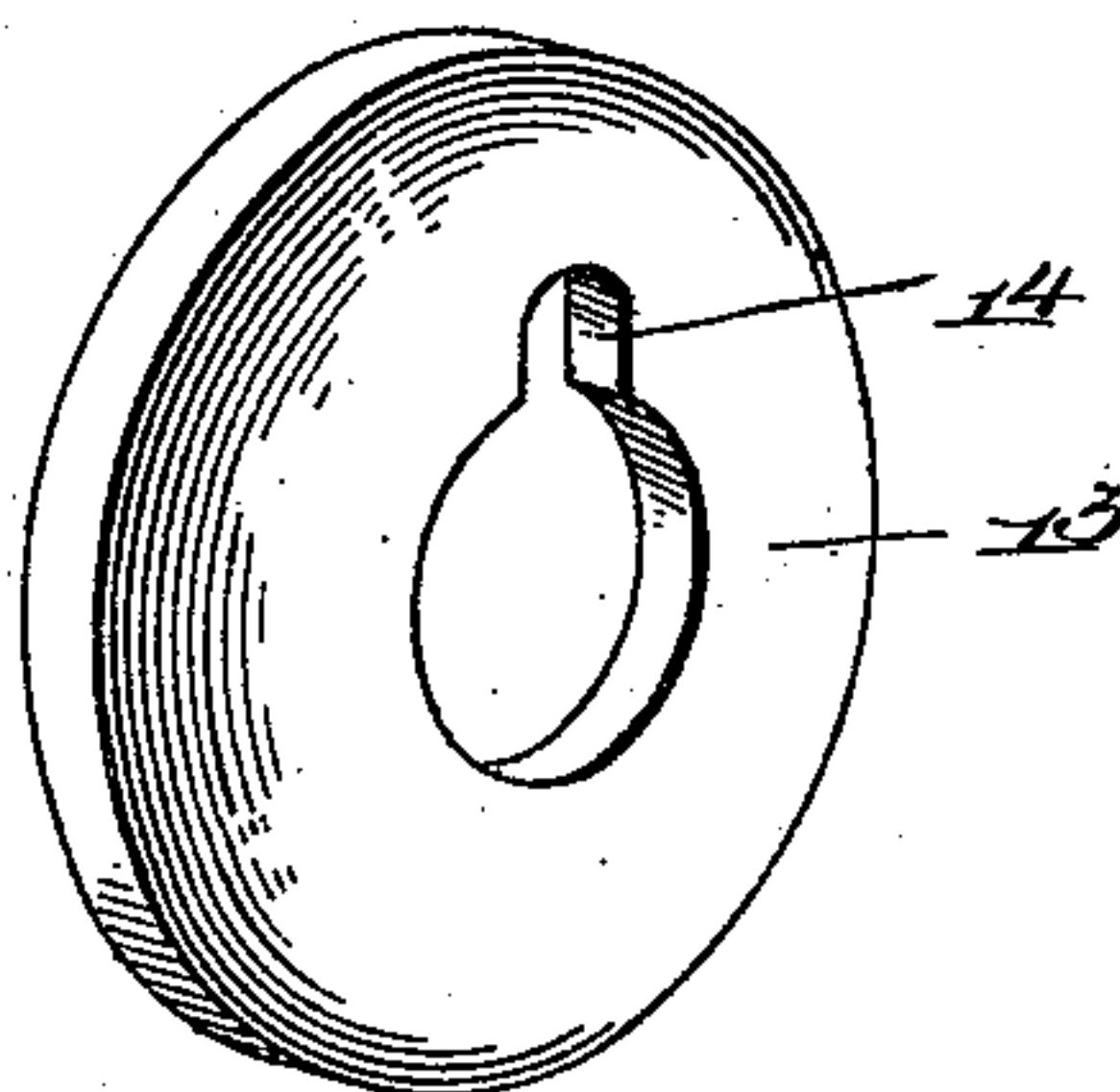


Fig. 4.



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Witnesses

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UNITED STATES PATENT OFFICE.

CHARLES SPORNHAUER, OF COLD WATER, OHIO.

DUST-GUARD FOR BALL-BEARINGS.

SPECIFICATION forming part of Letters Patent No. 549,750, dated November 12, 1895.

Application filed April 30, 1895. Serial No. 547,669. (No model.)

To all whom it may concern:

Be it known that I, CHARLES SPORNHAUER, a citizen of the United States, residing at Cold Water, in the county of Mercer and State of Ohio, have invented a new and useful Dust-Guard for Ball-Bearings, of which the following is a specification.

This invention relates to that class of machines known as "velocipedes."

The object of the present invention is to provide, in connection with the ball-bearings of bicycles, a flexible dust-guard capable of yielding in every direction and adapted to bear against the ball-case and to prevent the admission of dust, &c., with the smallest possible amount of friction.

To accomplish the above object the invention consists, briefly, in a ball-cone having a convex outer surface, a nut or washer arranged outside of said cone and provided with a concaved inner surface or side adjacent to the convex surface of the cone, and a washer or dust-guard, of leather or other flexible material, interposed between said cone and nut or washer, said dust-guard being adapted to bear at its peripheral edge against the inner surface of the ball-case.

It further consists in certain novel features and details of construction and arrangement of parts, as hereinafter fully described, illustrated in the drawings, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a longitudinal section through the hub of a bicycle-wheel, showing also the axle, a portion of the frame of the machine, and my improved dust-guard applied to said hub. Fig. 2 is a detail view of the adjusting-cone, showing the construction thereof. Fig. 3 is a detail view of the adjusting metallic washer. Fig. 4 is a detail perspective view of the flexible dust-guard.

Similar numerals of reference designate corresponding parts in the several figures of the drawings.

Referring to the accompanying drawings, 1 designates a bicycle-hub formed at each end with the usual ball cups or cases, and 2 the axle upon which said hub revolves.

3 designates a circular series of antifriction-balls, arranged within the ball-cup at each end of the hub, and 4 represents an adjust-

able cone having a threaded central perforation, by which it engages the correspondingly-threaded end of the axle, thus enabling said cone to be adjusted inward for taking up wear in the bearing.

The inner face of the adjusting-cone 4 is provided with the usual concavity or groove 5, forming a track or way in which the balls travel, the outer face of said adjusting-cone being rounded off or convex, as shown at 6 in the drawings. The cone 4 is provided in its outer convex face 6 with a socket or depression 7, adapted to be engaged by a pin or stud 8 on an adjusting-nut 10. The nut 10 is provided upon its inner face with a concave seat 11, corresponding to the outer convex face of the adjusting-cone 4, and said adjusting-nut is further provided with the pin or stud 8, which engages the socket 7, by means of which said adjusting-nut is adapted to revolve the adjustable cone.

13 designates a flexible dust-guard, which in the ordinary road-wheels is made from leather, and is substantially in the form of an ordinary leather-washer.

In racing-machines or very light roadsters the dust-guard 13 may, if desired, be formed from felt or other flexible material. This dust-guard is interposed between the outer convex face of the adjusting-cone and the corresponding inner concave face of the adjusting-nut and has a notch or opening 14, which receives the pin or stud 8. When the nut 10 is screwed inward upon the dust-guard, the dust-guard will be caused to assume the concavo-convex form, as indicated in the drawings. A similar dust-guard is located at the opposite end of the hub, the only difference in the arrangement being that said dust-guard is confined between the outer face of a cone having a fixed connection with the axle, and the inner face of a securing-nut 14^a, threaded on to the axle inside of the adjacent frame bar or fork 15. Both of said dust-guards bear at their outer peripheral edges against the inner surface of the ball cups or cases at the opposite ends of the hub of the wheel. The diameters of the adjusting-cone and of the inner concaved face of the adjusting-nut are purposely made considerably less than the internal diameter of the ball-case, in order that the outer peripheral edge or por-

tion of the dust-guard may be left free to yield laterally for permitting endwise movement of the hub in any direction for accommodating the play of the hub relatively to the stationary axle and its cone, and at the same time preventing dust and dirt from entering at the point 16.

By the construction above described a very simple and effective form of dust-guard is obtained. The dust-guard, by means of the shape of the cone and adjusting-nut, is pressed into such shape as will adapt it to shed the dust, dirt, &c., which falls upon its outer face. The peripheral portion of the washer is left perfectly free to accommodate itself accurately to the play of the wheel-hub, being entirely unsupported at its periphery except by the stiffness of the material from which the dust-guard is formed.

By saturating the dust-guard with oil the same is rendered very soft and pliable and will afford a minimum amount of friction, while at the same time the oil retained within said dust-guard will assist in lubricating the antifriction-balls. A dust-guard is thus obtained that will yield in every direction, lie flush with the edge of the ball-case, and bear snugly against the same with the smallest amount of friction, and will effectually exclude dust, &c., from the bearing.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. In a dust guard for ball bearings, the combination with an internally threaded cone, of an adjusting nut applied to the axle

outside thereof, a flexible washer interposed between said cone and nut and left laterally free or unsupported at its periphery so as to permit the endwise movement of the hub, and a pin carried by the nut and extending longitudinally of the axle into engagement with said cone, substantially as and for the purpose specified.

2. In a dust guard for ball bearings, the combination with the axle, of an adjustable cone having an outside diameter less than the internal diameter of the ball case, an adjusting nut also having a diameter less than the internal diameter of the ball case, and a flexible washer interposed between said cone and nut so as to be left free and unsupported laterally adjacent to its peripheral portion and capable of yielding to accommodate the endwise movement of the hub, substantially as specified.

3. In a dust guard for ball bearings, the combination of a cone applied to the axle and formed with a convex outer face, a nut provided with a concaved inner face, and a flexible washer interposed between said cone and concaved nut so as to yield in any direction for accommodating the play of the hub and to lie flush with the ball case, substantially as specified.

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

CHARLES SPORNIAUER.

Witnesses:

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FRANK. H. TANGEMAN.