No. 616,205. Patented Dec. 20, 1898.

G. W. SHAMP.

VELOCIPEDE BEARING.

(Application filed Jan. 21, 1897.)

(No Model.)

Fig. 1.

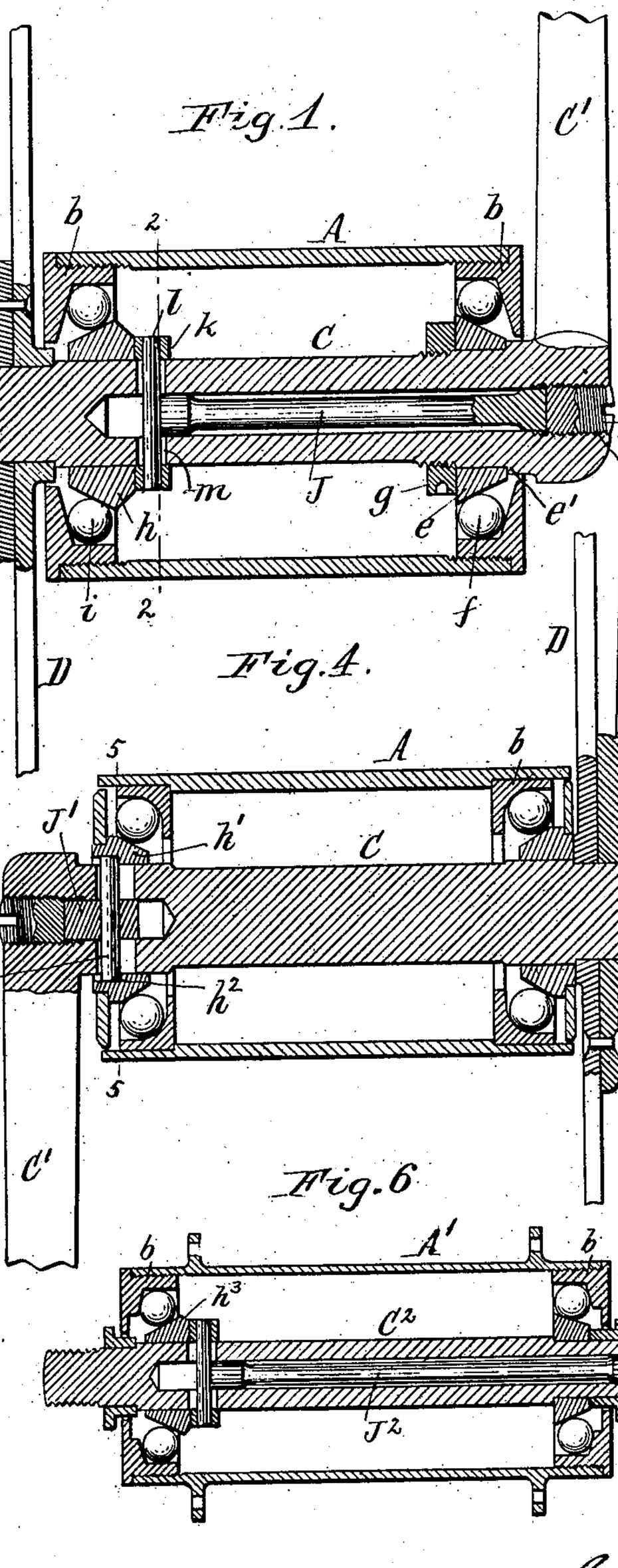


Fig. 4.

Fig. 2.

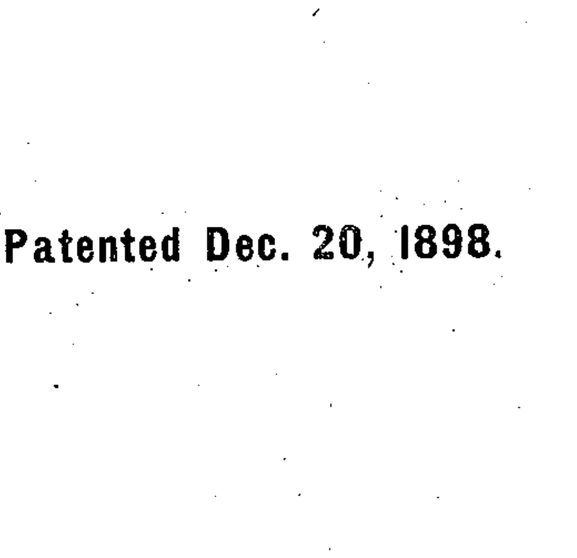


Fig. 5.

Fig. 6.

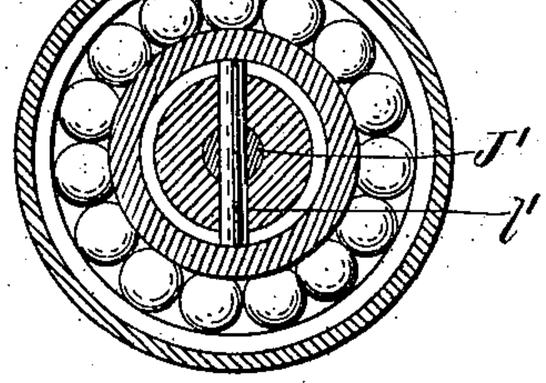
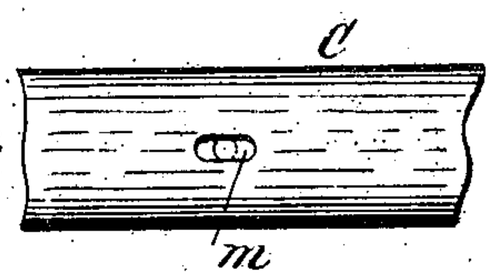


Fig. 3.



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UNITED STATES PATENT OFFICE.

GEORGE W. SHAMP, OF BUFFALO, NEW YORK.

VELOCIPEDE-BEARING.

SPECIFICATION forming part of Letters Patent No. 616,205, dated December 20, 1898.

Application filed January 21, 1897. Serial No. 620,043. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. SHAMP, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Velocipede-Bearings, of which the following is a specification.

This invention relates to the adjusting devices employed for taking up the wear of ball-bearings, and more particularly to an adjusting device which is especially desirable for bicycle-bearings.

My invention has for its object to provide an adjusting device of simple construction which is easily accessible and which permits a ready and accurate adjustment of the bearing.

In the accompanying drawings, Figure 1 is a sectional elevation of a crank-shaft and hanger provided with my improvement. Fig. 2 is a cross-section in line 2 2, Fig. 1. Fig. 3 is a detached fragmentary elevation of the shaft, showing the slot in the same. Fig. 4 is a sectional elevation of a crank-shaft and hanger, showing a modified construction of the adjusting means. Fig. 5 is a cross-section in line 5 5, Fig. 4. Fig. 6 is a sectional elevation of a wheel-hub provided with my improvement.

Like letters of reference refer to like parts in the several figures.

A is the hanger or bracket, which is of the usual cylindrical form and provided with the customary sockets or lugs for the attachment of the frame-tubes, which sockets are not shown in the drawings. In the construction shown in Figs. 1 and 2 the bearing-cups *b* are arranged to face inwardly and engage with the ends of the hanger by screw-threads.

C is the crank-shaft, C′ the cranks, and D the sprocket or driving wheel. One of the cranks is preferably integral with the shaft, and the other is detachably secured thereto by a key or other fastening, as shown.

e is the fixed cone, secured to the shaft preferably opposite the right-hand bearing-cup, and *f* are the balls interposed between said cup and cone. This cone abuts against a shoulder *e*′ of the shaft and is clamped against the same by a nut *g*; but the same may be secured to the shaft by any other suitable means, if desired.

h is the adjustable cone, arranged on the shaft opposite the left-hand bearing-cup, and *i* are the balls arranged between said cup and cone. The adjustable cone is arranged to slide on the shaft toward and from the opposing cup.

J is an adjusting-rod arranged axially in the shaft, which latter is hollow or bored out to receive the rod. This rod is free to move lengthwise in the bore of the shaft and operates upon the movable cone *h* through the medium of a ring or collar *k*, loosely surrounding the shaft and bearing against the inner or rear side of said cone, and a transverse pin *l*, passing through a longitudinal slot *m*, formed diametrically in the hollow portion of the shaft and having its ends secured to the ring *k*. The front or inner end of the adjusting-rod bears loosely against the transverse pin *l*, so that upon pushing the rod forwardly or farther into the shaft said pin and the ring *k* are shifted in the same direction, thereby moving the adjustable cone toward the opposing bearing-cup.

The bore of the shaft extends through the hub of the right-hand crank and opens at the outer face of the same, and the adjusting-rod terminates at a distance from that end of the shaft, as shown in Fig. 1. In the outer portion of the bore not occupied by the adjusting-rod is arranged an adjusting-screw or screw-plug N, which engages with an internal screw-thread *n* of the bore and bears at its inner end against the outer end of the adjusting-rod, so that upon screwing the plug farther into the shaft the rod is shifted forwardly, or toward the opposite end of the shaft. The adjusting-screw N extends to the outer face of the adjacent crank and is provided with a nick, as shown, for receiving a screw-driver, or, if preferred, its exposed end may be made flat-sided or otherwise formed to receive a suitable wrench for turning it.

When it is desired to take up the wear of the bearings, it is only necessary to screw the plug N forwardly, whereby the plug pushes the adjusting-rod J farther into the shaft, and the rod in turn shifts the sliding cone *h* toward the opposing bearing-cup through the intervention of the transverse pin *l* and the ring *k*. The bearings, if too tight, are loosened by unscrewing the plug N more or less,

whereupon the pressure of the balls against said cone will force the same away from the opposing ball-cup until the rod J limits the further movement of the cone by coming in contact with the screw-plug. As the adjusting screw or plug is accessible at the outer side of the adjacent crank, the adjustment is easily and quickly effected.

The adjustable cone is confined against movement in one direction by the balls and in the other by the ring *k*, which forms a positive stop, and no lock-nut or other additional retaining device which must be separately manipulated is therefore required for holding the cone in place after adjustment, thus not only simplifying the construction of the adjusting device, but greatly facilitating the adjustment of the bearings. The sliding cone also affords a more accurate adjustment than can be obtained by the use of a cone which engages with the shaft by a screw-thread.

The ring *k* may be made of soft metal, while the cones are hardened, as usual.

If desired, the adjusting-screw may be formed in one piece with the adjusting-rod; but the parts are preferably separate, as shown, because by that construction the adjusting-rod is not turned in adjusting the bearings, and the transverse pin is thereby relieved from the wear which it would receive by the rotation of the adjusting-rod against it if the rod were made integral with the adjusting-screw.

In Figs. 4 and 5 is shown a modified construction of my improvement which is applicable to bearings in which the cups face outwardly and the cones are arranged on the outer sides of the cups. The adjusting device is in this case arranged at the same end of the crank-shaft as the sliding cone h'. The bore of the shaft extends inwardly only a short distance beyond the sliding cone and a short adjusting-rod J' is employed, while the transverse pin l' passes through an opening formed diametrically in the adjusting-rod and bears with its projecting end portions directly against an internal shoulder h^2 of the adjustable cone, so that when the rod is moved inwardly by the screw-plug N' the pin carried thereby is caused to shift the cone toward the opposing bearing-cup.

My improved adjusting device is also applicable to the bearings of wheel-hubs, Fig. 6 showing a hub provided with the kind of adjusting device illustrated in Fig. 1. In this figure, A′ is the wheel-hub, having the usual perforated spoke-flanges; C^2, the bored axle of the wheel; h^3, the adjustable cone; J^2, the adjusting-rod, and N^2 the adjusting-screw. The bearings are in this case adjusted in the same manner as in the construction previously described.

In the construction shown in Figs. 1 to 5 the crank-shaft hanger forms the inclosing case of the bearings, while in the construction shown in Fig. 6 the wheel-hub forms the bearing-case.

I claim as my invention—

1. The combination with an inclosing case provided with a bearing cup or surface, of a shaft passing through the case and having a longitudinal bore and an opening extending from said bore to the surface of the shaft, an adjustable bearing-cone arranged to slide lengthwise on said shaft, a pin for shifting said cone arranged loosely in the opening of the shaft, and an adjusting-screw arranged in the longitudinal bore of the shaft and operating to shift said pin in its opening, substantially as set forth.

2. The combination with an inclosing case provided with a bearing-cup, of a shaft arranged in said case and having a longitudinal slot extending therethrough, an adjustable bearing-cone arranged to slide lengthwise on said shaft, a transverse pin for shifting said cone arranged in the slot of the shaft, and an adjusting-screw arranged axially in the shaft and operating to shift said pin in the slot of the shaft, substantially as set forth.

3. The combination with an inclosing case provided with a bearing-cup, of a shaft arranged in said case and having an axial bore and a longitudinal slot intersecting its bore, an adjustable cone arranged to slide lengthwise on said shaft, a sliding ring surrounding the shaft and bearing against the cone, a transverse pin carried by said ring and arranged in the slot of the shaft, an adjusting-screw arranged in the outer end of said axial shaft-bore, and a rod arranged loosely in said bore between said pin and said adjusting-screw, substantially as set forth.

Witness my hand this 16th day of January, 1897.

GEORGE W. SHAMP.

Witnesses:
CARL F. GEYER,
KATHRYN ELMORE.