

No. 651,662.

Patented June 12, 1900.

W. F. HAWES.
CRANK HANGER FOR BICYCLES.

(Application filed Mar. 22, 1897.)

(No Model.)

2 Sheets—Sheet 1.

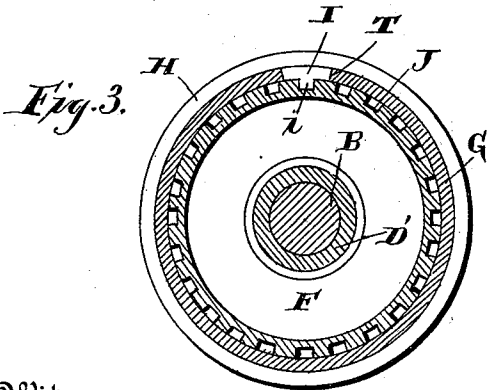
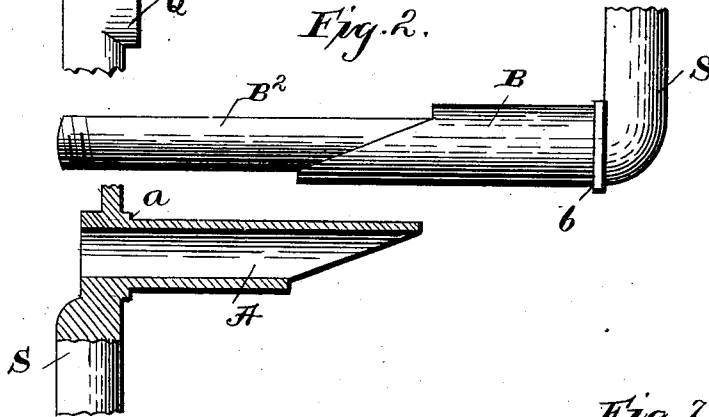
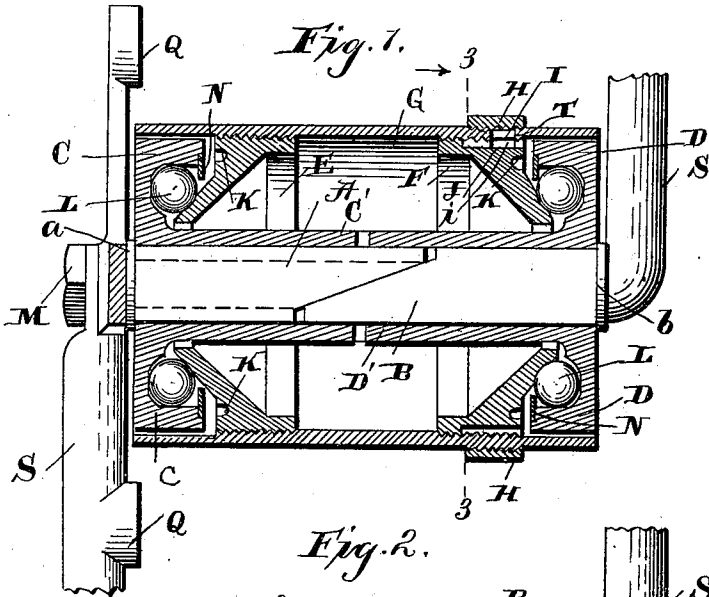
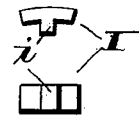


Fig. 1.



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2 Sheets—Sheet 2.

Fig. 4.

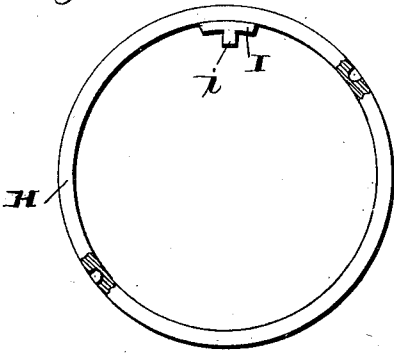


Fig. 5.

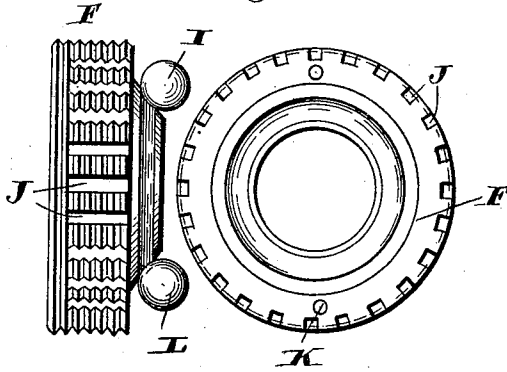


Fig. 6.

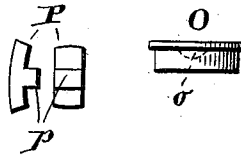
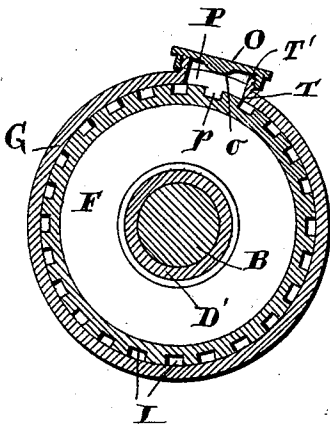


Fig. 8.



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UNITED STATES PATENT OFFICE.

WILBER F. HAWES, OF DENVER, COLORADO.

CRANK-HANGER FOR BICYCLES.

SPECIFICATION forming part of Letters Patent No. 651,662, dated June 12, 1900.

Application filed March 22, 1897. Serial No. 628,694. (No model.)

To all whom it may concern:

Be it known that I, WILBER F. HAWES, a citizen of the United States, and a resident of Denver, Arapahoe county, State of Colorado, have invented certain new and useful Improvements in Crank-Hangers for Bicycles; and my preferred manner of carrying out the invention is set forth in the following full, clear, and exact description, terminating with 5
10 claims particularly specifying the novelty.

This invention relates to bicycles, and more especially to crank-hangers used in connection therewith; and the object of the same is to produce an improved hanger and bearing 15 for the crank-shaft.

To this end the invention consists in the details of construction hereinafter more fully described and claimed and as illustrated in the accompanying drawings, wherein—

20 Figure 1 is a central longitudinal section of my preferred form of this improved bearing complete. Fig. 2 is a detail showing the two parts of the crank-shaft separated. Fig. 3 is a transverse section on the line 3 3 of Fig. 1. 25 Fig. 4 is a detail of the adjustable dust-cap ring. Fig. 5 is a detail of the adjustable cone. Fig. 6 is a detail of one form of the locking device and the dust-cap therefor. Fig. 7 is a detail of another form of locking device. Fig. 30 8 is a sectional view showing the position of the locking device and dust-cap of Fig. 6 in place.

Referring to the said drawings, the letter G designates the casing of the crank-hanger, 35 such as usually comprises a part of the framework of an ordinary rear-driving safety-bicycle, which casing is hollow and cylindrical for the reception of the entire bearing parts. Within the casing is located concentrically 40 the crank-shaft, which consists of the parts A and B, each of which is integrally connected with its crank S in a manner which will be clear and each of which is beveled at its inner end, so as to complement and make 45 a close connection with the bevel of the other part. One of the parts, as A, is hollow, smooth, and tubular, and the other part, as B, has a smooth cylindrical integral projection B², adapted to pass through the hollow part A 50 and receive at its threaded extremity a nut M, as seen in Fig. 1. By this construction the two parts of the crank-shaft are detachably

clamped together, as will be clear; yet when drawn forcibly together by the nut M the tendency of the complementary bevels to throw 55 the parts out of alinement is overcome by the close fit of the projection B² within the tubular part A.

Into one end of the casing G is screwed or otherwise secured the ball-race or cone E, 60 whose operative face stands outward and is preferably provided with openings K for the reception of a suitable spanner-wrench, by means of which it can be turned to proper position. It will be obvious, however, that 65 this cone E might be made integral with the casing G, entirely smooth, and set or pressed into position therein, as it is not intended for adjustment. Within the other end of said casing is screwed the adjustable ball-race or 70 cone F, whose operative face also stands outward and is preferably provided with openings K for the reception of a suitable spanner-wrench, by means of which it can be turned, and the radial edge of this cone is 75 also provided with recesses or grooves J, as seen in Fig. 3.

At a suitable point in the casing G is left an opening T, as seen in Fig. 8, through which the adjustable cone may be turned in either di- 80 rection by means of a screw-driver or other suitable tool inserted therein and engaged with one of the grooves J. After properly turning this cone there is inserted within the opening T a hard-metal locking device I or P, 85 according to which style of dust-cap and ring is used. The form lettered I, Fig. 7, is employed in connection with the ring H of Fig. 4. This locking device I has a projection *i* entering one of the grooves J, and its body 90 is held in place by the ring H, which is preferably interiorly threaded, so as to screw on the exterior of the casing G, the entire body being sufficiently small to pass completely into the opening T. The locking device P of 95 Figs. 6 and 8 has a small projection *p* engaging one of the grooves J; but its body is of such thickness that a hard-metal milled screw-cap O is necessarily employed in connection therewith, this cap taking onto an exteriorly- 100 threaded nozzle T', that surrounds the opening T, and having an interior centrally-disposed lug *o* with a rounded face bearing upon the back of the body P, so as to permit the

cap to be turned to throw its lug against the back of the device P, press it inward into position, and hold it there. It will be obvious that instead of milling the edges of the screw-cap O the latter may be made angular, so as to receive a wrench. I consider either form of locking device an improvement over that shown in my previous patent, No. 581,395, issued April 27, 1897, for the reason that the projection in the present instance extends from the center of the face of the body, whereby the locking device may be inserted with either end to the right. Moreover, the peculiar formation of the screw-cap is such as to cause it to bear ever upon the back of the locking device opposite this projection, even while the cap is being rotated.

The letters C and D designate cups forming the outer walls of the races for the reception of the balls L, the latter being held in position by the well-known retaining-washers N, as seen in Fig. 1. To these cups are integrally attached the sleeves C' and D', respectively, which sleeves fit snugly around parts A and B of the crank-axle, with their inner ends cut off squarely and out of contact with each other, and are held in position thereon against longitudinal displacement by means of fixed shoulders *a* and *b*, formed on said parts A and B, as seen in Fig. 2. This construction accurately centers the sleeves upon the crank-shaft and holds the parts of the latter in exact alinement against the tendency of the bevels to disturb it, as well as preventing the outer members or cups of the ball-races from spreading apart when the inner or conical members are adjusted outwardly.

With the above construction the adjustable cone F is set, the parts assembled, as seen in Fig. 1, and the nut M tightened to hold them in position when the balls are clamped with sufficient tightness in their races, and finally the locking device I or P is inserted in the opening T of the casing G and locked in place, so as to be dust-proof and so that it will hold the adjustable cone F against retrograde movement. It will also be clear that when the bearings are taken apart for the purpose of cleaning them it will not be necessary to disturb the adjustment of the cones E and F, whereby when all parts of the bearing are reassembled the sleeves and the cups C and D will be forced inward to the same relative positions they previously occupied.

The letters Q designate the points to which the driving sprocket-wheel is attached, and this wheel is obviously removed with the left-hand crank.

When it is desired to separate the parts of the bearing, as for cleaning or repairing, the nut M is removed, after which the parts A and B of the shaft can be drawn longitudinally out of the crank-hanger, the projection B² of the solid part sliding out of the hollow portion of the other part A. With each part of the shaft is also drawn out of the casing G

its half C' or D' of the sleeve, together with the integral cups C or D and the series of balls L, which are retained therein by the retaining-washer N, and the casing G is exposed for through and through cleaning, while its cones E and F are also exposed for cleaning and without having their adjustment interrupted. The removed parts can be further separated by slipping the sleeves off of the parts A and B, if desired, and when they are placed thereon the fact that the inner ends of the sleeves are cut off squarely and are never intended to contact or coast avoids the necessity of any exact relative arrangement of the sleeves with respect to their position around the parts of the crank-shaft. It is only necessary that the outer ends of the sleeves shall abut against the shoulders *a* and *b*, and then the parts can be reassembled in a manner that will be clear.

It is evident that the two-part-sleeve ball-race cups, with the oiler and facing ball-race cones set in the crank-hanger casing, can be adapted to other methods of connecting the crank-shafts, and it can be adapted to hub-bearings for the wheels. Therefore I do not limit my invention to the specific construction herein shown and described, but contemplate the employment of the same in any connection in which its utility may be manifest.

What is claimed as new is—

1. In a bicycle, the combination with a crank-hanger carrying outwardly-facing cones; of a two-part crank-shaft whose parts are struck on complementary bevels so that they shall interlock at their meeting ends, one part being tubular and the other having an integral projection passing through and fitting within the tubular portion and provided with a threaded extremity receiving a nut, a sleeve in two parts or sections with their ends entirely out of contact and closely surrounding and lapping the meeting bevels of the crank-shaft, integral ball-race cups at the outer ends of the sleeve-sections and facing inwardly, and means for drawing these sections toward each other, as and for the purpose set forth.

2. In a bicycle, the combination with a crank-hanger, and two outwardly-facing cones therein; of a two-part crank-shaft having shoulders on its parts and complementary bevels at their meeting ends, means for drawing said parts adjustably toward each other, a two-part sleeve closely surrounding the crank-shaft and its parts pressed inwardly by said shoulders, the inner ends of said parts being out of contact with each other but lapping the beveled ends of the parts of the crank-shaft, ball-race cups carried by the parts of the sleeve and facing inwardly, and ball-retaining washers carried by said cups, as and for the purpose set forth.

3. In a bicycle, the combination with a rotary member carrying ball-race cups, two series of balls therein, and a pair of cones for the balls, one of them being adjustable; of

an exteriorly-threaded casing supporting the
cones and having an opening at a point ad-
jacent the adjustable cone, the latter being
provided with peripheral grooves, an exteri-
5 orly-threaded nozzle surrounding such open-
ing, a locking device within said opening hav-
ing a central projection engaging one of said
grooves, and a screw-threaded cap fitting on
said nozzle and having a centrally-disposed
10 internal lug with a rounded face bearing upon
the back of said locking device and closing
the opening behind it, as and for the purpose
set forth.

4. In a crank-hanger for bicycles, the com-
15 bination with a tubular casing, outwardly-
facing cones therein, and means for adjust-
ing one of them; of a two-part crank-shaft
whereof one member is tubular, has a beveled
inner end, has an exterior shoulder near its
20 outer end which end is integrally connected
with its crank, and has means for the attach-
ment of the sprocket-wheel, and the other
member has a body portion beveled at its in-

ner end, an exterior shoulder at its outer end,
an integral crank beyond this shoulder, and 25
a reduced portion at and concentric with the
inner end of this body and of a size to pass
through the tubular member and threaded
at its outer end to receive a nut; a two-part
sleeve whereof the members closely surround 30
the connected crank-sections with their inner
ends out of contact and lapping the beveled
ends of the parts of the crank-shaft and their
outer ends abutting against said shoulder, in-
wardly-facing ball-race cups integrally car- 35
ried at the outer ends of the sleeve-sections,
and two series of balls, all as and for the pur-
pose set forth.

In testimony whereof I have hereunto sub-
scribed my signature on this the 11th day of 40
March, A. D. 1897.

WILBER F. HAWES.

Witnesses:

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JOHN S. GIBONS,
JAMES A. KILTON.