No. 607,055. Patented July 12, 1898.

J. KNAPE & C. W. DAKE.

CRANK SHAFT BEARING FOR BICYCLES.

(Application filed June 17, 1897.)

(No Model.)

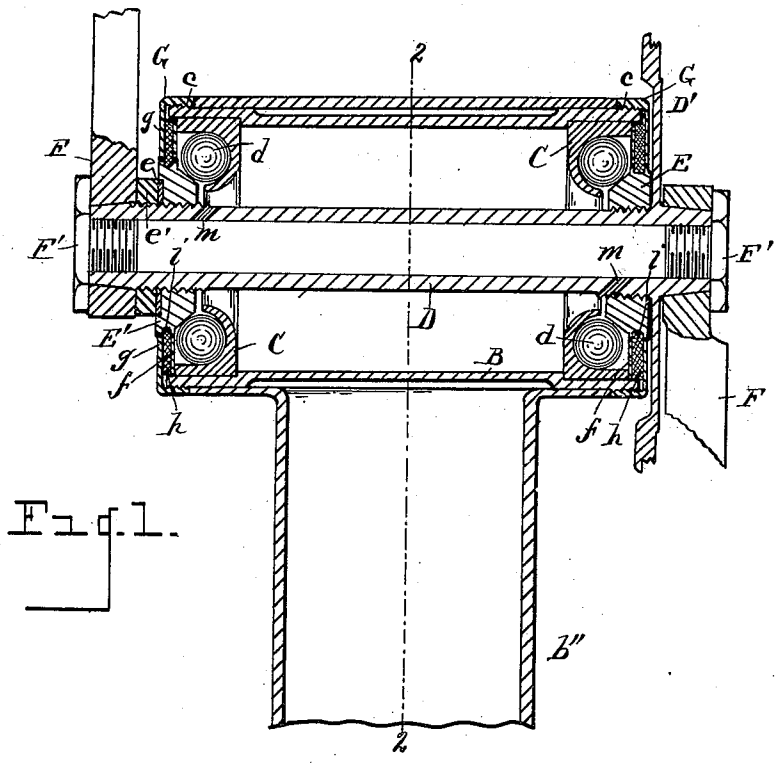


Fig. 1.

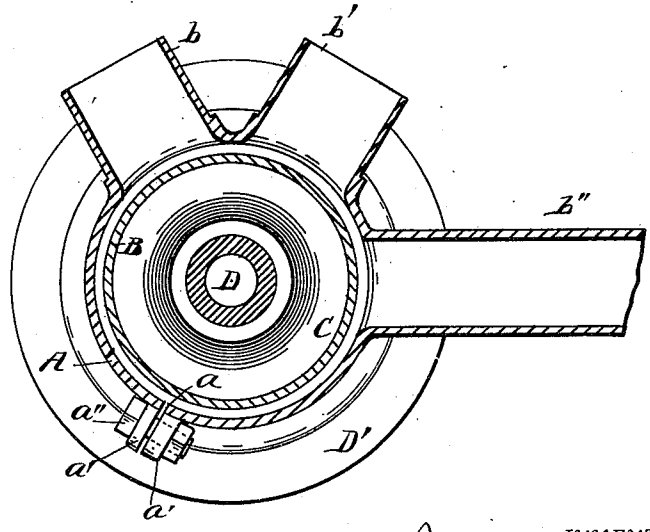


Fig. 2.

WITNESSES

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CRANK-SHAFT BEARING FOR BICYCLES.

SPECIFICATION forming part of Letters Patent No. 607,055, dated July 12, 1898.

Application filed June 17, 1897. Serial No. 641,094. (No model.)

To all whom it may concern:

Be it known that we, JOHN KNAPE and CHARLES W. DAKE, citizens of the United States, residing at Grand Rapids, in the county of Kent, State of Michigan, have invented certain new and useful Improvements in Crank-Shaft Bearings for Bicycles; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to new and useful improvements in crank-shaft bearings for bicycles; and it consists in the construction and arrangement of parts hereinafter fully set forth, and pointed out particularly in the claims.

The objects of the invention are to provide a simple, strong, and compact construction in which the crank-shaft bearing is located in a removable case which is supported in the crank hanger or bracket, the arrangement being such as to enable the removal of the bearing from the hanger without disturbing the bearing parts, and a further arrangement whereby the removable case may be securely locked within the hanger by suitable jam-nuts, which form dust-caps as well for excluding dust from the bearings. These objects are attained by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a central longitudinal section through the crank-hanger, crank-shaft, and bearings. Fig. 2 is a transverse section on line 2 2 of Fig. 1.

Referring to the letters of reference, A designates the crank-shaft bracket or hanger, which is of the barrel pattern and is provided on its under face with an open slot *a*, extending longitudinally thereof. Formed upon opposite sides of said opening are the ears *a'*, through which passes a bolt *a''*, whereby said ears may be drawn together and said hanger clamped upon the bearing-case, which is inserted therein to hold said case against rotary motion. Projecting from said hanger are the nipples *b b' b''*, which are adapted to be brazed to the tubes of the frame in the ordinary manner.

The bearing-case B consists of a cylindrical shell of such diameter as to fit snugly within the hanger and of such length as to project through and extend slightly beyond the hanger at each end, which projecting ends are externally threaded, as shown at *c*. Fixed within the opposite ends of said case B are the ball-races C, which are adapted to receive the balls *d*.

D designates the crank-shaft, which passes through said case and ball-races, said shaft being hollow and provided at one end with the integral disk D', to which the sprocket-wheel is adapted to be attached.

Upon the end of the shaft carrying the disk D' is a fixed cone E, while upon the opposite end of said shaft is an adjusting-cone E', which cones are adapted to engage the balls within the ball-races and form the bearings upon which the shaft D revolves in a manner well understood. The adjusting-cone E' is provided in its face with an annular recess, which receives a washer *e*, against which is screwed a jam-nut *e'* to lock said cone. The projecting ends of the shaft are tapered and receive the cranks F, secured by the headed bolts F', which screw into the ends of said shaft.

Located within the ends of the bearing-case B are the ball-retaining rings *f*, which serve to confine the balls within the ball-races when the shaft and cones are removed.

For the purpose of retaining the ball-case in place within the crank-hanger and at the same time exclude dust from the bearings the jam-nuts G are employed, which are adapted to screw onto the threaded ends of said case and abut against the opposite ends of the hanger, thereby firmly securing said case in position. Said jam-nuts G are provided with integral right-angled flanges *g*, which project diametrically of the hanger and embrace the bearing-cones on the axle, as clearly shown in Fig. 1, thereby forming dust-caps which exclude dust from the bearings.

The ends of the case B project slightly beyond the ball-retaining rings *f*, forming annular ways adapted to receive the felt wash-

ers *h*, while the bearing-cones E E′ are provided with peripheral grooves *i*, which receive the edges of said washers, whereby an additional guard against entrance of dust to the bearings is provided.

It will now be understood that by removing the cone E′, together with the jam-nut *e′* and the crank, the axle may be withdrawn from the bearing-case, while the balls are retained therein. It will also be understood that by removing the jam-nut G and the crank on the end of the shaft opposite from the disk D′ the bearing-case B, containing the bearings and the shaft, may be withdrawn from the hanger without disturbing said bearings.

Leading from the interior of the hollow shaft are the oil-ducts *m*, through which oil is conveyed to the bearings, oil being supplied to the opening through said shaft in any suitable manner.

Having thus fully set forth our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a crank-shaft bearing for bicycles, the combination with the hanger, the removable case therein having threaded ends which project beyond said hanger, the ball-races in said case, the crank-shaft carrying the bearing-cones, and the jam-nuts adapted to screw onto the projecting ends of said case and having the right-angled flanges forming dust-caps, substantially as set forth.

2. In a crank-shaft bearing for bicycles, the combination with the hanger, a removable bearing-case therein, the ball-races in said case, the ball-retaining rings within the ends of said case forming an annular space between the outer face of said rings and the outer ends of said case, the crank-shaft having the bearing-cones having circumferential grooves in the edges thereof, the felt washers lying upon said ball-retaining rings within said annular space in the ends of said case, their inner edges lying in the circumferential grooves of said cones, the jam-nuts screwed onto the ends of said case having right-angled flanges which embrace said cones and confine said felt washers between the inner faces of said flanges and said ball-retaining rings.

In testimony whereof we affix our signatures in presence of two witnesses.

JOHN KNAPE.
CHARLES W. DAKE.

Witnesses:
M. D. HOOGESTEGER,
L. F. MATHEW.