

UNITED STATES PATENT OFFICE.

LUCIEN SEYMOUR, OF GENEVA, OHIO, ASSIGNOR TO THE GENEVA CYCLE COMPANY, OF SAME PLACE.

CRANK-FASTENING.

SPECIFICATION forming part of Letters Patent No. 627,601, dated June 27, 1899.

Application filed February 12, 1898. Serial No. 670,038. (No model.)

To all whom it may concern:

Be it known that I, LUCIEN SEYMOUR, a citizen of the United States, residing at Geneva, in the county of Ashtabula and State of Ohio, have invented a certain new and useful Improvement in Crank-Fastenings, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

10 The object of my invention is to provide crank-shaft fastenings for bicycles which shall be cheap in construction, efficient in operation, and neat in appearance and in which the parts may be readily and conveniently detached.

15 The invention consists in the combination of parts hereinafter described and definitely enumerated in the claim.

20 The drawings clearly illustrate my invention.

Figure 1 is a vertical central longitudinal section through the crank-shaft and bearings. Fig. 2 is a perspective view of the end of a crank-arm, the spider, and a portion of the crank-shaft, which parts coöperate and are shown in position for attachment to each other. Fig. 3 is an end view of the invention, as shown in Fig. 1, being taken from the right-hand end of that figure.

30 Referring to the parts by letters, A represents the barrel of a suitable crank bracket or hanger which is adapted to be secured to and form part of a bicycle-frame. Screwing into the ends of the barrel are the ball-cups B and B'. The ball-cup B has a flange b , which contacts with the end of the barrel when the ball-cup is screwed into place, when it forms a stop and lock for such ball-cup. The other ball-cup provides for the adjustment of the bearings and instead of a rigid flange has a ring C, screwing onto its periphery and adapted to form a lock by jamming against the end of the barrel. The thread on the ball-cup B', which the ring C screws onto, is a continuation of the thread which screws into the barrel. Holes b' are provided in the ball-cups, whereby they may be turned by a suitable spanner-wrench, while the periphery of the ring C is suitably milled to provide for its turning by the fingers.

50 In the interior of the barrel is a tube or

sleeve F, which carries the cones E. These cones are rigidly secured to the sleeve by being forced onto it against shoulders f thereon. Between the cones and the ball-cups roll sets of balls D. Suitable ball-retainers b^2 are provided in each of the ball-cups, as shown, to confine the balls therein when the parts are separated.

When the parts so far described are in position, the bearings may be adjusted and locked without regard to the cranks or the crank-shafts, the bearings being entirely "self-contained" between the sleeve F and the barrel of the hanger.

65 The crank-shaft consists of two parts or shafts G G', each of which is adapted to be secured at one end to a crank-arm, and has its other end cut off diagonally, as shown in the drawings at g . These diagonal faces g contact with each other when the shaft is in position, whereby when the portions of the shaft are drawn tightly together they slip on each other slightly, and thus become tightly clamped to the sleeve F. The means for so forcing the two shafts together is furnished by the bolt H, which extends through a longitudinal hole g' in the shafts and has at one end a head h and at the other screw-threads which screw through internal threads g^4 near the end of the shaft G'. A nut h' screws over the projecting end of the bolt and acts as a jam-nut. The two crank-arms and the spider K for the sprocket-wheel L are secured to the crank-shafts before the bolt H is inserted. This securing is accomplished by the following means: On each portion of the crank-shaft is formed a flange g^2 . This flange is preferably integral with the shaft, extending from it at right angles. The approximately rectangular form of this flange shown in the drawings is deemed preferable; but it is only essential that it be of some form other than a circle about the axis of the shaft. In the inner face of the hub of the crank-arm J' is formed a recess j , adapted to accommodate the flange g^2 of the crank-shaft G', while in the hub of the spider K is formed a similar recess k for the reception of the flange g^2 on the crank-shaft G. On the opposite side of the spider-hub is a similar recess k' , which receives a projection j' on the hub of the crank-arm J. The

flanges g^2 and the projection j' and the corresponding recesses are preferably slightly beveled at their edges to insure a tight engagement.

5 The outer ends of the crank-shafts G G' are screw-threaded, as at g^3 . On these screw-threads turn conical nuts M , which are adapted to stand in conical depressions j^2 in the hubs of the crank-arms. These nuts, which
10 may be tightened by the application of a spanner-wrench to notches m in the nuts, lock the crank-arms tightly to their shafts. It will thus be seen that one crank-arm and the spider for the sprocket-wheel may be secured to its shaft
15 and the other crank-arm secured to its shaft independently of each other and independently of the hanger and bearings. When the parts are so secured, the shafts G G' are inserted in the sleeve F and the bolt H passed
20 through the shafts and screwed tightly into place and the nut h' turned on the bolt-head h and the head of the nut h' covering the corresponding nuts M , and thus hiding them from view. The assembled parts thus present a
25 very neat appearance.

On the inner face of the hub of the crank-arm J' is formed a flange j^3 , whereby a substantially annular space is provided between such hub and the bearing parts, in which a
30 felt washer may be inserted, if desired. Provision may be made at the other end of the hanger for a washer between the hub of the sprocket-wheel and the hanger.

In assembling the parts the cup B , carrying its quota of balls secured by the ball-retainer b^2 , is first screwed into place in the barrel A . The sleeve F , with its cones, is then placed in the barrel, and the ball-cup B' , with its balls and carrying the locking-ring C on
40 its periphery, is screwed into the barrel until the bearing is properly adjusted. The locking-ring C is then turned tightly against the end of the barrel. The bearing is thus adjusted and locked. The shaft G is then in-
45 serted through the spider and crank-arm J ,

and these parts are locked together by the nut M . Similarly the crank-shaft G' is secured to the crank-arm J' . The crank-shafts G and G' are then inserted into the sleeve F , the bolt H passed through them, and the nut
50 h' turned into place, thus completing the assembling of the parts. It will thus be seen that each portion of my crank-shaft and bearing is in reality self-contained, for the balls are held in the ball-cups by their retainers
55 before the ball-cups are screwed into the barrel of the hanger and the cones are permanently secured to the sleeve F , and after that sleeve and the ball-cups, with their balls, have been put in place the bearing is locked
60 without regard to the crank-shafts or cranks. Likewise after the spider has been put on the shaft G and the crank-arm J and nut M put in place this portion of the mechanism is locked together without regard to the rest,
65 and so is the crank-shaft G' and its arms J' . By providing a movable spider instead of one permanently secured to the crank-shaft I furnish means for the attachment to that shaft of sprocket-wheels, carrying their own hubs,
70 or wheels having simply a rim and web portion adapted to be secured to the spider-arms.

I claim as my invention—

The combination of a hollow crank-shaft having a thread on its end, a crank-arm hav-
75 ing a hub surrounding said shaft and thread, a recess in the outer side of said crank-hub, a nut M screwing onto said shaft and lying within said recess, a screw-threaded bolt projecting through the hollow shaft and a nut
80 screwing onto the end of the bolt and extending over said nut M , substantially as described.

In testimony whereof I hereunto affix my signature in the presence of two witnesses. 85

LUCIEN SEYMOUR.

Witnesses:

HENRY MEANS,
EDITH HARTE.