No. 737,603. PATENTED SEPT. 1, 1903.

J. S. FRITZ.

CRANK ARM CONNECTION.

APPLICATION FILED FEB. 16, 1903.

NO MODEL.

Fig. 1.

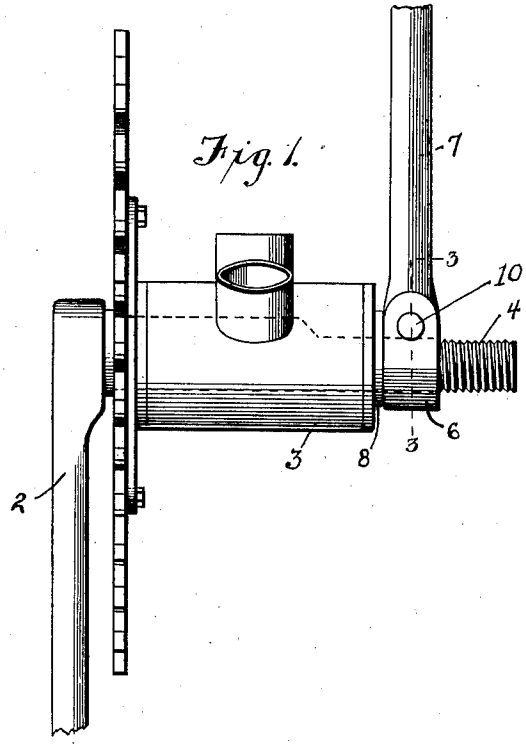


Fig. 2.

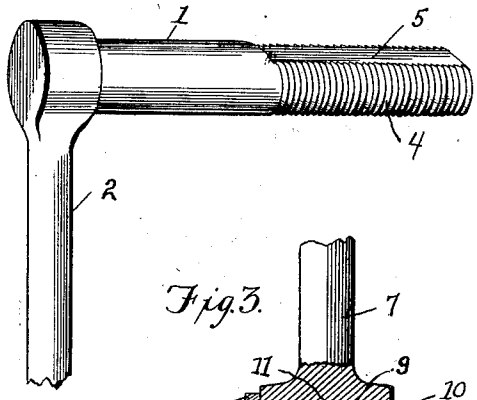
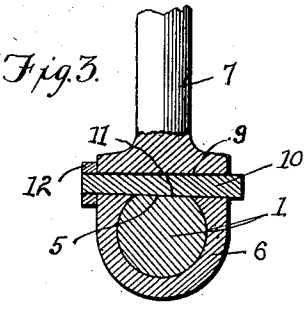


Fig. 3.



Witnesses
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No. 737,603. Patented September 1, 1903.

UNITED STATES PATENT OFFICE.

JACOB S. FRITZ, OF ZANESVILLE, OHIO.

CRANK-ARM CONNECTION.

SPECIFICATION forming part of Letters Patent No. 737,603, dated September 1, 1903.

Application filed February 16, 1903. Serial No. 143,576. (No model.)

To all whom it may concern:

Be it known that I, JACOB S. FRITZ, a citizen of the United States, residing at Zanesville, in the county of Muskingum and State of Ohio, have invented a certain new and useful Improvement in Crank-Arm Connections, of which the following is a specification.

This invention relates to means for connecting crank-arms to shafts, and is particularly designed for connecting pedal crank-arms to the drive-shafts of bicycles, and while the embodiment shown in the accompanying drawings illustrates its application to a bicycle it will of course be understood that it may be used in other connections as well.

In view of the fact that the crank-hangers of bicycles now on the market vary considerably in length difficulty is experienced in fitting a new shaft and pedal-cranks to a machine, as the shaft is either too long or too short for the hanger. This objection is effectually overcome by the present invention, which has for its object to provide a shaft of a length exceeding the greatest length of the crank-hanger and to arrange for conveniently fitting a pedal crank-arm thereto and adjusting the same in accordance with the length of any particular crank-hanger without altering or changing the latter in any manner whatsoever.

With this object in view the present invention consists in the combination and arrangement of parts, as will be hereinafter more fully described, shown in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that changes in the form, proportion, size, and minor details may be made within the scope of the claims without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings, Figure 1 is a front elevation of a crank-hanger having the features of the present invention applied thereto. Fig. 2 is a detail perspective view of a shaft constructed in accordance with the present invention and having an integral pedal-arm. Fig. 3 is a detail sectional view on the line 2 2 of Fig. 1.

Like characters of reference designate corresponding parts in each and every figure of the drawings.

The preferred embodiment of my invention so far as the shaft itself is concerned has been shown in Fig. 3, wherein the reference character 1 designates a shaft which is preferably provided at one end with an integral pedal crank-arm 2; but it will of course be understood that this arm may be integral or otherwise connected with the shaft without affecting the present invention. Wherein the present form of shaft differs from the common or ordinary shaft resides in the fact that it is considerably longer than is absolutely necessary for the crank-hanger, the latter being designated by the reference character 3 in Fig. 1. In addition to this first-mentioned difference that end of the shaft which is opposite the arm 2 is screw-threaded, as indicated at 4, for about one-half of its length, and these screw-threads are cut away or interrupted to form a flattened longitudinal portion 5, extending throughout the entire length of the screw-threaded portion and leading inwardly from the adjacent end of the shaft. When this improved shaft is fitted to an ordinary crank-hanger, it will be seen that the screw-threaded end thereof projects beyond one end of the hanger in order that the interiorly-screw-threaded terminal eye portion 6, which extends entirely through a detachable pedal crank-arm 7, may be fitted thereto and screwed up snugly against the cone-tightening ring or nut 8. To prevent the crank from backing off of the shaft, the arm 7 is provided with an interiorly smooth and tapered opening 9, extending transversely therethrough and intersecting the eye for the reception of a tapered cotter-pin 10, which has a flattened portion 11 to bear snugly across the flattened portion 5 of the shaft and thereby interlock the crank-arm and the shaft for simultaneous movement and to prevent the arm from backing off of the shaft. To prevent loosening and displacement of the cotter-pin, the smaller end thereof is projected beyond the arm and is screw-threaded for the reception of a suitable nut 12. After the detachable arm 7 has thus been secured to the shaft the projected portion of the latter is cut off flush with the outer face of the eye 6.

I am aware of the fact that a crank-arm has been connected to a shaft by means of a cotter-pin passed through the eye portion of the

arm and engaging a notch in the shaft, but appreciate the fact that in using a notch of a size to fit the pin the arm must be connected at one point and at one point only to the shaft, and therefore cannot be adjusted longitudinally of the shaft and locked or fastened at any point thereon. This difficulty is effectually obviated by providing the long continuous flattened portion 5 on the shaft, whereby the crank-arm may be adjusted longitudinally to any point and then interlocked with the shaft by means of the cotter-pin 10. Furthermore, the opening or eye in the crank 7 extends entirely through the same in order that the shaft may be projected entirely through the crank, as shown in Fig. 1 of the drawings, or, in other words, to permit of the crank being adjusted to any point of the screw-threaded portion of the shaft and not limited to a position at the extremity of the shaft.

From the foregoing description it will be understood that the essential object of the present invention is to provide a crank-shaft and a detachable pedal crank-arm therefor which are particularly adapted for use in repair-shops, wherein the workman may have a shaft which is longer than any size of crank-hanger and may be fitted to any crank-hanger without altering or changing the latter in any manner whatsoever.

What I claim is—

1. The combination of a shaft provided with an external elongated longitudinal flat portion, a crank-arm having an eye extending entirely through the arm and embracing that part of the shaft which has the flat portion and is adjustable longitudinally thereon to points inwardly beyond the extremity of the shaft, and a cotter-pin carried by the crank-arm and engaging the flat portion of the shaft to interlock the crank-arm thereon at any point.

2. The combination of a shaft having a screw-threaded portion that is flattened on one side throughout the length of the screw-threaded portion, a crank-arm having a screw-threaded eye adjustably fitted to the screw-threaded part of the shaft and provided with an opening intersecting the eye, and a cotter-pin set in said opening and engaging the flat portion of the shaft to adjustably interlock the crank-arm upon the shaft.

3. The combination with a crank-hanger, of a shaft journaled therein and having one end projected externally of the crank-hanger, said projected end portion being screw-threaded and flattened longitudinally throughout said screw-threaded part, a crank-arm having an interiorly-screw-threaded eye fitted to the projected end portion of the shaft, and a pin piercing the eye and engaging the flattened portion of the shaft to adjustably interlock the arm thereon.

4. As a new article of manufacture, a pedal-crank embodying a shaft having a pedal-arm at one end and a screw-threaded portion at the opposite end thereof, a portion of the shaft being removed from the screw-threaded part thereof to form a flat face leading inwardly from the adjacent end of the shaft for engagement by a cotter-pin.

5. As a new article of manufacture, a pedal-crank embodying a shaft having a pedal-arm at one end and a screw-threaded portion at the opposite end thereof, a portion of the shaft being removed longitudinally from the threaded part thereof at a point diametrically opposite the pedal-arm to form a broad flat face leading inwardly from the adjacent end of the shaft for engagement by a cotter-pin.

JACOB S. FRITZ.

In presence of—
A. L. PHELPS,
W. L. MORROW.