

(No Model.)

W. C. SMITH.
PEDAL CRANK FOR BICYCLES.

No. 510,620.

Patented Dec. 12, 1893.

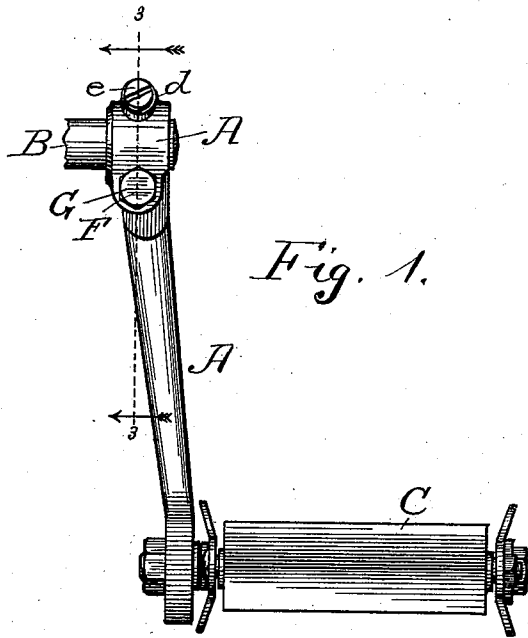


Fig. 1.

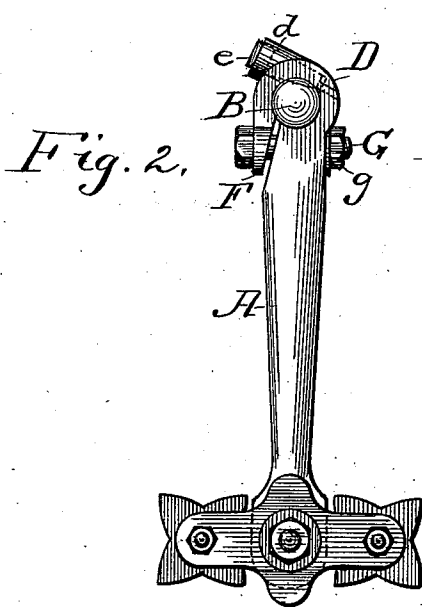


Fig. 2.

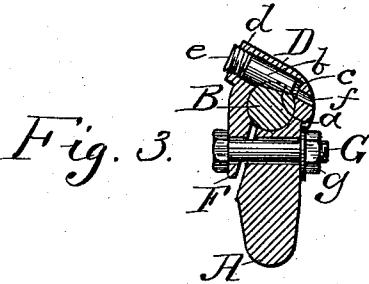


Fig. 3.

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UNITED STATES PATENT OFFICE.

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PEDAL-CRANK FOR BICYCLES.

SPECIFICATION forming part of Letters Patent No. 510,620, dated December 12, 1893.

Application filed February 23, 1893. Serial No. 463,518. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM CHURCH SMITH, of Goshen, in the county of Elkhart and State of Indiana, have invented certain new and useful Improvements in Pedal-Cranks for Bicycles, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

Heretofore considerable difficulty has been experienced by bicyclists in obtaining a pedal crank, which, when secured on the pedal-shaft would remain rigidly secured thereon, and yet, when for purposes of repair it was desirable to remove it could be easily removed without injuring the thread on the end of the wedge to such extent that it was very difficult to get the nut on the same again.

The object of my invention is to overcome the above objections, and, at the same time, provide a strong and durable crank connection with the pedal-shaft; substantially as hereinafter fully described, and as illustrated in the drawings, in which—

Figure 1, is an edge elevation of my improved pedal crank, secured to the broken off contiguous end of the pedal-shaft. Fig. 2, is a side elevation of the same, and Fig. 3, is a vertical section through the upper connecting end of the said crank, taken on dotted line 3, 3, Fig. 1.

In the drawings A represents the pedal-crank, the sweep of which may be constructed as to be at right angles to the pedal-shaft B, or oblique thereto, as shown in the drawings, or otherwise, and which has secured to its outer end any suitable form of pedal C in the usual manner. The end of the pedal-shaft B, to which the crank is secured, is provided with a suitable transverse recess *a*, the floor of which is perfectly straight as a chord connecting the ends of a segment, and affords a seat for the flattened beveled side of the wedge *b*. This recess *a* is located in the upper side of the shaft B, when the crank is in the vertical position shown in the drawings, and the wedge is seated in a circular chamber *c*, which commences in a suitable stub *d* projecting laterally to one side of the boss D of the crank, and extends a suitable distance into the opposite side of said boss, as shown.

The entrance to chamber *c* is provided with a female screw, and a short headless screw *e* is, after the wedge has been inserted into chamber *c*, screwed into the mouth of the same so as to force the wedge home. When this screw is removed the wedge can easily be driven out by inserting any kind of a suitable instrument through the passage *f* (which forms a continuation of less diameter than said chamber, and opens on the side of the boss opposite the mouth of the same) and hammering against the advance end of said wedge.

To be more exact about the location of the wedge, I would state that an imaginary line drawn longitudinally and centrally through chamber *c* and passage *f*, is, preferably, not at right angles to the plane of length of the crank, but at an angle of about twenty degrees or so, to such right angle.

As hereinbefore described I have a construction whereby it is impossible for the pressure on the wedge to affect the connection between the crank A and shaft B to its detriment. The screw *e* being headless, and entering well into the chamber when driving the wedge home is not affected by external agencies, and the direct pressure of the wedge against it cannot cause it to unscrew. Consequently, the connection must remain as originally made.

While what has been described heretofore could be used by itself, and a very perfect connection be thus obtained, I prefer to make a yet stronger connection whereby the possibility of the crank becoming loose on the shaft is precluded. This consists of providing the boss D with a downwardly extending lip F on that side adjacent to the mouth of the chamber *c*, instead of making the boss a solid ring surrounding the shaft. Thus lip F is obtained by slitting the crank from the edge to the shaft opening in the boss thereof in an almost longitudinal direction, as shown in Fig. 2, and it is secured to the main body of the crank by means of the bolt G, which extends laterally through said lip and crank and is tightened by a suitable nut *g*. Now, when the wedge is driven home by means of the screw *e* by tightening the bolt G, any possible looseness which might have been per-

mitted to exist by not driving the wedge home sufficiently can be taken up. By using the lip F, and bolt G, I also obtain a means which makes my improved crank connection practically adjustable on the end of the pedal-shaft of any bicycle, because I am thereby permitted to embrace the circumference of the same, which it will be borne in mind varies very little in diameter. Yet even a slight variation in diameter is enough to make a crank having the solid ring-shaped boss which would fit the shaft of one bicycle, not fit the shaft of the other.

What I claim as new is—

1. The combination in a vehicle with a shaft, having a transverse recess therein near its extremity, of a pedal crank having a transverse chamber in the rounded end of its boss, the entrance to which is provided with a female screw, a wedge seated in said chamber, a short screw entering the mouth of the same, and a pedal on the free end of said crank.

2. The combination in a vehicle with a shaft, having a transverse recess therein near

its extremity, of a crank having a transverse chamber in the rounded end of its boss, the entrance to which is screw-threaded, and which has a passage leading from the opposite end thereof in alignment therewith, a wedge seated in said chamber a short screw entering the mouth of the same, and a pedal on the free end of said crank, as set forth.

3. The combination in a vehicle with a shaft having a transverse recess therein near its end, of a pedal having a transverse chamber in the rounded end of its boss, the entrance to which is screw-threaded, a wedge within said chamber seated in said recess, a short screw entering the mouth of said chamber, a bolt G and nut g; said pedal having a lip made by slitting the same almost longitudinally from its edge to the shaft opening, through which said bolt passes transversely to clamp it to the main body of said crank, as set forth.

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Witnesses:

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