(No Model.)

W. R. MORRIS.

VELOCIPEDE CRANK.

No. 597,911. Patented Jan. 25, 1898.

Fig. 1.

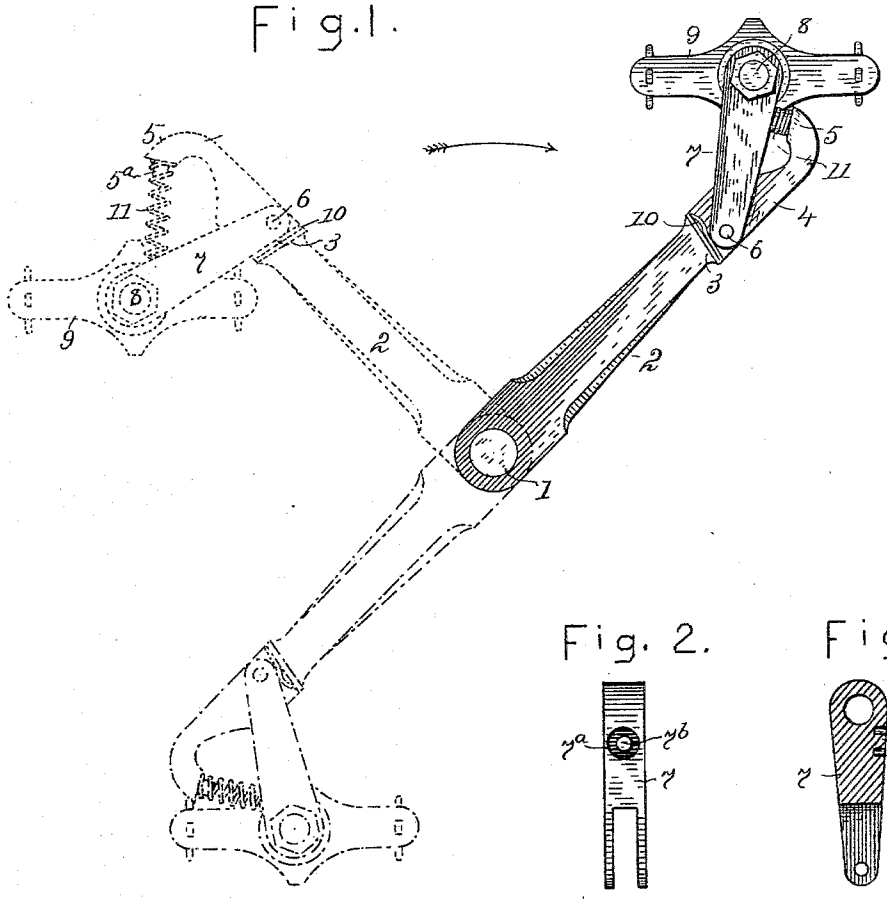


Fig. 2.

Fig. 3.

ATTEST

Ina Graham

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INVENTOR,

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM RUSLING MORRIS, OF RICHLAND, ILLINOIS.

VELOCIPEDE-CRANK.

SPECIFICATION forming part of Letters Patent No. 597,911, dated January 25, 1898.

Application filed June 24, 1897. Serial No. 642,203. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM RUSLING MORRIS, of Richland, in the county of Sangamon and State of Illinois, have invented certain new and useful Improvements in Velocipede-Cranks, of which the following is a specification.

The object of this invention is to provide a crank-arm for bicycles and other foot-propelled vehicles which will automatically increase the leverage proportionately to the resistance developed. It resides in certain details of construction and combinations of parts which are exemplified in the structure hereinafter described, and it is defined in the appended claims.

In the drawings forming part of this specification, Figure 1 is a side elevation of a crank-arm constructed in accordance with my invention and equipped with my improvements, one position of the parts being shown in solid lines, another in broken lines, and still another in dotted lines. Fig. 2 is an edge view of the leverage-increasing arm, and Fig. 3 is a section lengthwise of such arm.

The device comprises a crank-arm 2, mounted rigidly on an end of the drive-shaft 1 of a bicycle or other velocipede, a leverage-increasing arm 7, pivotally connected with the crank-arm between the ends thereof, a spring 11, located between the outer ends of the crank-arm and the leverage-increasing arm, and a pedal 9, pivoted in the swinging end of the leverage-increasing arm and extended sidewise therefrom. The crank-arm is diminished in width throughout the outer portion, (designated by 4,) thereby forming shoulders 3, and its outer end is hooked backward, as shown at 5, and provided with a backward-extending pin 5^a.

The leverage-increasing arm 7 is forked to embrace the thinned portion 4 of the crank-arm, it is pivotally connected with such thinned portion near shoulder 3 by means of pin 6, it is recessed at 7^a and provided in the recess with a pin 7^b, and it has a laterally-extending bolt 8, on which pedal 9 is journaled. The arm 7 swings behind the outer end of the crank-arm, and a spiral compression-spring is interposed between the two arms in such manner that one end encircles pin 5^a and the other end rests in recess 7^a and encircles pin 7^b. Flat springs, as 10, are fastened to the shoulders 3 in position to oppose extreme backward throw of the leverage-increasing arm.

In operation the arm 7 is normally held in the position with relation to the crank-arm shown in broken lines—that is to say, it is thrown back as far as the shoulders 3 and the spring thereon will permit. This brings the axis of the pedal to its nearest approach toward the shaft of the crank-arm and correspondingly shortens the leverage of the device. The spring 11 is strong enough to maintain these conditions against moderate pressure forward on the pedal, and so on level roads at comparatively slow speed the advantages of a short crank-arm are enjoyed. When occasion demands an unusual expenditure of force, as in climbing a hill or increasing the speed, the increased pressure on the pedal will in the downward motion of the foot overcome the resistance of the spring 11 to an extent proportionate to the pressure, thereby swinging the arm 7 outward and increasing the leverage. When the pressure is sufficient to entirely overcome the resistance of spring 11, as suggested in solid lines in Fig. 1, the end 5 of extension 4 will take the thrust of the foot throughout downward motion thereof the same as if the pedal were fixedly attached to such end. When sufficient pressure is applied to the pedal to overcome the resistance of spring 11, such spring will when the lowest point of swing is passed force the arm 7 sharply backward or away from the crank-arm and tend to develop a clicking sound by encountering shoulders 3. To avoid this is the function of the springs 10, which are interposed between the shoulder and the arm 7 in position to act as cushions for the arm.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a velocipede-crank the combination of a crank-arm, a leverage-increasing arm pivotally connected with the crank-arm between the ends thereof and provided with a pedal, and a spring between the outer end of the crank-arm and the leverage-increasing arm whereby the leverage of the crank may be increased against the resistance of the spring and the outer end of the crank-arm will form a positive stop to farther forward swing

of the leverage-increasing arm when the resistance of the spring is overcome.

2. In a velocipede-crank the combination of a crank-arm, a leverage-increasing arm pivotally connected with the crank-arm between the ends thereof and provided with a pedal, a spring between the outer ends of the arms, and a spring bearing on the crank-arm to limit the backward swing of the leverage-increasing arm thereon.

In testimony whereof I sign my name in the presence of two subscribing witnesses.

WILLIAM RUSLING MORRIS.

Attest:

JOSEPH F. BUNN,

E. W. PAYNE.