

No. 616,167.

Patented Dec. 20, 1898.

J. E. A. WALKER.  
BICYCLE PEDAL.

(Application filed Oct. 26, 1897.)

(No Model.)

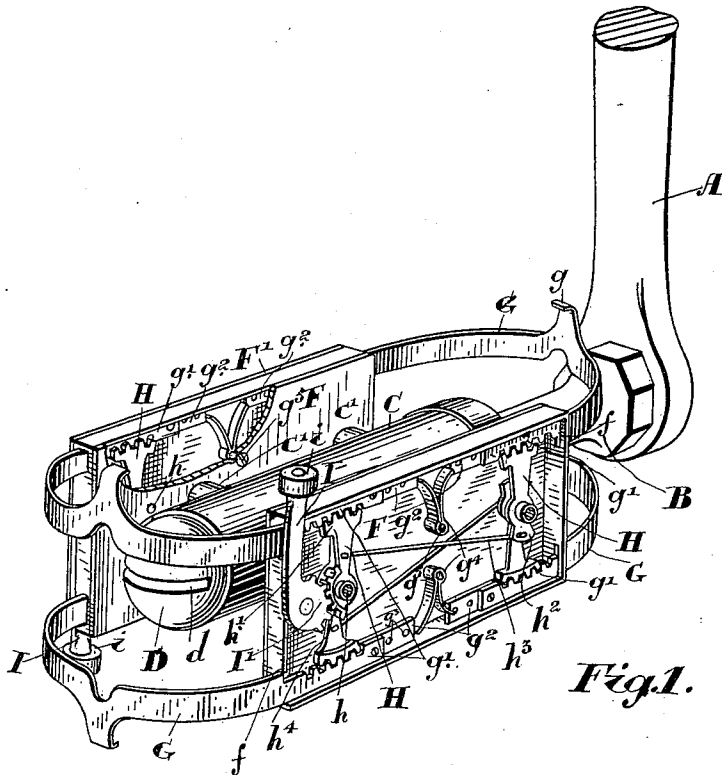


Fig. 1.

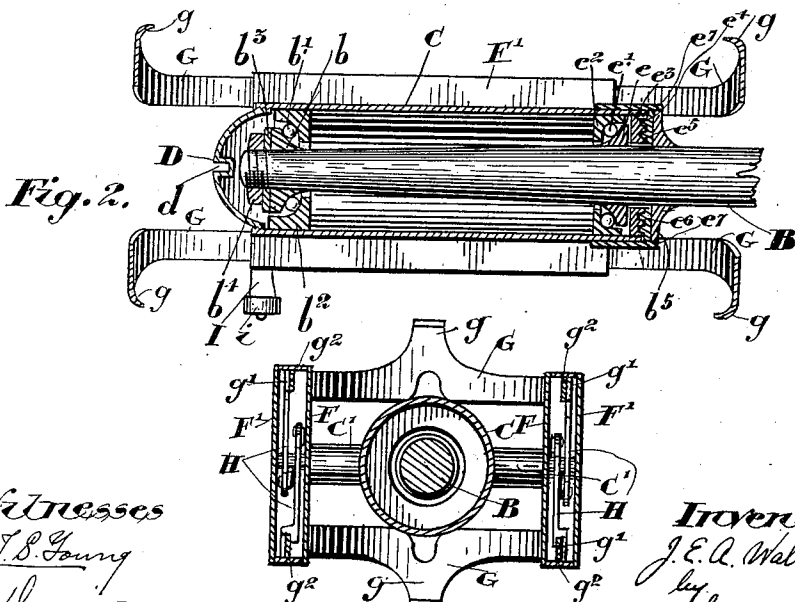


Fig. 2.

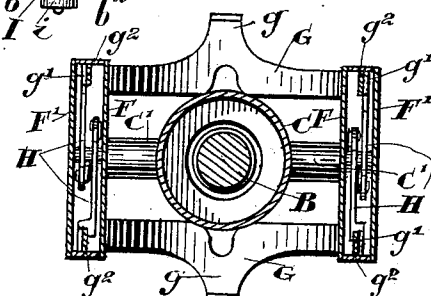


Fig. 3.

Witnesses  
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# UNITED STATES PATENT OFFICE.

JAMES ERNEST A. WALKER, OF WALKERTON, CANADA.

## BICYCLE-PEDAL.

SPECIFICATION forming part of Letters Patent No. 616,167, dated December 20, 1898.

Application filed October 26, 1897. Serial No. 656,442. (No model.)

To all whom it may concern:

Be it known that I, JAMES ERNEST A. WALKER, watchmaker, of the town of Walkerton, in the county of Bruce, in the Province of Ontario, Canada, have invented certain new and useful Improvements in Bicycle-Pedals, of which the following is a specification.

The invention has been patented in Canada November 8, 1897, No. 58,060.

My invention relates to improvements in pedals for bicycles; and the object of the invention is to devise a form of pedal which will dispense with the necessity of toe-clips now so frequently used to hold the foot securely on the pedal and yet will provide a very secure device forming part of the pedal which will securely retain the foot in position and from which the foot may be very readily withdrawn without any danger to the rider; and it consists, essentially, of a pedal the frame of which is suitably journaled on the spindle and is provided with laterally-adjustable looped bars held in the frame both at the top and bottom of the pedal in two sets, the inner ends of said bars being provided with toothed racks and having meshing therewith suitable gear-toothed quadrants manipulated by an arm pivoted in the frame and designed to be operated by the foot, said arm being provided with a toothed quadrant-shaped lower end, meshing with the toothed quadrant-shaped pivotal end of the operating-arm, such loop-shaped bars being provided with inwardly-extending lips at each end, and said bars being held out when not in use by springs and operatively connected together in the manner hereinafter more particularly explained.

Figure 1 is a perspective view of a pedal constructed in accordance with my invention. Fig. 2 is a longitudinal section through the pedal. Fig. 3 is a cross-section.

In the drawings like letters of reference indicate corresponding parts in each figure.

A is the pedal-crank, and B is the pedal-spindle, which is suitably secured in the end of the crank, as shown. The pedal-spindle is formed with a taper and is provided at the reduced end with ball-bearing cone  $b$ , balls  $b'$ , and the cup  $b^2$ , fitting within the cylinder C. The washer  $b^3$  is provided outside the cones on the threaded end of the spindle B and a suitable nut  $b^4$  to the outside of the

washer. I also provide a cap D, with a notch  $d$ , whereby it is screwed into the interior of the cylinder, closing it completely and rendering the ball-bearing dust-proof. The opposite end of the spindle is also provided with a cone  $e$ , balls  $e'$ , and cups  $e^2$ , securely screwed into the internal thread at this end of the cylinder. A disk  $e^3$  is also provided, which is screwed into the internal thread at this end of the cylinder, and such disk  $e^3$  has annular grooves  $e^4$ , into which fits a projection  $e^5$  at the inside of the disk  $e^6$ . An outer band  $e^7$  is also provided, which extends over a flange  $b^5$ , formed on or secured to the spindle B. It will thus be seen that the ball-bearings at this end of the cylinder are also rendered dust-proof.

The cylinder C is connected by hollow arms C', suitably brazed thereto, to the rectangular metal box-plates F, which form with the outer plates F' the side frames of the pedals.

G are end loops provided with upwardly and inwardly projecting lips  $g$ . I provide a pair of end loops G for the top and bottom of each pedal, and the inner ends of the loops have toothed racks  $g'$  formed on them and have supplemental ends  $g^2$  secured on each end, provided with a series of holes  $g^3$ , into which extend the screws on the ends proper. By means of these supplemental ends  $g^2$  the distances apart of the opposite lips  $g$  of the loops G may be regulated to suit the different widths of shoes. The supplemental ends  $g^2$  are pressed outwardly, so as to normally hold the loops out when not in use, by the V-shaped springs  $g^4$ , secured to the inside of the box-plate F by the screws  $g^5$ .

H are arms pivoted on the screws  $h$ , extending from the outside plate F' to the inside plate F. The outer ends of the arms are provided with quadrants  $h'$ , which mesh with the teeth of the racks  $g'$ . One arm H is provided with a tail  $h^2$ , which is connected by a rod  $h^3$  to the other arm H. Around the journal of the arm H is formed on the arm a quadrant  $h^4$ , which is engaged by a quadrant I', formed on the lower end of the arm I concentric to its pivot-point. The upper end of the arm I is provided with a friction-roller  $i$ .

It will be understood that the upper arms H are operated together on the depression of the arm I, then uppermost, and its quadrant I'. The lower arms H when the pedals are in one position become the upper arms when the

pedal is given a half-turn, and as either side of the pedal may be uppermost the mechanism of the pedal is duplicated.

The ends of the loops G extend through 5 guiding-slots *f* in the ends of the box-plates F. The opposite box-plate is provided with identically the same form of arms H and the quadrants formed on them meshing with the racks and the same form of springs corresponding to *g*<sup>4</sup>, and the same form of rod, as 10 *h*<sup>3</sup>, is also provided. The corresponding arms and their toothed quadrantal portions are provided at the opposite sides of the box-plates, as will be understood, so that both the 15 top and bottom of the pedal are similarly provided as to the loops and their coacting operating mechanism.

If it were convenient to have one side of the pedal always uppermost, it would be unnecessary to provide the duplicate sets hereinbefore referred to; but as it is necessary for the rider to be able to place his foot on the pedal at any moment and immediately secure it in position I provide such duplicate sets.

25 The manner of placing the foot on the pedal and securing it in position is as follows: It will of course be understood that when the lips *g* of the loops G are adjusted to the proper distances apart the foot may be placed in position 30 anglewise without being caught. By, however, twisting the foot so that the sole throws the roller *z*, and consequently the arm I, outwardly such arm imparts through its quadrantal connection with the racks of the 35 loops G an inward movement to the lips *g* of the loops G, thereby causing such lips to grasp the sole of the shoe, and thus securely hold the foot upon the pedal. By giving the foot 40 the reverse twist, so as to allow the outer end of the arm I to pass inwardly, the foot may be instantaneously released, or it may be released simply by drawing the foot backward, so that the narrow front portion of the foot 45 allows of the arm I to pass inwardly and the foot to become released.

A pedal constructed such as I describe can be made very cheaply, is conveniently journaled on the spindle of the pedal-crank, and as long as the foot when thrust into position 50 on the pedal is kept substantially parallel to the side of the machine such foot must be held securely in position; but any undue twist or tendency to fall would readily release the foot, so that all danger from accidents 55 would be absolutely avoided and yet during proper riding the foot be perfectly held in position upon the pedal.

Although I show and describe both end loops as adjustable, it will of course be understood that I might make one only adjustable and the other stationary, and I wish it to be understood that I lay claim to this equivalent construction.

What I claim as my invention is—

65 1. In combination, the pedal-spindle, the pedal-frame journaled thereon and loops arranged in pairs projecting from each face of

the pedal provided with suitable gripping-lips, guideways in the frame for holding said loops, and means independent of the tread of 70 the pedal common to each pair of end loops for simultaneously operating the same when the foot is placed in position on the pedal, substantially as described.

2. The combination with the pedal-spindle, 75 the pedal-frame suitably connected and journaled on the pedal-spindle, end loops for the pedal provided with suitable gripping-lips and held in suitable guideways in the frame, toothed racks on the inner ends of the loops, 80 quadrantal arms engaging said racks suitably pivoted in the frame and having the tail of one arm connected to the other arm proper and means for turning such arms on their pivot-points as and for the purpose specified. 85

3. The combination with the pedal-spindle, the pedal-frame suitably connected and journaled on the pedal-spindle, end loops for the pedal provided with suitable gripping-lips and held in suitable guideways in the frame, 90 toothed racks on the inner ends of the loops, quadrantal arms engaging said racks suitably pivoted in the frame and having the tail of one arm connected to the other arm proper, a quadrant formed on one arm around its 95 pivot-point and a supplemental arm provided with a quadrant concentric to its pivot-point engaging the quadrant on said quadrantal arm and having the upper end of the arm extending beyond the side of the pedal on which 100 the foot rests as and for the purpose specified.

4. The combination with the pedal-spindle, the pedal-frame suitably connected and journaled on the pedal-spindle, end loops for the pedal provided with suitable gripping-lips, 105 rack-shaped ends for the loops, suitably-pivoted quadrants meshing therewith and means for turning such quadrants so as to throw the loops inwardly by the outward lateral pressure of the shoe as and for the purpose specified. 110

5. In combination the pedal-spindle, the box-plates suitably connected thereto journaled thereon and provided with end slots, the end loops provided with gripping-lips and 115 arranged to extend through the end slot of the box-plate, the racks on the inner ends of the loops, the spring situated between the inner ends of the loops to normally hold them in the outer position, the quadrantal arms suitably pivoted in the box-plate, the rods connecting the tailless arm with the tail of the coacting arm, the quadrant on one arm concentric to the pivot-point the supplemental arm suitably pivoted in the box-plate and 120 having a quadrant meshing with the concentric quadrant on one arm and the upper end extending beyond the side of the pedal on which the foot rests as and for the purpose specified. 125

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