

No. 614,320

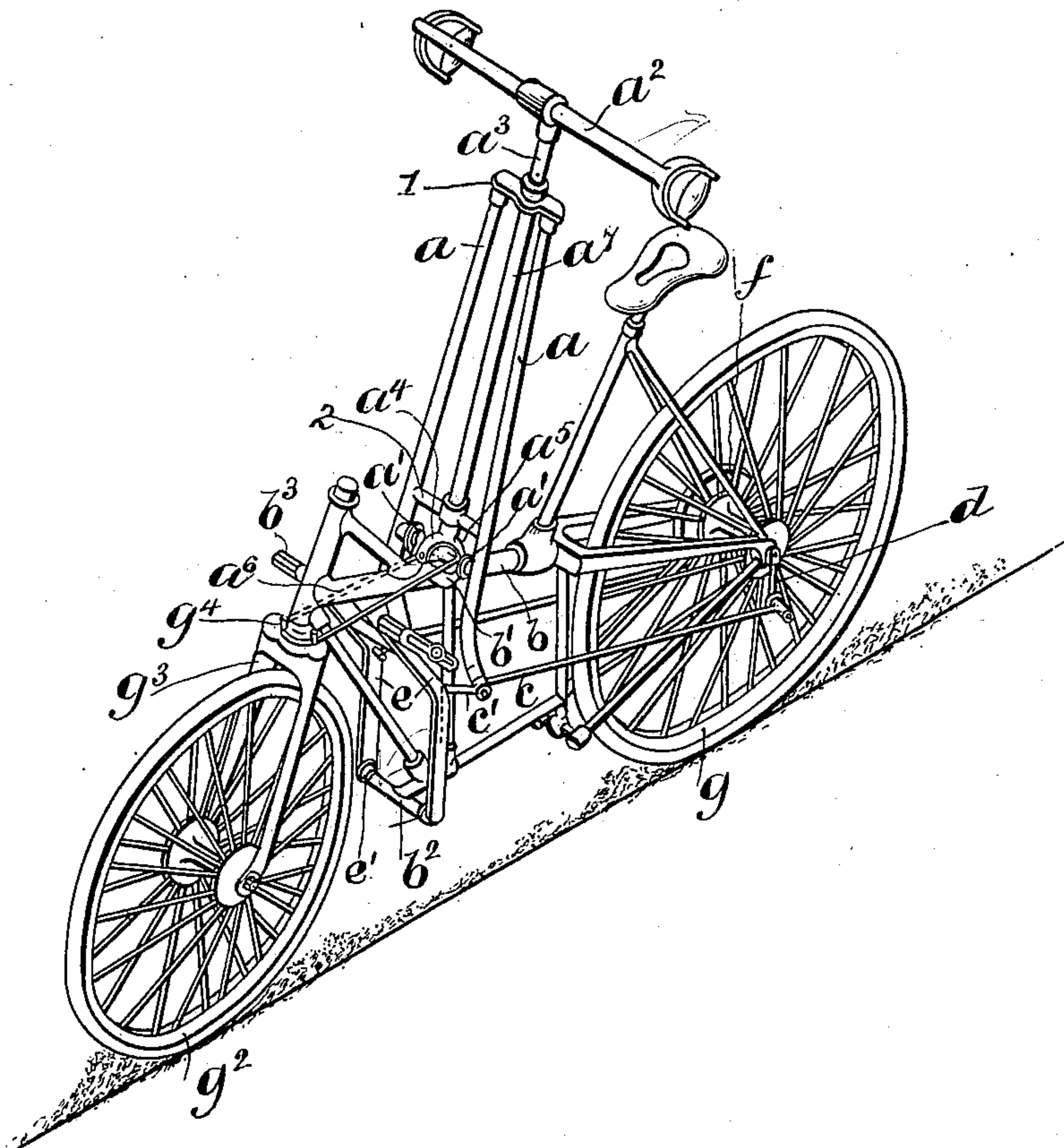
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T. C. DENNISON.

PROPELLING AND GUIDING MECHANISM FOR VELOCIPEDES, &c.

(Application filed Oct. 9, 1894.)

(No Model.)



Witnesses:-

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UNITED STATES PATENT OFFICE.

THOMAS CRAWFORD DENNISON, OF OAMARU, NEW ZEALAND.

PROPELLING AND GUIDING MECHANISM FOR VELOCIPEDES, &c.

SPECIFICATION forming part of Letters Patent No. 614,320, dated November 15, 1898.

Application filed October 9, 1894. Serial No. 525,382. (No model.)

To all whom it may concern:

Be it known that I, THOMAS CRAWFORD DENNISON, a British subject, residing at Oamaru, in the Colony of New Zealand, have

5 invented new and useful Improvements in Propelling and Guiding Mechanism for Velocipedes and other Similar Machinery, of which the following is a clear, full, and exact description.

10 My invention relates to velocipedes and other similar machines, and has for its objects providing mechanism for propelling and guiding the same so that a rider may employ the weight and muscles of his body to the best

15 advantage, and thus be enabled to attain a higher speed or propel himself with greater ease than with the velocipedes at present in use.

20 Further objects are to make provision for raising the rider's legs to such a height as to reduce liability of splashing with mud. At the same time the seat is so placed as to be in the most convenient position for mounting and dismounting with ease.

25 It is well known that most of the present forms of velocipedes are so designed that riding the same has a great tendency to contract the chest of the rider.

30 It is one of the objects of my invention to make the propelling mechanism of such a design as to have an opposite tendency—that is, to expand the chest of the rider.

I carry the objects of my invention into effect by providing a lever to be worked by the

35 hands and pedals to be worked by the feet. The lever and pedals are connected by sun-and-planet or other suitable gear with the driving-wheel of the velocipede in such a manner that while force is being exerted by pulling the lever the feet are employed in pushing the pedals. In this manner the weight and muscles of the body are used to greater advantage and better results obtained than where the legs only are used for propulsion

40 and the arms are employed for guiding the machine only. The said lever receives the handle-bar and rod for guiding the machine; and by my invention I provide suitable mechanism for guiding velocipedes with reciprocating guiding-rod and handle-bar.

50 The pedals are raised and have a nearly

horizontal reciprocating movement and are thus in such a position as to reduce liability of the rider's legs being splashed by mud.

The action of pulling with the hands and 55 pushing with the feet is similar to that of rowing a boat, where the shoulders are thrown back and the chest expanded at every stroke.

I am aware that reciprocating levers and pedals have been used in connection with epi- 60 cyclic trains for propelling velocipedes, especially upon railways, where the machine is guided by the rails; but with my invention I am able to propel and guide velocipedes upon ordinary roads when the propelling- 65 lever and guiding-rod are reciprocating together.

In order that my invention may be most easily understood by one skilled in the art to which it appertains, I will now proceed to de- 70 scribe the same in detail, and for that purpose shall refer to the accompanying drawing, whereon similar letters indicate corresponding parts.

The accompanying drawing represents an 75 isometrical view of a bicycle embodying my improvements.

The driving mechanism is as follows: The hand propelling-lever consists of two rods *a a*, fulcrumed, respectively, on the two sides of 80 the backbone or frame in the two bearings *a' a'* of the bracket *b'*. The two arms *a a* of the propelling-lever extend above and below their bearings, and above said bearings are connected by two cross-pieces 1 and 2. The lower 85 ends of said rods are connected, respectively, by jointed rods or links *c* with the two cranks *d d* of the driving-wheel, which are arranged on opposite sides of the same. A double pedal-lever, consisting of two arms *e e*, is ful- 90 crumed at the lower ends of said arms at *e'* to a support *b²* on an extension *b* of the frame situated under its main portion. Pedals *b³ b³* are attached to the upper ends of the two arms *e e*, respectively. Said arms are also con- 95 nected, respectively, to the lower ends of the two arms *a a*. A sleeve or pillar *a⁷* is located substantially midway between the two arms *a a* and firmly secured by the cross-braces 1 2 with the same, the sleeve *a⁷* passing through 100 said braces, a rod *a³*, having a handle-bar *a²* at its upper end, extending through said

sleeve a^7 and being revoluble therein. The lever a is operated by means of said handle-bar.

It will be seen that lever a and pedals b^3 work together and assist one another in giving motion to cranks d .

The guiding mechanism is as follows: Center pillar or sleeve a^7 of lever a receives rod a^3 , which at its upper end carries handle-bar a^2 . Rod a^3 is free to revolve within pillar a^7 and at its lower end has jaw a^4 securely attached for the purpose of receiving rocker a^5 , as in an ordinary universal joint. The other ends of rocker a^5 are coupled to one end of each of connecting-rods a^6 . Immediately above the fork g^3 and attached to same are furnished pins g^4 , upon which the other ends of connecting-rods a^6 fit.

It will thus be seen that when the handle a^2 is turned such movement is reproduced upon wheel g^2 by means of rod a^3 , rocker a^5 , rods a^6 , and pins g^4 . It will also be seen that by means of one and the same mechanism I am able to reciprocate lever a and pedals b^3 for driving velocipedes and at the same time guide the machine.

I wish it to be understood that I do not confine myself to the exact details hereinbefore specified, as these may be modified in several ways without departing from the principle of my invention.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. In combination with the frame of a velocipede, the double propelling hand-lever having its two rods a , fulcrumed respectively on the two sides of the frame and extending above and below the same, and connected with cross-braces 1 and 2 above the frame, an independent double pedal-lever having its two arms fulcrumed on different bearings from those of the hand-lever, the drive-wheel provided with a crank on each side, and the lower ends of the two rods a connected directly with said cranks and also with the arms of the pedal-lever by a rod or link, and a handle-bar attached to the upper end of the hand-lever, all as set forth.

2. In combination with the frame of a velocipede the double propelling hand-lever having its two rods a , fulcrumed respectively on the two sides of the frame and ex-

tending above and below the same, and connected with cross-braces 1 and 2 above the frame, an independent double pedal-lever having its two arms fulcrumed on different bearings from those of the hand-lever, the drive-wheel provided with a crank on each side, and the lower ends of the two rods a connected directly with said cranks and also with the arms of the pedal-lever by a rod or link, a rod revolubly connected with said lever and provided at its upper end with a handle-bar, and the lower end of said rod connected with the frame of the pilot-wheel by a joint connection, all as and for the purposes set forth.

3. In combination with the frame of a velocipede, the double propelling hand-lever having its two rods a firmly secured together, fulcrumed respectively on the two sides of the frame and extending above and below the same, and connected with cross-braces 1 and 2 below the frame, an independent double pedal-lever having its two arms fulcrumed on a portion of the frame below the bearings of the hand-lever, the drive traction-wheel provided with a crank on each side, and the lower ends of the two rods a connected directly with said cranks and also with the arms of the pedal-lever by a rod or link, the sleeve a^7 firmly attached to the arms a , the revoluble rod a^3 extending through said sleeve and provided with a handle-bar at its upper end and a joint connection at its lower end connecting the same with rods extending from the frame of the pilot-wheel, all as set forth.

4. In combination with the frame of a velocipede, the double propelling hand-lever having its two rods a firmly secured together, fulcrumed respectively on the two sides of the frame and extending above and below the same, an independent double pedal-lever having its two arms fulcrumed at their lower ends on a portion of the frame below the bearings of the lever a , the drive-wheel provided with a crank on each side, and the lower ends of the two rods a connected directly with said cranks and also with the arms of the pedal-lever by a rod or link and a handle-bar attached to the upper end of the hand-lever, all as set forth.

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Witnesses:

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