2 Sheets—Sheet 1.

D. T. ROBINSON.

VELOCIPEDE.

No. 86,251. Patented Jan. 26, 1869.

Fig. 1.

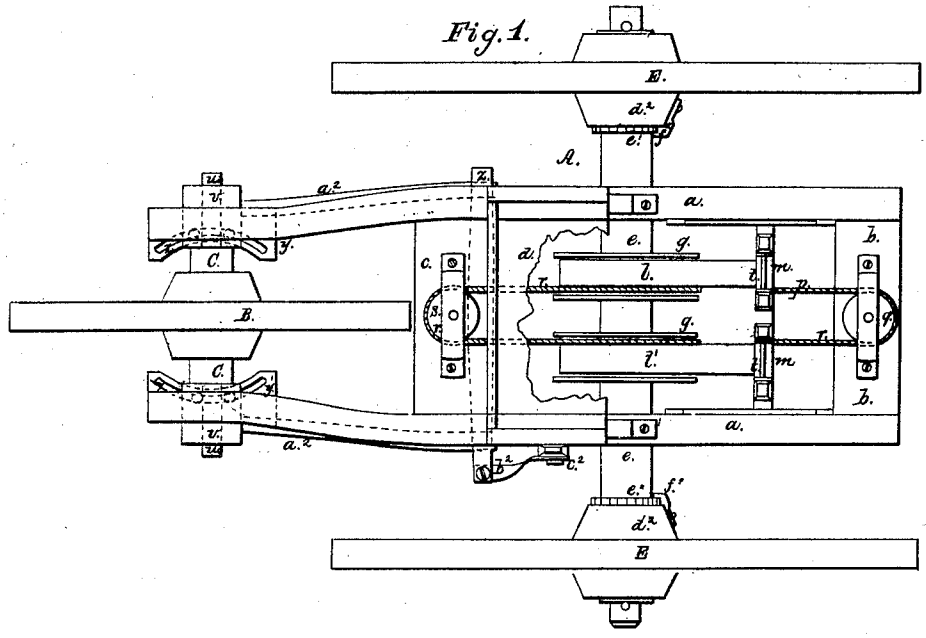
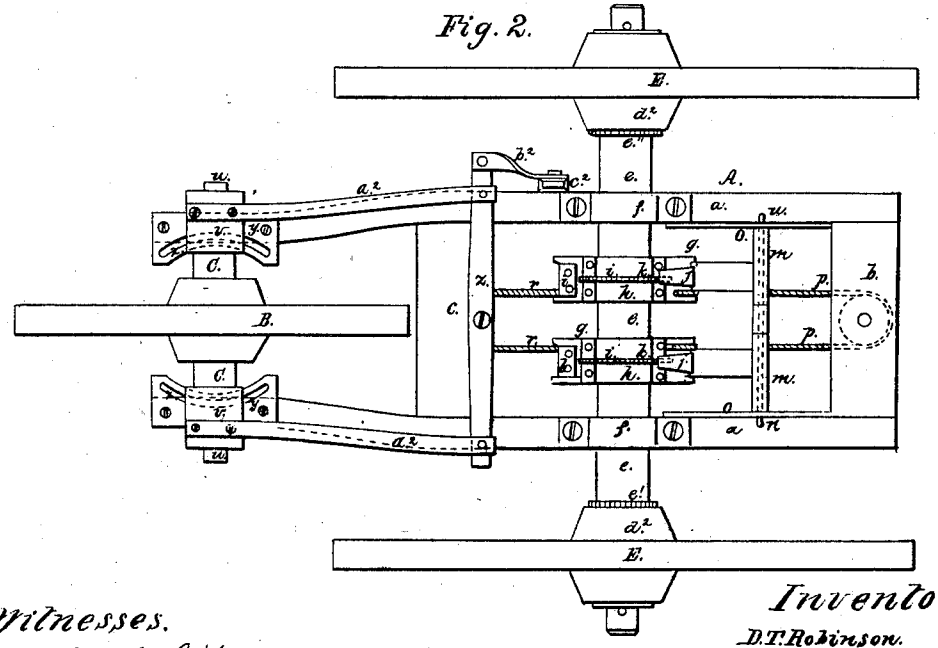


Fig. 2.



Witnesses.

Geo. A. Loring

Edward. Griffith.

Inventor.

D. T. Robinson.

by his attorney

Frederick Curtis.

2 Sheets—Sheet 2.

D. T. ROBINSON.

VELOCIPEDE.

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Fig. 4.

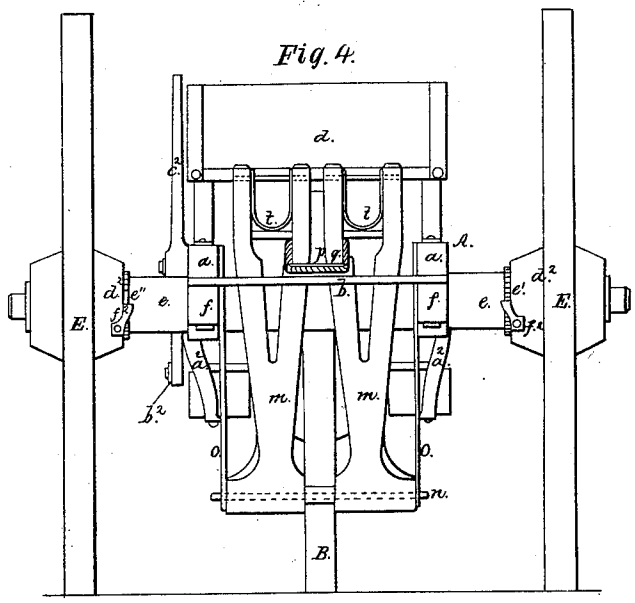
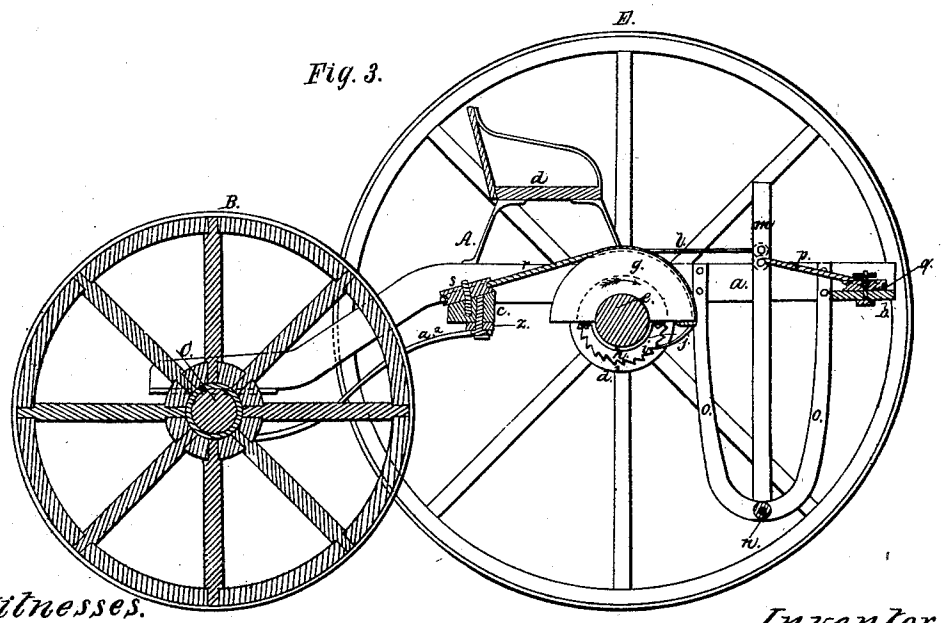


Fig. 3.



Witnesses.

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Edward Griffith

Inventor.

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Frederick Curtis

United States Patent Office.

DANIEL T. ROBINSON, OF BOSTON, MASSACHUSETTS.

Letters Patent No. 86,251, *dated January* 26, 1869.

IMPROVEMENT IN VELOCIPEDES.

The Schedule referred to in these Letters Patent and making part of the same.

To all to whom these presents shall come:

Be it known that I, DANIEL T. ROBINSON, of Boston, in the county of Suffolk, and State of Massachusetts, have made an invention of new and useful Improvements in Velocipedes; and do hereby declare the following to be a full, clear, and exact description thereof, due reference being had to the accompanying drawings, making part of this specification, and in which—

Figure 1 is a plan,

Figure 2, an under-side view,

Figure 3, a vertical, central, and longitudinal section, and

Figure 4, a front-end elevation of a velocipede containing my invention or improvements.

The main portion of this invention is a novel and simple device for enabling an individual to apply the power of his feet to rotate the axle and wheels of a velocipede, in order to propel it and himself over the surface of the ground; a secondary feature of the invention being a means of guiding and controlling the steering-wheel, whereby the course of the vehicle may be regulated by one hand of the rider, leaving his other hand free from service; the construction of parts which admits of this, also constituting a powerful means of securely holding the steering-wheel in one position, and enabling the course of the vehicle to be maintained in a uniform and even manner when travelling in a right line.

The portion of my invention first above enumerated, consists in two segmental or semicircular blocks, applied loosely to the upper side of the driving axle of the vehicle, in juxtaposition with each other, and upon opposite sides of the centre of said axle, these blocks having a vertical groove cut centrally, or thereabouts, within them, for reception of two toothed or ratchet-wheels, affixed to and revolving with the driving-axle, a pawl being pivoted or fixed to each block, and operating upon the toothed wheel in such manner that a partial rotation of either of the blocks in one direction, (that is, a forward one,) shall cause a corresponding partial rotation of the driving-axle, thus putting the vehicle in motion; the semi-rotative reciprocating movements of the blocks being effected by means of bands, or their equivalents, and cords or chains, the former of which are applied to the periphery of such blocks, and attached to twin swinging levers, pivoted to brackets depending from the forward end of the body of the vehicle, while the latter are secured at their opposite ends respectively to the blocks and levers, and carried about pulleys suitably applied to the body or frame of such vehicle; the whole being arranged and operating as hereinafter explained.

In the drawings above alluded to as accompanying this specification, and which illustrate my invention, the body of the velocipede is shown at A as composed in the present instance, for convenience, of two side rails *a a*, united at their forward extremities by a cross-bar, *b*, a second cross-bar, *c*, disposed toward the rear ends of such rails, serving to connect and securely hold the rails together.

The rider's seat is shown at *d* as surmounting the body A, and disposed about centrally thereof, the front edge of such seat being preferably about in a perpendicular line with the centre of the driving-axle, which is shown at *e* as revolving in boxes *f f*, affixed to the under side of the rails *a a*, the wheels of such axle being shown at E E.

The twin segmental blocks, before alluded to, are shown at *g g* as resting upon and partially encircling the driving-axle upon opposite sides of the centre, a strap, *h*, being affixed to each block, and carried about the axle, to preserve the union of the blocks therewith.

These blocks, as before observed, have each a vertical semicircular groove or saw-kerf, *k*, cut within them, for recessing a portion of two twin ratchet-wheels *l l*, which are affixed to the axle *e*, and revolving with it, a spring-pawl or pallet, *j*, being affixed to the forward part of each disk, and taking into the wheels *l l*, the shape of the teeth of the ratchets being such that a partial forward intermittent rotation of either block shall impart a corresponding semi-rotation of the ratchet, and with it, the axles and wheels.

A strap, *l* or *l'*, rests upon the periphery of each block *g g*, and is secured to its rear part; such straps *l* or *l'* being carried forward beyond the blocks, and fastened respectively to two upright vibrating levers *m m*, of equal length, disposed in advance of the said blocks, and in alignment therewith, and fulcrumed at their lower ends to a horizontal rod, *n*, supported by brackets *o o*, depending from the rails *a a* before mentioned.

p is a cord or chain, the two ends of which are secured respectively to the two levers *m m*, such cords being carried about a sleeve, *q*, pivoted to the front cross-bar of the body of the vehicle and forward of the said levers, the straps *l l'* and cord *p* being drawn taut when applied as described.

A second cord or chain, *p*, is passed in like manner about a second sheave or roller, *s*, pivoted upon the cross-bar *c*, before mentioned as disposed in rear of the driving-axle and the blocks *g g*; the two ends of this latter cord being secured to the forward part of such blocks, as shown in fig. 3 of the accompanying drawings.

Each lever *m m* is provided at its upper part with a stirrup, *t*, for reception of the feet of the rider, and to enable him to exert the power of his legs to good advantage upon such levers.

The steering-wheel of the vehicle is denoted by the letter B, and the axle to which it is affixed by *e*, the journals *u u'* of such axle being supported and revolving in movable boxes *v v*, suspended from the rear ends of the side rails *a a* of the body of the vehicle, and in rear of the cross-bar *c*, the said boxes being provided with screws or bolts, which extend through curved slots *x* or *x'*, made in two plates, *y* or *y'*, fixed to the under side of each rail *a*, the heads of the said screws or bolts resting upon the upper surfaces of such plates, and permitting sliding movements of the boxes *v v* in

a circular path about the centre of the wheel, the slots x x' being concentric with the combined axis of the wheel and its axle, in order to admit of the semi-rotations of the latter in either direction.

A swivelling-bar, z, is pivoted at its centre to the centre of the under side of the rear cross-bar c of the vehicle-body, the opposite extremities of this bar being connected with the boxes v v of the rear axle by connecting-rods a^2 a^2, while a third connecting-rod, b^2, connects one extremity of such bar to the lower end of an upright hand-lever, c^2, fulcrumed to the outer side of one of the side rails a, the upper end or handle of such lever extending into a convenient position to be readily grasped by the hand of the rider, who is thus enabled to steer the course of the vehicle with one hand only, as by forcing such handle forward or backward, as the case may be, and turning the bar z upon its fulcrum, a corresponding movement of the steering-axle is effected through the medium of the connecting-rods a a' and the boxes v v.

In addition to the above-described improvements, I have contemplated combining with the vehicle a device for the purpose of enabling both the wheels E E to be employed as driving-wheels, and yet allow either or both of them to accommodate themselves to the movements of the vehicle when travelling in a curved line, in which one wheel must travel faster than or at a different rate of speed from its fellow.

In carrying out this portion of my invention, I affix to each journal of the driving-axle, and alongside of the inner face of each hub d^2, of the wheels E E, a ratchet-wheel, c' or c'', and I pivot to the hub, and so as to take into the teeth of this ratchet, a spring-pawl, f^2, the inclination of the teeth of the ratchet being such that rotation of the driving-axle in the direction of its arrow shall cause a like rotation of its wheels, while, upon a reverse rotation of such wheels, the pawl shall slip over the teeth of the ratchet without actuating it.

It will be seen that upon turning a curve, the outer wheel, which travels the faster, may slip upon its journal sufficiently to accommodate itself to the retarded rotation of its fellow, while the axle, by means of the pawls and ratchets, is at all times ready to exert a propelling power upon both wheels.

The action of the above-described arrangement of the segmental blocks g g, ratchets i i, and levers m m, will be apparent to mechanics, as it is extremely simple.

An advance of one lever and its block of course causes a semi-rotation of the driving-axle, while at the same time it effects a retraction of the opposite lever and block, which are thus prepared to actuate, in their turn, the axle, and cause a retraction of the first-mentioned lever and block.

One advantage of the arrangement of the blocks, ratchets, and levers, as before set forth, is, that the dead-point of the common crank is entirely overcome. Another and important advantage of such arrangement, consists in the fact that the levers are automatically susceptible of any length of stroke, thus accommodating themselves without any adjustment to riders whose legs vary in length.

The advantage of the arrangement of the ratchets applied to the driving-axle will of course be understood, as while permitting both wheels to be driving-wheels, it also allows either to travel faster or slower than the other, as the case may be. Heretofore, in the construction of velocipedes, in order to allow one wheel to travel faster or slower than the other, it has been allowed to turn freely upon the driving-axle, thus throwing all the labor of propelling the vehicle upon one wheel, causing an unequal and one-sided distribution of power.

If both wheels are fixed upon the axle, an equally objectionable strain is brought upon the parts in turning curves of comparatively small radius.

The advantage of my mode of supporting and controlling the steering-wheel, as before observed, is that it enables the rider to steer the vehicle with one hand, leaving the other free.

The construction of this portion of the invention has the further merit of being extremely simple and cheap in construction, and durable in wear.

I would remark that I do not intend to confine myself to the employment of the ratchet-wheels for the purpose of connecting the segmental blocks to the driving-axle, as friction-plates or various other devices may be employed for the purpose.

I would remark that in place of the straps l l, before mentioned, for operating the blocks g g, other equivalent devices may be employed, without affecting the character of my invention.

I would remark that I have contemplated the application of anti-friction rollers to the axle of the driving-wheels, for the purpose of reducing friction on the same.

Claims.

I claim as my invention, and desire to secure by Letters Patent of the United States, as follows:

1. As an improved device for propelling velocipedes, I claim the combination and arrangement of the segmental blocks g g, ratchets i i, or their equivalents, and the levers m m, the blocks being provided with the cord or chain r, and connected to the levers and ratchets by means of the straps l l, or their equivalents, as described, and the levers being provided with the connecting-cord p, and fulcrumed as explained, and the whole being arranged and operating in manner as before explained.

2. I claim, in combination with the above, ratchet and pawls, applied to axle and wheels, or their equivalents, for the purpose above set forth.

3. I claim the herein-described devices for applying the steering-wheel and axle to the body of the vehicle, consisting of the boxes v v and the slotted plates y y, provided with means of actuating them, substantially as described.

DANIEL T. ROBINSON.

Witnesses:

FRED. CURTIS,

GEO. A. LORING.