

(No Model.)

2 Sheets—Sheet 1.

W. E. SMITH.

TRICYCLE.

No. 398,005.

Patented Feb. 19, 1889.

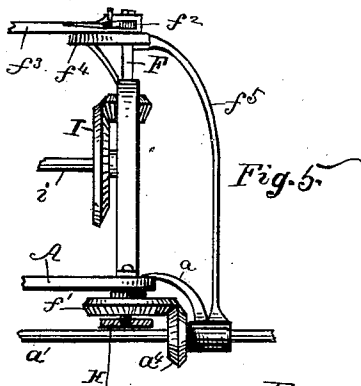


Fig. 5.

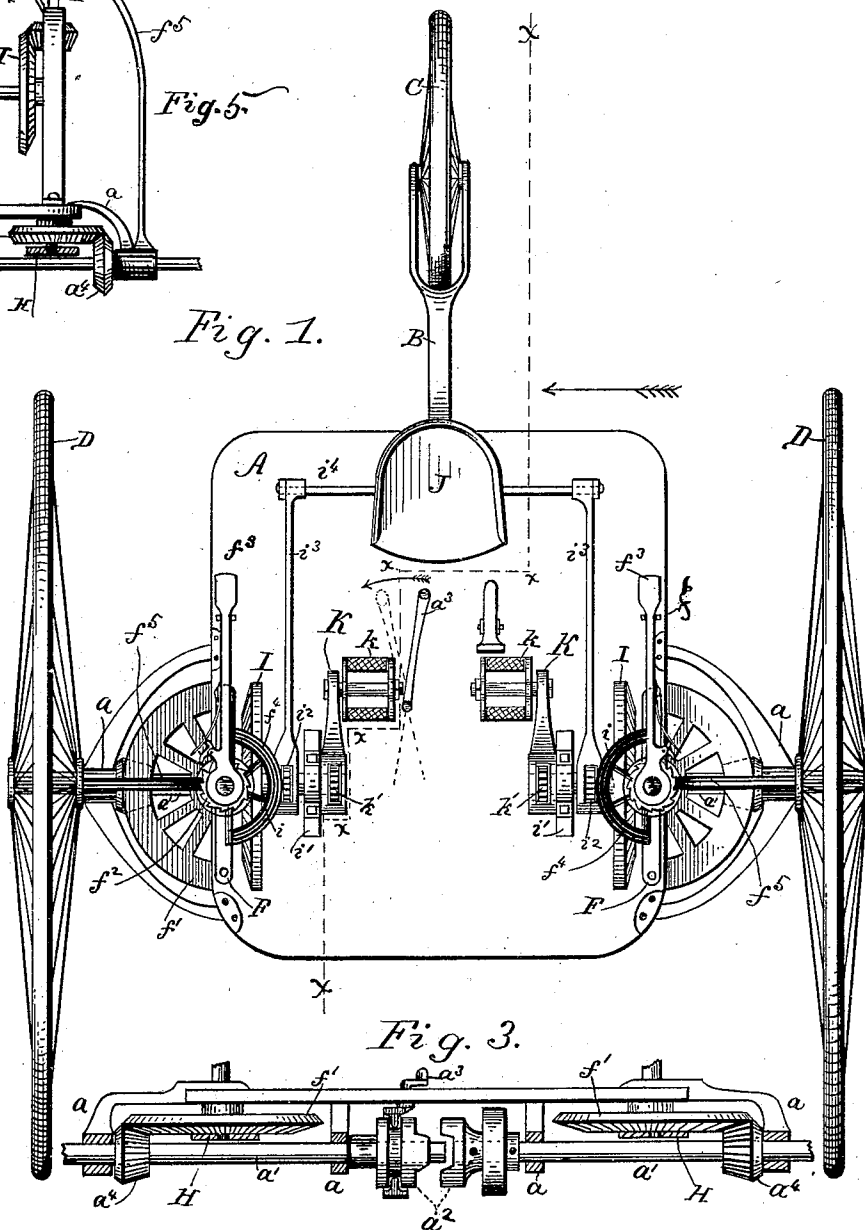


Fig. 3.

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M. C. Lansdale.

Inventor:
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Fig. 6.

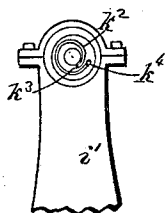


Fig. 4.

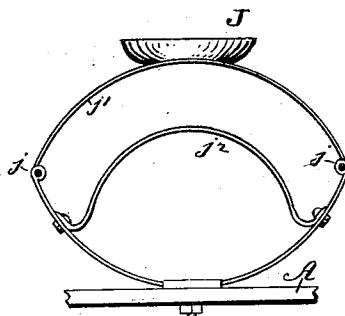
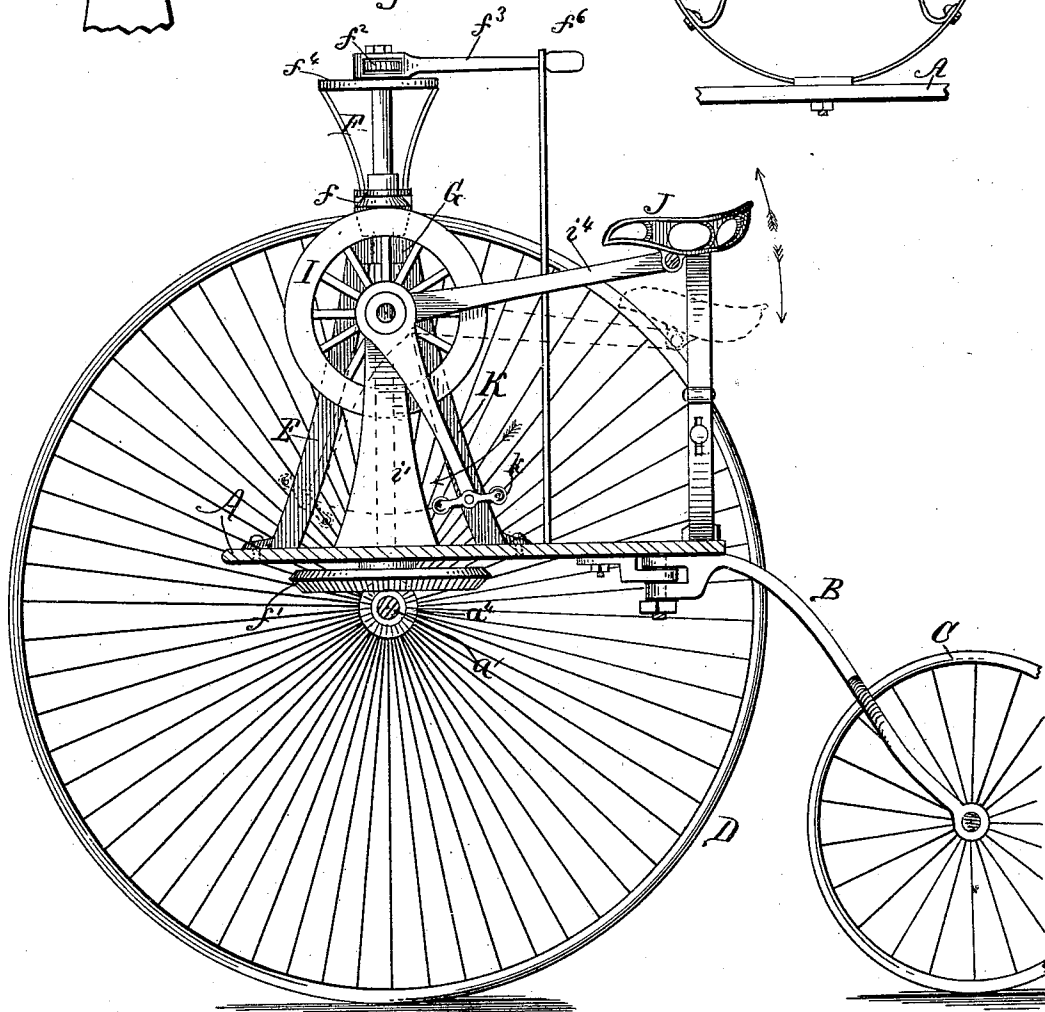


Fig. 2.



Witnesses:
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UNITED STATES PATENT OFFICE.

WILLIAM EDWARD SMITH, OF NEAR MAY, ARKANSAS.

TRICYCLE.

SPECIFICATION forming part of Letters Patent No. 398,005, dated February 19, 1889.

Application filed November 1, 1888. Serial No. 289,777. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM EDWARD SMITH, a citizen of the United States, residing near May, in the county of Garland and State of Arkansas, have invented certain new and useful Improvements in Tricycles; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention has relation to tricycles; and it consists in the novel construction and arrangement of its parts, as hereinafter set forth in this specification and claims.

My invention is designed to be operated on country-roads as well as in cities, and it is so constructed as to facilitate its speed, and that the rider may use all the muscles of his body in propelling the same. A part of this invention is especially designed to aid in driving it uphill.

This invention may be propelled by using the feet alone, or one foot at a time, or by using the seat alone, or by using the hands alone, or with one hand at a time, and it is so constructed that both hands, the seat, and both feet may all be used at the same time, and it is so constructed that in such case the person or the rider may assume a position nearly straight, which will enable him to put upon the operating power of the machine at least a one-horse power, and perhaps more, and thus enable him to drive the machine up any hill up which a horse may draw a single buggy.

In the accompanying drawings, Figure 1 is a top plan view of my tricycle. Fig. 2 is a longitudinal sectional view cut on the line X X, Fig. 1. Figs. 3, 4, 5, and 6 are detail views.

My invention is described as follows:

A, Fig. 1, represents the frame or body of the tricycle and may be made solid, as represented, or may be a light frame of any suitable material. To the rear end of said frame is pivoted a rudder-rod, B, in the rear end of which is journaled a small rudder-wheel, C, underneath the frame A, and near its front end is journaled in bearings *a* two half-axes,

a', which may revolve separately and independently of each other, but which may be rigidly united by means of clutch *a*², operated by a slight movement of the foot against the clutch-lever *a*³. Near the outer ends of said axles *a'* are rigidly secured beveled-pinion cog-wheels *a*⁴, and on the extreme ends of said axles are rigidly secured drive-wheels D. On the upper and right-hand side of the said frame A, and immediately over the axle *a'*, is bolted a gear-wheel frame, E, in which is pivoted a shaft, F, the upper end of which revolves in a collar, G, in said frame, while the lower end of said shaft is journaled in a longitudinal bar, H, which is secured to the front and rear ends of the frame A, and may be further secured by cross-bars, if deemed necessary. Near the upper end of said shaft is rigidly secured a beveled cog-pinion, *f*, and rigidly and horizontally secured near its lower end a beveled-cog drive-wheel, *f'*, the cogs of which mesh with the cogs of and rotate the cogged pinion *a*⁴, which in turn revolves the axle *a'* and the drive-wheel D. On the upper end of said shaft F is rigidly secured a ratchet-wheel, *f*², which is operated by a hand-lever and ratchet-pawl, *f*³. This hand-lever rests on a half-circle, *f*⁴, attached to a brace, *f*⁵, the upper end of which is provided with a socket for the shaft F, while the lower end is firmly secured to the outer end of the bearing *a*. When said hand-lever is not being operated, it may be turned back out of the way and lodged in a rest, *f*⁶, and when operated it turns shaft F, which revolves the drive-wheel *f'*, which in turn drives the pinion *a*⁴, and thereby sends the tricycle forward. This contrivance is not intended so much for speed as power, for in this I sacrifice speed for power, and by means thereof, together with the foot-levers and seat-levers hereinafter described, I can ascend a hill. Against the inner face of the gearing-post G, and in a socket therein provided, is vertically journaled a beveled drive cog-wheel, I, the cogs of which mesh with the cogs of and drive the cog-pinion *f*. In the neck of said drive-wheel I is secured an axle, *i*, supported on a post, *i'*, which is provided with proper cap and box for said axle. On said axle there is rigidly secured between the said drive-wheel I and the post *i'* a ratchet-wheel, *i*², oper-

ated by a seat-lever and ratchet-pawl, v^3 . In the rear end of said lever is pivoted a rod, v^4 , which extends across the rear end of the said frame and is pivoted in the rear end of the seat-lever. On said rod v^4 is secured a seat, J. This seat rests upon a spring, j , and when the rider is in it it descends until the upper spring, j' , comes in contact with the middle and shorter spring, j^2 , which, while it gives a little, arrests the further downward motion of the said seat. Said downward motion is indicated by the dotted lines, and rotates the ratchet-wheel v^2 by means of the seat-lever and pawl v^3 , which in turn operates the drive-wheel I, which rotates pinion f , and in consequence the drive-wheel f' , and thereby the tricycle is driven forward. The operator then bears his weight on the foot-pedals K and raises himself in the seat J, which is then thrown up to its former position by the spring j , ready to take a new hold on its ratchet-wheel. On the extreme inner end of the axle i , and fitting up close against the post i' , is the foot-lever and pawl K and pedal k , which operates the ratchet-wheel k' , rigidly secured on the inner end of said axle. The operation of this lever is manifest from the descriptions of the others above, as it is similar thereto. When this lever is pushed forward and the pressure is released, it returns to proper position to take a new hold by means of a coiled spring, k^2 , Fig. 6, which works in a proper opening in the post i' , one end thereof, k^3 , being secured in said post, while the other end thereof, k^4 , is secured in the adjoining face of said foot-lever. The pawls which operate said ratchet-wheels have a finger by which they may be thrown back out of engagement and so retained by means of their operating-springs; or I may adopt any convenient method of holding said pawls out of engagement with their ratchet-wheels, so that I may only have those engaged that are required to propel the machine. The others being out of engagement will lessen the noise and friction.

In describing the operating-gearing I have mostly described only one side, but a corresponding gearing is erected on the other side of the frame to drive the other wheel, but when the clutch is put on I can drive the machine by any one of the levers above mentioned. In ordinary use I ride with the clutch released, and when I wish to turn my machine to the left I hold on the left foot and drive ahead with the right, and when I wish to turn to the right I hold on the right foot and drive ahead on the left. In the manufacture of cheaper tricycles I purpose to do away with the clutch, in which case I will have one of the driving-wheels rigidly secured to a plain axle, while the other may play loose; or both wheels may be provided with ratchets, allowing the tricycle to turn, in which case the rudder-rod B will be rigidly secured to the rear end of the frame A, and the rudder-wheel C will be set in a proper socket and made to turn to the right or left by any convenient

method. My tricycle will also be provided with proper brake wheels and levers to check its speed or to arrest its motion entirely.

I do not claim all the parts of my tricycle as new. I am aware of the fact and admit that the clutch is old, and to ratchet the wheels to the axle is old, or to rigidly secure one and let the other play loose is old, and to set the rudder-wheel in a socket and turn it to the right or to the left with a proper device is also old, and therefore in the manufacture of my machine I have the right to adopt these or any similar methods not covered by Letters Patent; but

What I claim as new as well as useful is—

1. The combination, with the frame, axles, and drive-wheels of a tricycle, substantially as shown, of the beveled cog-pinion a^4 , rigidly secured to the driving-axles a' , gearing-frame G, secured to the frame A, shafts F, their upper ends working in sockets in said gearing-frame, and their lower ends working in bars H under said frames, drive-wheels f' , rigidly secured on the lower ends of said shafts, meshing with said pinions, ratchet-wheels f^2 , rigidly secured on the upper ends of said shafts, and hand levers and pawls f^3 , operating said ratchet-wheel and driving said gearing, substantially as shown and described.

2. The combination, with the frame, axles, and drive-wheels of a tricycle, substantially as shown, of the beveled cog-pinions a^4 , rigidly secured to the driving-axles, gearing-frames G, secured to the frame A, shafts F, their upper ends working in sockets in said gearing-frames and their lower ends in bars H, secured to the under side of said frame, drive-wheels f' , rigidly secured on the lower ends of said shafts, meshing with said pinions, ratchet-wheels f^2 , rigidly secured on the upper ends of said shafts, hand levers and pawls f^3 , operating said ratchet-wheel, pinion f , rigidly secured on said shaft, drive-wheel I, journaled in the gear-frame G and meshing with said pinion f , axle i , rigidly secured in the neck of said drive-wheels I and journaled in the boxing in the posts i' , ratchet-wheels v^2 , secured on said shaft, seat levers and pawls v^3 , operating said ratchet-wheels and having secured on their cross-rod v^4 a seat, J, and spring j , its lower half secured to the frame A and its upper half to the lower part of the said seat, substantially as shown and described.

3. The combination, with the frame, axles, and drive-wheels of a tricycle, substantially as shown, of the beveled cog-pinions a^4 , rigidly secured to the driving-axles, gearing-frames G, secured to the frame A, shafts F, their upper ends working in sockets in said gearing-frames and their lower ends in bars H, secured to the under side of said frame, drive-wheels f' , rigidly secured on the lower ends of said shafts, meshing with said pinions, ratchet-wheels f^2 , rigidly secured on the upper ends of said shafts, hand levers and pawls

f^3 , operating said ratchet-wheel, pinion f , rigidly secured on said shaft, drive-wheel I, journaled in the gear-frame G and meshing with said pinion f , axle i , rigidly secured in the neck of said drive-wheels I and journaled in the boxing in the posts i' , ratchet-wheels i^2 , secured on said shaft, seat levers and pawls i^3 , operating said ratchet-wheels and having secured on their cross-rod i^4 a seat, J, and spring j , its lower half secured to the frame A and its upper half to the lower part of the said seat, ratchet-wheel k' , rigidly secured to the inner ends of said axle i' , foot levers and pawls K, bearing the pedals k , and springs k^2 , set in proper openings in the post i' , one end secured to said posts and the other to said foot-levers, substantially as shown and described, and for the purposes set forth.

4. The combination, with the frame, axles, and drive-wheels of a tricycle, substantially as shown, of the beveled cog-pinions a^4 , rigidly secured to the driving-axes a' , gearing-frames

G, secured to said frame A, braces f^5 , their lower ends secured to the bearings a , and their upper ends receiving shafts F and bracing the same, shafts F, their upper ends working in said braces f^5 and in sockets in said frames, and their lower ends working in bars H, drive-wheels f'' , rigidly secured on the lower ends of said shafts, meshing the said pinions, ratchet-wheels f^2 , rigidly secured on the upper ends of said shafts, hand levers and pawls f^3 , operating said ratchet and driving said gearing, circular brace f^4 , secured to gear-frame G and brace f^5 , and supporting said lever f^3 , substantially as shown and described, and for the purposes set forth.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM EDWARD SMITH.

Witnesses:

M. DORIAN,

M. E. LANSDALE.