M. KOPPEL.

PEDOCYCLE.

APPLICATION FILED MAR. 6, 1911.

999,660.

Patented Aug. 1, 1911.

2 SHEETS—SHEET 1.

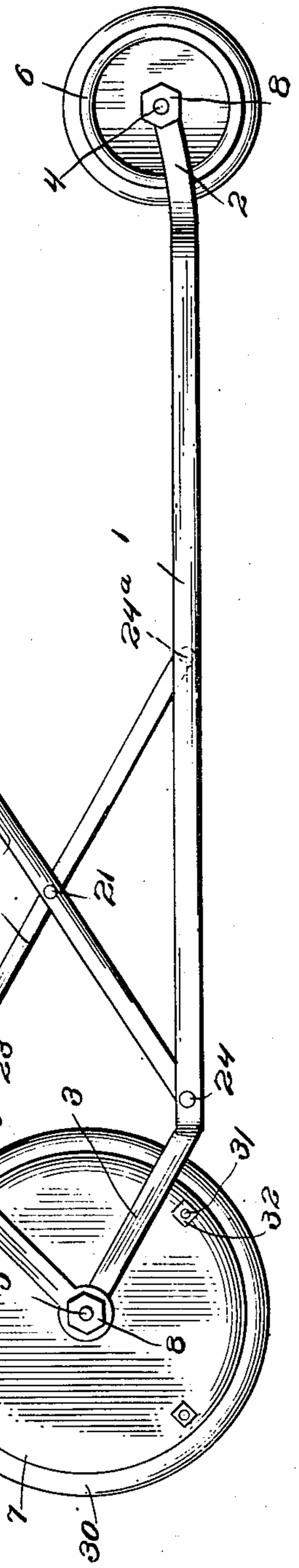

FIG. 1.

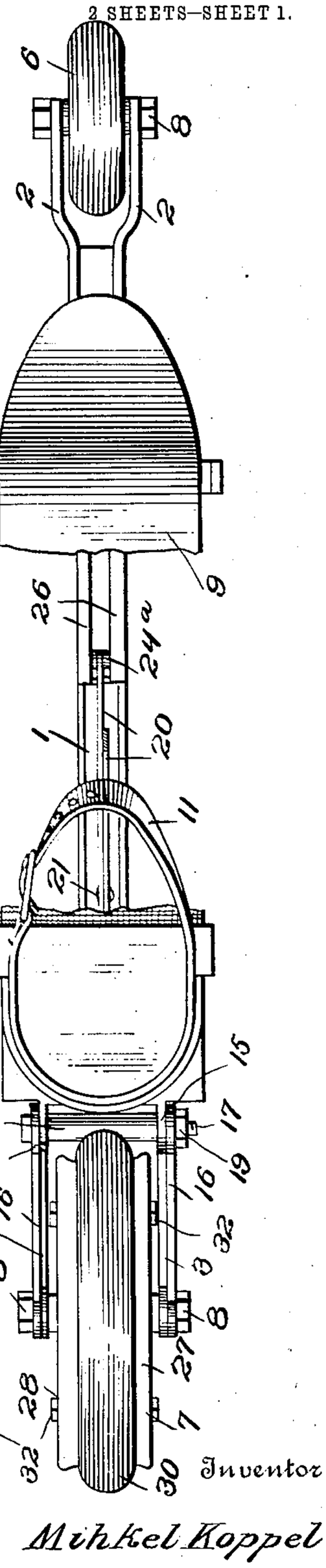

FIG. 2.

Witnesses

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2 SHEETS—SHEET 2.

Fig. 3.

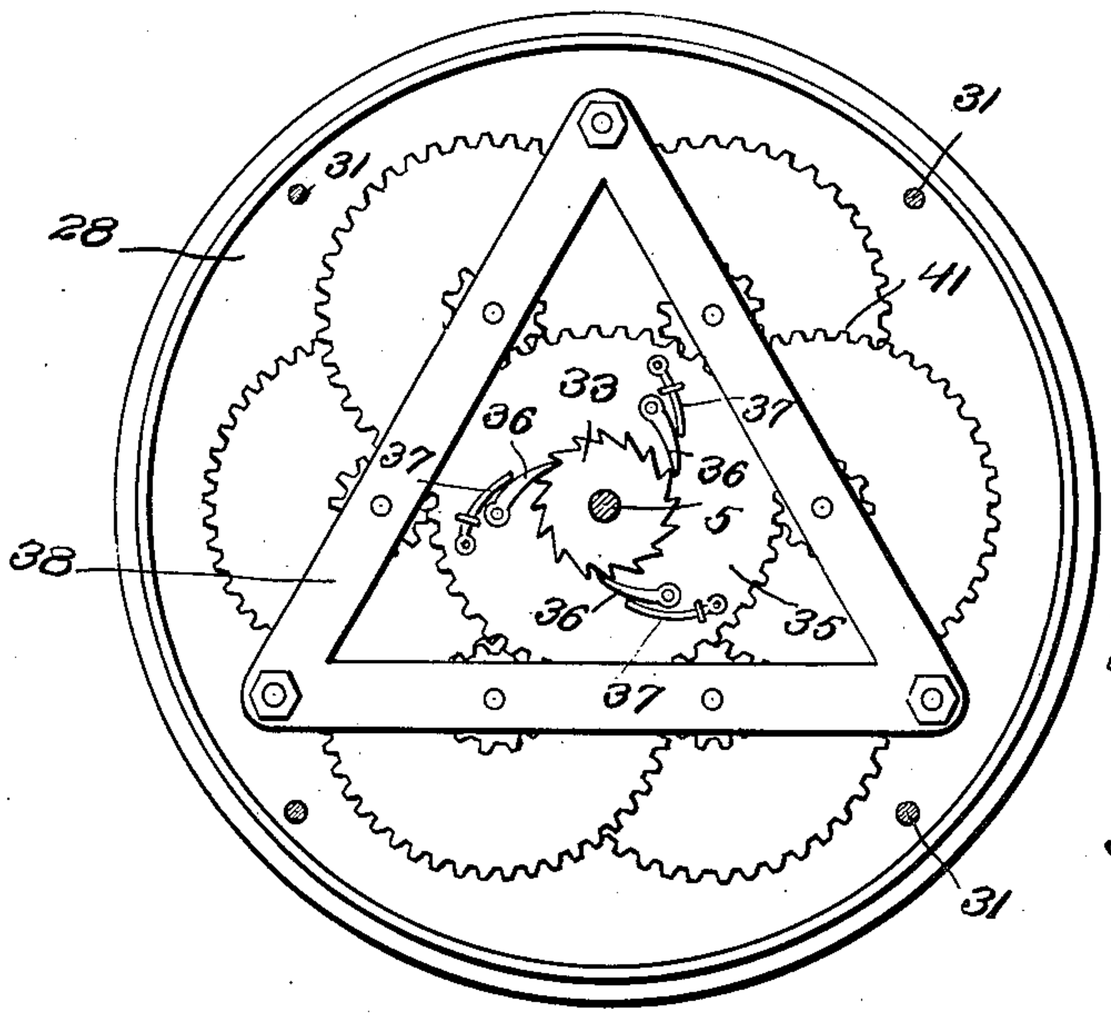


Fig. 4.

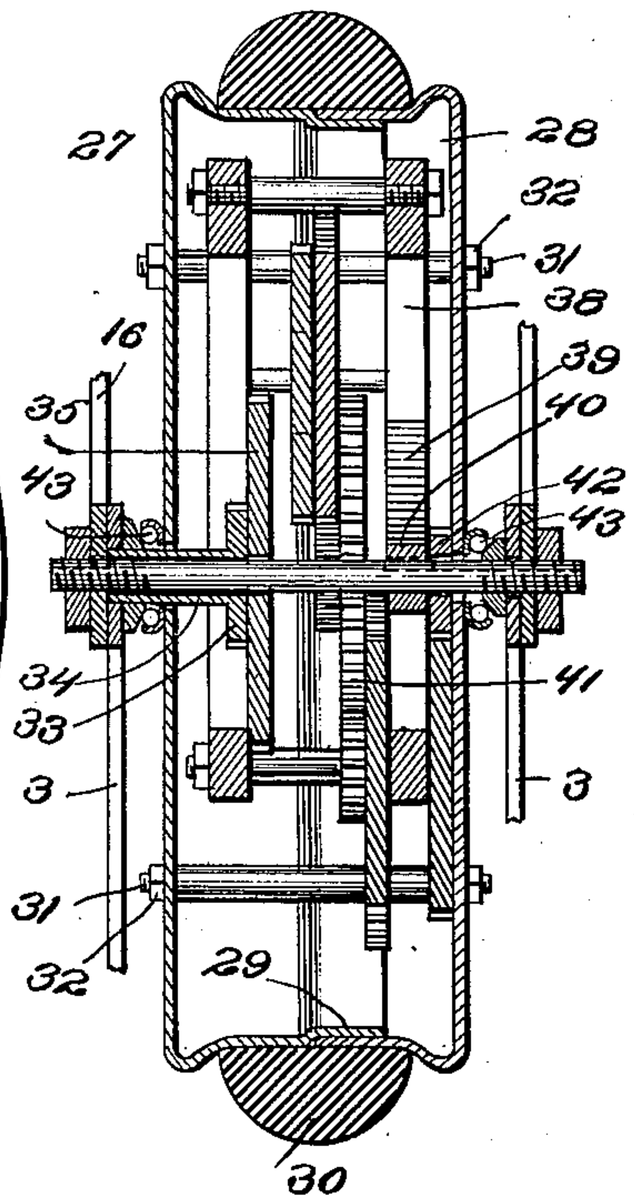


Fig. 5.

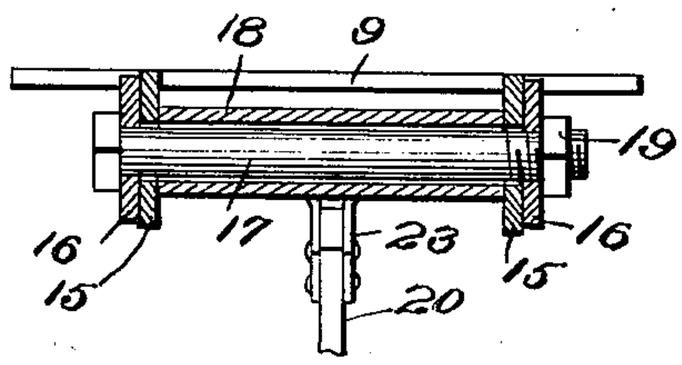


Fig. 6.

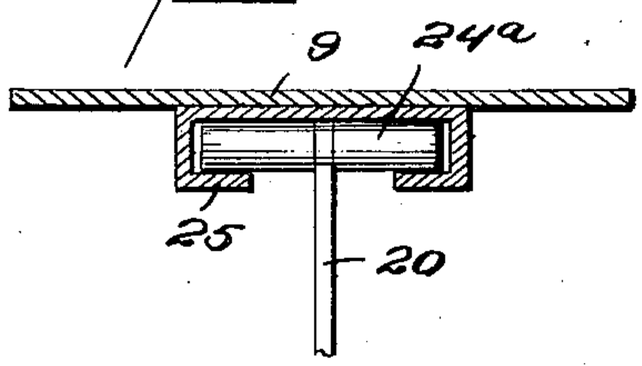
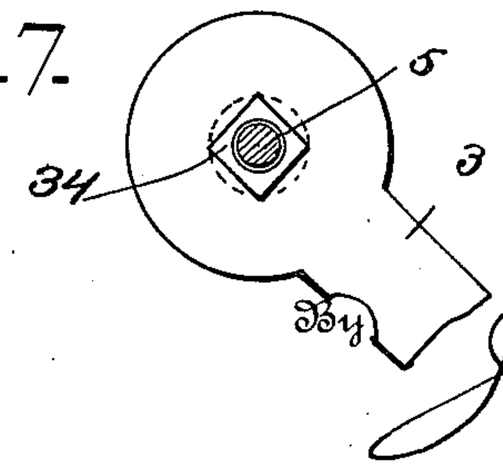


Fig. 7.



Witnesses

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PEDOCYCLE.

999,660. Specification of Letters Patent. Patented Aug. 1, 1911.

Application filed March 6, 1911. Serial No. 612,515.

To all whom it may concern:

Be it known that I, MIHKEL KOPPEL, a subject of the Czar of Russia, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Pedocycles, of which the following is a specification.

My invention relates to improvements in pedocycles, the object of the invention being to provide improved means for propelling one of the wheels, said propelling means operated by the weight of the user, who alternately applies his weight first upon one foot, and then upon the other.

A further object is to provide an improved wheel comprising two members inclosing a train of gearing, and a frame supporting the gearing with improved means for moving the frame and imparting rotary motion through the train of gears to the wheel.

A further object is to provide an improved propelling wheel in connection with a frame, and a foot supporting platform, said platform connected with the frame by means of toggle levers mounted to slide in the frame and foot rest, and permit the foot rest to raise and lower and transmit rotary motion to said wheel.

With these and other objects in view, the invention consists in certain novel features of construction and combinations and arrangements of parts, as will be more fully hereinafter described and pointed out in the claims.

In the accompanying drawings: Figure 1, is a view in side elevation illustrating my improvements. Fig. 2, is a plan view showing the foot rest broken away to illustrate the parts below. Fig. 3, is a view in elevation on an enlarged scale of the propelling wheel with one side of the wheel removed. Fig. 4, is a view in vertical section through the propelling wheel. Fig. 5, is a view in section on an enlarged scale on the line 5—5 of Fig. 1. Fig. 6, is a similar view on the line 6—6 of Fig. 1, and Fig. 7, is a detail view illustrating the manner of connecting one of the fork arms 3 with the sleeve 34.

In constructing my improved device, I provide a longitudinal bar 1, which is provided at its front and rear ends with forks 2 and 3 respectively, to receive the journal bolts 4 and 5 respectively, on which the front and rear wheels 6 and 7 respectively are mounted. These journals are secured by nuts 8, but other means for securing them may be provided as desired.

9, represents a foot rest to which the foot 10, illustrated in dotted lines, may be secured by a strap 11 and toe clamp 12, both of which are adjustable on the foot rest by means of brackets 13 and thumb screws 14 to adjust them in accordance with the size of the foot, but the invention is of course in no wise limited to the shoe securing means, as any may be provided that is adapted for the purpose. The foot rest 9 at its rear end, is provided with depending perforated ears 15 to which links 16 are pivotally connected by a bolt 17, a suitable spacing sleeve 18 being positioned on the bolt between the ears 15. This bolt is held in place by means of a nut 19, and the links 16 above referred to are keyed to the rear journal bolt 5. The foot rest 9 and bar 1 are connected by toggle levers 20, which are pivotally connected centrally between their ends by a pin 21, and at their rear ends are connected respectively to the foot rest 9 and bar 1. One of these levers 20 is pivotally secured to the sleeve 18 as shown at 23, and the other is pivotally connected to bar 1 as shown at 24. The forward ends of these levers 20 are provided with cross pins 24^a, which are positioned in flanged guides 25 and 26 respectively, the former being secured to the bottom of foot rest 9, and the latter forming an integral part of bar 1.

The rear wheel 7 comprises two members 27 and 28, which are preferably of sheet metal, and have their edges bent inwardly and overlapped as shown at 29, and these inwardly bent portions of the members form a rim for the reception of a tire 30, preferably of rubber, but of course may be of other material. These members 27 and 28 are rigidly connected by bolts 31 and nuts 32, so as to compel them to turn together as a single hollow wheel.

A ratchet wheel 33 is mounted loosely on journal 5, and is provided with a sleeve or hub 34, which extends through member 27. The end of this sleeve or hub 34 is made angular to enter an angular opening in one of the members of fork 3, so as to hold said sleeve and the ratchet wheel 33 against rotary movement. A gear wheel 35 is mounted loosely on journal 5 and on one face of said gear pivoted pawls 36 are located and

are held in engagement with the teeth of ratchet wheel 33 by springs 37, so that while the gear 35 is free to turn on the journal in one direction, it is held against movement in the opposite direction by means of the pawls.

A triangular frame 38 is provided with an inwardly projecting arm 39, having a bearing 40 which is keyed to journal 5. This frame 38 supports a train of gearing 41 which connects the gear 35 with a pinion 42 fixed to member 28 of wheel 7. The wheel 7 is supported on suitable ball bearings 43, and is mounted to turn loosely and with as little friction as possible. It is of course to be understood that one of these devices will be provided for each foot, and the operation is as follows: Assuming the parts to be in the position shown in Fig. 1, when the operator puts his weight upon the foot rest 9, said foot rest will move downward, causing the toggle levers 20 to ride forwardly in the guides 25 and 26. At the same time, links 16 will swing downwardly in the arc of a circle, turning journal 5. This movement of journal 5 causes frames 38 to move, and as the ratchet wheel 33 is held stationary and the pawls 39 are in engagement therewith, gear wheel 35 is held against rotary movement in this direction, so that the movement of frame 38 compels the train of gearing 41 to turn, and transmit a high speed to pinion 42 and the wheel 7. The momentum of the wheel, when the weight is released on foot rest 9 while it is being applied to the other device, attached to the other foot, will compel the train of gears 41 to continue their movement, which will cause gear 35 to turn, and will permit the foot rest 9 to rise, which movement is compensated for by the pawls 36, riding on the ratchet wheel 33.

With a device of this kind, a high speed may be attained by alternately placing the weight first on one foot, and then on the other, and this alternately shifting of the weight necessitates but slight exertion on the part of the operator, and he may attain any speed desired in accordance with the rapidity of such motion.

While I have shown the front wheel 6 smaller than rear wheel 7, the invention is in no wise limited to the relative sizes of these wheels, nor is it limited to any particular number of wheels, save that one of said wheels must constitute a driver as above explained.

Various slight changes might be made in the general form and arrangement of parts described without departing from my invention, and hence I do not limit myself to the precise details set forth, but consider myself at liberty to make such changes and alterations as fairly fall within the spirit and scope of the appended claims.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. In a device of the character described, the combination with a bar, wheels at the ends of the bar, one of said wheels constituting a hollow casing, and a foot support, of toggle levers connecting the foot support and the first-mentioned bar, said toggle levers constructed to slide at their ends, gearing entirely inclosed in the hollow wheel, and means operated by said platform for turning said gearing, substantially as described.

2. In a device of the character described, the combination with a bar, wheels at the ends of the bar, one of said wheels constituting a hollow casing, and a foot support, of toggle levers connecting the foot support and the first-mentioned bar, said toggle levers constructed to slide at their ends, gearing entirely inclosed in the hollow wheel, journal pins supporting said wheels, one of said journal pins compelling the movement of said gear, and links connecting the support with said last-mentioned journal, substantially as described.

3. In a device of the character described, the combination with a bar, forks at the ends of the bar, wheels mounted in said forks, and journals mounted in the forks and on which said wheels turn, one of said wheels hollow constituting a driving wheel, of a train of gearing in said hollow wheel, a pinion fixed inside of the hollow wheel and to which said train of gearing connects, and a vertically movable foot support compelling the operation of said train of gearing, substantially as described.

4. In a device of the character described, the combination with a bar, forks at the ends of the bar, wheels mounted in said forks, and journals mounted in the forks and on which said wheels turn, one of said wheels hollow constituting a driving wheel, of a train of gearing in said hollow wheel, a pinion fixed inside of the hollow wheel and to which said train of gearing connects, a gear loose on said journal in the hollow wheel, a ratchet wheel loose on said journal in the hollow wheel, a sleeve on said ratchet wheel projecting through the hollow wheel, and secured to one of the arms of one of said forks, spring pressed pawls on said gear engaging the teeth of said ratchet wheel, a frame fixed to said journal within the hollow wheel and supporting said train of gearing, and means for transmitting an oscillating movement to said journal bolt, substantially as described.

5. In a device of the character described, the combination with a bar, forks at the ends of the bar, wheels mounted in said forks, and journals mounted in the forks and on which said wheels turn, one of said wheels

hollow constituting a driving wheel, of a train of gearing in said hollow wheel, a pinion fixed inside of the hollow wheel and to which said train of gearing connects, a gear loose on said journal in the hollow wheel, a ratchet wheel loose on said journal in the hollow wheel, a sleeve on said ratchet wheel projecting through the hollow wheel, and secured to one of the arms of one of the said forks, spring pressed pawls on said gear engaging the teeth of said ratchet wheel, a frame fixed to said journal within the hollow wheel and supporting said train of gearing, a vertically movable foot support, and links fixed to turn with said journal bolt and pivotally connected to said foot support, substantially as described.

6. In a device of the character described, the combination with a bar, forks at the ends of the bar, wheels mounted in said forks, and journals mounted in the forks and on which said wheels turn, one of said wheels hollow constituting a driving wheel, of a train of gearing in said hollow wheel, a pinion fixed inside of the hollow wheel and to which said train of gearing connects, a gear loose on said journal in the hollow wheel, a ratchet wheel loose on said journal in the hollow wheel, a sleeve on said ratchet wheel projecting through the hollow wheel, and secured to one of the arms of one of said forks, spring pressed pawls on said gear engaging the teeth of said ratchet wheel, a frame fixed to said journal within the hollow wheel and supporting said train of gearing, a vertically movable foot support, links fixed to turn with said journal bolt and pivotally connected to said foot support, toggle levers, one end of one toggle lever pivotally connected to the support and mounted to slide against said bar, and the other toggle lever pivotally connected to the bar and mounted to slide against the foot rest, substantially as described.

7. In a device of the character described, the combination with a bar, forks at the ends of the bar, wheels mounted in said forks, and journals mounted in the forks and on which said wheels turn, one of said wheels hollow constituting a driving wheel, of a train of gearing in said hollow wheel, a pinion fixed inside of the hollow wheel and to which said train of gearing connects, a gear loose on said journal in the hollow wheel, a ratchet wheel loose on said journal in the hollow wheel, a sleeve on said ratchet wheel projecting through the hollow wheel, and secured to one of the arms of one of said forks, spring pressed pawls on said gear engaging the teeth of said ratchet wheel, a frame fixed to said journal within the hollow wheel and supporting said train of gearing, a vertically movable foot support, links fixed to turn with said journal bolt and pivotally connected to said foot support, toggle levers, one end of one toggle lever pivotally connected to the support and mounted to slide against said bar, and the other toggle lever pivotally connected to the bar and mounted to slide against the foot rest, cross pins in the free ends of said toggle levers, and flanged guides on said foot rest and bar guiding the movement of said toggle levers, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

MIHKEL KOPPEL.

Witnesses:
CHARLES E. POTTS,
R. H. KRENKEL.