(No Model.)

3 Sheets—Sheet 1.

J. M. MARLIN.

CLUTCH FOR TRICYCLES.

No. 348,680. Patented Sept. 7, 1886.

Fig. 2.

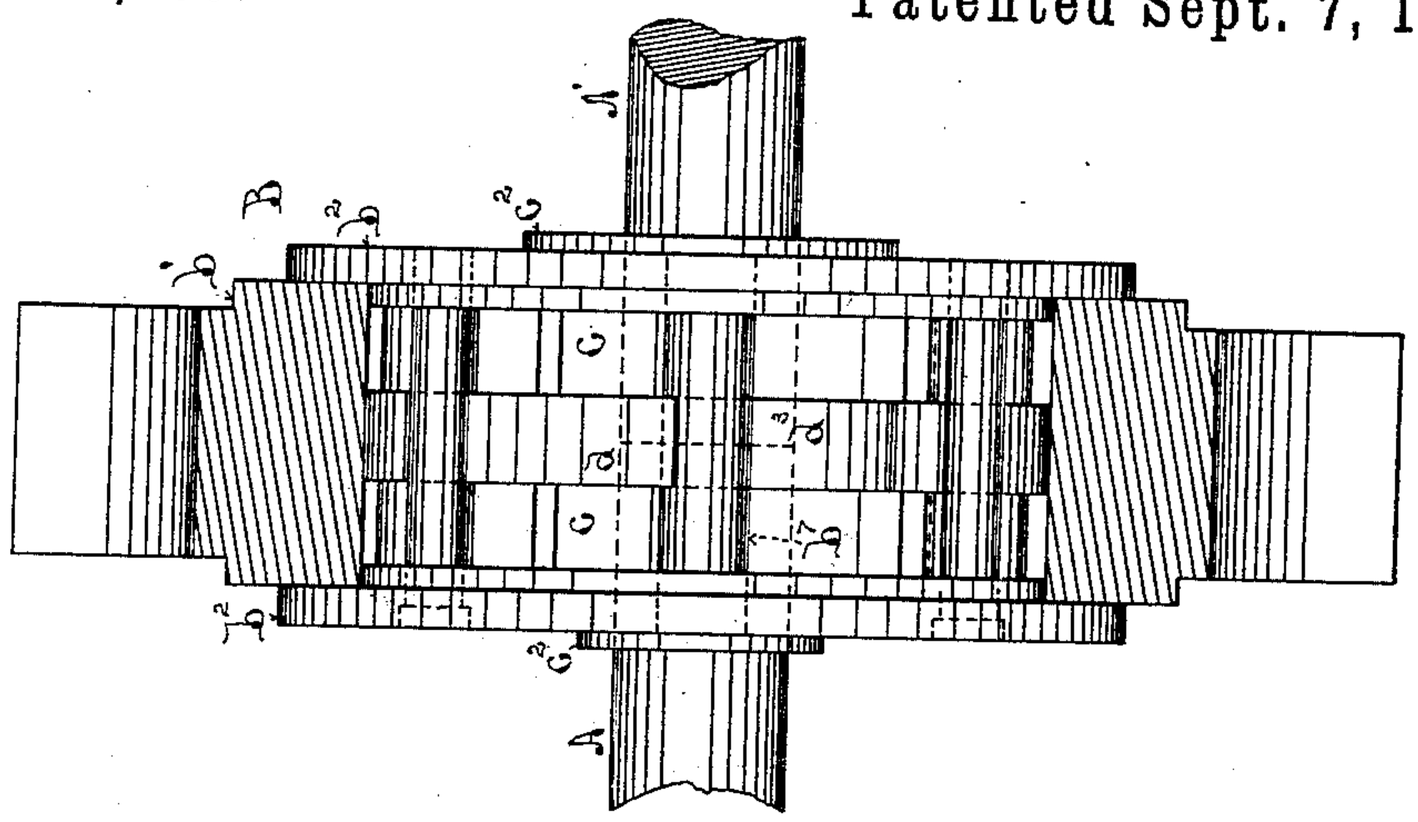
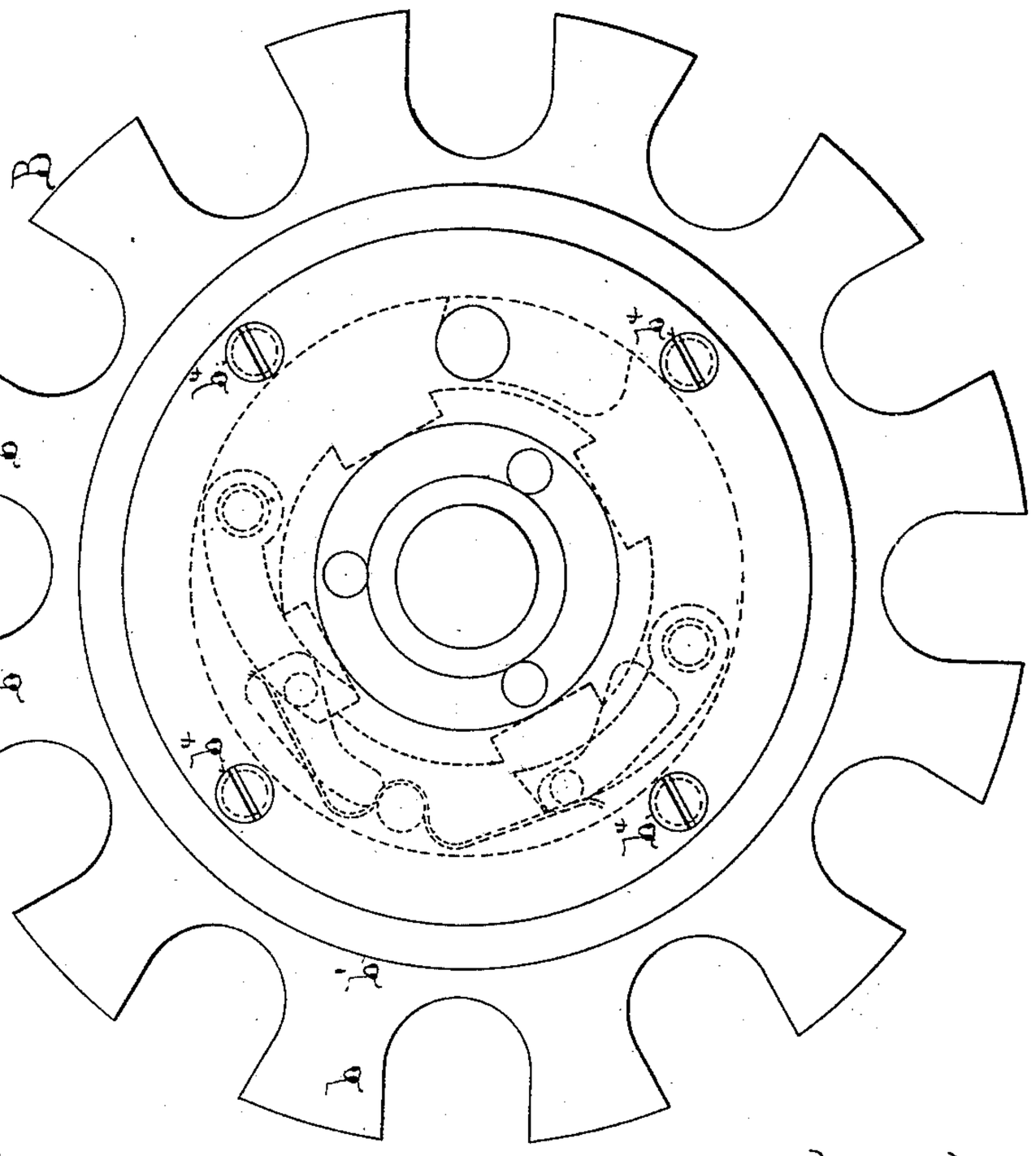


Fig. 1.



Witnesses
Wm. S. Brown
N. P. Ockington.

Inventor
J. M. Marlin
By David Hall Rice
Atty

(No Model.)

3 Sheets—Sheet 2.

J. M. MARLIN.

CLUTCH FOR TRICYCLES.

No. 348,680. Patented Sept. 7, 1886.

Fig. 3

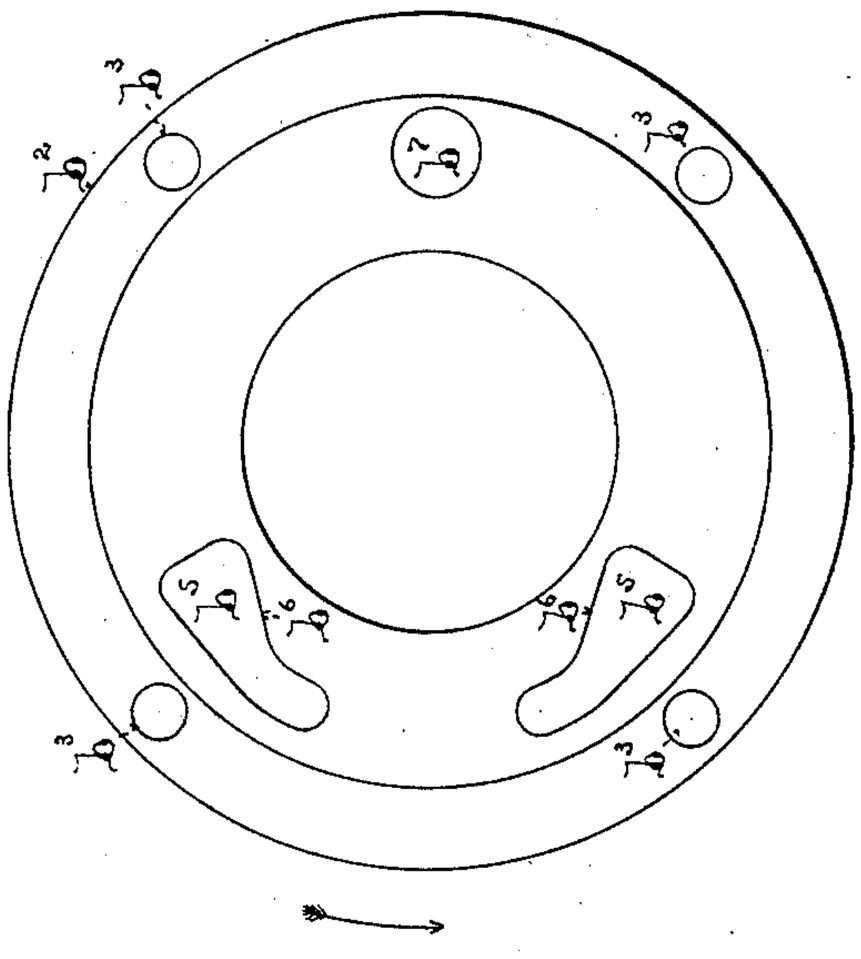
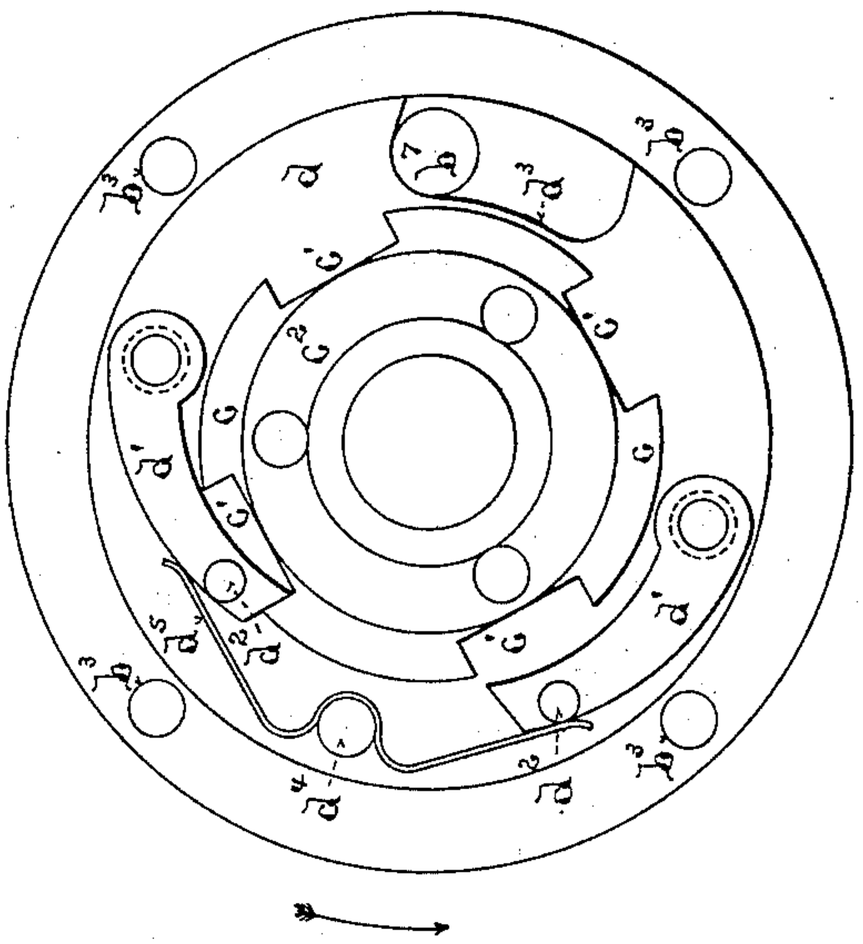


Fig. 4



Witnesses
Wm. S. Brown
N. P. Ockington.

Inventor
J. M. Marlin
By David Hall Rice
Atty

(No Model.)

3 Sheets—Sheet 3.

J. M. MARLIN.

CLUTCH FOR TRICYCLES.

No. 348,680. Patented Sept. 7, 1886.

Fig. 5

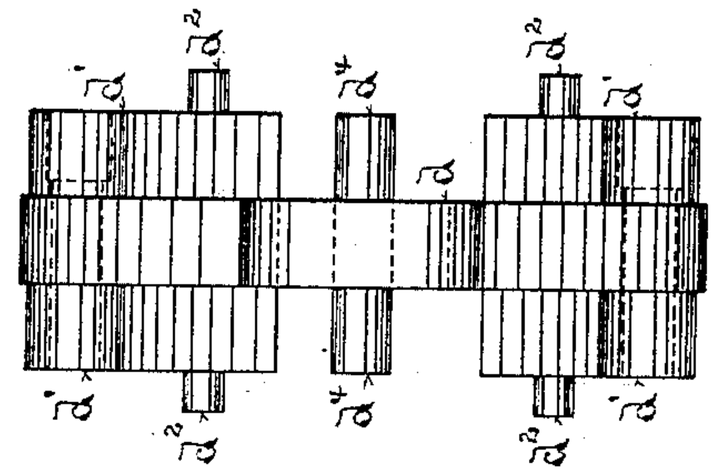


Fig. 6

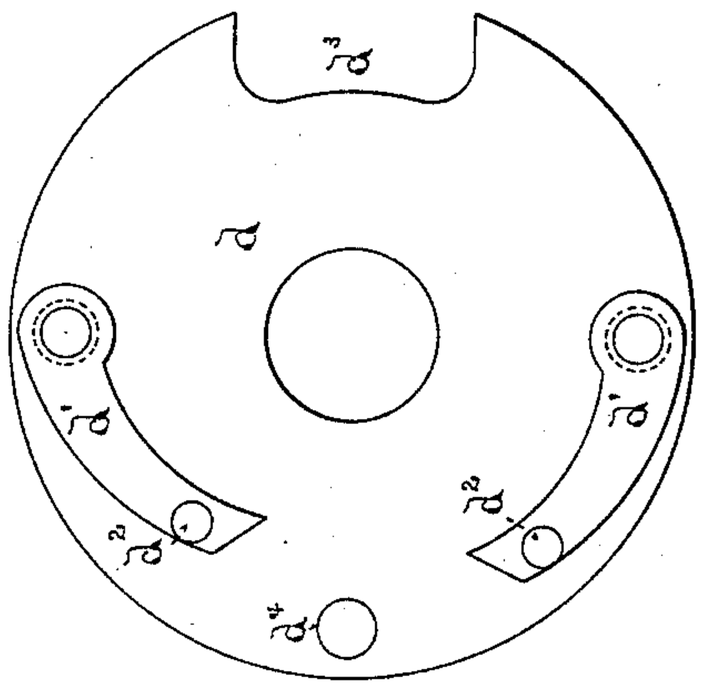


Fig. 7

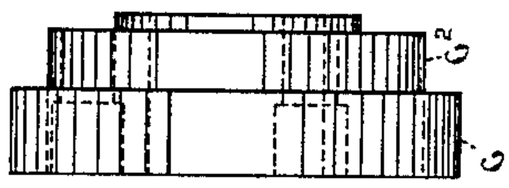
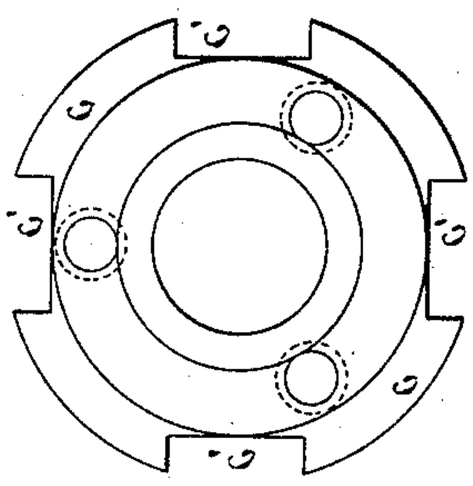


Fig. 8



Witnesses
Wm. S. Brown
N. P. Ockington

Inventor
J. M. Marlin
By David Hall Rice
Atty

UNITED STATES PATENT OFFICE.

JOHN M. MARLIN, OF NEW HAVEN, CONNECTICUT.

CLUTCH FOR TRICYCLES.

SPECIFICATION forming part of Letters Patent No. 348,680, dated September 7, 1886.

Application filed February 1, 1886. Serial No. 190,461. (No model.)

To all whom it may concern:

Be it known that I, JOHN M. MARLIN, of New Haven, in the county of New Haven and State of Connecticut, have invented a certain new and useful Improvement in Clutches for Tricycles, &c., of which the following is a specification.

My invention relates to clutches for tricycle-shafts and other similar shafts; and it consists in certain improvements upon the mechanism shown and described in the Letters Patent granted to me January 5, 1886, No. 333,331, substantially as hereinafter described and claimed.

In the drawings, Figure 1 is a side view of a pulley and clutch for tricycles constructed according to my improvements. Fig. 2 is an edge view of the same with the outer portion of the sprocket-gear in section to show the internal mechanism. Fig. 3 is an internal face view of one portion of the pulley-casing. Fig. 4 is a view of the clutch mechanism which is attached to one portion of the divided shaft when the side casing shown in Fig. 3 is removed. Fig. 5 is an edge view of the pawl-carrier. Fig. 6 is a side view of same. Fig. 7 is an edge view of the ratchet-disk attached to one portion of the divided shaft. Fig. 8 is a face view of same.

A and A′ are the two portions of the divided shaft, each of which is supported in bearings of the tricycle-frame, and carries upon its outer end one of the tricycle-wheels. This shaft is divided in the middle of the pulley-and-clutch mechanism, by which it is driven, into these two portions.

B is the pulley-and-clutch mechanism for driving this divided shaft A A′, so that it will positively drive both portions of the same either forward or backward; but in turning a corner either forward or backward the portion of the divided shaft which is attached to the wheel traveling on the outside or on the greater circle will be automatically released from the clutch-driving mechanism until the corner is turned and the wheels travel at equal speeds, and at the same time the clutch drives the divided shaft and releases the wheels equally well both forward and backward. The advantage of this mechanism is also very great in traversing a common road in a direct line, because if either of the wheels meets an obstruction which tends to retard it it is driven positively by the clutch mechanism and the whole power of the driving-wheel over the obstruction, instead of relying upon the mere momentum of the machine, whether forward or backward, and at the same time the faster running-wheel being independent of the driven one, there is no slip or friction of any connecting mechanism which communicates any portion of the retardation of the other wheel to it, and the tricycle therefore runs with great ease.

The outer portion of the pulley mechanism consists of a ring, b', having sprocket-teeth b b around it for the ordinary chain-belt, by which the pulley is driven. On each side the ring b' is attached to two disks, b^2 b^2, which form a casing for the clutch mechanism and revolve freely upon the divided shaft A A′ on their central bearing portions. Each of the disks b^2 is provided with holes b^3, registering with similar holes in the ring b', and through these holes screw-bolts b^4 b^4 are passed, which unite the disks together in the form of a hollow pulley.

Near the inner end of each member of the divided shaft A A′ is attached a disk, c, provided on its edge with ratchet-teeth c' c'. This disk revolves with the member of the divided shaft to which it is attached, and it has a hub, c^2, which forms a convenient bearing for the disk b^2 to revolve upon, as shown in Fig. 2. These two disks c are within the hollow pulley, and so protected from dust and dirt.

Between the two disks c c is placed upon the divided shaft A A′ a disk, d, which carries on opposite sides of it pawls d' d', so arranged that one pawl projects one way around the circumference and the other pawl projects the other way. These pawls are hung at such a distance from the center of the disk as to be outside of the circumference of the disks c c, attached to the parts of the shaft A A′, and so as to overhang these latter disks and engage with the notches c' therein, as hereinafter described. Each one of the pawls d' has projecting from its outer face a pin, d^2, near its outer or free end, by which it may be raised out of its notch c' in disk c. To effect this raising of it, it is made to enter a cam-shaped cavity, b^5, in the disk b^2, adjacent to it, there being in each of the disks b^2 two of these cam-

shaped cavities having their faces b^6, which are of the cam shape inclined in opposite directions toward each other corresponding with the opposite inclination of their respective pawls.

In the outer edge of pawl-carrier disk d is made on one side an elongated notch, d^3, opposite which a pin, d^4, is passed through the disk, as shown.

When the ratchet-disks c c and the pawl-carrying disk d are in place within the pulley and between the pulley face disks b^2 b^2, which incase them, a pin, b^7, firmly fixed in these latter disks, extends across within the pulley from side to side, passing through the notch d^3 in disk d, and entirely outside of the ratchet-disks c c. Springs d^5 are passed under the projecting ends of pin d^4 on each side of pawl-carrier disk d, and these springs, respectively, have their free ends resting upon the pawls d' d', so as to hold them inward toward the notches c' of their ratchet-disk. The distance apart around the disk b^2 of the cam-notches b^5 b^5 in a line described from its center is such that when the pin d^2 of one of the pawls is upon the part of its cam-surface b^6 farthest from the center the like pin of the oppositely-inclined pawl will be upon the part of its cam-surface b^6 nearest to the center. The pawl-carrier disk d is compressed between the faces of the ratchet-disks c on each side of it sufficiently to cause it to require greater force to move it than the pulley B in revolving around the shaft. The pin b^7, connecting disks b^2 b^2 of the pulley-casing, is so placed with reference to the cam-notches b^5 b^5 that when it is at one end of the notch d^3, through which it passes, one of the pawls will be raised and the other allowed to fall inward by these cam-notches, and when the pin is at the other end of the notch d^3 the one pawl will be lowered and the other raised.

The operation of the mechanism is as follows: By turning the ring b', which carries with it the disks b^2 b^2, these parts will revolve around the divided shaft A A′ in the direction of the arrow (see Figs. 3 and 4) until the pin b^7 has reached the end of the notch d^3 in pawl-carrier disk d. In the meantime the shaft A A′, with its attached disks c c, and the pawl-carrier-disk d have remained stationary because of the friction of the wheels upon the ground, which are attached to the outer ends of the shaft A A′. This movement of the pulley around the internal parts, however, has carried the upper cam-shaped notch, b^6, forward until the pin of its pawl has been pressed inward as far as possible by the spring d^5, carrying the pawl inward along with it and causing it to engage with one of the notches c' of the disk c. The same movement, however, carried forward the lower cam-shaped notch, b^6, causing it to lift out the lower corresponding pawl by means of its pin d^2, so as to be entirely clear of the ratchet-teeth in disk c. When the pin b^7 has arrived at this position in the end of the notch d^3 of disk d, it carries the latter disk along with it and the pawls d' on each side as well; but those on the upper side, being engaged with the notches c' of the ratchet-disks c carry the latter along with the pawls by positive driving power from the pulley; but each disk c is attached rigidly to its member of the divided shaft A A′, and therefore drives that.

Since the pawl-carrier disk d carries pawls on its opposite faces which will engage at the same time in the manner above described with the notches of the ratchet-disks c on opposite sides of the pawl-carrier disks, both members of the divided shaft will be driven alike. In case, however, one of the wheels is retarded or runs slower than the other, such other wheel, with its member of the shaft A A′ and its attached ratchet-disk c, will be free to run ahead of the driven disk d, carrying the pawl d', which is driving it, because the oppositely-projecting pawl is held clear of the path of this ratchet-disk c, as shown in Fig. 4. Thus either of the wheels will be free to run ahead of the other one without friction.

In case it is desired to drive the wheels of the tricycle in the opposite direction, the reversing of the motion of the pulley carries the pin b^7 to the other end of the notch d^3, lifts out of the path of the ratchet-disk the upper pawl d', Fig. 4, drops into the path of the ratchet-disk the lower pawl d', which thus engages with the ratchet-disk and drives the wheels in the opposite direction, while allowing either one of them to travel faster than the other, substantially as hereinbefore described.

It is evident that the pulley B may be made fast to one member of the divided shaft A A′ in case it is desired to have only the other member of it capable of running faster than the pulley, and in that case only one of the disks c and its corresponding pawls on the face of the disk d need be used to accomplish the desired result.

I am aware of the Letters Patent granted to David Hall Rice, February 23, 1886, No. 336,588, and I make no claim herein to anything therein shown and described. In my present invention the pawls d' d' are carried by a separate disk, d, connected to the outer shell of pulley B by the pin d^7 and slot d^3, giving a limited independent movement to the outer shell each way, while the shell controls the pawls by cam-surfaces connected to it, while in the said patent of Rice no similar pawl-carrying disk is found, the pawls being carried by the outer shell.

What I claim as new and of my invention is—

1. The combination of the divided shaft A A′, one or more disks, c, attached thereto, each provided with pawl-teeth fitted to hold against the pawls in opposite directions, a single pawl-carrier disk, d, provided on one or both its faces with corresponding oppositely-inclined pawls, d' d', and a driving-pulley part, B, connected to said disk d by a coupling, permitting a limited independent move-

ment of the same back and forth, and provided with lifting devices adapted to alternately raise and drop said pawls into their pawl-teeth as the said pulley is revolved in one direction or the other, substantially as described.

2. The combination of divided shaft A A′, pulley B, formed of ring b', and side disks, b^2 b^2, inclosing the other parts, one or more disks, c, attached to said shaft within said pulley, and each provided with pawl-teeth fitted to hold against the pawls in opposite directions, a pawl-carrying disk, d, within said pulley, provided with corresponding oppositely-inclined pawls, d' d', on one or both sides of it, and connected to said pulley B by a coupling, permitting a limited independent movement of the latter back and forth, and lifting devices attached to the latter internally, and adapted to alternately raise and drop said pawls into their pawl-teeth as said pulley is revolved in one direction or the other, substantially as described.

3. The combination of divided shaft A A′, one or more disks, c, provided with pawl-teeth fitted to hold against the pawls in opposite directions, a single pawl-carrying disk, d, provided with notch d^3, and with corresponding oppositely-inclined pawls d' d' on one or both sides of it, having pins d^2 d^2, and with one or more springs, d^5, and the driving-pulley B, provided with pin b^7 and cam-slots b^5 b^5 in one or both of its disks b^2, substantially as described.

4. The combination of divided shaft A A′, disks c c, provided with pawl-teeth fitted to hold against the pawls in opposite directions, a single disk, d, provided with notch d^3, and with corresponding oppositely-inclined pawls, d' d', on both sides of it, having pins d^2 d^2, and with springs d^5, and the driving-pulley B, provided with pin b^7 and cam-slots b^5 b^5 in the faces of its disks b^2, substantially as described.

JOHN M. MARLIN.

Witnesses:
C. F. DEMMER,
W. H. KINNEY.