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O. E. MILLER.
PROPULSION DEVICE FOR TOY VEHICLES.
APPLICATION FILED OCT. 19, 1909.

Patented July 12, 1910.

3 SHEETS—SHEET 1.

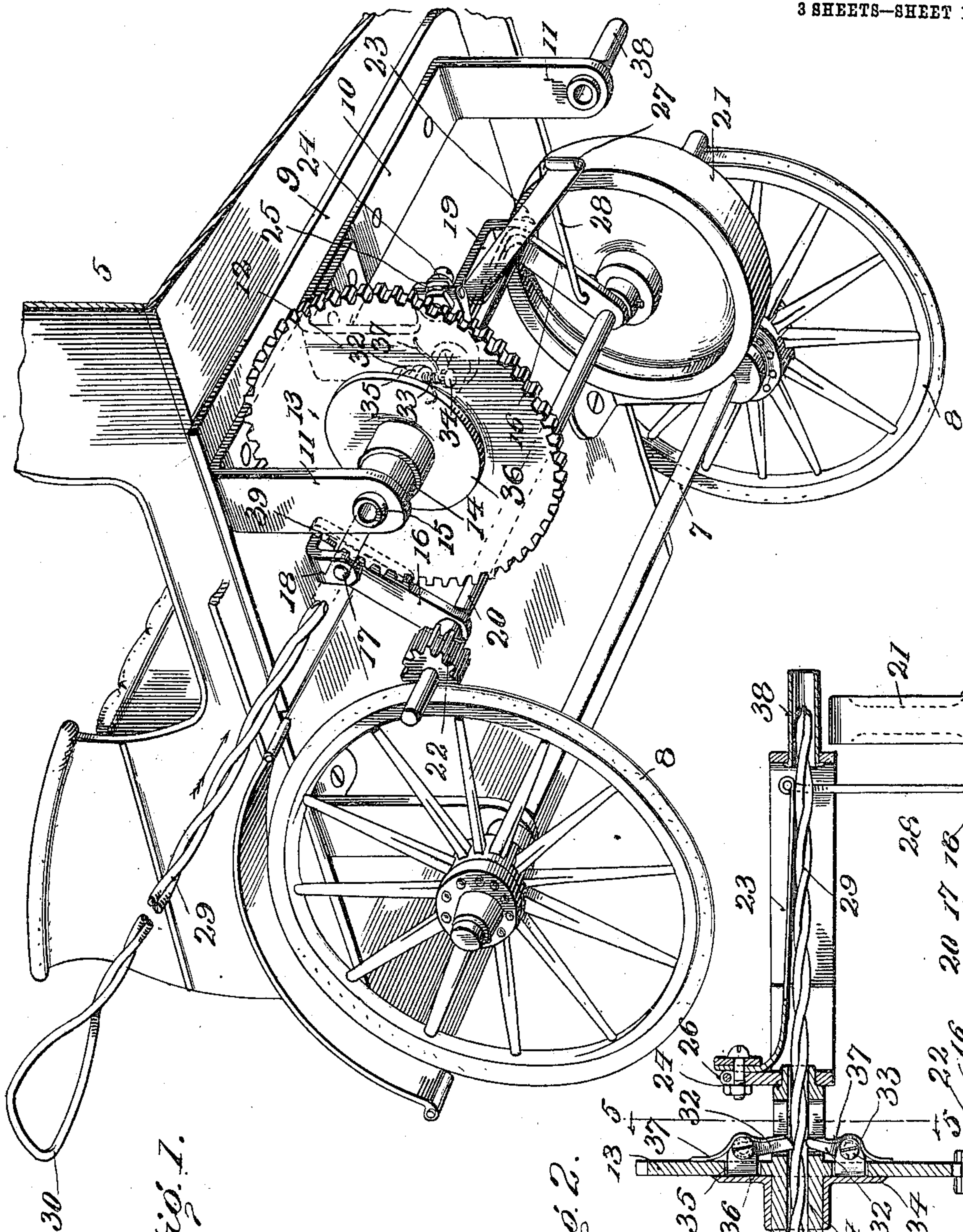
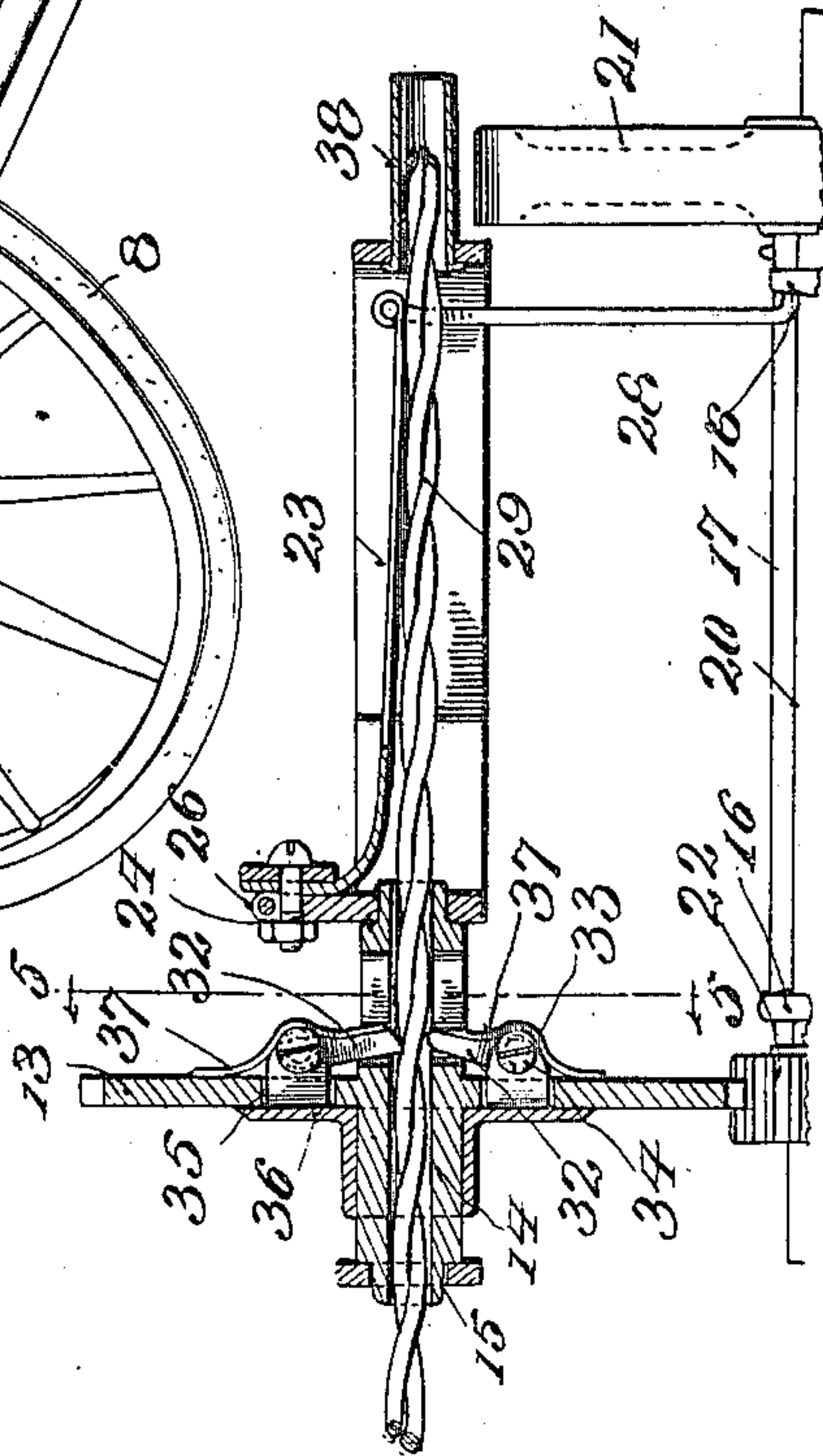


Fig. 1.

Fig. 2.



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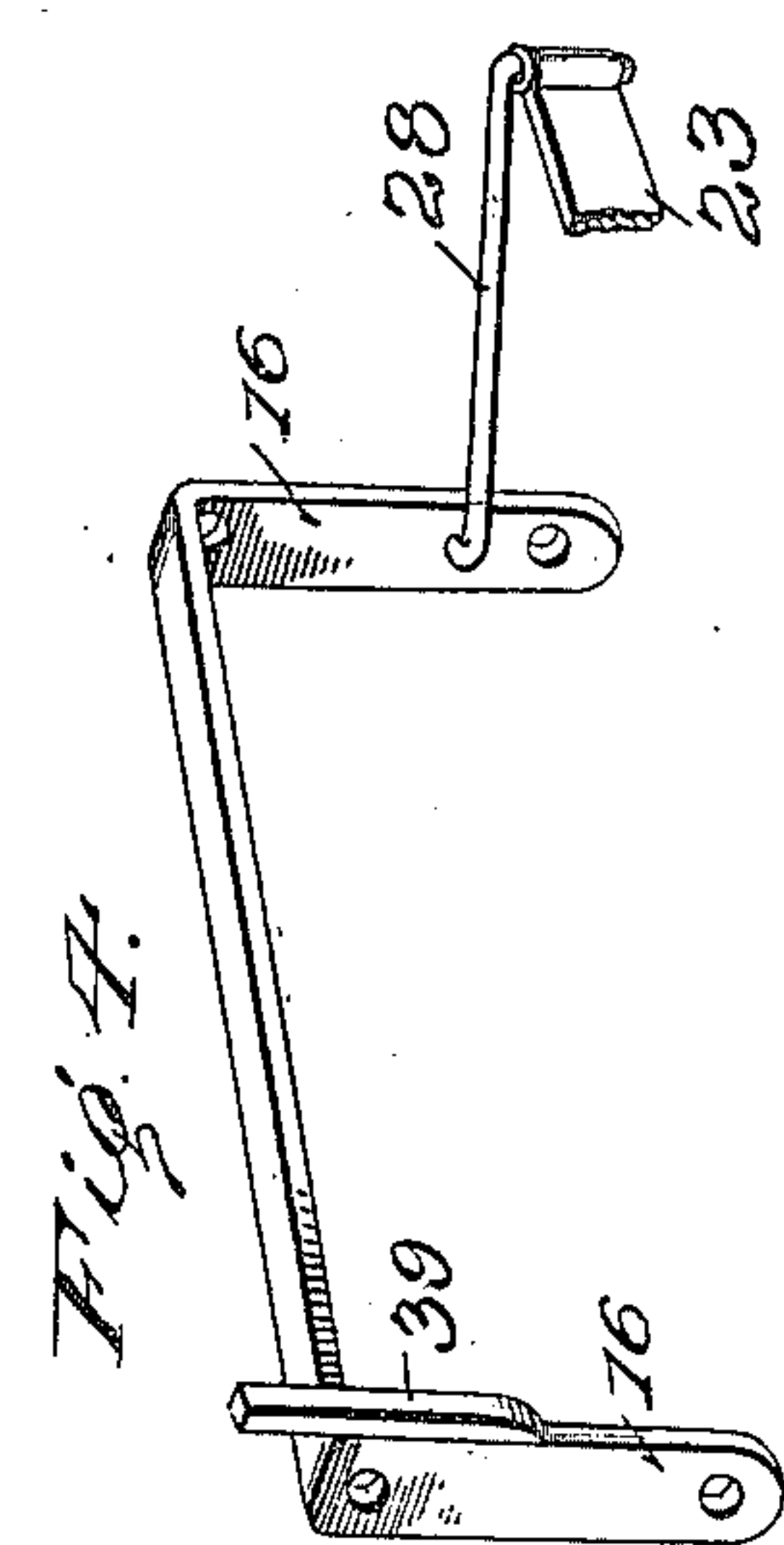
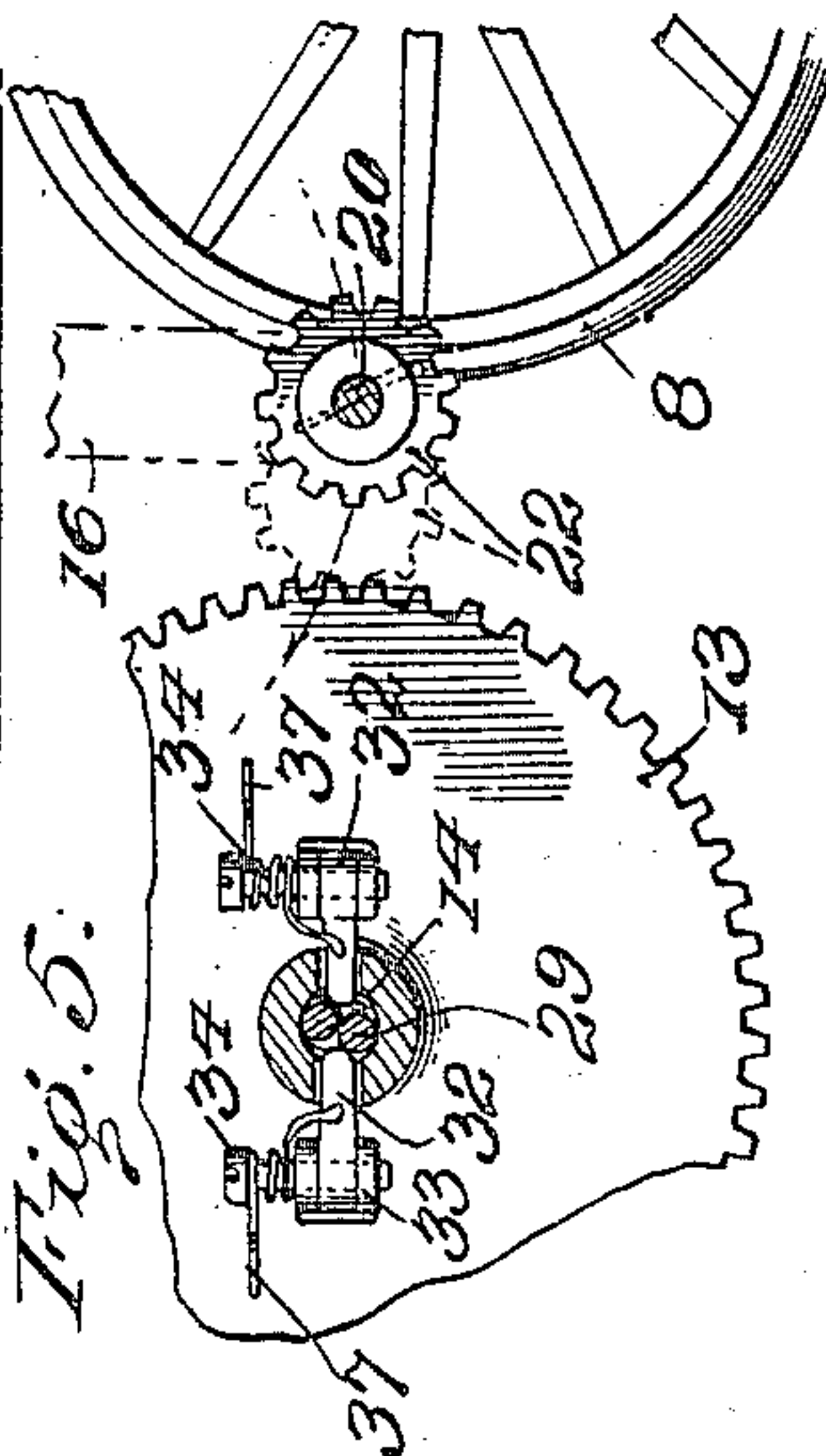
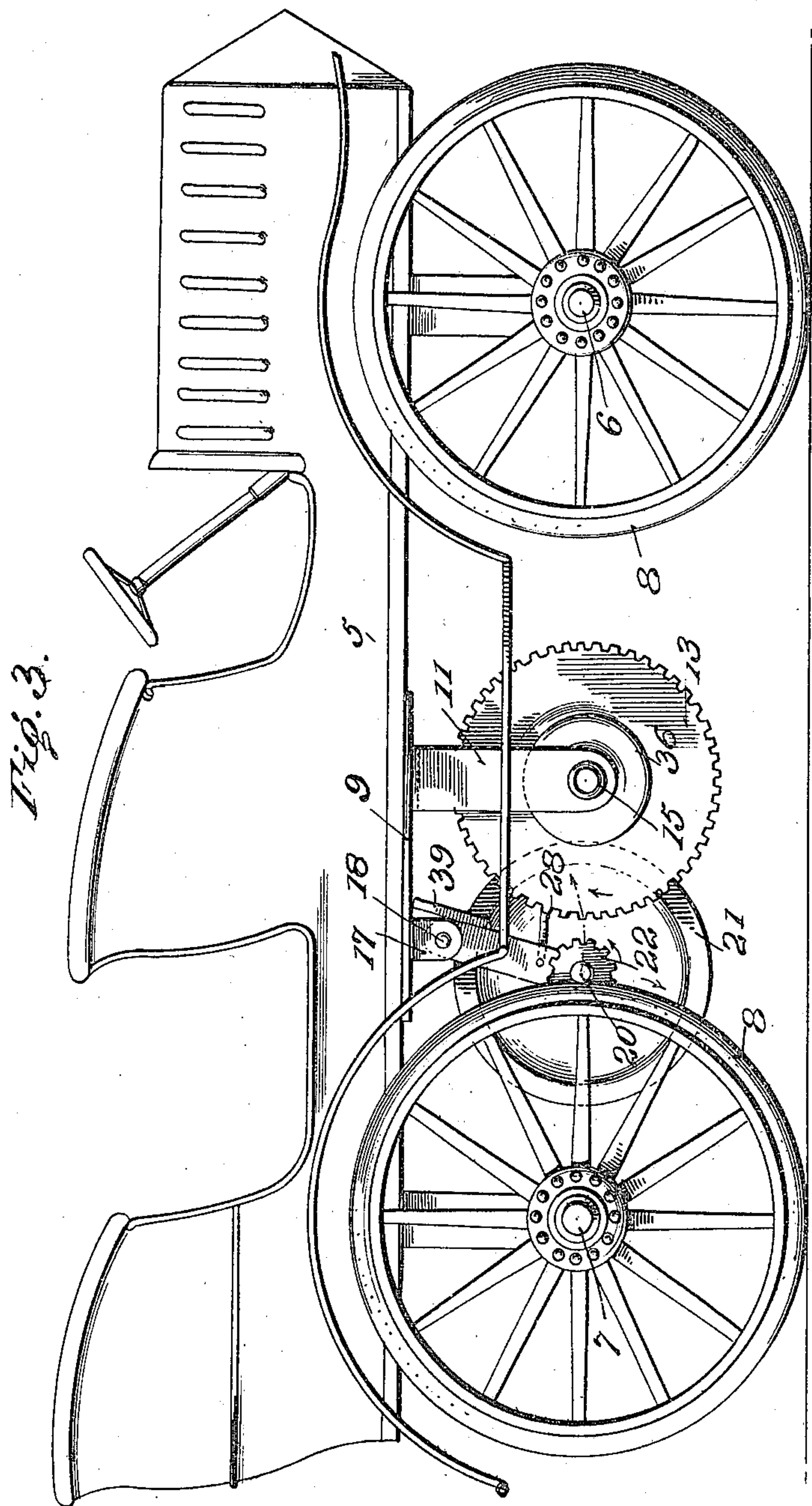
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3 SHEETS—SHEET 2.



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3 SHEETS--SHEET 3.



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UNITED STATES PATENT OFFICE.

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PROPULSION DEVICE FOR TOY VEHICLES.

964,294.

Specification of Letters Patent.

Patented July 12, 1910.

Application filed October 19, 1909. Serial No. 523,413.

To all whom it may concern:

Be it known that I, ORAM E. MILLER, citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Propulsion Devices for Toy Vehicles, of which the following is a specification.

This invention relates to toys and more particularly to mechanism for propelling the same.

The object of the invention is to provide a wheeled toy in which the momentum of a rapidly revolving fly wheel is utilized to effect the propulsion of the toy.

A further object is to provide a toy, the construction of which is such that the momentum of the fly wheel may be transmitted to the driving wheels of a toy without removing the latter from the floor or track.

A further object is to provide means for rotating the fly wheel at a higher rate of speed than is usually attained in devices of this character and consequently propel the toy for a longer period.

A further object is to provide a spirally disposed actuating rod adapted to engage suitable gripping dogs on a master gear to rotate the latter when said rod is moved longitudinally in one direction, motion being transmitted from the master gear through the medium of a pinion on the fly wheel shaft to the wheels of the toy.

A further object is to provide means for moving the fly wheel shaft out of engagement with the driving wheels of the toy when the actuating rod is inserted in the master gear, and means for automatically disengaging the master gear from the pinion and causing said shaft to frictionally engage the driving wheels when the actuating rod is withdrawn from said master gear.

A still further object of the invention is generally to improve this class of devices so as to increase their utility, durability and efficiency.

Further objects and advantages will appear in the following description, it being understood that various changes in form, proportions and minor details of construction may be resorted to within the scope of the appended claims.

For a full understanding of the invention and the merits thereof and also to acquire a knowledge of the details of construction

and the means for effecting the result, reference is to be had to the following description and accompanying drawings, in which:

Figure 1 is a perspective view of a portion of a toy vehicle provided with a propulsion device constructed in accordance with my invention; Fig. 2 is a longitudinal sectional view showing the actuating rod in position to rotate the master gear; Fig. 3 is a side elevation of my improved toy in operative position; Fig. 4 is a detail perspective view; Fig. 5 is a sectional view taken on the line 5—5 of Fig. 2 and looking in the direction of the arrow; Fig. 6 is a bottom plan view showing a modified form of the invention in an operative position; and, Fig. 7 is a further modification showing the actuating rod in position.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The propulsion device forming the subject matter of the present invention is principally designed for use in connection with toy vehicles and by way of illustration is shown applied to a wheeled toy in which 5 designates the body portion, 6 and 7 the front and rear axles, and 8 the ground wheels.

Fastened to the bottom of the body portion 5, is a plate 9 having a bracket 10 secured thereto and provided with depending arms 11, there being an intermediate arm 12 secured to or formed integral with the body of the bracket and spaced from one of the arms 11, as shown to provide a chamber for an actuating member 13. The actuating member 13 is preferably in the form of a master gear having a tubular hub 14, the opposite ends of which are reduced and journaled in suitable bearings 15 formed in the intermediate arm 12 and one of the arms 11.

Spaced from the rigid bracket 10, is a movable bracket 16, the arms of which are pivotally mounted at 17 on the depending lugs 18 of a strap iron or bar 19 also secured to the plate 9. If desired, however, the plate 9 may be dispensed with and the brackets 10 and 16 fastened directly to the bottom of the vehicle.

Journaled in the arms of the movable bracket 16, is a driving shaft 20 having a fly wheel 21 keyed or otherwise rigidly secured thereto, the opposite ends of the driving

shaft 20 being adapted to normally and yieldably engage the peripheries of the adjacent wheels 8 of the toy for rotating the latter, as will be more fully explained hereinafter.

Secured to the driving shaft 20, near one end thereof, is a pinion 22 adapted to mesh with the teeth of the master gear 13 when the bracket 16 is moved in one direction and to be disengaged from the master gear when said bracket is moved in another direction.

As a means for normally and yieldably supporting the opposite ends of the driving shaft 20 in frictional engagement with the adjacent wheels 8 of the vehicle, there is provided a trip device, preferably in form of a spring arm 23, one end of which is curved laterally and rigidly secured to the intermediate arm 10 of the stationary bracket by a bolt, screw or similar fastening device 24, the latter being passed through a slot 25 formed on an extension 26 of said intermediate arm. The opposite end of the trip device or arm 23 is bent to produce an eye 27, in which is seated one end of a connecting rod 28, the other end of said connecting rod being operatively connected with the movable bracket 16, as shown.

In order to rotate the actuating member or gear 13, there is provided an actuating rod 29 preferably formed of a single length of wire bent upon itself to form a terminal loop or handle 30, the wire strands being thence inter-twisted to form spirally disposed grooves 31. The actuating rod 29 is designed to be inserted in the tubular member 14 of the master gear 13, there being oppositely disposed gripping pawls 32 pivotally mounted at 33 between spaced lugs 34 and adapted to enter the spiral grooves of the actuating rod and thus rotate the master gear when said rod is withdrawn from the latter. The lugs 34 extend through apertures 35 in the master gear 13 and riveted, welded or otherwise rigidly secured thereto, is a reinforcing plate or disk 36 fastened to the tubular member 14, as best shown in Fig. 2 of the drawings.

The active ends of the pawls 32 are normally and yieldably supported within the tubular member 14 by means of torsion springs 37 having their intermediate portions coiled around the pivot pins 33, and one end thereof bearing against the adjacent pawl 32 and their other ends engaging the inner face of the master gear 13. A tubular member or guide 38 is preferably extended laterally from one of the depending arms 11 of the stationary bracket 10 for the purpose of forming a guide for the actuating rod 29. If desired however, this guide may be dispensed with, the side of the toy or vehicle affording a guide for said actuating rod.

Secured to one of the arms of the movable bracket 16, is a lug 39, the function of which is to prevent binding or wedging action between the master gear 13 and pinion 22 when the driving shaft 20 is in position to be rotated by said master gear, the free end of the lug 39 being adapted to bear against the adjacent surface of the supporting plate 9 to effect this result.

Attention is here called to the fact that the opposite ends of the driving shaft 20 are normally and yieldably held in frictional engagement with the wheels 8 of the vehicle by means of the trip arm, while the free ends of the latter are normally extended into the path of movement of the actuating rod 29 so that when said actuating rod is inserted in the bore of the tubular member 14, said actuating rod will press the trip device or arm 23 laterally and through the medium of the connecting rod 28 move the pinion 22 into mesh with the teeth of the master gear, the active ends of the pawls 32 riding loosely over the actuating rod as the latter is passed through the master gear and into the guide 38.

When the actuating rod is withdrawn, the pawls 32 will grip the grooved walls of the actuating rod 29 and rotate the master gear so that motion will be transmitted from the master gear to the pinion 22 and rapidly revolve the fly wheel 21. In the act of withdrawing the actuating rod from the tubular member 14, the free end of said rod will clear the trip device or spring arm 23, the spring properties of said arm causing the connecting rod 28 to tilt the movable bracket 16 laterally so as to disengage the pinion 22 from the master gear and at the same time move the opposite ends of the driving shaft 20 into frictional engagement with the wheels 8 of the vehicle so that the momentum of the fly wheel 21 will be imparted to the wheels 8 to propel the vehicle. It is obvious that when the actuating rod 29 is again inserted in the tubular member of the master gear, the free end of said actuating rod, by engagement with the arm 23, will operate the latter to again move the pinion 22 into engagement with said master gear so as to bring the parts into position to be operated, as before stated.

The construction of the device is such that the momentum of the fly wheel may be transmitted to the driving wheels of the toy without removing the latter from the floor or supporting track.

In Fig. 6 of the drawings, there is illustrated a modified form of the invention, in which the trip device is in the form of a rigid arm 40, the intermediate portion of which is bent laterally at 41 for engagement with the adjacent end of the actuating rod, while the free end thereof is connected through the medium of a rod 42 with the

swinging bracket 16', there being a coiled spring 42' secured to the movable bracket 16' and the base 9' respectively, so as to exert a constant pull on said bracket in the direction of the adjacent ground wheels.

A further modification is illustrated in Fig. 7 of the drawings, in which the trip arm 43 is also preferably in the form of a rigid bar having its intermediate portion bent upon itself and adapted to form an eye 44 arranged to fit between spaced perforated lugs 45 formed on the extension of the intermediate arm 12 of the stationary bracket, said trip arm being pivotally connected with the perforated lugs by means of a pin or bolt passing through the perforations in the lugs 45 and eye 44, as shown. In this form of the device one end of the metal constituting the arm or bar 43 is bent laterally into the path of movement of the actuating rod, as indicated at 45', while the other end thereof is provided with an eye for engagement with a connecting rod 46, there being a coiled spring 47 connected with the swinging bracket and base, respectively, so that the opposite ends of the driving shaft will be normally and yieldably supported in engagement with the driving wheels of the toy. The result accomplished by the construction shown in Figs. 6 and 7 is identical with the function performed by the trip arm shown in Figs. 1 and 2 of the drawings.

Having thus described the invention, what is claimed as new is:

1. A propulsion device for wheeled vehicles including an actuating member, a driving shaft for transmitting motion to the wheels of said vehicle, a longitudinally movable actuating device for rotating the actuating member, and means for imparting motion from said actuating member to the driving shaft.

2. A propulsion device for wheeled vehicles including an actuating member, a driving shaft, an actuating rod for rotating said member, means for transmitting motion from the actuating member to the driving shaft when the rod is moved in one direction, and means for transmitting motion from the driving shaft to the adjacent vehicle wheels when the rod is moved in the opposite direction.

3. A propulsion device for wheeled vehicles including an actuating member, a driving shaft, an actuating rod for rotating said member, means for moving the driving shaft into engagement with the actuating member when a longitudinal movement is imparted to the rod in one direction, and means for disengaging said driving shaft from said actuating member and moving the driving shaft into engagement with the adjacent vehicle wheels when the rod is moved in the opposite direction.

4. A propulsion device for wheeled vehicles including an actuating member, gripping pawls carried by said actuating member, a driving shaft for imparting motion to the wheels of the vehicle, a spiral actuating rod adapted to engage the gripping pawls for rotating the actuating member when a longitudinal movement is imparted to the rod, and means for transmitting motion from said actuating member to said driving shaft.

5. A propulsion device for wheeled vehicles including an actuating member, a driving shaft for imparting motion to the wheels of the vehicle, a fly wheel secured to said driving shaft, an actuating member, means for transmitting motion from the actuating member to the driving shaft, an actuating rod for rotating said member, and a trip device operatively connected with the driving shaft and disposed in the path of movement of the actuating rod, said trip device being actuated by the rod to move the driving shaft into engagement with the actuating member when a longitudinal movement is imparted to the rod in one direction and to disengage the shaft from the actuating member when a longitudinal movement is imparted to the rod in the opposite direction.

6. A propulsion device for wheeled vehicles including an actuating member, a driving shaft having a fly wheel secured thereto for imparting motion to the wheels of said vehicle, a longitudinally movable actuating device for rotating the actuating member, and means for transmitting motion from the actuating member to said driving shaft.

7. A propulsion device for wheeled vehicles including an actuating member, a driving shaft normally and yieldably engaging the wheels of the vehicle, means for rotating the actuating member, a trip device, and a connection between the trip device and driving shaft, said trip device being operable by the device for rotating the actuating member to move the driving shaft into engagement with said actuating member.

8. A propulsion device for wheeled vehicles including an actuating member, a driving shaft for imparting motion to the wheels of the vehicle and provided with a fly wheel, means for transmitting motion from the actuating member to the driving shaft, an actuating rod for rotating said member, and a trip device operatively connected with the driving shaft and disposed in the path of movement of the actuating rod for moving the driving shaft into and out of engagement with said actuating member.

9. A propulsion device for wheeled vehicles including relatively stationary and movable brackets, an actuating member

mounted for rotation on the stationary bracket, a driving shaft journaled on the movable bracket and adapted to normally and yieldably engage the adjacent wheels of the vehicle, a fly wheel carried by the driving shaft, an actuating rod movable longitudinally within the actuating member for rotating the latter, and a connection between the stationary bracket and movable bracket for causing the driving shaft to engage the actuating member when the actuating rod is moved in one direction and for automatically disengaging the driving shaft from the actuating member and moving said driving shaft into engagement with the wheels of the vehicle when the actuating rod is moved in another direction.

10. A propulsion device for wheeled vehicles including relatively stationary and movable frames, an actuating gear mounted for rotation on the stationary frame, a driving shaft journaled on the movable frame and provided with a pinion adapted to mesh with the actuating gear, a connection between the stationary and movable frames for normally and yieldably holding the driving shaft in frictional engagement with the adjacent wheels of the vehicle, and a longitudinally movable actuating device for rotating the actuating gear, said actuating device being adapted to move the pinion into engagement with the gear when the actuating device is moved in one direction and to disengage said pinion from the gear and automatically move the driving shaft in frictional engagement with the vehicle wheels when the device is moved in another direction.

11. A propulsion device for wheeled vehicles including relatively stationary and movable brackets, an actuating gear mounted for rotation on the stationary bracket and provided with gripping pawls, a driving shaft journaled on the movable bracket and provided with a pinion adapted to mesh with the actuating gear, a fly wheel carried by the driving shaft, a spiral actuating rod movable to operative position between the pawls and adapted to rotate the gear when the rod is moved in one direction, and a connection between the stationary and movable brackets, said connection being disposed in the path of movement of the actuating rod for automatically moving the pinion into mesh with the actuating gear when the rod is moved in one direction and to disengage said pinion from the gear when the rod is moved in the opposite direction.

12. A propulsion device for wheeled vehicles including relatively stationary and movable brackets, an actuating member mounted for rotation on the stationary bracket, a driving shaft mounted for rotation on the movable bracket for transmitting

motion to the adjacent wheels of the vehicle, an actuating device for rotating the actuating member, a connection between the stationary and movable brackets and disposed in the path of movement of the actuating device for moving the driving shaft into engagement with the actuating member and for automatically disengaging the driving shaft from said actuating member, and a lug carried by the movable bracket for limiting the tilting movement thereof.

13. A propulsion device for wheeled vehicles including relatively stationary and movable brackets, a tubular member journaled on one of the brackets and provided with spring pressed gripping pawls, a master gear secured to the tubular member, a driving shaft journaled on the movable bracket and provided with a pinion movable into engagement with the master gear, a fly wheel mounted for rotation on the driving shaft, a trip device forming a connection between the stationary bracket and movable bracket, and a spiral actuating rod movable to operative position between the spring pawls for rotating the master gear.

14. A propulsion device for wheeled vehicles including relatively stationary and movable brackets, the stationary bracket being provided with a guide, a tubular member mounted for rotation on the stationary bracket and having spaced openings formed therein, an actuating gear secured to the tubular member, a disk secured to one side of the actuating gear and provided with slots, spaced ears secured to the disk and extending through the slots, spring pressed pawls pivotally mounted between the ears and projecting through the openings in the tubular member, a driving shaft journaled on the movable bracket and provided with a pinion adapted to mesh with the master gear, a fly wheel secured to said driving shaft, a spring arm fastened to the stationary bracket and provided with an eye, a rod forming a connection between the eye and movable bracket, and a spirally disposed actuating rod movable between the active ends of the pawls to a position within the guide of the stationary bracket, said spring arm being operable by the actuating rod to throw the pinion into mesh with the gear when the rod is moved in one direction and to automatically disengage the pinion from the gear and cause the driving shaft to frictionally engage the wheels of the vehicle when the spiral rod is moved in another direction.

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

ORAM E. MILLER. [L. s.]

Witnesses:

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