

No. 689,659.

Patented Dec. 24, 1901.

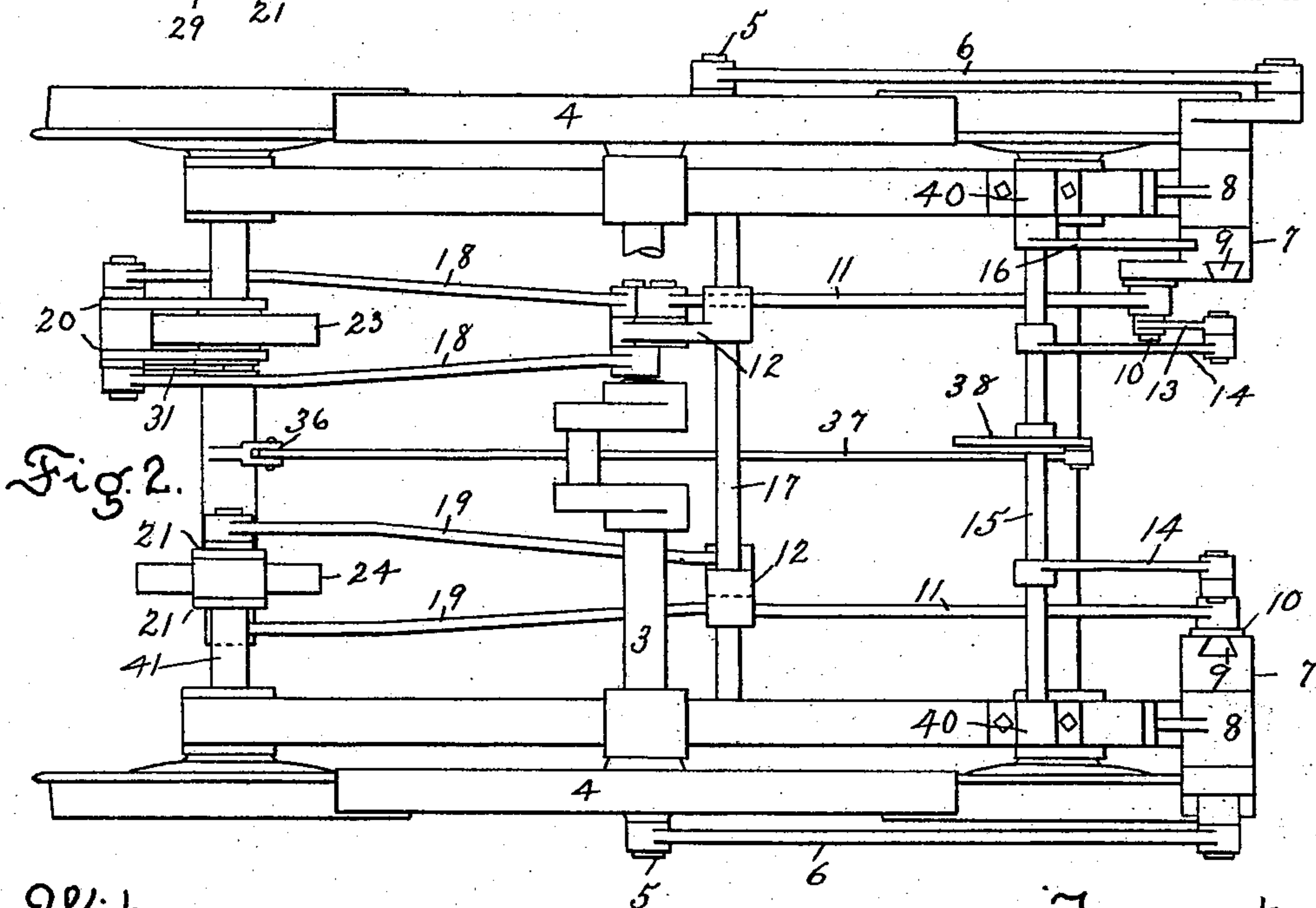
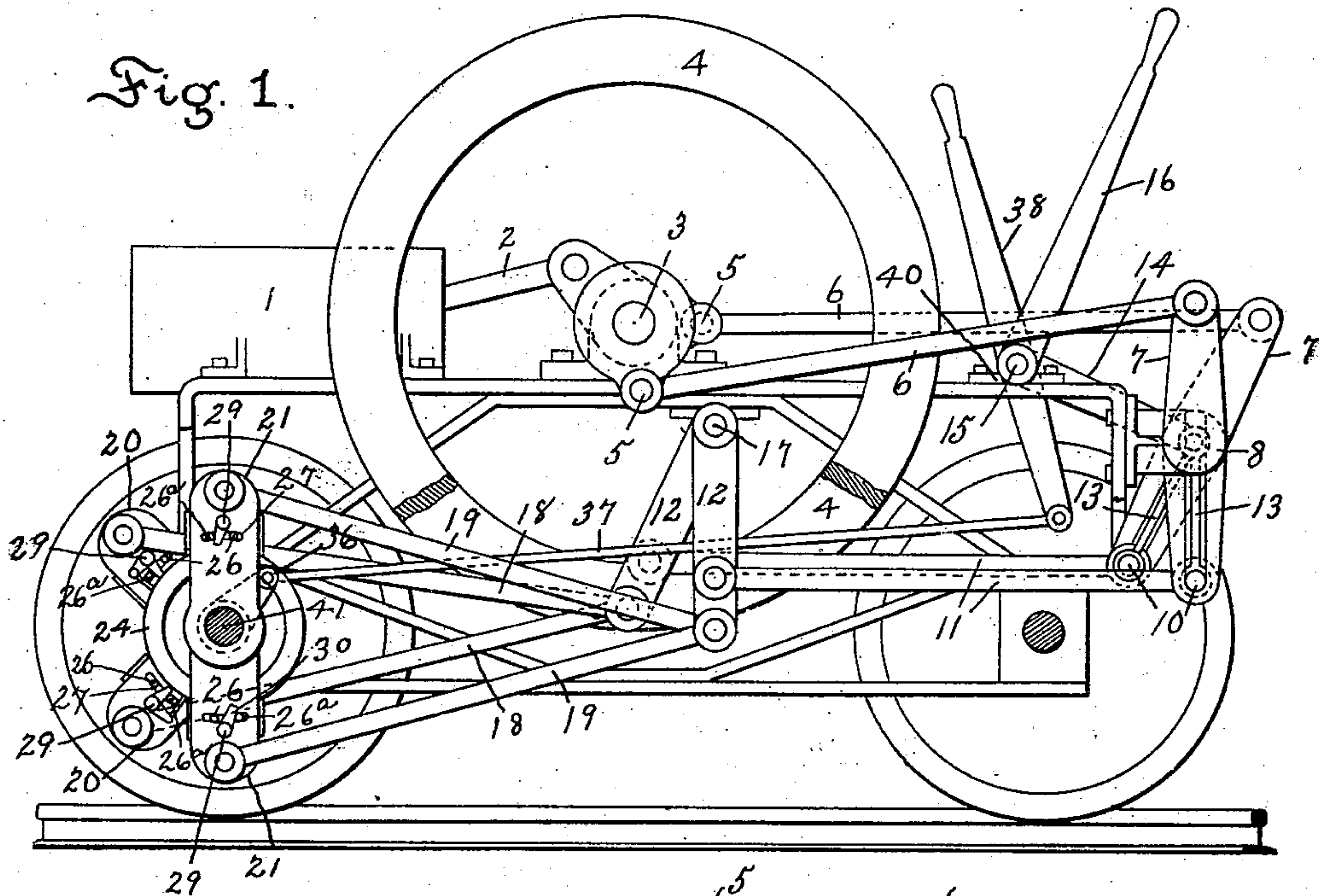
W. E. STIRLING.
AUTOVEHICLE.

(Application filed Dec. 26, 1900.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.



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2 Sheets—Sheet 2.

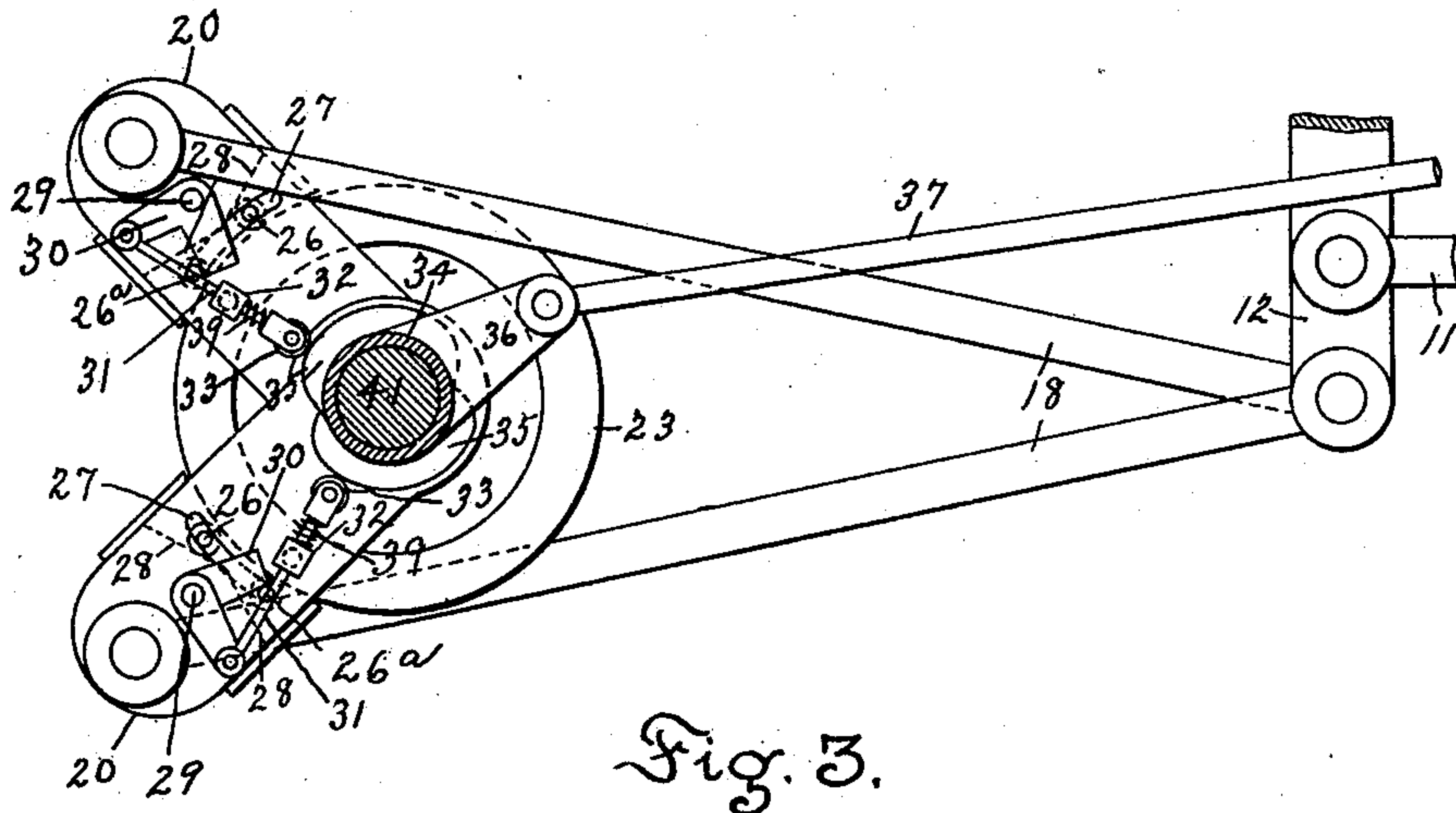


Fig. 3.

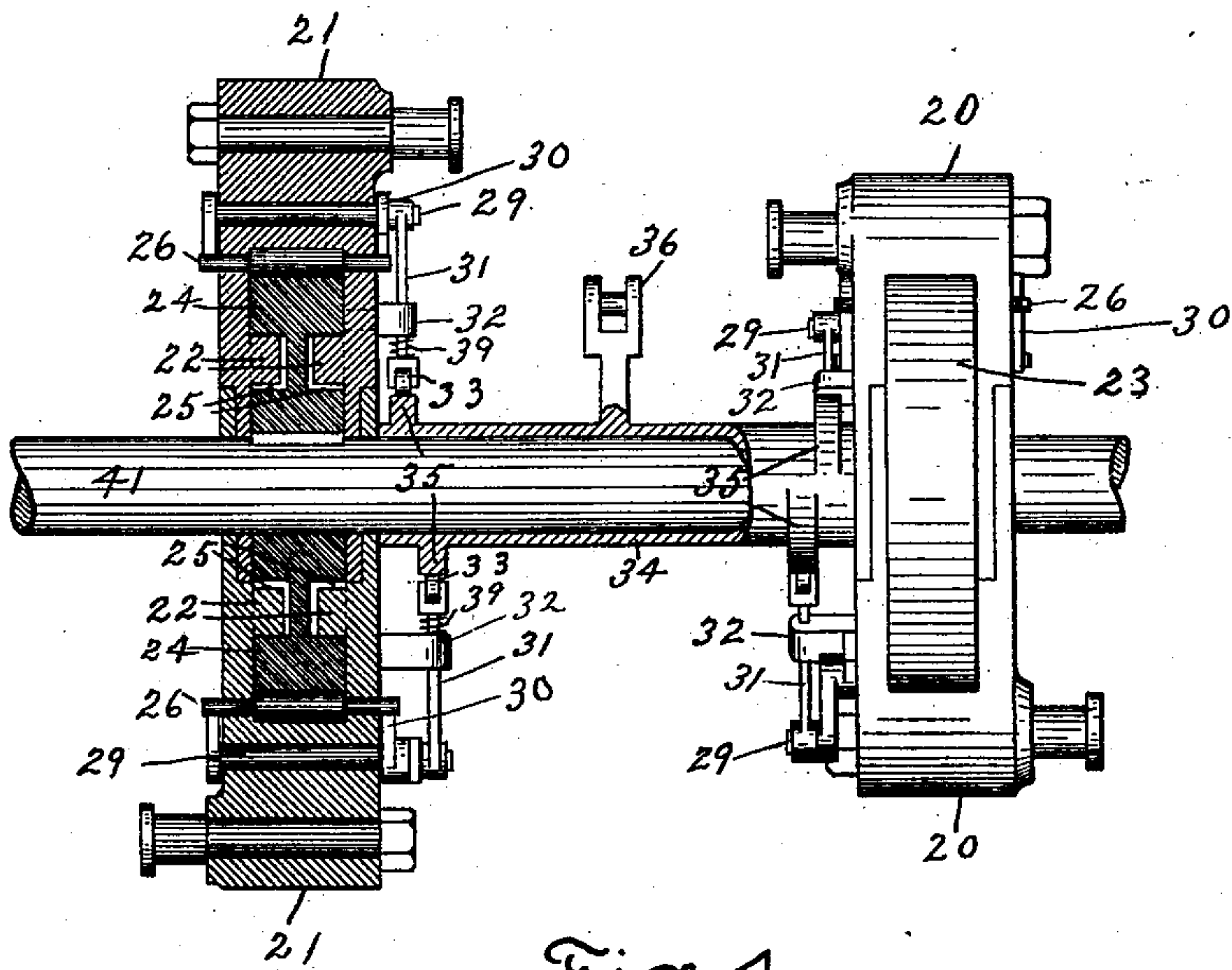


Fig. 4.

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UNITED STATES PATENT OFFICE.

WILLIAM EDGAR STIRLING, OF MOUNT WILSON, MARYLAND.

AUTOVEHICLE.

SPECIFICATION forming part of Letters Patent No. 689,659, dated December 24, 1901.

Application filed December 26, 1900. Serial No. 41,020. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM EDGAR STIRLING, a citizen of the United States, residing at Mount Wilson, in the county of Baltimore and State of Maryland, have invented certain new and useful Improvements in Autovehicles, of which the following is a specification.

This invention relates to improvements in speed-gear for autovehicles; and it consists of the new and novel parts and combination of parts hereinafter more fully set forth and claimed.

In the accompanying drawings, Figure 1 is a side elevation, partly in section, of a car truck and frame with my invention applied thereto. Fig. 2 is a plan view of same, the driving-shaft being broken away. Fig. 3 is a detailed view of one of the friction-wheels, which are keyed to the axle of truck. Fig. 4 is a detailed view of the two wheels mounted on the shaft to be driven, one of which is in section and showing the mechanism for reversing same.

For the purpose of illustration I have shown my invention applied to a car-truck and actuated by a gas-engine; but the same may be applied to other vehicles and may also be actuated by steam, electricity, or any other suitable power.

Referring to the accompanying drawings, 1 designates the cylinder of a gas-engine, having a piston 2 connected to the shaft 3 to actuate the latter. On each end of the shaft 3 is a fly-wheel 4, each of which is provided with a crank-pin 5, to which are secured one end of the rods 6, through which a reciprocating or rocking motion is imparted to the arms 7. The said pins 5 are set at right angles or ninety degrees with respect to each other. The opposite ends of the said rods 6 are pivoted to the upper ends of the rock-arms 7, which latter are mounted in the bearings 8, secured to the front of the truck-frame. The lower halves of the rock-arms 7 are provided with dovetailed slots 9, in which are vertically movable the pins 10. The rods 11 have their front ends loosely fitted over the pins 10 and their rear ends pivoted to the pendent rods 12. The rods 13 are secured by one end to the pins 10 and by the other ends to the rods 14, which latter are keyed to the shaft 15.

When it is desired to raise the front end of the rods 11 to shorten the stroke, the lever 16, which is also keyed to the shaft 15, is pulled back toward the rear of the truck, which movement turns the shaft 15, raising the rods 14 and 13, causing the pins 10 to move upwardly in the slots 9, carrying with them the front ends of the rods 11, thereby shortening the stroke of the said rods, and consequently diminishing the speed of the vehicle being driven. The shaft 15 is mounted in bearings 40 on each side of the truck-frame.

The pendent rods 12 are loosely secured by their upper ends to the shaft 17 and are free to reciprocate thereon. To the lower ends of the said rods 12 are pivoted the front ends of the rods 18 and 19. The rear ends of the rods 18 and 19 are pivoted to the outer ends of the bifurcated shoes 20 and 21, respectively. The inner ends of the shoes 20 and 21 are fitted over and are revoluble on the axle 41 of the vehicle driven and are provided with lugs 22 to fit within the grooves 25 of the wheels 23 and 24.

To the axle 41 is keyed the wheels 23 and 24, each side of which latter is provided with annular grooves 25, in which the lugs 22 project. Between the wheel 23 and shoes 20 and also between the wheel 24 and shoes 21 are placed friction-rollers 26 and 26^a, the ends of which project through the slots 27 in the sides of the shoes 20 and 21. The facing surfaces of the shoes 20 and 21 are inclined from the center outward, as indicated by dotted lines in Fig. 3, for the purpose hereinafter set forth. Projecting through the shoes 20 and 21 are pins 29, to which are secured the bell-crank levers 30, one arm of which latter projects between the two friction-rollers 26 and 26^a, and to the other arm is pivoted the rod 31. The rods 31 project down through lugs 32 on the sides of the shoes 20 and 21 and at the lower ends are provided with rollers 33.

On the axle 41 is loosely fitted a sleeve 34, having at each end cams 35, on which the rollers 33 reciprocate when the axle is traveling forward. In the center of the sleeve 34 is a lug 36, to which is pivoted a rod 37, which latter is connected to the lower end of the lever 28, by means of which the said sleeve 34 is turned on the axle 41, whereby the rods 31 are forced down on the sleeve 34 by means of the

springs 39, thus causing the bell-crank levers 30 to force one set of the rollers 26 out of engagement with the wheels 23 and 24 and allow the rollers 26^a on the opposite side to come into engagement therewith, whereby the action of the axle 41 will be reversed.

The operation of the device is as follows: The shaft 3 is driven by the piston 2 of the gas-engine cylinder 1. A reciprocating motion is transmitted through the shaft 3, rods 6, rock-arms 7, rods 11, 12, 18, and 19 to the shoes 20 and 21. As these shoes move back and forth the rollers 26 on one side of the inclined faces 28 are gripped between said incline faces of the shoes and wheels 23 and 24, which latter are keyed to the axle of the vehicle to be driven, thereby causing the said wheels 23 and 24, and consequently the said axle, to be revolved in one direction. The said shoes act on the wheels as follows: The upper shoe 20 pulls on the wheel 23 for part of the revolution of the latter, then the lower shoe 21 pushes the wheel 24, the lower shoe 20 then pushes the wheel 23, and, lastly, the upper shoe 21 pulls the wheel 24, the same action being repeated over and over again. The crank-pins 5 are arranged at right angles to each other, whereby one of the pins will always be in advance of the other one-quarter of a turn. When it is desired to reverse the action of the axle on the vehicle to be driven, the lever 38 is pushed forward, which through the medium of the rod 37 and lug 36 turns the sleeve 34 until the cams 35 are out of engagement with the rollers 33, whereby the rods 31 through the action of the springs 39 are forced downward, and by means of the bell-crank levers 30 the rollers 26, formerly in engagement between the shoes 20 and wheel 23 and shoes 21 and wheel 24, will be thrown out of engagement and the rollers 26^a on the opposite sides of the inclined faces 28 will be brought into play and reverse the action of the said shoes 20 and 21 on the wheels 23 and 24, and thereby cause the axle 41 to be revolved in the reverse direction from that above described for driving the vehicle forward. When the lever 16 is in the position shown in the accompanying drawings, the greatest speed is being obtained. When it is desired to decrease the speed, the lever 16 is pulled backward toward the rear of the truck, which turns the shaft 15 and rods 14, causing the rods 13 to pull the pins 10 upward in the slots 9, carrying with them the front ends of the rods 11 and bringing the latter nearer the center of the rock-arms 7. It will be seen that the nearer the front ends of the rods 11 are brought to the center of the rock-arms 7 the shorter the stroke of the rods 11 will be. Consequently the speed of the vehicle will be decreased without decreasing the speed of the shaft 3.

It will be seen that instead of the smooth-surfaced wheels 23 and 24 a ratchet-wheel may be used and pawls used instead of the rollers 26 and 26^a.

Slight alterations in the construction and arrangement of the several parts as shown in the accompanying drawings may be made without departing from the spirit of the present invention.

Having thus described my invention, what I claim is—

1. In a speed-gear for autovehicles, the combination of two friction-wheels rigidly secured to the axle to be driven; two shoes reciprocating on each of said wheels to revolve the latter; and means to impart a reciprocating motion to the said shoes, said means being so arranged that the shoes on one of the friction-wheels will always have a predetermined movement in advance of the shoes on the other wheel.

2. In a speed-gear for autovehicles, the combination of a plurality of wheels rigidly secured to the axle to be driven; two shoes on each wheel to revolve the latter; a plurality of cranks connecting with the said shoes to impart a rocking or reciprocating motion to the latter, the said cranks being set at right angles to each other whereby the shoes on one of the friction-wheels will move in advance of the shoes on the other.

3. In a speed-gear for autovehicles the combination of a plurality of wheels rigidly secured to the axle to be driven; two shoes loosely secured to the said axle and reciprocating alternately on said wheels to revolve the latter; a friction-roller between each of the shoes and said wheels to be gripped when the shoes are moving in one direction; and means to impart a reciprocating motion to the said shoes, said means being so arranged that the shoes on one of the friction-wheels will always have a predetermined movement in advance of the shoes on the other wheel.

4. In a speed-gear for autovehicles, the combination of a plurality of wheels secured to the axle to be driven; a plurality of shoes loosely secured to the said axle and reciprocating on the said wheels to revolve the latter; two rollers between each of the said shoes and wheels; a sleeve loosely fitted on the said axle; a lever to turn the said sleeve; and means secured to the said shoes by which when the sleeve is turned in one direction one set of rollers will be gripped by the shoes and wheels to turn the latter in one direction, and when the sleeve is turned in the opposite direction another set of rollers will be gripped and the action of the said wheels be reversed.

5. In a speed-gear for autovehicles, the combination of one or more friction-wheels rigidly secured to the axle to be driven; a plurality of shoes reciprocating alternately on said wheels; two friction-rollers carried by each shoe; a sleeve loosely mounted on the said axle having two cams near each end which when the axle is turned in one direction will throw one set of friction-rollers out of operation thereby allowing the remaining set to come into operation, as and for the purpose set forth.

6. In a speed-gear for autovehicles, the combination of one or more friction-wheels rigidly secured to the axle to be driven; a plurality of shoes reciprocating alternately on
5 said wheels; two friction-rollers carried by each shoe; a sleeve loosely mounted on said axle and having two cams near each end; a rod secured to each of the said shoes, said rods having one end resting on the said sleeve;
10 and means to turn the said sleeve on the axle whereby the said rods will raise, or lower, and cause one set of the friction-rollers to be thrown out of operation and the remaining set to come into operation to reverse the ac-
15 tion of the vehicle.

7. In a speed-gear for autovehicles, the combination of one or more friction-wheels rigidly secured to the axle to be driven; a plu-

rality of shoes reciprocating alternately on said wheels; two friction-rollers carried by 20 each shoe; a bell-crank lever secured to each shoe and having one arm projecting between the two friction-rollers; a sleeve loosely mounted on the said axle and having two cams near each end; rods having one end 25 secured to one arm of the bell-crank lever and the other end resting on the cams of the said sleeve; and means to turn the said sleeve, as and for the purpose set forth.

In testimony whereof I affix my signature 30 in the presence of two witnesses.

WILLIAM EDGAR STIRLING.

Witnesses:

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CHARLES H. MILLIKIN.