(No Model.)

J. M. TROTTER.

MOTOR FOR VEHICLES.

No. 592,674. Patented Oct. 26, 1897.

Fig. 1.

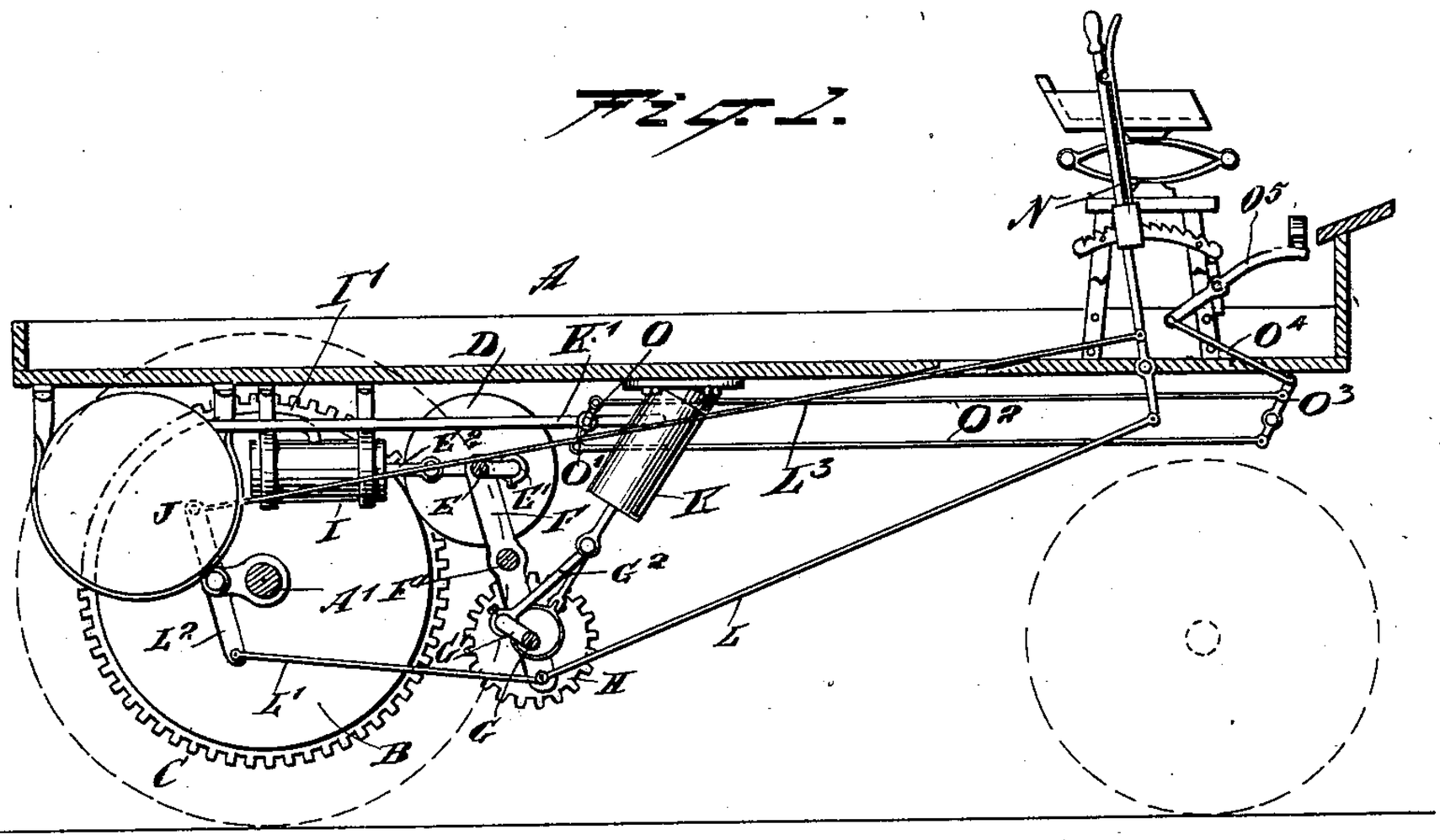


Fig. 2.

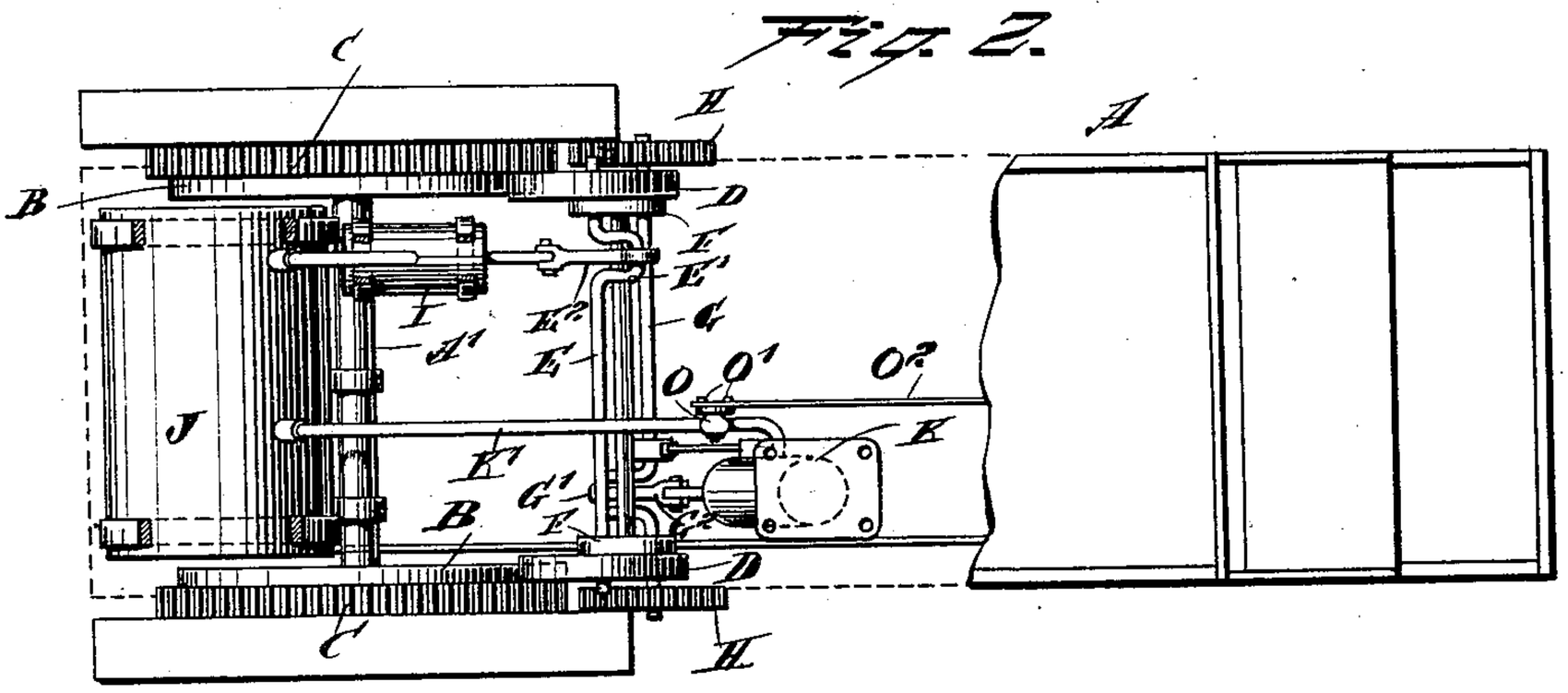
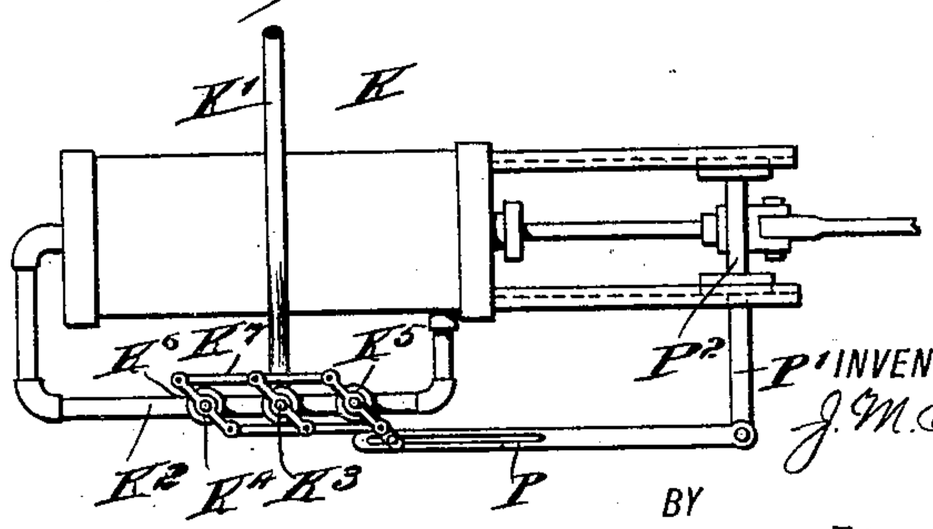


Fig. 3.



WITNESSES:
Henry T. Hirsch.
Rud. J. Hoster.

INVENTOR
J. M. Trotter.
BY
Munn & Co.
ATTORNEYS.

UNITED STATES PATENT OFFICE.

JAMES M. TROTTER, OF ALMA, CALIFORNIA.

MOTOR FOR VEHICLES.

SPECIFICATION forming part of Letters Patent No. 592,674, dated October 26, 1897.

Application filed November 9, 1896. Serial No. 611,528. (No model.)

To all whom it may concern:

Be it known that I, JAMES M. TROTTER, of Alma, in the county of Santa Clara and State of California, have invented a new and Improved Motor for Vehicles, of which the following is a full, clear, and exact description.

My invention relates to that class of motors used for the purpose of auxiliary propulsion; and the object of the invention is to provide a motor of the class specified which is simple and durable in construction, arranged to form a brake and to accumulate power during the travel of a drawn or propelled car, wagon, or other vehicle on a downgrade, and to utilize this power for propelling purposes when going uphill, &c.

The invention consists of certain parts and details and combinations of the same, as will be fully described hereinafter and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side elevation of the improvement. Fig. 2 is a plan view of the same with parts broken out, and Fig. 3 is a side elevation of a modified form of air-motor.

On the rear axle A′ of the vehicle A of any approved construction are secured the friction-disks B and the gear-wheels C, of which the former are adapted to be engaged at their peripheries by friction-disks D, secured on a transversely-extending shaft E, mounted to turn in suitable bearings arranged in levers F, fulcrumed at F′, and carrying a second shaft G, on which are fastened the pinions H, adapted to be thrown in mesh with the gear-wheels C. The friction-disks D are arranged on the upper end of the levers F and the pinions H on the lower end thereof, with the fulcrum F′ at the middle, so that when a swinging motion is given to the levers they move the friction-disks D in engagement with the friction-disks B, while the pinions H are thrown out of mesh with the gear-wheels C. A reverse swinging motion given to the levers F moves the pinions H in mesh with the gear-wheels C and carries the friction-disks D out of engagement with the friction-disks B.

On the shaft E is formed a crank-arm E′, connected by a pitman E^2 with the piston-rod of an air-compressor I, of any approved construction and secured to the under side of the vehicle-body, the said air-compressor discharging the air into a reservoir J, likewise attached to the under side of the vehicle-body. The other shaft G, carrying the pinions H, is formed or provided with a crank-arm G′, connected by a pitman G^2 with the piston-rod of an air-motor K, secured to the under side of the vehicle-body and deriving its motive agent by a pipe K′ from the reservoir J.

In order to impart a swinging motion to the levers F, I connect the lower end thereof by a link L with a hand-lever N under the control of the operator seated on the vehicle-seat. The levers F are also connected by a link L′ with a brake-lever L^2, connected by a link L^3 with the hand-lever N, as indicated in Fig. 1. By thus connecting the swinging levers F with the operating-lever N the fulcrum of the said levers is relieved of strain, and as the links alternately pull and push I am enabled to use very light links.

It will be seen that the operator by manipulating the hand-lever N can readily impart a swinging motion to the levers F, so that the disks D are thrown in engagement with the friction-disks B during the time the vehicle is going downhill, so that the air-compressor I is actuated to fill the reservoir J with compressed air and at the same time acts as a brake on the vehicle to check its downward movement.

In the pipe K′ is arranged a valve O, having its valve-stem provided with arms O′, connected by links O^2 with an arm O^3, fulcrumed on the front end of the vehicle-body and connected by a link O^4 with a foot-lever O^5 under the control of the operator. Thus when the vehicle reaches the bottom of the grade the operator imparts a swinging motion to the levers F by manipulating the hand-lever N so that the disks D are moved out of engagement with the disks B. The operator by imparting further movement to the levers F can throw the pinions H in mesh with the gear-wheels C, and by manipulating the foot-lever O^5 can open the valve O, so that compressed air previously stored in the reservoir J can flow from the latter to the air-motor K,

so as to actuate the same, and consequently rotate, by the pinions H, the gear-wheels C and the axle A′ to propel the vehicle. The hand-lever N and the levers F are so arranged that the disks D and pinions H can be thrown into an intermediate position—that is, out of contact with the disks B and gear-wheels C.

As illustrated in Fig. 3, the motor K is connected at its supply-pipe K′ with a pipe K^2, opening into the ends of the cylinder, to supply the latter with compressed air, using the pipe K^2 for the exhaust-pipe. For this purpose I provide the valves K^3 K^4 K^5, of which the valve K^3 serves to open and close the pipe K′, and the valve K^4 serves to control the inlet and outlet of the air at one end of the cylinder, and the other valve K^5 controls the inlet and exhaust of air at the other end of the cylinder. The several valves are provided with arms K^6, connected with each other by links K^7, and one of the arms is connected with a slotted link P, pivoted on a rod P′, extending from the cross-head P^2 of the motor.

It is evident that when the motor is running the cross-head p^2 and rod P′ carry the slotted link P forward and backward, so as to open and close the valves K^3 K^4 K^5 simultaneously for admitting compressed air alternately to the ends of the cylinder and to exhaust the air therefrom.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. A motor for vehicles, comprising an air-compressor, a reservoir for the compressed air, an air-motor connected with the said reservoir, swinging wheels adapted to be alternately thrown into engagement with wheels on the axle of the vehicle, a connection between one of the swinging wheels and reservoir, and a connection between the other wheel and the motor, substantially as and for the purpose set forth.

2. A vehicle-motor, comprising gear-wheels and friction-disks on the axle of the vehicle, gear-pinions and friction-disks adapted to be thrown in engagement with the said friction-disks and gear-wheels, levers carrying the shafts for the said friction-disks and gear-pinions, an air-compressor actuated from the friction-disks, a reservoir adapted to receive the compressed air from the compressor, and an air-motor connected with the shaft of the gear-pinions, substantially as shown and described.

3. A vehicle-motor, comprising gear-wheels and friction-disks on the axle of the vehicle, gear-pinions and friction-disks adapted to be thrown in engagement with the said friction-disks and gear-wheels, levers carrying the shafts for the said friction-disks and gear-pinions, an air-compressor actuated from the friction-disks, a reservoir adapted to receive the compressed air from the compressor, an air-motor connected with the shaft of the gear-pinions, and means, substantially as described, for controlling the said levers, as set forth.

4. The combination with a vehicle provided with friction-disks and gear-wheels on its axle, of levers fulcrumed at about the center of their length, crank-shafts mounted in opposite ends of the levers, friction-disks on one of the shafts, pinions on the other shaft, an air-compressor having its piston connected with the crank of the shaft carrying the friction-disks, a reservoir adapted to receive air from the compressor, and an air-motor connected with the crank of the shaft carrying the pinion and connected with the reservoir, substantially as described.

5. The combination with a vehicle having friction-disks and gear-wheels on its axle, of swinging friction-disks and pinions adapted to be alternately thrown into engagement with the disks and gear-wheels on the axle, an air-compressor having its piston connected with the swinging friction-disk to be operated thereby, a reservoir with which the compressor is connected, a motor having its piston connected with the swinging pinion, a pipe connecting the motor with the reservoir, and a valve in said pipe and under the control of the operator, substantially as described.

6. The combination with a vehicle having friction-disks and gear-wheels on its axle, of centrally-pivoted levers, crank-shafts mounted in the ends of the levers, disks on one shaft, pinions on the other shaft, a reservoir, a compressor connected with the reservoir and having its piston connected with the shaft of the disks, a motor connected with the reservoir and having its piston connected with the shaft of the pinions, the brake-lever, a link connecting one end of the lever with the said swinging lever, an operating-lever, and a link connecting the other end of the brake-lever with the operating-lever, substantially as described.

7. A motor for vehicles, comprising gear-wheels and friction-disks on the axle of the vehicle, pivoted levers, friction-wheels carried at one end of the levers, pinions at the other end of the said levers, a reservoir, an air-compressor connected with the shaft of the friction-wheels, an air-motor connected with the shaft of the pinions, a connection between the motor and reservoir, a valve in said connection, means for operating the valve, and means for swinging the levers carrying the friction-wheels and pinions, substantially as herein shown and described.

JAMES M. TROTTER.

Witnesses:
BERNHARD BÖHME,
MAGNUS TAIT.