

A. LEMAIRE-DOUCHY.
Car-Starter.

No. 222,288.

Patented Dec. 2, 1879.

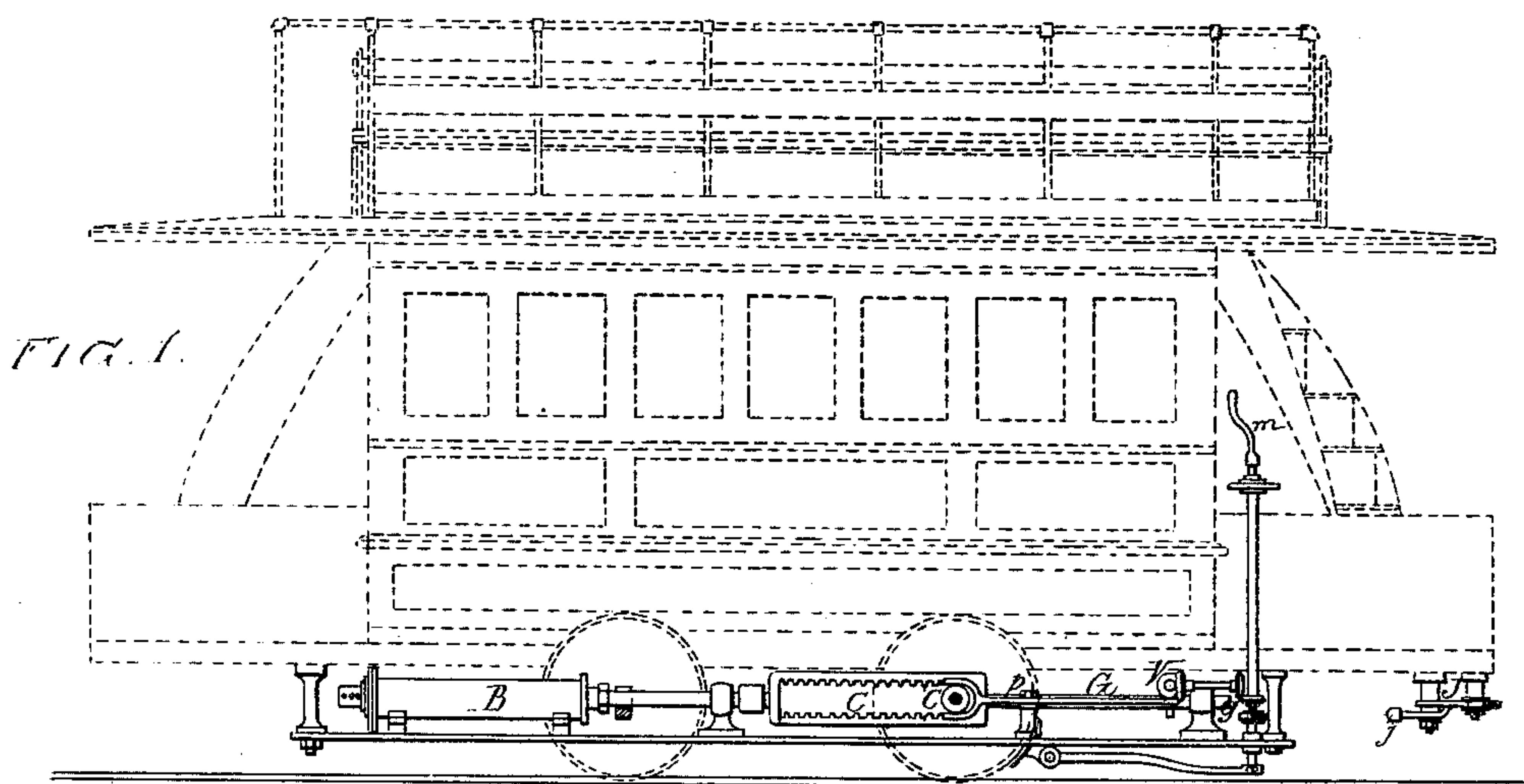


FIG. 2.

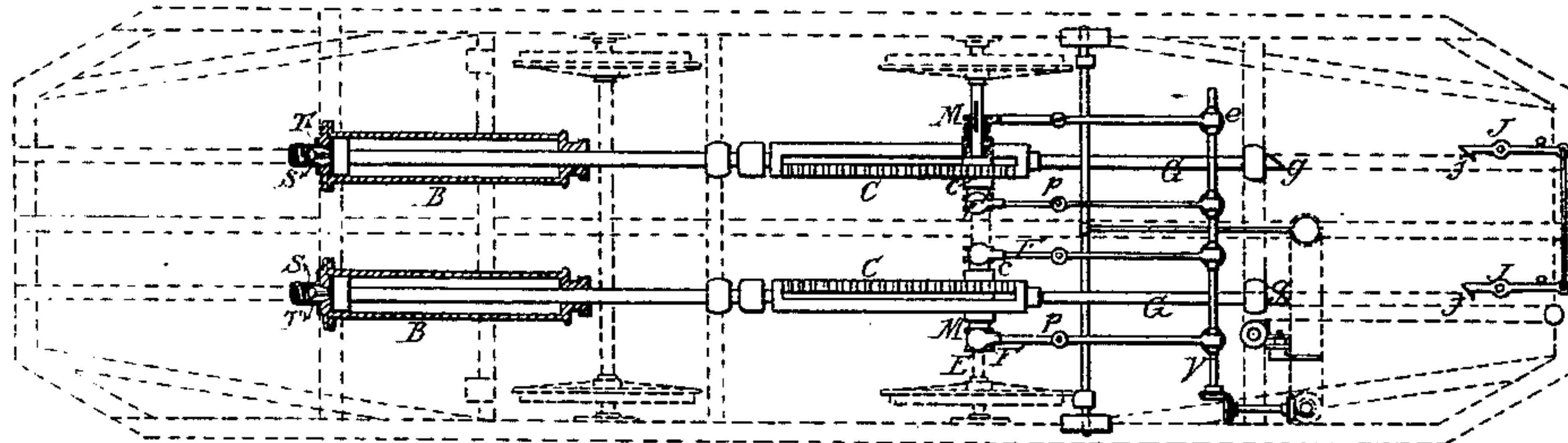


FIG. 3.

FIG. 4.

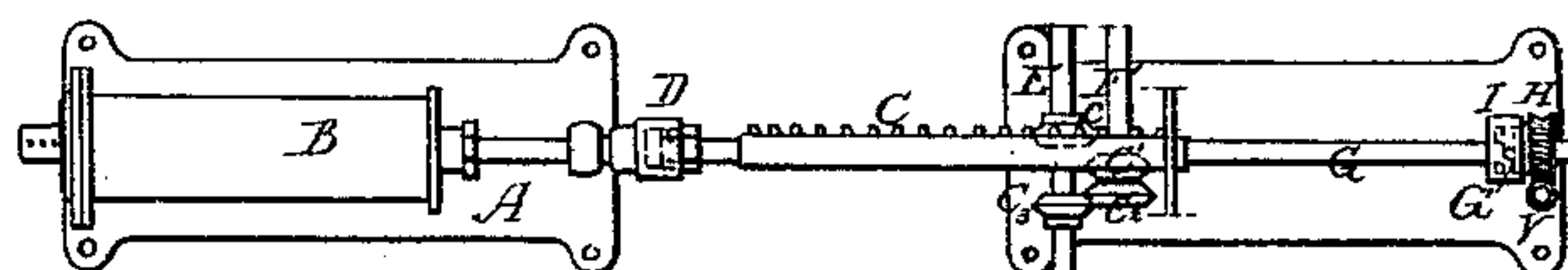
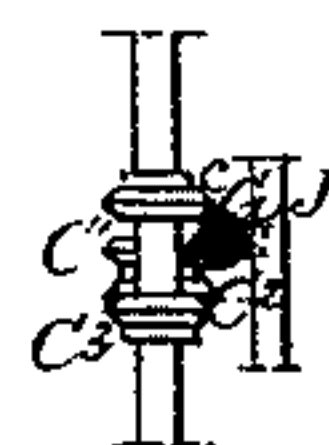


FIG. 5.



Witnesses.

Harry A. Crawford
Harry Smith

Inventor
Alexandre Lemaire-Douchy
by his attorneys
Howson and Son

UNITED STATES PATENT OFFICE.

ALEXANDRE LEMAIRE-DOUCHY, OF PARIS, FRANCE.

IMPROVEMENT IN CAR-STARTERS.

Specification forming part of Letters Patent No. **222,288**, dated December 2, 1879; application filed October 2, 1879.

To all whom it may concern:

Be it known that I, ALEXANDRE LEMAIRE-DOUCHY, of Paris, France, have invented certain Improvements in Car-Starters, of which the following is a specification.

The object of my invention is to construct a reliable and effective car-starter, which derives its power from the storing up of the motive power of the vehicle as it is being stopped, so that this power may be utilized to start the car again. This object I attain in the manner which I will now proceed to describe, reference being had to the accompanying drawings, in which—

Figure 1 is a side view of my improved car-starting devices, the car itself being indicated by dotted lines; Fig. 2, a plan view, partly in section, with the frame of the car indicated by dotted lines, and Figs. X, *x*, and *y* detached views of a modification.

The nature of my invention consists in constructing a combination of devices whereby the last revolutions of the car-wheels, as the car is being brought to stand-still, may be utilized to cause the piston of a cylinder so to move as to form a vacuum or compression in the cylinder, and by means of suitable catch mechanism to retain the piston of the cylinder in position until it is desired to start the vehicle again, when the power-transmitting mechanism is reversed and the catch mechanism released, so that the piston, under the action of the vacuum or compressed air, will return to its normal position, and in doing so cause the car-wheels to revolve and the vehicle to start on its way.

Referring to Figs. 1 and 2, B B are a pair of cylinders bolted to a frame secured to the under side of the car. The piston-rods of these cylinders are adapted to slide in guides, also secured to the frame, and are each provided with a double rack or two racks, C C, arranged on opposite sides of the front axle, F, and in different vertical planes, as shown in Fig. 2. With each of these racks gears a pinion, *e*, loose on the axle F, and in each pinion is a conical socket, into which can fit a clutch-block, M, secured on the shaft F by a feather, so that the block can slide on, but must turn with the shaft. The several clutch-blocks are under the control of forked levers F, pivoted

to the frame at *p*, and having pivoted nuts at their outer ends, which are adapted to screws *e* on the transverse shaft V. This shaft can be caused to rotate by means of the handle *m*, under the control of the driver or conductor, through the medium of bevel-gear, as shown in the drawings, so that the screws *e* on the shaft V can move the levers F, so as to throw the clutch-blocks M into gear with those pinions which control either the upper two racks or the lower two racks on the piston-rods of the cylinders B B. Secured to the outer ends of the racks on the pistons are extensions G, provided with hooks *g g*, which, when the piston-rods are moved out, engage with hooks *j* on pivoted spring-arms J. These spring-arms are connected, by a chain passing over a pulley, with the lower end of the rod controlled by the handle *m*, so that by turning this handle the spring-arms J may be so drawn back as to release the hooks *g g* on the piston-rods.

In the ends of the vacuum-cylinders B are openings closed by spring-valves S, which, when the piston reaches the end of inward motion, are acted on by a projection, T, on said pistons, so as to allow a little air to enter the cylinders and lessen the shock.

When the car is in progress the parts of the brake and starting mechanism are in the position shown in the drawings, none of the four pinions *c* being clutched to the shaft F.

When it is desired to stop the vehicle the handle *m* is so operated as to cause the levers F to force the clutch-blocks M into the two pinions *c*, which are in gear with the upper two racks, so that, as the axle continues to revolve, the piston-rods and pistons will be drawn outward until the hooks *g g* engage with the spring-catches T, by which time the car will have been brought to a stand-still, and a vacuum formed in the cylinders B B.

When it is desired to start the vehicle again the levers F are reversed, so as to cause the clutches to connect to the shaft F those two pinions which gear with the lower two racks, C C, and the catches J J are then released, so that, under the action of the vacuum in the cylinder, the pistons and piston-rods will be drawn back, and the racks caused to turn the axle, so as to start the vehicle.

Instead of working the apparatus with a

vacuum it may be operated by compressed air by a slight modification in the construction of the cylinders.

It is not necessary that two cylinders and attachments should be used. In many cases a single cylinder with piston-rod, rack, and connections will suffice.

In Fig. X I have illustrated a modification, consisting of a single cylinder and attachments. The piston-rod A of the vacuum or compressed-air cylinder B is connected by a swivel-joint, D, to a rack, C, having a prismatic extension, G, Fig. *x*, which passes through a corresponding opening in a worm-wheel, H, geared with a worm, V', under the control of the driver of the vehicle. This worm-wheel carries a socket adapted to a bearing, I, and held in place by a transverse pin, so that while the worm-wheel and shaft G must turn with each other the said shaft can slide longitudinally in the said wheel. Hence by operating the worm V' the rack C can be so turned as to gear either with a bevel-pinion, *c*, on the axle E of the vehicle or with a bevel-pinion, *c'*, on a counter-shaft, F, Fig. *y*, this latter pinion, *c'*, being geared to the axle E through the medium of the bevel-wheels or pinions *c*² *c*³.

The operation of the device will be readily understood from the preceding description.

I claim as my invention—

1. The combination of a compressed-air or vacuum cylinder having a piston-rod carrying a reversible or double rack, C, provided with a hooked extension, G, with the spring-catches J, under the control of the driver, and the car-axle carrying pinions and devices, substantially as described, for reversing the connections between the said rack or racks and pinions.

2. The combination of a compressed-air or vacuum cylinder having a piston carrying the two racks C C, in different vertical planes, with the car-axle carrying loose pinions *c c*, one gearing with each rack, and sliding clutch-blocks M and levers F, under the control of the driver, substantially as set forth.

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

ALEXANDRE LEMAIRE-DOUCHY.

Witnesses:

JOSEPH DEHAGEY,
ROBT. M. HOOPER.