

H. MOSCHCOWITZ.

Air-Brake and Car-Starters.

No. 166,026.

Patented July 27, 1875.

Fig 1.

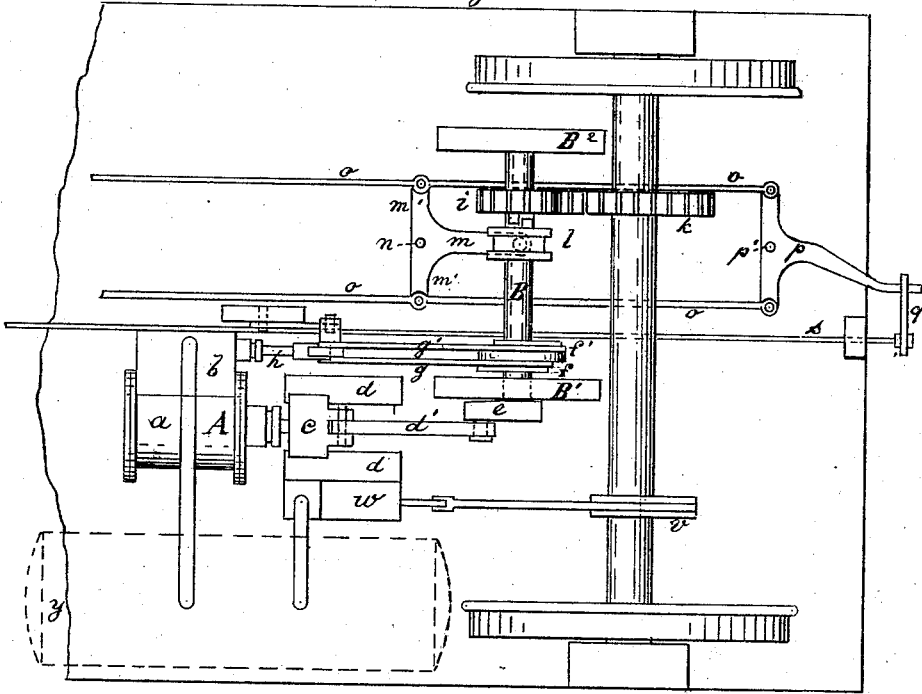


Fig 2.

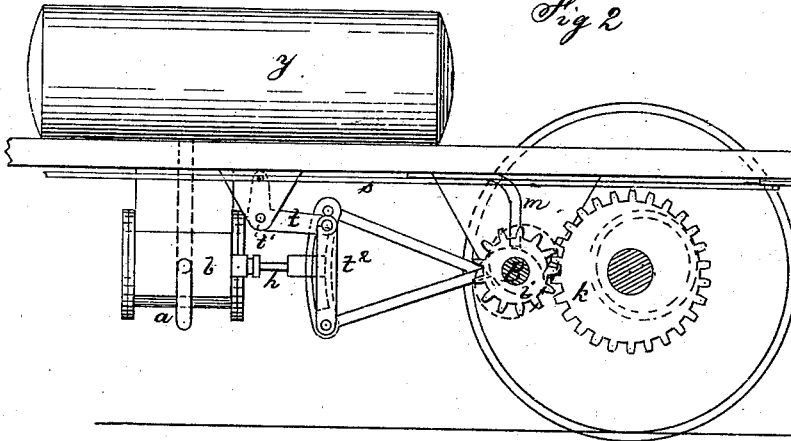


Fig 3.

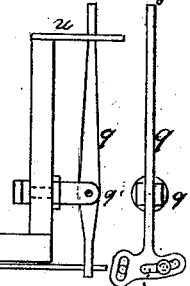
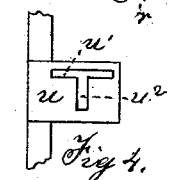


Fig 4.



Witnesses.  
A. Ruppert  
R. Mason

H. Moschcowitz  
Inventor  
D. P. Nollan & Co  
Attys

# UNITED STATES PATENT OFFICE.

HERMAN MOSCHCOWITZ, OF NEW YORK, N. Y.

## IMPROVEMENT IN AIR-BRAKES AND CAR-STARTERS.

Specification forming part of Letters Patent No. 166,026, dated July 27, 1875; application filed February 8, 1875.

To all whom it may concern:

Be it known that I, HERMAN MOSCHCOWITZ, of the city, county, and State of New York, have invented a new and useful Improvement in Car-Starters for Street-Railway Cars, of which the following is a specification:

This invention relates to that class of street-car starters in which an engine driven by compressed air is made use of to assist in starting the car and also in stopping, as well as to aid in propelling the car on up-grades and in checking the momentum on down-grades.

My improvements relate to the mechanism for operating the valve-gear by means of which the driver is enabled, by the manipulation of a single lever, to give the engine forward and back motion or shut off the air entirely, and also to throw an auxiliary shaft into or out of gear with the axle.

In the annexed drawing, making a part of this specification, Figure 1 is a bottom view, and Fig. 2 is a sectional elevation, of the car and machinery. Fig. 3 is an elevation of the lever. Fig. 4 is a plan, showing a slotted plate through which the upper end of the lever passes.

The same letters are employed in both the figures in the designation of identical parts.

The force of compressed air carried in a receiver, which may be conveniently placed in the car under the seat, is employed for acting on the wheels through the medium of a cylinder, A, the piston-rod of which turns a crank, c, on an auxiliary shaft, B. A loose pinion, i, runs on the shaft B and engages with a spur-wheel, k, on the car-axle. The clutch l, sliding on the shaft, with feather and spline, is used to throw the shaft B into or out of connection with the axle. This movement is effected by means of the bell-crank lever m, which has three arms, one engaging the groove in the clutch, and the others, m' m', being pivoted to two parallel rods, a a. The lever m swings on a pivot at n. The ends of the sliding rods a a are connected at both ends of the car with the arms of similar bell-crank levers p, pivoted at p' and having their elongated third arm passing through a slot in the hand-levers q attached to the platforms, and in convenient reach of the driver. The fulcrum of the lever q is on the swiveling-standard q',

which, turning on its own axis, permits the lever to be swung sidewise to shift the lever p and clutch, and also permits the lever to be swung forward and back in the line of the length of the car for the purpose of shifting the eccentrics f f', and, through the link-motion g g' t t' t'', opening the valve to give forward or back motion to the engine. The lever q has in its lower end an elongated slot, r, to receive the end of the rod s, which passes under the floor of the car and is attached to the end of a bell-crank lever, t, pivoted at t', the other arm of which throws up or down the link t'', the curvature of whose bars shifts the valve so as to open either end of the cylinder to give forward or back motion, or, when placed midway, shuts off the air from both ends. This valve-motion is well known, and need not be particularly described. Whatever of novelty there is in this part of the mechanism is found only in the combinations for operating the valve. The valve is actuated by the eccentrics f f' on the shaft B. Another eccentric on the axle, shown at v, operates an air-pump, w, and pumps the air into the receiver. A safety-valve should be placed on the receiver to regulate the pressure; and the air-pump may be allowed to work constantly, or it may be made so as to be thrown into and out of gear by the driver. The driving-engine, however, only operates while the clutch is engaged with the pinion. A plate, u, is fastened in such position as to receive the long arm of the lever q, which passes through the T-formed slot w' w''. This slot permits the lever to have its three motions—forward to give forward motion to the car, and back to give backward motion or resistance, or sidewise to throw the clutch into or out of gear. This movement, it will be observed, is made when the valve is in its central position, so that the forward or backward action can only be given when the clutch is engaged, and the movement of the lever, which shuts off the air and closes the valve, necessarily precedes the throwing out of gear of the clutch. Thus all the movements required to be made can be accomplished by a single lever, and at the same time the driver cannot make a mistake by applying the air to the engine when the clutch is disengaged, or throwing out the clutch while the air is on, as

would be the case if these operations were regulated by independent levers.

It is in this mode of applying a single lever that my invention is distinguished from others.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In combination with the clutch for throwing the auxiliary shaft into or out of gear with the car-axle, the lever *m*, rods *a*, and levers *p* and *q*, operating substantially as set forth.

2. The lever *q*, rod *s*, bell-crank lever *t*, and link-motion and valve for giving the three positions of the valve, and starting, stopping, and reversing by one lever, substantially as set forth.

3. In combination with the clutch and valve-gear, the lever *q*, having a longitudinal and

transverse movement for stopping and starting and reversing and actuating the clutch, substantially as set forth.

4. The lever *q*, having independent slots in its short arm for receiving and independently actuating the arm of the lever *p* and the rod *s*, substantially as set forth.

5. In combination with the lever and swiveling-fulcrum *q'*, the plate *u*, slotted as described.

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

HERMAN MOSCHCOWITZ.

Witnesses:

R. MASON,

A. RUPPERT.