C. H. THOMPSON.

CAR-STARTER AND MOTOR.

No. 193,356. Patented July 24, 1877.

Fig. 1.

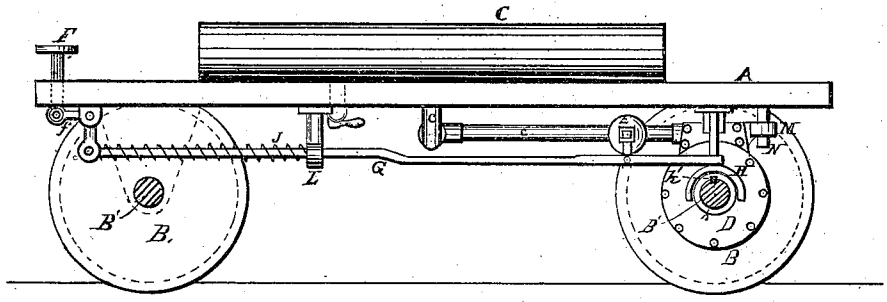
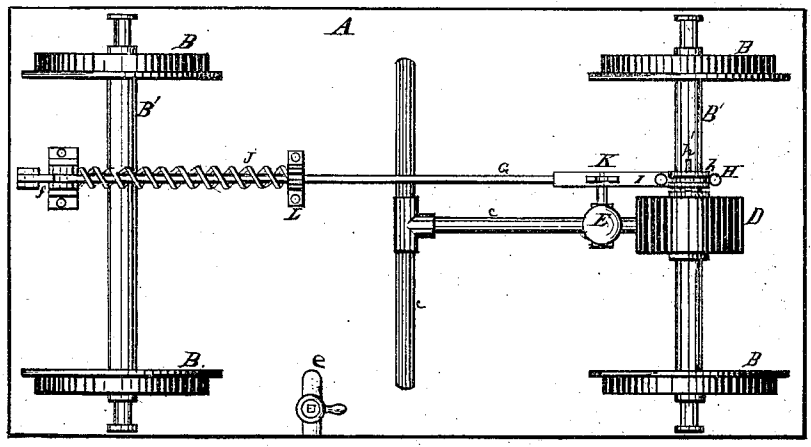


Fig. 2.



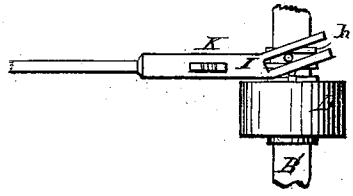


Fig. 3.

Witnesses:

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UNITED STATES PATENT OFFICE.

CHARLES H. THOMPSON, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF HIS RIGHT TO THOMAS O'NEILL AND IRA JENREE, OF SAME PLACE.

IMPROVEMENT IN CAR STARTERS AND MOTORS.

Specification forming part of Letters Patent No. **193,356**, dated July 24, 1877; application filed January 20, 1877.

To all whom it may concern:

Be it known that I, CHARLES H. THOMPSON, of New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Car-Starters and Car-Motors; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the arts to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

The object of my invention is to provide a simple and efficient means of starting horse-cars by the use of a rotary engine operated by compressed air or steam, so that the horses may be relieved from the strain now imposed upon them in overcoming the inertia of a heavily-loaded car, and also to aid the horses on up-grades, so that the necessity of having an extra horse or team for that purpose may be avoided; and in climates where the roads are not liable to obstruction by ice or snow, I design using it as a motor, dispensing with the use of horses.

My invention consists in attaching a rotary engine to the axle of the car in such a manner that the car-axle becomes the axis of the engine, and in such manner that when the engine is set in motion it rotates the car-axle, and thus propels the car, and that when the car is in motion and being drawn by the horses the engine may remain motionless.

To accomplish this, I secure the cylinder of the engine to the body of the car by sliding brackets engaging with suitable lugs on the cylinder in such manner as to firmly secure the cylinder, and also allow for the up-and-down motion of the car-body as the springs upon which it rests are depressed or extended. Within this cylinder is the rotating piston, fitting loosely on the axle of the car, and is provided with a hub on one side, which projects through the side of the cylinder, and forms a clutch, the engaging piece being also loosely attached to the axle, but secured from turning by a feather or fixed key, which is solid on the axle, and fits a notch in the engaging-clutch, which slides longitudinally upon the axle and fixed key, being moved by a yoke.

In the drawings, Figure 1 is a longitudinal vertical section, showing the general arrangement, in which A is the body of the car; B, the wheels; B′, the axle; C, the air-reservoir or steam-boiler; D, the rotary engine; H, the yoke for moving the clutch; *h*, the movable clutch; *h′*, the feather or fixed key for securing the clutch to the axle; M, the lug on the cylinder for securing it in position; N, the bracket which engages with the lug M, and is bolted to the bottom of the car; *c*, the pipe which conducts the air or steam to the engine; E, valve for controlling the air or steam; G, rod which operates valve E, and also the clutch *h*; L, bracket which supports rod G; J, a coil-spring which draws the rod back, closing valve E, and disengaging the clutch *h*; *f*, bell-crank lever for operating rod G; F, a foot-piece connected with the crank-lever *f*. *e* is a pipe and valve for admitting the air when charging the reservoir.

Fig. 2 is a bottom plan view, showing all the above parts, and, at K, the means of operating valve E.

Fig. 3 is a top view of the engine D, showing means of operating the clutch *h* by means of the beveled slot I in the end of rod G.

When used as a motor, the clutch *h*, yoke H, and beveled slot I are dispensed with, the engine-piston being rigidly attached to the axle in that case.

In cases where the cars are driven either end forward, the engine is provided with means for reversing the motion, so that it may propel the car in either direction, while in those cases where the car always goes one way it would be made to operate only in one direction for purpose of economy.

The operation of my invention is as follows: A suitable reservoir or boiler, in which compressed air or steam is stored, is located in any desired place on the car, and connected to the engine by pipes, with a flexible connection between the body of the car and the engine, to allow for the motion of the springs. Now, by pressing down the foot-lever F, the clutch *h* is thrown into gear, and by the same motion valve E is opened, admitting the power

into the rotary engine, causing it to revolve, and, it being engaged with clutch *h*, which is secured by the fixed key *h'*, rotates the axle, to which wheels B are rigidly attached, thus propelling the car. When as much distance as is desired has been traveled, the foot is removed from the foot-piece F, and spring J returns rod G, closing valve E, and disengaging clutch *h*.

In cases where the car is driven either end forward, a foot-lever, F, would be located at each end of the car, both connecting with and operating rod G, and a suitable hand-lever would be used for reversing the engine.

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

1. The combination of a rotary engine with the axle of a car, the engine being secured directly thereto, in the manner specified, so that it may be engaged or disengaged at will, as shown, and for the purpose set forth.

2. The combination of axle B′, rotary engine D, clutch *h*, key *h'*, and operating-yoke H, substantially as arranged and described.

3. The combination of foot-lever F, bell-crank lever *f*, rod G, spring J, valve-connection K, slot I, yoke H, clutch *h*, fixed key *h'*, axle B′, and rotary engine D, substantially as described, and for the purpose set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

CHARLES H. THOMPSON.

Witnesses:
THOMAS C. CONNOLLY,
A. E. BEECHER.