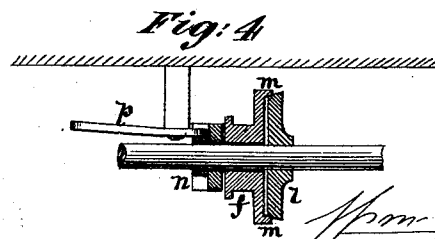
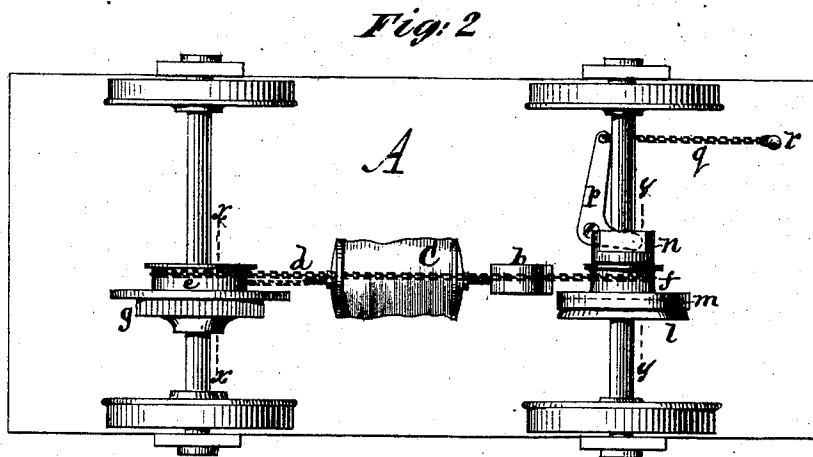
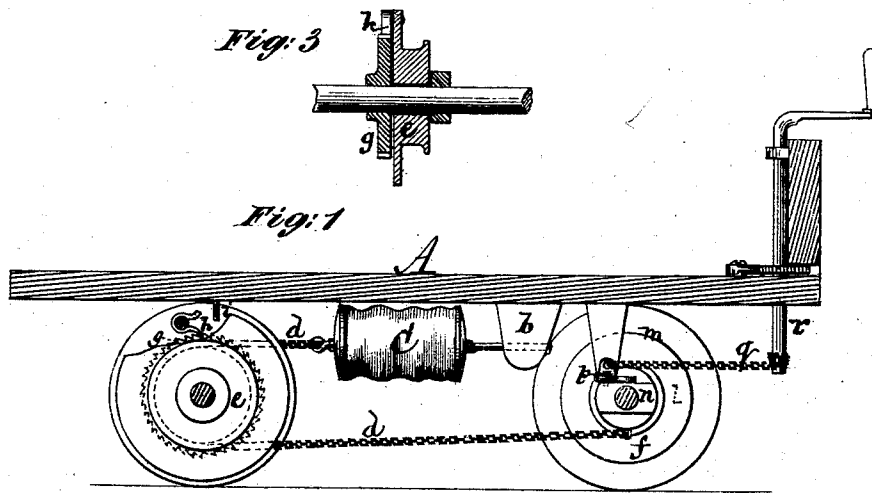


W. R. LANDFEAR.  
Car-Starters.

No. 155,958.

Patented Oct. 13, 1874.



Witnesses:

Michael Ryan  
Fred. Haynes

Wm. R. Landfear  
by his Attorneys  
Brown & Allen

# UNITED STATES PATENT OFFICE.

WILLIAM R. LANDFEAR, OF HARTFORD, CONNECTICUT.

## IMPROVEMENT IN CAR-STARTERS.

Specification forming part of Letters Patent No. **155,958**, dated October 13, 1874; application filed January 23, 1874.

*To all whom it may concern:*

Be it known that I, WILLIAM R. LANDFEAR, of Hartford, in the county of Hartford and State of Connecticut, have invented an Improved Car-Starter, of which the following is a specification:

My invention relates to certain improvements whereby the pressure of the atmosphere is made to operate on the mechanism for starting the car.

The invention consists in a compressible vacuum-chamber connected with the brake mechanism in such a manner that, when the handle is turned to put on the brake, the vacuum-chamber expands, and a pawl is thrown into engagement with a ratchet on one of the axles, and when the brake is taken off the atmospheric pressure on one or both ends of the vacuum-chamber causes it to collapse, and, being connected by a chain with the pawl and ratchet, to turn the axle and start the car.

In the accompanying drawing, Figure 1 is a longitudinal vertical section of a car with my improvements attached. Fig. 2 is a bottom view of the same. Fig. 3 is a section taken in the line *xx* of Fig. 2. Fig. 4 is a section taken in the line *yy* of Fig. 2.

A represents the floor of the car, on the under side of which is a block, *b*, extending downward. C is the vacuum-chamber, which is formed with two heads, connected by flexible air-tight material, such as india-rubber or oiled cloth. The ends may be circular or angular, so as to form a cylindrical or polygonal chamber, as may be preferred. The material which forms the sides of the chamber may be made to fold regularly like a bellows; or it may be soft and flexible enough to allow it to readily lie in between the heads when they are pressed toward each other. One end of the chamber C is attached to the block *b*, so as to hold it stationary. To the other end is attached one end of a chain, *d*, which passes around a pulley, *e*, on the rear axle, and is attached to a drum, *f*, on the front axle. The pulley *e* and drum *f* work loosely on the respective axles, so that the axles may revolve independently of them. On the rear axle, close beside the pulley *e*, is a ratchet-wheel, *g*, keyed to the axle, so as to revolve with it. On the side of the pulley *e*, immediately over the

face of the ratchet-wheel, is a pawl, *h*, which may act by its own weight, or may be provided with a spring for throwing it into engagement with the ratchet. At a point immediately over the rear axle is a stud or protection, *i*, extending downward from the under side of the platform, and serving to throw the pawl *h* out of engagement with the ratchet. (See Fig. 1, where the pulley is represented as partly broken away.) On the front axle, close beside the drum *f*, is keyed a disk, *l*, the face of which is tapering toward and engages with a flange, *m*, on a disk, which is attached to or made in one piece with the drum *f*, thus forming a friction-clutch. Close beside the disk *l*, on the front axle, is a collar, *n*, sliding freely on the axle, and engaging with the short arm of an elbow-lever, *p*, which is pivoted to a block on the under side of the floor, and has its long arm connected, by a chain, *q*, with the lower end of the brake-rod *r*, with which the brake mechanism is connected in the usual or any suitable manner.

The air having been exhausted from the chamber C, it is compressed and placed in position with the other parts, as described. When the handle is turned to apply the brakes the chain *q* is wound around the rods *r*, pulling on the long arm of the lever *p*, and causing its short arm to press the collar *n* against the drum *f*, and force said drum against the disk *l* until the face of the latter engages with the flange *m*, and causes the drum to revolve and wind the chain *d* around it. This causes the pulley *e* to revolve, expanding the vacuum-chamber C and releasing the pawl *h* from the stud *i*, so as to allow it to engage with the ratchet *g*, as shown in Fig. 1. When the handle is released the atmospheric pressure upon the ends of the chamber C causes it to collapse, reversing the motion of the pulley *e*, and, by the engagement of the pawl and ratchet, causing the rear axle and wheels to revolve in a forward direction and to start the car. When the pawl *h* reaches the stud *i* in its forward motion it is thrown out of engagement with the ratchet *g*, so as to allow the axle to revolve independently of the ratchet.

This invention may be readily arranged to operate in both directions, either by duplicating the parts or by a suitable arrangement of

chains and pulleys with relation to the vacuum-chamber. Instead of being compressible or collapsible, the vacuum-chamber may consist of a cylinder with a piston working therein, said piston being connected with the starting mechanism.

I am aware that a car has been provided with a collapsible chamber for operating mechanism to start the car; but such itself I do not claim.

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

The combination of the chamber C, chain *d*, pulley *e*, pawl *h*, ratchet *g*, and drum *f*, constructed to operate substantially as shown and described.

WILLIAM R. LANDFEAR.

Witnesses:

MICHAEL RYAN,  
FRED. HAYNES.