

J. L. COLE.
Car Brake and Starter.
No. 223,885. Patented Jan. 27, 1880.

Fig. 1

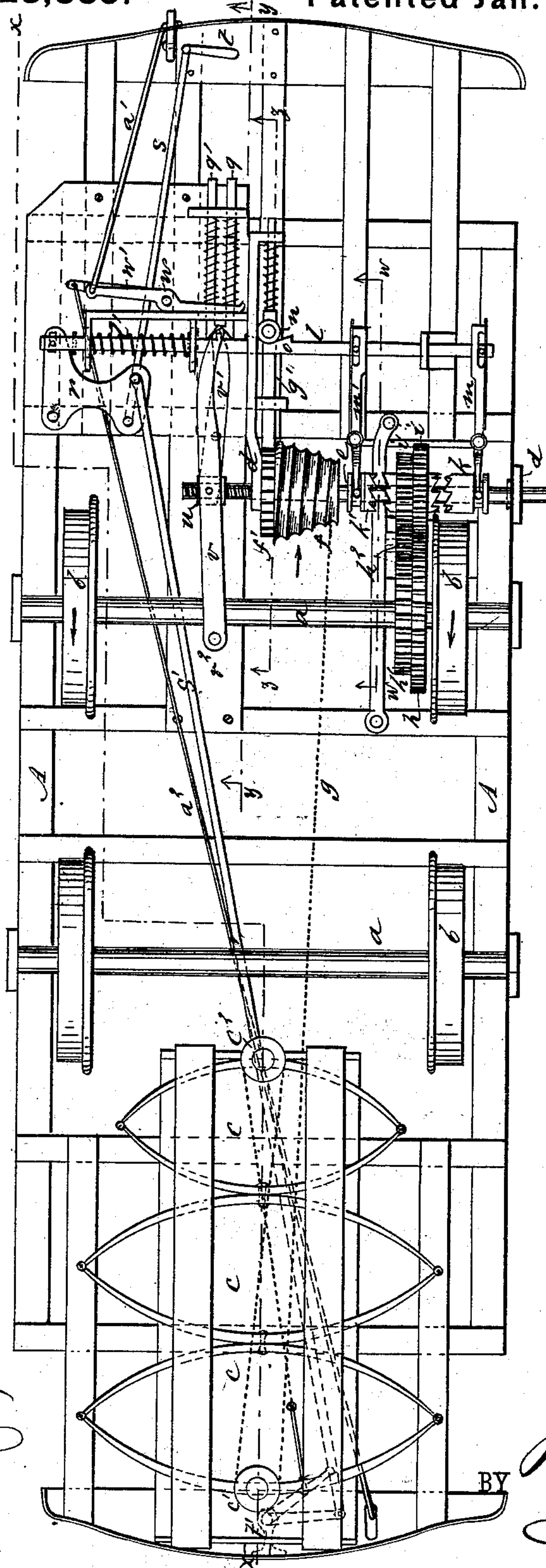


Fig. 6



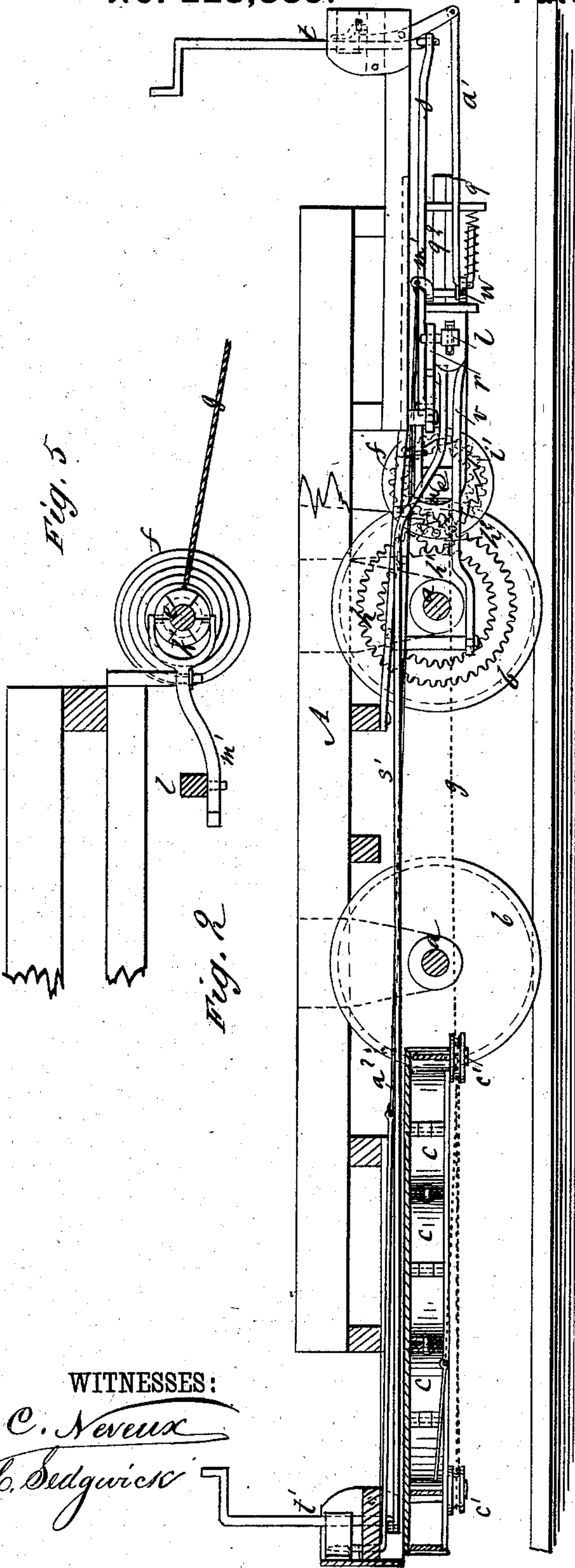
WITNESSES:

C. Neveux
C. Sedgwick

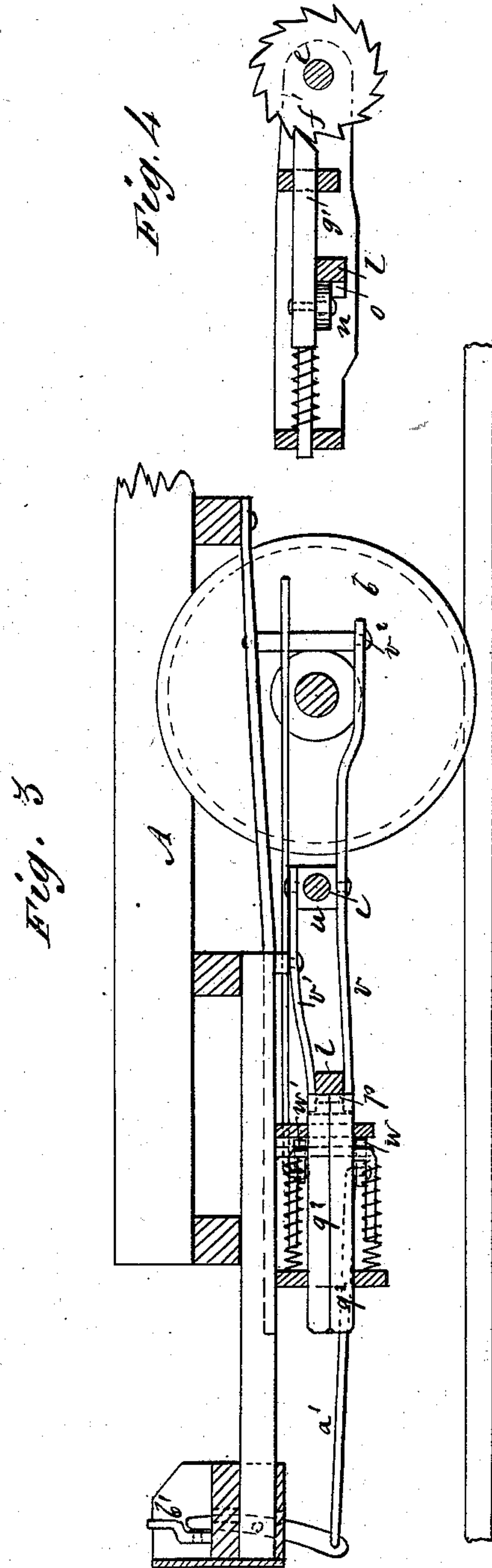
INVENTOR:

J. L. Cole
Munn & Co.
ATTORNEYS.

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UNITED STATES PATENT OFFICE.

JOHN L. COLE, OF WILLIAMSTOWN, MASSACHUSETTS.

CAR BRAKE AND STARTER.

SPECIFICATION forming part of Letters Patent No. 223,885, dated January 27, 1880.

Application filed June 19, 1879.

To all whom it may concern :

Be it known that I, JOHN LEONARD COLE, of Williamstown, in the county of Berkshire and State of Massachusetts, have invented a new and Improved Car Brake and Starter, of which the following is a specification.

My improvements relate to apparatus for checking the momentum of railroad-cars and storing power to be subsequently used in starting or impelling the car, which apparatus consists, generally, of springs, a cord or chain, a conical spirally-grooved winding-drum, and gearing and clutches for connecting the drum with the car wheels or axle, whereby the cord is wound on the drum, the springs compressed and held for use in propelling the car by their expansion.

My invention consists in certain novel features of construction and combination of mechanism whereby the propulsion of the car in the proper direction by the springs is obtained and the compression of the springs by the momentum of the car is arrested at a definite point, which mechanism is both simple and durable.

The construction and operation will be described in connection with the accompanying drawings, and the invention pointed out in the claims.

In the drawings, Figure 1 is an inverted plan view of a car fitted with my improved mechanism. Fig. 2 is a vertical longitudinal section on line *x x* of Fig. 1. Fig. 3 is a similar section of one end of the car on the line *y y* of Fig. 1. Fig. 4 is a partial section on line *z z* of Fig. 1. Fig. 5 is a partial section on line *w w* of Fig. 1. Fig. 6 is a detail view.

Similar letters of reference indicate corresponding parts.

A is the frame of a horse-car, mounted on axles *a* and wheels *b*. Beneath one end of the car are fitted steel springs *c*, sustained by a suitable frame. These springs are shown as of an elliptic form, but may be spiral or in other form. At the opposite end of the car, in hangers *d*, a cross-shaft, *e*, is fitted, upon which is attached a conical spirally-grooved drum, *f*, from which passes a rope or chain, *g*, that is connected with the moving end of the springs *c*; and, to obtain greater power in compressing the springs, the rope or chain

passes around a roller, *c'*, on the moving end of the springs, thence around a fixed roller, *c''*, and back to the moving end of the spring, to which it is connected. Upon one end of the drum *f* is a ratchet-wheel, *f'*, that is engaged by a sliding spring-pawl, *g'*.

The shaft *e* is fitted contiguous to one of the axles *a*, and to the axle *a* or wheel *b* gear-wheels *h h'* are attached, so as to turn together and with the wheel, which gear-wheels mesh with the gears *i i'*, respectively, that are loose on shaft *e*, and independent of each other. The gear *h* meshes directly with *i*, while *h'* turns *i'* by a small intermediate, whereby *i* and *i'* are rotated in contrary directions.

The gears *h h'* are shown as attached to the wheel *b*, which will be the construction when the car-wheels turn on their axles; but they may be attached to the axle when the axle rotates.

The shaft *e* carries sliding clutches *k k'*, by which the gears *i i'* are connected at-will with the shaft to wind the chain *g* on the drum or to turn the wheel *b* by the recoil of the springs. The mechanism whereby this is accomplished is operated from either end of the car, and I will first describe the mechanism as operated from one end, without reference to the duplicate parts.

A cross-bar, *l*, fitted to slide in suitable supports, is connected, by forked levers *m m'*, with the clutches *k k'*, and by a spiral or rubber spring, *l'*, is moved to a position where neither clutch is operative. The pawl *g'*, before mentioned, is fitted for movement to and from the ratchet-wheel *f'*, at right angles to the bar *l*, and carries on a stud a friction-roller, *n*, which engages a double-inclined projection, *o*, on the bar *l*, (see Fig. 6,) whereby the movement of bar *l* in either direction from the intermediate point disengages the pawl from the ratchet.

Upon one side of bar *l* is a square lug or projection, *p*. (See Fig. 6.) *q q'* are sliding spring-fingers, fitted for engagement with the projection *p*, whereby the bar *l* is held in one direction by pawl *q* and in the other direction by *q'*. At one end of the bar *l*, upon frame A, a crank-lever, *r*, is hung, one end of which is slotted to receive a pin that projects from *l*, and to the other end of lever *r* is connected a rod, *s*, that passes to the end of the car, where

it is connected to a crank-arm on a brake-shaft, t , which has a handle, whereby it is operated.

Upon the inner projecting end of shaft e a screw-thread is formed, to receive a nut, u , which is connected to a lever, v , that is fulcrumed at v^2 . The moving end of lever v is rounded or beveled, and projects between the beveled ends of the spring-fingers q q' , so that by the movement of the lever v , caused by the rotation of shaft e , and consequent movement of nut u , the fingers q q' are forced back and disengaged from bar l —that is to say, the movement of lever v is in the right direction for disengaging the finger, q or q' , which is in use.

These parts operate as follows: The car moving in the direction of the arrow, Fig. 1, when it is desired to stop, the brake-shaft t is turned by its handle to move the bar l and engage the clutch k with the gear-wheel i , thereby winding the cord on the drum and compressing the springs c . The projection p is at the same time caught by the spring-finger q , the pawl g' forced back by the inclined projection o , and these parts thereby retained in this position until, by the movement of nut u , the lever v disconnects the finger q , when the parts are returned to the normal position by spring v' , the springs c being retained compressed by the pawl g' of the ratchet-wheel f' . The cord is attached to the smaller end of the drum f , so that the compression of the springs increases gradually, and the car is not checked suddenly, and on release of the springs the greatest power is applied first.

To start the car the brake-shaft t is to be turned in the direction opposite to the first movement, which engages the clutch k' with the gear i' , and at the same time releases the pawl g' , so that the springs are released and their power is exerted to drive the car forward.

The end of lever v is always in such position that if the brake-shaft is turned in the wrong direction in stopping or starting, the catches q q' are prevented from catching and the bar l returns to its normal position.

To stop the car when going in the other direction, the bar l has first to be moved in a contrary direction to cause the winding of the cord on the drum f by means of the clutch k' , and then the starting of the car by engagement of clutch k . The following additional and duplicate parts are made use of for that purpose: q^2 q^3 are spring-fingers, fitted contiguous to q and q' , for engagement with the

projection p . v' is a lever connected to the nut u , and operating in the same manner as lever v for disengaging the catches q^2 q^3 , but fitted so that its moving end travels in a contrary direction to v . s' is a rod from crank-lever r to a brake-shaft, t' , at the end of the car opposite to t . w is a lever hung on the car-frame, one end of which lever takes upon lugs or projections on fingers q q' , and to the other end is connected a rod, a' , that passes to the car-platform adjacent to brake-shaft t . w' is a second lever, connected with fingers q^2 q^3 , and from which a rod, a^2 , passes to the car-platform at the other end, contiguous to the brake-shaft t^2 . These levers w w' are for forcing back the pawls, q q' or q^2 q^3 , not in use, which will be done by pressing back the rod, a' or a^2 , at the rear platform and catching it by a hook, b' . The rods a' a^2 are fitted at the platform for operation by the driver's foot. The rod a' or a^2 , that goes to the front platform, may also be used to release the bar l before the cord is fully wound or the car fully stopped.

The apparatus described is to be used with or without brakes of ordinary character, and it may be put in operation, when the car is on a descending grade, to store power for aiding the propulsion on an ascending grade. It may also be applied to steam-railroad cars.

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

1. In car brakes and starters, the combination, with the car-axle a and wheel provided with the fixed gearing h h' , of the drum-shaft e , winding-drum f , ratchet f' , gears h^2 i i' , clutches k k' , levers m m' , sliding bar l , having projection o , and pawl g' , fitted with a stud or roller, n , substantially as described and shown, and for the purposes set forth.

2. In car brakes and starters, the spring-fingers q or q' , the sliding clutch-operating bar l , having the lug or projection p , the lever v , the nut u , and drum-shaft e , combined substantially as described and shown, for holding the clutches and automatically releasing them.

3. In car brakes and starters, the combination, with the sliding clutch-operating bar l and its retaining spring-finger q or q' , of the lever w and rod a' , for releasing the fingers by hand, substantially as and for the purposes set forth.

JOHN LEONARD COLE.

Witnesses:

ANDREW WOLLESEN,
FERRY H. COLE.