

CHARLES P. LEAVITT.
Improved Car Starter.

No. 121,635.

Patented Dec. 5, 1871.

Fig. 1.

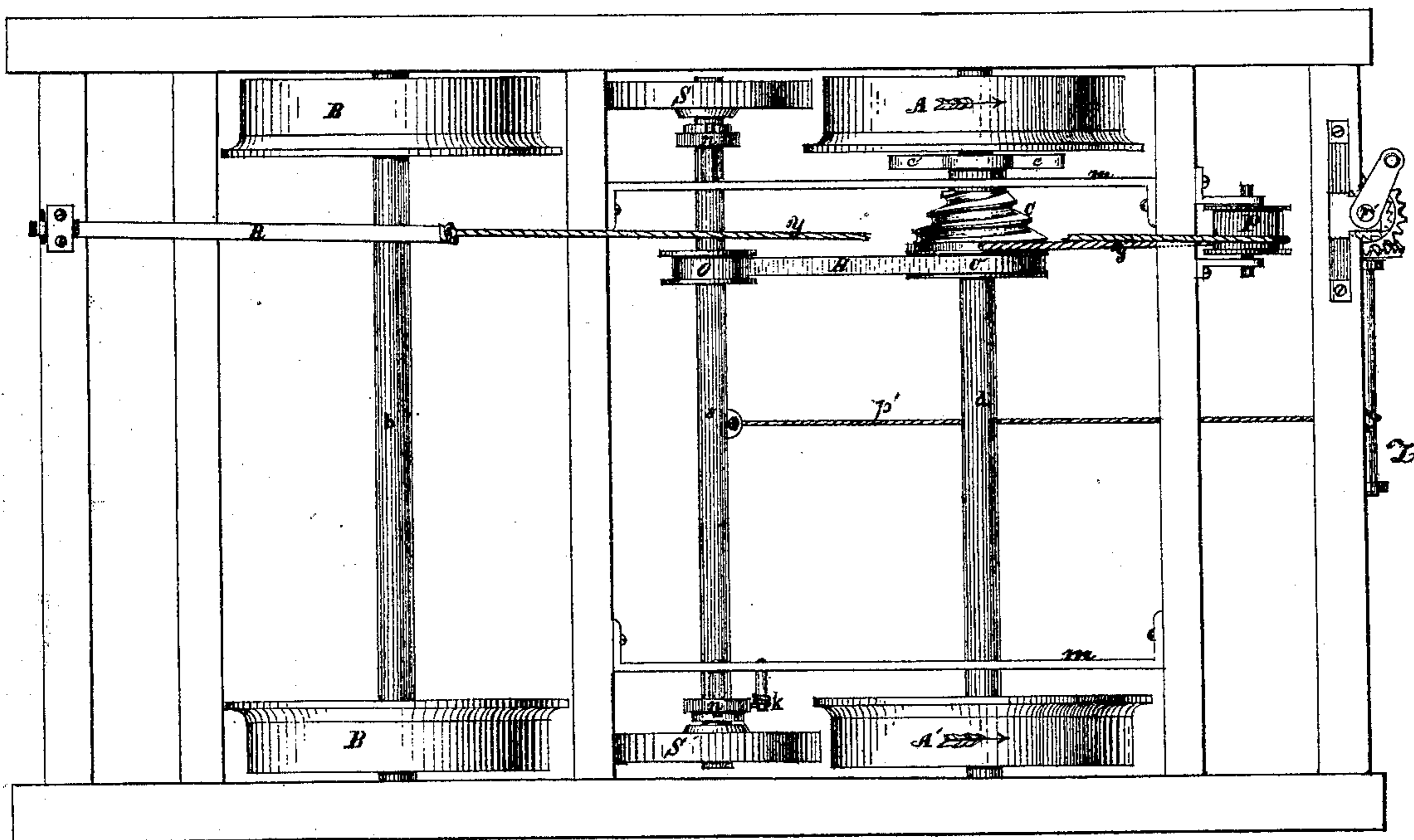
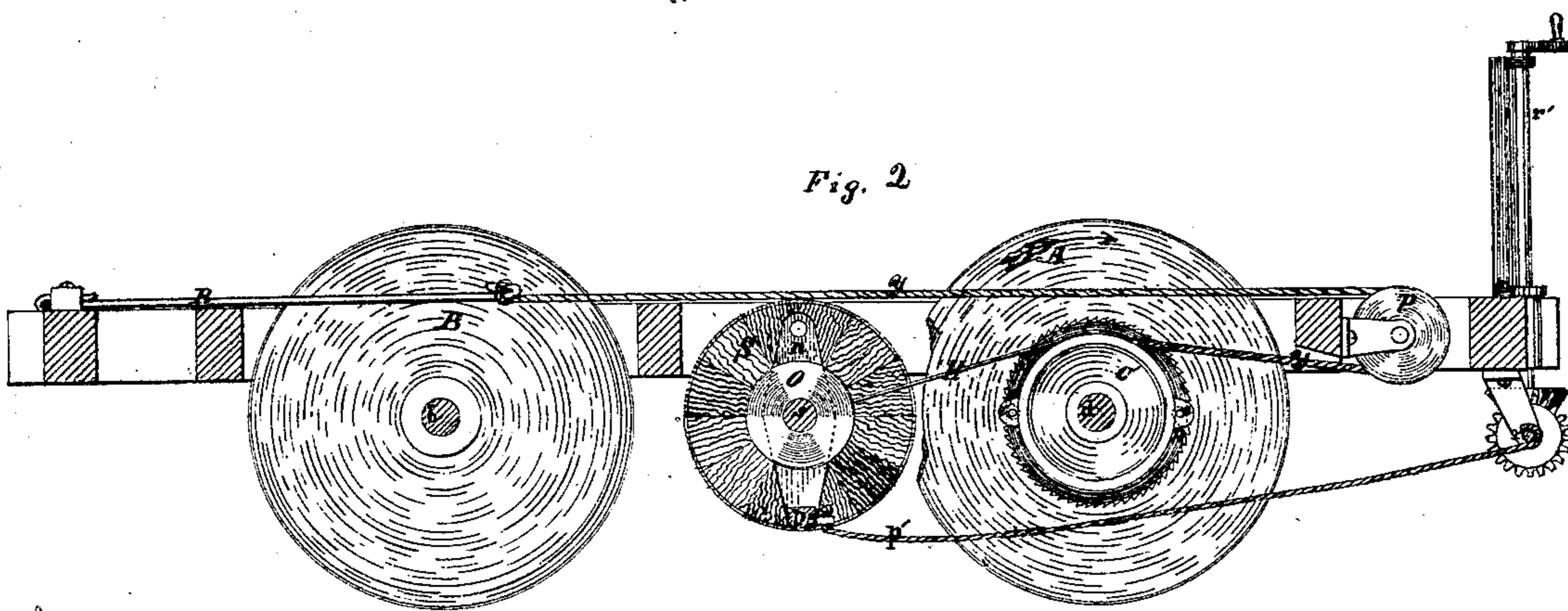


Fig. 2.



Witnesses

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CHARLES P. LEAVITT, OF NEW YORK, N. Y.

IMPROVEMENT IN CAR-STARTERS.

Specification forming part of Letters Patent No. 121,635, dated December 5, 1871; antedated November 25, 1871.

To all whom it may concern:

Be it known that I, CHARLES P. LEAVITT, of New York, and the county and State of New York, have invented a new and useful Improvement for Starting Cars; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawing and to the letters of reference marked thereon forming a part of this specification.

The nature of my invention can be best understood by reference to the following description:

Figure 1 is a plan of the starter as applied to a common street-car. The cord Y is broken away for a short distance so as not to confuse the drawing. Fig. 2 is a vertical longitudinal section on the line X Z, in Fig. 1. In this figure the fixed brace *m* is removed.

A A' and B B are four wheels of the car fast on their axles *d b* in the ordinary manner. The wheel A has cast within it an inside ratchet, acted on by the pawls O O', which are carried by the revolving arms *c c'*. Immediately adjoining these arms is the spiral windlass or fusee C and the drum C'. The arms *c* and *c'*, the fusee C, and the drum C' are all cast in one piece and turn together loosely upon the axle *d*. S S are two friction-wheels, made of wood with end grain out, or of metal. They are firmly secured to the shaft *s*. This shaft is suspended so as to turn freely in the lower bearings of the swinging arms *n n*, which in their turn are suspended from the stationary cross-braces *m m*, as shown. These arms are acted on by a spring, *k*, that tends to swing the friction-wheels away from the car-wheels A A'. The swinging arms *n n* are firmly connected at their lower ends by the cross-piece *p*, from the center of which the cord or chain *p'* leads to the horizontal rod *r* in the front of the car, where it is geared by miter-wheels to the upright rod *r'*. This rod is fitted with a crank-handle, and by turning this the cord *p'* is wound on the rod *r*, and by its action on the cross-piece *p* overcomes the resistance of the spring *k* and presses the friction-rollers firmly against the car-wheels. The shaft *s* has the small drum O firmly keyed upon it. The strap H has one end firmly attached to the drum O and the other to the drum C'. It is long enough to be wound three or four times around the larger drum. R is a strong spring made of rubber, capable of receiving a large extension. The rubber is fastened to

the car-frame at one end, and at the other is attached firmly to the long cord Y, which is carried over the direction-drum P and then to the fusee C, where it is firmly secured at the beginning of the spiral groove at the highest part of the cone, as shown. When the car is in motion in the direction of the arrows the attachments are all in the position shown in the drawing, the friction-wheels clear of the car-wheel and the fusee stationary, with the ratchet running ahead of the pawls. The length of the strap H is so made that at this point, where it is unwound from the drum O, the cord Y is not quite unwound from the fusee, so that the spring has tension enough to keep the cord from sagging. If, now, while the car is in motion, it be desired to stop it the brake-handle is to be turned so as to wind the cord *p'* on *r* and press the wheels S S firmly against the wheels A A'. The friction between the wheels will at once cause the wheels S to turn and wind up the strap H on the small drum O, and, of course, unwinding it from the large drum C', which, together with the fusee and pawl-arms, turn in an opposite direction to the wheels A A'. Simultaneous with the unwinding of the strap from the drum C' the cord Y is wound on the fusee C, thereby extending the spring R. Since the cord Y, in following the course of the groove in the fusee, travels nearer the center of the axle the friction-wheels have a continually-increasing leverage upon the spring, a provision rendered necessary by the fact that the spring offers a continually-increasing resistance as it is extended. By the time the spring is extended as much as it will bear the strap H is unwound from the drum C' to where it is secured at the end to that drum; hence no further extension of the spring can take place; and if the car continues to advance the wheels A A' must either slip upon the track or upon the friction-wheels S S. If, now, the brake be released the spring *k* at once throws the wheels S S out of contact with the wheels A A', when the whole force of the spring R is exerted on the fusee to turn it ahead; but the pawls O O', catching at once in the ratchet within the car-wheel, compel that wheel to turn in that direction with the fusee, and thus the force of the spring is exerted to start the car ahead. While the cord Y is being unwound from the fusee the strap H is rewound on the drum C', being at the same time unwound from the drum O, thus turning the

wheels S S as many times ahead as they were turned back by the wheels A A'. After the spring has thus exerted its force the apparatus is in the position shown in the drawing, ready for the next operation. In this starter the power of the spring may be concentrated to start the car in less space than it stopped in by simply varying the proportion of the parts C C' and O. A steel or other spring may be used in place of rubber, and in a spring of short range I multiply its motion by passing the cord Y into a set of blocks of several pulleys, and while one block is held fast on the frame the spring acts on the other block to separate them. I also can use a common chain-belt between the drums O and C' in place of the strap H; and, lastly, I can dispense altogether with the friction-wheels S S and shaft s, and place the drum O loosely on the shaft b by simply adding to the length of the strap H

and then by means of a friction or other clutch throw the drum O into gear with the shaft b when I wish to stop the car, and out of gear when I wish to start it. The form here shown I, however, conceive to be the best.

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

1. The fusee C, in combination with the car-axle d, cord Y, and spring R, substantially as described, and for the purpose set forth.

2. The friction-wheels S, in combination with the strap H, the drum C' and fusee C upon the car-axle d, substantially as described, and for the purpose set forth.

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Witnesses:

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