

T. S. BIGELOW.  
Car Starter.

No. 39,091.

Patented June 30, 1863.

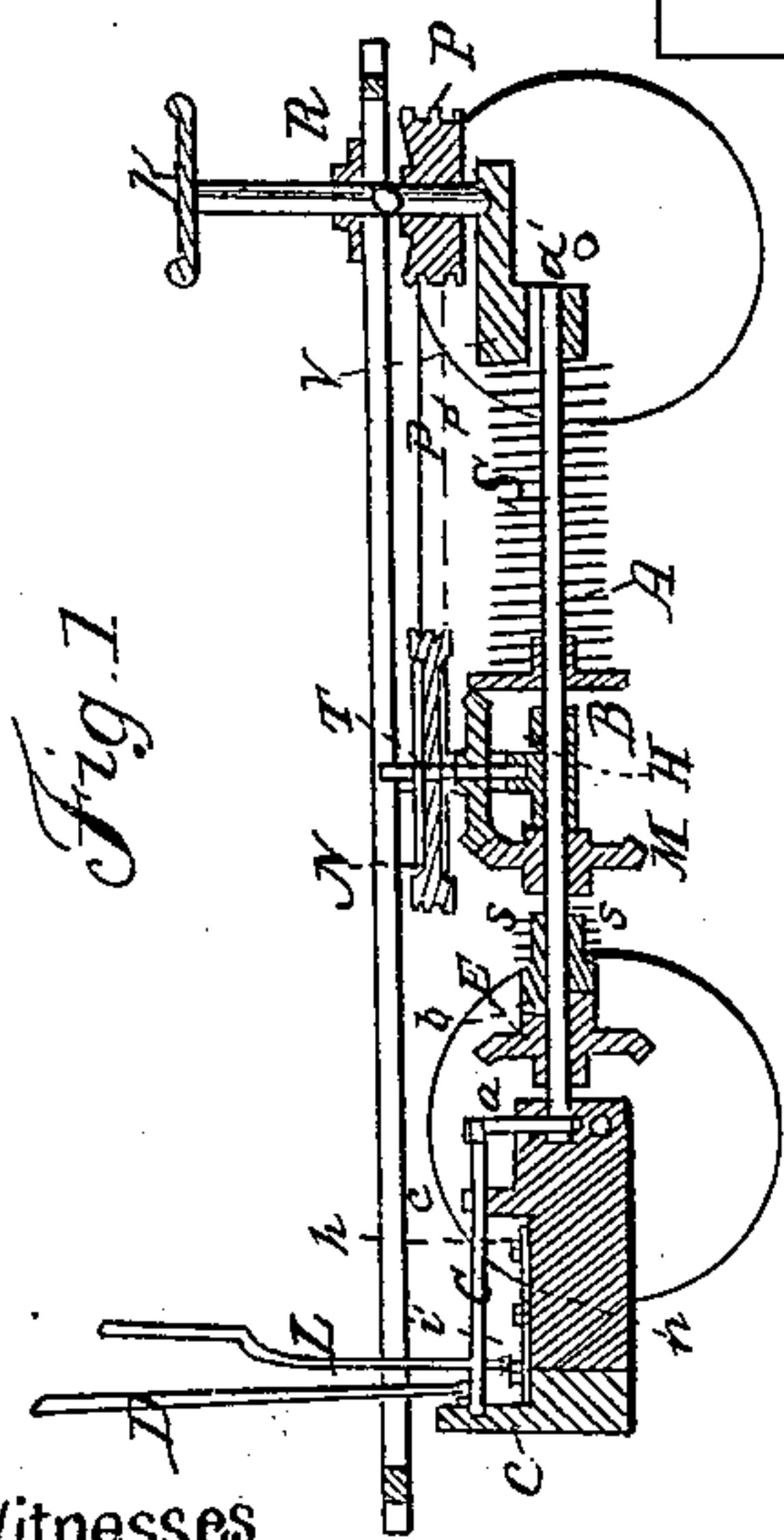


Fig. 1

Witnesses

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E. C. Bigelow

Fig. 2.

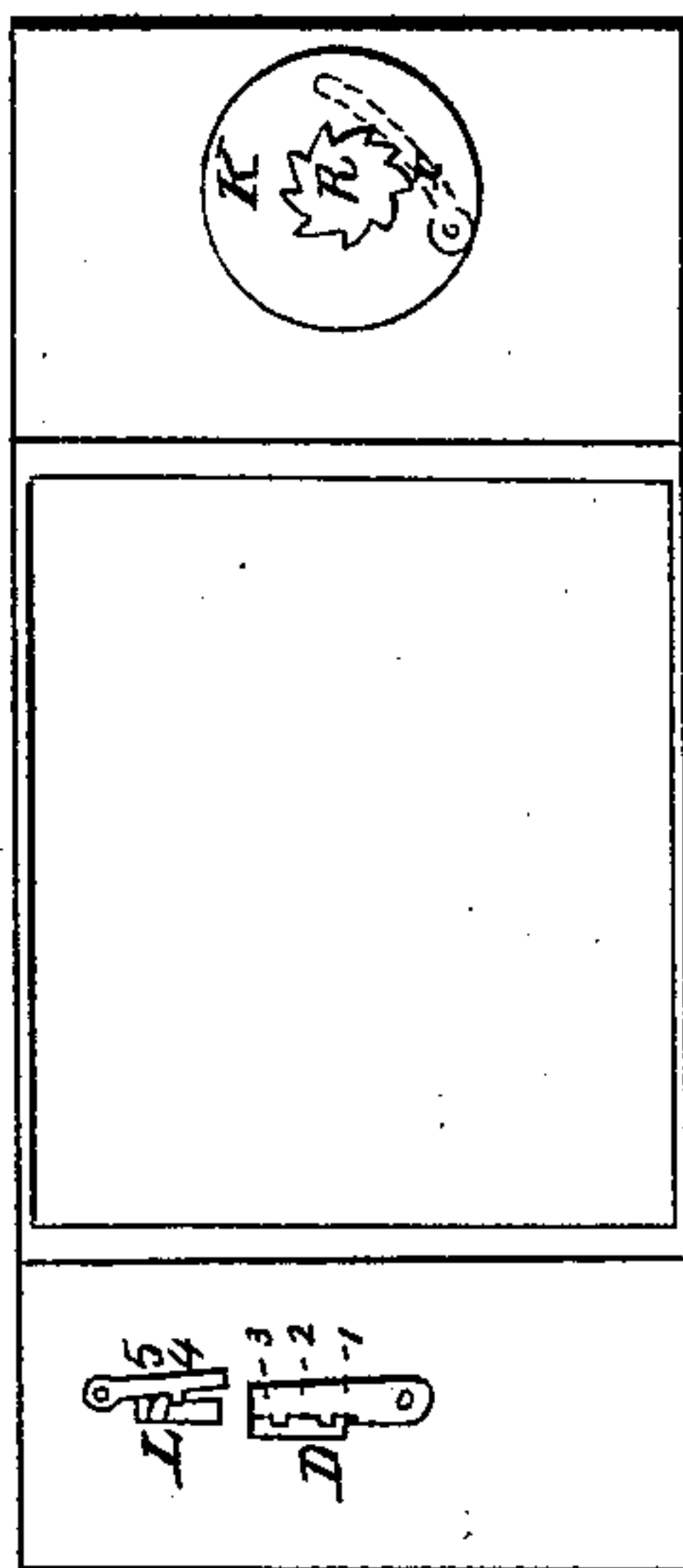
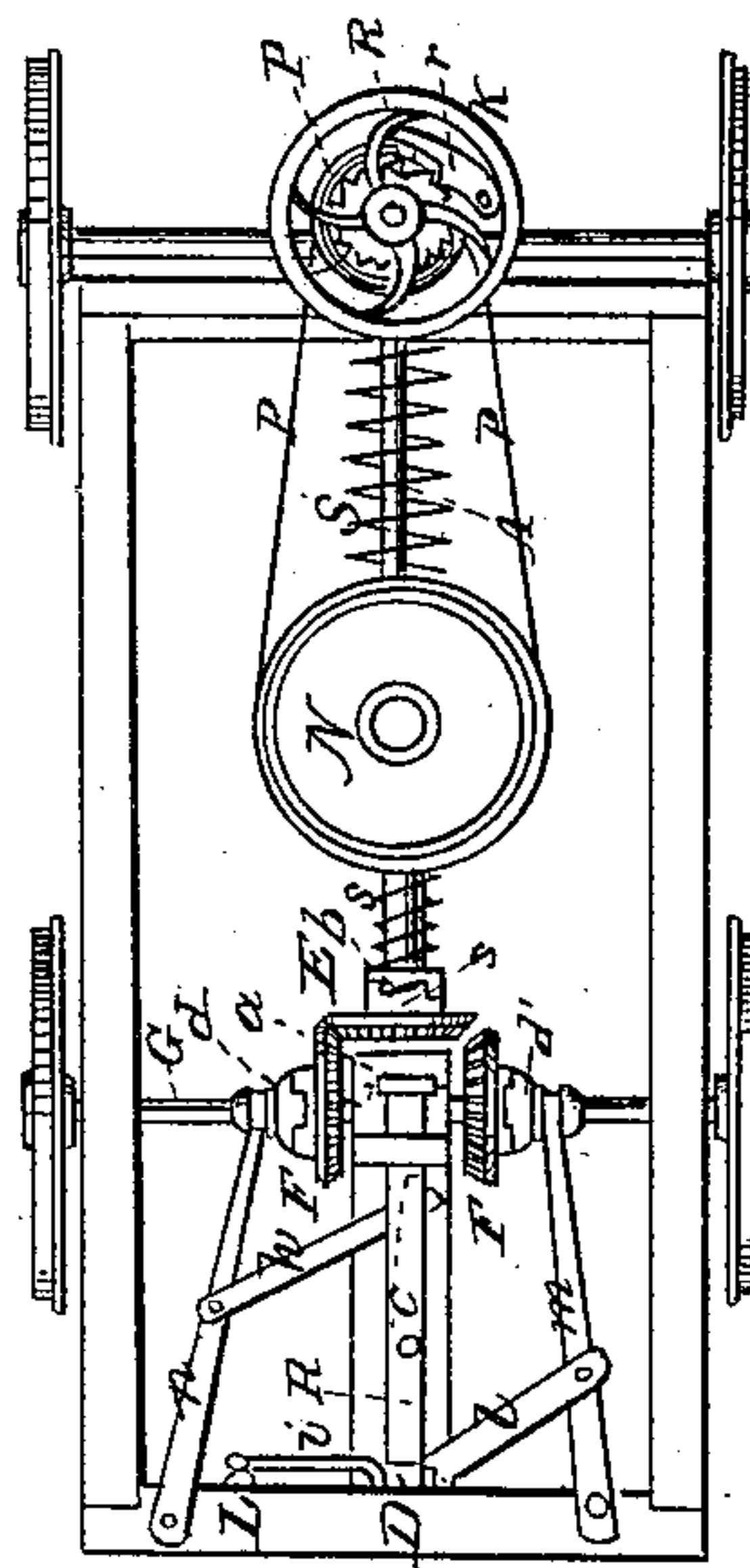


Fig. 3



Inventor

Thomas S. Bigelow

# UNITED STATES PATENT OFFICE.

THOMAS S. BIGELOW, OF LAKE MILLS, WISCONSIN, ASSIGNOR TO HIMSELF,  
AND LUTHER E. PORTER AND SAMUEL M. ROWE, OF SAME PLACE.

## IMPROVEMENT IN MODES OF STOPPING AND STARTING CARS.

Specification forming part of Letters Patent No. 39,091, dated June 30, 1863.

*To all whom it may concern:*

Be it known that I, THOMAS S. BIGELOW, of Lake Mills, in the county of Jefferson and State of Wisconsin, have invented a new and useful improvement in devices or apparatus for starting and stopping horse or street cars, or any other land conveyance; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings and the letters and figures marked thereon, which form part of this specification.

In the said drawings, which are hereunto annexed, Figure 1 represents a longitudinal vertical section of my invention, taken at the line *x* in Fig. 3. Fig. 2 represents a plan or top view of the same, and Fig. 3 represents a top view thereof with the floor or platform of the car removed.

Similar letters in the several figures denote corresponding parts of my invention.

The nature of my invention consists in a novel arrangement whereby, by throwing certain parts into gear by means of a lever, a spring is wound up, whose resistance immediately brakes up and stops the car; and it also consists in a novel device for keeping said springs so wound up as aforesaid, after the car is stopped, until the gearing is changed by the reverse movement of the aforesaid lever, when, by allowing the said spring to relax, the elasticity thereof acts as a propelling force and impels the car forward, thus avoiding and obviating the great strain upon the horses, which is made when they are obliged, unaided, to start the cars, and rendering them fit for service for a much longer time than they would otherwise endure.

This invention is especially adapted to street-cars drawn by horses, on account of the frequent stopping and starting to which said cars are liable, but may be used for any other species of car or conveyance, if desired.

To enable others skilled in the art fully to understand, construct, and make use of my invention, I will now proceed to describe the same with particularity.

A in the annexed drawings represents a horizontal revolving shaft, arranged longitudinally under the car, supported at one end in the immovable bearing at *a'*, and at the other end by the movable support *a*, which is so ar-

ranged that by a lever marked D in the drawings a lateral movement may be given to said shaft for the purpose of throwing said shaft into gear with the mitered-cogged wheels F or F', as may be desired. These wheels F and F' are connected together by a sleeve, within which the axle G freely revolves.

C represents a revolving rod supported at *c c*, upon the end of which the support *a*, in which the shaft A revolves, is fixed immovably. The lever D is also fixed upon said rod C, so that by moving the said lever D to the right or left the rod C is revolved, and the lower end of *a*, which supports the end of the shaft A, is thrown or moved to the right or left, as desired.

*d d* represent two clutches, which are fixed upon the axle G in such a manner as to revolve with said axle, but at the same time to admit of a sliding motion upon said axle, so as to be moved into gear, as shown in the drawings, or out of gear, as may be required. The said clutches may be arranged, as described, upon the axle G by passing a pin through the clutch and axle, the pin passing through a longitudinal slot in the axle, or by any other suitable method. The arrangement for throwing said clutches into or out of gear with the wheels F F', connected by a sleeve as aforesaid, is as follows: The upright lever L is attached to the rod marked *i*, which is in turn connected at the ends with the rods *l* and *k*, the rod *k* moving about the point *o*. The rod *l* is connected with the lever *m*, one end of which lies in the groove shown in the clutch *d'*, and the rod *h*, which is attached to *k*, as shown, is connected with the lever *n*, one end of which rests in the groove in clutch *d*. By this arrangement, by simply throwing the vertical lever L to the right or left, the said clutches may be readily thrown into or out of gear with the wheels F F', as can readily be understood by observing the arrangement as shown in the drawings. The cogged wheel E upon the shaft A revolves freely upon said shaft, while the sleeve *b* is fixed upon said shaft, so as necessarily to revolve with it, and yet by a similar arrangement to that described for fixing the clutches *d d'* upon the axle G the ratchet-clutch or sleeve *b* has a sliding movement upon said shaft A. The said sleeve or ratchet-clutch *b* is kept closely against the ratchet



upon the wheel E, as shown in the drawings, by the action of the spring, (marked s.)

The object of the ratchet arrangement between the wheel E and the sleeve *b* is to enable the wheel E to turn upon the shaft A without revolving said shaft in case it should be necessary to back the car for any reason.

M is a miter-wheel fixed upon the shaft A, so as to revolve with it, which gears into the miter-wheel I, which is itself fixed upon the vertical shaft T, whose lower bearing rests in H, which is supported on the shaft A which revolves within it. Upon the said vertical shaft T is fixed the drum N, which is provided with two grooves, as shown. Upon the vertical shaft or rod O is fixed another smaller drum, also provided with two grooves, and passing around said two drums N and P are the cords or chains *p* and *p'*, *p* passing around in the upper grooves and *p'* in the lower one in such a manner that while one of said chains winds up on either drum the other will unwind from the same. There is also fixed upon said shaft O the ratchet-wheel R, to which there is applied the dog or catch *r*.

B represents a circular plate, which is fixed immovably upon the shaft A. Between said circular plate B and the frame V, coiled around the shaft A, as shown in the drawings, is the spiral spring S, which may be of steel wire of sufficient size and strength, one end of said wire being fastened at V and the other end to the plate B. By this arrangement, when the shaft A revolves, the spring S is wound up, and when the spring, after being so wound up, is allowed to resume its original position, it revolves the shaft A.

Having thus described the construction of my invention, I will now proceed to describe its operation.

In Fig. 2, when the lever D is at 2, the shaft A is directly beneath the center of the car and the wheel E is free from both the wheels F and F'. When D is moved to 1, E is thrown into gear with F, and when D is moved to 3, E is in gear with F'. When the lever L is at 4, the clutches *d d'* are out of gear with F and F', and when said lever L is at 5 said clutches are thrown into gear, as shown in Fig. 3. Supposing, first, that the car is to move forward toward the left hand. The lever D is adjusted at 1, thereby putting the wheel E in gear with F. The clutches *d d'* are then thrown out by adjusting L at 4. As the car moves forward, the axle G revolves freely within the wheels F F' and the sleeve connecting them. When the car is to be broke up or stopped, the driver moves the lever L back to 5, thereby throwing the clutches into gear with F and F'. The wheels F F' now commence to turn with the axle G, and, acting upon the wheel E, revolve the shaft A and the plate B fixed thereon. By

the revolution of the said circular plate B the spring S is wound up, and by its resistance, growing more and more forcible with each revolution, the car is immediately stopped. As the shaft A revolves, the gearing M I also revolves the drum N, which, by means of the chain *p*, turns the drum P, the shaft O, and the ratchet-wheel R. The conductor, by keeping his foot against the ratchet-catch or dog *r*, prevents the retrograde or reverse revolution of the shaft O, and thus also prevents the reverse revolution of the shaft A by the action of the spring S. When it is desired to start the car again, the lever D is moved to 3, thus throwing E into gear with F', when, by throwing out the catch *r* from the ratchet-wheel R, the spring S is allowed to exert its elastic power in resuming its original position, and by unwinding revolves the shaft A, which, by means of the gearing E F', revolves the axle and wheels, thus serves as a propelling force to drive the car forward, thus greatly assisting the horses in their efforts to start the car. When the car moves toward the right, the first position of the lever D is at 3, and it is moved to 1, when the car is to be started again, after stopping as aforesaid.

The above-described invention may also be used with railroad-cars or any other kind of wheeled land conveyance, though I consider it peculiarly well adapted to horse-cars on street-railways.

K represents a wheel, whereby the stopping of the car can be aided by hand in the ordinary way.

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

1. The combination of the clutches *d d'*, the miter-wheels F, F', and E, the revolving shaft A, and the spring S, constructed, arranged, and operating substantially as and for the purposes herein delineated and set forth.

2. The combination and arrangement of the miter-wheels M I, the drums N P, chains *p p'*, and ratchet-wheel R, constructed and operating as and for the purposes specified and shown.

3. The arrangement of the miter-wheel E with the adjustable sleeve *b* and the spring S, for the purposes here in specified.

4. The arrangement of the lever L and the rods *i, l, k*, and *h*, with the levers *m n*, substantially as shown, for the purpose of operating the clutches *d d'*, as specified and described.

5. The combination of the lever D, the revolving rod C, and the movable support *a*, for the purposes herein specified and shown.

THOMAS S. BIGELOW.

Witnesses:

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E. E. BIGELOW.