W. CARPENTER & G. S. BAILEY.

Car-Starters.

No. 150,936. Patented May 19, 1874.

Fig: 1.

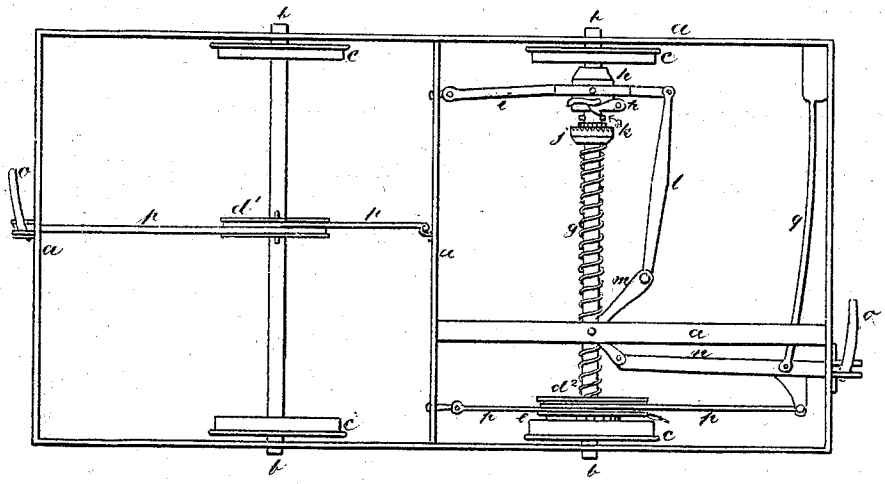


Fig: 3.

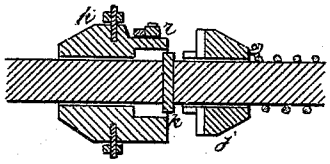
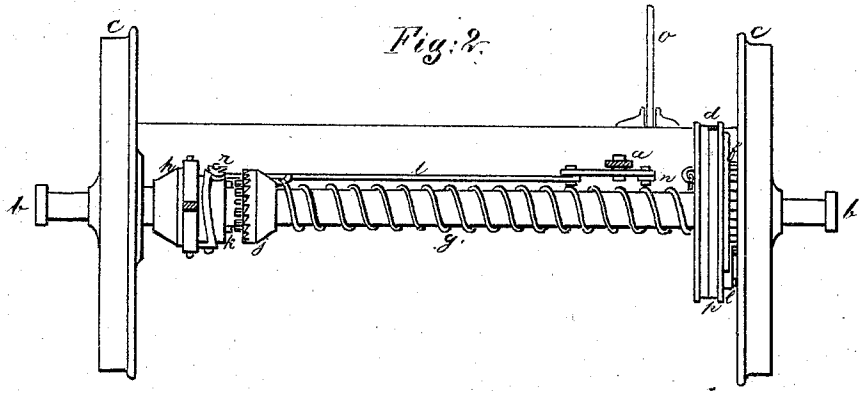


Fig: 4.

Fig: 2.



Attest.

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UNITED STATES PATENT OFFICE.

WILLIAM CARPENTER, OF LAWRENCE, KANSAS, AND GILBERT S. BAILEY, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN CAR-STARTERS.

Specification forming part of Letters Patent No. **150,936**, dated May 19, 1874; application filed March 9, 1874.

To all whom it may concern:

Be it known that we, WILLIAM CARPENTER, of Lawrence, in the county of Douglas and in the State of Kansas, and GILBERT S. BAILEY, of Chicago, in the county of Cook and in the State of Illinois, have invented new and useful Improvements in Railway-Cars; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and the letters of reference marked thereon, making a part of this specification.

The nature of our invention consists, first, of a new method of braking railway-cars, and, secondly, of a device whereby the power usually lost by friction in stopping a car is retained, to be used for starting the same.

The arrangements described are adapted to horse-cars; but by slight modification in the arrangement of connections, they can be used for railway-cars of every description, whatever may be the motive-power or the device, whether lever or common wheel and chain for tightening brakes.

The description is as follows:

Figure 1 is a plan of a car-frame, showing our improvements thereon. Upon one axle is our new braking device, simply, and upon the other the combination of the brake and automatic starter. Fig. 2 is an end elevation of the axle, showing the braking and starting devices combined. Fig. 3 is a longitudinal section of clutch-sleeve and spring-ratchet. Fig. 4 is an end elevation of spring-ratchet.

The description of the braking device is as follows: *a* is the frame of a car. *b* are the axles, and *c* are the running wheels, securely keyed to the axles. d^1 is a flanged pulley, also keyed firmly to the axle *b*. *p* is a metallic band, secured at one end to frame *a*, and, passing once entirely around pulley *d*, is connected to lever *o*, which is arranged in a convenient position for the management of the driver. The flanges upon pulley *d* are for the purpose of keeping the metallic band upon the pulley.

The driver, desiring to stop or check the car, draws lever *o* toward him, which action tightens the metallic band *p* around the pulley *d*, and thus forms a brake. The pulley *d* can be keyed in a convenient place upon the axle, or cast upon the wheel *c*.

The description of the brake and starter combined is as follows: *a* is the frame of a car, and *b* are the axles, with the running wheels *c* firmly secured to them. d^2 is a flanged pulley, fitting loosely upon the axle *b*, and is provided upon one side with a pawl, *e*, for the purpose of working into a ratchet, *f*, which is cast upon, or firmly secured to, running wheel *c*. *g* is a spiral spring, of sufficient strength to move a car. *h* is a sleeve or shifting-clutch, loose upon the axle, and is provided at one end, near the center, with a recess of sufficient size and length to admit of a pin, *k*, driven through the axle *b*, forming two projections, for the purpose hereinafter described. Sleeve *h* is also provided with a pawl, *r*, for the purpose hereinafter named. *i* is a metallic bar, having an opening near its center of sufficient size to admit of sleeve *h*, which is pivoted into the same, that it may have freedom in sliding upon the axle *b* when brought into use. *j* is a ratchet, fitting loosely upon the axle *b*, to which one end of spring *g* is firmly secured. Ratchet *j* is also provided at one end, near the axle, with cogs, for the purpose of acting in connection with the projections formed by pin *k*, as hereinafter described. Spring *g* is also firmly secured to flanged pulley *d*, and is loose enough upon the axle *b* to allow it to wind up a number of revolutions of the pulley, more or less, as shall be found best upon practical experiments. Spring *g*, also, in extending itself along the axle, is intended to keep pulley *d* in its proper place, as well as spring-ratchet being forced so that its cogs are always engaged with pin *k*, unless forced away by sleeve *h*, as hereinafter described. The metallic bar *i* is jointed at one end to frame *a*, and at the other end to connecting-rod *l*, which is also jointed to crank *m*. *n* is a sliding bar connected by joint to crank *m*, and also to lever *o*, which is jointed to frame *a* in a convenient position for the management of the driver. *p* is a metallic band, secured at one end to frame *a*, and, passing once around the flanged pulley *d*, is made fast to sliding bar *n*. *q* is a spring, intended to work both ways, as hereinafter described.

The operation of the brake and starter is as follows: While the lever *o* is at liberty, or before the driver has his hand upon it, the spring

q is intended to stand straight, in which position neither the brake nor the liberating device will in any way interfere with the freedom of the wheels and axles, so that the car will move as freely, either forward or backward, as if there were nothing upon the axle except the little friction caused by the sleeve *h* not revolving with the axle.

When the car is running forward and the driver desires to stop it, he forces the lever *o* toward him, which action tightens the metallic band *p* around the flanged pulley *d*, and holds it firmly. The pawl *e*, pivoted upon the side of pulley *d*, at once plays upon the teeth of ratchet *f*, which is secured to the running wheel *c*, and revolving with it, the spiral spring *g* being secured at one end to pulley *d*, which is held fast by the driver, and at the other end (by means of the cogs on spring-ratchet being engaged with pin *k*) to the axle, the spring *g* is at once wound up, which action stops the car. The driver simply loosing the lever *o* does not liberate the spring *g*, but it remains wound up, and will remain so until the driver desires to use it to start the car. In going down a descent this would be a very desirable feature, as the pulley *d* would be about as fast to the axle as if keyed there, and could be used for a common brake or check as long as desired, and the power of the wound-up spring taken to start the car when needed. This is accomplished by the driver forcing the same lever *o* from him, which action draws the sleeve *h* along the axle and into contact with ratchet *j*, forcing it from its connection with pin *k*, thus setting the axle at liberty, and the pawl *e* being engaged with the ratchet upon the running wheel *c*, the unwinding of the spiral spring *g* moves the car forward. Another important feature of this invention is the fact that the power of the wound-up spring can be taken for use, whether the car is fully stopped or in motion. If the car is in motion, the pawl *r* plays upon the ratchet *j* until it is released from pin *k*, when the pawl *r* at once receives the whole power of spring *g*.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. Flanged pulley d^1, fast to the axle *b*, metallic band *p*, and lever *o*, combined to operate in the manner and for the purpose described.

2. Flanged pulley d^2, loose upon the axle *b*, spring *g*, metallic band *p*, sliding bar *n*, and lever *o*, combined to operate in the manner and for the purpose described.

3. Ratchet *f*, pawl *e*, pulley d^2, metallic band *p*, spring *g*, spring-ratchet *j*, pin *k*, sleeve *h*, and pawl *r*, combined to operate in the manner and for the purpose described.

4. Flanged pulley d^2, metallic band *p*, sliding bar *n*, and lever *o*, combined to operate in the manner and for the purpose described.

5. Metallic bar *i*, connecting-rod *l*, crank *m*, sliding bar *n*, and lever *o*, combined to operate in the manner and for the purpose described.

6. The combination of frame *a*, axles *b*, wheels *c*, pulley d^2, pawl *e*, ratchet *f*, spring *g*, sleeve *h*, bar *i*, ratchet *j*, pin *k*, rod *l*, crank *m*, sliding bar *n*, lever *o*, band *p*, spring *q*, and pawl *r*, to operate in the manner and for the purpose described.

In testimony that we claim the foregoing we have hereunto set our hands this 3d day of March, 1874.

WILLIAM CARPENTER.
GILBERT S. BAILEY.

Witnesses:
J. A. EDGREN,
G. E. BAILEY.