2 Sheets—Sheet 1

W. SCOTT.

CAR BRAKE AND STARTER.

No. 171,246. Patented Dec. 21, 1875.

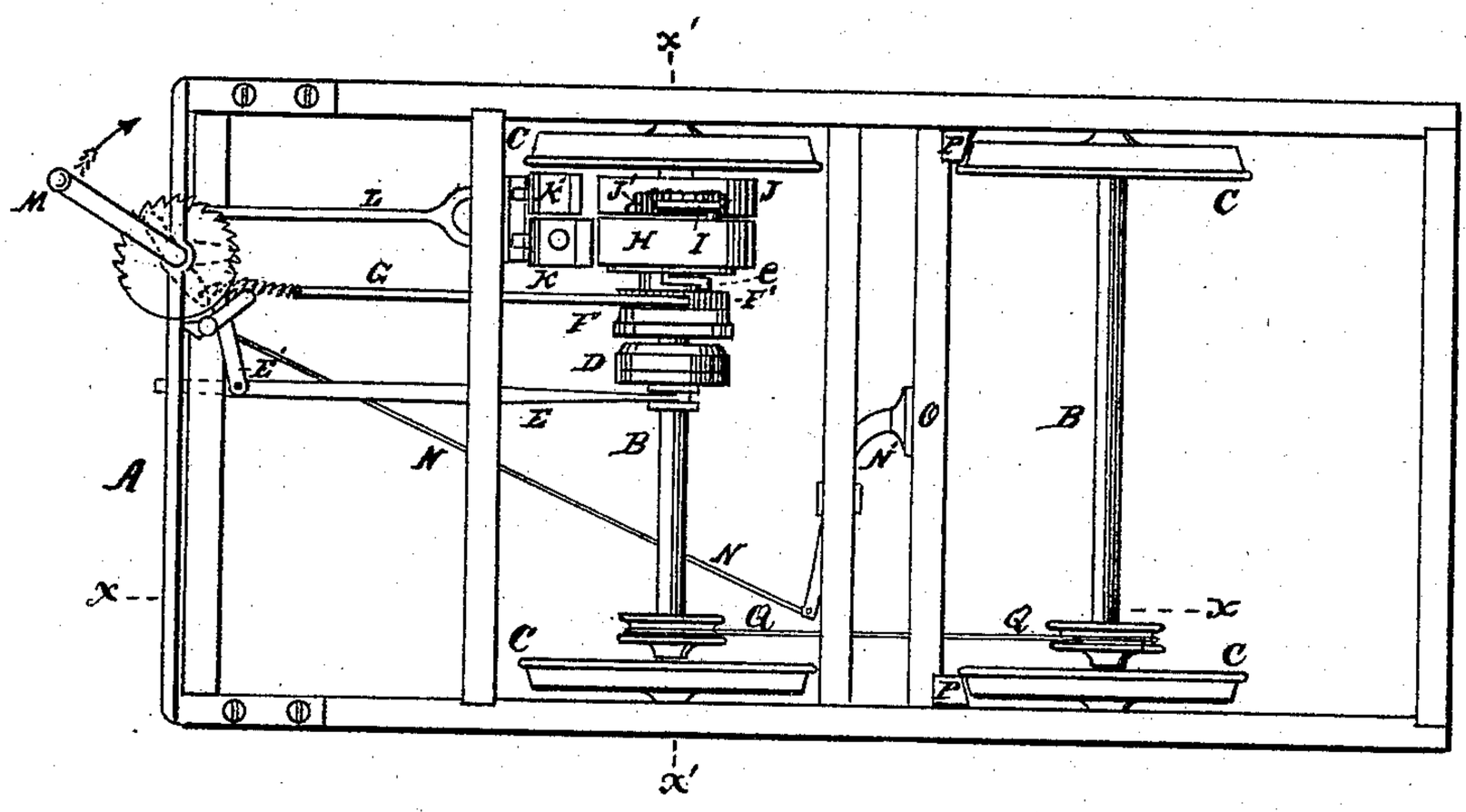


Fig. 1.

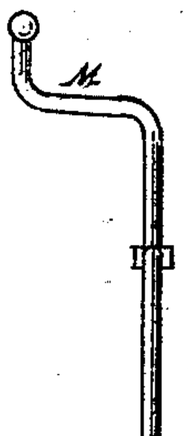
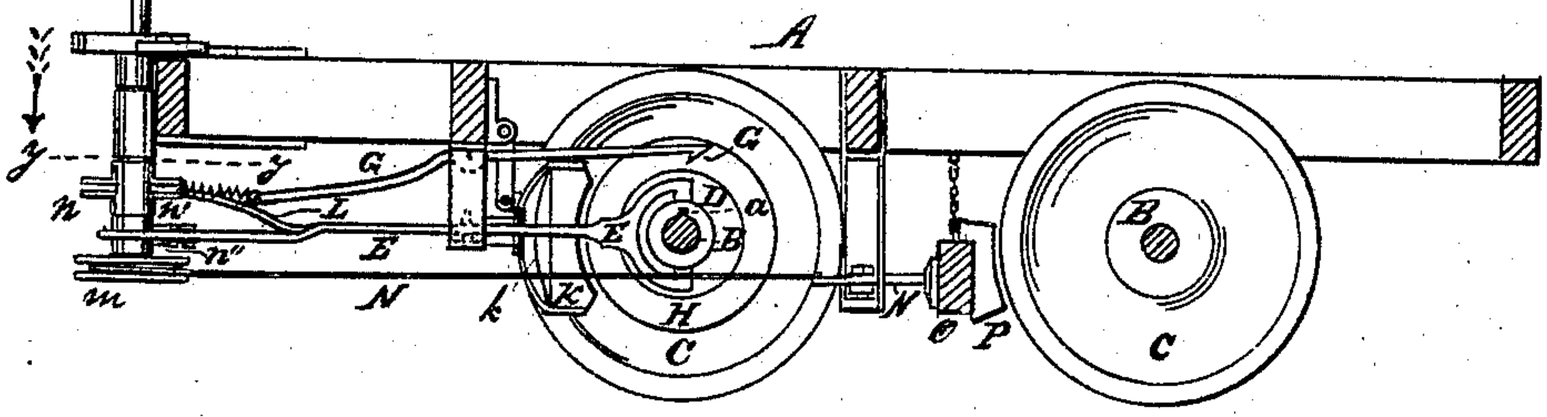


Fig. 2.



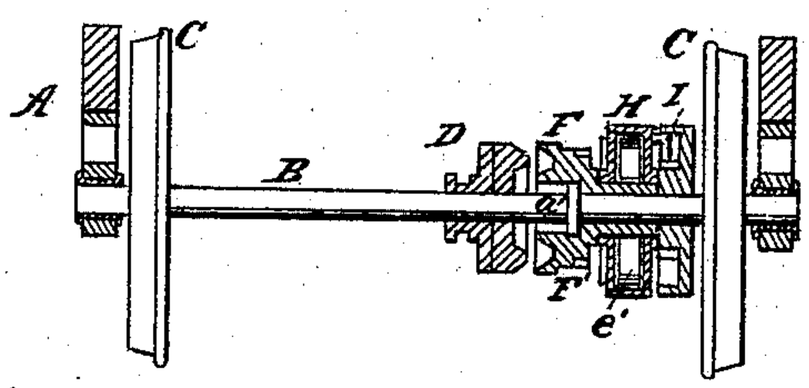


Fig. 3.

Witnesses:

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N. C. Linley

Inventor:

Walter Scott.

2 Sheets—Sheet 2

W. SCOTT.

CAR BRAKE AND STARTER.

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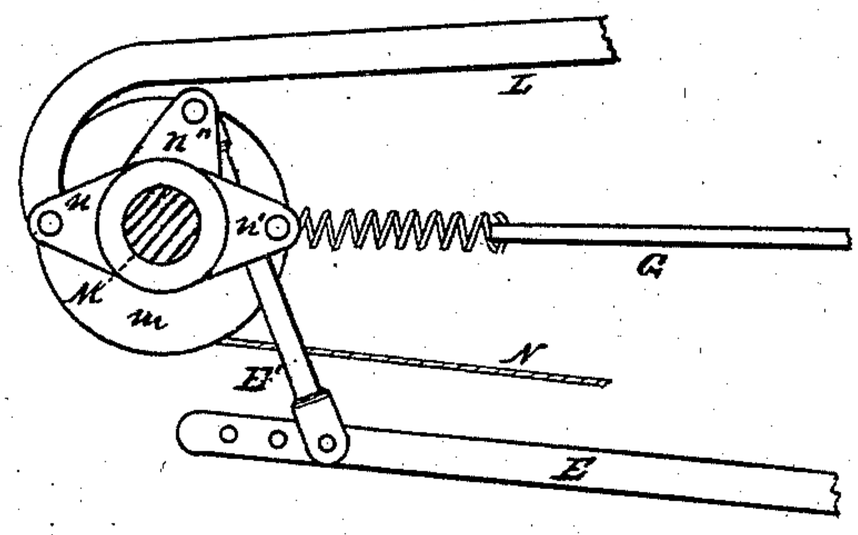


Fig. 4.

Fig. 5.

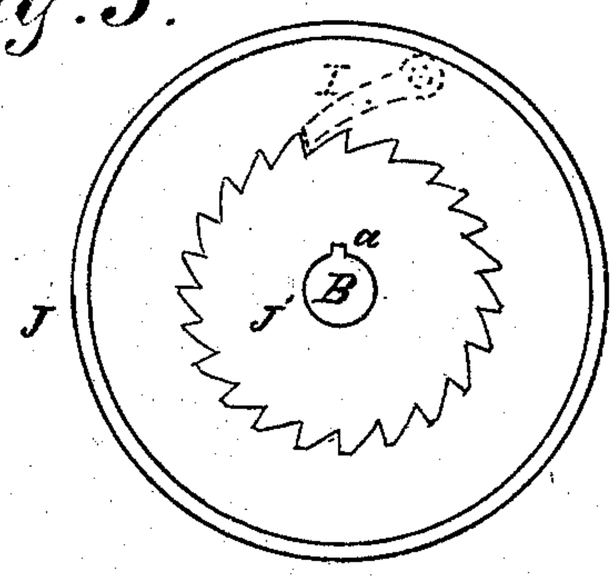
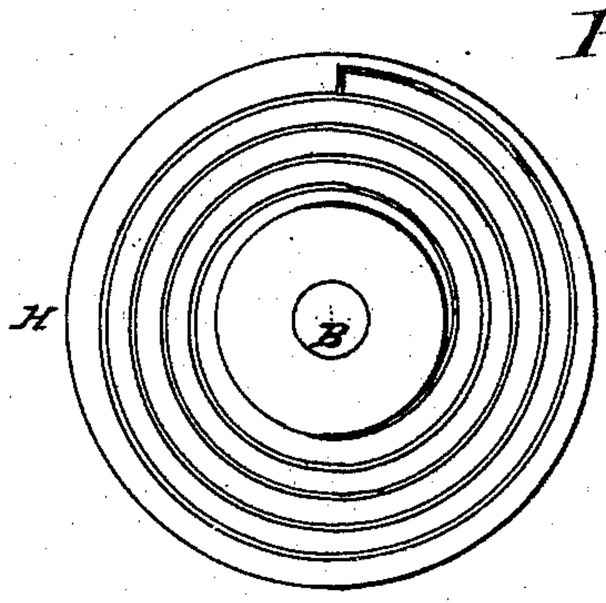


Fig. 6.



Witnesses:

F. F. Warner.
N. C. Gidley

Inventor:

Walter Scott

UNITED STATES PATENT OFFICE.

WALTER SCOTT, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN CAR BRAKES AND STARTERS.

Specification forming part of Letters Patent No. **171,246**, dated December 21, 1875; application filed July 9, 1875.

To all whom it may concern:

Be it known that I, WALTER SCOTT, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Car Brakes and Starters, of which improvements the following is a full, clear, and exact description, which will enable others skilled in the art to which my invention appertains to make and use the said improvements, reference being had to the accompanying drawings forming a part hereof, and in which—

Figure 1, Sheet 1, represents a top or plan view of a car brake and starter embodying my invention; Fig. 2, Sheet 1, a section in the plane of the line *x x;* Fig. 3, Sheet 1, a section in the plane of the line *x' x';* Fig. 4, Sheet 2, a section in the plane of the line *y y;* Fig. 5, Sheet 2, a side elevation of the auxiliary brake-wheel; and Fig. 6, Sheet 2, a like elevation of the spring-drum.

Like letters of reference indicate like parts.

My object is to improve the construction and operation of that class of car-brakes adapted for operation in connection with mechanism for starting the car; and to that end my invention consists in certain novel features, substantially as hereinafter described, relating to the means employed for the purpose of stopping and starting the car.

A in the drawing represents the car-truck. B B are loose axles, resting in suitable bearings; and C C are wheels, rigidly mounted on the axles. D is a clutch-block, loosely mounted on one of the axles so as to be capable of a laterally-sliding movement thereon, but is keyed thereto by means of a spline, as shown at *a*, Fig. 2. E is a lever pivoted to the frame, and engaging the clutch. F is a sleeve loosely mounted on the axle which carries the clutch. The sleeve and clutch are constructed and arranged for engagement with each other. *a'*, Fig. 3, is a collar, to limit the lateral movement of the sleeve in one direction. F' F' are ratchet-teeth on the sleeve. *e* is a pawl or stop pivoted to the sleeve. G is a counter-weighted pawl or hook, pivoted to the frame and arranged for engagement with the teeth F' F'. H is a drum or barrel, loosely mounted on the sleeve. Within this drum is a coiled spring, *e'*, one end of which is attached to the drum, and the other to the sleeve. One end of this drum is grooved, as shown in Fig. 6, and the free end of the stop *e* is bent to lie in this groove. I is a push-pawl, pivoted to the opposite end of the drum. J is a brake-wheel rigidly mounted on the shaft which carries the clutch, and J' is a ratchet-wheel, rigidly attached to the wheel J. The pawl I is arranged to engage the teeth of the wheel J'. K and K' are brake-shoes, pivoted to hangers jointed to the truck-frame. L is a forked push-bar, one of the forked ends of which is pivoted to the shoe K', and the other end of which passes freely into a recess or chamber in the shoe K. *k* is a spring arranged in this recess. M is the brake rod or shaft, and *m* is a pulley rigidly mounted thereon. *n*, *n'*, and *n''* are arms projecting laterally from the rod M. The bar L is pivoted to the arm *n*, the hook G is connected to the arm *n'* by means of a spring, as shown, and the lever E is connected to the arm *n''* by means of a connecting-arm, E'. N is a chain or cable, attached to the pulley *m* and to a brake-lever, N', operating in connection with the suspended bar O, provided with the shoes P P. Q is a chain arranged over pulleys on the axles B B.

It is not essential to my invention that a brake should operate in connection with the rear axle; neither is it essential that the axles should be connected by the chain Q; but I deem it preferable to employ these parts as auxiliary to those operating in connection with the forward axle, and have here alluded to the rear brake and connecting chain to indicate that they may be employed with advantage and controlled from the same brake rod or shaft M. Neither is the employment of the pawl I, in connection with a groove in the drum H, essential, except for the purposes set forth.

The operation of the parts now described is as follows: When the rod M is turned in the direction indicated by the arrow shown in Fig. 1, the lever E, which should be slightly flexible or spring-like, is vibrated in such a direction as to crowd the block D firmly into the correspondingly-formed end of the sleeve F. In order to produce great friction between

the block and sleeve, I deem it preferable to make a V-shaped annular groove in the latter, and a correspondingly-formed rib on the former, as shown. The same movement which forces the clutch-block against or into the sleeve also sets the shoe *k* against the periphery of the drum H, and throws up the weighted end of the hook G, so that its hooked end is brought into contact with the teeth F′ F′. As soon as the clutch engages the sleeve during the forward movement of the car, the spring *e′* will be wound, for the reason that the sleeve, to which one end of the spring is attached, will be rotated, while the drum, to which the other end is fastened, will be held by the shoe K. The force exerted by the spring *e′* is thus communicated to the axle on which the clutch is mounted, and, while the shoe K is in contact with the drum, this force will be exerted in the opposite direction from which the axle is rotated.

The momentum of the car is thus employed to wind the spring, and the car will be stopped as soon as the resistance of the spring is equal to the momentum.

In order to prevent the spring from being wound too tight I employ the pawl *e* in connection with the groove in the drum, as described, so that when the pawl reaches the end of the groove the drum will be rotated, the resistance of the shoe K being thereby overcome. During this rotation of the sleeve F the hook G rides freely over the teeth F′ F′, the hook and teeth being beveled for that purpose, and the hook being yielding. When the rod M is turned in the opposite direction from that indicated the clutch will be drawn from the sleeve and the shoe K from the drum. The weighted end of the hook G will also be released, but the spring *e′* will now tend to turn the sleeve in the opposite direction, and the friction or engagement of the teeth F′ F′ with the hook G will hold the latter to this engagement as long as the spring *e′* exerts any considerable degree of force. The drum, being now free, will therefore be rotated by the spring, and as the drum carries the pawl I, resting on the ratchet J′, the rotation of the drum will be communicated to the wheel J and forward axle, on which this wheel is rigidly mounted. The car will thus be driven forward until the spring exhausts its impelling force, and as soon as this force is exhausted the hook G will leave the teeth F′ F′, being sufficiently counterweighted for this purpose, thus preventing the further movement of the car from being interfered with in either direction by the stopping and starting mechanism, and also leaving this mechanism unaffected by the movement of the car until the rod M is again turned, when the operation already described will be repeated.

If, after releasing the starting mechanism, it may be necessary to stop the car before the force of the spring *e′* is expended, the rod M must be turned until the shoe K′ strikes the wheel J. This operation will also throw the shoe K against the drum, as before described, so that the spring *e′* will be again wound to an extent corresponding to the forward movement of the car after the shoe last referred to strikes the drum. Whenever the rod M is turned, either to brake or release the forward wheels, the brake operating in connection with the rear wheels, when a brake is employed in connection therewith, will also be set and released.

The shoe K need not be yielding except when employed in connection with the shoe K′ in the manner described, and the arm L need not be forked except for the purpose of rendering it operative on both of these shoes. Any brake mechanism may be employed in connection with the shoe K, the latter being used only to prevent the rotation of the drum H while the spring *e′* is being wound. In other words, the shoe K, though eventually overcoming the momentum of the car, properly belongs to the starting mechanism herein described, and not to the brake mechanism, when such other mechanism is employed to stop the car. I deem it preferable, however, to make the shoe K yielding when it is adapted to be set by the same rod which is employed to set the clutch.

When it is unnecessary to stop the car suddenly the shoe K only should be set, in order that the momentum of the car may be wholly utilized to wind the spring *e′*, for the tighter the latter is wound the greater will be its starting-force. When the shoes P P are employed in connection with the yielding shoe K the former should be hung far enough from the wheels to admit of the contact of the shoe K with the drum before the shoes P P are brought against the drum.

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

1. In combination, the clutch D, sleeve F, teeth F′ F′, drum H, and ratchet J′, all mounted on the same axle, stop-pawl G, push-pawl I, and spring *e′*, all operating together, substantially as described, in connection with the shoe K and a clutch-lever, the said shoe, stop-pawl, and lever being connected to the same rod M.

2. The combination of the yielding shoe K, spring-drum H, ratchet J′, pawl I, a fixed wheel, and a friction-shoe, the latter and the shoe K being connected to the same brake rod or shaft, for the purposes set forth.

3. The combination of the drum H, provided with a groove in one end, and the sleeve F, carrying the pawl *e* projecting into the said groove, the said drum and sleeve being connected by a spring, *e′*, substantially as and for the purposes specified.

4. In combination, the clutch-block D, sleeve F, provided with the teeth F′ F′, stop hook or pawl G, drum H, provided with the push-pawl I, spring *e′*, attached at one end to the drum

and at the other to the sleeve, shoe K, ratchet J′, clutch-lever E, push-bar L, and brake-rod M, substantially as and for the purposes specified.

5. The combination of the wheels C C, brake-shoes P P, actuated by means of a lever connected to the brake-rod M, yielding shoe K, also actuated by means of an arm connected to the rod M, and the spring-drum H, substantially as specified, whereby the starting mechanism may be controlled either independently or simultaneously with the brakes P P.

WALTER SCOTT.

Witnesses:

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F. F. WARNER.