

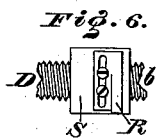
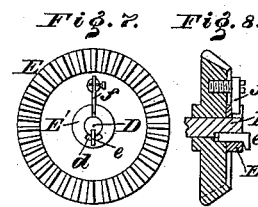
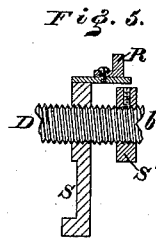
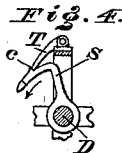
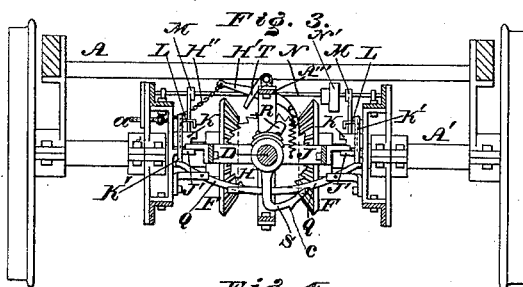
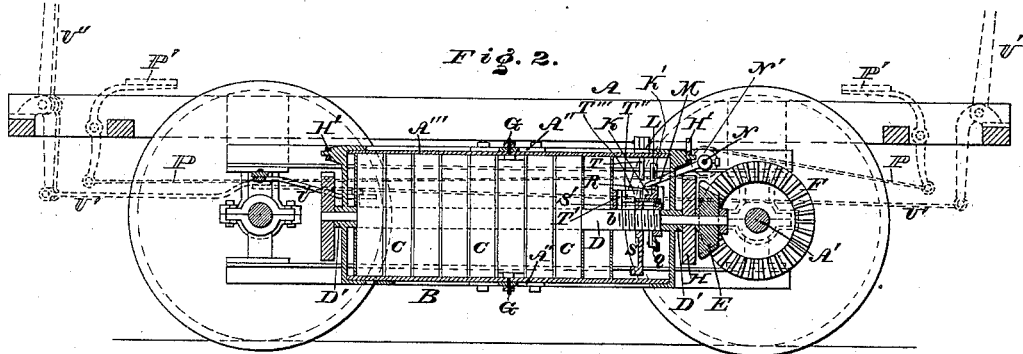
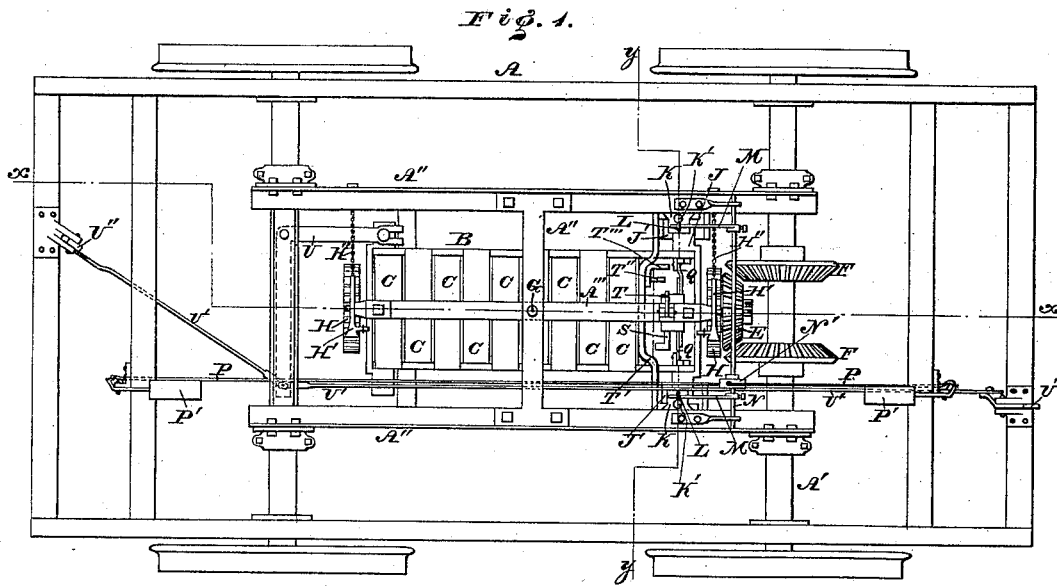
(No Model.)

J. F. MORELL & D. GOFF.

CAR STARTER.

No. 307,569.

Patented Nov. 4, 1884.



WITNESSES:

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JAMES F. MORELL, OF CAMDEN, AND DANIEL GOFF, OF MILLVILLE, N. J.

CAR-STARTER.

SPECIFICATION forming part of Letters Patent No. 307,569, dated November 4, 1884.

Application filed June 16, 1884. (No model.)

To all whom it may concern:

Be it known that we, JAMES F. MORELL, of the city and county of Camden, State of New Jersey, and DANIEL GOFF, of Millville, in the county of Cumberland, State of New Jersey, both citizens of the United States, have invented a new and useful Improvement in Car-Starters, which improvement is fully set forth in the following specification and accompanying drawings, in which—

Figure 1 is a top or plan view of a car-starter embodying our invention. Fig. 2 is a vertical section thereof in line *x x*, Fig. 1. Fig. 3 is a transverse section in line *y y*, Fig. 1.

The remaining figures are views of detached parts on an enlarged scale.

Similar letters of reference indicate corresponding parts in the several figures.

Our invention consists of certain improvements in a car-starter, as will be hereinafter fully set forth and definitely claimed.

Referring to the drawings, A represents the truck of a car, and B represents the longitudinally-extending drum or casing, which is secured to the under side of the truck or truck-frame, and contains a series of coiled springs, C, which are attached to said casing and to a rotary shaft, D, which latter is mounted on the plates or bearings D'.

Connected with the shaft D is a bevel-wheel, E, and connected with the axle A' are bevel-wheels F, with either of which the wheel E is adapted to engage, the shifting of said wheel E being accomplished by attaching the drum or casing B to the truck by means of a pivot, G, which is secured to a hanger or bearing of frame, A'', beneath the truck, and permits the drum to be oscillated to the right and left, whereby the wheel E may be moved toward and from either wheel F, as is evident.

To the shaft D is fixed a ratchet, H, the engaging-pawl H' whereof is hung on the end of the drum or casing B, and has connected with it one end of a chain, H'', whose other end is secured to the frame of the truck, as at *a*.

J represents a cross-bar, through which the shaft D is passed, the ends of the same being movably supported on ledges J', projecting horizontally and inwardly from the frame A''.

Above the ends of the cross-bar are rising and falling blocks K, which are fitted to the sides of the frame A'', and have their inner faces stair-shaped for locking with the ends of the cross-bar relatively to the position of the latter, it being noticed that said cross-bar moves with the casing B either to the right or left, or may occupy a central position relatively to the location of the bevel-wheel E.

Connected with the blocks K, on the upper side thereof, are hooks L, with which engage arms M, the latter being secured to a rock-shaft, N, which extends transversely and has its bearings on the frame A''. In order to operate said shaft N, and thus raise the arms M, and consequently the blocks K, so as to release the ends of the cross-bar J, there is connected with said shaft a crank arm or wheel, N', to which is secured a rod, P, the forward end of which is attached to a treadle, P', the latter being properly mounted on the truck and within convenient reach of the car-driver.

To opposite sides of the frame A'', and located below the shaft D, are pivoted levers Q, whose outer ends are connected with the blocks K by means of upright rods or pins K'. These levers Q are adapted to be depressed, and thus raise the blocks K, by means of a lug or finger, R, which is secured to a hook-shaped cam, S, the latter having a threaded opening, which is fitted on the threaded portion *b* of the shaft D, so as to travel thereon.

Fastened to the shaft D adjacent to the cam S is a collar, S', which is adjustably held in position and adapted to rotate with the shaft, and at a certain time have the cam abut against it and cause the rotation of the cam, whereby the finger R is carried around to the levers Q and caused to depress the same, thus raising the blocks K, as hereinbefore referred to.

To the upper end of the piece A''' of the frame A'' is pivoted a tooth, T, which is so hung that when the rotating and moving cam S reaches said tooth T the latter then engages with a shoulder, *c*, on the back of said cam. On a cross-bar, T', of the frame A'' is a pin, T'', which is so disposed that when the cam S reaches said pin it takes hold of the same, and thus draws with it the casing B and connected

parts in the direction from one of the bevel-wheels F, placing the bevel-wheel E free between said bevel-wheels F.

Adjacent to the pin T'' is an abutment, T''', which is so disposed that when the cam S reaches the same the back of the cam bears against and rides on said abutment, so that the casing B and connected parts are forced in the opposite direction, and thus in the direction from the other bevel-wheel F, also placing the wheel E free between the wheels F, the operations of the cam S with either the pin T'' or abutment T''' depending upon the direction in which the frame A'' is at the time of the engagement of the cam S.

In order to move the casing B and connected parts, which, as has been stated, has a pivotal connection with the truck-frame, we employ an elbow-lever, U, which is pivoted to the frame A'', and is connected with one end of a rod, U', whose other end is connected with a lever, U'', the latter being mounted on the truck-frame convenient to the car-driver, it being evident that the operation of the lever U'' in reverse order serves to operate the casing B in reverse directions, thus shifting the bevel-wheel E from either of the bevel-wheels F when so required.

The operation is as follows: The treadle P' is depressed, thus rotating the rock-shaft N and operating the arms M, which act against the hooks L, and thus raise the stair-shaped blocks K, releasing the cross-bar J, and allowing the frame A'' and connected parts to be moved. This is done by operating the lever U'', which, moving the rod U', turns the elbow-lever U, and so throws the frame A'' to one side or the other, thus putting the bevel-wheel E in engagement with one of the bevel-wheels F. As the car continues to move, the shaft D is rotated, and thus the springs are wound, the pawl H' and ratchet-wheel H serving to lock or retain the spring in a wound condition. As the shaft D continues to rotate, it causes the cam S to travel toward the collar S'. When the cam S comes in contact with the collar S', the latter causes the cam to rotate with the shaft D. As the cam now rotates, the finger R strikes the levers Q, and thus raises the blocks K. The cam now comes in contact with the pin T'' or abutment T''', according to the position of the frame A'', and so moves the wheel E clear of the wheels F. The power stored in the springs C is retained through the pawl H' and ratchet-wheel H. In order to utilize this power when so desired, the treadle P' is again operated and the lever U'' moved in opposite direction to that described above. This throws the wheel E in engaging contact with the other wheel F, so that the power of the spring may be transmitted through the wheels E F to the axle A', and so to the truck-wheels. The chain H'' is of such length that when the frame A'' is moved into its second position it causes the pawl H' to be held free of the ratchet-wheel H, and thus no

longer controls the springs C. As the cam S may be so tightly forced against the collar S' that it will be carried in a backward direction, and not ride freely on the thread b of the shaft D, I provide the tooth T, which, as the cam S comes around, engages the same at the shoulder c of the cam, and starts the latter backward on the thread b, and places it in position for the next operation of winding the springs.

Since the meshing of the bevel-wheels may at times be hard to accomplish, owing to the position of their teeth, we form (see Figs. 7, 8, and 9) in the bore of the wheel E a segmental recess, d, in which the key e is free to move. Secured to the wheel is a spring, f, which has its free end in a collar, E', attached to the shaft D. The teeth are formed somewhat in the shape of a wedge at their outer end, (see Fig. 9,) and thus by the wedging action of the teeth and the slight play of the wheel E on the shaft D we are enabled to readily and reliably place the wheels in operative contact. The latter feature, however, may be embodied in another application for Letters Patent.

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

1. In a car-starter, a coiled spring or springs, a winding and unwinding shaft having a yielding gearing, and a car-axle having a rigid gearing thereon, in combination with a drum or casing for said spring or springs pivotally connected with the truck-frame, substantially as and for the purpose set forth.

2. In a car-starter, a spring or springs inclosed in a casing which is pivotally connected with the truck-frame, in combination with a winding-shaft, D, having a yielding gear-wheel, E, thereon, and a car-axle having rigid gear-wheels F F, substantially as and for the purpose set forth.

3. In a car-starter, a casing with springs, having a pivot, G, a ratchet, H, on the shaft D, a pawl, H', mounted on said casing, and a chain connected with the pawl and the truck-frame, substantially as and for the purpose set forth.

4. The ledges J' on the frame A'', the cross-bar J, and shaft D, fitted to said bar, in combination with the rising and falling blocks K, substantially as and for the purpose set forth.

5. The blocks K, with hooks L, the arms M, the rock-shaft N, and operating mechanism, combined and operating substantially as and for the purpose set forth.

6. The blocks K and the shaft D, in combination with the cam S, finger R, and levers Q, substantially as and for the purpose set forth.

7. The shaft D, in combination with the cam S, collar S', finger R, and levers Q, substantially as and for the purpose set forth.

8. The piece A''', with pivoted tooth T, cam S, with shoulder c, pin T'', and abutment T''', combined and operating substantially as and for the purpose set forth.

9. A casing which contains coiled springs and a winding and unwinding shaft, and is pivotally connected with the truck-frame, in combination with the elbow-lever U, rod U',
5 and operating-lever U'', substantially as and for the purpose set forth.

10. The bevel-wheel E, having a recess, *d*, in combination with a key, *e*, spring *f*, and a

collar E' on the shaft D, substantially as and for the purpose set forth.

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Witnesses:

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