

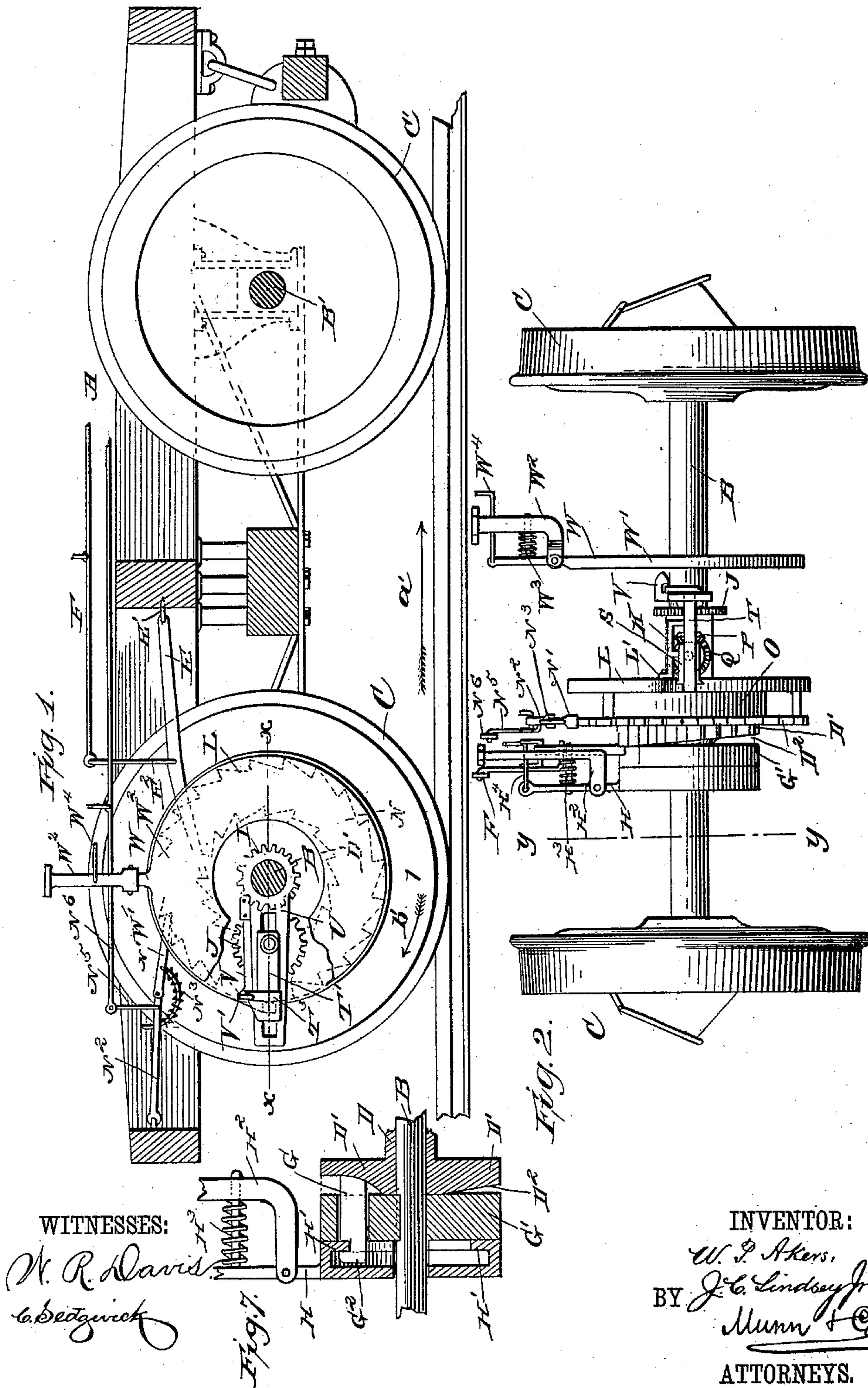
(No Model.)

2 Sheets—Sheet 1.

W. P. AKERS & J. C. LINDSEY, Jr.  
CAR STARTER.

No. 397,327.

Patented Feb. 5, 1889.



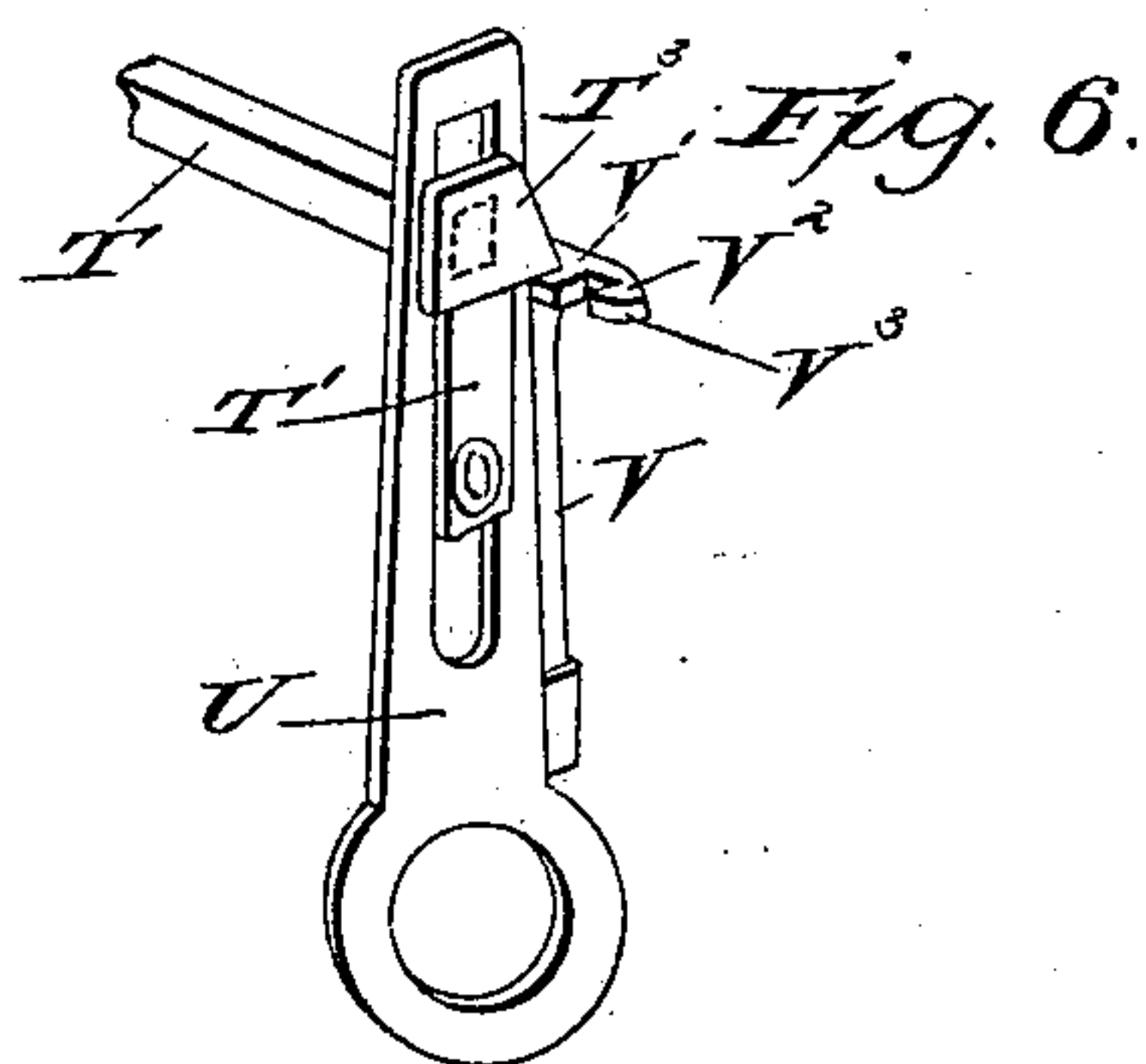
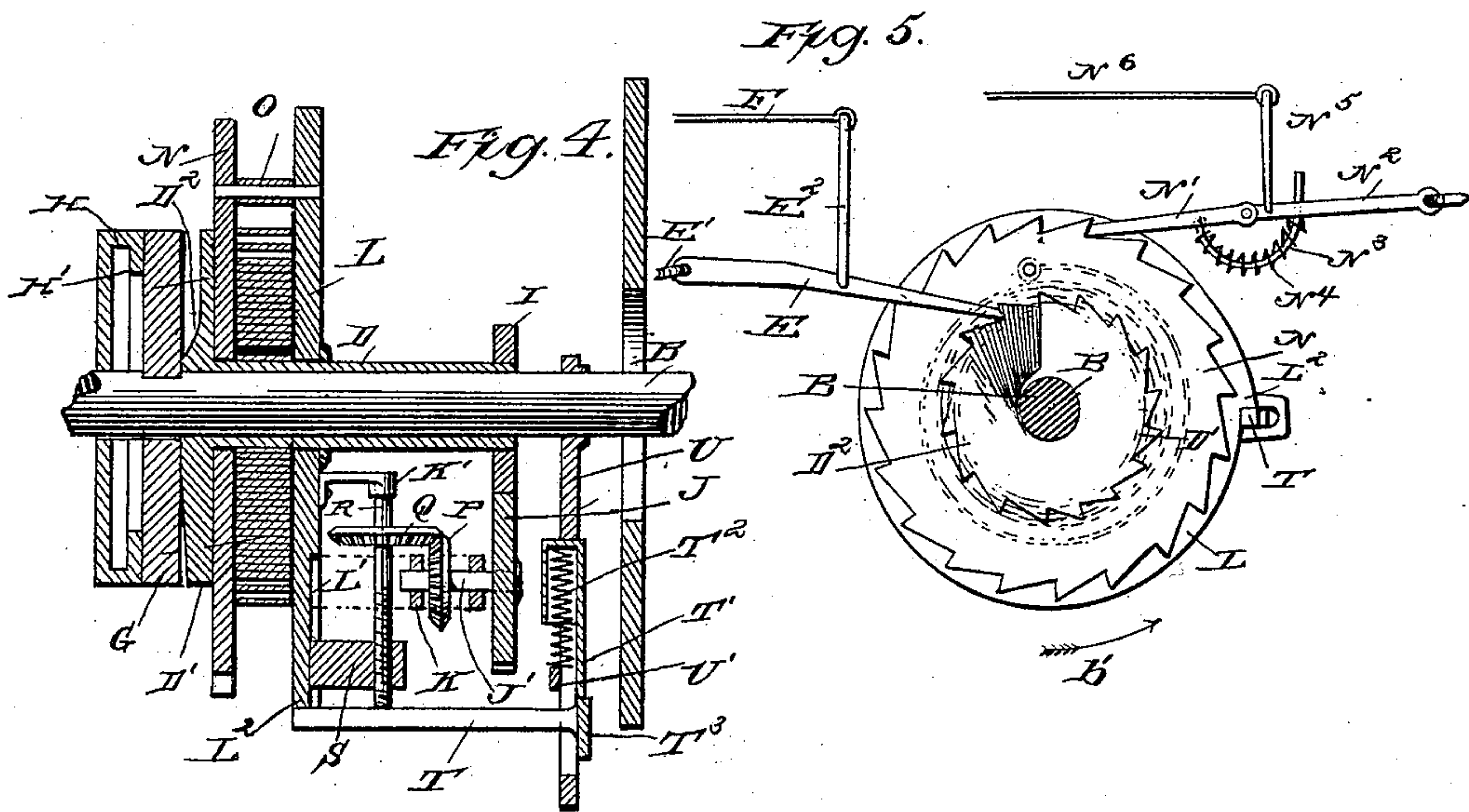
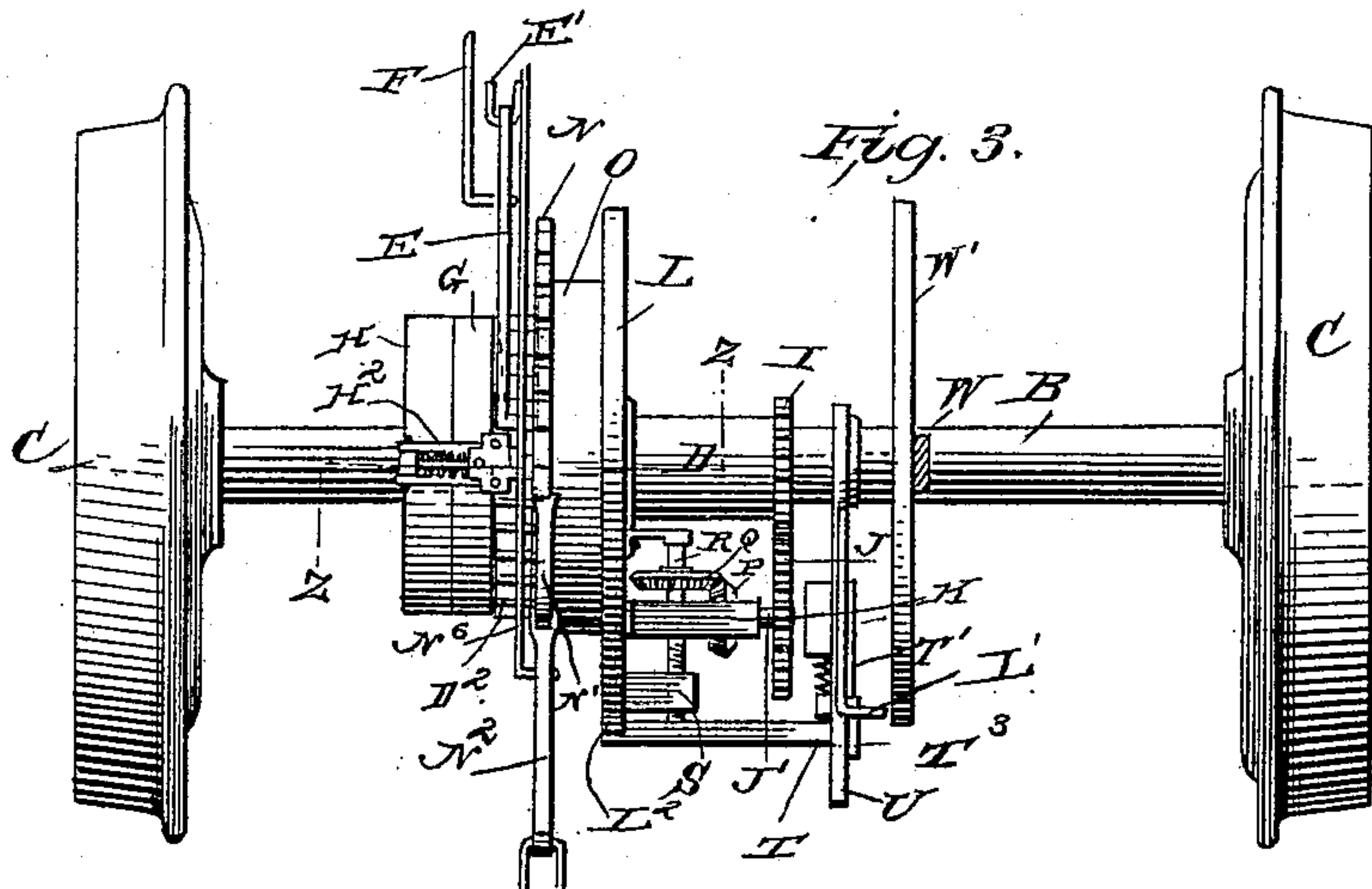
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# UNITED STATES PATENT OFFICE.

WILLIAM P. AKERS AND JOHN C. LINDSEY, JR., OF JACKSBOROUGH, TEXAS.

## CAR-STARTER.

SPECIFICATION forming part of Letters Patent No. 397,327, dated February 5, 1889.

Application filed May 28, 1888. Serial No. 275,380. (No model.)

*To all whom it may concern:*

Be it known that we, WILLIAM PARKS AKERS and JOHN COLLIER LINDSEY, Jr., both of Jacksborough, in the county of Jack and State of Texas, have invented a new and Improved Car-Starter, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved car-starter adapted for all kinds of cars and vehicles, being specially of great value on grades.

The invention consists of certain parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a longitudinal sectional elevation of a car provided with the improvement, parts being in section. Fig. 2 is an end elevation of the same. Fig. 3 is a plan view of the same. Fig. 4 is an enlarged sectional plan view of the same on the line  $x x$  of Fig. 1. Fig. 5 is a sectional side elevation of the improvement on the line  $y y$  of Fig. 2. Fig. 6 is a perspective view of the crank-arm, and Fig. 7 is a sectional end elevation of part of the improvement on the line  $z z$  of Fig. 3.

The car or vehicle A, of any approved construction, is provided with the usual axles, B B', carrying the wheels C C'. On the rear axle, B, is held loosely a sleeve, D, provided with a ratchet-wheel, D', engaged by a pawl, E, fulcrumed at E' to the car A and pivotally connected by a link, E<sup>2</sup>, to a lever, F, fulcrumed on the car A and operated by the driver or conductor of the car. On the front face of the ratchet-wheel D' is formed a spiral cam, D<sup>2</sup>, on which operates the block G, held to slide transversely in a wheel, G', secured to the axle B of the car. The outer end of the block G is provided on top with a shoulder, G<sup>2</sup>, engaged by annular flange H', formed on the lever H, fulcrumed on the bracket H<sup>2</sup>, attached to the car A. A spring, H<sup>3</sup>, is located between the lever H and the bracket H<sup>2</sup>, and serves to press the flange H' against the wheel G', so as to hold the block G in its innermost position. To the upper end of the lever is secured a rope or rod, H<sup>4</sup>, for moving the lever

toward the bracket H<sup>2</sup> to disengage the block G from the cam D<sup>2</sup>. The rope or rod H<sup>4</sup> extends to a brake-staff on the car to be operated conveniently by the operator whenever desired.

To the other end of the sleeve D is secured or on it is formed a gear-wheel, I, meshing into a gear-wheel, J, fastened on a shaft, J', mounted to rotate in suitable bearings, K, fastened on the inner face of the disk L, mounted to rotate loosely on the sleeve D. To the disk L is secured a ratchet-wheel, N, which has its bearing on the sleeve D, and between the said ratchet-wheel N and the disk L is held a coiled spring, O, fastened by one end to the said disk L and by its other end to the sleeve D.

The ratchet-wheel N is engaged by a pawl, N', pivotally connected with the arm N<sup>2</sup>, fulcrumed on the car A. On the pawl N' is pivoted the semicircular arm N<sup>3</sup>, which passes through the arm N<sup>2</sup>, the center of the said semicircular arm N<sup>3</sup> being in the pivot of the pawl N' and the arm N<sup>2</sup>. A spring, N<sup>4</sup>, is coiled on the said semicircular rod or arm N<sup>3</sup>, resting at one end against the said pawl N' and at its other end against the said arm N<sup>2</sup>, and having the tendency to hold the said pawl N' at its other end against the said arm N<sup>2</sup> in a straight position, as shown in Fig. 5. The arm N<sup>2</sup> is connected by a link, N<sup>5</sup>, to a lever, N<sup>6</sup>, fulcrumed on the car, which lever serves to raise said arm, so as to disengage the pawl N' from the ratchet-wheel N whenever the operator desires to do so.

The shaft J, before mentioned, carries a bevel gear-wheel, P, which meshes into a bevel gear-wheel, Q, secured on a screw-rod, R, held by one end in a bearing, K', secured on the disk L, and the other end of the said screw-rod R engages a threaded block, S, held to slide radially in a suitable groove, L', formed on the disk L. The block S is adapted to engage a wrist-pin, T, held adjustably in the crank-arm U, fastened on the axle B. Said wrist-pin T is adapted to engage a notch, L<sup>2</sup>, formed in the periphery of the disk L next to the groove L', in which the block S slides. The wrist-pin T is held to slide in a slot in the crank-arm U, as is plainly shown in Fig. 6, and the outer end of the said wrist-pin is provided with an outwardly-extending arm,



T', against which presses one end of a coiled spring, T<sup>2</sup>, pressing with its other end against the projection U', formed on the crank-arm U. The coiled spring T<sup>2</sup> has a tendency to  
 5 press the wrist-pin T inward. On the extreme outer end of the wrist-pin T is secured a plate, T<sup>3</sup>, provided with one inclined edge, as shown in Fig. 6.

The bottom of the plate T<sup>3</sup> is adapted to  
 10 rest on an arm, V', formed on the upper end of a spring, V, secured to the crank-arm U. Said plate T<sup>3</sup> is also adapted to engage a notch, V<sup>2</sup>, formed in the said arm V' of the spring V, and the extreme outer end of the said  
 15 spring-arm V' forms a bevel, V<sup>3</sup>, adapted to be engaged by the face of a ring, W', formed on a lever, W, fulcrumed on a bracket, W<sup>2</sup>, secured to the car A. A spring, W<sup>3</sup>, is placed  
 20 between the bracket W<sup>2</sup> and the upper end of the lever W, so as to hold the ring W' out of contact with the bevel V<sup>3</sup>. A cord or rod, W<sup>4</sup>, is connected with the upper end of the lever W and extends to the driver or conductor, and is operated by the same.

25 The operation is as follows: When the plate T<sup>3</sup> of the wrist-pin T rests on the arm V' of the spring V, as illustrated in Fig. 6, the said wrist-pin T is disengaged from the notch L<sup>2</sup> of the disk L. When the car A now travels  
 30 in the direction of the arrow a', the crank-arm U rotates with the axle B without engaging the disk L by means of its wrist-pin T, so that the latter, with the sleeve D, remains inactive. Now, when the operator desires to wind up  
 35 the spring O—at the downward movement of the car on a grade, for instance—the operator pulls on the rope or cord W<sup>4</sup>, so that the lever W swings and causes its ring W' to press the bevel V<sup>3</sup> outward, so that the spring-arm  
 40 V' is moved outward, whereby the plate W<sup>3</sup> passes into the notch V<sup>2</sup>, and the spring T<sup>2</sup> forces the wrist-pin T inward until the outer end of the wrist-pin T is brought in close contact with the periphery of the disk L and  
 45 engages, finally, the notch L<sup>2</sup> of the disk. The latter is then rotated by the movement of the crank-arm U and its wrist-pin T in the direction of the arrow b', whereby the spring O is coiled up, and a return movement of the disk  
 50 is prevented by the pawl N' engaging the ratchet-wheel N, connected with the said disk L. When the disk L commences to rotate, the gear-wheel J also commences to rotate on account of being in mesh with the gear-wheel  
 55 I, held on the now stationary sleeve D. The rotary movement of the gear-wheel J imparts a like movement to the gear-wheels P and Q and to the screw-rod R, whereby the latter imparts an outwardly-sliding movement to the block S. When the spring O is nearly  
 60 wound up, the block S comes in contact with the wrist-pin T, and finally lifts the latter from the notch L<sup>2</sup> of the disk L, and the spring-arm V' again assumes its former position, so that the bottom of the plate T<sup>3</sup> rests  
 65 on the top of the arm V' of the spring V, as shown in Fig. 6, the operator having previ-

ously released the rope or cord W<sup>4</sup>. The wrist-pin T is then completely disengaged from the disk L and rotates with the crank-arm U and  
 70 the axle B without touching the disk L. The spring O is held wound up, as the disk L is prevented from a return movement by the pawl N', before mentioned, and the sleeve D, to which the other end of the spring O is se-  
 75 cured, is also prevented from rotating as long as the pawl E engages the ratchet-wheel D', formed on the said sleeve D. When the car now travels up a grade, or is starting after  
 80 having stopped, and the operator desires to utilize the force of the wound-up spring O, he operates the crank-lever F, so that the pawl E is thrown out of contact with the ratchet-wheel D'. The coiled spring O, by exerting  
 85 its pressure against the sleeve D, causes the latter, as the disk L is held stationary, to rotate in the direction of the arrow b', and as the said sleeve is connected with the axle B by the block G, held in the wheel G', and  
 90 against the cam D<sup>2</sup> of the ratchet D', the said axle B receives the force of the coiled spring O, whereby a forward movement in the direction of the arrow a' is given to the car A. By the unwinding of the spring O the block S is  
 95 returned to the inner position. When the car runs backward and the force of the wound-up spring is to be utilized to assist in running backward, then the operator pulls the rope H<sup>4</sup>, so that the lever H, with its an-  
 100 nular flange H', moves the block G outwardly until the latter disengages the spiral cam D<sup>2</sup> on the ratchet-wheel D', thus permitting the car A to run backward without hinderance, as the movement of the wheel G, secured on the  
 105 axle B, is not transmitted to the ratchet-wheel D' on account of the block G' being disengaged with the ratchet-wheel D'. The operator then pulls the cord W<sup>4</sup>, which causes the wrist-pin T to come in close contact with the periphery of the disk L, but does not engage  
 110 the notch L<sup>2</sup> on said disk, because it moves backward over it. The pawl N' is then raised out of notch on ratchet-wheel N, which allows the disk L to be turned backward until the notch L<sup>2</sup> engages the wrist-pin T, thereby as-  
 115 sisting to the extent of the full force of the spring in the backward movement of the car. When the operator, however, desires to wind up the spring O on this backward movement of the car, he slackens the pull on the cord or  
 120 rope H<sup>4</sup>, so that the spring H<sup>3</sup> forces the block G' inward to engage the cam D<sup>2</sup>, whereby the ratchet-wheel D' and its sleeve are turned in the inverse directions of arrow b' and the spring O is wound up. When the force of  
 125 the wound-up spring is to be utilized, the operator proceeds the same as above described.

It is understood that any desired number of such devices may be employed on one axle or on both axles, as desired. When the spring  
 130 O is unwound, the operator drops the pawl E again into contact with the ratchet-wheel D', and when the operator again desires to coil the spring O he operates the lever W, as be-



fore described, and the same operation is repeated.

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

1. In a car-starter, the combination, with a crank-arm held rigid on the axle, of a notched disk adapted to be engaged by the said crank-arm, a coiled spring secured by one end to the said disk, and a sleeve connected with the axle on which the other end of the said spring is secured, said disk being held to rotate loosely on the said sleeve, substantially as shown and described.
2. In a car-starter, the combination, with a crank-arm provided with an adjustable wrist-pin and held rigidly on the axle, of a notched disk adapted to be engaged by the wrist-pin of the said crank-arm, a coiled spring secured by one end to the said disk, a sleeve connected with the axle, and on which the other end of the said spring is secured, a ratchet-wheel connected with the said disk, and a pawl engaging the said ratchet-wheel, substantially as shown and described.
3. In a car-starter, the combination, with a crank-arm provided with an adjustable wrist-pin and held rigidly on the axle, of a notched disk adapted to be engaged by the wrist-pin of the said crank-arm, a coiled spring secured by one end to the said disk, a sleeve on which the said disk is held to rotate, and on which is also secured the other end of the said spring, a ratchet-wheel connected with the said disk and engaged by a fixed pawl, a ratchet-wheel formed on the said sleeve and provided with a spiral cam, and a wheel secured on the axle and carrying a sliding block adapted to engage the said spiral cam, substantially as shown and described.
4. In a car-starter, the combination, with a crank-arm provided with an adjustable wrist-pin and held rigidly on the axle, of a notched disk adapted to be engaged by the wrist-pin of the said crank-arm, a coiled spring secured by one end to the said disk, a sleeve on which the said disk is held to rotate, and on which is also secured the other end of the said spring, a ratchet-wheel connected with the said disk and engaged by a fixed pawl, a ratchet-wheel formed on the said sleeve and provided with a spiral cam, a wheel secured on the axle and carrying a sliding block adapted to engage the said spiral cam, and a lever connected with the said sliding block to move it in and out of contact with the said spiral cam, substantially as shown and described.
5. In a car-starter, the combination, with a crank-arm provided with an adjustable wrist-pin and held rigidly on the axle, of a notched disk adapted to be engaged by the wrist-pin of the said crank-arm, a coiled spring secured by one end to the said disk, a sleeve on which the said disk is held to rotate, and on which is also secured the other end of the said spring, a ratchet-wheel connected with the said disk and engaged by a fixed pawl, a ratchet-wheel

formed on the said sleeve and provided with a spiral cam, a wheel secured on the axle and carrying a sliding block engaging the said spiral cam, and a pawl adapted to engage the ratchet-wheel on the said sleeve, substantially as shown and described.

6. In a car-starter, the combination, with a crank-arm provided with an adjustable wrist-pin and held rigidly on the axle, of a notched disk adapted to be engaged by the wrist-pin of the said crank-arm, a coiled spring secured by one end to the said disk, a sleeve on which the said disk is held to rotate, and on which is also secured the other end of the said spring, a ratchet-wheel connected with the said disk and engaged by a fixed pawl, a ratchet-wheel formed on the said sleeve and provided with a spiral cam, a wheel secured on the axle and carrying a sliding block engaging the said spiral cam, a pawl adapted to engage the ratchet-wheel on the said sleeve, and a lever connected with the said sliding block to move it in and out of contact with the said spiral cam, substantially as shown and described.

7. In a car-starter, the combination, with an axle, of a crank-arm secured on the said axle, a wrist-pin held to slide radially in the said crank-arm, a spring for pressing the said wrist-pin inward in the said crank-arm, a plate held on the extreme inner end of the said wrist-pin, a spring provided with a notch adapted to engage the said plate, and also provided with a bevel, and a lever having a ring adapted to engage the said bevel of the said spring, substantially as shown and described.

8. In a car-starter, the combination, with an axle, of a crank-arm secured on the said axle, a wrist-pin held to slide radially on the said crank-arm, a spring for pressing the said wrist-pin inward in the said crank-arm, a plate held on the extreme inner end of the said wrist-pin, a spring provided with a notch adapted to engage the said plate, and also provided with a bevel, a lever having a ring adapted to engage the said bevel of the said spring, a disk provided with a notch adapted to be engaged by the said wrist-pin, and a coiled spring connected with the said disk and wound up by the rotation of the said disk, substantially as shown and described.

9. In a car-starter, the combination, with a sleeve connected with the axle and provided with a gear-wheel, of a coiled spring secured by one end to the said sleeve, a disk on which the other end of the said spring is secured, said disk turning loosely on the said sleeve, a second gear-wheel meshing into the gear-wheel on the said sleeve, a screw-rod operated by the said second gear-wheel, a threaded block held to slide on the said disk and screwing on the said screw-rod, and a wrist-pin adapted to engage the said disk and held to slide in a crank-arm secured to the axle, said wrist-pin being operated on by the said threaded block, substantially as shown and described.

10. In a car-starter, the combination, with the axle and a sleeve connected with the said



axle, said sleeve being provided with a gear-wheel, of a coiled spring secured by one end to the said sleeve, a disk on which the other end of the said spring is secured, a second gear-wheel meshing into the said gear-wheel on the sleeve, a screw-rod operated by the said second gear-wheel, a threaded block held to slide on the said disk and screwing on the said screw-rod, a wrist-pin engaging the said disk and operated on by the said threaded block, and a crank-arm on which the said wrist-pin is held to slide radially, said crank-arm being secured to the axle, substantially as shown and described.

11. In a car-starter, the combination, with the axle and a sleeve connected with the said axle and provided with a gear-wheel, of a coiled spring secured by one end to the said sleeve, a disk on which the other end of the

said spring is secured, a second gear-wheel meshing into the said gear-wheel on the sleeve, a screw-rod operated by the said second gear-wheel, a threaded block held to slide on the said disk and screwing on the said screw-rod, a wrist-pin engaging the said disk and operated on by the said threaded block, a crank-arm carrying the said wrist-pin and in which it is held to slide radially, said crank-arm being secured to the axle, a spring secured to the said crank-arm and supporting the said wrist-pin, and a lever having a ring adapted to operate on the said spring, substantially as shown and described.

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Witnesses:

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