

(No Model.)

J. O'NEILL.

CAR STARTER.

No. 377,113.

Patented Jan. 31, 1888.

Fig. 2.

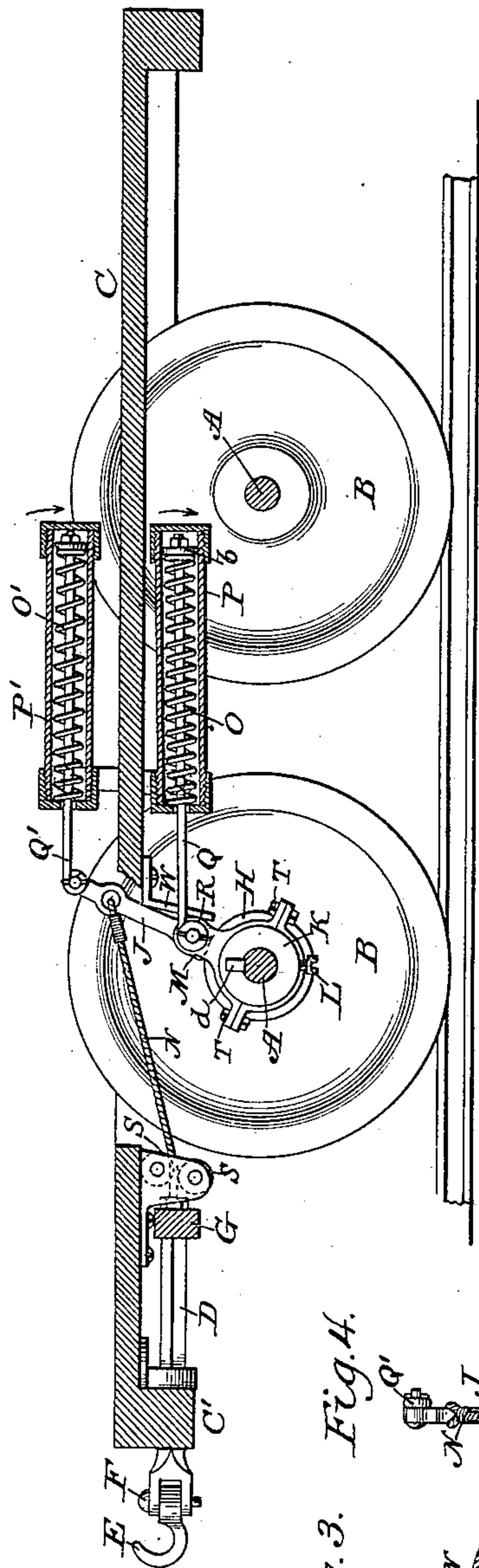


Fig. 1.

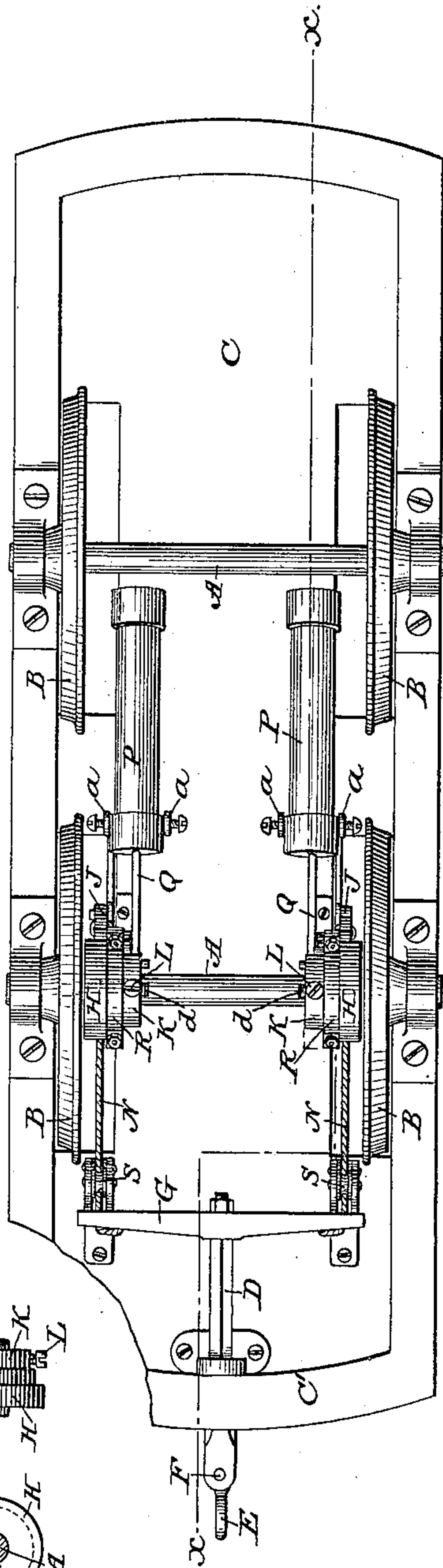


Fig. 3.

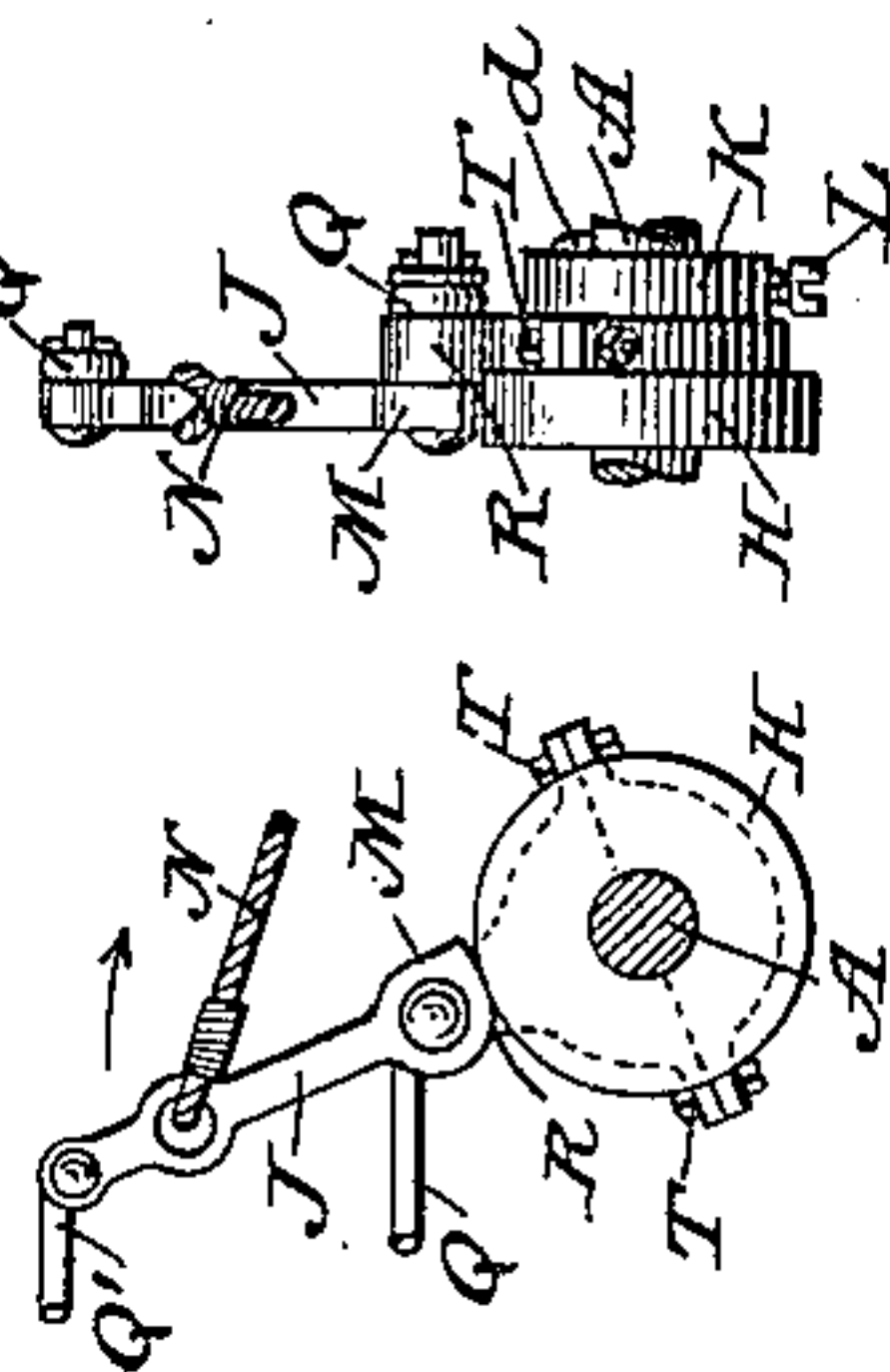
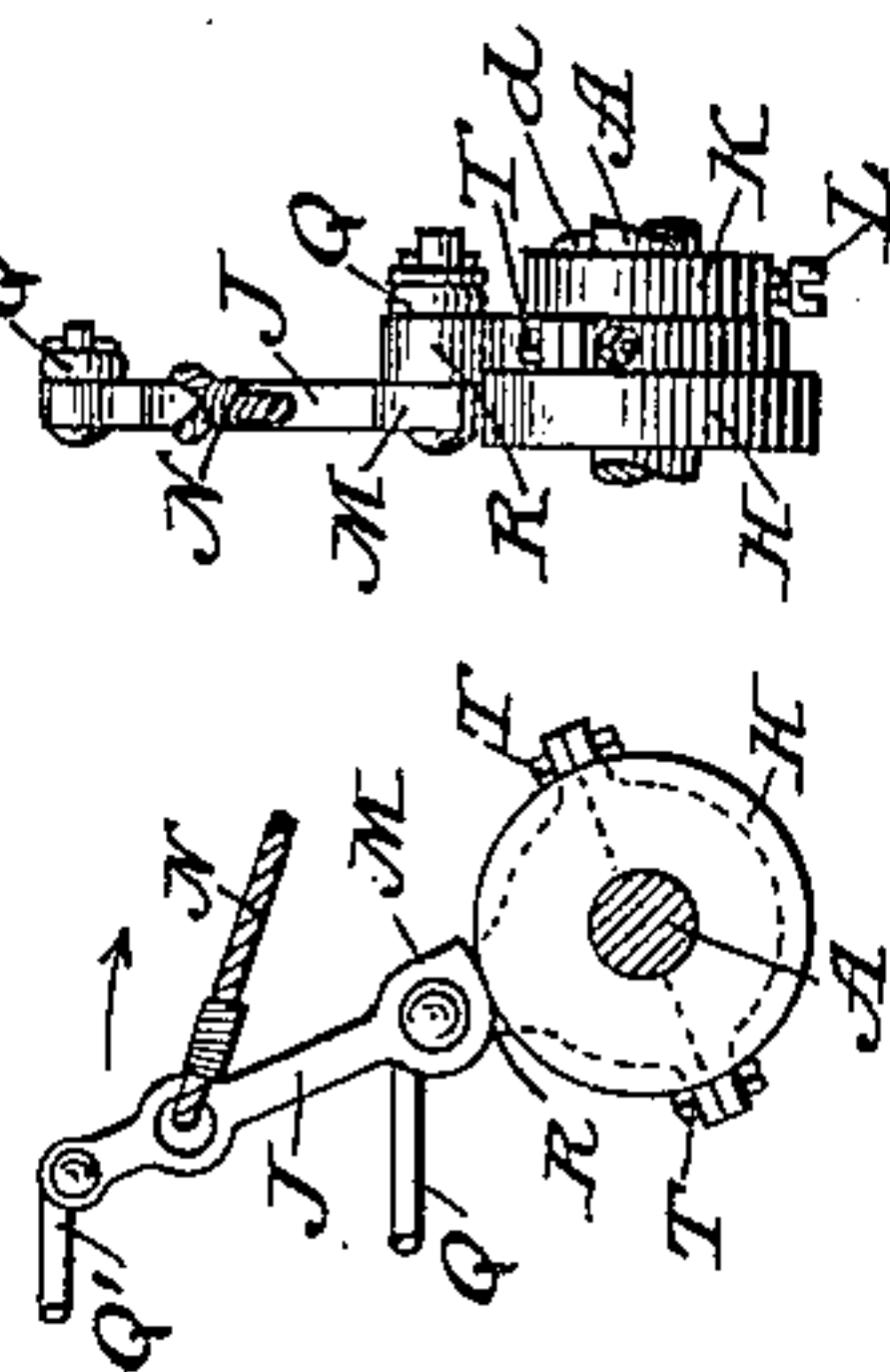


Fig. 4.



Attest:

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CAR-STARTER.

SPECIFICATION forming part of Letters Patent No. 377,113, dated January 31, 1888.

Application filed May 14, 1887. Serial No. 238,165. (No model.)

To all whom it may concern:

Be it known that I, JOHN O'NEILL, of the city, county, and State of New York, have invented certain new and useful Improvements in Car-Starters; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

Figure 1 is a plan view of the under side of the running-gear of a street-car having my improved car-starter applied thereto; Fig. 2, an irregular longitudinal section in line *xx* of Fig. 1; Fig. 3, a detached side elevation of the starting lever and cam, the axle to which it is applied being cut in transverse section; and Fig. 4, an end or edge view of the lever and cam and of the pivotal connections thereof detached.

Similar letters indicate like parts in all of the figures.

My invention relates to that class of car-starters in which a sliding draw-bar connected to an oscillating lever and mounted so as to engage and actuate the periphery of a disk secured upon the axle is employed for the purpose of starting the car forward. Ordinarily the engagement of the oscillating lever with the periphery of the disk has been effected by means of a pawl engaging a ratchet upon the disk.

The object of my invention is to avoid the disadvantages attending the use of ratchet-teeth in this connection, which arise from the liability of the teeth to be broken in the shock and jar of starting the car, and to improve the construction and increase the durability and efficiency of operation of the several parts of the mechanism employed.

It consists, mainly, in the combination, with a circular disk secured to the axle, of a lever pivoted to an arm, itself pivoted loosely upon the same axle at the side of the disk, said lever terminating at its lower pivoted end in a cam or toe projecting eccentrically below the pivot to bear upon the periphery of the adjacent disk, the cam being so shaped as to move freely over the periphery of the disk when the lever is thrown back and engage and take hold thereof when the lever is moved forward.

It consists, also, in the combination, with the radial arm to which the lever is pivoted, of a rod pivoted to said arm, and which extends thence to the rear end of a spiral spring inclosed within a cylindrical case pivoted at its forward end under the car-frame, whereby the spring is compressed when the lever is drawn forward, while its case being free to swing upon its pivoted axis insures constantly a direct line of draft upon the spring in all positions of the lever.

In the accompanying drawings, A A represent the axles; B B the car-wheels, and C the frame, of a car, said frame being mounted over and upon the axles in the customary manner, which it is not necessary herein to describe.

D is a draw-bar mounted centrally under one end of the car or its platform in suitable ways, which permit its longitudinal movement.

E is a hook coupled by a draw-pin, F, to the front end of the draw-bar, and by means of which the horses are attached to the car.

G is a cross-head secured to the rear end of the draw-bar at a right angle therewith.

H H are circular disks secured to the front axle at each end thereof inside of its wheels. Radial arms R R are pivoted upon the axle adjacent to said disks. To each arm R a lever, J, is so pivoted as that its lower end shall overhang the adjacent disk H. The lower end of each lever J projects somewhat beyond its pivot, and is shaped to form an eccentric toe or cam, M, adapted to bear upon the periphery of the adjacent disk H, and which is so shaped and adjusted as that when the upper end of the lever is swung forward toward the draw-bar D the toe or cam will engage and take firm hold of the disk to move it; but when the lever is reversed the cam will move freely back clear of the disk.

Each pivoted radial arm R is confined against the fixed disk H by means of a collar, K, fitted upon the axle and secured thereto by means of a set-screw, L, or in other suitable manner, so as to allow the arm to oscillate freely upon the axle, yet prevent any lateral displacement thereof.

The lever-bars J are made of such length as to afford a powerful leverage upon the disks H, which they engage, and by means thereof upon the axle and wheels. The upper end of

each passes through a slot in the platform of the car, and may be inclosed within the box covering the top of the proximate wheel, and it is connected at or near its outer extremity 5 with the corresponding end of the cross-head G of the draw-bar D by a strong cord or cable, N, led out from the cross-head between a pair of friction-rollers, S S. (See Fig. 2.)

The levers J J are automatically drawn back 10 to retract the draw-bar D each by means of a spiral spring, O, which is preferably inclosed in a cylinder, P, pivoted at its front end by means of trunnions or lateral pins *a a*, Fig. 1, to and between suitable bearings secured for the purpose to the under side of the car frame or floor.

Each spring O is coupled to the radial arm R, to which the lever J is pivoted by means of a rod, Q, which is pivoted at one end to said radial arm, and extends thence through the 20 front end of the cylinder to the rear end of the spring, where it terminates in an enlarged head or washer, *b*, fitted upon the end of the rod, as shown in Fig. 2. A forward movement of the lever J and pivoted arm R is thus 25 made to compress the spring, which is kept in proper alignment with the coupling-rod Q by the oscillation of the pivoted case or cylinder P, in which it is inclosed. By preference, a second similar spring, O', incased in a corresponding cylinder, P', pivoted at its front 30 end to bearings above the frame or floor of the car, is coupled by a rod, Q', to the extreme outer end of each lever J, as shown in Fig. 2. The rearward movement of each lever 35 is arrested by a suitable stop, W, its forward movement being arrested by the contact of the cross-head with the front bar, C', of the car-frame.

To facilitate the application of the disks H, 40 radial pivoted arms R, and collars K to the axle of the car, I contemplate dividing the bearings of each diametrically into two sections, (see dotted line, Fig. 3,) which after being fitted upon the axle are fastened by bolts 45 T T, passing through radial flanges or ears projecting from the periphery thereof, as shown in Figs. 1 and 3. The disk H thus clamped in place upon the axle is fixed by means of a central key, *d*, inserted in a suitable seat be- 50 tween the axle and the disk. By means thereof the starting devices admit of ready attachment to or detachment from the car.

In the operation of this improved device, when the car is at rest, the levers J J are 55 automatically drawn back against the rear stop, W, by the action of the springs O O'. So soon, however, as the horses are started the draft upon the draw-bar and cross-head communicated to the levers J J is transferred to the 60 springs O O', and as these yield to the strain the levers swing forward until arrested by the contact of the cross-head with the front bar of the car-frame, the springs being meantime

compressed thereby. As the levers swing forward, the cam or toe M at the inner end of 65 each engages the disk H, fixed upon the axle, by reason of the wedging action of the cam as it bears against the periphery of the underlying disk, and the disk, and with it the axle and wheels, are thereby made to turn and so 70 to start the car. So soon, however, as the draw-bar is released from tension the resiliency of the compressed springs will come into play to draw back the levers in position to take automatically a fresh hold upon the disks, 75 in readiness to again start the wheels forward at the next pull upon the draw-bar.

I claim as my invention—

1. In a car-starter, the combination, with the car-frame and car-axle, a circular disk secured upon the axle, and an arm pivoted 80 loosely upon said axle at the side of the disk, of a lever pivoted to the arm to overhang the adjacent disk and provided with a toe or cam at its lower end to engage the periphery of the 85 disk when the lever is thrown forward, a spring attached to the radial arm to pull it and the attached lever backward, and a draw-bar fitted to the car-frame and coupled to the lever to pull it and the car forward, substantially in 90 the manner and for the purpose herein set forth.

2. The combination, in a car-starter, of a circular disk secured to the car-axle, a radial 95 arm pivoted loosely upon the axle at the side of the disk, a lever pivoted to said arm and terminating in an eccentric toe or cam adapted to engage the disk, a draw-bar coupled to the free end of the lever, a cylinder pivoted at its 100 forward end to oscillate in the same vertical plane as the lever, a spiral spring fitted within said cylinder, and a coupling-bar engaging at one end the rear end of said spring and pivoted at its opposite end to the radial arm carrying the lever, all substantially in the man- 105 ner and for the purpose herein set forth.

3. The combination, in a car-starter, with an arm pivoted loosely upon the axle, a lever pivoted to said arm, a circular disk secured to the axle and engaged peripherally by said lever 110 when it is moved forward, a draw-bar, and a cord or cable coupling the draw-bar to the lever to move it forward, of a spring coupled to the radial arm on the axle, and a second spring coupled to the outer end of the lever pivoted 115 to said arm, said springs being made to operate conjointly in the retraction of the lever, substantially in the manner and for the purpose herein set forth.

In testimony whereof I have signed my name 120 to this specification in the presence of two subscribing witnesses.

JOHN O'NEILL.

Witnesses:

CHARLES HVASS,
A. N. JESBERA.