

(No Model.)

3 Sheets—Sheet 1.

L. M. WOODCOCK.
CAR STARTER.

No. 509,419.

Patented Nov. 28, 1893.

Fig. 1

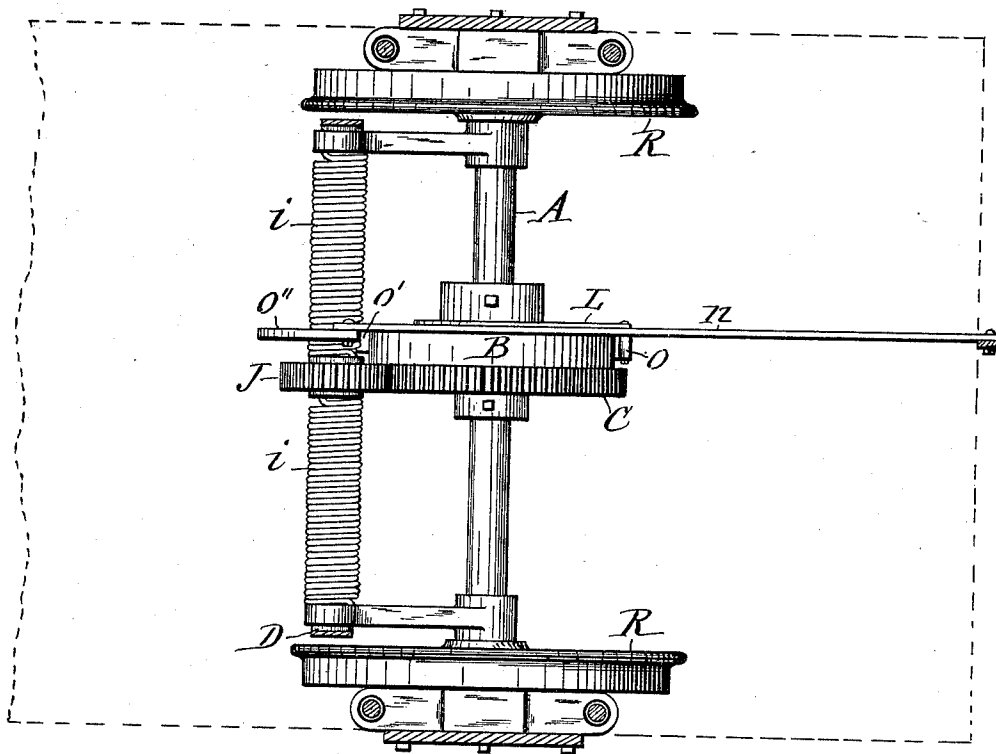
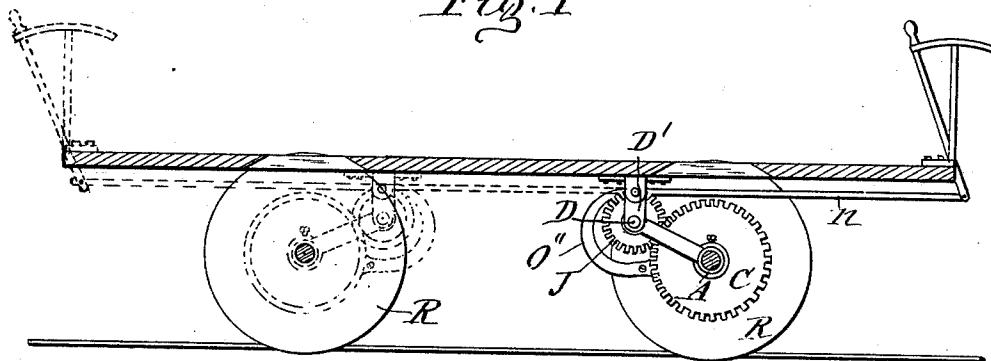


Fig. 2

WITNESSES:

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INVENTOR:

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his ATTORNEY

(No Model.)

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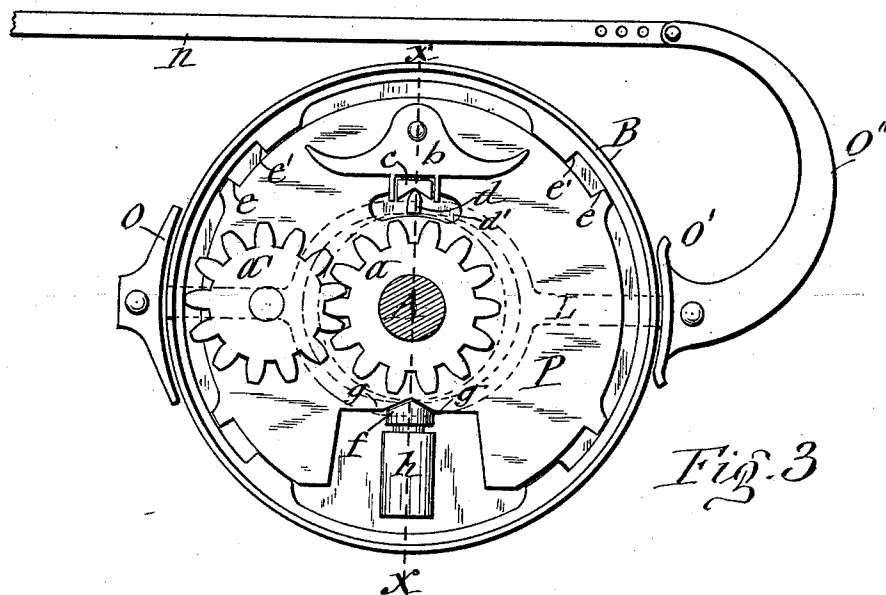


Fig. 3

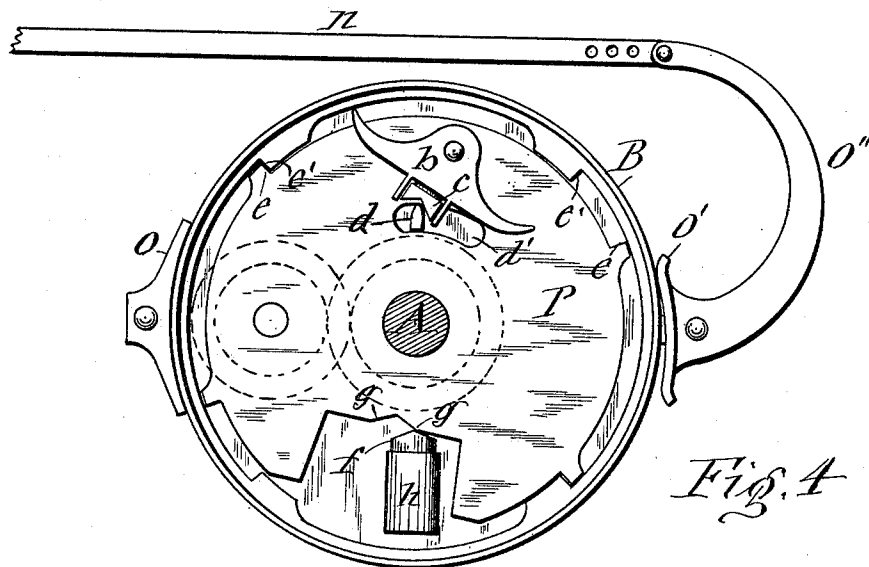


Fig. 4

WITNESSES:

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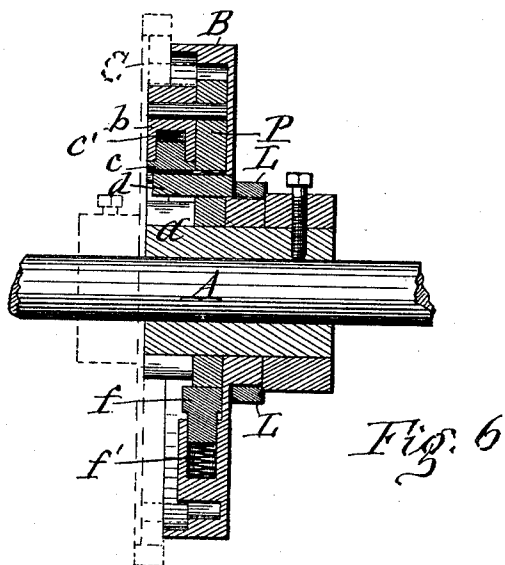
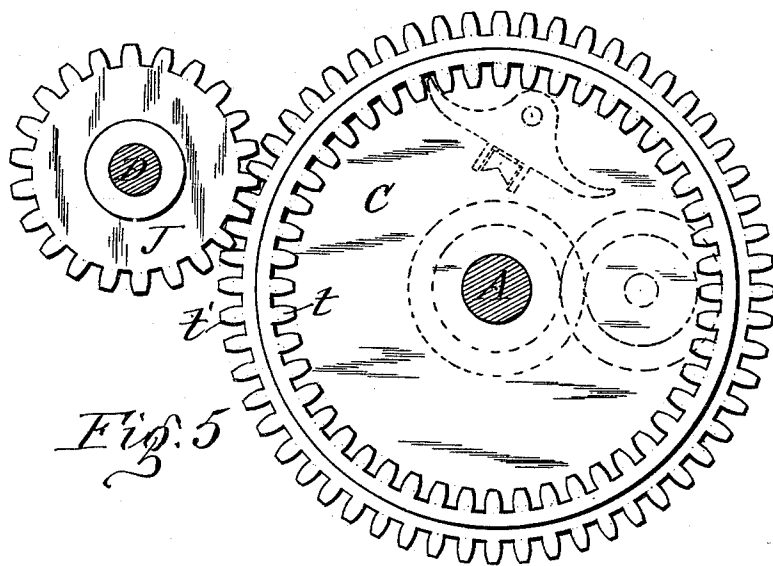
(No Model.)

L. M. WOODCOCK.
CAR STARTER.

3 Sheets—Sheet 3.

No. 509,419.

Patented Nov. 28, 1893.



WITNESSES:

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UNITED STATES PATENT OFFICE.

LEONARD M. WOODCOCK, OF SYRACUSE, NEW YORK.

CAR-STARTER.

SPECIFICATION forming part of Letters Patent No. 509,419, dated November 28, 1893.

Application filed April 8, 1893. Serial No. 469,556. (No model.)

To all whom it may concern:

Be it known that I, LEONARD M. WOODCOCK, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Car-Starters, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to the class of car-starters by which the momentum of the car in motion is utilized for storing power for imparting initial propelling force to the car when first released from the effects of the brake.

My present invention consists in the novel construction and combination of parts hereinafter fully described and specifically set forth in the claims.

In the annexed drawings Figure 1 is a vertical longitudinal section of a car equipped with a car-starter embodying my invention. Fig. 2 is an enlarged plan view of said car-starter. Fig. 3 is a face view of the interior of the brake-wheel of the car-starter showing the same in its normal position. Fig. 4 shows the same in its operative position. Fig. 5 is a face view of the duplex gear-wheel in its connection with the spring-restrained pinion, and Fig. 6 is a transverse section on line *x, x*, in Fig. 3.

Similar letters of reference indicate corresponding parts.

A—represents the car-axle and —R—R—the wheels which are fixed to said axle and carry the car. Upon the axle—A—is loosely mounted the brake-wheel—B—and duplex gear-wheel—C—both of which are formed with annular cavities in their adjacent sides. Said gear-wheel is fitted with one-half of the width of its rim inside of the cavity of the brake-wheel and revolubly therein. The inner portion of the gear-wheel is formed with internal cogs or teeth—*t—t*—, and the outer portion of said wheel is formed with external cogs or teeth—*t'*— as shown in Fig 5 of the drawings. Between the two wheels—B—and—C—is a pinion—*a*—fastened to the axle, and a plate—P—mounted loosely on the axle or hub of the aforesaid pinion. To this plate is pivoted the pinion—*a'*—which

meshes with the pinion—*a*— and internal cogs—*t—t*— of the wheel—C. To the plate—P—is also pivoted the duplex pawl—*b*— which is held normally out of engagement with the internal cogs of the wheel—C— by means of a dog—*c*—backed by a spring—*c'*— which forces the dog outward from the pawl. To the inner side of the brake-wheel is rigidly secured the stud-pin—*d*— which projects through a slot—*d'*—in the plate—P—and has the dog—*c*—resting upon it. The interior of the brake-wheel and the plate—P—are provided respectively with the stops—*e'*— and—*e*— which limit the movement of the plate upon the brake-wheel for the purpose hereinafter described.

The plate—P—is held normally with the pivot of the pawl—*b*—in line with the stud-pin—*d*—and center of the axle—A—by means of the centering dog or bolt—*f*—which is seated in a socket—*h*—formed on the brake-wheel and is backed by a spiral spring—*f'*—as shown in Fig. 6 of the drawings. The outer end face of the said bolt is beveled from the center to opposite sides and bears on centering guides—*g—g*—formed on the plate—P—as illustrated in Figs. 3 and 4 of the drawings.

Parallel with the axle is a shaft—D—mounted on hangers—D'—D'—attached either to the car-body as shown in Fig. 1 of the drawings, or to the truck-frame when such are employed for supporting the car-body on the axle, not necessary to be here shown. On said shaft is mounted the pinion—J—which meshes with the external cogs—*t'—t'*—of the gear-wheel—C. Surrounding the shaft—D—at opposite sides of the pinion—J—are stout spiral springs—*i—i*—fastened at one end to the pinion and at the opposite end to the stationary supports of the shaft, so as to subject the pinion to the resilience of the springs. The springs are wound in one and the same direction and by being connected to opposite sides of the pinion the latter is restrained from turning in either direction.

O— and —O'— represent two brake-shoes which are pivoted to opposite ends of a yoke—L—indicated by dotted lines in Fig. 3 of the drawings. The shoe—O'—is formed

with an arm —O'— which is connected to the brake rod —n.

The operation of the described car-starter is as follows: When the car is in motion the brake-wheel —B— is revolved by the strain exerted on the pinion —a'— which is compelled to travel around the interior of the gear-wheel —C— held stationary by the resistance of one of the springs —i—. The resistance exerted on the plate —P— by the force of the spring bolt —f— and of the stud-pin —d— causes the brake-wheel to turn with the plate —P—. When the brake is applied to the wheel —B— in arresting the movement of the car, the momentum of the car causes the pinion —a— to exert such a force on the pinion —a'— as to turn the plate —P— on the brake-wheel —B— and thereby throws the pawl —b— into the position shown in Fig. 4 of the drawings, in which position said pawl enters between the internal cogs —t— of the gear wheel but is allowed to slip over the same. In this action the stops —e— —e'— serve to prevent the plate from turning too far and the pawl —b— from becoming jammed between the cogs. The plate —P— being thus locked on the brake-wheel, causes the pinion —a'— to transmit motion from the pinion —a— to the gear-wheel —C— which turns the pinion —J— and thereby winds up one of the springs —i— which is retained in said condition until the brake-wheel —B— is released from the brake —O— —O'— and when this takes place, the gear-wheel —C— is allowed to be turned by the resilience of the spring, and the rotation of said gear-wheel imparts motion to the axle —A— by the engagement of the pawl —b— with the internal teeth —t— of the gear-wheel —C— and thus the car is set in motion. As soon as the car is propelled by its motor the pawl —b— becomes released from the gear wheel —C— and the plate —P— is restored to its normal position by the centering pawl —f—.

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

1. A car-starter comprising a pinion fastened to the car-axle, a brake-wheel mounted loosely on the axle, a brake adapted to engage and release said brake-wheel, a gear-wheel mounted loosely on the axle, an intermediate pinion transmitting motion from the aforesaid fastened pinion to the gear-wheel, and the starting-power stored by the movement of said gear-wheel, as set forth.

2. A car-starter comprising a pinion fastened to the car-axle, a brake-wheel mounted loosely on the axle, a brake adapted to engage and release said brake-wheel, a gear-wheel mounted loosely on the axle and having internal and external cogs, an intermediate pinion meshing with the aforesaid fastened pinion and internal cogs of the gear-wheel, a shaft parallel with the axle, a pinion on said

shaft meshing with the external cogs of the aforesaid gear-wheel, and a spring wound around said shaft and held stationary at one end and connected at the opposite end to the pinion, as set forth.

3. A car-starter comprising a pinion fastened to the axle of the car, a brake-wheel and a gear-wheel both mounted loosely on the axle, a brake adapted to engage and release said brake-wheel, a plate interposed movably between the brake-wheel and gear-wheel, a pinion pivoted to said plate and engaging the aforesaid fixed pinion and the loosely mounted gear wheel, a pawl connected to the loose plate and adapted to engage and release the aforesaid gear-wheel, and a spring exerting its resilience on the latter wheel in opposition to its movement received from the aforesaid pinions, as set forth.

4. The combination, with the car-axle, of a brake-wheel mounted loosely on the axle, a brake adapted to engage and release said wheel, a pinion fastened to the axle, a duplex gear-wheel having internal and external cogs and mounted loosely on the axle, a plate interposed movably between the said brake wheel and gear-wheel, a pinion pivoted to said plate and meshing with the aforesaid fastened pinion and with the internal cogs of the gear-wheel, a pawl pivoted to the aforesaid plate and adapted to engage and release said internal cogs, a spring holding said pawl normally disengaged, a stud on the brake-wheel actuating the pawl, a pinion meshing with the external cogs of the duplex gear-wheel, and a spring exerting its resilience on said pinion in opposition to its movement received from the aforesaid gear-wheel, as set forth.

5. In combination with the axle —A—, the brake-wheel —B— and spring-resisted gear-wheel —C— both mounted loosely on the axle, the pinion —A— fastened to the axle, the plate —P— movable independently of said wheels, and pinion, the pinion —a'— transmitting motion from the pinion —a— to the gear-wheel —C— the pawl —b— pivoted to the plate, the spring-dog —c— connected to said pawl, the stud-pin —d— projecting from the brake-wheel and engaging said dog, and stops —e— —e'— on the plate —P— and wheel —B— limiting the independent movements of said plate and wheel, as set forth.

6. In combination with the axle —A—, the brake-wheel —B— and internally and externally toothed gear-wheel —C— both mounted loosely on the axle and formed with cavities in their adjacent sides, the pinion —a— fastened to the axle between the aforesaid wheels, the plate —P— seated movably in the cavity of the brake-wheel, the pinion —a'— pivoted to said plate and meshing with the pinion —a— and internal cogs of the wheel —C—, stops —e— —e'— on the plate and brake-wheel, the pawl —b— pivoted to said plate,

the spring-dog —c— connected to the pawl,
the stud-pin —d— projecting from the brake-
wheel and engaging said dog, the spring-bolt
—f— sustained on the brake-wheel, the cen-
5 tering guides —g—g— on the plate —P—, the
shaft —D— parallel with the axle, the pin-
ion —J— mounted on said shaft, and the
springs —i—i— —j— mounted on said shaft,
and the springs —i—i— connecting said pul-

ley to the stationary support of the shaft, as 10
set forth.

In testimony whereof I have hereunto
signed my name this 5th day of April, 1893.

LEONARD M. WOODCOCK. [L. s.]

Witnesses:

H. M. SEAMANS,
J. J. LAASS.