

(No Model.)

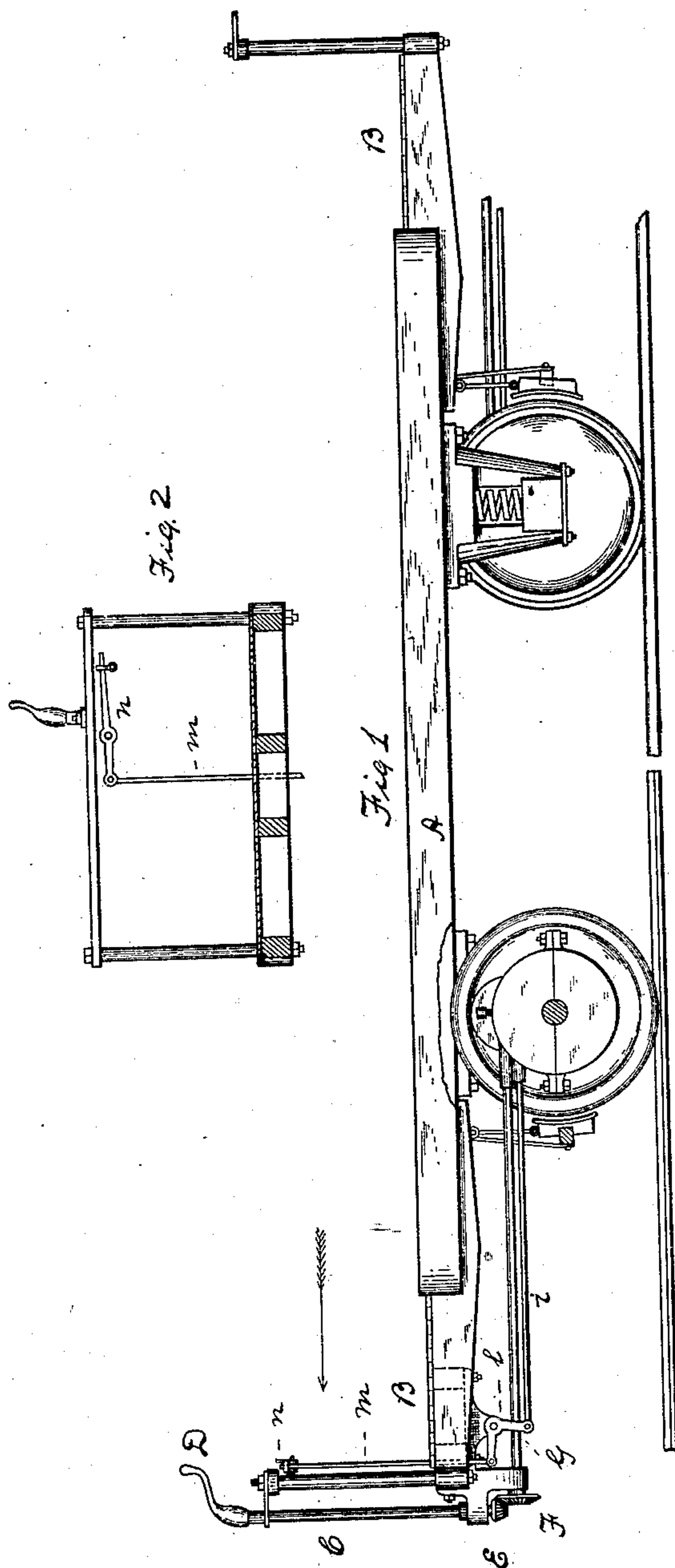
2 Sheets—Sheet 1.

J. LOWBRIDGE.

CAR STARTER.

No. 317,394.

Patented May 5, 1885.



Witnesses.

J. A. Burns.
J. K. Smith

Inventor

Jabez Lowbridge
by his attorneys
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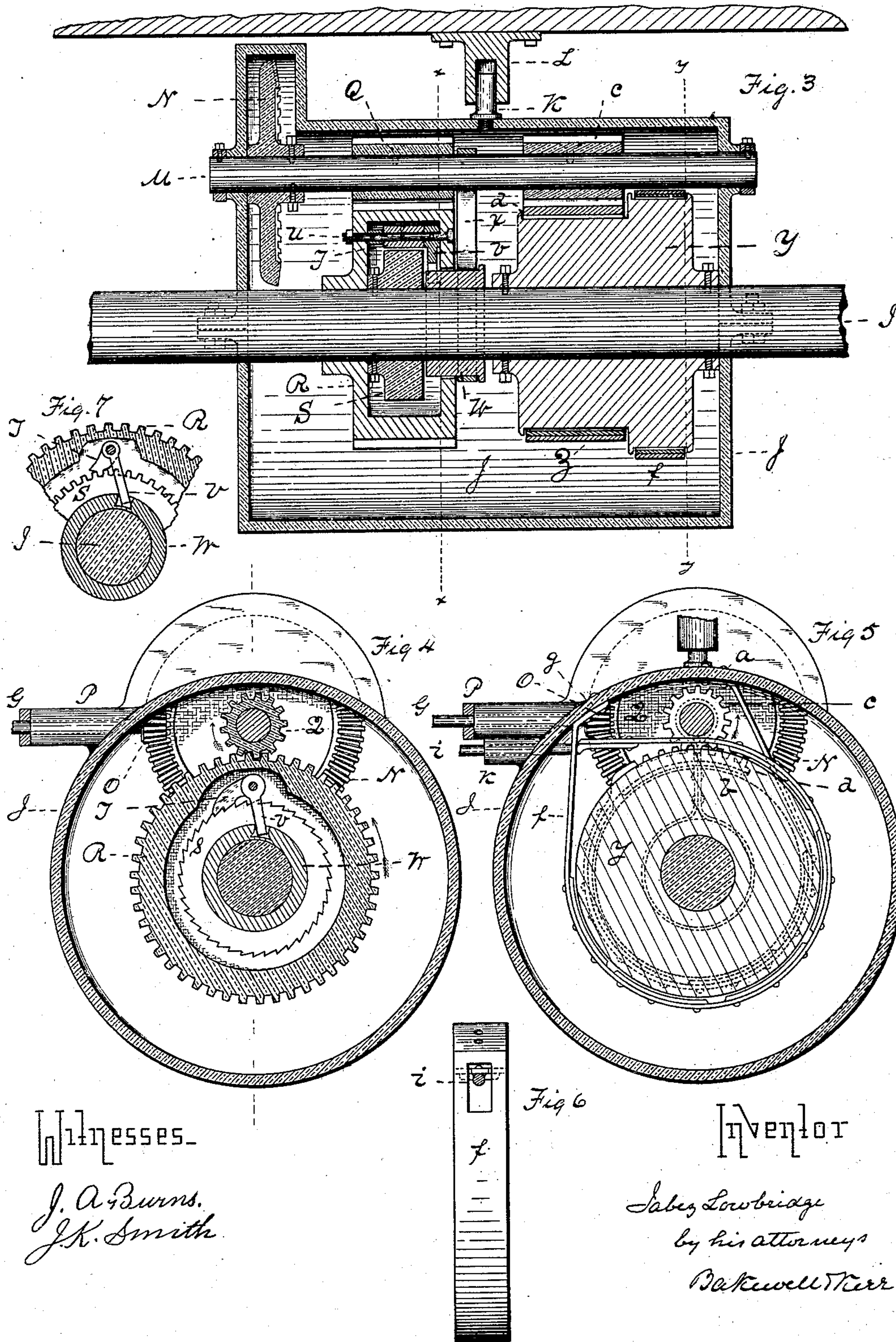
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UNITED STATES PATENT OFFICE.

JABEZ LOWBRIDGE, OF ALLEGHENY, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO PETER WALTER, JR., OF SAME PLACE.

CAR-STARTER.

SPECIFICATION forming part of Letters Patent No. 317,394, dated May 5, 1885.

Application filed September 15, 1884. (No model.)

To all whom it may concern:

Be it known that I, JABEZ LOWBRIDGE, of the city of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Car-Starters; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to an improvement in car-starting mechanism so arranged as to transmit power from a hand-wheel, crank, or other source to the axle or wheels of a car or other vehicles and to a brake-connection which may be employed therewith for stopping the car.

It is well known that in starting street-cars the power required to overcome the inertia of the car taxes the strength of the horses and exhausts them to a much greater extent than the exertion required to draw the car after it has attained a certain amount of momentum. It is therefore the object of my invention to provide a means by which this inertia may be overcome by the driver of the car, and a certain amount of momentum having been attained thereby, the horses are relieved from the sudden strain, and are enabled to draw the car with ease.

My invention is adapted not only for the purpose of relieving the horses of street-cars, but also as well for the purpose of transmitting power having a rapid motion—such as is produced by steam or electric motor—to the axle and wheels of a car, diminishing the speed and increasing the power without any serious loss from friction or other causes.

I will now describe my invention, so that others skilled in the art may manufacture and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of the bed and wheels of a street-car, showing my improvement. Fig. 2 is an end view of the platform of the car, showing the auxiliary brake-lever. Fig. 3 is a vertical longitudinal section through the drum on the axle of the car, and the mechanism contained in the drum by which the power transmitted from the hand-crank by a horizontal shaft is applied to the axle. Fig. 4 is a vertical cross-sectional view of the same

on the line *x x* of Fig. 3. Fig. 5 is a like view on the line *y y* of Fig. 3. Fig. 6 is a detached view of the auxiliary brake-band, and Fig. 7 is a view of a modified form of the pawl T.

Like letters of reference indicate like parts wherever they occur.

In the drawings, A represents the bed or frame of the car, having a platform, B B, at each end thereof.

Attached to the front platform is the usual vertical brake-shaft, C, which I employ, however, as well for the purpose of transmitting power to the car-starting mechanism. At the upper end of this shaft is the hand-crank D, and at the lower end of the shaft is a beveled gear-wheel, E, which meshes into the teeth of a beveled gear-wheel, F, on the end of a horizontal shaft, G. This shaft G extends horizontally under the bed of the car to the mechanism contained within the drum around the axle.

Fitting loosely around the axle I is the drum J, which is secured by the sliding pin K in the socket-piece L, the socket-piece being bolted to the bottom of the bed of the car. In the upper portion of this drum, above and parallel with the axle I, is a horizontal shaft, M, at one end of which, bolted or keyed thereto, is a beveled gear-wheel, N, which meshes with a smaller beveled wheel, O, (see Figs. 4 and 5,) on the end of the horizontal shaft G, which is supported by a horizontal sleeve, P, extending through the circumference of the drum J.

Keyed to the shaft M, at one side of the gear-wheel N, is a gear-wheel, Q, which meshes into gear-teeth on the periphery of the case or hollow wheel R, which fits loosely around the axle I.

Within the hollow wheel R, keyed to the axle I, is a ratchet-wheel, S, outside of the periphery of which, within the wheel or case R, is a pawl, T, keyed to the pivotal bolt U, which passes through the sides of the case or wheel R.

At one side of the pawl T, also keyed to the bolt U, is an arm, V, which extends downward into a notch or slot in the sleeve W, which fits loosely around the axle I.

Fitting around the sleeve W, outside of the hollow wheel or case R, is a friction-band, X, which extends upward around the shaft N, so

as to cause a certain amount of friction between the sleeve W and the shaft M.

These devices together form my improved car-starter.

5 Within the drum J, bolted or keyed to the axle I at one side of the wheel R, is a drum, Y, around a portion of the periphery of which extends a band, Z, preferably formed of flexible metal—such as steel—one end of which is
10 bolted to the inner circumference of the drum J at *a*, from which point the band extends around the periphery of the wheel or drum Y to the point *b* on the periphery of the drum Y.

15 On the shaft M, directly below the band Z, is keyed a gear-wheel, *c*, which meshes into a rack, *d*, which is secured on the outer face of the end of the band Z. The inner face of this band Z is provided with shoes, which bear
20 on the periphery of the drum Y.

In a suitable groove or recess in the periphery of the drum Y is a second brake-band, *f*, the inner end of which is bolted to the inner face of the drum J at the point *g*. Extending
25 thence around the periphery of the drum Y, it is bolted to the end of the rod *i*, which passes through a slot in the brake-band, thence through a sleeve, *k*, directly below the sleeve P, and thence passes parallel with the shaft
30 G to a bell-crank lever, *l*, pivoted to a lug on the lower face of the front platform of the car, the other end of which lever is connected with a vertical rod, *m*, the other end of which is connected with the short arm of a pivoted lever, *n*, which is secured to the platform-railing.
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The operation is as follows: When it is desired to start the car, the driver, by turning the hand-crank D, imparts motion through the vertical shaft C, horizontal shaft G, and
40 bevel-wheel O to the bevel-wheel N, which, through the shaft M and gear-wheel Q, imparts motion to the wheel or case R on the axle I. As this wheel R begins to revolve, the pawl T is thrown onto the teeth of the ratchet-wheel S (so as to engage the same) by the arm
45 V, the end of which engages with the slot or recess in the sleeve W, which sleeve is held stationary by the band *x* until, the pawl having engaged with the ratchet, the sleeve is
50 caused to rotate by being carried by the end of the arm V, which engages on the side of the slot or recess in the sleeve W, so that the arm and sleeve retain their relative position to each other. The purpose of the friction-band is merely
55 to insure the downward movement of the pawl before motion is communicated to the sleeve. When the pawl T engages with the ratchet-wheel S, so as to cause it to revolve with the wheel or case R, the wheel S being keyed to the axle causes it to revolve, and the car is
60 set in motion. After the car has been set in motion and the driver ceases to turn the crank D, the wheels R, Q, and N remain stationary, while the ratchet-wheel S continues to revolve with the axle, the pawl T and sleeve W also remaining stationary, the pawl being raised by the sleeve W, which continues to revolve

until held by the arm V, and thereby the disagreeable clicking noise of the pawl passing
70 over the ratchet-teeth is prevented.

In order to stop the car, the brake-lever D is turned in the reverse direction, which imparts a reverse movement to the shaft *m*, which causes the gear-wheel *c* to engage with the teeth of the rack *d*, and thereby draws
75 on the spring-band Z and causes the shoes *e* to bear on the periphery of the wheel or drum Y, which drum turns with the axle I, being keyed thereto. The friction caused by this pressure gradually stops the revolution of the
80 axle and wheels. During this reverse motion the wheel R is caused to revolve in a reverse direction, the pawl T being held away from the ratchet T by the arm V and sleeve W.

When the car-starting mechanism is in operation, as described, the wheel *c* runs off the rack *d* until the car has been started.
85

The safety or auxiliary brake mechanism is designed to be used should the brake mechanism, already described, get out of order, and
90 it is operated by pressing on the arm of the lever *n*, which, by the connecting rods and lever, draws the shoes on the brake-band *f* against the periphery of the drum Y.

Instead of having the shaft G attached to the brake-shaft D, as described, it may be connected with a steam-engine or electric motor.
95

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—
100

1. In a car or vehicle starter or propeller, the combination of a ratchet-wheel secured to the axle, a power-wheel journaled loosely on the axle around the ratchet-wheel, a pawl pivoted
105 within the power-wheel, so as to engage with the ratchet, and an arm connected with the pawl, said arm being operated either directly or indirectly by the axle to engage or disengage the pawl, substantially as and for the
110 purpose specified.

2. A car or vehicle starter or propeller consisting of a shaft suitably journaled or supported and connected with the axle by a gear-wheel keyed to the shaft, and a gear-wheel
115 fitting loosely on the axle and having a pawl pivoted so as to engage with a ratchet-wheel keyed to the axle, said pawl being connected either directly or indirectly with the axle, so as to be operated automatically by the axle
120 in engaging and disengaging with the ratchet-wheel, and mechanism for imparting power to the shaft, substantially as and for the purpose specified.

3. In a car or vehicle starter or propeller, the combination of a ratchet-wheel keyed to the axle, a power-wheel fitting loosely around the axle, pawl connected with the power-wheel, and a sleeve fitting around the axle and connected with the pawl, substantially as
130 and for the purpose specified.

4. In a combined car starter or propeller and brake, the combination of a power-wheel, a disk keyed to the axle, a friction-band en-

circling the disk, and a rack secured to one end of the band and engaging with the power-wheel, substantially as and for the purpose specified.

- 5 5. In a combined car starter or propeller and brake, the combination of a brake-band connected with the brake-rod and an auxiliary brake-band encircling a disk keyed to the axle, said auxiliary brake being operated

by a separate lever, substantially as and for the purpose specified.

In testimony whereof I have hereunto set my hand this 2d day of September, A. D. 1884.

JABEZ LOWBRIDGE.

Witnesses:

THOMAS W. BAKEWELL,
JAMES H. PORTE.