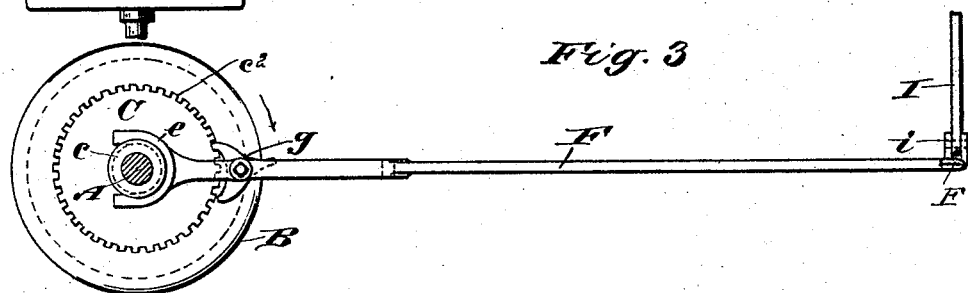
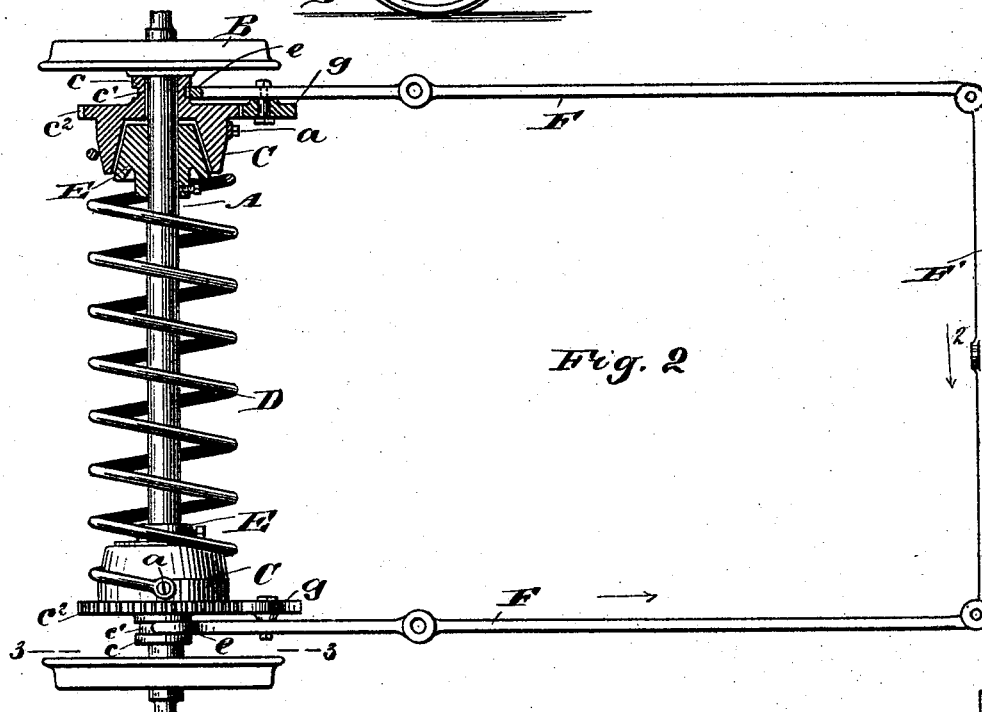
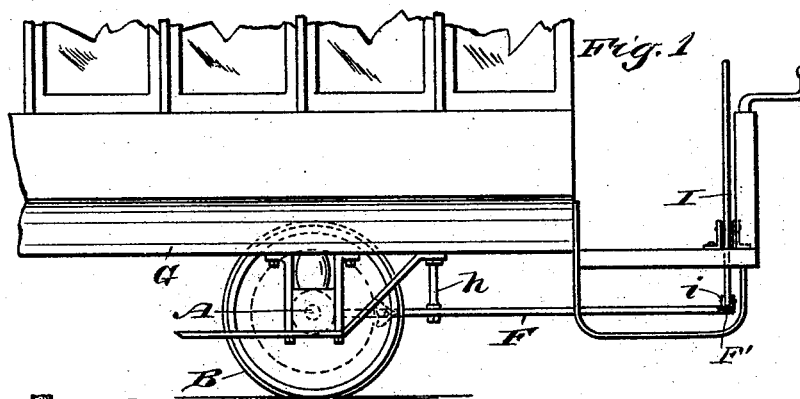


(No Model.)

K. J. PIHL & O. W. HULT.
CAR STARTER.

No. 494,026.

Patented Mar. 21, 1893.



WITNESSES:

J. a. Bergstrom
L. Sedgwick

INVENTORS;

K. J. Pihl
O. W. Hartz

BY

ATTORNEY.

UNITED STATES PATENT OFFICE.

KARL J. PIHL AND OSCAR W. HULT, OF BROOKLYN, NEW YORK.

CAR-STARTER.

SPECIFICATION forming part of Letters Patent No. 494,026, dated March 21, 1893.

Application filed June 7, 1892. Serial No. 435,808. (No model.)

To all whom it may concern:

Be it known that we, KARL J. PIHL and OSCAR W. HULT, both of Brooklyn, in the county of Kings and State of New York, have
5 invented a new and useful Car-Starter, of which the following is a full, clear, and exact description.

The object of this invention is, to provide a novel, simple, and practical device for attachment upon street railway cars, which will be adapted to store the energy due to an arrest of progressive movement of the car by said device, and by manipulation of a releasing lever, transmit this conserved force to the
15 engaged axle of the car, so as to rotate it and thus start the car when desired.

To this end our invention consists in the construction and combination of parts, as is hereinafter described and claimed.

20 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 side view of a street car broken, showing the improvement thereon partly in dotted lines. Fig. 2 is an enlarged detached plan view of a car axle broken, two wheels thereon and the improved car starting mechanism in place, shown partly in section; and
30 Fig. 3, is a side view in section, taken on the line 3—3 in Fig. 2.

The mechanism comprising the novel car starter, is preferably located upon the front axle A, of a street car, which part is rendered
35 cylindrical and true near each wheel B, between the latter, for the support of two similar clutch disks C, that are a part of the improvement, said pieces being located near the inner faces of the wheel hubs. Upon the axle
40 body there is placed a strong spiral spring D, and two similar clutch hubs E; said hubs are slightly coniform tapering toward the disks C, that are cupped to fit accurately upon the hubs when brought into contact therewith.

45 The clutch hubs E, are secured to the axle A, properly separated, so as to leave space for the reciprocation of the clutch disks C, whereon the ends of the spiral spring D, are affixed as at *a*, in Fig. 2.

50 The clutch disks C, have each a hub *c*, projected from the side nearest to the car wheel, concentric with the rim of the disk, said hubs

being grooved peripherally as at *c'*. On the edges of the cupped disks C, near the end walls from which the hubs *c*, project, teeth *c*² 55 are radially formed on each.

Two similar shifting bars F, are provided, which are lapped and pivoted at their forward ends, upon the end portions of the spacing bar F', which is of a proper length to
60 maintain the bars parallel when they are rearwardly engaged as will be explained.

On the rear end portions of the shifting bars F, similar forks *e*, are formed which are shaped and proportioned to permit them to loosely
65 engage the grooves *c'*, in the hubs *c*.

At a proper point on the side of each of the shifting bars F, a pawl *g*, is pivoted; preferably these pawls are furnished with two toes apiece, which by a rocking movement of
70 the pawl, may be made to successively engage the teeth *c*², of the clutch disk C.

At a correct distance from the front axle A, the shifting bars F, are pivotally supported from the car frame G, by loosely engaging the
75 journaled lower ends of a depending post *h*, for each bar, or by equivalent means, so that the shifting bars will be maintained thereon and forwardly projected below the car body toward its platform their points of pivotal
80 attachment being loose enough to permit a slight vibration of the bar F, at the same time.

Near the center of the spacing bar F', a vertical lever I, is pivoted by its lower end
85 thereto as at *i*, which lever projects through the car platform and is fulcrumed thereon, so that its upper end will be in a convenient position for manipulation by the car driver.

In service, it will be seen that if the lever
90 I, is vibrated so as to move the forward ends of the shifting bars F, in the direction of an arrow 2 in Fig. 2, the clutch disk on the side toward which said arrow points, will be thrown into locked condition with the adjacent clutch hub E, thereby connecting the
95 clutch disk with the axle A, so that the rotary motion of the axle will be transmitted to the hub and the connected spring D. The pawl *g*, that is upon the shifting bar nearest to the
100 other clutch disk, which has been slid away from its mating clutch hub by the vibration of lever I, as stated, should be engaged with the teeth *c*², above the upper edge of the shift-

ing bar, as represented in Fig. 3, which will hold the engaged clutch disk so that the progressive motion of the car due to its momentum after draft force is removed therefrom will have a tendency to wrap the spring D closer upon the axle, thus storing the torsional force of the spring; it being understood, that the movement of the lever I, is effected at a time when the car is to be stopped, the enforced coiling of the spring D, serving to check the car as a brake.

Any preferred means may be employed to retain the lever I, laterally adjusted, and thus hold the spring D, in a wrapped condition; and when the car is to be started, an opposite movement of the lever I, will transmit the force of the spring to the axle, so as to aid the progressive movement of the car, if the pawls *g*, are suitably set to allow the torsional energy of the spring to be exerted in the proper direction.

It will be evident that the device will operate effectively in either direction of travel, if a correct adjustment of the pawls *g*, is produced at a proper time.

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

1. The combination with an axle, and two wheels fixed thereon, of two fixed clutch hubs, two loose clutch disks a spiral spring loose on the axle and fast to the clutch disks, and means to detachably lock either clutch disk, substantially as described.

2. The combination with a car body, a car axle, and two fixed car wheels, of two fixed clutch hubs on the axle, two loose clutch disks, a spiral spring loose on the axle and fast at the ends to the disks, two vibratable shifting bars loosely engaging the clutch disks, and two pawls on the shifting bars adapted to interlock with teeth on the clutch disks, substantially as described.

3. The combination with a car body, a car axle, and two car wheels fixed on the axle, of two fixed clutch hubs on the axle, two loose

clutch disks thereon each having a grooved hub, a spiral spring encircling the axle and fixed at the ends on the clutch disks, two pivotally sustained shifting bars that are joined at one end of each, and forked at their other ends which engage the hub grooves, and a double toed pawl on each shifting bar adapted to interlock with radial teeth on the clutch disks, substantially as described.

4. The combination with a car body, an axle, two fixed car wheels, and two coniform clutch hubs fixed on the axle near the wheels, of two cupped clutch disks loose on the axle between the clutch hubs and car wheels, a spiral spring encircling the axle and attached by its ends to the clutch disks, two parallel shifting bars pivoted on the car below, each having a fork at one end that loosely engages a grooved hub on a clutch disk, a spacing bar joining the other ends of the shifting bars, a double toed pawl pivoted on each shifting bar and adapted to interlock with teeth on the clutch disks, and means to vibrate the shifting bars, substantially as described.

5. The combination with a car body, an axle, two fixed car wheels, and two clutch hubs adjustably fixed on the axle, of two cupped clutch disks, a series of radial teeth on each disk, a peripherally grooved hub on each disk, a spiral spring encircling the axle and attached at the ends to the clutch disks, two parallel shifting bars pivoted on the car frame, a spacing bar on the shifting bars at one end, forks on the opposite ends of the shifting bars entering the grooves of the disk hubs, a double toed pawl pivoted on each shifting bar and adapted to engage the teeth on the clutch disks, and a lever that is adapted to vibrate the shifting bars, when manipulated, substantially as described.

KARL J. PIHL.
OSCAR W. HULT.

Witnesses:

E. M. CLARK,
F. W. HANAFORD.