2 Sheets—Sheet 1.

C. A. HARVEY.

CAR-STARTER.

No. 190,853. Patented May 15, 1877.

Fig. 2.

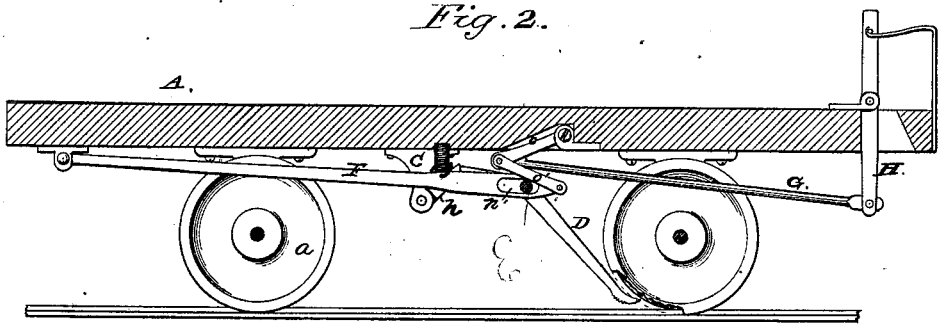


Fig. 1.

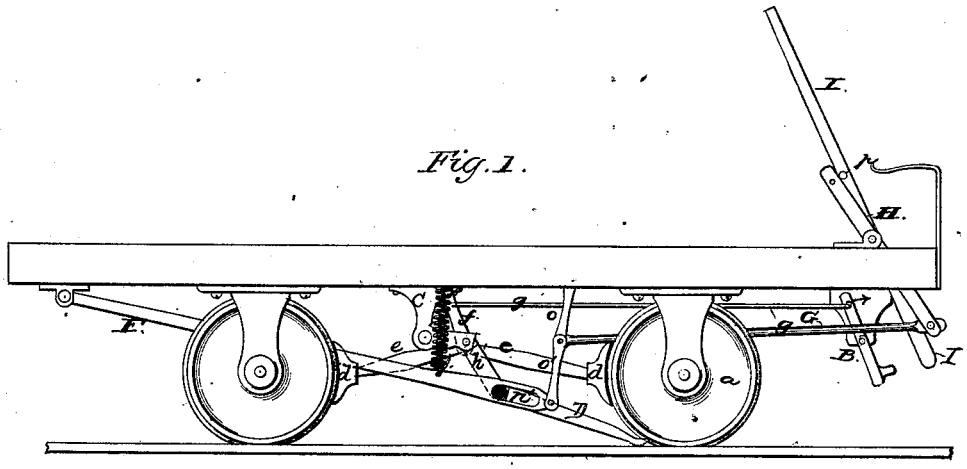
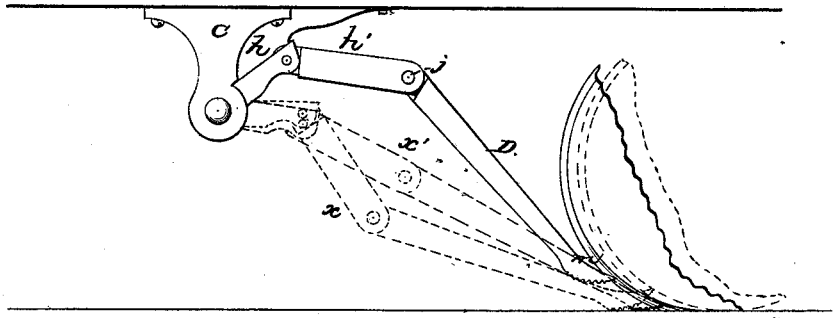


Fig. 5.



Witnesses;
Fred Benjamin
George Thom

Inventor,
C. A. Harvey
By his atty
Charles E. Foster

2 Sheets—Sheet 2.

C. A. HARVEY.

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Fig. 3.

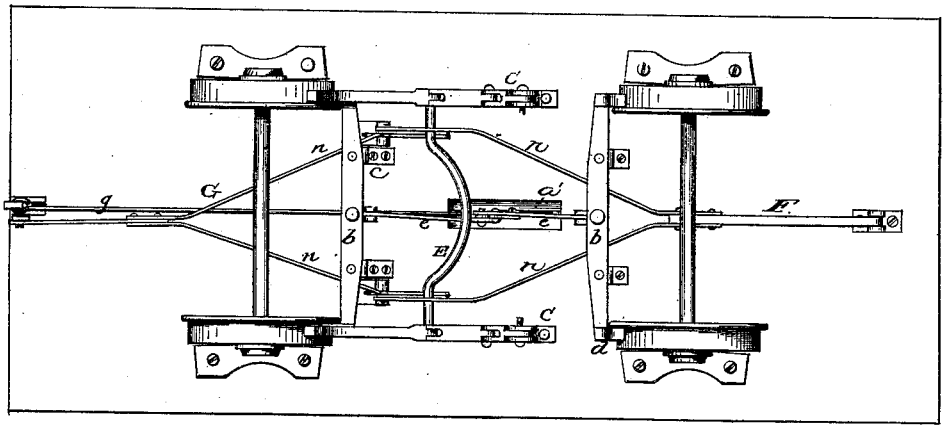
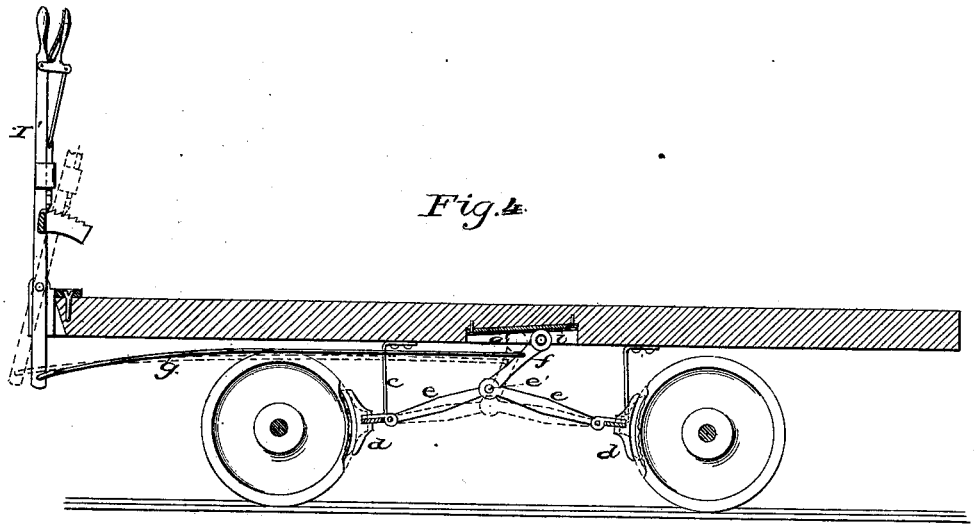


Fig. 4.



Witnesses
Fred Benjamin
George Thom

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Charles E. Foster

UNITED STATES PATENT OFFICE.

CHARLES A. HARVEY, OF WASHINGTON, DISTRICT OF COLUMBIA.

IMPROVEMENT IN CAR-STARTERS.

Specification forming part of Letters Patent No. **190,853**, dated May 15, 1877; application filed April 17, 1877.

To all whom it may concern:

Be it known that I, CHARLES A. HARVEY, of Washington city, District of Columbia, have invented certain new and useful Improvements in Car-Starters, of which the following is the specification:

The object of my invention is a street-car, constructed as fully described hereafter, so as to permit the brakes to be applied by the movement of a lever, and by the other movements of the same or of an independent lever to impart the initial movement to the car quickly and with comparatively little exertion of power.

In the accompanying drawing, Figure 1 is a side elevation of sufficient of a street-car to illustrate my invention. Fig. 2 is a sectional elevation, showing part of the devices. Fig. 3 is an inverted plan view; Fig. 4, a sectional elevation, showing a modification; and Fig. 5 a detached view enlarged.

The platform A is provided with hangers, and is supported by the flanged wheels *a*, in the usual manner. The brake-shoes *d* are secured to the brake-bars *b*, which are suspended, by flexible hangers *c*, or otherwise, from the car-frame. To the center of each brake-beam is jointed the outer end of one of a pair of toggle-levers, *e e*, and to the coupling-pin *e'* of said levers is jointed the lower end of an arm, *f*, the upper end of which is provided with a friction-roller, *i*, having its bearing upon a plate, *a'*, at the under side of the platform, the said plate being, preferably, inclined and grooved. Below the front of the platform is jointed a lever, B, the upper end of which is connected, by a rod, *g*, to the lever *f*.

From the bottom of the platform, on a line with the wheels, are suspended hangers C C, to each of which is jointed, by two links, *h h'*, a pinch-bar, D, the foot *m* of which is rounded and roughened on the under side in the same manner as that of an ordinary hand pinch-bar. The two pinch-bars are connected by a cross-bar or rod, E, the ends *j* of which form the coupling-pins uniting the pinch-bars D and links *h'*, the rod being curved downward, as shown, so that its movements will not conflict with those of the brake mechanism.

To a stud beneath the rear end of the platform is hung the rear end of a lever, F, which is forked at the inner end, each branch *n* having a slot, *n'*, through which the rod E passes, and to the inner end of each fork is jointed the lowermost of a pair of toggles, *o'*. The center pin of each toggle is connected to one of the branches of a forked bar, G, which is jointed to the lower end of a lever, H, extending through and above the platform, and pivoted centrally thereto. To the platform adjacent to the lever H is hung a hand-lever, I, the lower end of which may be brought against the lower end of the lever B, and which is provided with a stud, *p*, arranged to strike the lever H when the handle is drawn back.

When the movement of the car has to be arrested the hand-lever I is thrown forward by the driver until the lower end strikes the lower end of the lever B, which will be turned, as shown by the arrow, Fig. 1, drawing forward the rod *g* and the upper end of the arm *f*, thereby depressing the toggles *e*, and forcibly applying the brakes. By leaving the upper end of the arm *f* free, and giving it a sliding bearing upon the plate *a'*, a most simple and effective means of applying power to the toggles, quickly and with little friction, is provided. When the car is to be started the lever I is pulled back, so as to straighten the toggles *o o'*, and is then pushed forward, so as to fold them, these operations being several times repeated. The operation of the toggles *o o'* alternately raises and depresses the ends of the forked lever F and the cross-bar E, carrying the pinch-bars D to the positions shown in plain and dotted lines, Fig. 5. Thus, when the lever F is raised the bars D are carried to the position shown in Fig. 5; but as the lever is depressed, the bar is gradually brought in line with the links, and is forced forward until its end is wedged between the tread of the wheel and the rail, as shown in dotted lines *x'*. The further downward movement of the lever depresses merely the outer end of the pinch-bar, causing it to rock on the rounded face of the foot *m*, which bites into the rail, so that it cannot slide, while the pointed inner end rises and turns the wheel in precisely the same manner as the ordinary hand pinch-bar, the movements of which are more closely copied by means of the arrangement of devices above described than when the power is applied to the first link, as here-

tofore. A series of such movements resulting from the alternate backward and forward motions of the lever I will soon give the requisite forward motion to the car, which motion may be instantly arrested at any time by extending the forward movement of the lever I, so as to bring it against the lever B, and operate the brake, as before described.

It will be seen that the irregular and somewhat complicated movements of the pinch-bars are obtained through the medium of the links *h h'* and the vibrating rod E, and that the arrangement of devices for operating the said rod is of an extremely simple character, readily adapted for cars of the ordinary construction. Where it is not expedient to use a single lever, I, as described, for operating both the brake and the pinch-bars, a separate lever, I', may be used for the brake, as shown in Fig. 4.

I do not confine myself to the precise devices described for operating the pinch-bars, as other devices connected at the points *j*—as a slotted cam—might be used, and it will be seen that the arm *f* may be attached to a shaft or pivoted at the upper end, and have its sliding bearing on a plate or roller attached to the toggles.

I claim—

1. The combination of the pinch-bars D D, hung below the platform, their operating devices connected to the lever H, the brake-shoes *d*, their operating devices connected to the lever B, and the hand-lever I, arranged to bear both on the lever B and on the lever H, substantially as set forth.

2. The combination, with the toggles attached to the brake-bars of an arm, *f*, interposed between the toggles and the platform, pivoted at one end, and having a sliding bearing at the other, substantially as set forth.

3. The pinch-bars D, their links *h h*, in combination with the devices, substantially as described, for applying the power to elevate and depress the bars to the joints *j*, as set forth.

4. The combination of the bars D, their links *h h*, cross-rod E, lever F, and toggles *o'*, operated from a lever on the platform, as specified.

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

C. A. HARVEY.

Witnesses:

C. E. FOSTER,

FRED. BENJAMIN.