2 Sheets--Sheet 1.

F. ASHLEY.
Car Starter.

No. 164,127. Patented June 8, 1875.

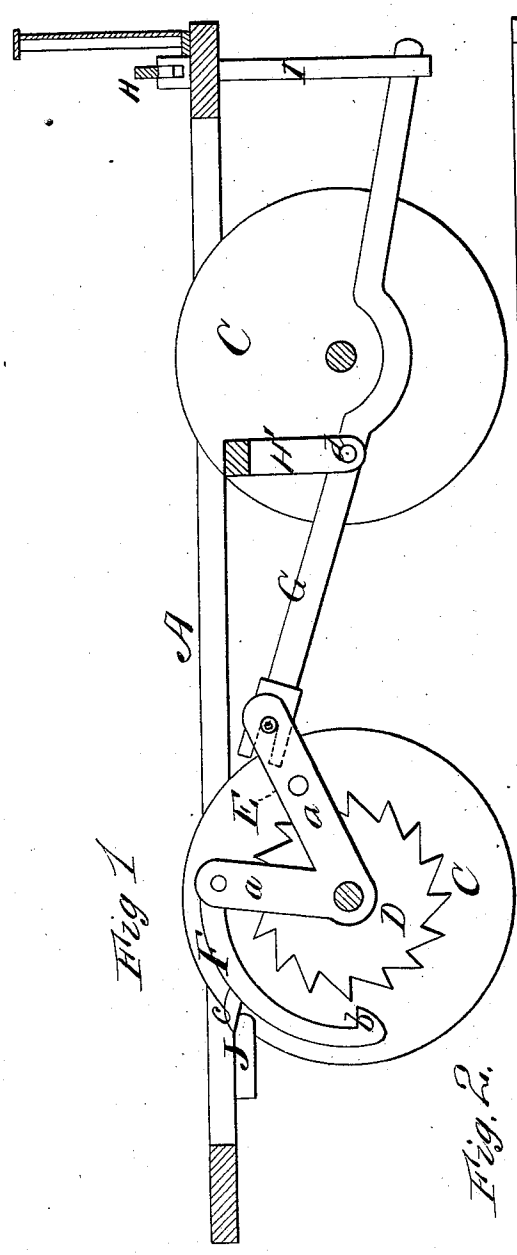


Fig. 1.

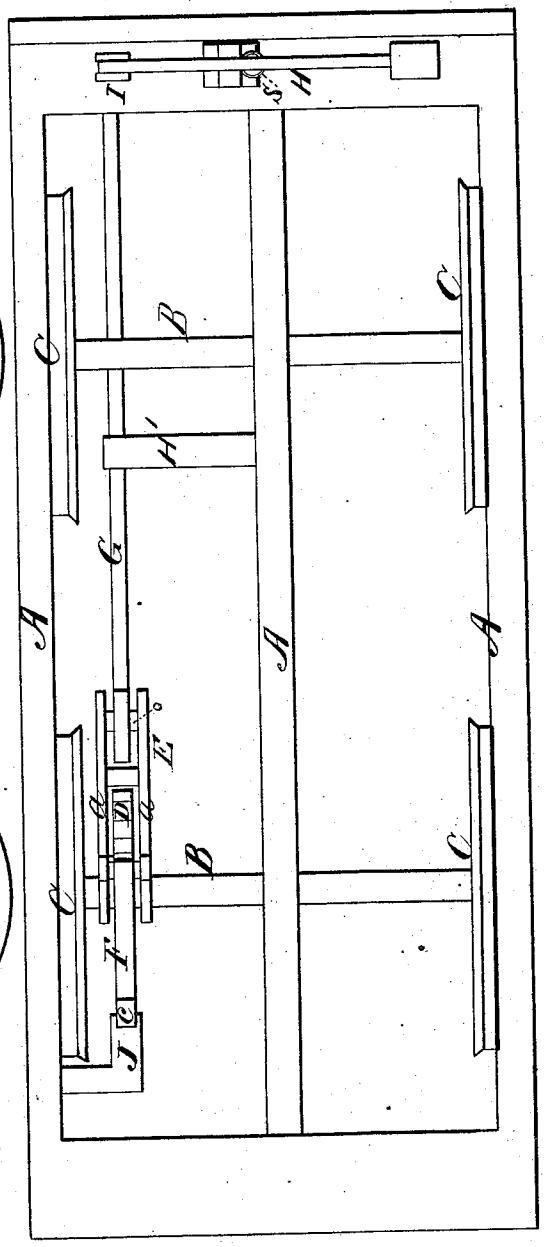


Fig. 2.

WITNESSES
E. H. Bates
Eug. W. Johnson

INVENTOR
Frederick Ashley.
Chipman Fosmer & Co.,
ATTORNEYS

THE GRAPHIC CO. PHOTO-LITH. 39 & 41 PARK PLACE, N.Y.

2 Sheets--Sheet 2.

F. ASHLEY.

Car Starter.

No. 164,127. Patented June 8, 1875.

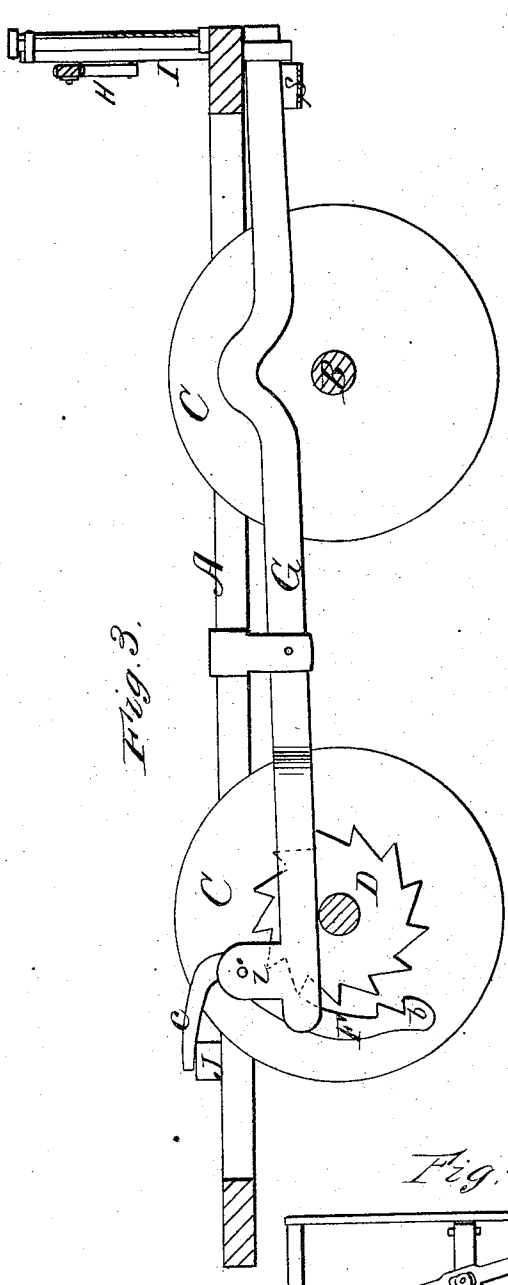


Fig. 3.

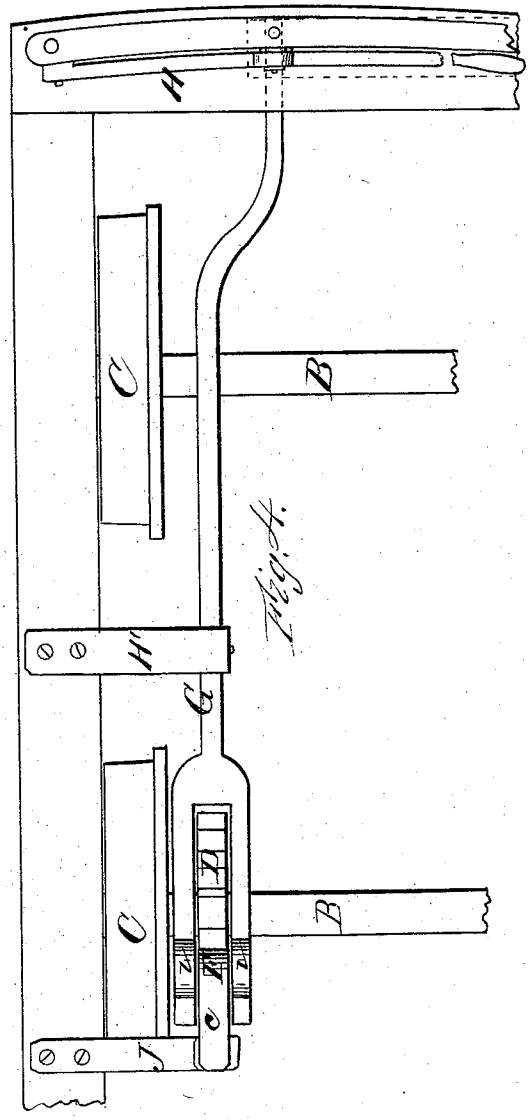
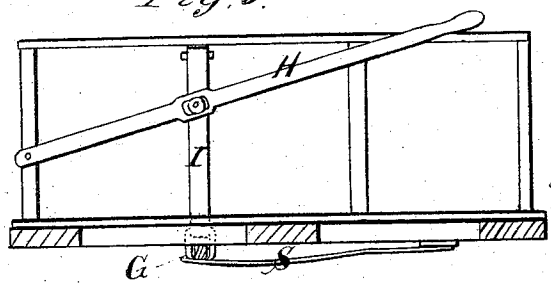


Fig. 4.

Fig. 5.



WITNESSES

Eug. M. Johnson

E. H. Bates

INVENTOR

Frederick Ashley

Cushman Darby & Cushman

ATTORNEYS

THE GRAPHIC CO. PHOTO-LITH. 39 & 41 PARK PLACE, N. Y.

UNITED STATES PATENT OFFICE.

FREDERICK ASHLEY, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN CAR-STARTERS.

Specification forming part of Letters Patent No. **164,127**, dated June 8, 1875; application filed March 27, 1875.

To all whom it may concern:

Be it known that I, FREDERICK ASHLEY, of Brooklyn, in the county of Kings and State of New York, have invented a new and valuable Improvement in Car-Starters; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a longitudinal vertical section of my car-starter, and Fig. 2 is a plan view of the same. Figs. 3, 4, and 5 represent views of a modification.

This invention has relation to improvements in car-starters for street-railways, which are designed for giving initial movement to the car for the purpose of relieving the draft animals of the intense effort necessary to overcome the inertia of the same when heavily loaded; and the nature of the invention consists in an angular lever vibrating vertically and loosely upon the axle of a horse-car, which lever has on its upper end a vibrating pawl adapted to engage automatically with a rack-wheel rigidly keyed upon the said shaft when the said angular lever is actuated by an operating lever and its connections, the latter being in reach of the driver, whereby a very great degree of power for turning over the car-wheels is obtained, and a very effective start is given to the car. It also consists in a shelf or rest upon which the said pawl is adapted to be received, and held clear of the aforesaid rack-wheel, when the said angular lever is returned to its normal position by a retracting-spring, whereby the wheels are allowed to rotate freely, and all disagreeable and undue clatter is prevented, all as will be hereinafter more fully explained and claimed.

In the annexed drawings, A designates the frame-work of the car-floor mounted upon the axles B of the usual well-known transporting-wheels C. D represents a rack-wheel keyed or otherwise suitably secured upon the rear axle of the said car, and embraced within the bars *a* of a vertically-vibrating angular lever E, which is loosely applied upon the said axle, as shown in Fig. 1. The weight-arm of this lever sustains in its upper end a vertically-vibrating pawl, F, upon the lower end of which is a tooth, *b*, which is adapted, when the power-arm of lever E is thrust down, by means hereinafter described, to engage with the teeth of rack-wheel D, causing the axle to be turned bodily over, and forcing the car ahead. It has also a projecting lug, *c*, upon its rear surface, the use and advantages of which will be fully made clear in the course of this specification. G indicates a vertically-vibrating connecting-lever, pivoted in any suitable manner to the rear end of angular lever E, and having its fulcrum at *d* in an outwardly-projecting horizontally-arranged arm, H′, situated in rear of the front axle. With a view to giving it the greatest possible leverage consistent with obtaining the length of the vibration of the power-arm of lever E, I prefer to fulcrum the lever G as above described; and, in order to supplement this vibration by adding to it that of lever G, the power-arm of the latter is bent where it passes under the front axle, its convexity being downward, thus obtaining, through the increased power of levers E and G, and the greater length of vibration of their respective power-arms, an increased length of the arc of vibration of pawl F, and a consequent more marked rotation of the wheels and starting of the car. The power-arm of lever G is operated by a treadle-lever, H, through the medium of a rod, I, pivoted to the power and weight ends, respectively, of the said levers, as shown in Fig. 1. When the power-arm of lever H is forcibly thrust down by the foot of the driver, the weight-arm of lever G will be depressed, at the same time depressing the power-arm of lever E, bringing its weight-arm forward, and actuating pawl F to cause the wheel to rotate, thus giving a forward impulse to the car which the draft animals will readily take up, thus relieving them of great strain and consequent frequent injury from falls or lesions. When the car has been started the driver will remove his foot from the treadle when a suitable spring, S, which was compressed by the previous actuation thereof, will force the power-arm of the said lever upward, reversing all the movements of the above-described connecting-levers.

As a consequence of this reversal, lug *c* of angular lever E will be thrust rearwardly on a shelf or support, J, being then held with its tooth free from the periphery of rack-wheel D, thus preventing all clattering and undue wear thereof in consequence of the friction of the former during the rotation of the latter during the progress of the car. Pawl D, not being in engagement with the rack-wheel, will also allow the car to be backed if it should be at any time necessary. Under certain circumstances I may prefer to dispense with lever E. In this case lever G will extend rearwardly to rack-wheel D, its rear end being bifurcated, and inclosing the said rack-wheel, as shown in Fig. 4. In this case also pawl F will be pivoted in standards *i* on the arms of the said bifurcation, and will be held from an engagement with the teeth of the said wheel during the forward progress of the car by means of an arm, *c*, projecting rearwardly from the said pawl, and forced up upon a shelf, J, by the reaction of a suitable spring, S. In practice also I may use a treadle or a hand-lever, as I may elect.

I am aware that a street-car, provided with a toothed wheel, operated by a band-lever having two pawls, so that the vibration of the lever causes a continuous forward strain to turn the car-wheel, has heretofore been employed, and I, therefore, lay no claim to such invention.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a horse-car starter, the combination of angular lever E, having its fulcrum in one of the car-axles, hinged pawl F, having a projection, *b*, the toothed wheel D, lever G, bifurcated at its rear end, rod I and treadle H, all substantially as described, for the purpose set forth.

2. The combination, in a car-starter, of a reaction-spring, S, a propulsion-pawl, F, having a lug or arm, *c*, the necessary connecting mechanism, and a shelf, J, for holding the said pawl free from the toothed periphery of the rack-wheel, substantially as set forth.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two subscribing witnesses.

FREDERICK ASHLEY.

Witnesses:

GEO. H. FISHER,

WM. B. HURD, Jr.