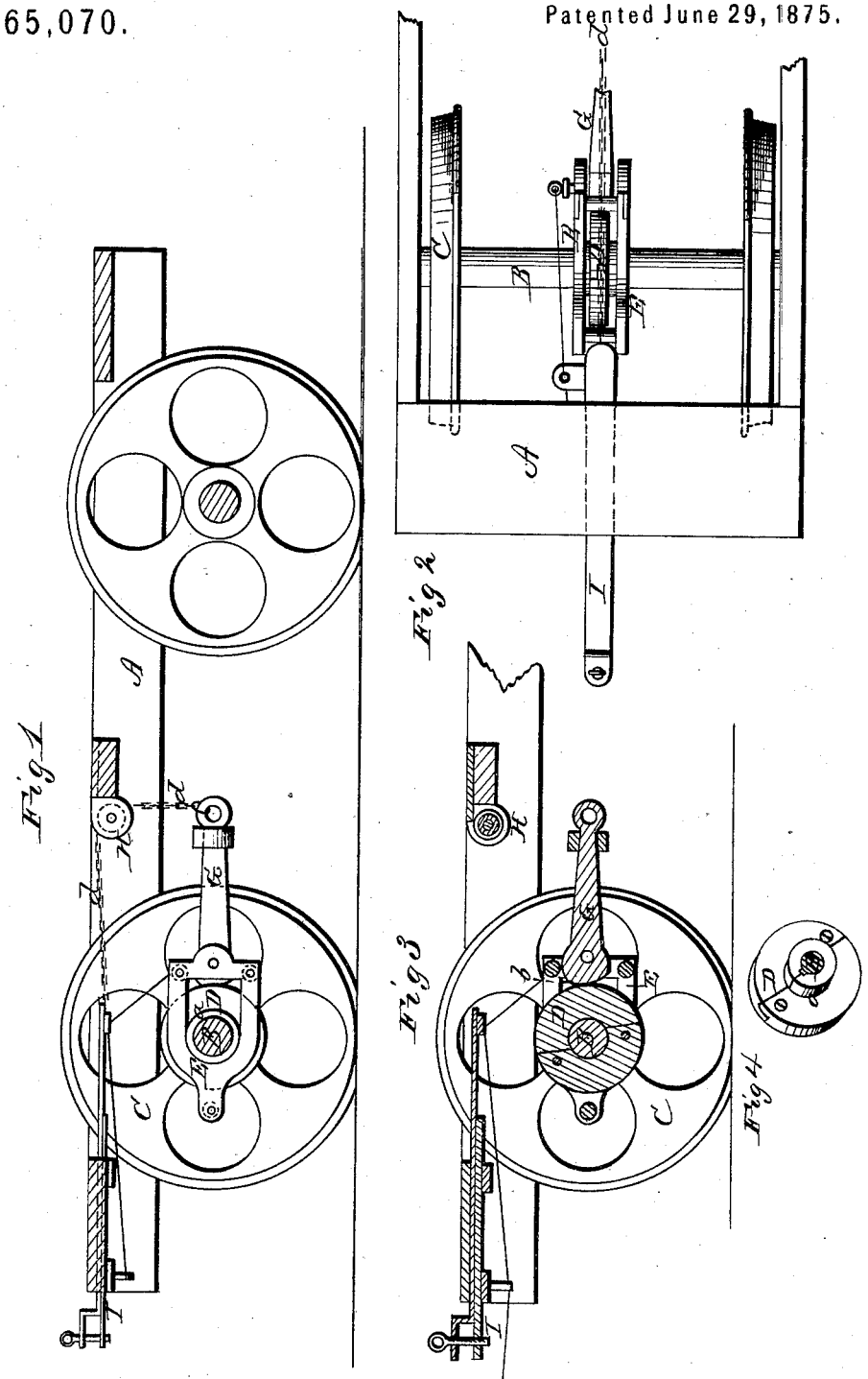
G. S. CURTIS.

Car-Starter.

No. 165,070. Patented June 29, 1875.



WITNESSES

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UNITED STATES PATENT OFFICE.

GEORGE S. CURTIS, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN CAR-STARTERS.

Specification forming part of Letters Patent No. **165,070**, dated June 29, 1875; application filed February 18, 1875.

To all whom it may concern:

Be it known that I, GEORGE S. CURTIS, of Chicago, in the county of Cook and in the State of Illinois, have invented certain new and useful Improvements in Car-Starters and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

The nature of my invention consists in the construction and arrangement of a device attached to the axle of a horse-car, and so connected with the draw-bar as to materially assist the horse or horses in starting the car when heavily loaded, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawing, in which—

Figure 1 is a longitudinal vertical section of a car-frame with wheels and my car-starter applied thereto. Fig. 2 is a plan view of my invention. Fig. 3 is a longitudinal section of the same; and Fig. 4 is a detached view of a part thereof.

A represents the bottom frame of the car. B is the front axle, and C C the driving-wheels fastened thereon. For a full-sized car I use a collar, D, about eight inches in diameter, and of suitable thickness, with a hub, *a*, on each side, all made of cast-iron, in two parts, and bolted or screwed together. It is then bored to the size of the axle, put on a mandrel, and the hubs turned to one size, and the periphery of the collar also turned. Being in two halves allows it to be put on the center of the axle, and securely keyed thereto to prevent it from turning, without the necessity of taking off a car-wheel, and, as the axle is frequently smallest in the center, more likely to get a good fit. On the hubs *a* of this collar are two stirrups, E E, long enough to allow of their being bolted together outside of the collar, with studs between them to prevent their binding the collar, and allowing it to revolve freely in the stirrups. Between the rear ends of these stirrups is pivoted a lever, G, the inner end *b* of which is eccentric-shaped, and bears on the collar a little above the center. The eccentric end *b* of the lever, bearing above the center of the collar, must form a bight upon it, when the outer or rear end of the lever is raised, which is sure and instant. The lever G extends back from the center of the axle from eighteen to twenty inches, more or less, and to its rear end is attached a draw-chain, *d*, which passes upward over a pulley, H, arranged in the frame A, directly over the end of the lever. The chain *d* is attached to the rear end of a draw-bar, I, which moves freely in suitable guides at the front end of the car, and is long enough to allow it to be drawn out and back about ten inches, more or less. The distance between the pulley H and the rear end of the lever G, when at rest, should also be about ten inches.

The lever may be weighted sufficiently to drop when the traces are slacked, or a spring may be arranged to accomplish the same object.

It will be seen that when the horses commence to draw they act upon the lever G, and as this lever takes immediate hold on the collar D it will roll the wheels about ten inches, and requiring but about one-third the pull that it would in starting without this attachment; and as the horse moves forward twenty inches while the car only moves ten inches it gives the horse a position to draw a heavy load without that great exertion required to give a heavy load the first start. By this arrangement he starts the load with hardly an effort. This attachment also helps, by the same principle, to keep the car in motion, as when the traces are slack from depressions in the track the lever will drop, and when the traces are tightened it must act upon the lever, as its action is instantaneous. It also acts as a perfect brake when the car stops on an ascending grade without the attention of the driver, and he is ready to start without manipulating the ordinary crank-brake, and his team also having all the advantages of the lever.

I am aware that a car-starter having a pivoted cam which acts in connection with a col-

lar or projection on the car-axle is, broadly, not new.

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

The combination of the axle B, collar D, made in two parts, and having hubs *a a*, stirrups E E, horizontal lever G, pivoted to the stirrups, and having eccentric *b*, the chain *d*, pulley H, and sliding draw-bar I, substantially as and for the purposes set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 20th day of January, 1875.

GEORGE S. CURTIS.

Witnesses:

HENRY CURTIS,

S. E. HURLBUT.