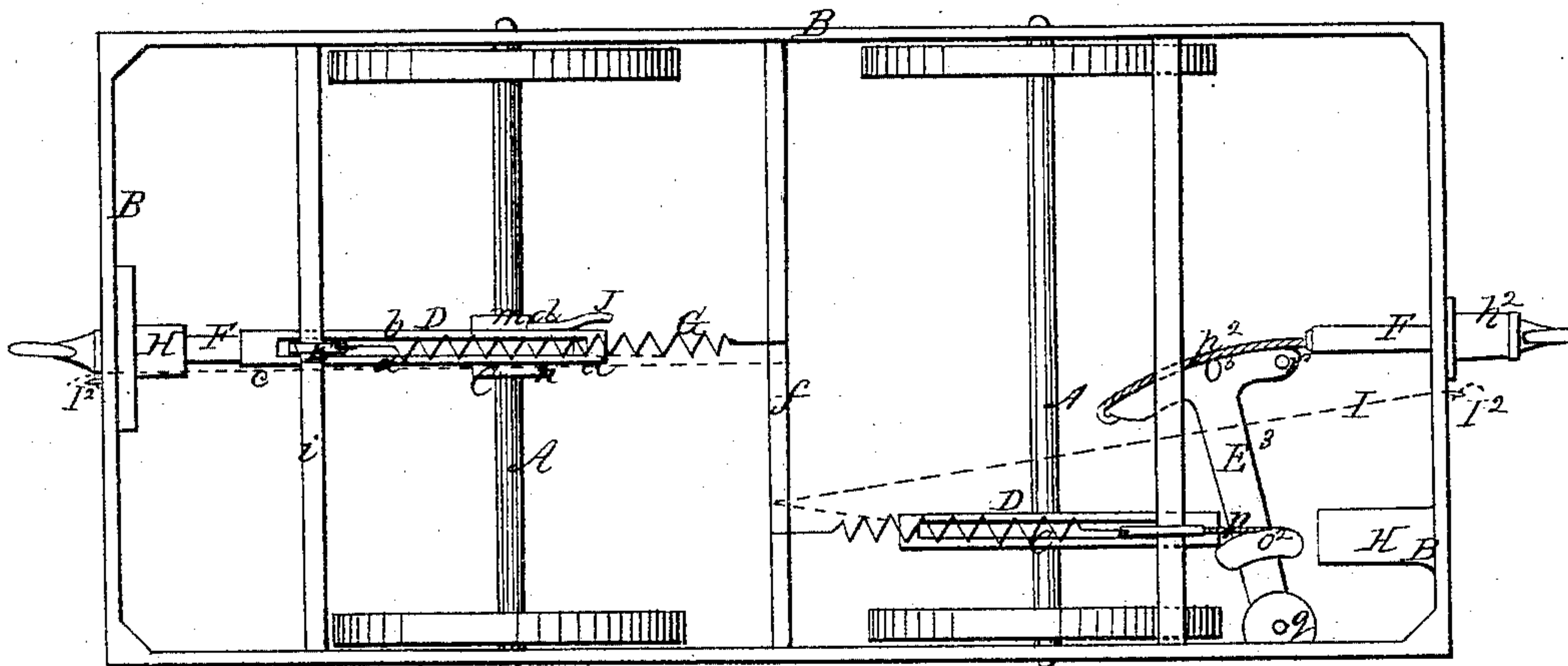


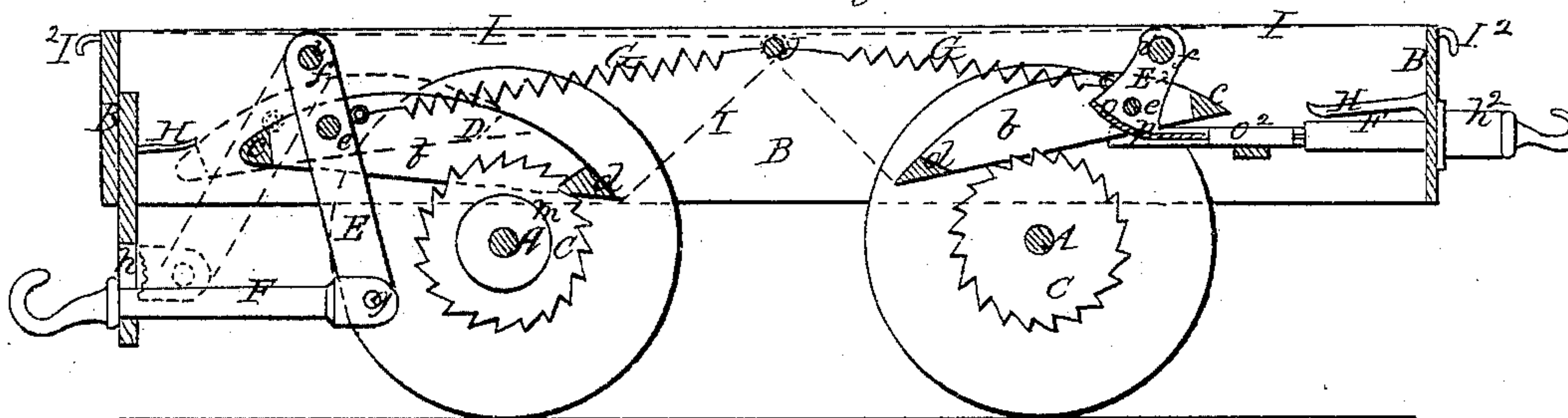
## Car Starter.

Patented Sept. 5, 1865.

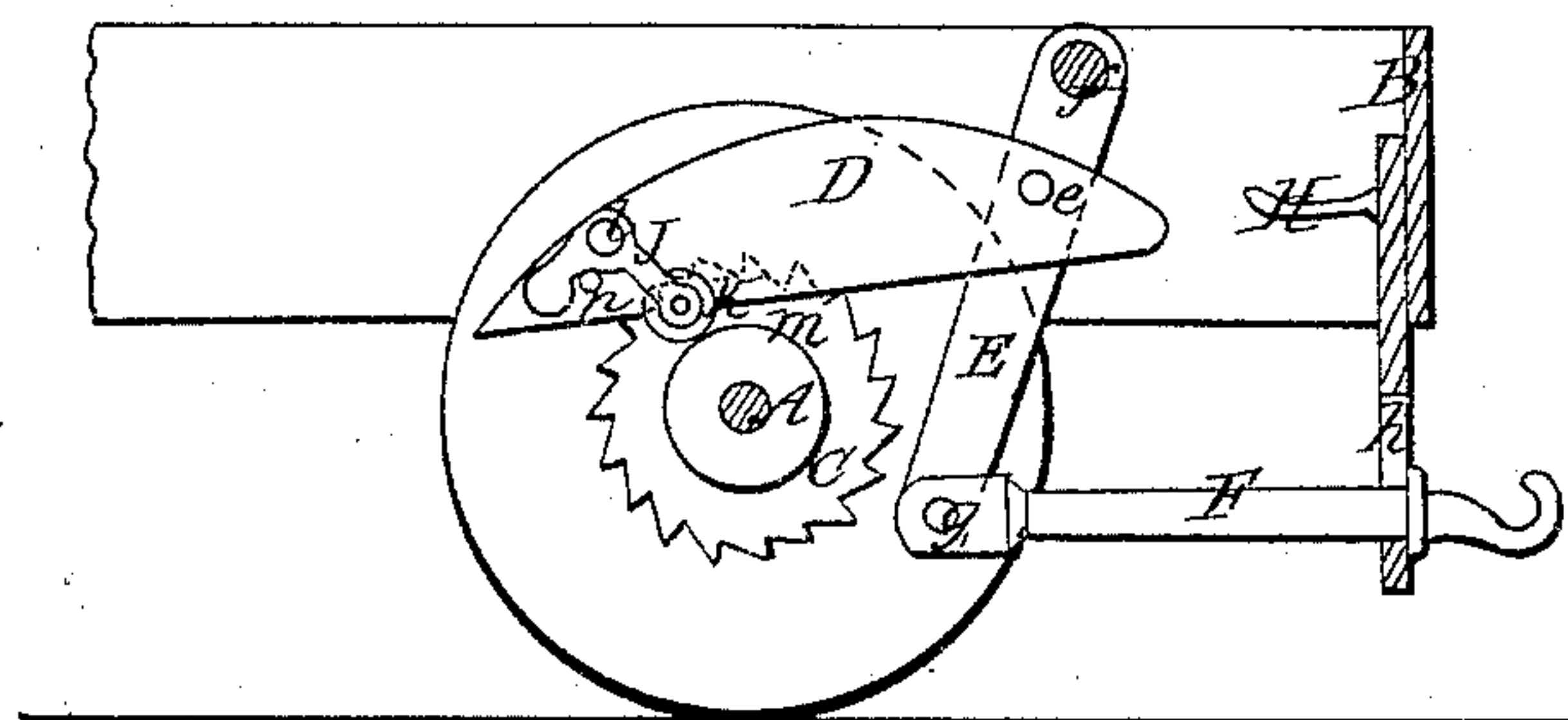
Fig. 1.



*Fig. 2.*



*Fig. 3.*



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# UNITED STATES PATENT OFFICE.

WILLIAM LAWTON, OF NEW YORK, N. Y.

## IMPROVED MODE OF STARTING RAILWAY-CARS.

Specification forming part of Letters Patent No. 49,770, dated September 5, 1865.

*To all whom it may concern:*

Be it known that I, WILLIAM LAWTON, of the city, county, and State of New York, have invented an Improved Device for Starting Street or Horse Railway-Cars or other Vehicles; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a plan view of a truck having my device attached thereto. Fig. 2 is a vertical section of the same. Fig. 3 is a vertical sectional view of one end of the same, shown in the position of running down a grade.

Similar letters of reference indicate corresponding parts in the several figures.

The object of my invention is to facilitate the starting of street-railway cars which are drawn by horses. I employ for this purpose a ratchet-wheel fast upon the axle and a pawl connected with the draw-hook or its equivalent, to which the horses are connected; and my invention consists in a novel mode of combining the pawl with the draw-hook, and in certain appliances for throwing the pawl out of gear automatically after the car has been started, whether there is or is not any draft on the draw-hook.

To enable others skilled in the art to construct my invention and apply it to use, I will proceed to describe it, having reference to the drawings.

To each of the axles A of a truck, B, is rigidly secured a ratchet-wheel, C, of any desired number of teeth. Acting on the teeth of this ratchet-wheel is a pawl, D, which is formed of two solid ends, *c* and *d*, and two side plates, *a* and *b*, the end *d* serving as the detent or nose of the pawl, the side plates serving as guides to keep it in place on the ratchet-wheel, and the other end being used for a purpose hereinafter described. The pawl D (shown at the left-hand end of Figs. 1 and 2 and in Fig. 3) is connected at *e*, by a pin or bolt, to a primary lever, E, working on a fulcrum, *f*, on the bar *i*, running across the truck, and swinging in the manner of a pendulum, the lower part of which is made two to three times as long as the portion between the points *e* and *f*, and is

connected by a pin or bolt, *g*, to the draw-hook F, which slides or is drawn through a slot, *h*, in the end of the truck B.

In order to always bring the pawl back to its proper position at each stoppage of the car, a spring, G, is attached one end to an eye on the back of the lever E and the other end to the central rod, *j*, which runs from one side to the other of the truck, and securely attached thereto. The pawl D (when the car is being drawn by the horses after starting, and the draw-head at its full extension) is raised clear of the teeth of the ratchet-wheel C by the upper face of the end *c* coming in contact with the lower side of a fixed guide or projection, H, which is fastened to the framing of the truck B and tilts or lifts the end *d* of the pawl D out of or clear from the teeth of the ratchet-wheel C. This last-mentioned position is shown in red outline on Fig. 2. This guide H may be elastic. The lever E moves between the two side plates, *a* and *b*, of the pawl D, as well as the ratchet-wheel C.

This device should be applied to each end of the truck, so as to facilitate the starting in either direction, the pawl at the rear end of the car always, when running, being put out of connection with the ratchet-wheel by means of a cord, chain, or other equivalent device, I, which draws the pawl out of connection with wheel C, and can be operated upon by the driver or conductor before leaving that end of the car, the end of this cord being fastened to a hook or pin, *l*<sup>2</sup>, on the outside of the platform, or in any other convenient place.

When the car is running down a grade, as shown in Fig. 3, it is apt to acquire a velocity sufficient to keep the draw-hook slackened up, in which case the pawl would be brought back to its place by the spring G, and unnecessarily produce a clicking or rattling sound, objectionable to many persons; but to remedy this I attach a lever, J, to each outer side of the pawl D by a pivot, *l*, bearing in their lower ends a small friction-roller, K, of rubber or other adhesive substance, which revolves against a hub or concentric face, *m*, on each side of the wheel C, and when the pawl is allowed to be drawn back, when the car is under any considerable speed, the roller K adheres to the face *m*, and



is carried up by it until the lever J strikes a pin, *n*, in which position the pawl is clear of the teeth, and produces no noise of any account.

A modification of the invention is shown at the right-hand end of Figs. 1 and 2, wherein a horizontally-moving lever is used in combination with a series of sectors and cords or chains passing over and connecting from one to the other.

$E^2$  is a lever, jointed and arranged in the manner of the one shown on the left, but extending only a short distance below the pin *e*, this lower end being formed into a sector,  $O$ , which passes a rope or chain, *p*, secured thereto, and passes over a horizontally-moving sector,  $O^2$ , on the lever  $E^3$ , to which its other end is secured. The lever  $E^3$  works on a fulcrum, *q*, situated at or near the frame B, and the outer end is formed into a sector,  $O^3$ , which is attached by the one end of a cord or chain,  $p^2$ , to the draw-hook F, moving always in a directly horizontal forward or backward line through a bearing,  $h^2$ , and is prevented from being drawn out too far by a stud, *r*, coming against the frame B. The arrangement of the spring and disengaging cord or chain is the same as that shown in the device on the left end of the truck, and operates in a similar manner.

Supposing the car to be standing and it is desired to start it, the horses are attached by the whiffletrees and link to the hook F. They are then ordered to go ahead, which draws out the hook F, and with it the lever E or  $E^2$  and the pawl D, which acts upon the teeth of the ratchet-wheel C and starts the wheels a

distance of one, two, three, or more teeth, sufficiently far to overcome the inertia of the stationary body of the car, when the horses proceed onward without any undue straining of muscles and slipping of their shoes on the road.

Instead of applying the power directly to the body of the car I apply it, through the means of the lever or levers and the pawl and ratchet-wheel, directly to the wheels at a point not far from their periphery, the force or power applied acting in the same manner as the power transmitted to a traction or locomotive engine by the pressure on the piston acting against a crank or lever on the driving-wheel through the intervention of the connecting-rods.

Having described the construction and operation of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the lever E or  $E^2$ , pawl D, ratchet-wheel C, with the axle and draw-hook of a railway-car, the whole operating and constructed substantially as herein described.

2. In combination with the double-ended pawl D, the fixed guide or projection H, operating in the manner and for the purpose herein described.

3. The lever J and stop *n*, in combination with the pawl D and ratchet-wheel C, substantially as and for the purpose herein specified.

WILLIAM LAWTON.

Witnesses:

J. W. COOMBS,

G. W. REED.