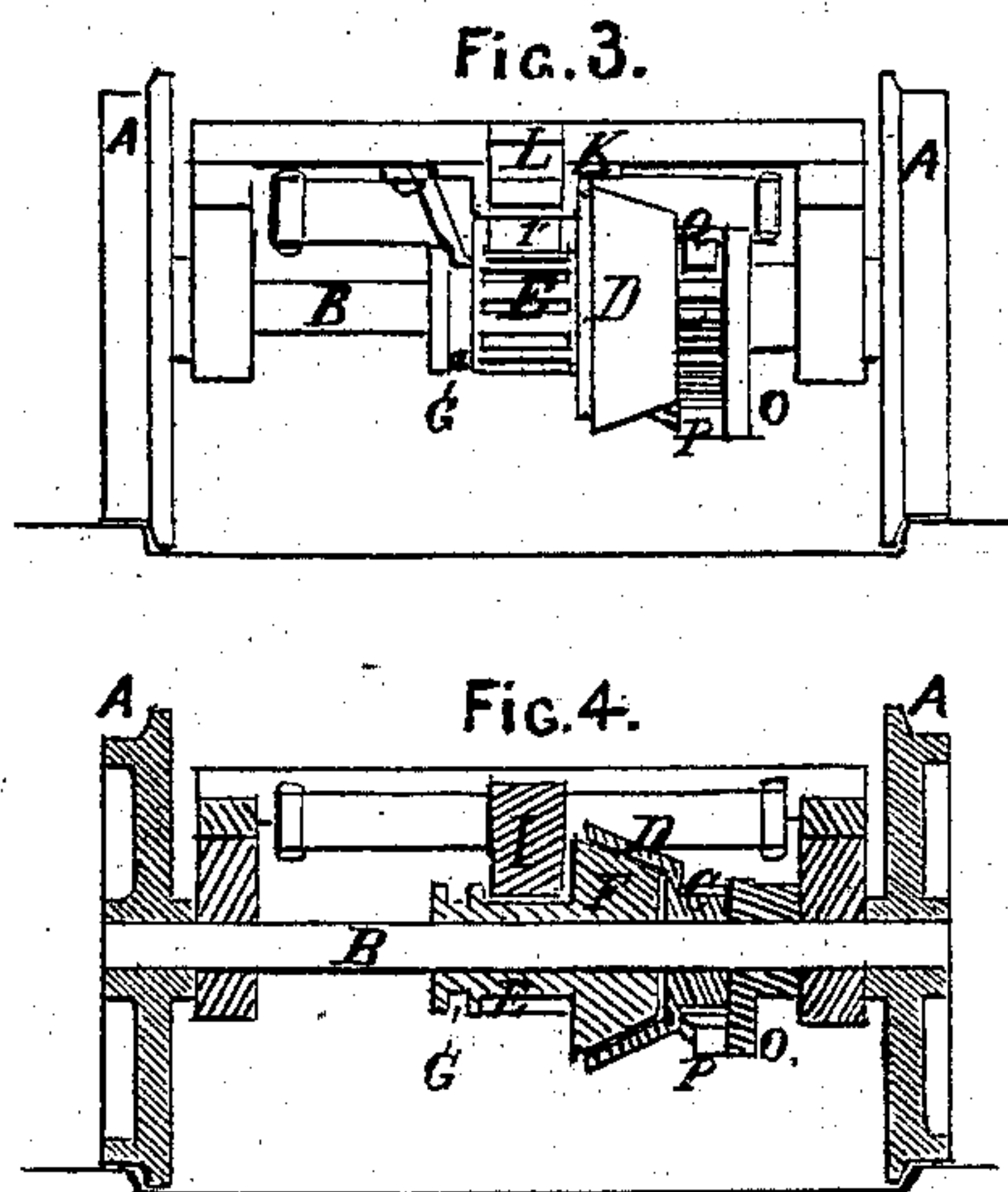
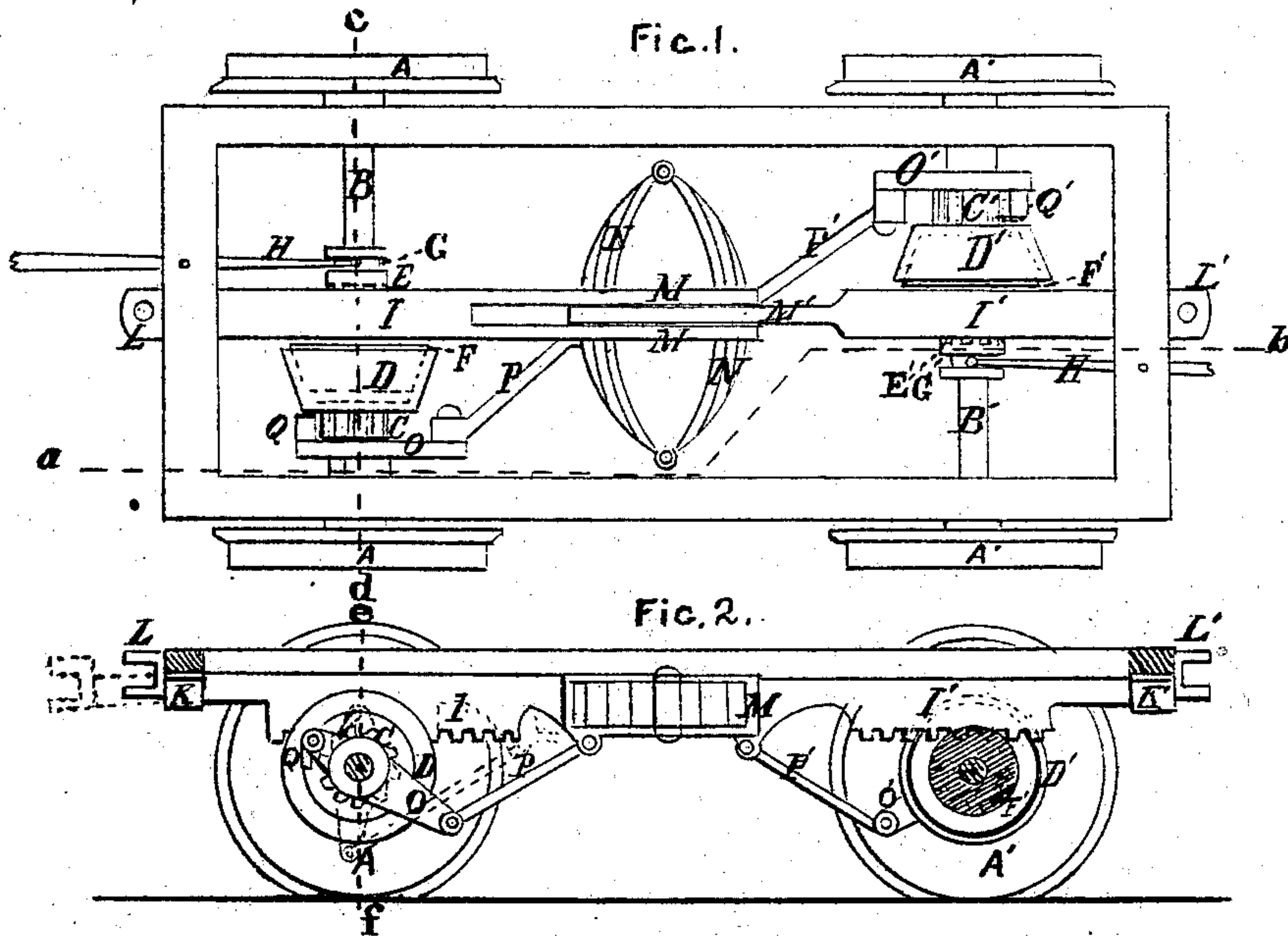


T. COOPER.
Car-Starters.

No. 138,233.

Patented April 29, 1873.



Witnesses.
James W. Benson
Walter J. Brady

INVENTOR.
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UNITED STATES PATENT OFFICE.

THEODORE COOPER, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN CAR-STARTERS.

Specification forming part of Letters Patent No. **138,233**, dated April 29, 1873; application filed April 17, 1872.

To all whom it may concern:

Be it known that I, THEODORE COOPER, of the city and county of Philadelphia and State of Pennsylvania, have invented a certain new and useful Draft-Bar and Brake for Cars; and I do hereby declare that the following is a sufficiently full, clear, and exact description of my invention, and the manner in which the same is made and operated, to enable a workman skilled in the art of making railway cars to make and use my said invention, reference being had to the accompanying drawing and letters of reference marked thereon.

The nature of my invention consists in a novel arrangement, on the axles of the car, of a rack-and-pinion gearing, in combination with a friction-clutch and a ratchet and pawl connected by a link and lever with a strong spring in such a manner that, while the momentum of the car is expended in compressing the spring, and the reaction of the spring assists in starting the car, any excess of momentum, when running at high velocity, will be relieved by the friction-clutch in braking; and when the brake is not in use, it neither offers any impediment to the motion of the car in either direction; nor does it occasion any noise by the trailing of pawls on the rotating ratchet-wheels.

The same letters of reference apply to the same parts in the several figures.

Figure 1 shows a plan. Fig. 2 shows a section in the vertical plane indicated by the dotted line *a b* in Fig. 1. Fig. 3 shows a front elevation, and Fig. 4 shows a section, in a vertical plane indicated by the dotted line *c d* in Fig. 1, and the dotted line *e f* in Fig. 2.

A and A' represent the wheels; B and B', the axles; C and C', ratchet-wheels keyed on the axles B and B', and turning with them. Fastened securely upon each of the axles B and B' are the outer halves of the conical friction-couplings D and D'. On each of the axles B and B' is a spur-wheel or pinion, marked E and E', which are fitted so as to slide, and also to turn freely on the axles B and B'. On one side of each of the pinions E and E' are conical sleeves F and F' fitting into and forming the male halves of the friction-couplings D and D'. On the other side of each of the

pinions E and E' are grooves marked G and G', in which are fitted forks H and H', such as are usually employed to shift revolving sleeves upon shafts in motion. The function of the forks H and H' is to enable the brakesman to couple and uncouple the pinions with the axles B and B'. The couplings should be of such a taper as not to jam or stick, but so as to disengage or uncouple when the pressure of the forks H and H' in the grooves G and G' is discontinued. Placed above and gearing into each of the pinions E and E' are racks marked I and I', one end of each passing through guides K and K', so as to slide thereon, having a stop formed upon it marked L and L', and is used as a draw-head. The other ends of the racks I and I' are formed into yokes M and M', which, encircling a spring, N, compress the spring whenever either of the pinions E or E' rotates in the direction of the arrow marked in Fig. 2. Hanging loosely upon the axles B and B' are two armed levers, O and O', which are by their lower arms connected, by means of links P and P', with the yokes M and M'. To the upper arms of the lever O and O' are hung pawls Q and Q', which hang, when the car is in motion, clear of the ratchets C and C'; but so soon as the brakesman, by means of the fork H, couples the pinion E with the axle, the momentum of the car, turning the pinion E, moves the rack I to the left in the guide K, (see Fig. 2,) and the yoke M compresses the spring N. The stop L', abutting against the guide K', holds the rack I' and yoke M' so as to afford an abutment for the spring N'. The rack I, yoke M, link P, lever O, and pawl Q then assume the position indicated by the dotted portion of Fig. 2, where the pawl Q is shown engaged in the teeth of the ratchet-wheel C.

Upon compressing the spring N completely the excess of momentum of the car is expended in friction between the two cones of the clutch D, and so soon as the brakesman uncouples the clutch D the spring N reacts, and, through the medium of the yoke M, link P, lever O, pawl Q, and ratchet C assists in starting the car in motion, when the pawl Q hangs in the position shown in the full lines in Fig. 2.

When the car is running in the opposite direction (or toward the right, in Fig. 2,) the similar parts operate in the same manner as

already described. Chains and drum may be substituted for the rack and pinion.

I am aware that friction-clutches, in conjunction with chains and drums or racks and pinions have been applied to railway-car axles to operate brakes on the wheels thereof by the momentum of the train. This I distinctly disclaim; but

What I claim as my invention, and desire to secure as such by Letters Patent, is—

The combination of the friction-clutch D, pinion E, rack I, spring N, lever O, pawl Q, and ratchet C, substantially in the manner described and shown.

THEODORE COOPER.

Witnesses:

ROBERT D. COXE,
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