

(No Model.)

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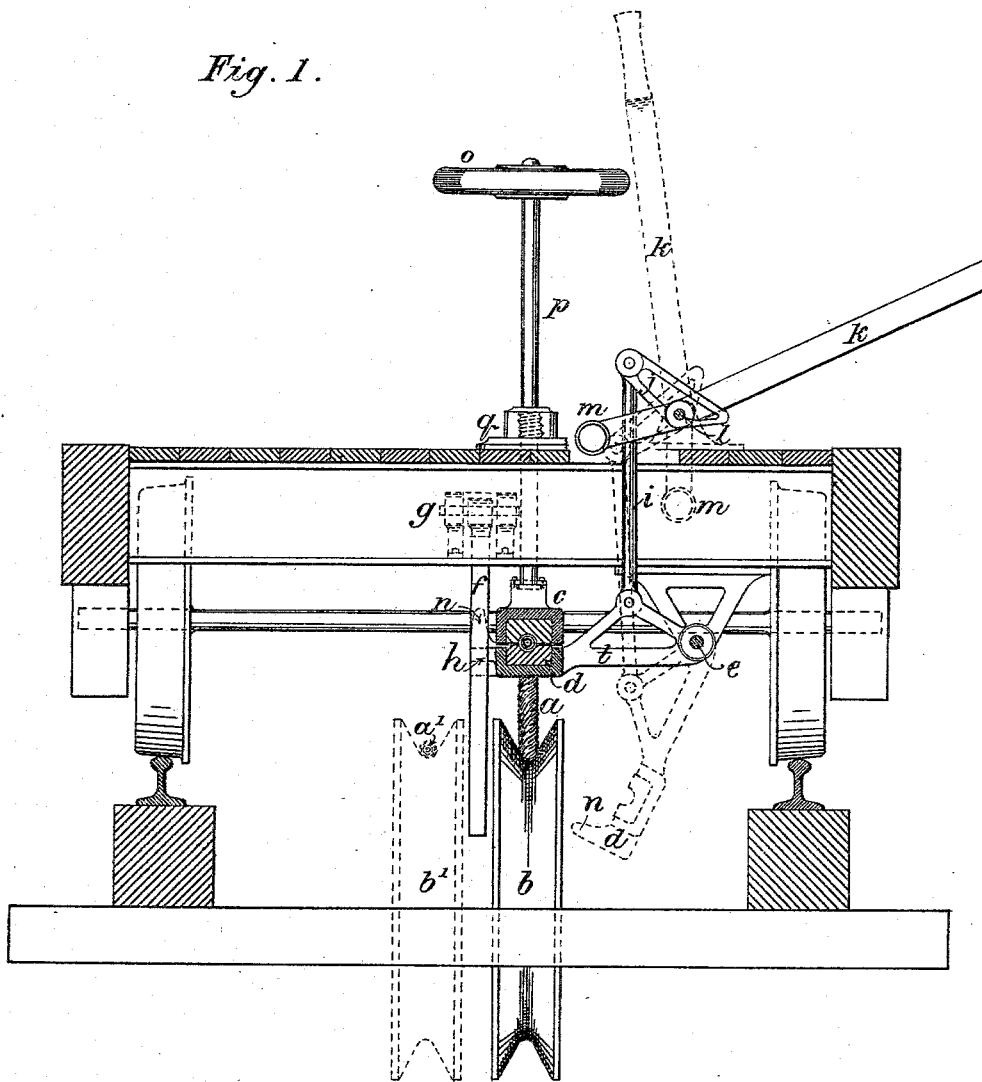
C. F. FINDLAY.

MECHANISM FOR OPERATING RAILWAYS OR TRAMWAYS  
BY MEANS OF ROPES.

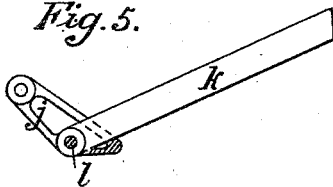
No. 301,489.

Patented July 8, 1884.

*Fig. 1.*



*Fig. 5.*



Witnesses :-  
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(No Model.)

2 Sheets—Sheet 2.

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Fig. 2.

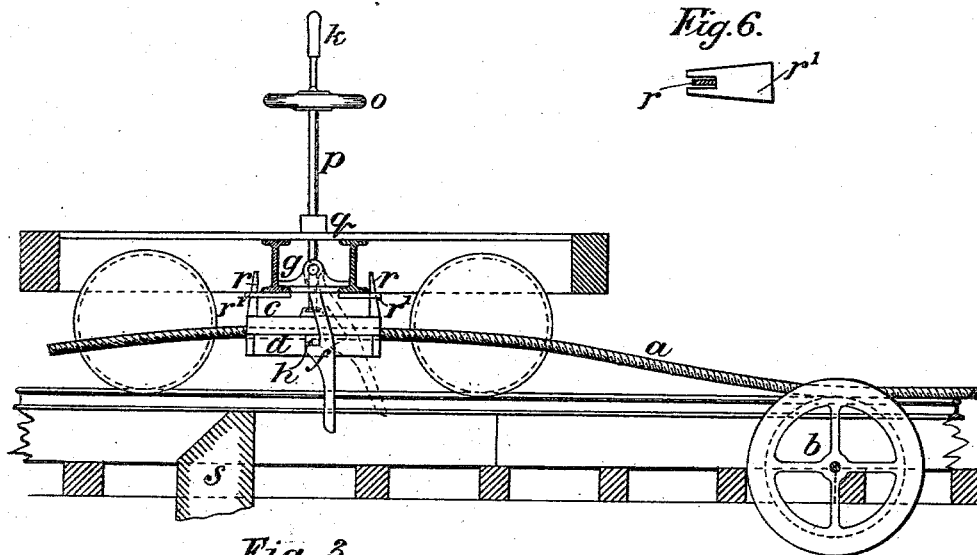


Fig. 6.

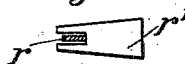


Fig. 3.

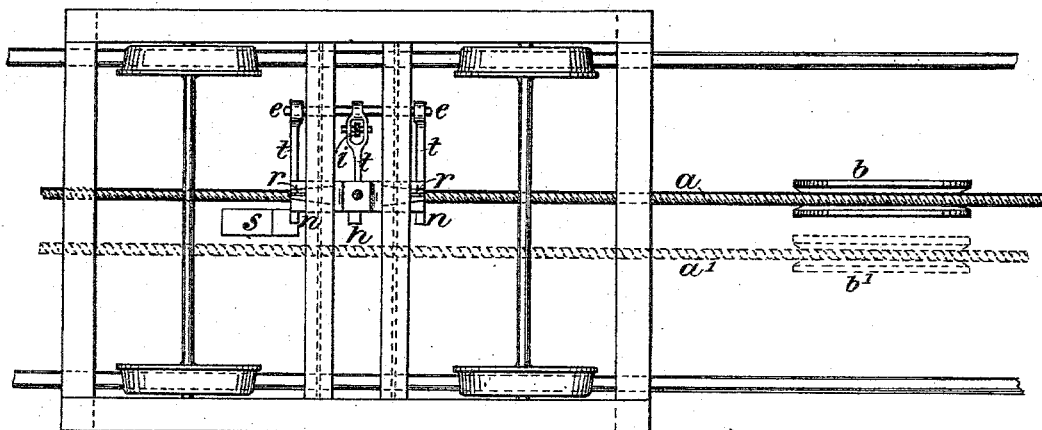
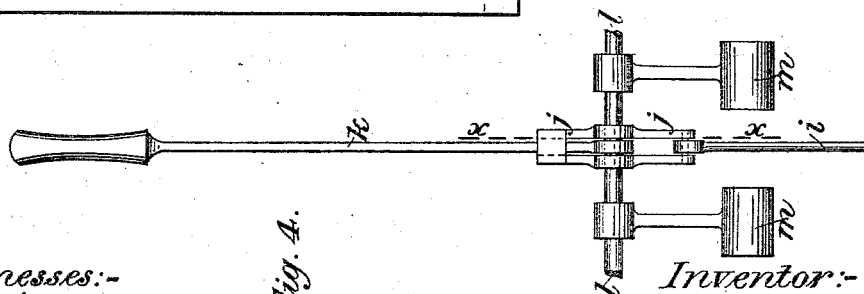


Fig. 4.



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# UNITED STATES PATENT OFFICE.

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MECHANISM FOR OPERATING RAILWAYS OR TRAMWAYS BY MEANS OF ROPES.

SPECIFICATION forming part of Letters Patent No. 301,489, dated July 8, 1884.

Application filed May 12, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES FARQUHAR FINDLAY, of London, in the county of Middlesex, England, have invented a new and useful Improvement in Machinery for Operating Railways or Tramways by Means of Ropes, of which the following is a specification.

My invention relates to apparatus for operating railways and tramways by ropes put in motion by stationary engines, and comprises special machinery for picking up and making fast the rope to a car, and means for automatically disengaging the rope at fixed points. This apparatus is illustrated in the accompanying drawings, in which—

Figure 1 is a cross-section of the track, car, and gripping apparatus. Fig. 2 is a longitudinal section of the car, showing the side view of the apparatus. Fig. 3 is a plan, in which the floor of the car and some portions of the apparatus are omitted for clearness. Fig. 4 is a side view of the hand-lever, crank, &c., of which the other view is given in Fig. 1. Fig. 5 is a section taken on line *x x* in Fig. 4. Fig. 6 is a detailed view of one top jaw-guide.

*a* is the rope, supported on pulleys *b*. It is attached to the car by being gripped between an upper jaw, *c*, and a lower jaw, *d*. The lower jaw, *d*, is connected by arms *t* to an axle, *e*, whose bearings are rigidly attached to the frame of the car, and is supported on the other side by a pendulum, *f*, which turns freely on another axle, *g*, whose bearings are also rigidly attached to the frame of the car. On a step in this pendulum rests a piece, *h*, projecting from the jaw *d*. When the car is disconnected from the rope, the jaw *d* hangs below the axle *e*, as shown by the dotted lines in Fig. 1. To connect the car with the rope, the jaw *d* must be raised. This is done by a link, *i*, hinged to one of the arms *t*, as shown in Fig. 1, and hinged at its other end to one arm of a bell-crank, *j*, whose other arm passes round and can be moved in one direction by the hand-lever *k*. This hand-lever *k* is keyed on an axle, *l*, on which the crank *j* turns freely, and on the same axle, *l*, are keyed two short arms carrying counter-weights, *m*, which bring the hand-lever *k* into the position shown by dotted lines in Fig. 1 when it is not in use.

The operation of this mechanism is as follows:

Suppose the jaw *d* to be hanging in the position shown by dotted lines in Fig. 1. The right-hand arm of the crank *j* is then in contact with the lever *k*. By moving the lever to the right the crank is turned and the jaw *d* raised by means of the link *i*. As the jaw *d* rises the projection *h* strikes the inclined under side of the pendulum *f*, pushes it aside, and passes above the step in the pendulum, which then falls back by its own weight. When the jaw *d* has risen thus far, the lever *k* is let go, and is brought back by the counter-weights *m* to its former position. Meanwhile the jaw *d*, being now unsupported by the link *i*, drops until the projection *h* rests on the step in the pendulum *f*. By this means it is provided that when the jaw *d* is released from the pendulum, as hereinafter described, and falls, it does not move the hand-lever *k*. As the jaw *d* is raised, as above described, it picks up the rope by means of the two curved arms *n n*, (clearly shown by the dotted lines in Fig. 1,) which guide the rope into its proper place in the center of the jaw. The upper jaw, *c*, has a vertical motion only, and is raised and also forced down on the cable by means of a hand-wheel, *o*, and shaft *p*, turning in a fixed nut, *q*. The shaft *p* rests at its foot on the jaw *c*, and has a circular flange, over which is fitted a collar firmly attached to the jaw *c*, so that the vertical motion only of the shaft *p* is transmitted to the jaw *c*. The jaw *c* is guided in its motion by vertical plates *r r* at each end of it, which slide between suitable fixed guides, *r' r'*, as shown in Figs. 2 and 3. One of these guides *r'* is shown in detail in Fig. 6, with the vertical plate *r* in section. This plate *r* is rigidly attached to the top jaw, *c*, and moves vertically in the slot of the guide *r'*, which is secured to the platform of the car. The rope is released by means of block *s*, placed at the point of the track where it is desired to disengage the rope, firmly fixed in the ground, and of such form as to clear every part of the car except the lower part of the pendulum *f*. As the car moves along, the pendulum strikes this obstruction *s*, and is driven backward, thus allowing the jaw *d* to swing round the shaft *e* into a position where it travels clear of the pulleys *b*, and the cable to fall onto its supporting-pulleys *b*.

The apparatus above described is equally

applicable where two cables are in use, either of which may at different times require to be attached to the car. The duplicate machinery has not been shown in the drawings for the sake of simplicity; but the second cable, *a'*, and the second set of supporting-pulleys, *b'*, are shown in the dotted lines in Figs. 1 and 3. When two cables are used, the pendulum *f* hangs in the central plane of the track, and serves equally for both sets of gripping apparatus. The rest of the machinery must all be supplied in duplicate, except the hand-wheel *o* and the hand-lever *k*, which are made detachable and transferred to the duplicate apparatus when required. The jaw *d* hangs constantly in its lower position, as shown dotted in Fig. 1, when the duplicate apparatus is in use.

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

1. On a rope railway, the combination of jaw *d*, arms *t*, shaft *e*, link *i*, crank *j*, and hand-lever *k*, for raising the rope from off its supporting-pulleys, substantially as set forth.
2. On a traction-rope railway, the combination of the pendulum *f*, pivoted at its upper

end, and provided with a step engaging with a projection on the lower jaw of the gripping apparatus, with the block *s*, adapted to disengage the projection from the step when the lower projecting end of the pendulum *f* strikes against it, and thus releases the rope, substantially as set forth.

3. On a traction-rope railway, the combination of the pendulum *f*, jaw *d*, with projection *h*, arm *t*, and shaft *e*, for carrying and supporting the rope, substantially as set forth.

4. The combination of the hand-lever *k*, counter-weight *m*, crank *j*, and link *i*, with the gripping apparatus of a rope railway, substantially as and for the purpose set forth.

5. In combination with the gripping apparatus of a traction-rope railway, the hand-wheel *o*, shaft *p*, nut *q*, guiding-plates *r*, rigidly attached to the top jaw of said gripping apparatus, and guides *r'*, which allow the top jaw to move vertically and prevent it from turning, substantially as set forth.

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Witnesses:

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