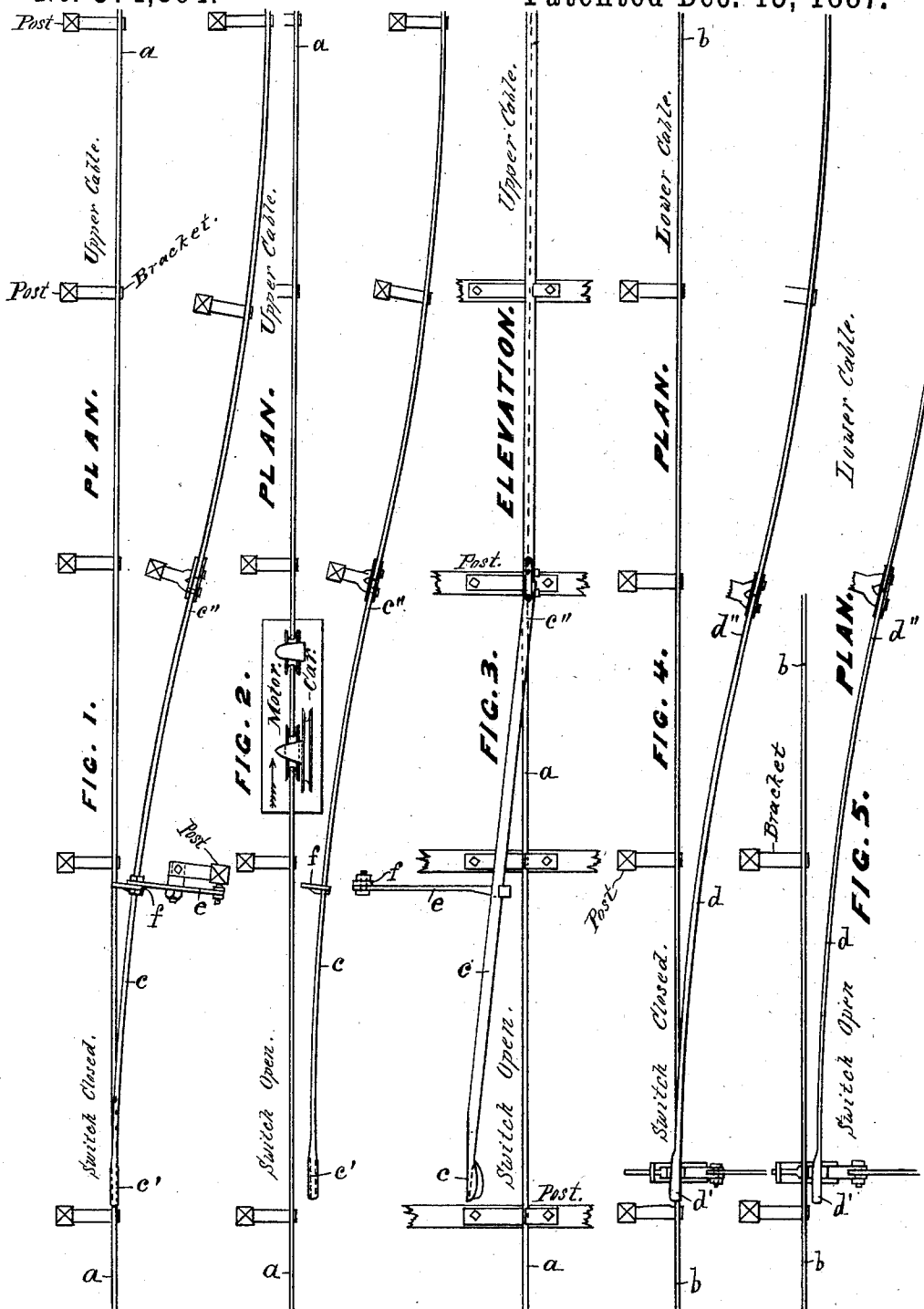


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SWITCH FOR SUSPENSION OR CABLE ROADS.

No. 374,864.

Patented Dec. 13, 1887.



WITNESSES.

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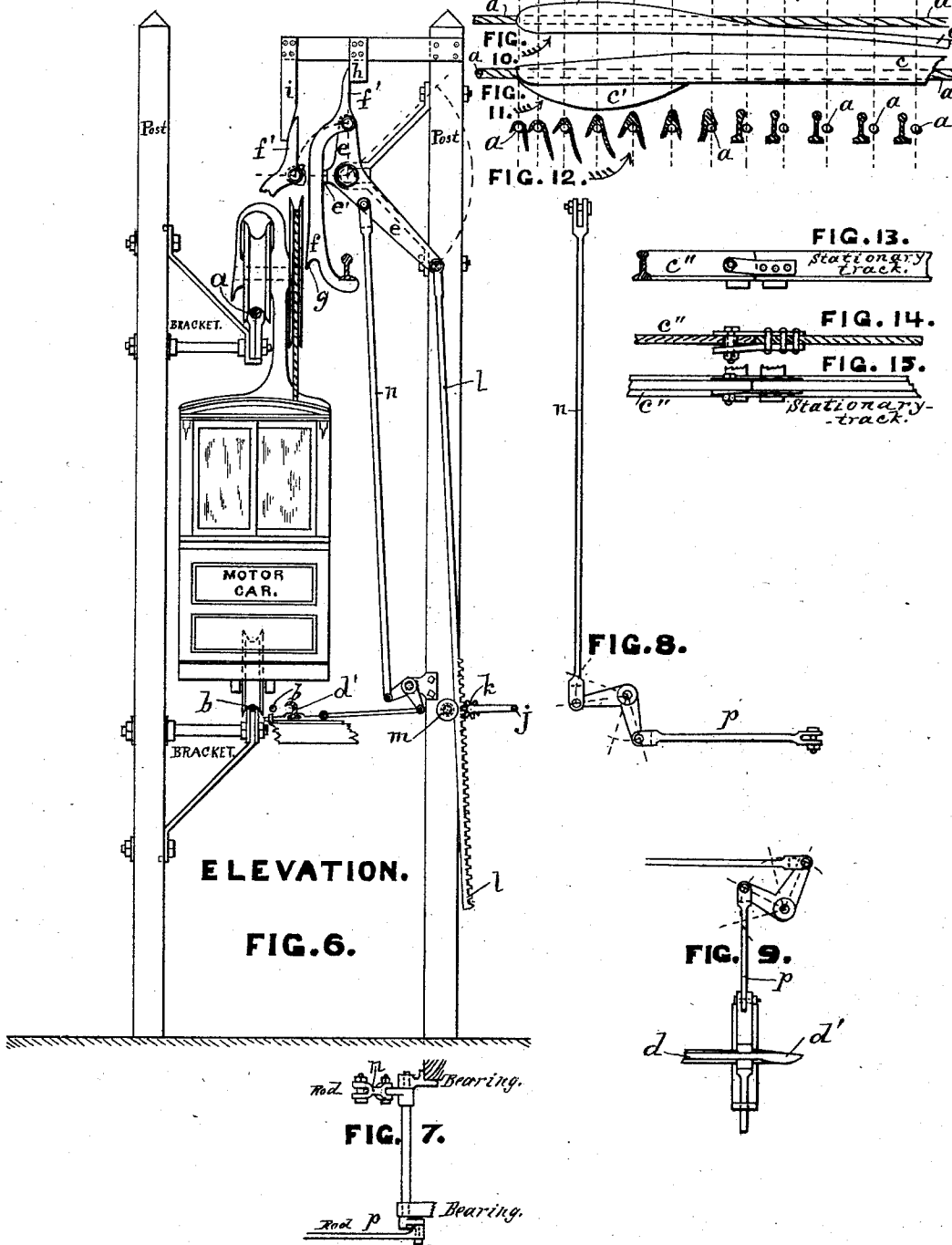
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UNITED STATES PATENT OFFICE.

CHARLES CARR, OF BOSTON, MASSACHUSETTS.

SWITCH FOR SUSPENSION OR CABLE ROADS.

SPECIFICATION forming part of Letters Patent No. 374,864, dated December 13, 1887.

Application filed April 30, 1887. Serial No. 236,721. (No model.)

To all whom it may concern:

Be it known that I, CHARLES CARR, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful improvements in switches or switch mechanism adapted to roads having cable or suspension tracks—*i. e.*, tracks consisting of cables or wires stretched from post to post—or other supports, of which the following is a full, and exact description, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which drawings form a part of this specification.

These roads may consist of one cable or of two, one being arranged directly over the other.

The nature of my invention relates to the construction of the movable switch-tongue, the method of operating the same, the means for operating the same, and the construction and combination of parts, substantially as hereinafter more fully set forth.

Referring to the drawings, I have illustrated my improvements as applied to a road having two cable tracks, one above the other, and I have shown a motor-car with its wheels resting upon these two tracks, over which it is to travel.

Figure 1 is a plan showing the upper cable track with the switch-tongue closed upon it, its connections, &c. Fig. 2 is a plan similar, but showing the switch-tongue in the open position and the motor-car in the position of having just passed the open switch on the main track. Fig. 3 is an elevation and shows the switch-tongue in the open position. Fig. 4 is a plan of the lower cable track and shows the switch-tongue in the closed position. Fig. 5 is a similar plan and shows the switch-tongue in the open position. Fig. 6 is an elevation showing the upper and lower cables in section and the motor-car with its wheels upon the cable tracks and at the point or position of passing the open switch. The lower cable is duplicated for the purpose of showing, without confusion, its relations to the lower-switch tongue and the mechanism for operating it. The arm *f'* is repeated, broken off, showing its position when the switch is closed. Fig. 7 is a sectional plan and shows the connecting-rod between the upper and lower track switch mechanism, connections, &c;

Fig. 8, a modification of the same in elevation. Fig. 9 is a plan showing a part of the same modification, with the further parts completing the connection to the switch-tongue *d* of the lower track. Fig. 10 is a plan showing the saddle end of the switch-tongue and a section of the upper-track cable on which it rests when in closed position, as shown. Fig. 11 is an elevation of the same. Fig. 12 is a series of sectional views illustrating the construction of the same at the points indicated by the contiguous dotted lines. Fig. 13 is an elevation illustrating the opposite or hinge end of the switch-tongue. Fig. 14 is a sectional plan of the same. Fig. 15 is a corresponding plan.

Like letters refer to the same or corresponding parts in all the figures.

It has been a matter of much study and great difficulty to overcome the obstacles in the way of constructing a practicable device by means of which cars might be easily and safely switched off from a suspension or cable track. A little thought will make it apparent that the supporting of such mechanism, including the movable switch-tongue, is a difficult matter to accomplish and give ample space clear for the passing of the cars. I will proceed to describe the method and mechanism by which this and other difficulties have been overcome by means of the improvements herein described.

Referring to the drawings, *a* is the upper track cable. *b* is the lower track cable. *c* is the upper-track switch-tongue with saddle end at *c'* and hinge end at *c''*.

The lower-track switch-tongue is marked *d*, its point or lip end is marked *d'*, and its hinge end *d''*. The switch-tongue *c*, for the upper track, has its free end formed into a saddle adapted to rest on the cable track *a*, and having depending sides or flanges to reach down on each side of the cable track, to prevent the possibility of its being crowded off the cable track. This tongue *c* is hinged or pivoted at the end opposite the saddle *c'* to a stationary part of the track leading to the next stretch of cable or other track to which the switch leads. The switch-tongue *c* is lifted at its free end when opened sufficiently to allow the upper wheel and its connections to the car to pass clear of it. I also prefer to

combine with the lifting movement a side-wise or transverse movement. The two movements combined will sometimes give the best opening to the switch with less travel than either alone.

For lifting the switch-tongue, I provide, preferably, the lever *e* and suspend the switch-tongue *c* to it by means of the link *f*. This link *f* is provided with a lug, *g*, which, when the switch is closed, engages and rests upon the adjacent main track. I also prefer to provide the link *f* with the arm *f'* and the lever *e* with the stop *e'*, so that when the switch is open the link will be firmly clamped in position, as shown in Fig. 6, the arm *f'* bearing on a stop, *h*. Other means, however, may be used for steadying the link. These, though preferred, are not deemed essential.

A stop, *i*, will guard the link *f*, with its lug *g*, from missing their connection with the main track when the switch-tongue in closing approaches its closed position.

A variety of appliances may be used to give movement to the link *f* and lever *e*—as, for instance, a screw, a lever, and rod-connections, a windlass, &c.; but I prefer, as shown in Fig. 6, a crank, *j*, with its shaft and pinion *k* playing into and operating the rack-rod *l l'*. A flanged roller, *m*, serves to keep the rack in mesh with the pinion.

Any suitable fastening—as, for instance, the common railroad-switch locks—may be used to secure the switch in the open or closed positions.

For the purpose of giving to the lower-switch tongue a simultaneous movement with the upper one, I provide the rod *n*, jointed to the lever *e*. This rod is jointed, by any suitable system of levers and connections, to the lower-switch tongue, which has its free end mounted in the usual slide-shoe used for ordinary switches. One system of such levers and connections is illustrated in Figs. 6 and 7; another in Figs. 8 and 9. The free end of the tongue is formed with a flange to slide over the lower track when pressed against it, as will be understood from the illustration in Fig. 6, and when the switch is locked, as above alluded to, the closing is complete.

The switch-tongues may be hinged or pivoted in any convenient way; but Figs. 13, 14, and 15 show a preferable method. Two straps are bolted or riveted one on each side of the rail. The switch-tongue fits closely between these iron straps at the joint; but the ends receiving the switch-tongue are spread apart enough to allow the proper angular movement of the tongue. A bolt passes through the straps and the tongue, upon which is placed a tubular pivot piece or journal, about which the tongue hinges, and this, being of suitable length, goes between the straps and keeps them open at the proper angle, where they are firmly held by the central bolt.

With the foregoing description the operation of the switch-tongues will be readily understood on referring to Fig. 6.

The saddle end of the upper-switch tongue and the lipped or flanged end of the lower-switch tongue are made of a wedge shape—*i e.*, gaining in thickness immediately over the main track as closed upon it—so as to give a sufficient upgrade to allow the flange of the wheels to pass over the main track as they leave in going onto the switch.

It is obvious that other means than that shown may be used to lift the switch-tongue of the upper track. The method shown, however, gives ample support, with ample space for the cars to pass the switch, and requires no inconvenient frame-work to carry it. The parts are generally of wrought-iron and steel—the free ends of the switch-tongues preferably of steel. When the cars are to be operated by electrical power through the tracks as conductors, the parts may be insulated by means of the ordinary devices and methods.

In Fig. 6 the switches at both upper and lower tracks are shown in open position. To close them, any lock which may be used is first unlocked. The crank and pinion *j k* are then turned over to the right and rotated in the same direction, which drives the rack-rod *l l'* upward, causing the lever *e* to describe the quarter-circles of movement indicated by dotted lines, and the link *f* to come, with its lug *g*, to its resting-place on the main track. By the same movement the rod *n* is caused, through the systems of cranks or levers and connections shown, to force the lip end *d'* of the lower-switch tongue *d* into contact with main-track *b*, as described. Thus both upper and lower switches are closed. The reverse movement of the crank *j* opens them again alike simultaneously.

The improved switch mechanism is applicable as well to curves and sections made of ordinary rail.

I claim—

1. The switch-tongue having a saddle end and a hinged end, in combination with a lifting-link arranged between, substantially as described.

2. The switch-tongue having a saddle end and a hinged end, in combination with an intermediate lifting link and lever, substantially as described.

3. The lever *e* and link *f*, in combination with the saddle-end hinged switch-tongue, substantially as described.

4. The saddle-end hinged upper-switch tongue, the lever *e*, and link *f*, in combination with the pinion *k*, rack-rod *l l'*, and crank *j*, substantially as described.

5. The lower-switch tongue constructed with lip or flange to shut over the track and the saddle-end upper-switch tongue, in combination with an intermediate connecting system of levers, link, and rods, substantially as described.

CHARLES CARR.

Witnesses:

FRANK G. PARKER,
D. N. B. COFFIN.