(No Model.)

C. E. EMERY.

CABLE SUBURBAN RAILWAY.

No. 430,180. Patented June 17, 1890.

Fig. 1.

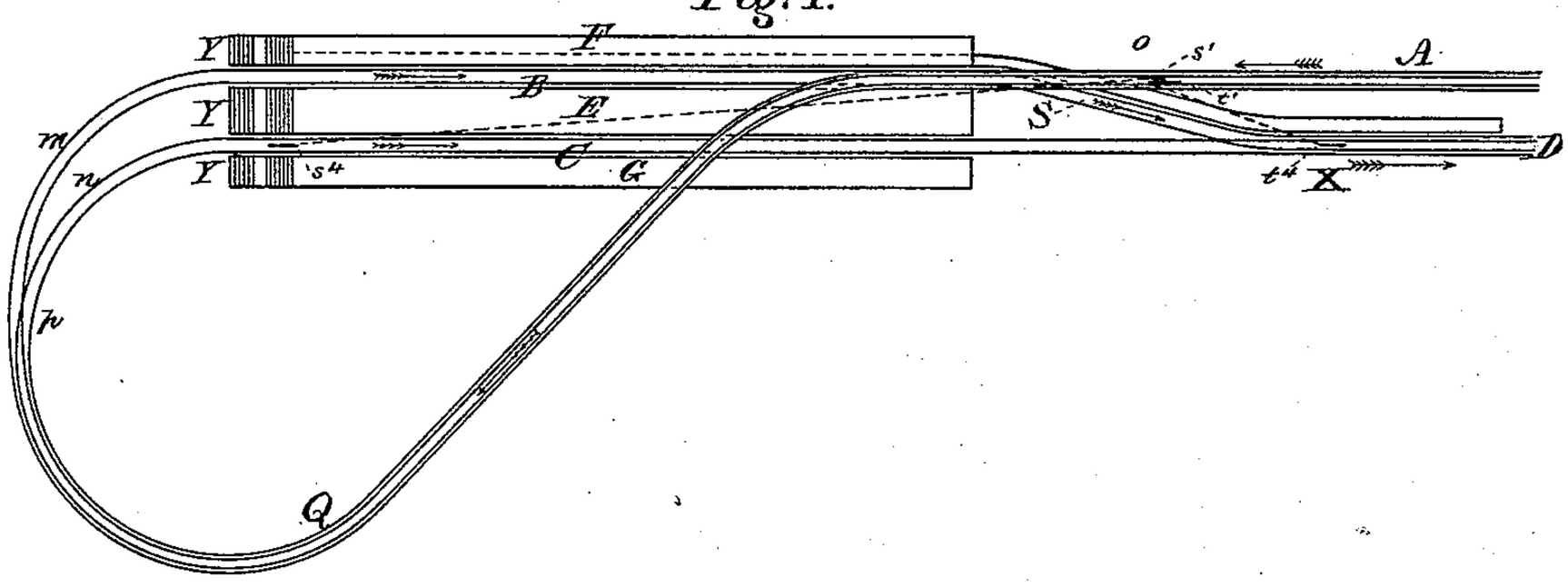


Fig. 2.

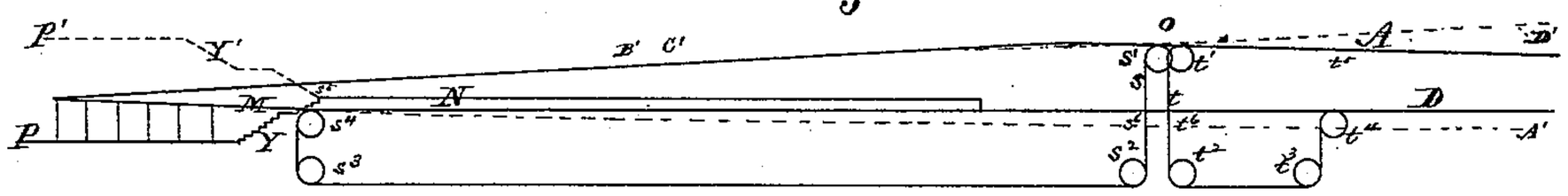


Fig. 3.

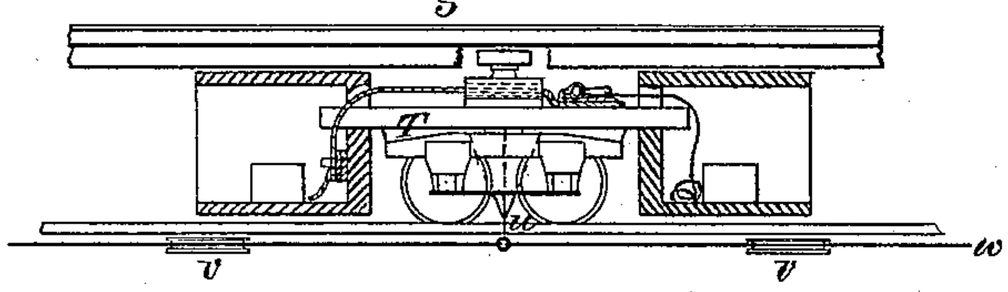
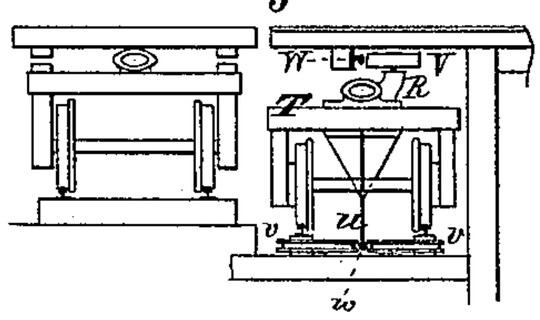


Fig. 4.



WITNESSES:-

H. W. Cook

R. M. Reeves

INVENTOR:-

Chas. E. Emery.

UNITED STATES PATENT OFFICE.

CHARLES E. EMERY, OF BROOKLYN, NEW YORK.

CABLE SUBURBAN RAILWAY.

SPECIFICATION forming part of Letters Patent No. 430,180, dated June 17, 1890.

Application filed June 12, 1888. Renewed April 19, 1890. Serial No. 348,592. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. EMERY, of Brooklyn, Kings county, New York, (office, New York city,) have invented certain new and useful Improvements in Cable Suburban Railways; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making part of this specification.

This invention is an adaptation to one form of the system of multiple starting-points for suburban railways, &c., set forth in my application, Serial No. 263,295, filed February 7, 1888, of a cable-haulage system arranged so that the grips may be located above the lines of the rails, whereby the cars may be run over ordinary switches and frogs, and relates particularly to means whereby the trains are brought into the stations off the lines of the main track and again dispatched on the main track.

In the drawings, Figure 1 is a plan view showing the arrangement of the tracks. Fig. 2 is a diagram elevation showing the relative elevations of the tracks, platforms, and street. Fig. 3 is a longitudinal elevation, partly in section, of a switching-car; and Fig. 4, a cross-section of a track for the switching-car under a platform and an end elevation of the switching-car and of the truck of a car on the main track.

A represents the incoming main track; D, the outgoing main track; B and C, station-tracks, and F, E, and G station-platforms.

In Fig. 2, M represents the elevation of the rails; N, that of the platforms; P, that of the street when below the grade of the rails, and P′ that of the street when above the grade. Y Y′, &c., are corresponding staircases.

When cable-grips are arranged on the cars above the lines of the rails, as proposed, so that no part will project below the latter to interfere with switching such car the same as other rolling-stock, the cars cannot be run on ordinary curves when attached to the cable, as the latter will not on account of its tension drop below the level of the rails sufficiently to engage with certainty the lateral diverting-sheaves. It is proposed, therefore, to propel the trains around the curves and over the switches at the station and elsewhere by gravity and mechanical means. In the drawings the incoming track A is shown approaching the station at a higher elevation than the outgoing track D, and the particular arrangement being designed for a terminal station, the incoming track A swings to one side on approaching the station and by means of a curve Q directs the incoming cars over switches or branches *m* and *n* at the rear of the station to the station-tracks B and C. The elevation of the main line A may be secured by an upgrade from right to left as far as the main line is straight, and the cars can maintain connection with the cable, and, a suitable elevation being secured, the grade may reverse at a point *o* near where the direction of the main track is changed and a sharp downgrade be maintained around the curve over the branches *m* and *n* and into or nearly into the station. For a station other than a terminal station the general features of the elevation would be the same, but the arrangement in plan changed to suit the conditions. For instance, if there were a train approaching on a straight line at the point *p*, where the tracks diverge from curve to station tracks, the downgrade need not commence till at or near *p*. If the train were approaching the station from the left and incoming track A were directly in line with the outgoing track D, the cable on that track might be run through the station, but the tracks at the left would need to be elevated at a short distance out, so that the trains for station-track B could be brought in by gravity.

Preferably the two station-tracks B and C are gauntleted together on the main line, forming a double single track on a little more than a single-track width, as shown in application above named and my applications, Serial No. 274,384, filed May 19, 1888, and Serial No. 276,388, filed June 7, 1888—that is, there would be a double set of rails on the main track A following around the curve Q and separating to form independent tracks at B and C. Track C would preferably, but not necessarily, run out in a straight line with the outgoing track D, while the rails of the station-track B would, by means of the curved branch S, run over to gauntlet with the rails of the station-track C on the main line D. If the gauntleted tracks are not used, switches would be needed at the

point *p* to separate the trains for the two station-tracks B and C and at the point X to make connection from such tracks to the outgoing track D. It is also preferred that double cables be used, one on the center line of each of the gauntleted main-line tracks, as shown clearly in said applications Nos. 274,384 and 276,388. The station arrangement of such cables is shown in Fig. 2 and position of sheaves in Fig. 1; but the cables between the rails are omitted in Fig. 1 to avoid confusing the drawings. Such cables would run on supporting-sheaves placed between the lines of rails on main incoming tracks A to a point *o* near where the tracks curve, one cable *s* turning down over sheave *s'* and one cable *t* turning down over sheave *t'*. The cable *s'* passes over sheave s^2 horizontally and diagonally across to the rear of the station between the rails of starting-track C, then upward and between the rails over sheaves s^3 s^4, when it would be run along the station-track C and continue through a properly-arranged cut in the rail of the switch S directly out on main line, substantially as shown in another application. Cable *t* would turn downward and be conducted over sheaves t' t^2 t^3 t^4 and run between the rails of the main line beyond the switch or branch S, but in the center line of the rails connecting with such switch, and the cars coming from the station-track B over such switch would take this cable by means of pick-ups out on the approach, substantially as shown in said applications Nos. 274,384 and 276,388. It will be observed that by this arrangement the cars would be propelled on the main line A to the summit of the grade by cable, and then run by gravity in on the two station-tracks B and C. The cars on station-track C can then be dispatched by picking up the cable and starting from a state of rest in the station. Those, however, on the station-track B must by some means be dispatched out of the station across the switch S and out on the main line to pick up the cable. This it is proposed to accomplish by means of a switching-car at the side, arranged, preferably, under the edge of the platform F in the station, and a suitable continuation thereof along the switch S and for a certain distance out along the outgoing track D, (it being understood that the incoming tracks A are out of the way above on an elevated structure.) This switching-car may be a small engine, generally of the "fireless" type, provided with ropes to connect to train on station-track B; but I prefer to use a platform-car T, Figs. 3 and 4, operated by an endless cable connected with a stationary engine. In practice this car would have two trucks and the pulling-cable be connected to platform between them. For simplicity of illustration, but one truck is shown. As the car is required to run curves in following the switch S, the cable propelling such car is connected to a rigid arm *u*, fastened to the truck or platform and extending below the level of the rails and at or near the elevation of the diverting-sheaves *v v*, in addition to which there would of course also be supporting-sheaves, as usual. The cable *w* propelling such car would, for the short distance to be run, preferably be wound on a large drum, as in inclined-plane practice, and the ends brought over suitable sheaves from different directions to the grip or holdfast *u*, one part of *w* passing over a tightening arrangement, as is customary. Then by arranging switch-signals between the moving car and the engine-room such car could be propelled back and forth at will. Little cabs for a conductor and assistant are formed on the ends of the car slightly above the rails, with roofs to protect the men's heads from the platform, and it is proposed to have a pulling-rope coiled on the platform, the end of which can be pulled off and connected to either the front or rear of a train on the station-track B, and the train thereby "roped" out. A switching-rope is shown brought into one end compartment and the end secured in a manner so that the slack can be taken up, and a small line secured to the tow-rope enters the other compartment to pull the former on the platform when it is cast off from cars on main line. The side-thrust of the tow-rope is provided for by erecting on the platform an arm R, provided with a roller V, running against a rail W, secured to a timber on the under side of the platform.

By the means described cars on the track B may be pulled out promptly onto the main track D at practically the same speed as the main cable, so that it will be simply necessary to grip the latter in the manner described in said applications Nos. 274,384 and 276,388, when the pulling-rope may be cast off and the pulling-car return.

In general it is preferred that the train be pushed out from the rear either with the ordinary switching bar or "pole," or by pulling with the tow-rope shown around the rear of the last car. In case it be not possible or convenient to put one of the station-tracks C in line with the main track, necessarily two such pulling cars and tracks would be required—one for each starting-track. The number of station-tracks may be multiplied at will and switching performed for each in the way described.

In some cases it may be practicable and desirable to run the trains away from the station-tracks by gravity. For instance, in Figs. 1 and 2 the station-tracks B and C and outgoing tracks D for a certain distance may be run on a descending grade away from the station, when the switching would be done entirely by gravity without the switching-car. Such a grade is shown in dotted lines in Fig. 2 and designated A'. The direction of motion in the figures can also be reversed, in which case trains would approach the station on tracks D in Fig. 1; but the tracks D, as well as the starting-tracks B and C, would in this case descend from right to left, substan-

tially on the lines D′ B′ C′. After stopping at the station the train would run out by gravity until a tangent was reached in any direction—for instance, the tangent A in Fig. 1—in which case the route would be *via* the rear branches *m n* and curve Q in such figure; but such curve and also the track A would necessarily be at a lower elevation than the station-tracks B and C, or more closely at the elevation of the dotted line marked A′.

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

1. In combination, an incoming main track, a curved inclined plane Q, multiple starting-tracks B and C, and a main return track, connected and arranged to secure operation substantially in the manner specified.

2. In combination, an incoming main track, a curved inclined plane Q, multiple starting-tracks B and C, a main return track, and gauntleted rails on main line separating to the multiple starting-tracks, all connected and arranged to secure operation substantially in the manner specified.

3. In combination with incoming and outgoing main tracks and multiple starting-tracks, with trains running in on one end and off the other of the same, an inclined plane to transfer cars by gravity over necessary intermediate curves from the line of an incoming track to that of an outgoing track.

4. In combination with multiple starting-tracks (with one of such tracks in the line of the outgoing main track and the other at the side) and an inclined-plane curve to transfer cars from a tangent of the main line to such starting-tracks, a pulling-car operating, substantially as described, to transfer trains on the starting side track over and upon the outgoing main line, substantially as described.

5. In combination with a main track provided with a cable for propulsion and a side track connected therewith, a switching engine or car arranged at the side to transfer cars from the side track over the cable, substantially as and for the purposes specified.

6. Multiple starting-tracks, with one arranged in line with outgoing main line, so that cars can be started by cable from a state of rest, and the other provided with auxiliary switching power on a separate track at the side to transfer the cars thereon to main line.

7. In combination with a station track and platform, a transfer-car suitably guided on rails or equivalents at the side of the track and below the platform, substantially as and for the purposes specified.

8. In combination with a transfer-car, a roller or slide V and a suitable rail or guide W, to prevent capsizing, substantially as and for the purposes specified.

9. In combination with a platform or roof arranged in connection with tracks or guides for a transfer-car, and said car, a side rail or guide W, arranged and operating substantially as specified.

CHAS. E. EMERY.

Witnesses:
H. W. YORK,
R. M. REEVS.