

(No Model.)

C. E. EMERY.  
CABLE SUBURBAN RAILWAY.

No. 428,384.

Patented May 20, 1890.

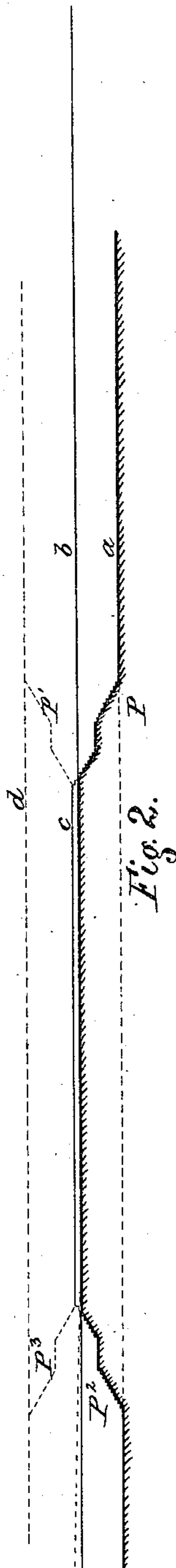
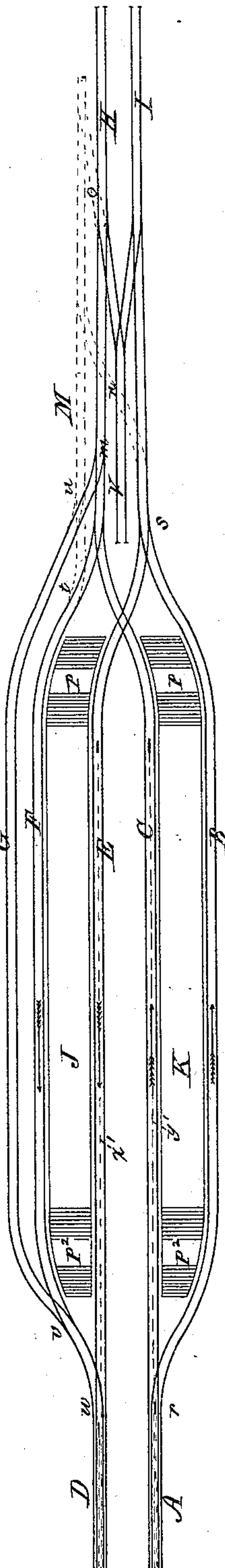
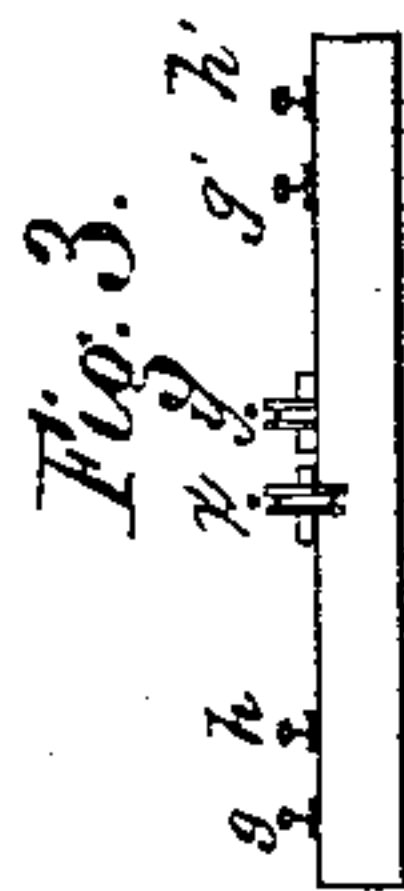


Fig. 2.

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# UNITED STATES PATENT OFFICE.

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## CABLE SUBURBAN RAILWAY.

SPECIFICATION forming part of Letters Patent No. 428,384, dated May 20, 1890.

Application filed July 21, 1888. Renewed April 19, 1890. Serial No. 348,589. (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.

In the operation of railroads designed to furnish means of communication from the business districts of cities to the residence districts or suburbs a very great concentration of travel occurs morning and evening, requiring the use of long trains at very frequent intervals. The problem of so operating trains that there will be no danger of collision, and of providing means to receive and discharge passengers in the limited time allowed is a serious one. When trains are running at frequent intervals, if one be stopped at a station on the main line to receive or discharge passengers the train immediately following will rapidly approach the rear of such train during the time not only of the stop, but while the train ahead is moving at reduced speed in stopping and starting. In practice the trains must be kept sufficiently separated, so that the following train will not be in danger of striking the rear of the standing train in case of unavoidable delays. In application Serial No. 263,295 an arrangement of multiple station-tracks is shown, whereby alternate trains in the same direction are run to different starting-tracks, so that a standing train is menaced not by the train immediately following, but by the second following train, and gauntleted tracks are shown for separating the two systems of cars without switches. In another application provision is also made for operating cars on such a system by cable.

The present invention relates to an improved arrangement of platforms and to a switching turn-out and arrangement of switches for use in connection with multiple starting-tracks, designed to secure increased efficiency and facility of operation.

In the drawings, Figure 1 represents a plan view of the tracks and platforms of a terminal station. Fig. 2 represents a diagram

elevation showing relative positions of the street, tracks, and platforms, and Fig. 3 is a cross-section of the road-bed on main line, showing gauntleted tracks and cables for same.

A represents the incoming main track; D, the outgoing main track; H and I, tail switching-tracks; B and C, multiple station-tracks for incoming passengers; E and F, multiple station-tracks for outgoing passengers; G, a switching turnout-track; K, platform for incoming passengers; J, platform for outgoing passengers, and P P' P<sup>2</sup> P<sup>3</sup> represent staircases.

In operating the system trains approaching on the incoming track A would be separated by switches or gauntleted tracks and directed on the tracks shown, alternately to the station-tracks B and C, and the passengers discharged to platform K. As a train approached the platform on one of the tracks C, for instance, the train which has previously entered on B would be hauled to the rear, preferably by a locomotive, on rear switching-track I, and immediately pushed out over the connecting-curve shown onto the outgoing station-track E, where passengers would be received from platform J. Meanwhile as another train entered on station-track B the train on track C would be pulled to the rear on rear switching-track H and pushed out immediately on return station-track F and stop to be loaded, when the train on track E would be dispatched, preferably, by gripping a cable  $\alpha'$  directly underneath it. As another train came upon station-track E the train on station-track F would be pushed out onto the main return-track D, and there pick up the cable.

In application Serial No. 276,823 is shown means for transferring a car from a turn-out to main line by means of a trolley or switching car at the side. In the present invention it is proposed to make this transfer by means of a locomotive. Trains on the general system can be run so close together that by the time a locomotive has pushed a train from station-track F, opposite the platform J, out on the return-line D, another train may be due upon or near the other end of the same track F, so that the locomotive cannot go back by the same route without so separating the trains as to lose much of the benefit of such an ar-



rangement. To overcome this difficulty, an additional turn-out G is provided outside the turn-out F specially to permit the return of the locomotive, and in operation the locomotive which transfers the train from incoming station-track C to rear switching-track H and from this to outgoing station-track F would remain behind the train until the passengers had entered from platform J, and then push the train over the curve shown out upon the main line D, where pick-ups would be located equivalent to those shown in application Serial No. 276,388, whereby the cable would be picked up and the train propelled on its way, when the locomotive would back away from the train, and at the point *v* be switched to the turn-out G, and upon the same proceed to the rear and enter at the point *m* upon the rear switching-track H after the next following train for track F has been pushed out in position opposite platform J by another locomotive, which takes the same circuit. Each locomotive upon reaching the rear switch H would run out and connect to the next train upon the incoming station-track C, pull the train on the rear switching-track, push it to station-track F, and from thence out on the approach, and return by the outer turn-out G, as previously described.

Should there be a grade in the direction D requiring a heavier locomotive than is necessary to do the switching in the rear, evidently one locomotive may in turn pull each train from incoming station-track C onto the rear switching-track H and "fly" it out on station-track F, in which case the turn-out G would connect by a curve *u* with an additional rear switching-track M, (shown in dotted lines,) which latter track would also be extended toward the front of the station and connect with the station-track F by a switch *t*. In this way a heavy locomotive could pass from the turn-out G to the additional rear switching-track M and move forward over switch *t* onto station-track F behind the train already switched to that point, push such train out on the approach, where it would pick up the cable and then return along the turn-out G and repeat the operation.

When it is not convenient to run the cable along the outgoing station-track E—for instance, when the same cannot be put in line with outgoing track D—trains on the track E may be pushed out by locomotive and the same returned by switching at or near the point *w* onto the curve for turn-out F, and from there to turn-out G or directly to the latter, and such locomotive thereby reach the rear and from thence cross to rear switch I by a cross-over *n*, (shown in dotted lines,) or by any system of switches and curves which can be conveniently arranged in the particular location. The switches M and *n* may also be used in handling trains in emergencies.

When the trains are not run so closely together, the outer turn-out G may be omitted or not used, when the locomotive would be

backed down the outgoing station-track F and onto the side switch M before the next train was pushed out on the outgoing track F and connect to next train either on track F by switch *t* or on track C by switches *o* and H.

The arrangement of the platform K between the two incoming station-tracks B and C and the platform J between the two outgoing station-tracks E and F facilitates the operation as compared with the five-platform arrangement shown in application Serial No. 263,295, as passengers for the same direction are kept together and can be disposed of more promptly.

An intermediate switch V is shown, which is intended as a station for the locomotive to receive coal and water or for a disabled car, but can be made a part of crossing between tracks M, H, and I.

It is preferred to use a cable system in which the grips are located on the cars above the rails, so that no part will project below the latter to interfere with running such cars over ordinary switches and in trains with other cars of ordinary railroads. With such grips the cars cannot be run on ordinary curves when attached to cable, as the latter will not, on account of its tension, drop below the rails sufficiently to engage with certainty the lateral diverting-sheaves. The cables, therefore, for such a system will only be run on the tangents.

It is preferred that the tracks to the multiple-station tracks be gauntleted on the main line—that is, that double rails be provided each side, as shown in Fig. 3, the outer one on one side and the inner one on the other, forming separate tracks *g g'* and *h h'*, which at the station separate to the two staffing-tracks, it being understood that more than two can be arranged on the same principle. On the center line of each of the gauntleted tracks it is proposed to arrange a cable on suitable supporting-sheaves—for instance, a cable *x* for rails *g g'* and a cable *y* for rails *h h'*.

In the arrangement shown a cable *y'* can be run on the incoming main track A in line with the center of station-track C and along such station-track and be carried below where such track is curved to connect with rear switches. The cable for the station-track on turn-out B would, however, stop on the main line before reaching the curve at *r* and be carried below the track to the head of turn-out B, as shown in another application, or across to form a return-cable on the other side. When the outgoing station-track E is in line with main line D, the cable, as shown at *x'*, would be brought up to the surface on the same near the curve, connecting to rear switches and be carried along the center of such track out in proper position on the gauntleted tracks of the main outgoing line D. The cable for cars coming from the station-track or turn-out F off the line of the



main line would, however, be brought up at or near *w* on outgoing line D and pick-ups be there provided, so that cars pushed out from the turn-out F would pick up the cable and proceed thereby. The pick-ups may be of any form adapted for the purpose, as previously explained.

The station-platforms are always to be kept off the grade of the railroad-tracks. They are shown connected with the street when below the level of the rails by staircases P P<sup>2</sup>, and when the street is above the rails, as shown by dotted line *d*, by staircases P' P<sup>3</sup>, *c* being in both cases the level of the platform.

The outer turn-out G may evidently be used at any station on the main line as well as at a terminal station. It will also be equally as efficacious when the cars are transferred from an incoming to an outgoing track by means of a rear curve instead of rear switches. (See applications Serial Nos. 276,388 and 276,823.)

The method of applying the system of handling passengers and of operating the system with the outer turn-out to a local station would be simply to lengthen the station-tracks E and F, for instance, also platform J, and to extend an outer turn-out G alongside and beyond the station in both directions, when the cars would be stopped at one end of said platform as an incoming station, and be discharged down the stairs at that end, and then

the train be pulled ahead to the other end of said platform as an outgoing station, and receive passengers coming up the stairs from that end.

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

1. In combination, double station-tracks for motion in the same direction, gauntleted tracks on main line separating to the two station-tracks, separate cables for each of the gauntleted tracks on main line, and a passenger-platform between the station-tracks connecting with the street at another grade, all arranged and operating substantially as described.

2. In combination with multiple starting-tracks for trains moving in the same direction and with rear switching-tracks conducting trains to such starting-tracks, an additional switch M, connected, arranged, and operated substantially as described.

3. In combination with multiple starting-tracks for trains moving in the same direction, gauntleted together and provided with a cable or cables on the main line, a switching turn-out G, arranged and operating substantially as described.

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Witnesses:

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