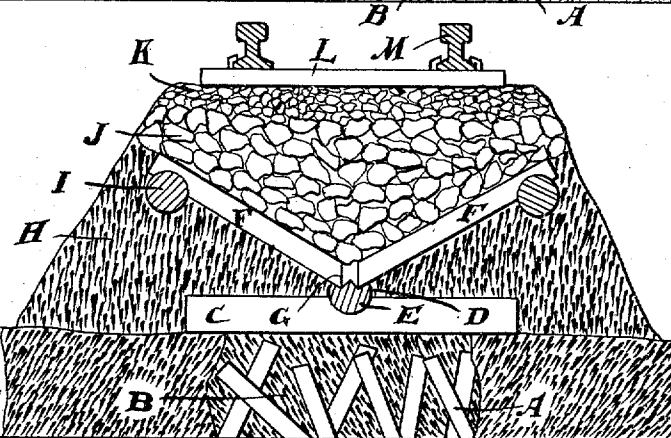
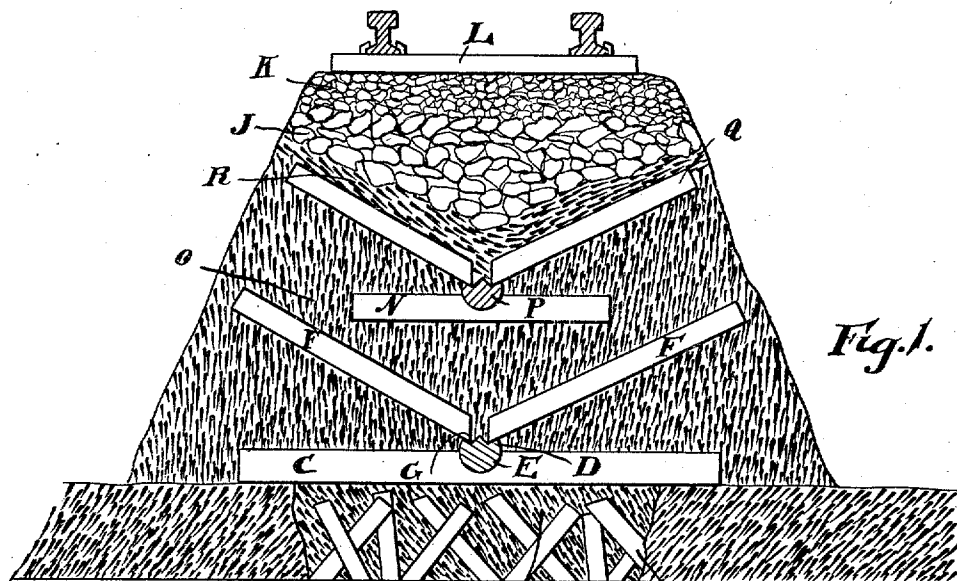
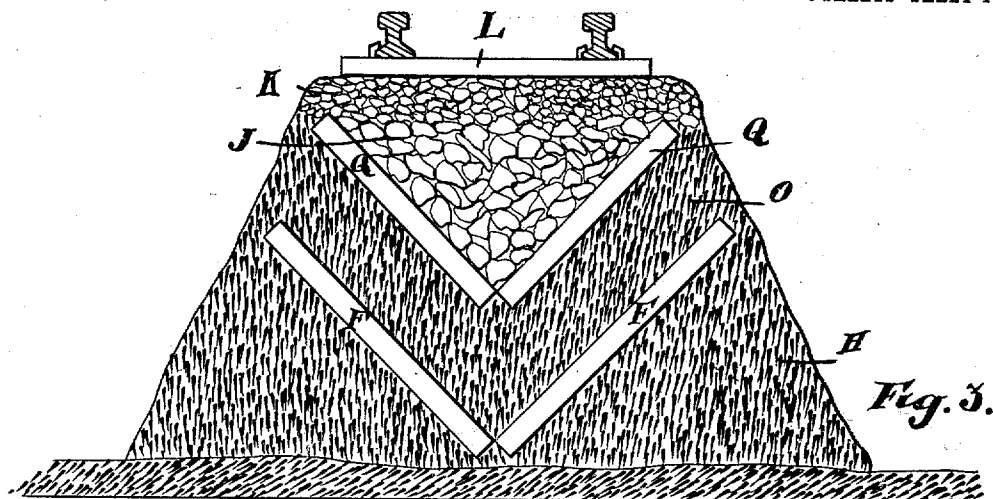


D. MARCONI.
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APPLICATION FILED JULY 6, 1909.

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Patented May 3, 1910.

3 SHEETS—SHEET 1.



Witnesses

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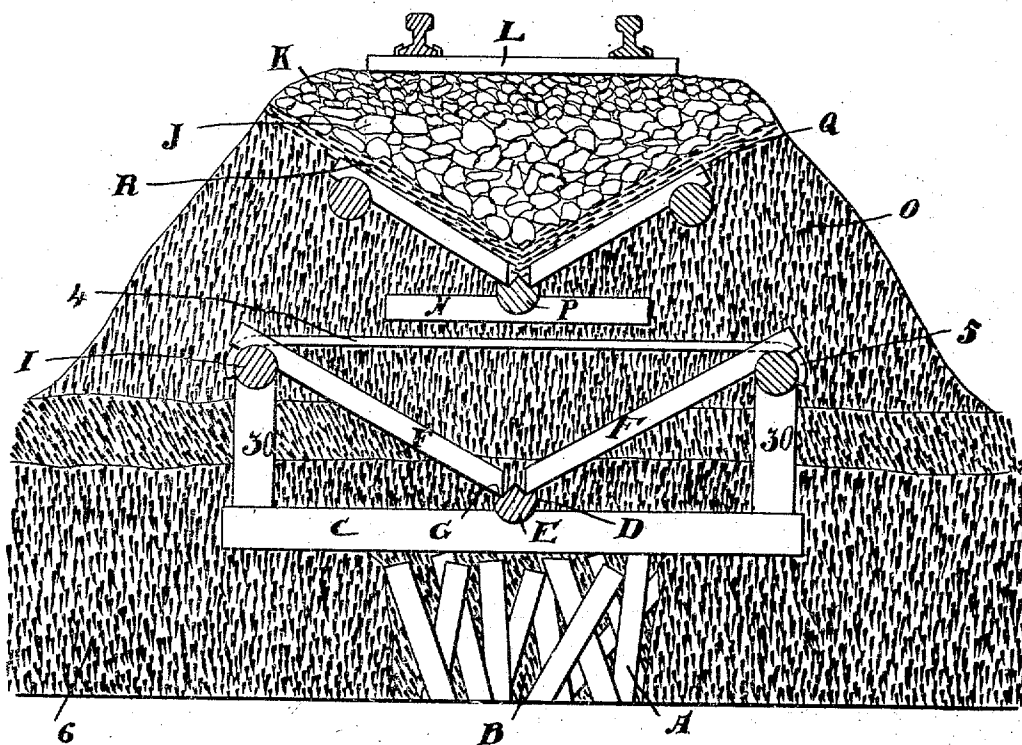


Fig. 5.

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UNITED STATES PATENT OFFICE.

DAVID MARCONI, OF RENNIE, MANITOBA, CANADA.

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Specification of Letters Patent.

Patented May 3, 1910.

Application filed July 6, 1909. Serial No. 506,238.

To all whom it may concern:

Be it known that I, DAVID MARCONI, a subject of the King of Great Britain, residing at Rennie, in the Province of Manitoba, Canada, have invented certain new and useful Improvements in Methods and Constructions for the Prevention of Sink-Holes in Railroad-Beds, of which the following is a specification.

My invention relates to improvements in method and construction for the prevention of sink-holes in railroad beds, and the chief object of my invention is to construct a road-bed so that in boggy and swampy land the formation of sink-holes will be impossible, and thus very considerably reduce the cost of maintenance of road-beds over swampy or boggy land, and to insure the stability of the bed for the track.

Another object of my invention is to provide a method and construction whereby when the sink-hole occurs in the ground underneath the road-bed, the same may be filled up and the road-bed strengthened so as to prevent any sinking in the track above the sink-hole.

A still further object of my invention is to provide a method for repairing railroad beds in case a depression should be caused by the falling away of the ballast through the use of loam or clay in the grading.

My method and construction for putting the same into practice, will be hereinafter particularly described, and what I claim as new will be pointed out in the claims forming part of this specification.

Figures 1 and 2, are vertical cross-sections through a road-bed constructed according to my invention. Fig. 3 is a vertical cross-section through a road-bed constructed according to my invention over a stretch of boggy or swampy land, in which no sink-hole has occurred. Fig. 4 is a vertical cross-section through a section of road-bed constructed according to my invention, which section is shown in perspective, and part of the embankment broken away so as to illustrate details of construction, and Fig. 5 is a vertical cross-section through a road-bed showing a further alternative form of construction of my invention.

In the drawings, like characters of reference indicate corresponding parts in each figure.

In constructing railroads over swampy or boggy land, it is well known that notwithstanding the method employed to give a firm foundation for the road-bed, portions of the road-bed, of various lengths, oftentimes sink, thus rendering it very difficult, if not impossible, to operate trains over the tracks. Now the sinking of the road-bed is caused by the giving away of the soft ground on which the road-bed is built, and the consequent falling into the hole thus formed, of the material composing the road-bed. It is one of the objects of my invention to provide a method which can be carried out in different ways whereby a firm road-bed can be built over swampy or boggy places and maintained in good conditions so that it will support any amount of traffic.

In Figs. 1, 2, and 4, I show a road-bed construction over a boggy or swampy piece of land in which a sink-hole A already exists. Now before I can build my construction, the sink-hole A must be filled in by any suitable material, such as logs, earth, or stones, B. Bridging the sink-hole are a plurality of cross-logs C which are long enough so that their ends will rest upon firm ground. The cross-logs C are placed close together, as shown by dotted lines, Fig. 4. The said cross-logs are preferably, though not essentially, notched as shown at D so as to receive the longitudinal logs E, which are placed end to end. The road-bed is then built up part way so as to slope inward at each side down to the longitudinal logs E. The side logs F are then placed in two rows with their lower ends resting in the notches G formed in the longitudinal logs E, and resting upon the material forming the lower portion H of the road-bed. If desired, before placing the side logs F in place, longitudinal side logs I may be placed in position, and said side logs F may be rested on said longitudinal side logs. Either the side logs F or the longitudinal side logs I may be notched in order to stiffen the construction. When the before-mentioned logs are placed in position, the cavity above the said logs is filled in by means of rock J, and the whole topped off by any suitable ballast K on which are placed the sleepers L carrying the rails M. If conditions warrant it, the construction shown in Fig. 1 may be used. This construction illustrates an upper row of cross-

logs N which are placed on the earth filling O covering the logs F and their supports. Carried by the upper cross-logs N are upper longitudinal logs P which carry the upper side logs Q. Covering the logs N, P, and Q, may be any suitable filling R of earth, and above the earth R may be placed the rock filling J, as before described.

Where the railroad is to be built over boggy or swampy land in which no sink-holes are visible, I may use the side logs F and upper side logs Q, and dispense with the other supporting logs. Of course it is conceivable that conditions may only require the use of the side logs F, either with, or without, the other side logs thereunder or thereabove as will be understood.

If desired, the longitudinal side logs I may be secured together as shown at 2, and under the jointed ends of said side logs an under-supporting log 3 may be placed, (see Fig. 4).

If desired, the side logs F may be supported at their outer ends on vertical logs 30 which rest upon the cross-logs C.

4 is a brace-bar having bent ends 5 which overlap the longitudinal side logs I so as to prevent the same from spreading apart.

In Fig. 5 I have illustrated the cross-logs C as being placed in the bottom of a trench 6, shown as filled in and over the top of the sink-hole. This construction places the cross-logs C below the top surface of the firm ground. There may be conditions under which this construction may be very useful.

Although I have illustrated my method by different constructions of putting the same into operation under a single track, it will be understood that the method can be employed on double tracks, or, in fact, above road-beds of any width, because to get the desired width it is only necessary to either increase the length of the side logs and vary their angle of inclination to each other as circumstances may demand, or else construct the road-bed with the constructions illustrated the desired number of times in order to provide for the width of the road-bed.

Sometimes it is essential in railroad construction, because of the dearth of first-class material, to make the grading of a large percentage of loam or clay. Now moisture has an injurious effect on railroad beds so constructed, and consequently such road-beds are apt to more or less cave in in places, and without further illustration it will be understood that my method can be employed in repairing such road-beds. In repairing a sink-hole in the railroad bed, itself, it will be understood that the angularly disposed logs F will be employed, with or without, the supporting logs, and that when the logs have been positioned, the cavity will be filled up in the usual way.

The angular disposition of the logs F and Q to each other is essential, and I have found from actual practice that these logs maintain, or hold in position, the earth between them and prevent the spreading of the road-bed.

In putting my method into practice, I find that the inclined logs are most efficient when placed at an angle anywhere from 25 degrees up to 30 degrees.

While I have described what I consider to be the best embodiment of my invention, I desire it to be understood that the principles can be embodied in different forms, and I desire not to be limited beyond the requirements of the prior art, and the terms of my claims.

It will of course be understood that my methods and constructions may be employed in the building of ordinary road-beds.

What I claim as my invention is:

1. The method of the prevention of the formation of sink-holes in railroad-beds, which consists in building in with the road-bed, in two side rows, a plurality of logs placed at the angle of highest efficiency.

2. The method of the prevention of the formation of sink-holes in railroad-beds, which consists in building in with the road-bed, supporting logs, and resting upon the supporting logs, in two side rows, a plurality of logs placed at the angle of highest efficiency.

3. The method of the prevention of the formation of sink-holes in railroad-beds, which consists in filling in the sink-holes with suitable material; then bridging it over with cross-logs, and then building in with the road-bed, in two side rows, a plurality of logs placed at the angle of highest efficiency, and carried by said cross-logs.

4. The method of repairing sink-holes in railroad beds, which consists in placing in the cavity a plurality of logs placed at the angle of highest efficiency, and then filling up the cavity with the desired material.

5. The method of preventing the spreading of railroad beds which consists in building in with the road-bed, in two side-rows, a plurality of logs placed at the angle of highest efficiency.

6. The combination with a railroad-bed, of a plurality of logs forming two side rows which are placed at the angle of highest efficiency to each other.

7. The combination with a railroad bed, of a plurality of logs forming two sets of side rows, the sides of each row being placed at the angle of highest efficiency to each other, and the said sets of rows being separated by material composing the road-bed.

8. The combination with a railroad-bed, of a plurality of supporting logs, and another plurality of logs carried by said supporting logs and forming two side rows which

are placed at the angle of highest efficiency to each other.

9. The combination with a railroad-bed, of a plurality of cross-logs; a plurality of longitudinal logs carried thereby; a plurality of longitudinal side logs, and a plurality of side logs forming two side rows which are carried by the said longitudinal logs and

said longitudinal side logs, and placed at the angle of highest efficiency to each other.

In testimony whereof I have affixed my signature in presence of two witnesses.

DAVID MARCONI.

Witnesses:

M. F. CLARKE,
E. G. FRICK.