

E. DIEBITSCH.
SUBWAY CONSTRUCTION.
APPLICATION FILED JULY 11, 1911.

1,002,904.

Patented Sept. 12, 1911.

2 SHEETS—SHEET 1.

Fig. 1.

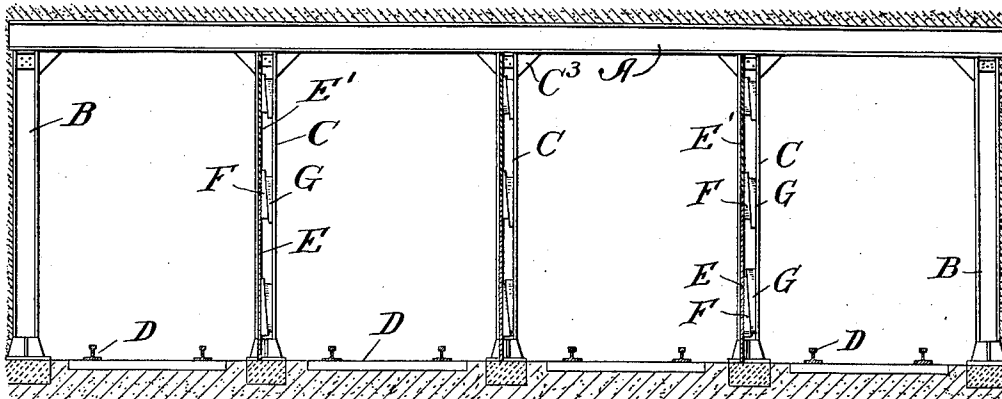
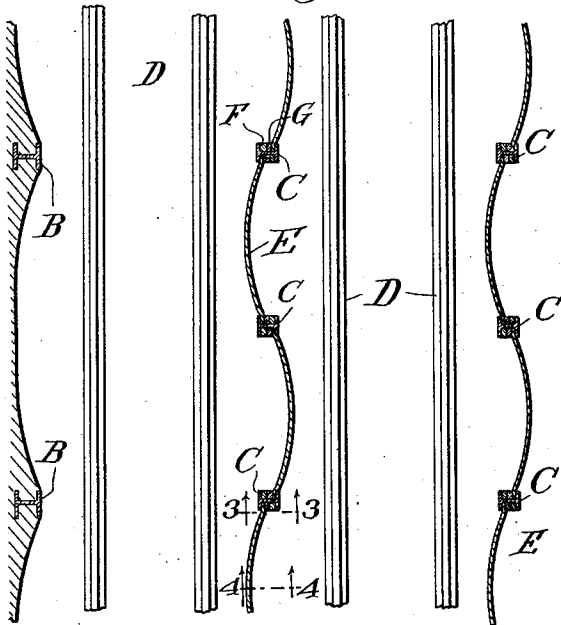


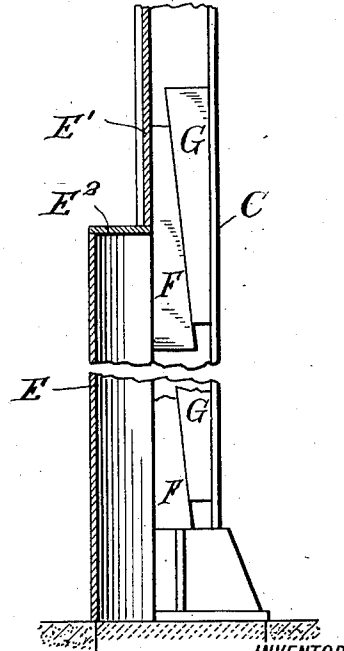
Fig. 2.



WITNESSES

William K. Deuener
Lulu Stuberwell

Fig. 4.



INVENTOR

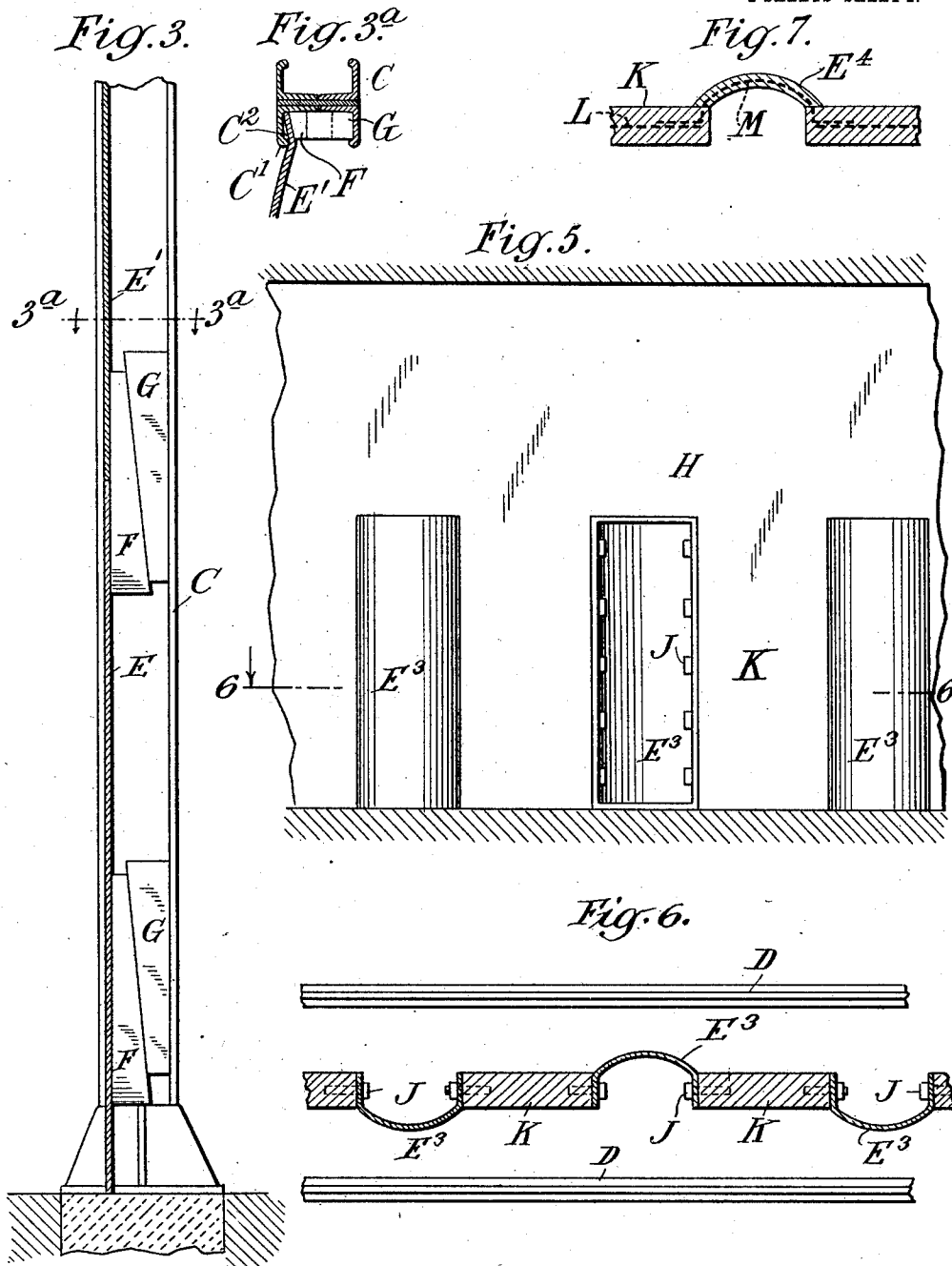
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SUBWAY CONSTRUCTION.

1,002,904.

Specification of Letters Patent. Patented Sept. 12, 1911.

Application filed July 11, 1911. Serial No. 637,864.

To all whom it may concern:

Be it known that I, EMIL DIEBITSCH, a citizen of the United States, and a resident of Nutley, Essex county, New Jersey, have
5 invented certain new and useful Improvements in Subway Constructions, of which the following is a specification.

In building railway tunnels and subways it is customary where they are far below
10 the surface to construct a separate tube for each track, smaller tubes being better adapted to the methods of boring in use. At the same time such single tubes serve
15 as cylinders through which the train runs in the manner of a piston carrying a considerable quantity of air along with it or ahead of it, and so ventilating the tunnel. In subways constructed near the surface it is more economical to build one tube to
20 carry a plurality of tracks. In use, however, such a subway is not ventilated to any substantial extent by the movement of the trains, because of the smallness of their transverse section compared with that of the
25 subway. According to this invention I purpose to divide such a subway by suitable partitions extending from the roof to the floor into separate tubes for each of the
30 trains, so as to provide the desired ventilation by the movement of the trains, and to provide a partition of special design and construction whereby the erection of such partitions in existing subways will be facilitated.

35 The accompanying drawings illustrate embodiments of the invention.

Figure 1 is a transverse section, and Fig. 2 a partial horizontal section of a four-track subway. Fig. 3 is an enlarged vertical longitudinal section on the line 3—3 of Fig. 2.
40 Fig. 3^a is a section on the line 3^a—3^a of Fig. 3. Fig. 4 is a modification, being a vertical section on the line 4—4 of Fig. 2. Fig. 5 is a face elevation and Fig. 6 a section on
45 the line 5—5, of another style of construction embodying the invention. Fig. 7 is a horizontal section of still another style.

Referring to Figs. 1 and 3, the roof girders A are supported by the side columns B and
50 the interior columns C. The tracks D are arranged between the vertical supports of the roof. In the usual prior constructions longitudinal spaces are left between the columns which permit track walkers or other work-
55 men to pass from one track to the other in order to avoid passing trains. But occasion-

ally in avoiding one train the workman fails to observe another coming on the adjacent track and is struck by the second train. These openings also prevent automatic ven-
60 tilation. This lack of ventilation is a serious matter, especially where the roof of the subway is near the surface of the earth so that it becomes quite hot in the summer. The friction incident to the passing of the
65 trains also adds very much to the heat within the subway. The air is vitiated by the large number of passengers usually carried as well as heated by the conditions above referred to and the volume of air is so great
70 that ventilation by fans and other extraneous means is almost if not quite impracticable.

To insure ventilation by the moving trains, a partition is extended along the
75 lines of the interior columns. The construction of such a partition in existing subways which have been built without the same is a matter of difficulty and expense, taking
80 into consideration the necessary mode of introduction of the material through the stations and the necessity of avoiding interruption of traffic or reducing such inter-
85 ruption to a minimum. The material of the partitions must also be strong enough to withstand the sudden air pressures to which they are subjected by passing trains. To
provide for these conditions I propose to make the partitions of sheets of suitable
90 material, the sheets being made beforehand of lengths at least sufficient to extend integrally from one column to the next; the panel between each two columns consisting
95 of a single sheet of the full height or of several of such sheets, one above another.

Where the columns are close enough the
sheets may be made longer than the distance between two successive columns. For
100 example, each sheet may span three or more of the columns. In the preferred construction, illustrated, however, each sheet is equal
105 in length to the panel and each sheet is fastened at its edge to a column. A great variety of fastening devices may be used. I have shown a style of fastening in Figs. 1,
110 2, 3 and 3^a which is especially adapted to the columns illustrated in that it uses the channels in the faces of the column and does not require the drilling of rivet holes or any similar operations upon the columns themselves. Each sheet E has each of its edges entering a channel in one of the col-

umns and fastened therein by a pair of wedges F and G driven between the edge of the sheet and the opposite flange of the column. The columns, as shown in the enlarged view, Fig. 3^a, are built up of angles and the central plate, the outer edges of the angles being provided with ribs or beads C'. The edge of the sheet is bent around such ribs leaving a triangular space C² which may be filled with a strip of transite board or a suitable material to take the pressure of the wedges. The combination of wedges with this particular type of column is especially useful, the thickness of the wedges being only such as will bring them within the beads C'; so that when the wedges are driven home the beads prevent their outward movement as well as increasing the hold upon the edge of the sheet. The fitting of the edges of the sheets in the channels of the columns is also advantageous as it can be accomplished with little or no cutting and fitting of the sheets. The columns are usually provided at their upper ends with triangular braces C³ (Fig. 1) which would interfere with the laying of the sheets against the side faces of the columns, but which are not in the way when the construction illustrated is adopted.

The sheets E may be of any suitable material. I prefer to use transite board, a material made of asbestos and cement, which can be readily molded to the shape and dimensions desired and which has the necessary strength and the very desirable quality of being fireproof. This material is also very much less resonant than metal, which is an important advantage, the unavoidable noise in such subways being so great that it is important to stifle it as much as possible.

The introduction of a partition into a subway of the design shown in Figs. 1 and 2 cuts off the possibility of a track walker passing from one track to another at all points. Openings will be provided at intervals for this purpose; but in order to provide an abundant refuge for such men I purpose to make some of the sheets bent or curved in horizontal section as shown in the Fig. 2. This provides the desired refuge and protects the workman from inadvertently getting into the way of another train. Preferably all of the sheets are so curved and the successive sheets are curved in alternate directions and at any point on the track the sheet at one side projects inward and at the opposite side projects outward. Thus there is provided a series of niches into which the track walker can retreat. If he is in the center of the track he can step into a niche immediately at one side of him. If he is at one side of the track he can walk forward or backward to the next panel at the same side of the track and find a suitable refuge.

It is not necessary that the niche formed by the curved sheets extend clear to the top of the track. For example, as shown in Fig. 4, the curved sheet or sheets E may extend only a sufficient height to accommodate a man and the sheet or sheets E' constituting the upper part of the partition may be flat. The flat sheets are more economical of material and more easily molded. When such a construction is used the curved sheet E (or the upper one of such sheets where a plurality of them are used in a panel) must also be molded with a horizontal portion E² to close the gap which would otherwise exist at the upper edge of the curved sheet; or the piece E² may be separately made and set in place.

Subways or tunnels are sometimes designed with a masonry partition between tracks as shown in Figs. 5 and 6, with openings at intervals through the masonry to provide a refuge and to permit crossing from one track to another. My invention may be applied to such a subway by means of sheets E³ similar to those used in the construction previously referred to and extending across the openings in the wall K (an opening or door being left clear at long intervals for crossing from one track to another). The sheets E³ in this case may have their edges bearing against the edges of the openings in the wall and fastened by means of expansion bolts J screwing into the wall. When the openings in the masonry are only a little higher than a man the sheet E³ will be curved throughout its height. The parts K of the masonry wall are in effect columns which aid in supporting the roof and between which the sheets of partitioning material are applied, similarly to the columns C of Figs. 1 and 2. Such masonry walls are ordinarily quite thick and, depending upon the depth of the niche required and upon the thickness of the wall the sheets E³ may be more or less curved or may be laid flush with one face of the wall.

For masonry walls where the improvement is to be applied during construction of the wall, the method illustrated in Fig. 7 is probably better. Here the wall K is provided with reinforcing material L a web of which is embedded in the masonry and runs lengthwise. When an opening in the wall is to be left a sheet of reinforcing material M is set up with its edges embedded in the edges of the masonry and with its intermediate part bent around to the horizontal section of the panel (or extending straight across the opening where the panel is to be flat). Thereafter a coating of plaster or mortar is applied to the netting to form a thin panel E⁴ corresponding with the sheet of transite board E³, Fig. 6.

What I claim is:—

1. A tunnel or subway carrying a plural-

ity of tracks, and having a partition comprising a line of columns between said tracks and sheets of suitable material between each two successive columns, each sheet extending integrally from one column to the next and being fastened at its opposite edges respectively to successive columns.

2. A tunnel or subway carrying a plurality of tracks, and having a partition comprising a line of columns between said tracks and sheets of transite board between each two successive columns, each sheet extending integrally from one column to the next and being fastened at its opposite edges respectively to successive columns.

3. A tunnel or subway carrying a plurality of tracks and having a partition comprising a line of columns between said tracks and sheets of suitable material between each two successive columns, some of said sheets being curved in plan and providing niches for refuge from passing trains.

4. A tunnel or subway carrying a plurality of tracks and having a partition comprising a line of columns between said tracks and sheets of suitable material between each two successive columns, successive sheets being extended outward on opposite sides of the line of the columns.

5. A tunnel or subway carrying a plurality of tracks and having a partition comprising a line of columns between said tracks and sheets of suitable material between each two successive columns, said sheets being curved to provide niches between successive pairs of columns, the successive niches along the partition being at opposite sides thereof.

6. A tunnel or subway carrying a plurality of tracks, and having a partition comprising a line of columns between said tracks and sheets of suitable material between each two successive columns said sheets being curved to provide niches between successive pairs of columns, the successive niches along the partition being at opposite sides thereof the curvature in the partition at opposite sides at any points in the track being at opposite directions so as to provide a niche at one side or the other throughout the length of the track.

7. A tunnel or subway carrying a plural-

ity of tracks and a partition comprising a line of columns between said tracks and sheets of suitable material between each two successive columns, the lower part of each panel being curved in transverse section to provide a niche for retreat from passing trains, and the upper part of the panel being flat.

8. A tunnel or subway carrying a plurality of tracks and having a partition comprising a line of columns between said tracks and sheets of suitable material fastened to said columns, each sheet extending integrally in a longitudinal direction for a distance equal at least to that between two successive columns.

9. A tunnel or subway carrying a plurality of tracks and having a line of columns between said tracks, the transverse faces of said columns being provided with vertical channels and sheets of suitable material between each two successive columns, each sheet extending integrally from one column to the next and having its edges entering the channels in the transverse faces of said columns and fastened therein.

10. A tunnel or subway carrying a plurality of tracks and having a partition comprising a line of columns having their transverse faces channeled and provided with inward beads on the edges, sheets having their edges within said channels and fastening means for the edges of the sheets, said fastening means being held in by said beads.

11. A tunnel or subway carrying a plurality of tracks and having a partition comprising a line of columns having their transverse faces channeled and provided with inward beads on the edges, sheets having their edges within said channels and wedging means between the edges of said sheets and the opposite walls of the channels, said wedging means being held in by said beads.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

EMIL DIEBITSCH.

Witnesses:

D. ANTHONY USINA,
WILLIAM N. SEEWAGEN.