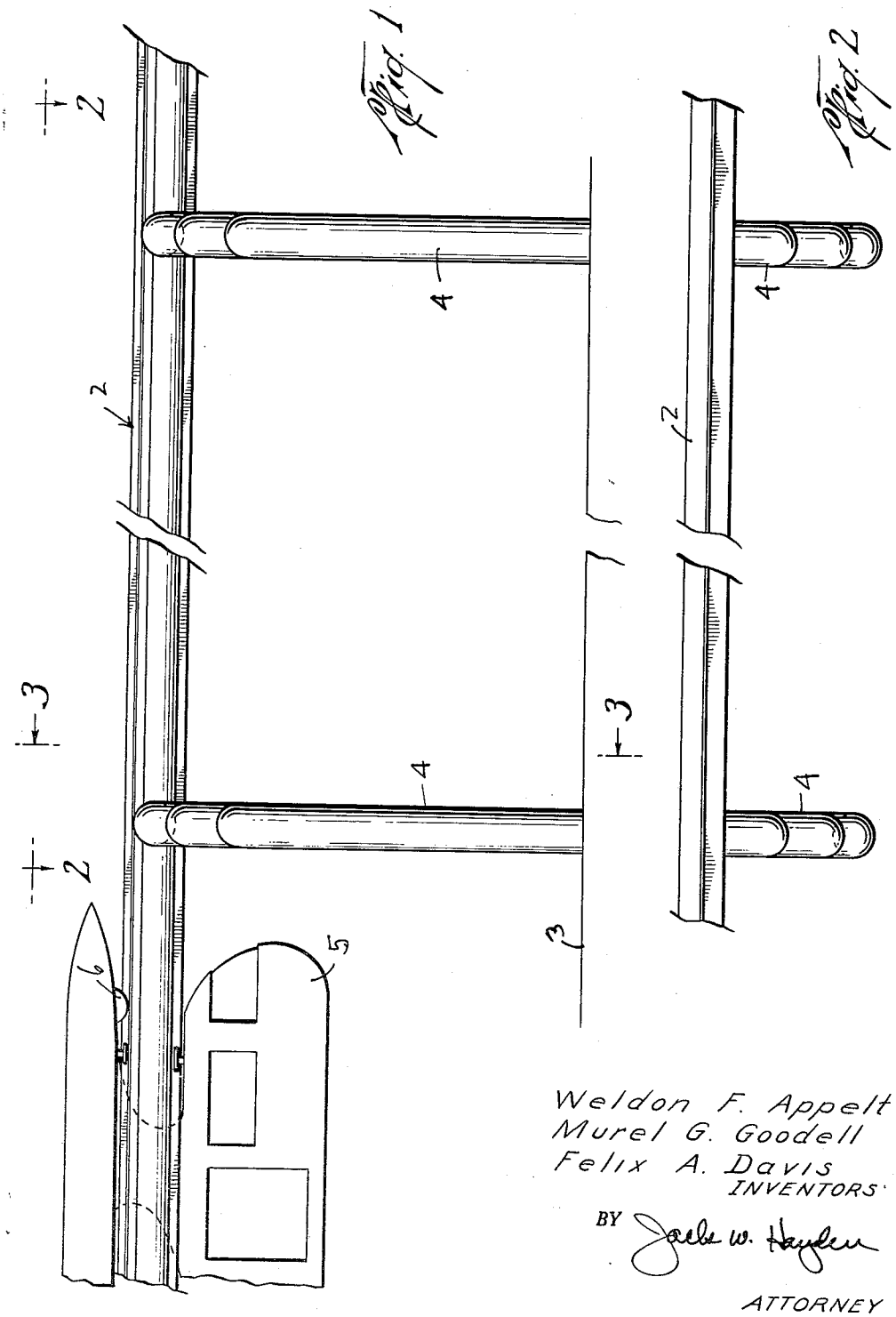
May 21, 1963 M. G. GOODELL ET AL 3,090,326

ELEVATED TRACK AND SUPPORT STRUCTURE THEREFOR

Filed Feb. 23, 1956

4 Sheets-Sheet 1



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Fig. 3

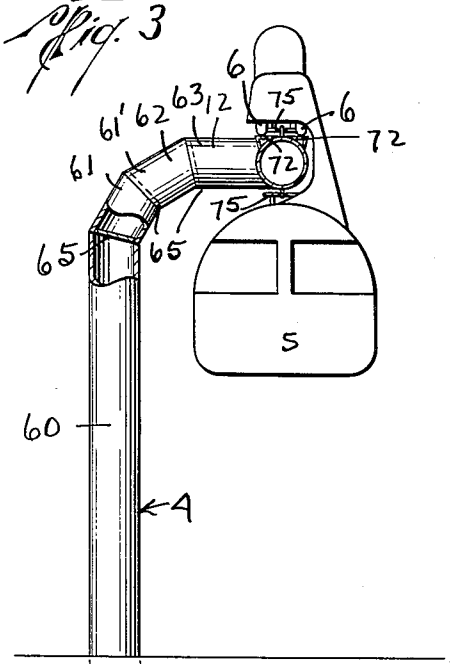


Fig. 4

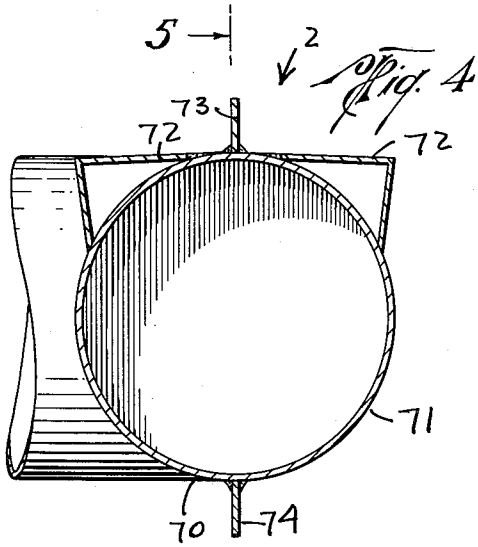
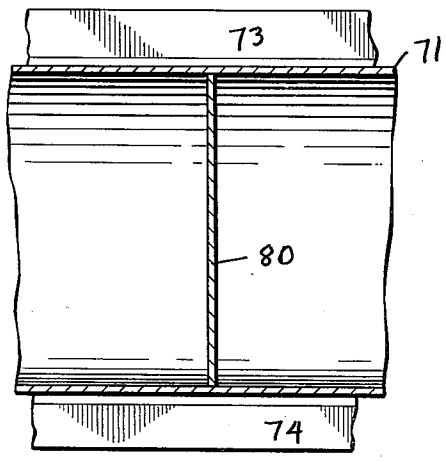


Fig. 5



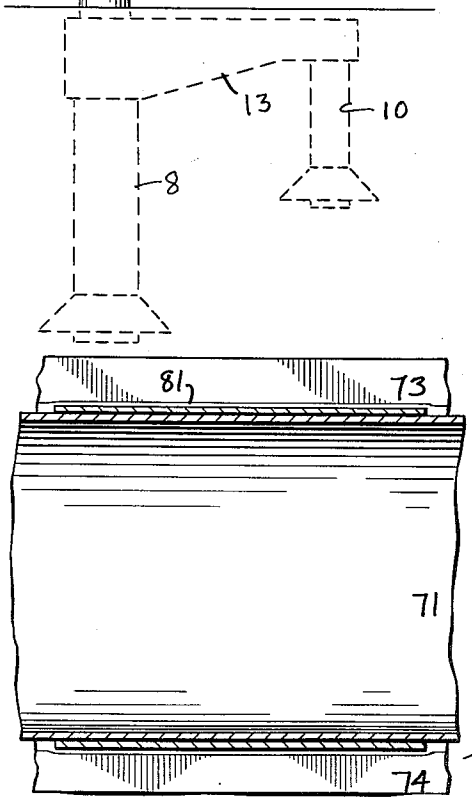


Fig. 6

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ELEVATED TRACK AND SUPPORT STRUCTURE THEREFOR

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Fig. 7

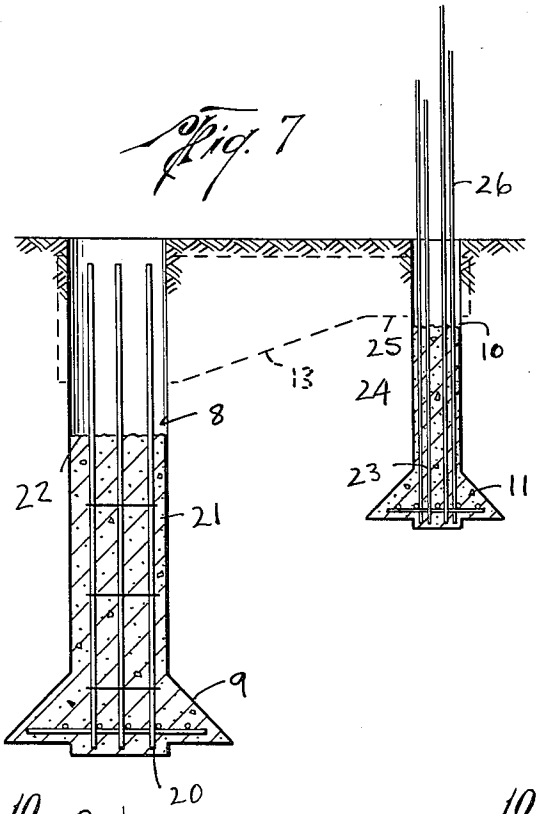
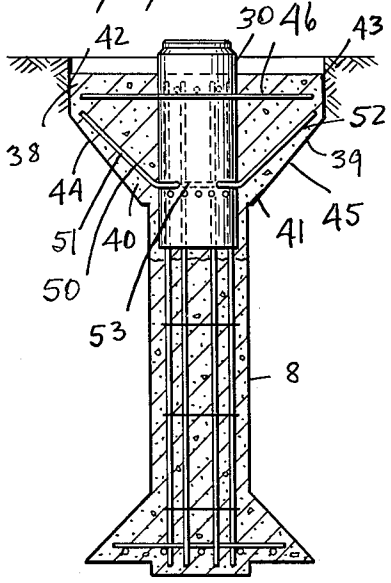


Fig. 9



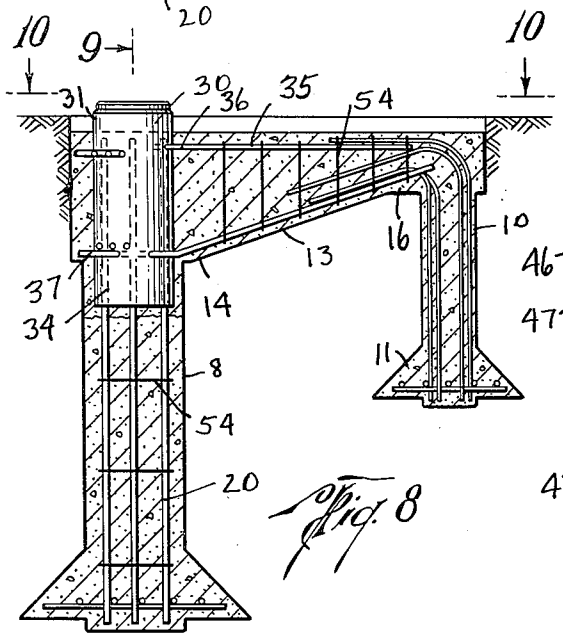


Fig. 8

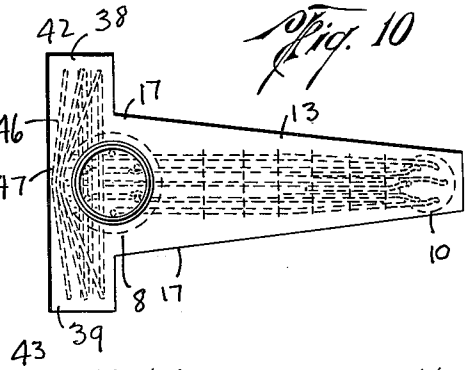


Fig. 10

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Fig. 11

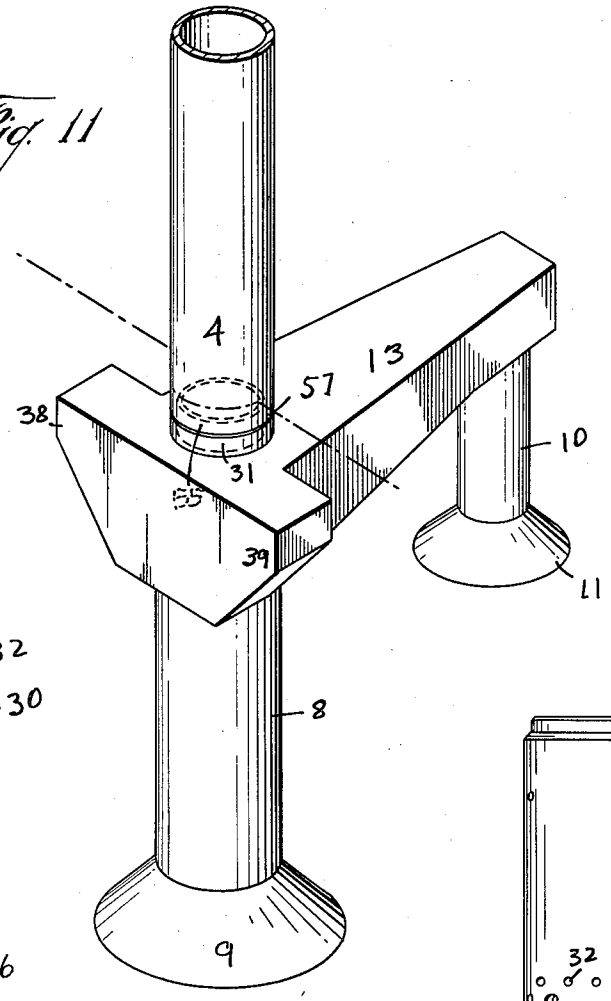
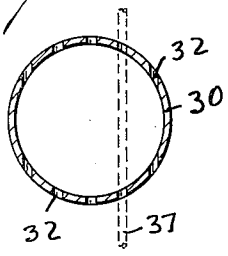


Fig. 13



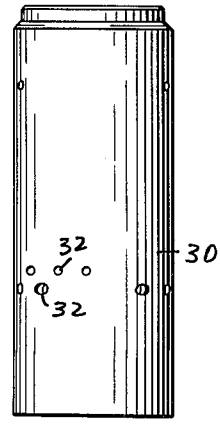


Fig. 14

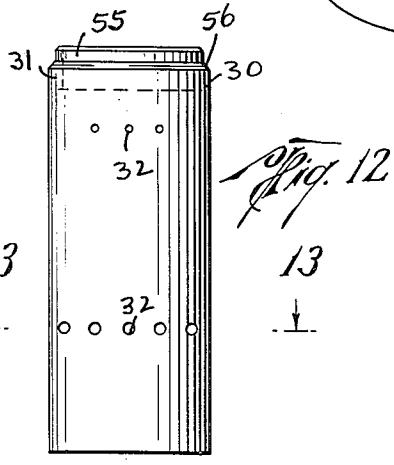


Fig. 12

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United States Patent Office 3,090,326 Patented May 21, 1963

3,090,326

ELEVATED TRACK AND SUPPORT STRUCTURE THEREFOR

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Filed Feb. 23, 1956, Ser. No. 567,101
2 Claims. (Cl. 104—124)

The present invention relates to an elevated rail and a support structure therefor.

An object of the present invention is to provide an elevated rail construction which is capable of withstanding tremendous loads.

Still another object of the invention is to provide a unique foundation construction for supporting a tower and elevated track.

A further object is to provide a foundation for towers which are spaced, but connected together by an elevated track or rail along which a coach is adapted to move.

Still another object of the invention is to provide an elevated rail which can be used as a track for an elevated coach and as a conductor for a fluid medium.

Still another object of the invention is to provide a tower and foundation construction for supporting an elevated rail thereon.

Yet a further object of the invention is to provide an elevated rail and support structure therefor which is economical to build, but yet sturdy enough to withstand the tremendous forces to which it will be subjected.

Other objects and advantages of the present invention will become more readily apparent from a consideration of the following description and drawings wherein:

FIG. 1 is a side elevation showing a portion of a rail and the preferred arrangement of the towers for supporting the rails;

FIG. 2 is a top plan view on the line 2—2 of FIG. 1;

FIG. 3 is a side view on the line 3—3 of FIG. 1, partly in section showing some of the details of the tower and the rail construction;

FIG. 4 is an enlarged view of the rail and upper end of the tower structure of FIG. 3;

FIG. 5 is a vertical sectional view on the line 5—5 of FIG. 4 showng a form of reinforcing used in the rail as well as the guide fins secured thereto and extending from opposite sides thereof;

FIG. 6 is a side view similar to FIG. 5 and showing an alternate form of reinforcing for the rail when it is to be used as a conductor for a fluid medium;

FIG. 7 is a vertical sectional view, partly in elevation, showing the foundation for the tower and rail partly formed;

FIG. 8 is a sectional view similar to FIG. 7, showing the foundation of FIG. 7 completely formed with the base tube of the tower positioned in the foundation;

FIG. 9 is a sectional view on the line 9—9 of FIG. 8 partly in elevation and showing the rear end of the main footing or pier;

FIG. 10 is a top plan view on the line 10—10 of FIG. 8 showing in dotted line part of the reinforcing arrangement;

FIG. 11 is an isometric view of the foundation construction showing the lower portion of the tower secured to the base tower tube in the foundation;

FIG. 12 is a side elevation of the insert or tower tube which is positioned in the foundation at the time it is poured;

FIG. 13 is a sectional view on the line 13—13 of FIG. 12 illustrating the manner of securing reinforcing within the insert or tube to aid in tying all of the elements of the foundation together to form a unitary structure; and

FIG. 14 is an additional view of the insert showing it in a rotated position to illustrate additional openings therein for receiving the reinforcing of the foundation therethrough.

In FIG. 1 the rail is denoted generally by the numeral 2 and is supported at a desired elevation above ground level 3 by means of the towers 4 which are spaced at suitable intervals. It is contemplated that the construction and arrangement of the towers and foundation therefor, as well as the construction and arrangement of the rail 2 will be strong enough to permit spacing of the towers as much as 100 or 200 feet apart. However, the exact spacing of the towers 4 may be varied as desired without departing from the scope of the invention.

The rail 2 is adapted to receive the coach 5 whereby such coach may be moved along the rail on the wheels 6. The construction of the coach 5 and arrangement for supporting or suspending the coach on the track 2 is disclosed and claimed in our copending application, bearing Serial No. 567,100, titled "Coach and Suspension Therefor" and filed on February 23, 1956.

Reference is now made to FIGS. 7, 8, 9 and 10 which illustrate in more detail the preferred arrangement of the foundation for supporting each of the towers 4. In FIG. 7 a main footing or pier 8 is shown which extends into the ground a suitable distance such as, for example, sixteen feet and is provided with a bell bottom illustrated at 9 which is preferably at least five feet in diameter. The exact length and size of the footing 8 and bell bottom 9 may be varied depending upon the size tower, the spacing of the towers, the load to be carried by each tower and other such factors.

An auxiliary pier or footing 10 is spaced in front of the main footing 8 and extends downwardly into the ground a suitable distance, and as shown in the drawings, may extend approximately one-half of the depth of the main footing 8. A bell bottom 11 is formed on the auxiliary pier 10 in a well known manner, it being desired that the diameter of such bell bottom approximate at least four feet in order to provide ample bearing surface for the tower and rail, as well as the vehicle or coach traveling therealong. The size of the auxiliary pier 10 and the bell bottom 11 may be varied as previously mentioned in regard to the main footing 8 and its bell bottom 9.

As shown in FIG. 3 the main footing 8 is aligned with the vertical axis of the tower 4 while the auxiliary pier 10 is spaced forwardly thereof and substantially in alignment with the projecting or overhanging portion 12 of the tower 4. The arrangement of the main footing 8 and auxiliary footing 10 provides sufficient stabilization to the tower 4 to prevent tilting or tipping thereof in any plane when a load is applied on the rail 2.

It is to be further noted that the main pier 8 and auxiliary pier 10 are connected together by the reinforced beam 13 which is shown in dotted line in FIG. 3 and FIG. 7 and in sectional view in FIGS. 8 and 9. The beam 13 is of greater depth as illustrated at 14 adjacent the main pier 8 and gradually decreases in depth until it is joined to the auxiliary pier 10 as shown at 16. Also, the beam 13 is of greater width as illustrated at 17 adjacent the main footing 8 than it is adjacent the auxiliary footing 10 and gradually decreases in width as shown in FIGS. 10 and 11 of the drawings.

It is to be noted that the beam 13 includes laterally extending portions 38 and 39 which extend outwardly relative to the beam 13 and adjacent the top of the footing 8 and surround the tube 30 as well as the upper part of pier 8. The laterally extending portions 38 and 39 are thicker adjacent their point of juncture with the footing 8 as illustrated in FIGS. 9 and 11 at 40 and 41 respectively. The portions gradually decrease in thickness to-

wards their outer ends 42 and 43 as illustrated by the numerals 44 and 45 in FIG. 9 of the drawings.

In forming the foundation construction illustrated in FIGS. 7, 8, 9, 10 and 11, the main footing 8 is drilled into the earth a suitable distance as previously described and the bell bottom 9 formed at the lower end thereof, all by means well known in the art. Similarly, the auxiliary pier 10 and the footing 11 at the lower end thereof are formed in the earth by means well known in the art and the earth between the piers or footings 8 and 10 is then removed to form the beam 13 of a particular configuration as previously described herein. Suitable reinforcing as illustrated at 20 is arranged within the pier 8 and concrete, as illustrated at 21, then poured to a suitable height as illustrated at 22. Similarly, reinforcing 23 is positioned in the pier 10 and concrete poured therein to the point 24 which is slightly below the bottom 25 of the beam 13. The reinforcing 23 of the auxiliary pier 10 is of a suitable length as illustrated at 26 so that it may be bent over into the beam 13. A tower tube insert illustrated at 30 is positioned in the main footing 8 as illustrated in FIG. 8 of the drawings so that the top 31 thereof projects upwardly above the ground a suitable distance. As shown in FIG. 12 of the drawings, the insert 30 is provided with suitable openings 32 therein for receiving the reinforcing of the foundation therein so as to tie the main footing 8, beam 13 and auxiliary footing 10 together as a unitary structural foundation. The reinforcing 20 of the pier 8 extends upwardly within the insert 30 as illustrated at 34 in dotted line. Similarly, the reinforcing 35 within the beam 13 extends through some of the openings 32 in the insert 30 as illustrated at 36 and at 37 in FIG. 8.

It is to be noted that reinforcing 46 is provided adjacent the upper portion of the laterally extending portions 38 and 39 of the beam 13 with such reinforcing being bent as illustrated in dotted line at 47 of FIG. 10 so as to fit around the back of the insert 30. Reinforcing 50 is arranged in the lower end of the laterally extending portions 38 and 39 and is bent upwardly as illustrated at 51 and 52 to conform with the shape of the portions 38 and 39. The reinforcing 50 extends through other openings 32 in the insert 30 as illustrated at 53 to aid in further uniting and forming a unitary foundation structure as previously mentioned hereinabove.

Hoops 54 may be arranged at spaced intervals in pier 8, pier 10 and beam 13 to secure the reinforcing in these portions of the foundation structure together. The reinforcing used may be rods formed of metal having desired physical characteristics for its intended function.

After the reinforcing of the beam 13, including the reinforcing of the laterally extending portions 38 and 39 thereof, have been positioned in the insert and the insert positioned in the footing 8, the remainder of the concrete may be poured in the footing and in the insert and in the beam 13, as well as in the auxiliary footing 10.

When the foundation has been completely poured, a unitary foundation structure is provided which is shown in the isometric view of FIG. 11. The arrangement of the reinforcing rods not only strengthens the footings 8 and 10 respectively, as well as the beams 13, but the arrangement of the reinforcing relative to the insert 30 ties both footings and the beam and the insert 30 together to form a unitary foundation construction which is relatively easy to form, but which is sturdy to withstand the tremendous loads involved.

FIG. 13 illustrates the insert 30 with some of the openings 32 therein at the lower end of the insert for receiving the ends 37 of the reinforcing 35 in the beam 13.

It is to be noted that the upper end of the insert 30 is provided with a tubular extension 55 which telescopically fits within the insert 30 and is secured thereto by suitable means such as by welding 56. This arrangement provides a seat for receiving the lower end 57 of the tower whereby the tower may be secured to the insert 30 by suitable means such as welding.

FIG. 3 shows in more detail the arrangement and construction of the tower which is shown as including a main body portion 60 that extends upwardly a suitable distance from the tube or insert 30 and to which is connected an extended arm 61' formed by portions 61, 62 and 63. It will be noted that the body 60 and the arm 61' form a tower structure in the general shape of an inverted J. Each of the portions 61, 62 and 63 may also be formed of tubular material having suitable physical characteristics and a desired diameter to yield the necessary structural characteristics to support the load of the rail 2 and the coach 5 thereon. To aid in further reinforcing and adding additional strength to the tower 4 a plurality of partitions 65 are provided in the portions 60, 61, 62 and 63. These partitions may be spaced a suitable distance to provide a tower 4 of sufficient strength for the load to be supported thereon. It is noted that the rail 2 is secured to the outer end 70 of the portion 63, such securing being effected by suitable means such as welding.

The rail 2 includes the girder 71 having a track 72 arranged on the upper side thereof for receiving the wheels 6 of the coach 5. Fins 73 and 74 are also secured to the girder 71 and are arranged to provide a bearing surface for the auxiliary support wheels 75 of the coach 5. The details of construction of the auxiliary wheels 75 and their arrangement on the coach 5 are described and claimed in our copending application above referred to, filed on even date herewith. However, it is to be noted that the fins 73 and 74 are arranged so that the auxiliary wheels 75 may roll therealong and prevent turning or rotating of the coach about the longitudinal axis of the girder 71.

The girder 71 may be provided at desired spaced intervals with reinforcing 80 to supply additional strength thereto.

Under some conditions it may be desirable to use the girder 71 as a means for flowing a fluid medium therethrough, while simultaneously using it to support or carry the coach 5 therealong. Under such circumstances, if it is necessary to provide additional reinforcing for the girder 71, it may be applied externally as illustrated at 81 in FIG. 6.

The arrangement of the track 72 on the girder 71 as well as the fins 73 and 74 add additional strength to the track 2 while simultaneously providing a bearing surface for the wheels 6 to move along the track and a bearing surface for the auxiliary guide wheels 75 to move along the fins.

What is claimed is:

1. A construction for supporting an elevated rail to receive a coach for movement therealong comprising, a hollow tubular tower, a foundation therefor, said foundation including a main footing axially aligned with said tower, an arm extending from said tower at the upper end thereof, an auxiliary footing spaced in front of said main footing and in substantially the same vertical plane with said arm, a beam extending between said footings, a tower tube at the upper end of said main footing to which said tower is connected, reinforcing in said footings and beam and connected to said tube to join said footings and beam into a unitary foundation, a rail girder secured to the outer end of said arm, a track on the upper surface of said girder for moving the coach therealong, and projecting fin surfaces on opposite sides of said girder for guiding the coach on said girder.

2. A construction for supporting an elevated rail to receive a coach for movement therealong comprising, a hollow tubular tower, a foundation therefor, said foundation including a main footing axially aligned with said tower, an arm extending from said tower at the upper end thereof, an auxiliary footing spaced in front of said main footing and in substantially the same vertical plane with said arm, a beam extending between said footings, said

beam having its widest and thickest portion adjacent said main footing and gradually decreasing in width and thickness toward said auxiliary footing, said beam also including projections extending laterally thereof and outwardly from adjacent said main footing to aid in stabilizing said tower, a tower tube at the upper end of said main footing to which said tower is connected, reinforcing in said footings and beam and connected to said tube to join said footings and beam into a unitary foundation, a rail girder secured to the outer end of said arm, a track on the upper surface of said girder for moving the coach therealong, and projecting fin surfaces on opposite sides of said girder for guiding the coach on said girder.

References Cited in the file of this patent

UNITED STATES PATENTS

65,909	Harrey	June 18, 1867
276,878	Pyott	May 1, 1883
476,720	Arnold	June 7, 1892
731,743	Becher	June 23, 1903
799,908	Humphrey	Sept. 19, 1905
825,903	Hallberg	July 17, 1906
933,914	Neville	Sept. 14, 1909
1,122,397	Jackson	Dec. 29, 1914
1,137,108	Anderson	Apr. 27, 1915
1,425,805	Strass	Aug. 15, 1922
1,451,799	Youngblood	Apr. 17, 1923
1,602,066	Burton	Oct. 5, 1926
1,612,331	Vass	Dec. 28, 1926
2,014,430	Fish	Sept. 17, 1935
2,045,478	Kuehn	June 23, 1936
2,052,865	Burnett	Sept. 1, 1936
2,161,105	Strauss	June 6, 1939
2,282,452	Brown	May 12, 1942
2,374,624	Schwendt	Apr. 24, 1945
2,630,075	Omsted	Mar. 3, 1953
2,741,910	Thornley	Apr. 17, 1956

FOREIGN PATENTS

681,809	France	Feb. 4, 1930
2,807	Great Britain	Aug. 29, 1912