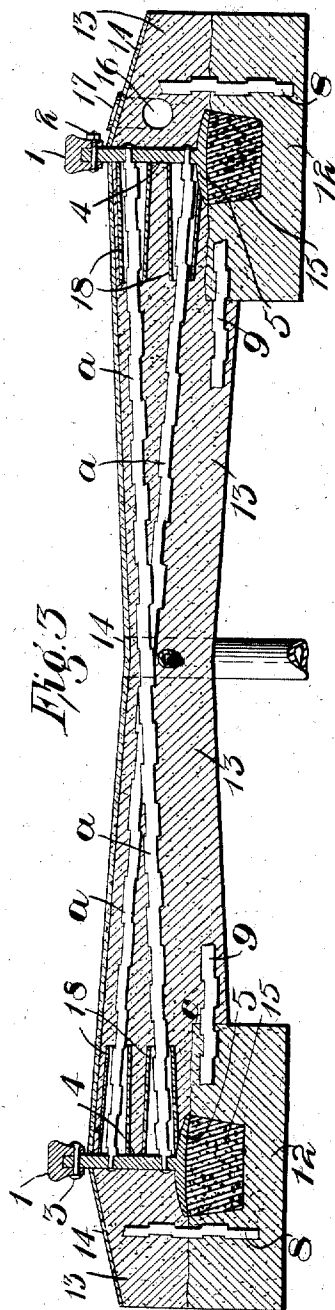
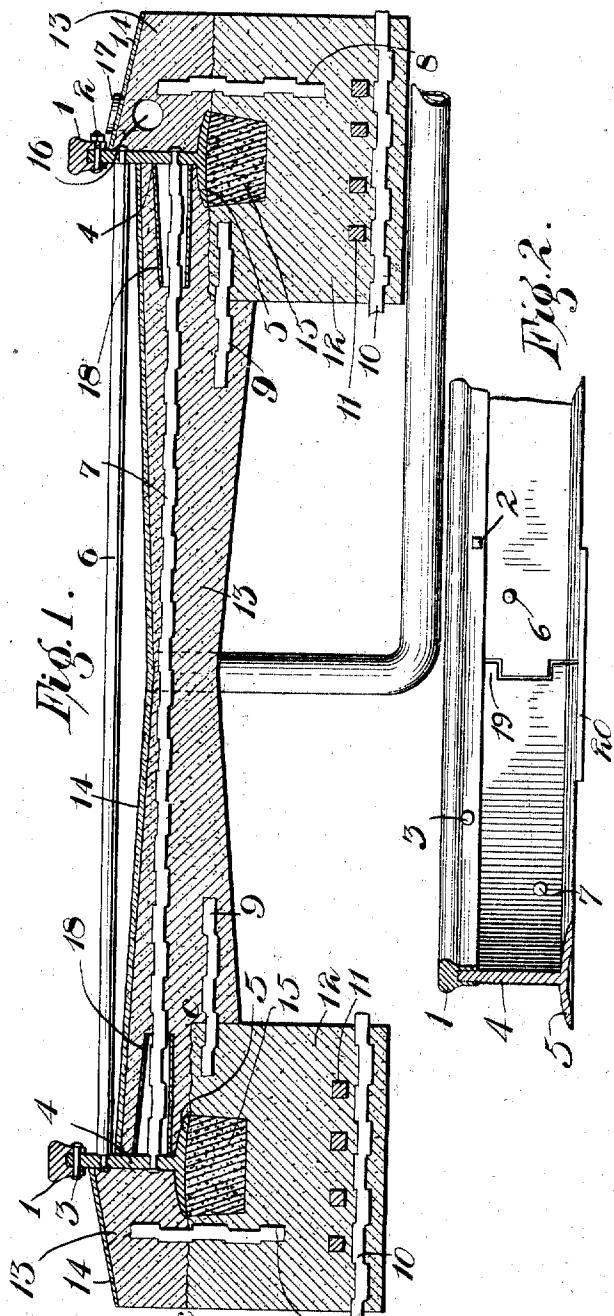


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APPLICATION FILED JAN. 30, 1911.

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2 SHEETS—SHEET 1.



Witnesses:
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Inventor:
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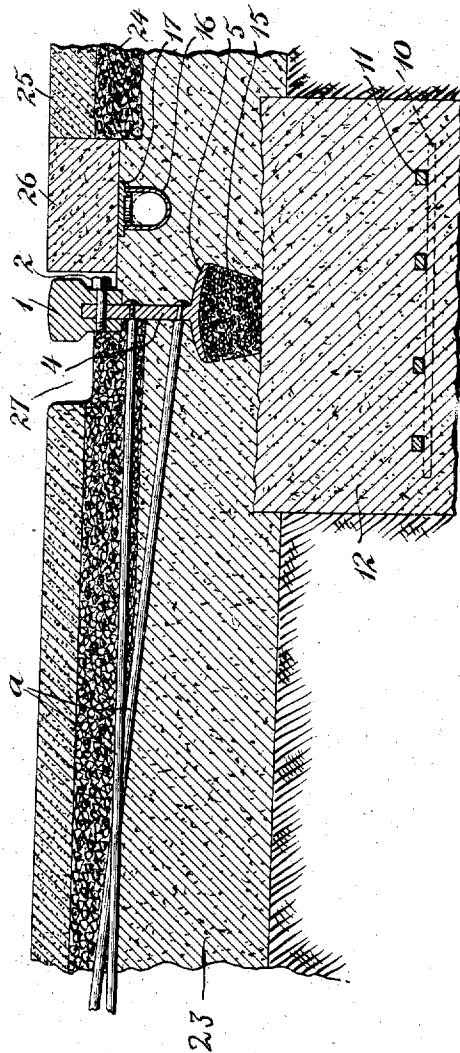
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Fig. 4.



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UNITED STATES PATENT OFFICE.

JOHN N. D. BROWN, OF ANADARKO, OKLAHOMA.

RAILWAY ROAD-BED AND TRACK CONSTRUCTION.

992,403.

Specification of Letters Patent.

Patented May 16, 1911.

Application filed January 30, 1911. Serial No. 605,418.

To all whom it may concern:

Be it known that I, JOHN N. D. BROWN, a citizen of the United States, residing at Anadarko, in the county of Caddo and State of Oklahoma, have invented new and useful Improvements in Railway Road-Bed and Track Construction, of which the following is a specification.

My invention relates to improvements in railway road-bed and track construction; and the object of the invention is to simplify, improve and cheapen proposed methods of steel-reinforced-concrete road-bed and track construction; to eliminate all wood ties and telegraph or telephone poles and to reduce the quantity of concrete and steel required in such a construction to a minimum; and to provide a construction in which the entire supporting power of the earth road-bed is utilized, and means provided by which the rail can be removed and replaced when damaged or worn without disturbing any other part of the construction; and also to provide the resiliency necessary in a safe construction, and at the same time provide for compression, contraction and expansion; the arrangement and construction being hereinafter clearly set forth and specified.

Figure 1 is a vertical cross-sectional view of my proposed construction. Fig. 2 is a perspective lineal view of a section of the rail-chair and rail showing manner of joining the ends of rail-chair. Fig. 3 is a modification of Fig. 1 in which the exposed tie-rod of Fig. 1 is eliminated and the reinforced concrete between the rails raised to as near the top of rail-chair as practicable. Fig. 4 is a vertical cross sectional view of a part of Fig. 3 adapted to street railway construction when streets are paved with any material having a concrete base.

Corresponding parts of each figure are indicated by like numbers and letters.

1 is the new form of rail used in this construction.

2 is a bolt holding the rail on the chair, while on the left.

3 is a rivet, as either bolts or rivets may be used.

4 is the vertical part of rail-chair and should be three quarters of an inch thick.

5 is the base of rail-chair, three quarters of an inch in center and one quarter at ends.

6 is a tie-rod three quarters of an inch in diameter and riveted to rail-chair.

7 is three quarters of an inch square steel

reinforcing bar riveted to rail-chairs. 8 and 9 are also three quarters of an inch steel reinforcing bars.

10 is five-eighths of an inch square steel reinforcing bar.

11 is one inch square steel reinforcing bar.

12 is the steel-reinforced-concrete base for the rail.

13 is the concrete that is applied after track is in place.

14 is a finishing coat of sand and Portland cement.

15 is a cushion of asphalt and sand or other materials.

16 is a conduit for wires used in railway operation.

17 is the cover over manhole to conduit.

18 is a loose sleeve of sheet iron, enlarged at the rail-chair end.

19 shows the manner of joining the rail-chairs at ends.

20 is a curved steel plate under rail-chair joints.

21 is a five eighths of an inch square reinforcing bar.

22 represents a sewer pipe drain.

23 indicates the concrete base of street paving.

24 represents small crushed stone and asphalt.

25 is the finishing coat of asphalt paving.

26 represents a row of paving brick.

27 is the space left for flange of wheels.

c c indicate the wavy line between primary and secondary concrete.

a a are three quarters of an inch steel reinforcing bar crossed and riveted to rail-chairs in place of tie-rods.

I would provide that the parallel trenches required by my construction be dug ten to fifteen inches deep according to character of earth road-bed and the requirements of the construction, and that bottom of trenches be well tamped, and if road-bed is soft and spongy, that the trenches be dug deeper and the deeper part filled in with dry clay or broken stone; that when so dug plank of the proper width be provided in sufficient quantity for one day's construction, and that three-quarters of an inch holes be bored in the plank one-half inch deep and one and one-half inches from the bottom of same, and at intervals of four feet; and that steel reinforcing bars (10) be cut to seventeen inch lengths, and placed in the above holes after the plank are set in the trenches, and earth

packed against the bottom of plank on the outside; to hold the top of plank together and parallel, nail cleats on top of same, and fill in earth or brace from the sides, to keep the plank firm, and the center of box thus formed directly under the center of rail and rail-chair, to be hereafter placed. Line and level up the parallel boxes to conform to the established line and grade of road-bed and gage of rails; and place the four one inch lineal reinforcing bars, as shown in Fig. 1, and wire them to the bars (10) near bottom of box; lap these lineal bars about one foot at the ends, or have one end a hook and the other an eye and thus join them; have a supply of timbers of the size and form of cushion (15)—three and one-half inches in the center and six inches at widest part—and press the same down into the concrete while soft and before box is full; line and level these timbers up and gage them the same as you would the rails; place vertical reinforcing bar (8) and horizontal reinforcing bar (9) while concrete is soft. The timbers and plank can be removed the next day and carried forward for additional use.

The cushion (15) should be composed of asphalt, sand and crude oil or oil residuum, substantially the same as that used for the finishing coat of asphalt pavement; or dry sawdust may be used in place of the sand; or small wood fiber (the size of wheat straw) saturated with crude oil and tied in small bundles may be used in combination with the asphalt mixture; or wood or vegetable pulp saturated with oil as above may be used; or any other resilient material suitable for such a purpose may be used. The cushion should be rolled or pressed into the proper form while hot, and in such lengths as would be convenient to ship and handle. When cushion is placed rail-chairs are set thereon; the iron sleeves (18) are then slipped on—these sleeves should be near the size of reinforcing bars 7 or *a a* at ends nearest the center of track and larger at the rail-chair ends to keep the concrete away from the reinforcing bars at these points, to provide for compression, expansion and contraction—and insert the ends of tie-rods (6) and reinforcing bars (7) or *a a* in Fig. 3 in the rail-chair and rivet thereto; these rods or bars should be of the exact length required to bring rails in gage when riveted snugly up to the shoulders. When the rail-chairs are in place and secured by the tie-rods or reinforcing bars, place the rails on the rail-chairs and bolt or rivet same thereto, and apply a thin coat of asphalt and oil to rail-chairs, put on hot, to keep the concrete from adhering to same. After a short section of track is completed back up the construction train with more material, and thus proceed, while the second construction train backs up with a concrete mixer on the

end of a flat car, with crushed stone, sand, Portland cement and water on the car or cars behind the mixer, and lays the secondary concrete (13) and before the same hardens puts on and trowels down the finishing coat of sand and Portland cement (two parts sand to one of cement). Place conduit (16) when putting on the secondary coat of concrete; it may be metal tubing on the paper composition tubing used for such a purpose. Place manholes at suitable intervals and provide covers for same to keep out water and dust. To provide for unequal expansion and contraction of rail and rail-chair the bolt or rivet holes should be slightly elongated from the center of rail-chair toward the ends; if the bolt or rivet nearest the center of rail-chair fits snug there can be no creeping of rails. To prevent creeping of rail-chairs rivet a piece of steel, of suitable form, width and length, on the inside of rail-chairs at center of same and at right angles thereto.

In order to break joints of rails and rail chairs, I provide for the alternate use of different lengths of rails and rail-chairs. If one length is thirty feet I would make the other length forty feet; place the center of the thirty foot rail over the center of the forty-foot rail chair and the center of the forty-foot rail over the center of the thirty foot rail chair and have the center bolts or rivets fit snugly while all other bolt or rivet holes in the rail chairs are slightly elongated.

For street railway construction where streets are paved with asphalt or any material having a concrete base, as shown in Fig. 4 and omit the vertical (8) and the horizontal (9) reinforcing and bring all up flush with top of rail except narrow grooves on the inside of rails where flange of wheel runs; and to provide a means for getting at the bolts or rivets in rail and the cover to manhole run a row of vitrified brick outside of rail and joining same. To change the rails when worn or damaged remove the bolts where bolts are used or punch out the rivets.

For drainage of space between rails, my construction collects the water in center of track, and I provide for disposing of same through sewer pipe by conducting it down and out under the rail bases, or through the same when necessary, at such intervals as the local conditions would suggest.

My construction is adapted to either new construction or the reconstruction of existing railways; when a reconstruction is proposed I would run the traffic around the point of construction on a temporary track when practicable.

In Fig. 3 I run five-eighths of an inch reinforcing bar in the center between rails and wire the same under *a a* where this reinforcing bar crosses, this to prevent cracking of the concrete between rails.

I provide and claim the right to vary the size, of the steel reinforcing and the intervals at which it is placed; the size of the rail and rail-chair; the thickness, width and depth of concrete and any other matter essential to the adaptation of my construction to the make of different railways and differing local conditions.

In my construction, after material is provided in the proper form, no skilled labor would be required other than the concrete and cement boss, the track construction boss and the civil engineer to give lines and levels.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. The combination in a railway road-bed and track construction of parallel steel-reinforced-concrete stringers; called primary concrete, united and connected by a secondary coat of steel-reinforced concrete extending, and covering the surface of earth road-bed, between the rails, and having steel-reinforcing bars placed across said stringers with lineal steel reinforcing bars resting thereon and near the bottom of stringers, and having vertical steel-reinforcing bars placed at intervals to bind the primary and secondary concrete together, and having horizontal steel-reinforcing bars so placed as to bind the concrete stringers to the concrete between the rails, as and for the purpose shown and specified.

2. The combination in a railway road-bed and track construction of parallel steel-reinforced concrete stringers, called primary concrete, united and connected by a secondary coat of steel-reinforced concrete extending, and covering the surface of earth road-bed, between the rails, and having a cushion of resilient materials embedded in said stringers and continuous therewith, said cushion having resting thereon, a rail-chair having a curved base and an upright arm which carries the rail and to which the rail is bolted or riveted, as and for the purpose shown and specified.

3. The combination with a railway reinforced concrete road-bed of a track construction having parallel continuous rail chairs connected and held in gage by crossed and incased reinforcing bars riveted to said rail chairs; said rail chairs comprising a base, resting on a cushion, and an upright arm which carries a new form of rail in which the base and web of the old form of rail is cut away and the head narrowed and elongated on the lower side and having a groove therein which fits over the upright arm of rail chair and is riveted thereto, as and for the purpose specified.

4. The combination in a railway road-bed and track construction of concrete strengthened laterally by steel reinforcing bars and tie rods and lineally by steel reinforcing bars and rail chairs and a conduit; said concrete having parallel cushions embedded therein and rail chairs supported thereon; said rail chairs united and held in gage by a tie rod and reinforcing bars riveted thereto, as and for the purpose specified.

5. The combination in a railway road-bed and track construction of reinforced parallel concrete stringers in connection with the concrete base of street paving; said stringers having a cushion thereon upon which a rail chair rests; said rail chair having a curved base and an upright arm with a new form of rail fitted thereon and bolted thereto; having the paving materials brought up flush with the top of the rail, except a place for the flange of wheels, and a row of paving brick so placed as to provide a means of getting at the rail bolts and the cover to manhole to conduit; and embedded tie rods placed at intervals to bind rail-chairs together and hold the rails in gage, as and for the purpose specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN N. D. BROWN.

Witnesses:

H. E. SUTTER,
S. E. ELLISON.