

July 7, 1936.

W. DALTON

2,047,007

CONTINUOUS RAIL

Filed May 25, 1935

Fig. 1.

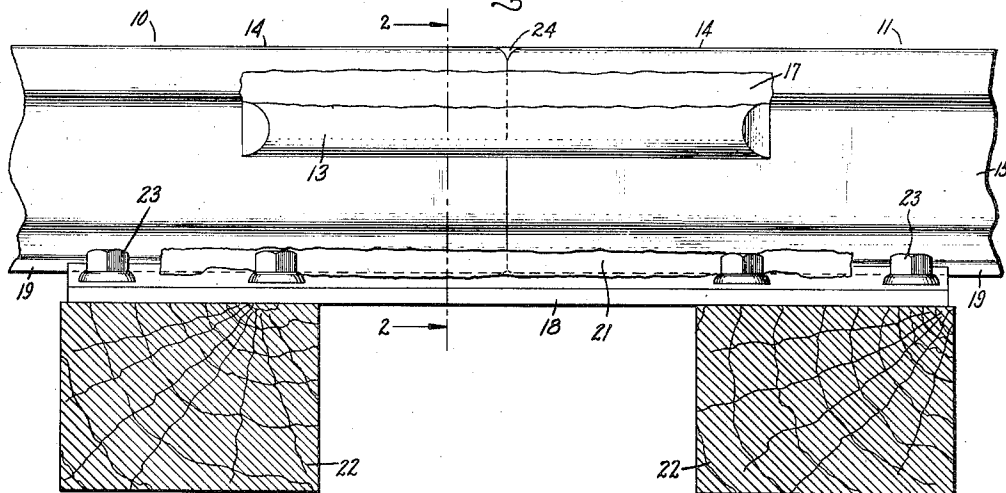
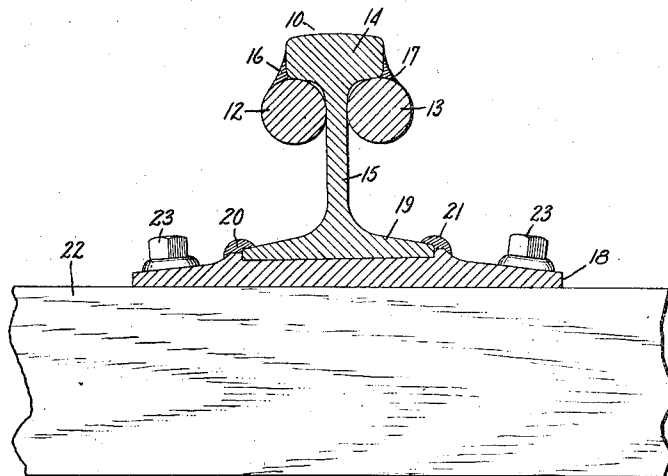


Fig. 2.



Inventor:
William Dalton,
by *Harry E. Dunham*
His Attorney.

UNITED STATES PATENT OFFICE

2,047,007

CONTINUOUS RAIL

William Dalton, Schenectady, N. Y., assignor to
General Electric Company, a corporation of
New York

Application May 25, 1935, Serial No. 23,390

11 Claims. (Cl. 238—164)

My invention relates to a continuous rail intended primarily for use in railroad tracks.

It is an object of my invention to provide a continuous rail formed of abutting rail sections connected by members welded thereto which at the joint between rail sections form a truss having substantially the same strength and stiffness as the rail sections.

It is a further object of my invention to provide a rail joint of improved construction which is readily fabricated by welding.

Further objects of my invention will become apparent from consideration of the following description taken in connection with the accompanying drawing, in which Fig. 1 shows a side view of a rail joint embodying my invention, and Fig. 2 of which shows a section of the rail joint taken along the lines 2—2 of Fig. 1.

According to my invention abutting rail sections are joined at their tops and bottoms by separate members of such size that, at the joint between sections, the truss of which they form the top and bottom members has a strength and stiffness substantially equal to the strength and stiffness of the rail sections. These members are welded to the rail sections and are of such lengths that the ends of the welds may be spaced in different right transverse planes when the lengths of welding are sufficient to equal in shear strengths the compressive and tensile strengths of these members. Preferably the tops of the rail sections are joined by bars attached to the heads of the rails and the bottoms of the rail sections are joined by a plate having a channel within which the bases of the sections are supported. This plate is made of sufficient length to extend a slight distance beyond the welds by means of which it is attached to the bases of the rail sections.

One embodiment of a rail joint made in accordance with my invention is illustrated in the accompanying drawing. In the drawing the abutting rail sections 10 and 11 are joined by bars 12 and 13 welded to the tops of the rail sections in positions not to interfere with the flange of a car wheel supported thereon. I prefer to use round bars which are located on, and extend from the undersides of the heads 14 on each side of the webs 15 of the rail sections and which are joined to the heads of the rail sections by welds 16 and 17 which can be made by depositing weld metal in a down direction onto the upper surfaces of these bars. Generally the exposed surfaces of these welds should be slightly concave so as not to interfere with the flange portions of

wheels supported on the rail. As shown in the drawing the ends of the rail sections are supported on a base plate 18 having a channel within which the bases 19 of the rail sections are located. The edges of the bases are attached to the shoulders or flanges defining the channel in the base plate by means of welds 20 and 21 which may also be made by depositing weld metal in a down direction onto the upper surfaces of the plate and rail bases. The base plate is of similar construction to the supporting plates heretofore employed between rails and the sleepers upon which the rails are supported. These plates may be attached to the sleepers 22 of a track by means of lag screws 23 as illustrated in the drawing.

The ends of the welds 16 and 17 are in different right transverse planes from the ends of the welds 20 and 21, and the ends of the welds 20 and 21 are also spaced from the ends of the plate 18. In accordance with my invention the ends of each weld 16, 17, 20 and 21 may be located in different right transverse planes. This construction is employed in order to stagger the points of maximum strain in the joint resulting from the welding operation by means of which the joint is made. At those points where the welding operation is started and stopped the sudden heating and cooling of the metal produces strains in the welded structure which may facilitate a fracture at these points. By staggering these points relative to one another the possibility of fracture is greatly reduced. Furthermore, by providing a base plate with a channel within which the rails are supported, the side thrust on a rail exerted by a vehicle passing thereover is effectively resisted even though the rail should fracture at the ends of one of the rail welds. It is thus apparent that a joint fabricated as illustrated is possessed of certain safety features which renders it particularly acceptable for use in railroad tracks.

When a continuous rail is formed in accordance with my invention out of used rail sections having battered ends, a weld is placed between the heads of the rail sections as indicated at 24. This weld should fill the depression in the rail surfaces to substantially the same level as the wheel supporting surfaces of the rail sections beyond their battered end portions. In making this weld surplus weld metal may be removed by chipping, grinding or similar processes in order to remove excess weld metal and establish the desired uniform level between rail sections.

By joining the rail sections by members which

are attached thereto by welds of sufficient lengths to equal in shear strengths the compressive and tensile strengths of these members which in themselves are of such size that at the joint between abutting rail sections the truss of which they form the top and bottom members has a strength and stiffness substantially equal to the strength and stiffness of the rail sections, a continuous rail is formed which by reason of its uniformity furnishes an ideal support for rolling stock. As the load moves along such a continuous rail there is no unusual deflection at any point in the rail which will cause uneven riding conditions or produce a hammering effect destructive both to the rolling stock passing along the rail as well as the rail bed in which the track is supported. Track maintenance is thus practically eliminated as is the wear and tear on the rolling stock heretofore resulting from the non-uniformity of the track upon which such rolling stock is supported.

It is to be understood that my invention is not limited to the particular shapes and relative dimensions of the parts illustrated in the drawing since the members welded to the rail sections may assume any configuration or relative size so long as the truss of which they form the top and bottom members has a strength and stiffness substantially equal to the strength and stiffness of the rail sections. It will be noted, however, that by employing the particular arrangement illustrated in the drawing the welding operation is greatly facilitated by reason of the fact that the weld metal may be deposited in a down direction to form welds on the upper surfaces of the bars and plates. It will also be noted that by placing the head bars as illustrated in the drawing they in no way interfere with the flange of a car wheel moving along the rail. Where the head bars extend out from under the rail heads, the ends of the bars may be beveled as illustrated, in order to deflect any part of a car structure that may be dragging and in a position to engage these bars.

The procedure in welding the various members forming the joint is not limited to any particular sequence of operations. I prefer, however, to attach the head bars and base plate to the rail sections by tack welds and thereafter complete the welding operation by forming a continuous weld between these members and the rail members. The welds may be formed in a single pass, although preferably more than one pass is employed not only to secure the desired strength of weld, but also to attain the improved characteristics of a multiple pass weld. The welding may be alternated from side to side in order to relieve warping strains, although such procedure is not necessary.

What I claim as new and desire to secure by Letters Patent of the United States, is:—

1. A continuous rail formed of abutting rail sections joined by members welded to the bases of said sections and separate members welded to the tops of said sections in positions not interfering with the flange of a car wheel moving along said continuous rail, each of said members being of sufficient lengths to accommodate lengths of welding equal in shear strengths to the compressive and tensile strengths of said members which in themselves are of such size that, at the joint between abutting rail sections, the truss of which they form the bottom and top members, has a strength and stiffness substantially equal to the strength and stiffness of said rail sections.

2. A continuous rail formed of abutting rail sections joined by bars welded to the tops of said sections in positions not interfering with the flange of a car wheel moving along said continuous rail and also joined by a plate underlying and welded to the bases of said sections, said bars and said plate being of sufficient lengths to accommodate lengths of welding equal in shear strengths to the compressive and tensile strengths of said bars and said plate which in themselves are of such size that, at the joint between abutting rail sections, the truss of which they form the top and bottom members has a strength and stiffness substantially equal to the strength and stiffness of said rail sections.

3. A continuous rail formed of abutting rail sections joined by bars welded to the under portions of the heads of said sections and also joined by a plate underlying and welded to the bases of said sections, said bars and said plate being of sufficient lengths to accommodate lengths of welding equal in shear strengths to the compressive and tensile strengths of said bars and said plate which in themselves are of such size that, at the joint between abutting rail sections, the truss of which they form the top and bottom members has a strength and stiffness substantially equal to the strength and stiffness of said rail sections.

4. A continuous rail formed of abutting rail sections joined by bars welded to the tops of said sections in positions not interfering with the flange of a car wheel supported on said continuous rail and also joined by a plate welded to and having a channel within which is supported the bases of said sections, said bars and said plate being of sufficient lengths to accommodate lengths of welding equal in shear strengths to the compressive and tensile strengths of said bars and said plate which in themselves are of such size that, at the joint between abutting rail sections, the truss of which they form the top and bottom members has a strength and stiffness substantially equal to the strength and stiffness of said rail sections.

5. A continuous rail formed of abutting rail sections joined by bars welded to the tops of said sections in positions not interfering with the flange of a car wheel supported on said continuous rail and also joined by a plate underlying and welded to the bases of said sections, the ends of the welds in said plate being spaced from the ends of said plate and all of said welds in said bars and said plate being in different right transverse planes, said bars and said plate being of sufficient lengths to accommodate lengths of welding equal in shear strengths to the compressive and tensile strengths of said bars and said plate which in themselves are of such size that, at the joint between abutting rail sections, the truss of which they form the top and bottom members has a strength and stiffness substantially equal to the strength and stiffness of said rail sections.

6. A continuous rail formed of abutting rail sections joined by bars welded to the under portions of the heads of said sections and also joined by a plate underlying and welded to the bases of said sections, the ends of the welds in said plate being spaced from the ends of said plate and in different right transverse planes from the ends of the welds in said bars, and said bars and said plates being of sufficient lengths to accommodate lengths of welding equal in shear strengths to the compressive and tensile strengths of said bars and said plate which in themselves are of such size that, at the joint between abutting rail sections,

the truss of which they form the top and bottom members has a strength and stiffness substantially equal to the strength and stiffness of said rail sections.

7. A continuous rail formed of abutting rail sections joined by round bars welded to the undersides of the heads on each side of the webs of said sections and also joined by a plate welded to and having a channel within which is supported the bases of said sections, the ends of the welds in said plate being spaced from the ends of said plate and in different right transverse planes than the ends of the welds in said bars and said bars and said plate being of sufficient lengths to accommodate lengths of welding equal in shear strengths to the compressive and tensile strengths of said bars and said plate which in themselves are of such size that, at the joint between abutting rail sections, the truss of which they form the top and bottom members has a strength and stiffness substantially equal to the strength and stiffness of said rail sections.

8. A continuous rail comprising abutting rail sections, bars spanning the joints between said sections and located on the undersides of, and extending from the heads on each side of the webs of said sections, plates spanning the joints between said sections and having channels within which are supported the bases of said sections, and welds located on the upper surfaces of said bars and plates and connecting said bars and plates to the ends of said rail sections, said bars and said plates being of sufficient lengths to accommodate lengths of welding equal in shear strengths to the compressive and tensile strengths of said bars and said plates which in themselves are of such size that, at the joints between abutting rail sections, the trusses of which they form the top and bottom members have strengths and stiffnesses substantially equal to the strength and stiffness of said rail sections.

9. A continuous rail comprising abutting rail sections, bars spanning the joints between said sections and located on the undersides of, and extending from the heads on each side of the webs of said sections, plates spanning the joints between said sections and having channels within which are supported the bases of said sections, and welds located on the upper surfaces of said bars and plates and connecting said bars and plates to the ends of said rail sections, the ends of the welds on said plates being spaced from the ends of said plates and said bars and said plates being of sufficient lengths to accommodate lengths of welding equal in shear strengths to

the compressive and tensile strengths of said bars and said plates which in themselves are of such size that, at the joints between abutting rail sections, the trusses of which they form the top and bottom members have strengths and stiffnesses substantially equal to the strength and stiffness of said rail sections.

10. A continuous rail comprising abutting rail sections, bars spanning the joints between said sections and located on the undersides of, and extending from the heads on each side of the webs of said sections, plates spanning the joints between said sections and having channels within which are supported the bases of said sections, and welds located on the upper surfaces of said bars and plates and connecting said bars and plates to the ends of said rail sections, the ends of the welds on said plates being spaced from the ends of said plates and in different right transverse planes than the ends of the welds on said bars, and said bars and said plates being of sufficient lengths to accommodate lengths of welding equal in shear strengths to the compressive and tensile strengths of said bars and said plates which in themselves are of such size that, at the joints between abutting rail sections, the trusses of which they form the top and bottom members have strengths and stiffnesses substantially equal to the strength and stiffness of said rail sections.

11. A continuous rail comprising abutting rail sections the ends of which have become battered through previous use, bars spanning the joints between said sections and located on the undersides of, and extending from the heads on each side of the webs of said sections, plates spanning the joints between said sections and having channels within which are supported the bases of said sections, a weld between said rail sections and filling the depression therebetween to substantially the same level as their wheel supporting surfaces beyond said battered end portions, and welds located on the upper surfaces of said bars and plates and connecting said bars and plates to the ends of said rail sections, said bars and said plates being of sufficient lengths to accommodate lengths of welding equal in shear strengths to the compressive and tensile strengths of said bars and plates which in themselves are of such size that, at the joints between abutting rail sections, the trusses of which they form the top and bottom members have strengths and stiffnesses substantially equal to the strength and stiffness of said rail sections.

•WILLIAM DALTON. 55