

B. SANI.

REINFORCED CONCRETE RAILWAY SLEEPER WITH SPECIAL FIXING DEVICE.

APPLICATION FILED FEB. 15, 1907.

Patented July 20, 1909.

928,617.

2 SHEETS—SHEET 1.



Fig. 2

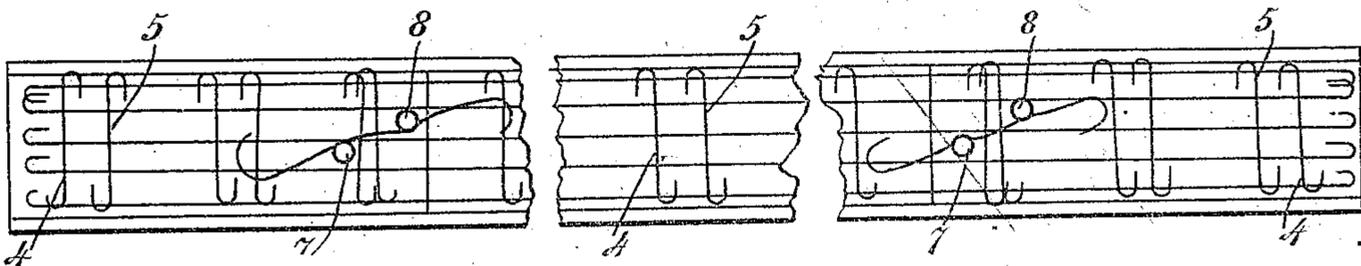


Fig. 3

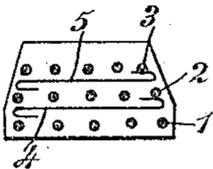


Fig. 5

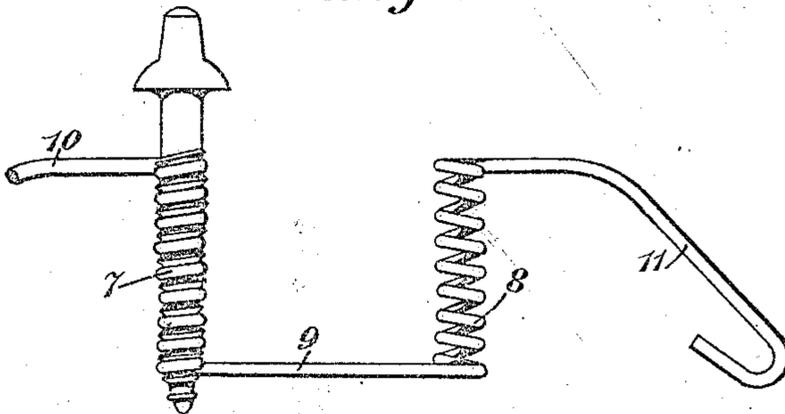


Fig. 4

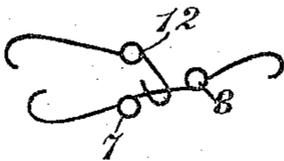


Fig. 6

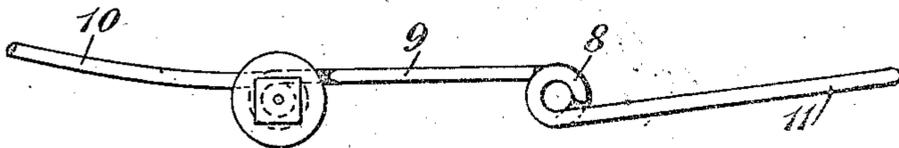


Fig. 8.

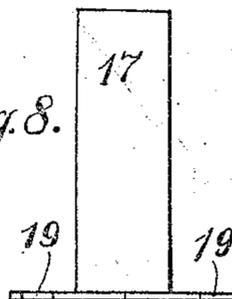
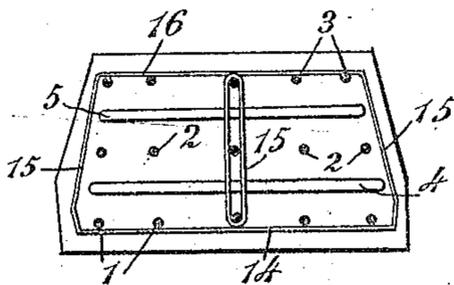


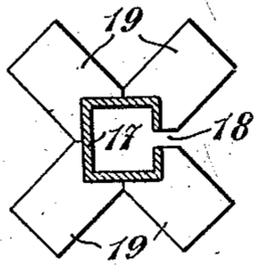
Fig. 7



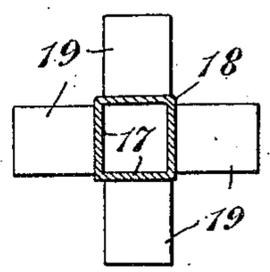
Witnesses:  
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Inventor:  
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By his Attorney  
F. H. Richards.

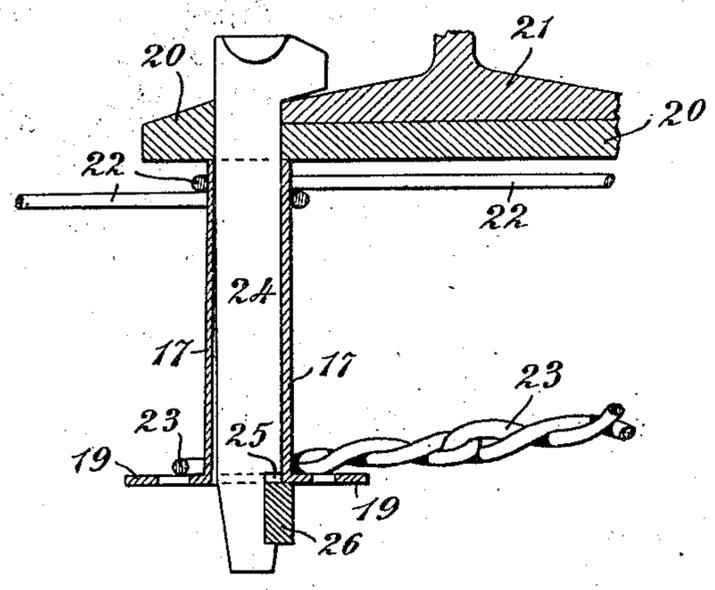
*Fig. 9*



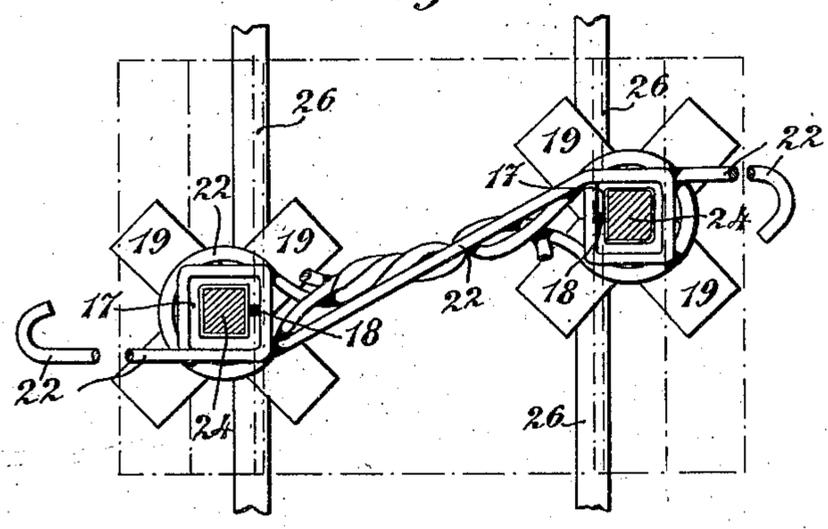
*Fig. 10*



*Fig. 11*



*Fig. 12*



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# UNITED STATES PATENT OFFICE.

BONAVENTURA SANI, OF ROME, ITALY.

## REINFORCED-CONCRETE RAILWAY-SLEEPER WITH SPECIAL FIXING DEVICE.

No. 928,617.

Specification of Letters Patent.

Patented July 20, 1909.

Application filed February 15, 1907. Serial No. 357,431.

*To all whom it may concern:*

Be it known that I, BONAVENTURA SANI, subject of the King of Italy, residing at Rome, Italy, have invented certain new and useful Improvements in Reinforced-Concrete Railway-Sleepers with Special Fixing Devices, of which the following is a specification.

My present invention has for its object to provide a new and improved reinforced concrete railway sleeper with a special fixing device, shown in the annexed drawings where—

Figure 1 is a vertical longitudinal section, Fig. 2 a horizontal longitudinal section, Fig. 3 a cross section of the reinforced concrete sleeper, and Fig. 4 a plan view of helical wire winding, while Fig. 5 is an elevation of another form of winding, Fig. 6 a plan, and Fig. 7 a cross section of the tie. Fig. 8 is an elevation of one form of socket, Fig. 9 a plan view, and Fig. 10 a plan of another form of socket. Figs. 11 and 12 are an elevation and a plan view, respectively, of one element of my new metal reinforcement for concrete sleepers.

My said metal reinforcement comprises three longitudinal rows 1, 2, 3 of iron bars or wires between which two rows of S-shaped wires are placed. My said concrete sleepers are made with the aid of wood molds into which a layer of concrete thoroughly mixed with sand is filled in whereupon a first row or series of metal bars or wires, generally five, are placed in the concrete layer, connected together by ten transverse wires. A fresh layer of concrete is then filled in, and thereupon a second series of wires placed in position, and then a third layer of concrete, a third series of wires and a fourth layer of concrete.

My improved sleeper is roughly trapeze shaped and provided at its ends with rail fixing devices.

The special rail fixing device according to my present invention comprises two integral lengths 7 and 8 of galvano plated wire helically wound up and connected by an intermediate straight length 9 and having two ends 10 and 11 bent so as to embrace the longitudinal irons. The said connections are placed in the mold first of all and held in place by two perforated boards suitably fixed to the frame according to the usual railway model so that the finished

sleeper will have recesses 6 and holes 7 and 8 for screw bolts and hooks placed at intervals according to the model adopted. The helical winding forms the female threading for the screw bolt designed to fix the rail placed in position on the sleeper. Besides the connections with two holes 7 and 8 at each side two more connections must be provided for each pair of rails, having three pairs of holes 7, 8 and 12 (Fig. 4) on each side for the joints.

In order to facilitate moving and positioning the sleepers they have two transverse side for the joints.

As to the material of the sleeper good results have been obtained by using slow binding concrete and mixing washed sand and small silicic or volcanic stones, basalts etc. therewith.

For main railway lines with a great number of heavy cars running on them very good results have been obtained by inserting wire gauze 14 besides reinforcing wires into the concrete sleeper, in which case the various rows of longitudinal bars are connected by joints embracing the wires or bars 1 of the lower row to wires 3 of the upper row or, alternatively, those of the lower row to those of the intermediate one 2, or those of the latter to those of the upper one. The wire gauze pieces 14 and 16 to be inserted depends obviously upon the resistance the sleeper is designed to afford. The upper and intermediate wire gauzes, if such are used, must be cut so as to correspond to the female threads or holes for the rail fixing screw bolts.

The main feature of my present improved railway sleeper is the special rail fixing device securing precise gage and absolute stability of track. The construction of the said device is shown in Figs. 5 and 6 which are respectively a front and plan view where 10 and 11 are the ends, 7 and 8 the helical windings and 9 the horizontal length of wire. My improved sleeper may also be so constructed that hooks and plates as now used on railway lines may be used in connection therewith. In plates with circular holes the latter will be slightly enlarged so as to be used with the screw bolts according to my invention. When desired to use my invention with metal reinforcements having rectangular or square sectioned hooks, for the above described female screw winding a

stamped or otherwise produced metal socket 17, Figs. 8, 9 and 10 surrounding the fixing bolt or hook may be substituted, which may be of rectangular or square cross section, and is open in longitudinal direction, as shown at 18, and has at the bottom four extensions 19 in diagonal direction of section, Fig. 9, or normal, Fig. 10.

Fig. 12 is a plan view showing the way in which sockets 17 are distanced and positioned in the sleeper, a plate being indicated by dotted lines.

20 in Fig. 11 shows the plate, 21 the rail. A wire 22 embraces with one or more coils socket 17 toward its hook shaped extended end. At the lower part another wire 23 is wound on both of them and on itself in the intermediate length. Bolt 24 is like those used but has a rectangular groove 25 to receive a pin or key 26 completing the connection device, and inserted into rectangular holes provided in the sleeper.

When the sleeper is put in place plate 20 is placed under the rail, hook bolts 24 are inserted into sockets 17 and keys 26 are introduced so as to impart pressure on lower parts of socket 17 and groove 25 of hook bolt. The above described wires, bars, sockets or other metallic parts may be gal-

vano plated, or not, as preferred. Having now fully described my said invention and the manner in which the same operates, what I claim and desire to secure

by Letters Patent of the United States of America is:—

1. A metal-reinforced concrete railway sleeper composed of concrete containing rows of longitudinal wires connected by rows of transverse wires, the concrete having embedded therein elongated helical wire windings forming threaded sockets for engagement with clamping bolts, the helical windings being connected across the sleeper.

2. A metal-reinforced concrete railway sleeper composed of concrete containing rows of longitudinal wires connected by rows of transverse wires, the concrete having embedded therein elongated helical wire windings forming threaded sockets for engagement with clamping bolts, the helical windings being connected across the sleeper, and also connected with the longitudinal wires.

3. A metal-reinforced concrete railway sleeper composed of concrete containing rows of longitudinal wires connected by rows of transverse wires, the concrete having socket portions, and wires embedded in the concrete and having elongated helical windings located in the sockets forming threaded sockets for the attachment of threaded bolts.

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

BONAVENTURA SANI.

Witnesses:

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DUILIO NARDONI.