

949,262.

Fig. 1.

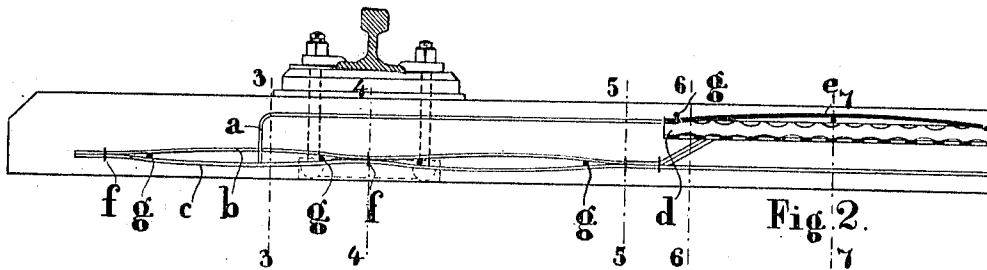


Fig. 2

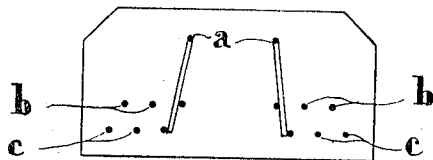


Fig. 3.

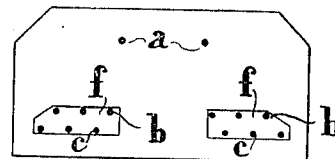


Fig. 4.

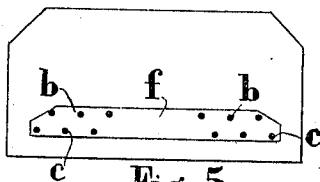


Fig. 5.

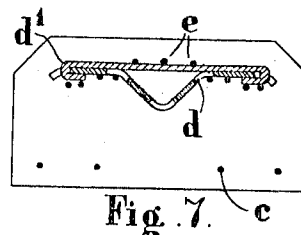
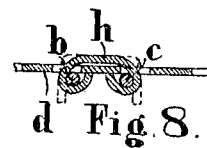


Fig. 7.



d¹ Fig. 8.

f' Fig. 6.

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UNITED STATES PATENT OFFICE.

PERCY WILLIAM COOK, OF LIDCUP, ENGLAND.

REINFORCED CONCRETE CONSTRUCTION.

949,262.

Specification of Letters Patent.

Patented Feb. 15, 1910.

Application filed August 12, 1909. Serial No. 512,548.

To all whom it may concern:

Be it known that I, PERCY WILLIAM COOK, a subject of the King of England, residing at Lidcup, in the county of Kent, England, have invented certain new and useful Improvements in Reinforced Concrete Construction, of which the following is a specification.

This invention relates to concrete constructions. It is particularly applicable to railway sleepers of reinforced concrete but it may, however, be applied to other structures of reinforced concrete of a similar nature.

The invention consists of an improved skeleton or grille for reinforced concrete, of the type in which wires or rods are employed.

According to the present invention, the armoring consists of a number of rods or wires preferably of round steel, which are laid substantially parallel with one another and are connected at suitable intervals by sheets of thin metal through which the rods are threaded; the holes in these sheets are arranged alternately in two or more rows at a very short distance apart, so that a cross rod or bar may be placed between two rows of parallel rods and drawn toward the sheet-connectors in order to wedge the two rows of rods apart so as to form bows and loops and in this way the rods are locked firmly in position. The metal sheets, therefore, replace the usual stirrups and binding wires for connecting the parts of the metallic skeleton, and insure the accurate spacing and retention of the rods; they are, moreover, more quickly placed in position in a structure of the kind mentioned than the usual connectors.

The invention also comprises subordinate features hereafter described and claimed.

Upon the accompanying drawings I have illustrated the application of the invention to a railway sleeper of reinforced concrete.

Figure 1 shows a half plan of the skeleton or grille. Fig. 2 is a longitudinal section on line 2—2 of Fig. 1. Figs. 3, 4, 5, 6 and 7 are sections on lines 3—3, 4—4, 5—5, 6—6 and 7—7 respectively of Fig. 2. Fig. 8 is a detail on a larger scale.

Referring to Fig. 5, it will be seen that the rods constituting the main reinforce or grille are threaded or passed through a perforated metal sheet *f*, forming a distance piece or connector, the holes in which are

arranged in two rows situated at a short distance apart. The two sets of rods *b c* are thus in two planes one above the other, as seen in Fig. 2, and by introducing the cross-bar *g* the two sets may be forced apart so as to assume a bowed shape intermediate of the sheet-connectors *f*. In this way the rods are firmly locked in position and fastened to the connectors *f*. The rods and sheets may for example be made of mild steel and the connectors may extend across the whole of the longitudinal rods or otherwise, both arrangements being shown in Fig. 1.

In the case of a railway sleeper, the main reinforce is required to strengthen the lower portion of the sleeper beneath the rail seatings and the upper portion of the sleeper at the center of the track. The grille composed of the rods *b c* is therefore shown as passing from bottom to top at or about the point of flexion of the sleeper.

The middle of the sleeper illustrated is additionally reinforced by a grooved and perforated plate *d* having a longitudinal rib extending downward in the mass of the concrete. The grille *b c* is anchored or connected to this plate by metallic clips *h*, passing through the perforations and arranged transversely or obliquely of the plate *d*. One of these clips is shown in Fig. 8, the dotted lines representing the shape of the clip before it is clamped around the rods *b c*. In this arrangement the use of the sheet-connectors *f* is not necessary at the central parts of the grille, the perforated plate acting in their stead to secure and space the rods. The plate *d* is then arranged above the grille *b c* but it may alternatively be arranged below the grille.

The sides of the plate *d* may be bent down as shown in Figs. 6 and 7 and connected by cross wires *g*. A number of rods *e* are placed along the top of the V-groove and passed alternatively above and below the cross wires *g*.

A pair of longitudinal wires *a*, are inserted in the upper portion of the sleeper and cranked downwardly at their extremities, preferably extending down to the main grille. These wires are arranged to pass beneath the plate *d* and at the sides of the V-shaped rib, preferably fitting in the angles between the sides of the V and the flat surface of the plate.

Any desired number of rods and perforated connectors may be employed.

The rail shown is of the Vignoles type fitted upon a metallic bedplate and elastic packing such as impregnated felt; the fastening consists of shouldered clips engaging with the flanges of the rail and secured by means of twin bolts of which the heads are sunk in a recess in the lower surface of the sleeper.

The improved structure fitted with this grillage or reinforce is distinguished by a very high elasticity and is well adapted to resist the shearing stresses imposed by the method of loading. The reinforcing grille is very securely locked in position because not only are the rods wedged tightly in the sheet-connectors *f* but also the bowing of the rods intermediate of the connectors prevents any endwise movement through their cavities such as is known to occur in wire reinforce of the usual type.

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

1. A reinforce for concrete constructions comprising a plurality of rods, forming a grille, perforated cross-connections threaded upon said rods, and means for bowing the rods between said cross-connections.

2. A reinforce for concrete constructions comprising a plurality of metallic rods, said rods being substantially parallel and forming a grille, cross-connections having perforations through which the rods are threaded, and means for bowing said rods in opposing directions between said cross-connections.

3. A reinforce for concrete constructions, comprising a plurality of metallic rods, said rods forming a grille, perforated metallic connectors threaded upon said rods, and means for locking said rods to said perforated connectors.

4. A reinforce for concrete constructions, comprising a plurality of metallic rods, said rods forming a grille, perforated metallic connectors threaded upon said rods, and means for bowing said rods between said connectors.

5. A reinforce for concrete constructions, comprising a plurality of metallic rods said rods forming a grille, perforated metallic connectors threaded upon said rods, and cross-wires inserted between sets of said rods, said cross-wires being forced toward said connectors.

6. A reinforce for concrete constructions, comprising a plurality of metallic rods, said rods forming a grille, perforated metallic connectors threaded upon said rods, said connectors having their perforations in rows at a short distance apart, said rods being thereby divided into sets, and means for wedging apart the rods of adjacent sets.

7. A reinforce for concrete constructions, comprising a plurality of metallic rods, said

rods being substantially parallel and forming a grille, perforated metallic connectors threaded upon said rods, said connectors having their perforations in rows at a short distance apart, said rods being thereby divided into sets, and cross-wires inserted between said sets of rods, said cross-wires being forced toward said connectors.

8. A reinforce for concrete constructions, comprising a plurality of metallic rods, said rods forming a grille, perforated metallic connectors threaded upon said rods, said connectors having their perforations located alternately in two rows at a short distance apart, said rods being thereby divided into two sets, and cross-wires inserted between said two sets of rods, said cross-wires being forced toward said connectors and said two sets of rods being thereby bowed in opposite directions.

9. As a new article of manufacture, a railway tie of reinforced concrete, comprising a molded slab of concrete, a plurality of metallic rods located in said slab, said rods forming a grille, perforated metallic connectors threaded upon rods, and means for locking said rods to said perforated connectors.

10. As a new article of manufacture, a railway tie of reinforced concrete, comprising a molded slab of concrete, a plurality of metallic rods located in said slab, said rods forming a grille, perforated metallic connectors threaded upon said rods, and means for bowing said rods between said connectors.

11. As a new article of manufacture, a railway tie of reinforced concrete, comprising a molded slab of concrete, a plurality of metallic rods located in said slab, said rods forming a grille, perforated metallic connectors threaded upon said rods, and cross-wires inserted between sets of said rods, said cross-wires being forced toward said connectors.

12. As a new article of manufacture, a railway tie of reinforced concrete, comprising a molded slab of concrete, a plurality of metallic rods located in said slab, said rods forming a grille, perforated metallic connectors threaded upon said rods, said connectors having their perforations in rows at a short distance apart, said rods being thereby divided into sets, and cross-wires inserted between said sets of rods, said cross-wires being forced toward said connectors.

13. As a new article of manufacture, a railway tie of reinforced concrete, comprising a molded slab of concrete, a plurality of metallic rods located in said slab, said rods forming a grille, perforated metallic connectors threaded upon said rods, said connectors having their perforations located alternately in two rows at a short distance apart, said rods being thereby divided into two sets, and

cross-wires inserted between said two sets of rods, said cross-wires being forced toward said connectors and said two sets of rods being thereby bowed in opposite directions.

14. A railway tie of reinforced concrete, comprising a molded slab of concrete, a plurality of metallic rods embedded in said slab, said rods forming a grille, perforated metallic connectors for said rods, means for locking said rods to said connectors, and a perforated metal plate embedded in the central portion of said slab, said plate being connected to said metallic rods.

15. A railway tie of reinforced concrete, comprising a molded slab of concrete, a plurality of metallic rods embedded in said slab, said rods forming a grille, perforated metal-

lic connectors threaded upon said rods, said connectors having their perforations in rows at a short distance apart, said rods being thereby divided into sets, cross-wires inserted between the sets of said rods, said cross-wires being forced toward said connectors, a perforated metal plate embedded in the central portion of said slab, said plate being bent longitudinally to afford a rib, and clips passing through the perforations in said plate and around adjacent rods.

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

PERCY WILLIAM COOK.

Witnesses:

VICTOR F. FEENY,
CYRIL J. FEENY.