No. 868,065. PATENTED OCT. 15, 1907.

J. S. BARNES.

CONCRETE REINFORCEMENT.

APPLICATION FILED JUNE 28, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

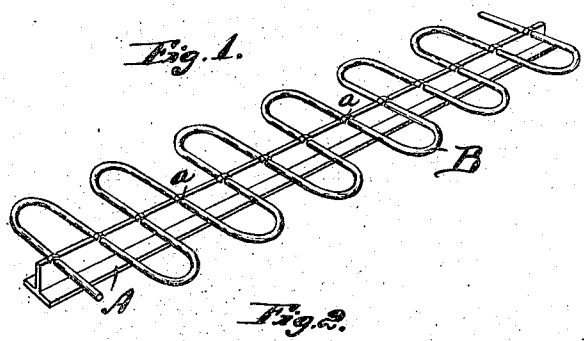


Fig. 6.

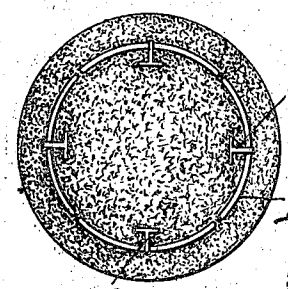


Fig. 7.

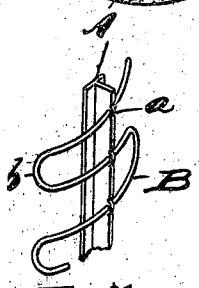


Fig. 2.

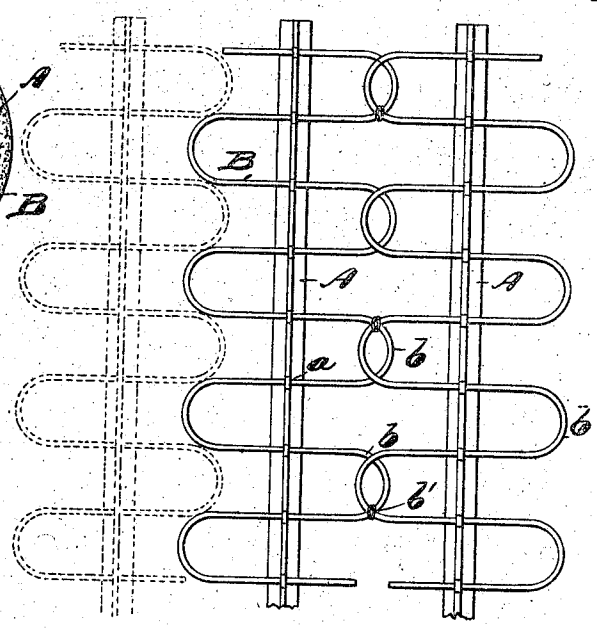


Fig. 5.



Fig. 3.

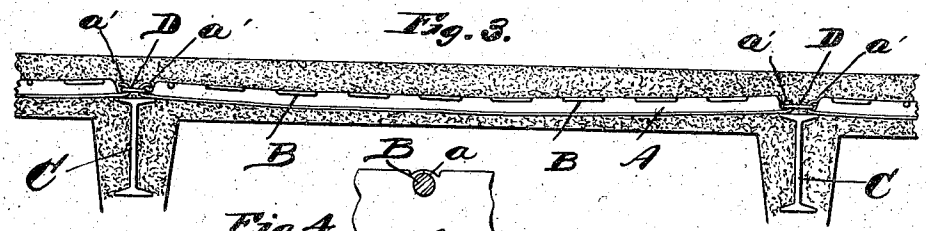
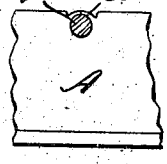


Fig. 4.



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2 SHEETS—SHEET 2.

Fig. 8.

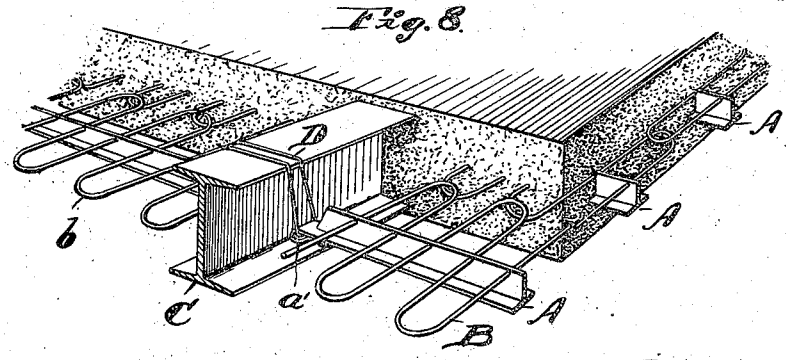


Fig. 9.

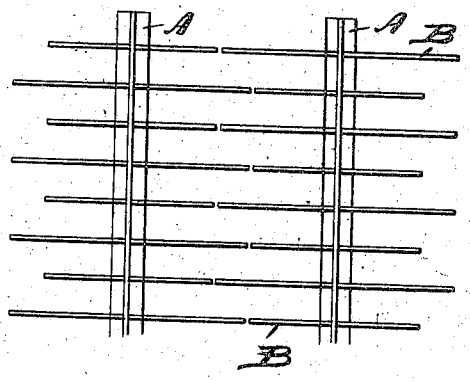


Fig. 10.

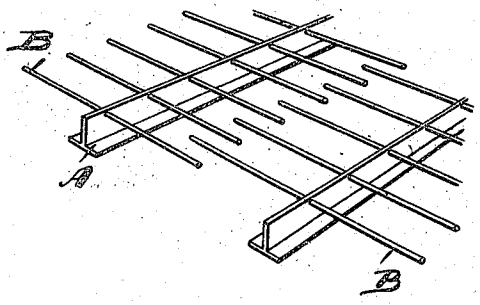


Fig. 13.

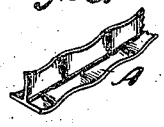


Fig. 11.

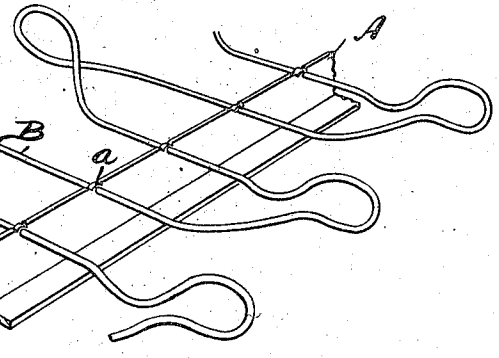
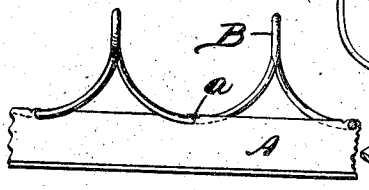


Fig. 12.



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CONCRETE REINFORCEMENT.

No. 868,065. Specification of Letters Patent. Patented Oct. 15, 1907

Application filed June 28, 1906. Serial No. 323,827.

To all whom it may concern:

Be it known that I, JOHN S. BARNES, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Concrete Reinforcements, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to an improvement in means for reinforcing concrete used in the construction of beams, floors, columns, etc., for buildings, or other structures, shown in the accompanying drawings and more particularly set forth in the following specification and claims.

In the drawings: Figure 1 is a perspective view of the reinforcing member. Fig. 2 is a plan view showing two or more of the members in adjacent relation. Fig. 3 is a sectional view through a floor or ceiling showing the reinforcement embedded in the concrete and in turn supported by the usual I-beams. Fig. 4 is a detail showing the manner of securing the binding rod or wire in the web of the T-bar. Fig. 5 is a variation showing the T-bar crimped to increase its bearing surface in the concrete. Fig. 6 is a cross-sectional view through a column showing the binding wires formed on the arc of a circle to adapt them for purposes of this and like constructions. Fig. 7 is a perspective view of the reinforcement employed in Fig. 6. Fig. 8 is a perspective view showing a portion of the concrete floor and ceiling broken away to expose the reinforcing members and the manner of engaging the latter with the I-beams. Fig. 9 is a modification of the form of the binding wires employed in the reinforcing member. Fig. 10 is another modification of the same. Fig. 11 shows the ends of the binding wire bent upward in the form of a loop to increase its cross-sectional reinforcing area. Fig. 12 is an elevation of the reinforcing member shown in Fig. 11 looking toward the ends of the binding wire. Fig. 13 shows a modification in the form of the T-bar for supporting the binding wire.

The object of my invention is to construct a reinforcement which will be inexpensive to manufacture and readily adapted for use in different forms of concrete construction. Other advantages will hereafter appear.

Referring to the letters of reference shown in the drawings, A is an ordinary T-bar, though other forms of commercial iron may be employed if desired. At suitable intervals throughout its length, depressions *a*,—or perforations, if desired,—are made in the web of the bar to receive the binding wire B, arranged to project in opposite directions from the web of the bar. When the T-bars are assembled in adjacent relation, the return bends *b* of the binding wire may overlap, as shown in Fig. 2, and if desired, locked together by tie wires *b'*;—or, as indicated in dotted lines in the same figure, the return bends may project into the open end of the loop of the opposite binding wire and, if desired, be locked together where the wires abut.

As shown in Figs. 3 and 8 of the drawings, the T-bars are linked together over the I-beams C, as indicated at D, the T-bars being perforated at their ends, or provided with a return bend *a'*, as indicated in the views referred to. When used in reinforcing concrete columns or other like structures, the binding wires B are formed on an arc of a circle, as shown in Figs. 6 and 7 of the drawings, to more particularly adapt them to the necessities of this construction.

By crimping the T-bar supporting the binding wires, I greatly increase the binding surface exposed to the concrete and thereby add to its efficiency.

While I have shown the web of the T-bars cut with a U-shaped opening to receive the binding wires, the construction is such that the edges of the web are closed over the binding wire to secure it in the T. In place of the depressions in the T-bar the web may be perforated to receive the wire, being afterwards swaged to secure it in the web of the bar. I prefer, however, the construction shown as it is more simple, and cheaper to manufacture.

In the modification shown in Fig. 9, the binding wire is made of short sections, each alternate wire being longer than that on either side in order that the adjacent T-bar with its series of binding wires may interlock in order to afford an unbroken reinforcement when embedded in the concrete.

In the form shown in Fig. 10, the binding wires are of equal length, but when the reinforcing members are placed in adjacent relation they are placed so that the binding wires will interlock in order to present an unbroken surface. It will be seen that in the use of either of the forms shown in Fig. 9 or 10 that considerable wire will be saved, as the wire necessary to form the loop in the other figures will be dispensed with.

In the modification shown in Figs. 11 and 12, the loops at the end of the binding wire are turned at right angles in order to widen the reinforcing area.

It will be seen that by the employment of my invention the entire concrete area is knit together, it being impossible for a crack to extend in a direction not covered by reinforcing wire.

Having thus described my invention, what I claim is:—

1. A reinforcement for concrete construction consisting of a supporting bar including a base and also a web portion, the web portion having a series of pairs of fingers along its upper edge, said fingers being bendable in the longitudinal plane of the web, and a continuous binding

wire secured at intervals to the web between said pairs of fingers, the wire projecting upon opposite sides of the web beyond the outer opposite edges of the base portion of the bar.

2. A reinforcement for concrete construction consisting of supporting bars each including a base and also a web portion having a series of pairs of fingers along its upper edge, the bars being arranged in parallelism and the fingers of each web being bendable in the longitudinal plane of the web, a continuous binding wire secured to the web of each bar between the corresponding fingers, each wire projecting upon opposite sides of the web beyond the outer opposite longitudinal edges of the base of the corresponding bar, the wire of one bar overlapping the wire of the other bar, and means for connecting the overlapping portions of the wires together.

3. A reinforcement for concrete construction consisting of a beam including a base, supporting bars arranged in alinement upon opposite sides of the beam with the inner ends of the bars resting upon the base, the ends of the bars adjacent the beam having eyes therein, means passed through the eyes of the bars and bridging the beam to secure the beam and bars together, and binding wires secured to each bar, the binding wires of adjacent bars upon each side of the beam overlapping it at intervals, and means for connecting the overlapping parts of the binding wires together.

4. A reinforcement for concrete construction consisting of a beam including a base, supporting bars arranged in alinement upon opposite sides of the beam with the inner ends of the bars resting upon the base, the ends of the bars adjacent the beam having eyes therein, means passed through the eyes of the bars and bridging the beam to secure the beam and bars together, each bar including a base and also a web portion having a series of fingers in its upper edge bendable longitudinally of the web, and a continuous binding wire secured to the web of each bar between the corresponding fingers, each wire projecting upon opposite sides of the web beyond the outer opposite longitudinal edges of the corresponding bar, the wire of one bar overlapping at intervals the wire of the adjacent bar upon corresponding sides of said beam, and means for connecting the overlapping parts of the wires together.

In testimony whereof, I sign this specification in the presence of two witnesses.

JOHN S. BARNES.

Witnesses:
S. E. THOMAS,
HENRY E. VILLERAT