W. C. EDWARDS, Jr.

REINFORCEMENT FOR CONCRETE FLOORS, FLOOR BEAMS, GIRDERS, AND THE LIKE.

APPLICATION FILED APR. 11, 1912.

1,045,006.

Patented Nov. 19, 1912.

2 SHEETS—SHEET 1.

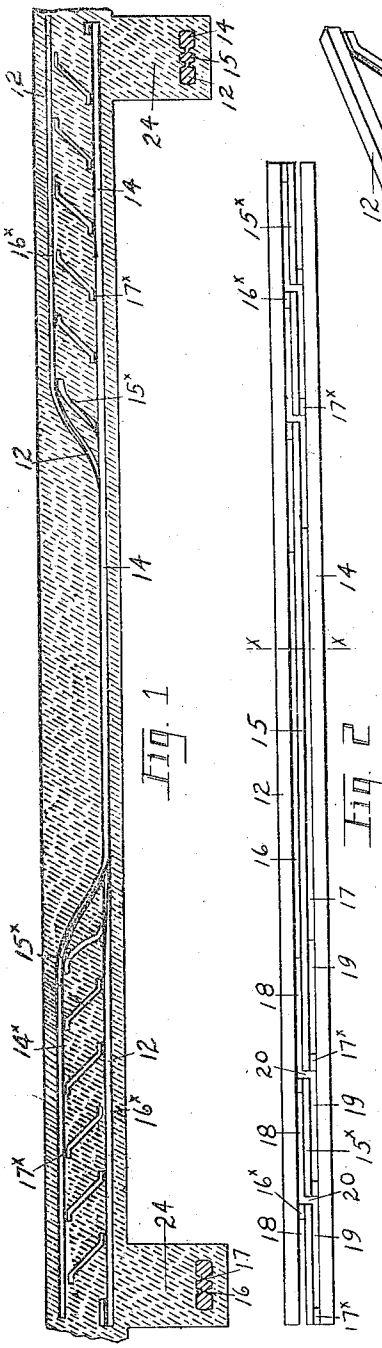

Fig. 1

Fig. 2

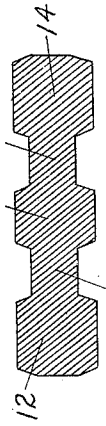

Fig. 3

Fig. 4

Fig. 7.

Witnesses

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2 SHEETS—SHEET 2.

Fig. 6

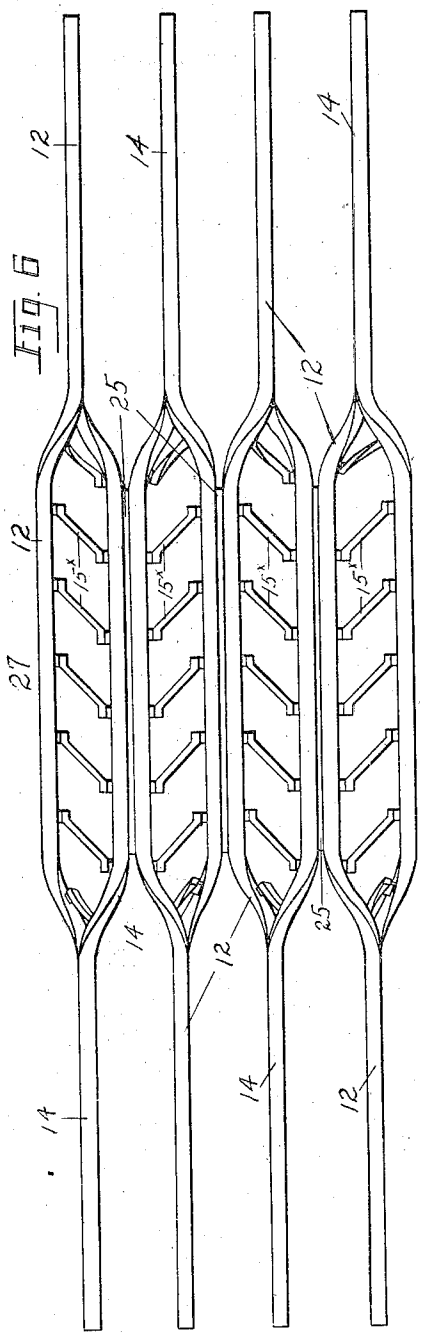
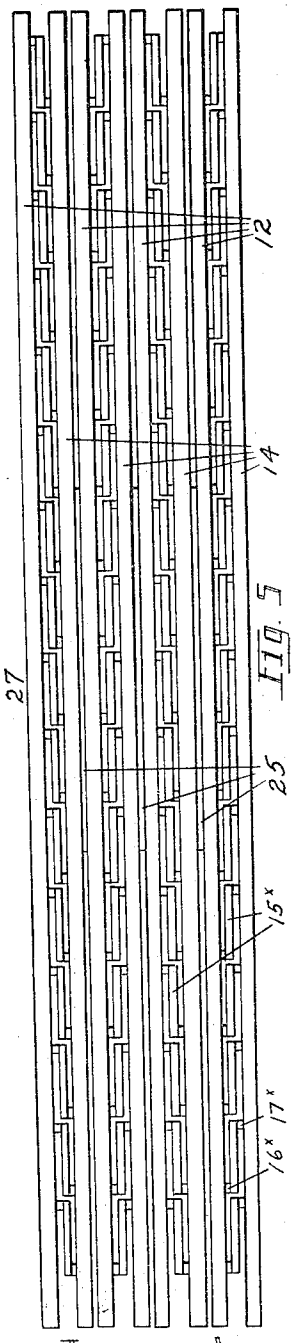


Fig. 5



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REINFORCEMENT FOR CONCRETE FLOORS, FLOOR-BEAMS, GIRDERS, AND THE LIKE.

1,045,006. Specification of Letters Patent. Patented Nov. 19, 1912.

Application filed April 11, 1912. Serial No. 690,010.

To all whom it may concern:

Be it known that I, WILLIAM C. EDWARDS, Jr., a citizen of the United States of America, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Reinforcements for Concrete Floors, Floor-Beams, Girders, and the Like; and I do hereby declare that the following is a full, clear, and exact description of the invention, such as will enable others to make and use the same, reference being had to the accompanying drawings, forming a part of this specification.

The invention consists in the novel construction and combination of parts hereinafter fully described and specifically pointed out in the claims.

In the drawings: Figure 1 is a longitudinal, vertical, sectional view of the concrete floor and reinforced concrete beams supporting said floor, embodying the invention. Fig. 2. is a plan view of the slitted roll blank, from which the reinforcement is fabricated. Fig. 3. is a transverse section, taken on the lines x, x, on Fig. 2. Fig. 4. is a view, in perspective, of the complete reinforcement. Fig 5. is a plan view of the rolled blank for the reinforcement, in multiple, showing the slitted parts. Fig. 6. is a plan view of the reinforcement in multiple. Fig. 7. is a modification of the rolled blank or plate, shown in Figs. 2 and 3.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

In the details of construction of my reinforcement, as seen in the drawings, to which reference is now made, a longitudinal metallic plate or "blank," such as open hearth steel of the requisite width, or as shown in Fig. 2, embodying the width of a single device, is rolled lengthwise in the shape or form as seen in cross-section in Fig. 3, thereby producing the longitudinal outer bars 12 and 14, which are substantially rectangular in cross-section, and an intermediate bar 15, of slightly less area in cross-section, which latter bar is integrally connected with the outer bars 12 and 14, by the web portions 16 and 17, which are of reduced thickness to that of the said bars. Portions of the webs 16 and 17 are now cut or slitted along the lines of the inner surfaces of the bars 12 and 14, at intervals beginning at one end of the rolled bar or plate, producing the longitudinal slits 18 and 19, as seen in Fig. 2, the slit 18 extending transversely at 20, through the bar 15, and connecting with the slit 19, leaving small portions of the webs 16 and 17 uncut, as seen at 16^x, 17^x, thereby forming a longitudinal section 15^x, of the intermediate bar 15. The slitting or cutting is then continued at intervals, in the plate and in the webs, in like manner as first described, in the direction of the central portion of the barred plate, thereby forming a number of the short members 15^x, of the intermediate bar 15. The said central portion of the plate constituting one-third, or more of the rolled shape or plate is left unslitted. The slitting is then resumed in the remaining portion of the plate constituting the other end of the plate, in the same manner as heretofore described, forming a series of like portions 15^x, of the intermediate bar 15. It will be, therefore, seen that the portions 15^x, of the said bar 15 are rigidly connected by means of the portions 16^x, 17^x, of the respective webs 16 and 17 with the outer bars 12 and 14.

Upon the completion of the slitting of the barred plate, the outer portions of the barred plate are twisted or given a quarter turn at the points at which the slitted portions of the webs meet the central non-slitted portions of the barred plate. The outer portions are now expanded, the connecting portions assuming a diagonal position at an angle of 45°, to the longitudinal plane of the central portion of the reinforcement. In the completion of the expanding of the bars 12 and 14, the ends of the bars 12 and 14 at the respective ends of the reinforcement are in alternate vertical positions, the outer bar 12, at one of the reinforcements occupying a position in the same horizontal plane as that of the central portion of the reinforcement, while the end of the outer bar 14 extends upwardly and outwardly from said central portion of the reinforcements integrally above and in a vertical position to that of the end bar 12. While at the outer end of the reinforcement the positions of the said bars are reversed, the bar 14 forms the lower horizontal member of the said end of the reinforcement.

For floor construction, the reinforcement as seen in Fig. 4 is preferably made in multiple and fabricated from barred plates, of increased width to that from which Fig. 2 is constructed. In the latter construction the bars 12 and 14 are connected to similar bars, by means of the webs 25, as seen in the

slitted multiple rolled plate, in Fig. 5, these webs extending along the line of the central portion of the rolled plate. The slitting of the webs from which the members 15^x are formed is continued the entire length of the rolled plate. The central portion 27, of the multiple reinforcing device, are each expanded, while the same twisting of the ends of the bars are performed as described of bars 12 and 14, in Fig. 1, and occupy corresponding positions in the reinforcement. It will be seen, therefore, that the portions 15^x, in the central portion 27, of the multiple device care for such transverse stresses as may be set up in slab construction, and obviate the necessity of the placing of loose rods transversely to the main reinforcement. Likewise, if desired, the web portions 25 may be slitted and expanded to form members similar to the members 15^x in the central portion of the multiple device.

The form of the rolled plate as seen in Fig. 3, may be further modified as seen in Fig. 7, in which the outer, rolled bars 40 and 41, are approximately circular in construction, and the web 42 essentially depressed. In the latter construction, a V-shaped rib 43 is formed, on the lower surface of the web 42.

The advantages of my invention, when acting as a reinforcement to concrete structures, are such that when the structure is loaded to destruction, the entire tension reinforcement will act as a single unit, thereby increasing to a marked degree the efficiency of the reinforcement.

As will be clearly seen by reference to Fig. 1. the several allied parts constituting the central portion of the reinforcement are approximately equidistant from the top of the concrete structure within which it is embedded, hence each unit part will therefore bear its proportionate share of the tension stresses set up in the structure.

It is obvious that the form of the reinforcement shown may be adapted to such uses as varying circumstances require, and such modifications employed as are within the scope of the appended claims.

Having fully described my invention, what I now claim as new and desire to secure by Letters Patent is:

1. A reinforcement for concrete construction composed of integrally connected triple parallel bars and intermediate webs lying substantially in the same horizontal plane, which webs at the outer ends of the reinforcement are slitted, progressively, longitudinally and transversely at intervals, said transverse slits extending through the intermediate bar to form sectional members, of said intermediate bar, which are integrally connected with the outer bars of said reinforcement; the ends of said outer combined bars being twisted in reverse directions through a quarter turn adjacent the central portion thereof, the outer bars at said ends forming top and bottom reinforcing members, which bottom members lie substantially in the same vertical and horizontal plane as the intermediate bar in the central portion of the reinforcement, the top member and the integrally connected sectional members being raised and expanded from the bottom member.

2. A reinforcement for concrete construction composed of triple parallel bars, and webs intermediate and integrally connected with said bars, the said bars and webs lying substantially in the same horizontal plane, which webs at the outer ends of the reinforcement are slitted, progressively, at intervals in longitudinal and transverse slits, said transverse slits extending through the intermediate bar to form sectional members, of said intermediate bar, which are integrally connected with the outer bars; the ends of which reinforcement are twisted in reverse directions a quarter turn, adjacent the central portion thereof, thereby forming top and bottom reinforcing members lying in a vertical plane at right angles to the plane of the central portion of the reinforcement, the top and integrally connected sectional members being raised in said vertical plane and expanded from the bottom member, whereby the sectional parts in the outer portions of the reinforcement are brought into oppositely and outwardly inclined positions to the central portion of the reinforcement.

3. A reinforcement for concrete structures composed of a series of integrally connected reinforcing devices, each device consisting of triple parallel side and intermediate bars, integrally connected by intermediate web portions, said bars and webs lying in substantially the same horizontal plane, the said webs being slitted, progressively, longitudinally and transversely at intervals, said transverse slits extending through the intermediate bar to form sectional members of said intermediate bar, the said side members being expanded and integrally connected with each other by the said sectional members; the ends of which device being twisted in reverse directions in a quarter turn adjacent the central portion thereof, the said side bars and intermediate sectional portions thereby forming top, diagonal and bottom reinforcing members of the said device, the diagonal members being outwardly and upwardly inclined to the central portion of the reinforcement.

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