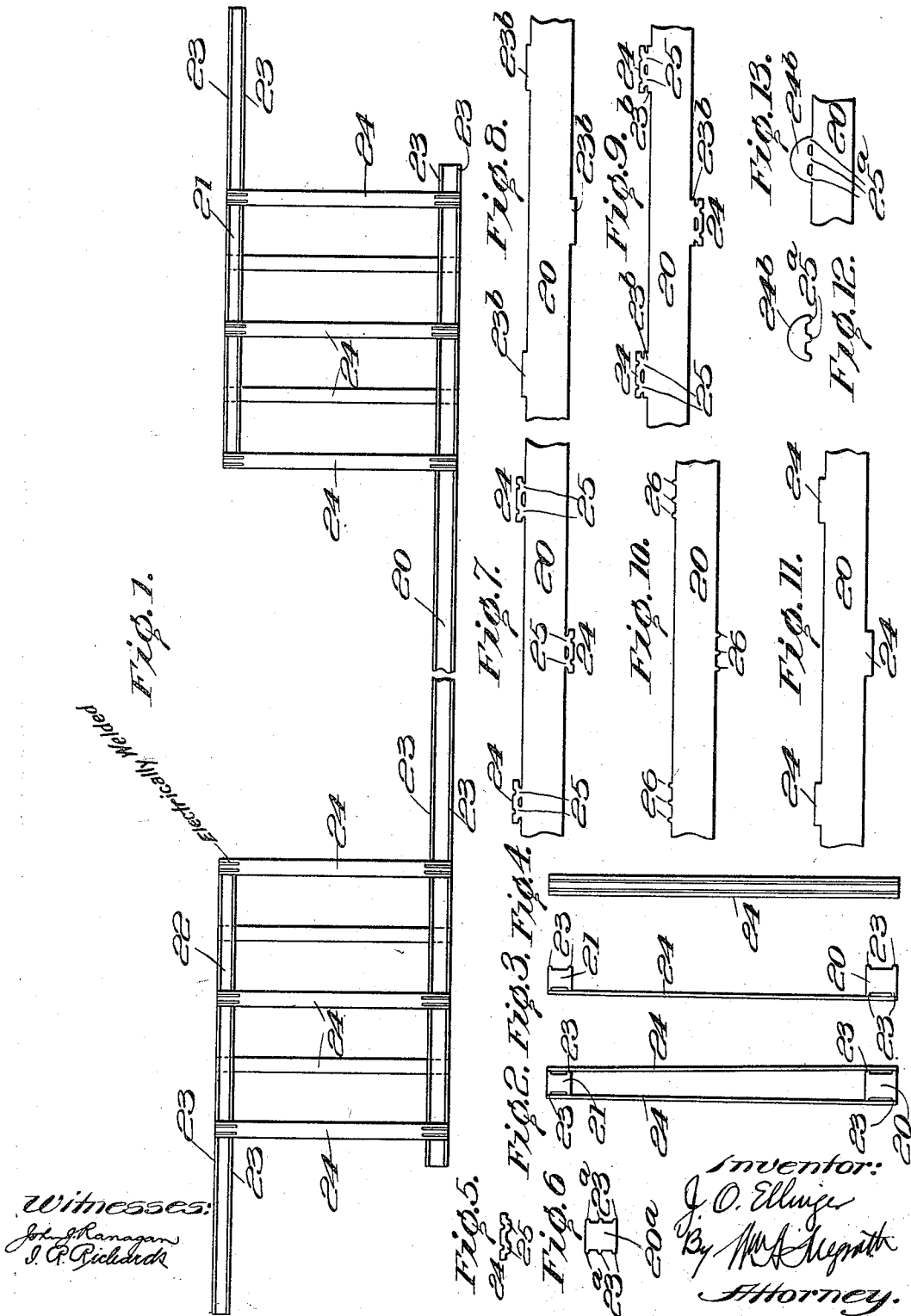


J. O. ELLINGER.
 REINFORCEMENT FOR CONCRETE CONSTRUCTION.
 APPLICATION FILED SEPT. 22, 1909.

952,891.

Patented Mar. 22, 1910.



UNITED STATES PATENT OFFICE.

JULIAN O. ELLINGER, OF NEW YORK, N. Y.

REINFORCEMENT FOR CONCRETE CONSTRUCTION.

952,891.

Specification of Letters Patent. Patented Mar. 22, 1910.

Application filed September 22, 1909. Serial No. 518,944.

To all whom it may concern:

Be it known that I, JULIAN O. ELLINGER, a citizen of the United States, and a resident of the city, county, and State of New York, have invented certain new and useful improvements in Reinforcement for Concrete Construction, of which the following is a specification.

This invention relates to improvements in reinforcements for beams, girders, &c., having their body portions composed of concrete or analogous plastic material.

The objects of the invention will appear from the hereinafter description.

Several embodiments of the invention are disclosed in the accompanying drawing in which the same reference character indicates the same part in the several views.

Referring to the drawing: Figure 1 is a side elevation of a unit frame made according to my invention. Fig. 2 is an end view of the same. Fig. 3 is an end view of a slight modification. Fig. 4 is a side view of a modified form of strap. Fig. 5 is an end view of the strap. Fig. 6 is an end view of a modified form of bar forming one element of the frame. Fig. 7 is a top plan view on an enlarged scale of a bar and straps showing the homogeneity of the strap and bar after they have been connected according to my invention. Fig. 8 is a top plan view on an enlarged scale, of a modified construction of bar. Fig. 9 is a top plan view showing the strap connected to such bar as illustrated in Fig. 8. Fig. 10 is a top plan view of another modification of bar. Fig. 11 is a top plan view of said bar with the straps connected thereto. Fig. 12 is an end view of a modified construction of strap or shear member. Fig. 13 is a top plan view showing said strap or shear member connected to such bar, as shown in Figs. 1, 2, 3 and 6.

The part marked 20 represents the lower bar of the frame and 21 and 22 represent the upper end bars. Each of these bars is above the end portion of the lower bar and substantially parallel thereto, with the outer ends thereof projecting beyond the outer ends of said lower bars. Each of these bars at the upper and lower edges thereof is provided with longitudinal ribs or projections 23. The part marked 24 represents straps which connect the end portions of the lower bar with the inner portions of the upper bars and form shear members. The ends of each

of these straps are provided with projections or ribs 25, preferably formed by pressing longitudinal depressions in the bar, said projections extending across and contacting with the ribs or projections 23. The straps are alternated on each side of said bars, as more clearly shown in Figs. 1 and 2. When the straps have been connected to the longitudinal bars by welding, the metal forming the projections on the straps and that of the ribs 23 becomes plastic and under pressure is forced together and forms what might be termed a solid homogeneous mass, without any apparent weld, see Fig. 7. The shear value of the weld is directly proportionate to the area of the metal involved and where the shear straps are welded to the longitudinal bars or tension members, the tension members at these points have increased tensile value and the elastic limit of the tension bars is increased at these points. The shear value of the weld for any given size of strap may be increased by increasing the width of the projection or ridge in the strap. That is to say, suppose a one half inch strap using a ridge of a given area develops five thousand pounds ultimately in the strap, then by using a three quarter inch strap the shear value of the weld may be increased to seventy-five hundred pounds, by widening out the ridge, thereby making its area of contact with the ridges on the longitudinal bars or tension members of greater value. Instead of placing these straps on both sides of the longitudinal bars, as shown in Figs. 1 and 2, all the straps may be placed on one side of the bars, as shown in Fig. 3. Instead of having the ridges on these straps only at the edge, the ridges may extend longitudinally throughout the straps for additional strength, as shown in Fig. 4.

In some constructions instead of providing each side of the longitudinal bars with two ridges, they may be provided with three ridges, as shown in Fig. 6, the middle ridge in such construction being marked 23^a and the bar being indicated by the reference character 20^a.

Instead of providing the longitudinal bars with projections or ribs 23 throughout their length, I may form ridges or projections 23^b on the bars, as shown in Fig. 8, and only at the places where the straps or shear members are to be welded thereto. Fig. 9 shows the shape or form of the metal when the straps are connected to such a bar.

In some constructions I may provide the longitudinal bars with points 26, as shown in Fig. 10, instead of the ribs 23, for the purpose of welding the straps thereto. In such construction the straps or shear members 24 need not necessarily be provided with projections or ridges 25 at the ends thereof, but may be plain throughout their length. In Fig. 11 is shown the final relation of such a bar and such a strap. In this construction the metal forming the points becomes plastic and forms with the metal of the straps when pressed, a homogeneous mass, as appears in said Fig. 11.

In Fig. 12 is shown a strap or shear member 24^b made of substantially half round metal, provided with contact projections or ridges 25^a. When such a shear member is used the points during the process of welding unite with the ridges 23 and form a homogeneous mass, as is more clearly shown in Fig. 13.

In constructing a reinforcing frame as hereinabove described, the shear and longitudinal members are rigidly connected and the metal of said elements unites so that the metal at the joints is homogeneous.

Certain features of the invention herein described are disclosed in my prior application, Serial No. 503,773, filed June 23, 1909.

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

1. A reinforcement for concrete construction, comprising lower and upper spaced longitudinal bars having welding projections throughout their length, flat transverse shear members having welding projections at their ends and in contact with the projections on the longitudinal bars, said projections being weldably united.

2. A reinforcement for concrete construction, comprising lower and upper spaced longitudinal bars having on the sides thereof welding projections, transverse shear members on each side of said bars, said shear members being provided with welding pro-

jections at the ends and in contact with the projections on the longitudinal bars, said projections being weldably united.

3. A reinforcement for concrete construction, comprising lower and upper spaced longitudinal bars having on the sides thereof welding ridges throughout their length, flat transverse straps or shear members extending from the lower bar to the upper bar or bars, said straps being provided with longitudinal welding projections or ridges at the ends thereof, said ridges contacting with the ridges on the longitudinal bars, and said ridges being weldably connected.

4. A reinforcement for concrete construction, comprising lower and upper longitudinal bars having welding projections, flat transverse members having welding projections in contact with the projections on the longitudinal bars, said projections being weldably united.

5. A reinforcement for concrete construction, comprising lower and upper longitudinal bars having welding projections, flat transverse members having one or more welding projections in contact with the projections on the longitudinal bar, the said projections being weldably united, the area of the metal in the projections being so proportioned that the shear value of the weld is directly proportioned to said area.

6. In a reinforcement for concrete construction, longitudinal bars forming tension members having welding projections on the sides thereof, and a series of straps forming shear members, the free end of each strap being provided with welding projections, the said straps at the free ends being weldably connected to the longitudinal bars to form a homogeneous construction.

In witness whereof I have hereunto set my hand at the city, county and State of New York, this 21st day of September, 1909.

JULIAN O. ELLINGER.

In presence of—

ISABEL R. RICHARDS;
JOS. J. RANAGAN.