E. CANNES.

REINFORCING FRAME FOR CONCRETE CONSTRUCTION.

APPLICATION FILED FEB. 16, 1909.

963,685.

Patented July 5, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

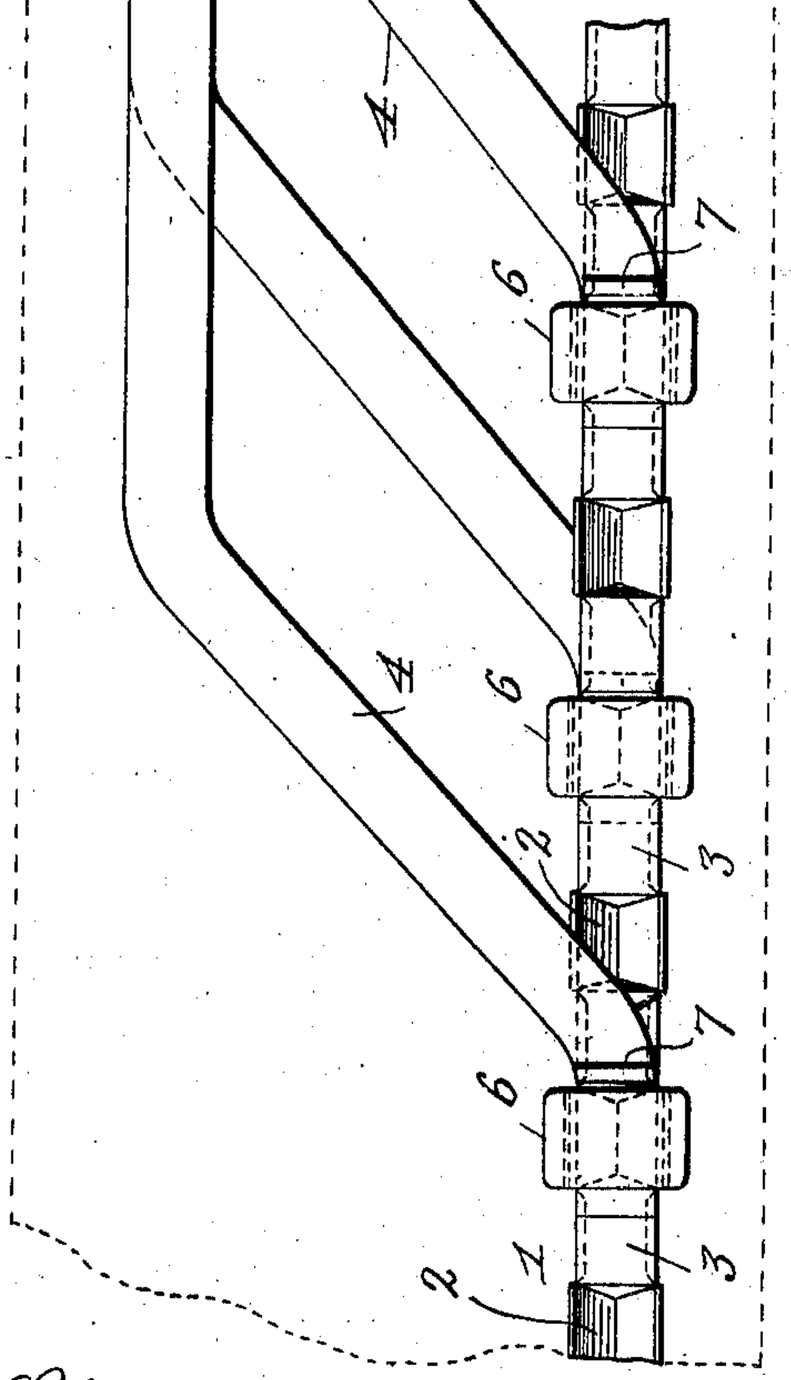


Fig. 3.

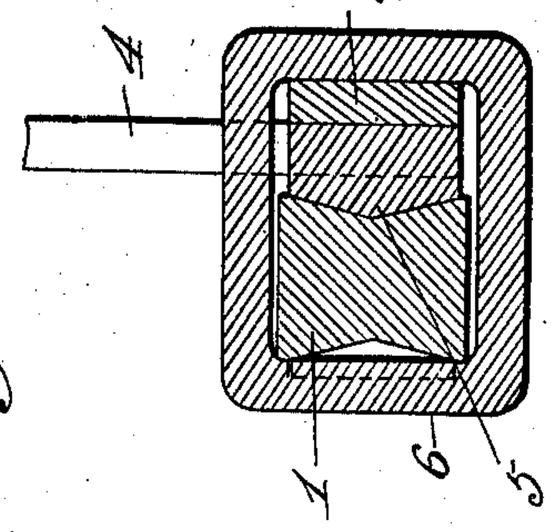


Fig. 4.

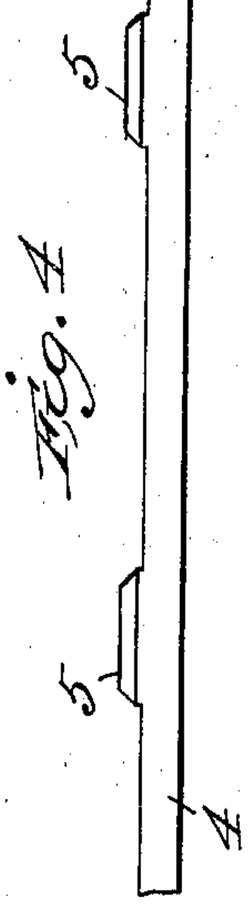


Fig. 5.

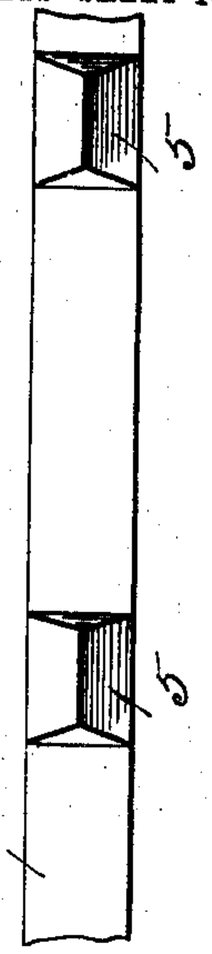
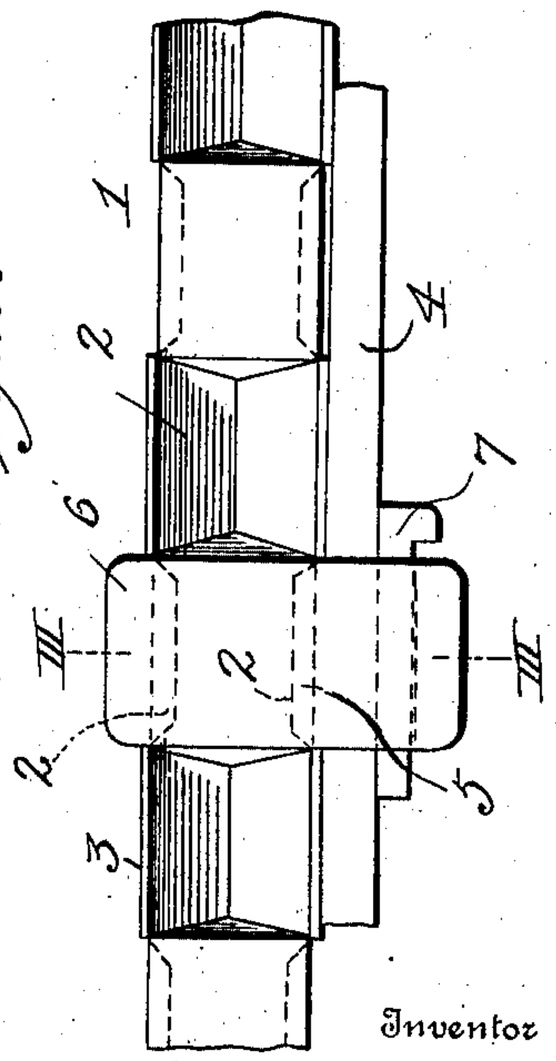


Fig. 2.



Witnesses

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2 SHEETS—SHEET 2.

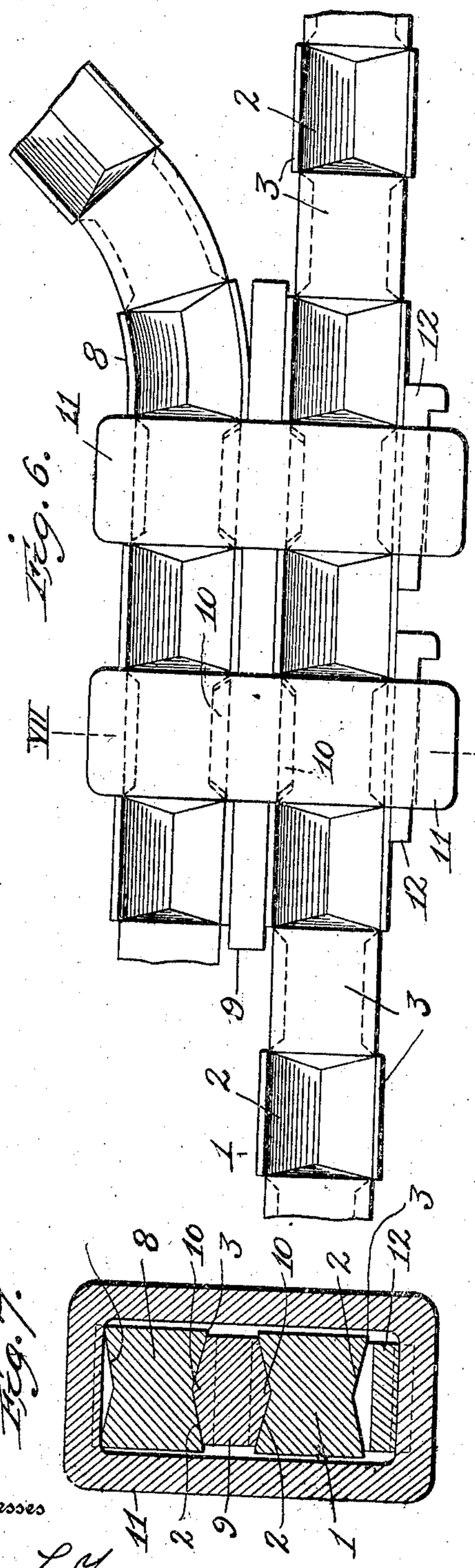

Fig. 6.

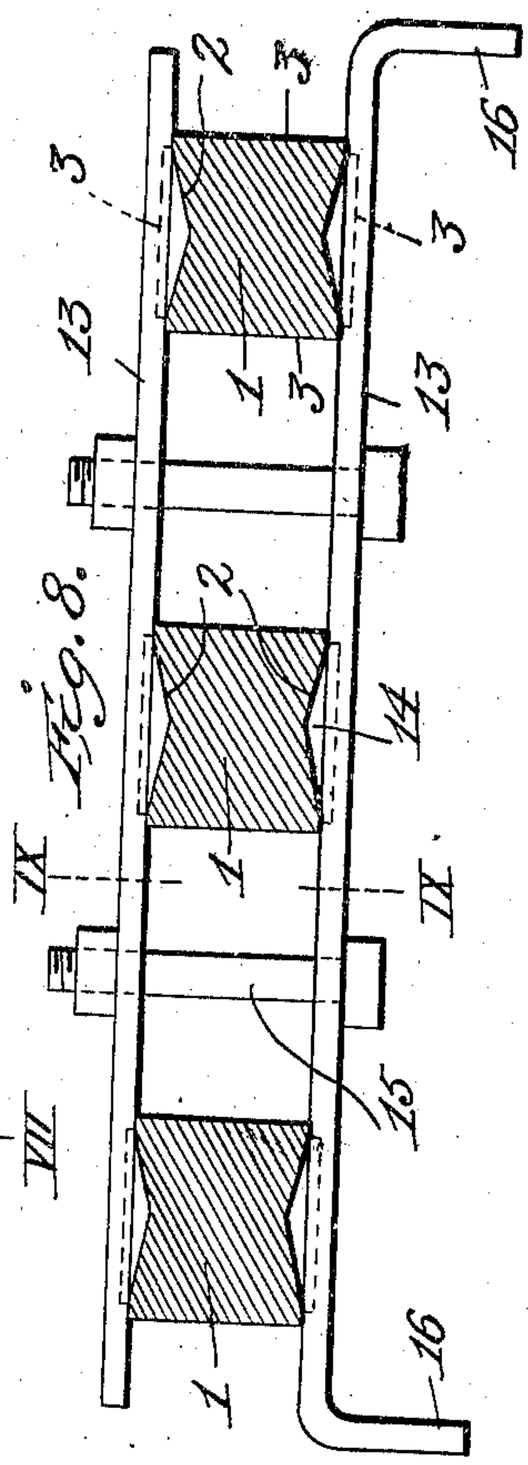

Fig. 8.

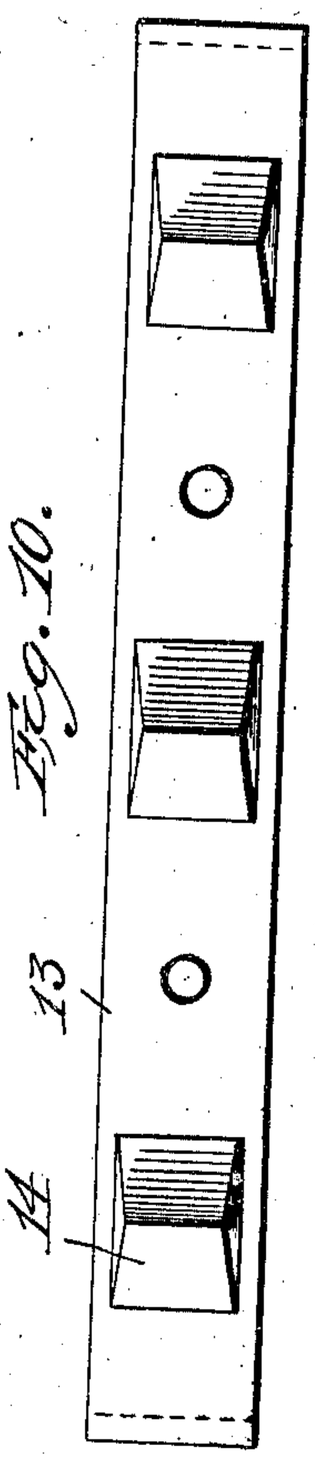

Fig. 10.

Fig. 7.

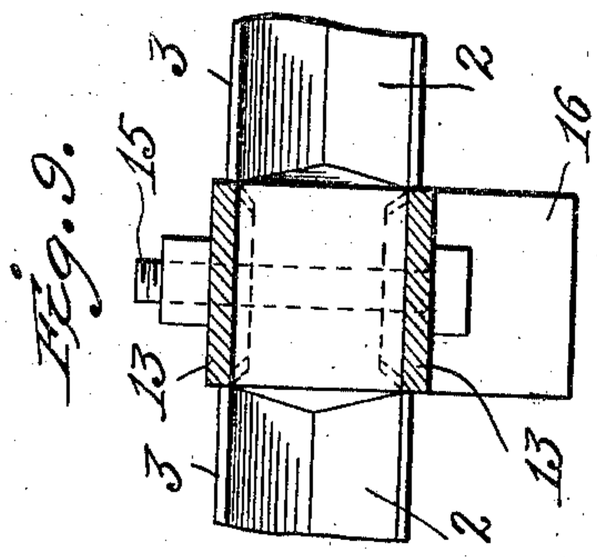

Fig. 9.

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REINFORCING-FRAME FOR CONCRETE CONSTRUCTION.

963,685. Specification of Letters Patent. Patented July 5, 1910.

Application filed February 16, 1909. Serial No. 478,225.

To all whom it may concern:

Be it known that I, ELIE CANNES, a citizen of the United States, residing at New York, in the borough of Manhattan and State of New York, have invented new and useful Improvements in Reinforcing-Frames for Concrete Construction, of which the following is a specification.

My invention relates to reinforced concrete construction, wherein the beam or girder is composed of concrete having embedded therein metallic reinforcing bars, and has for its object to provide an improved means for uniting the reinforcing bars to each other in such manner that the connections between the several bars shall be absolutely rigid.

It is well known that when a beam or girder is loaded the reinforcing bars therein tend to slide in the concrete, this tendency or horizontal strain being zero at the center of the span, and maximum near the supports. The tensile bars should, therefore, all end at the supports. To take up the shear stresses other bars are provided, which are bent up at an angle to the longitudinal tensile bars, and are connected to said tensile bars at fixed points. It is to form these connections absolutely rigid, as well as to rigidly connect said horizontal tensile bars transversely to each other, that my present invention is directed.

In the drawing accompanying this description:—Figure 1 is a side elevation of a portion of a beam or girder embodying my invention, the concrete being shown in dotted outline. Fig. 2 is an enlarged detail top plan view of a portion of one of the tensile bars showing the connection between the same and one of the diagonal bars for taking the shear stresses. Fig. 3 is a transverse section on the line III—III, Fig. 2. Fig. 4 is an enlarged detail edge view of a portion of one of the diagonal bars. Fig. 5 is a face view of the same. Fig. 6 is a view similar to Fig. 1 showing a slightly modified construction. Fig. 7 is a transverse sectional view taken on the line VII—VII, Fig. 6. Fig. 8 is a transverse sectional view through a plurality of longitudinal tensile bars showing my improved means for rigidly connecting them together to prevent lateral movement. Fig. 9 is a transverse sectional view on the line IX—IX Fig. 8. Fig. 10 is a detail face view of one of the connecting plates shown in Figs. 8 and 9.

Similar numerals of reference denote, as far as possible, corresponding parts in the several views.

In the said drawings, referring more particularly to Figs. 1 to 5, the reference numeral 1 denotes the horizontal tensile bar extending from end to end of the beam or girder, which is preferably one of a series of similar bars lying in the same horizontal plane but spaced apart as hereinafter described.

In an application for Letters Patent filed by me November 13, 1908, Serial No. 462,490, I have shown and described a concrete reinforcing bar of novel construction, and in Figs. 1, 2 and 3 have shown that bar 1 of similar construction, that is to say, formed with a series of oppositely disposed depressions 2 having the form of a triangular prism alternating with flat projections 3. The diagonal shear bars 4 are bent at their lower ends to lie parallel with the bar 1 and terminate at their upper ends a certain length in the compression side of the beam. Said bars 4 are provided at their lower ends on one side with one or more projections 5 shaped to accurately conform to the shape of the depressions 2 in bar 1 so that when the two are interlocked they will be rigidly maintained against independent longitudinal movement. To firmly retain the bars 1 and 4 in this engagement I provide collars 6 of a width equal to the distance between the projections 3 on one side of bar 1, but of an interior area large enough to loosely embrace both said bars 1 and 4, and firmly clamp said collar and bars 1 and 4 together by means of wedges 7 inserted between said collars and bars 4, as shown in Figs. 2 and 3, the result being that not only are said bars firmly held against longitudinal movement with respect to each other, but said collars 6 are also held by said projections 3 against said movement, and a substantially integral construction is produced.

I have shown in Figs. 1 to 5 a flat bar 4 provided with projections 5, but I may employ diagonal shear bars identical in structure with longitudinal bars 1, as shown at 8 in Figs. 6 and 7, in which event it will be necessary to provide intermediate plates 9 having on both sides projections 10 adapted

to register with the depressions in said bars 1 and 8, said bars being retained together by collars 11 and wedges 12.

In the construction shown in Figs. 1 to 5, it may be desirable to extend the horizontal portions of the bars 4 to engage two or more of the depressions 2 in bars 1, and in doing this I may position the projections 5 on said bars 4 so that they will register with alternate depressions in bar 1.

Where a series of longitudinal tensile bars 1 are employed in a single beam or girder, I maintain them in position relative to each other by means of cross plates 13, shown in Figs. 8 to 10, said plates having projections 14 corresponding accurately in shape with depressions 2 in said bars 1, said plates being connected by bolts 15 whereby the spaces between said bars 1 are maintained in fixed relation, it being observed that the width of said plates 13 is equal to that between the projections 3 on said bars 1, whereby movement of said plates longitudinally with respect to said bars is effectually prevented. By turning down the ends of the plates 13, as shown at 16, I provide a support for bars 1 and also the necessary space or depth for the concrete below these bars.

By means of my improved connections I provide a reinforced structure for the concrete that may be readily assembled, either at the point of manufacture of the iron work, or at the point of erection, and which when assembled will form a substantially integral structure in which there can be no separate movement after the concrete has been applied thereto, whereby splitting or disintegrating of the concrete is effectually prevented and a true monolithic beam or girder is produced.

While I have shown and described my invention as particularly applicable to beams or girders, it will be understood that the same may be used in connection with reinforced concrete columns of any character.

My improved form of connection may also be used to connect the ends of two short bars extending in opposite directions, whereby a rigid lengthened bar will be produced.

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

1. In a reinforcing frame, a longitudinal tensile bar having depressions and projections in its surface, a diagonal shear bar having one end lying parallel with said tensile bar and provided with a projection adapted to engage and fit one of the depressions in said tensile bar, a collar embracing said bars at their point of connection and of a width equal to the space between the projections on said tensile bar to prevent longitudinal movement thereon, and means for clamping said collar upon said bars.

2. In a reinforcing frame, a longitudinal tensile bar having depressions and projections in its surface, a diagonal shear bar having one end lying parallel with said tensile bar and provided with a projection adapted to engage and fit one of the depressions in said tensile bar, a collar embracing said bars at their point of connection and of a width equal to the space between the projections on said tensile bar to prevent longitudinal movement thereon, and a wedge for clamping said collar on said bars.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

ELIE CANNES.

Witnesses:
C. O. Hopper,
Wm. B. Barry, Jr.