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R. R. MOORMAN & C. W. YELM.
MEANS FOR REINFORCING CONCRETE STRUCTURES.
APPLICATION FILED APR. 7, 1905.

Fig. 1.

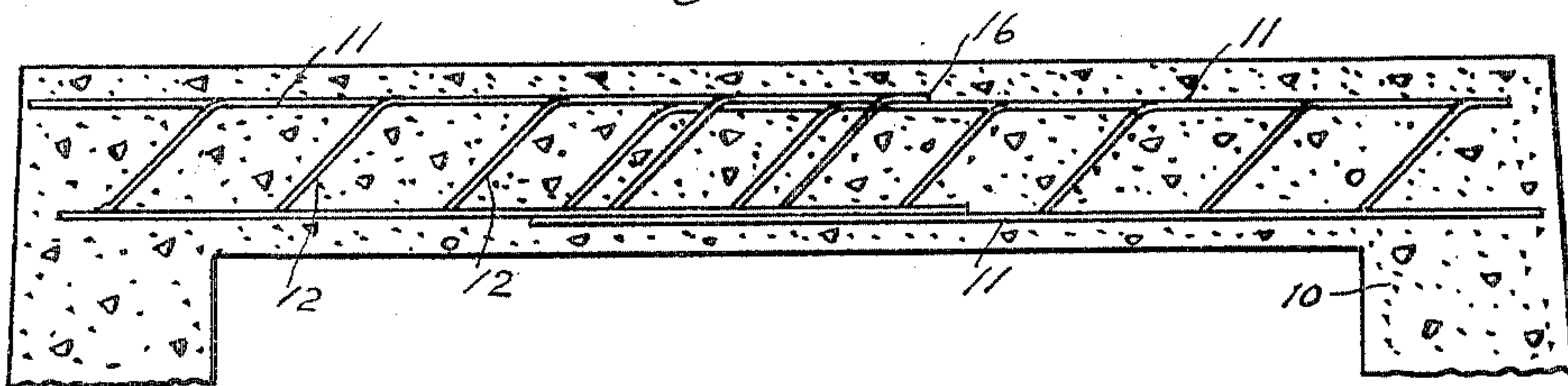


Fig. 2.

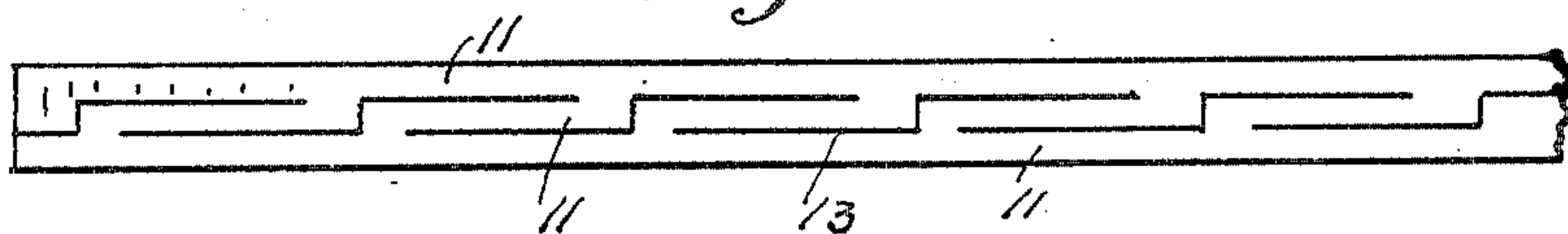


Fig. 3.

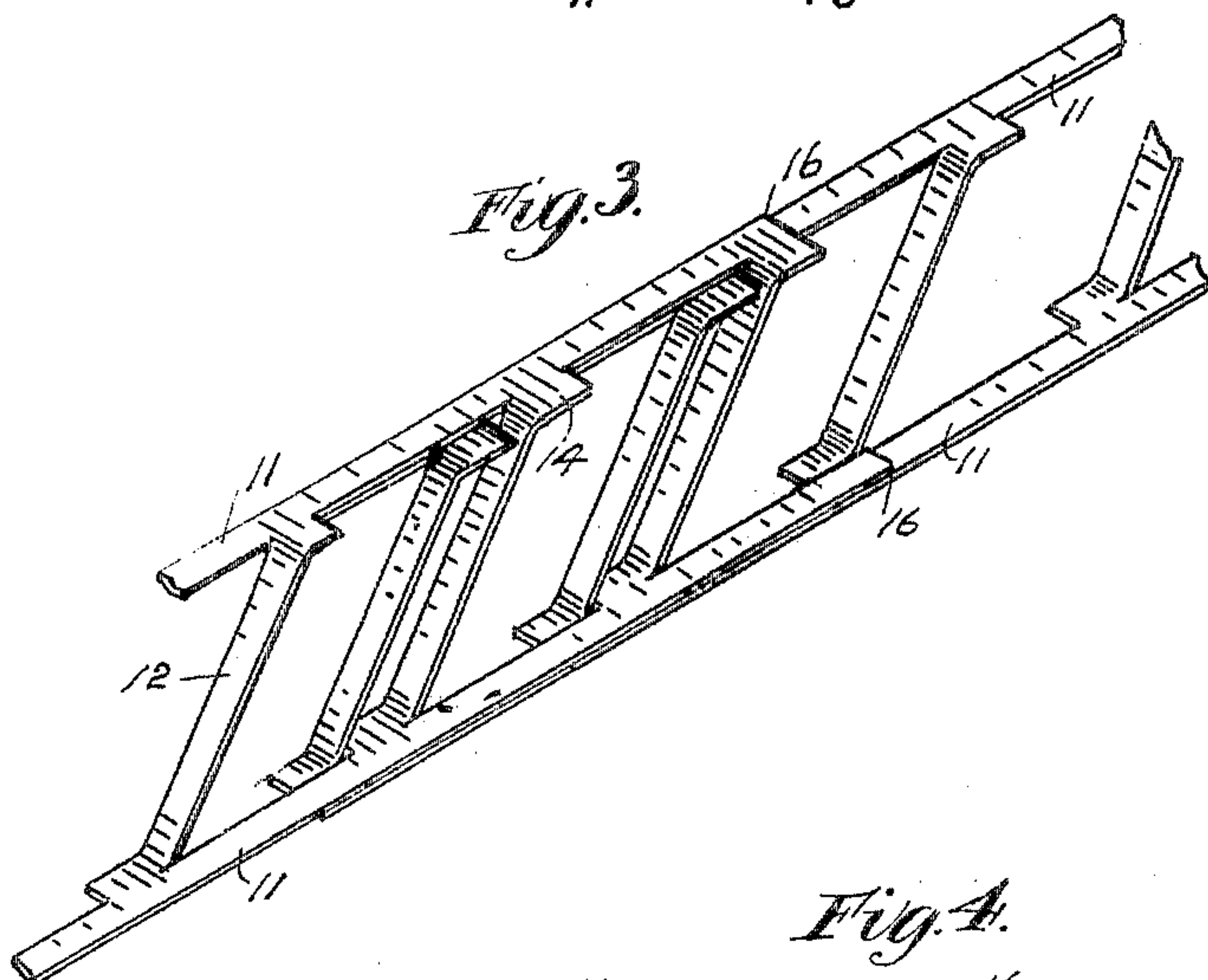


Fig. 4.

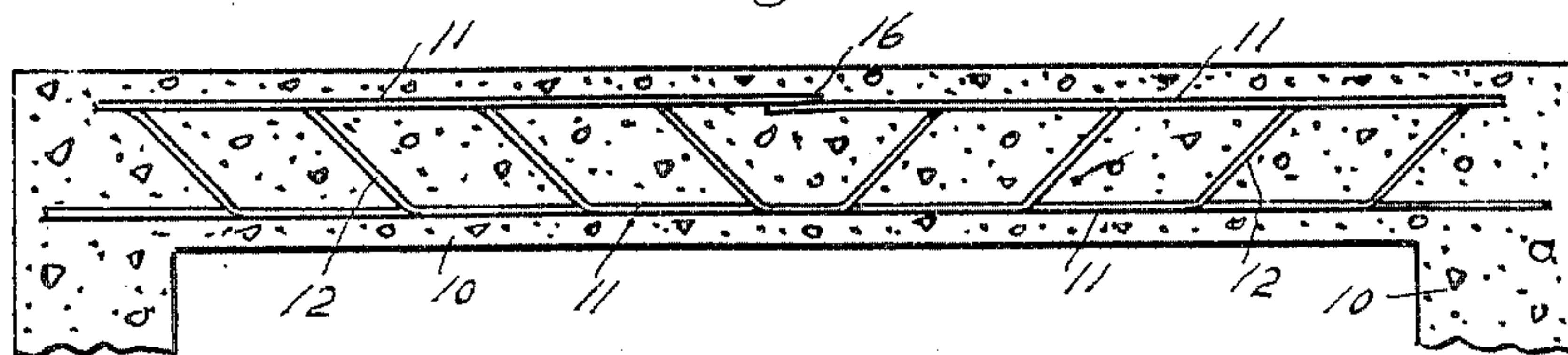
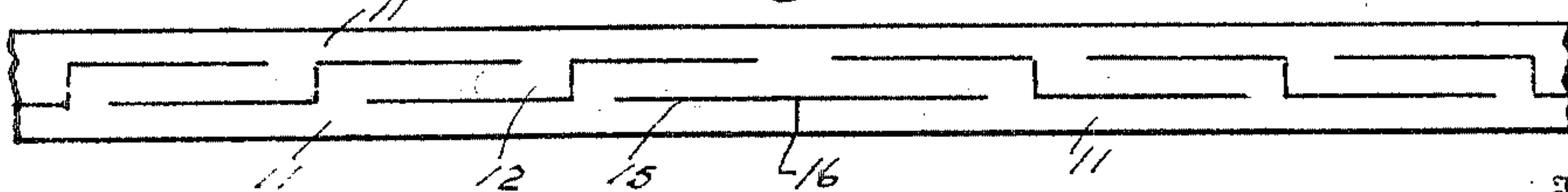


Fig. 5.



Witness

N. Allmon
C. Hoer.

Inventors

Robert R. Moorman
Charles W. Yelm
By V. H. Lockwood

Attorney

UNITED STATES PATENT OFFICE.

ROBERT R. MOORMAN AND CHARLES W. YELM, OF LAFAYETTE, INDIANA.

MEANS FOR REINFORCING CONCRETE STRUCTURES.

No. 804,614.

Specification of Letters Patent.

Patented Nov. 14, 1905.

Application filed April 7, 1905. Serial No. 254,323.

To all whom it may concern:

Be it known that we, ROBERT R. MOORMAN and CHARLES W. YELM, of Lafayette, county of Tippecanoe, and State of Indiana, have invented a certain new and useful means for Reinforcing Concrete Structures; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which like numerals refer to like parts.

The object of this invention is to improve the construction, arrangement, and disposition of bars for reinforcing concrete for use in various kinds of cement constructions.

One feature of this invention consists in the idea of cutting out of a plate a pair of parallel bars connected by intermediate strips so that the bars may be separated from each other and held in connection with each other and when embedded in the cement will strongly reinforce the same, because of the plurality of parallel bars and their connections. This gives a strong reinforcing means capable of effectually resisting the shear and compression of the cement.

Another feature of the invention consists in splicing said bars, for, constructed as broadly described above, their ends are adapted to fit in and interlock with each other effectually without the use of any bolts or rivets, and thus render their union and manipulation very convenient.

The various features of the invention will be understood from the accompanying drawings and the following description and claims.

In the drawings, Figure 1 is a vertical section through a cement structure that is reinforced by the bars above referred to, two of said bars being shown therein spliced. Fig. 2 is a plan view of a strip of metal from which the bar construction is cut, one end being broken away. Fig. 3 is a perspective view of the spliced portion of a pair of said bars, the remaining portion being broken away. Fig. 4 is a vertical section through a cement structure reinforced by a modified form of said invention. Fig. 5 is a plan view of the strip of metal from which said modified bar is cut, parts being broken away.

In the drawings herein 10 represents a cement structure that is reinforced by said bar construction. Said bar construction consists of a pair of bars 11, connected integrally by the inclined strips 12. The bar construction is made from a piece of plain flat metal, as shown in Fig. 2. It is punched with a series

of slots 13, said slots each consisting of two long portions extending longitudinally of the metal plate and not parallel with each other, and with the short transverse portion connecting the approximate ends. The successive slots in each series likewise partially overlap each other, as shown in Fig. 2, so that when the plate is punched the bars 11 may be separated so that they will be considerably distanced apart, as shown in Fig. 1, and yet they will be connected integrally by the strips 12. Likewise when cut in the way described the plate will provide in the finished product lateral extensions 14 at the point of connection of the bars and said connecting-strip 12. When the various bars are thus cut out of plates similarly, they may be interlocked, as shown in Fig. 3, said projections 14 fitting behind each other and the bars 11 overlapping. Thus in Fig. 3 the two sets of bars overlap for two sections; but they may be made to overlap any number of sections, so as to get the desired length in the combined sections. This splicing, therefore, is effective without rivets or bolts and when embedded in the cement is as firm and permanent as if riveted. The bars thus formed are entirely embedded in the concrete, so that the diagonal strips 12 tend to transfer the strain from one to the other of the bars 11. In other words, the diagonally-connecting strips take up the horizontal and vertical shear, while the two long bars 11 take up the tension or compression under the stress.

The bar may be so cut as to adapt the construction for use in an arch or in a beam or to form a column. Thus the arrangement shown in Figs. 1, 2, and 3 is well adapted for an arch. The modified form shown in Figs. 4 and 5 is well adapted for the beam. There the metal plate 5 is punched at one end the same way as in Fig. 2 and at the other end in a reverse way, so that the two series of punches are pivoted to each other through a longitudinal slot 15 at the center and a transverse slot 16 cut in one of the bars 11. Taking the cut bar 11 and elevating it from the other bar 11 we get the form shown in Fig. 4, the cut ends of the bars 11 overlapping. This gives to the connecting-strips 12 the desired inclination at the two ends of the structure, so as to more effectually resist the shear.

It is thus seen that this bar construction is very simple and easy to make and therefore economical and is infinitely greater in strength than two disconnected bars, for the inclined

connecting-strips not only form the two bars into a frame, but thus powerfully resist the shear in concrete structures.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. Means for reinforcing concrete structures consisting of a plurality of parallel bars in different planes with intermediate strips connecting the approximate lateral edges of said bars.

2. Means for reinforcing concrete structures consisting of a pair of parallel bars with intermediate connecting-strips attached to the approximate lateral edges of said bars, whereby the ends of two of said reinforcing means may be spliced firmly by overlapping the ends thereof.

3. Means for reinforcing concrete structures consisting of a pair of parallel bars in different planes, and connecting-strips integrally

attached to the inner edges of the bars so as to form inward projections from the bars that interlock when the ends of two of said reinforcing means are overlapped.

4. Means for reinforcing concrete structures consisting of two sections, each section formed of two parallel bars with inclined connecting-strips and the ends of the two sections overlapping so that the corresponding bars of each section will overlap each other and the connecting-strips will be in the same plane.

In witness whereof we have hereunto affixed our signatures in the presence of the witnesses herein named.

ROBERT R. MOORMAN.
CHARLES W. YELM.

Witnesses:

THOMAS P. HUFFMAN,
WILLIAM J. ROSEBURY.