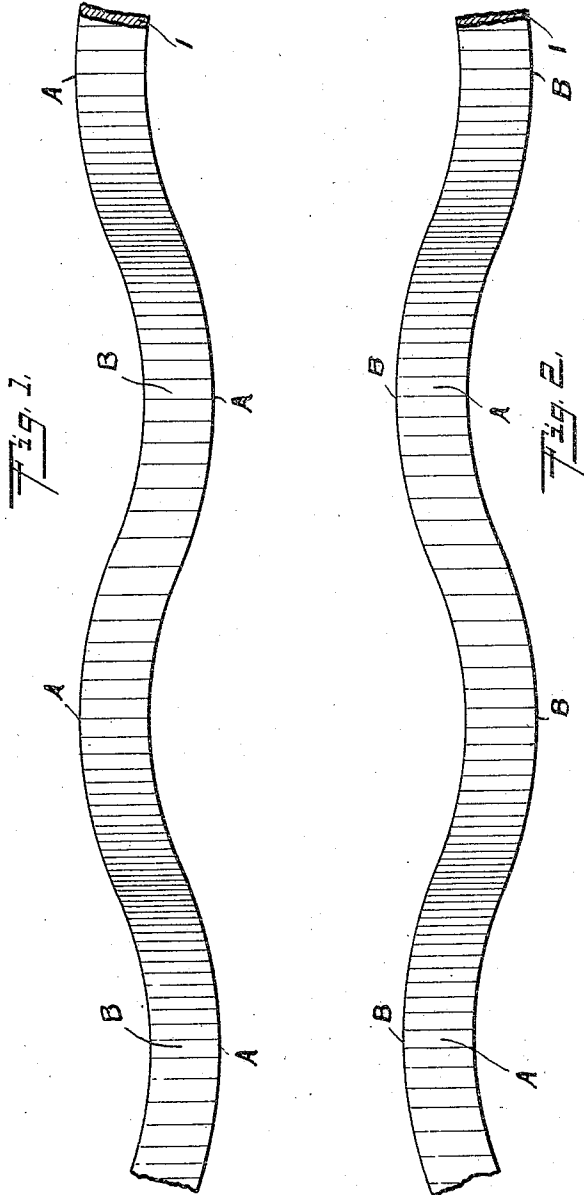


D. BAUM, JR.
REINFORCING BAR FOR CONCRETE STRUCTURES.
APPLICATION FILED SEPT. 24, 1907.

944,589.

Patented Dec. 28, 1909.
2 SHEETS—SHEET 1.



Daniel Baum, Jr. Inventor.

Witnesses:

Boyd E. Kratz
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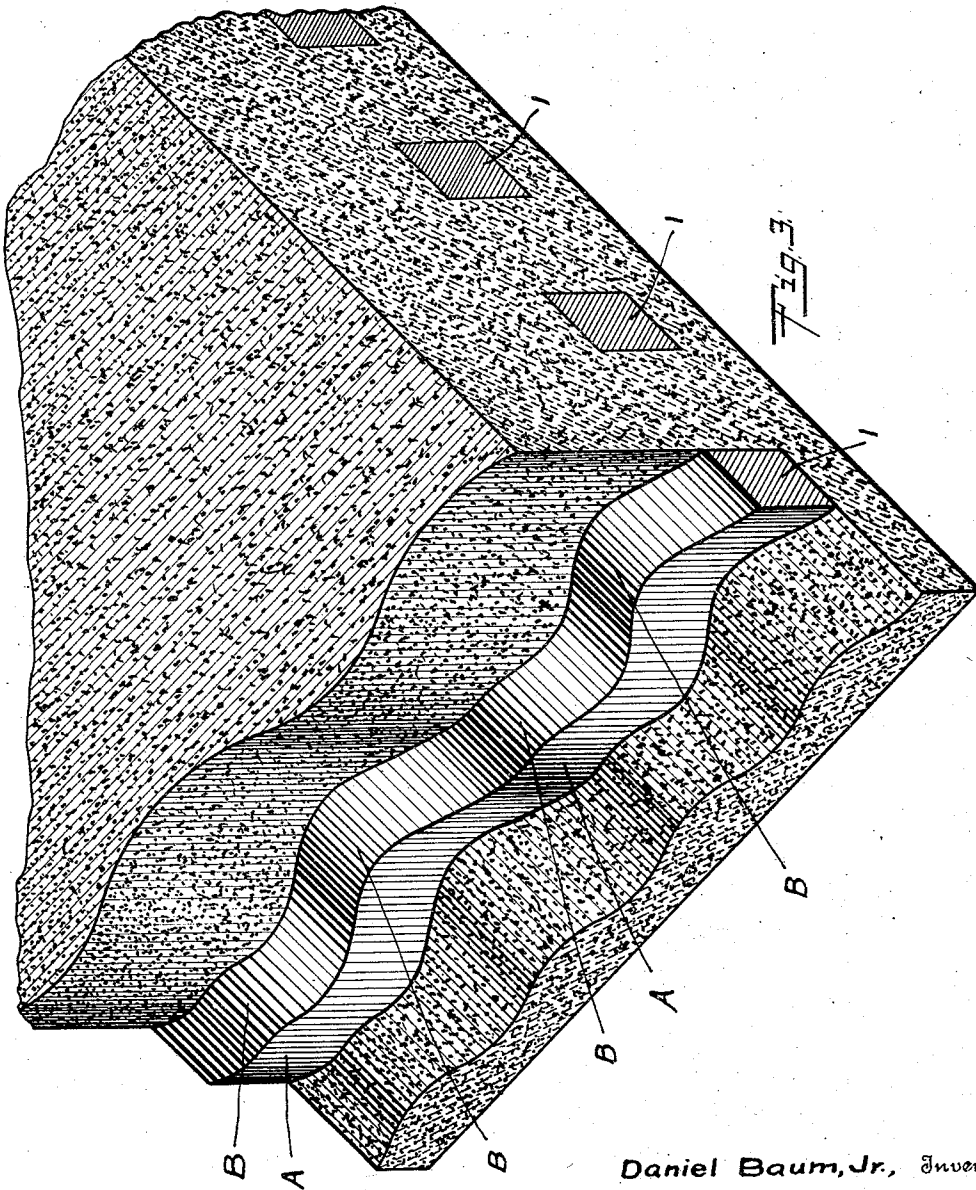
By *David O. Barnell*

Attorney.

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UNITED STATES PATENT OFFICE.

DANIEL BAUM, JR., OF OMAHA, NEBRASKA.

REINFORCING-BAR FOR CONCRETE STRUCTURES.

944,589.

Specification of Letters Patent.

Patented Dec. 28, 1909.

Application filed September 24, 1907. Serial No. 394,415.

To all whom it may concern:

Be it known that I, DANIEL BAUM, JR., a citizen of the United States, and a resident of Omaha, in the county of Douglas and State of Nebraska, have invented certain new and useful Improvements in Reinforcing-Bars for Concrete Structures, of which the following is a specification.

My invention relates to steel reinforcing bars for concrete structures, and it is the object thereof to provide a bar of this class of such form that the bar and the concrete body in which it is embedded are mechanically interengaged to prevent any longitudinal movement of the bar, so that the bond between the concrete and steel does not depend upon adhesion of the contacting surfaces and cannot be injured by vibration.

Further objects of my invention are to produce a bar of this class having a uniform cross section area, in which the fiber stresses occasioned in forming the same are substantially uniform throughout the bar, and in which the mechanical interengagement of the bar and concrete body is made by lateral deviations of the entire body of the bar in two non-parallel planes.

A bar embodying my invention is illustrated in the accompanying drawings in which—

Figures 1 and 2 are projections of the bar in two planes at right angles with each other, showing the alternate bending or waving of the bar in both of said planes of projection. Fig. 1 may be regarded as a plan view and Fig. 2 as a side elevation of the same portion of a bar, and Fig. 3 is a perspective view of a body of concrete broken away in planes coincident with two sides of the bar.

The cross section of the bar shown is square, and such is the preferred section, although my invention may be applied to any parallelogrammatic section.

In carrying out my invention a bar 1 has a uniform series of alternating bends or waves made therein in planes parallel with two sides of the bar, and a second series of alternating bends or waves made in planes parallel with the other two sides of the bar, so that every longitudinal surface element thereof when projected into a plane at right angles thereto shows as a uniformly-waved line. In a square bar or in any rectangular bar, the two series of waves are in planes at right angles with each other, but for any

parallelogrammatic section each of the two series of waves are made in planes parallel with two sides of the bar. The length of the waves, or the distance from crest to crest thereof is, in the bar shown in Figs. 1 and 2, made the same in both wave series, so that the longitudinal position of the crests A of one wave series correspond with the crests B of the other wave series, but the wave length in the two series may be different, as shown in Fig. 3 where the length of the waves of one series is double the length of the waves of the other series.

I am aware that reinforcing bars have been made in which a mechanical interengagement of the bar and concrete body is secured by (a) providing the bar with lugs or projecting parts, or (b) by twisting a square or polygonal bar so that the outer fibers thereof are made to assume a screw-like or helical form around the central fibers thereof, or (c) by a simple undulation of the bar in a single plane. Each of these types of reinforcing bar are open to objections which are overcome in the bar made according to my invention. In the first mentioned case, the bar provided with lugs or projections is more expensive to manufacture, and is not of uniform sectional area; the material used in the lugs or projections is not useful for any other purpose; and the sharp corners and abrupt changes of outline incident to the formation of the lugs is liable to start cracks in the concrete. In the second case, in which the outer fibers of the bar are made to assume a helical or screw-like form around the central fibers thereof, there is a lack of homogeneity in the bar, due to the fact that the centermost or axial fiber is unaffected by the twisting operation while the outer fibers are elongated proportionally to their distance from the axial fiber, on account of the greater length thereof required in the helix than in the untwisted bar where all the fibers are parallel and of equal length. In the case of the simple undulating bar the interengagement between the bar and the concrete body is less complete and efficient than is possible to effect by forming the bar in the two series of waves in non-parallel planes.

Now, having described my invention, what I claim and desire to secure by Letters Patent of the United States is:

1. A reinforcing bar for concrete structures comprising a bar of uniform parallelogrammatic section having a series of waves

made therein in planes parallel with two sides of the bar, and a second series of waves made therein in planes parallel with the other two sides of the bar.

5 2. A reinforcing bar for concrete structures comprising a bar of uniform rectangular cross section having two series of waves made therein in non-parallel planes, and being longitudinally and uniformly waved
10 throughout its length.

3. A reinforcing bar for concrete structures comprising a bar of uniform rectangular cross section having a uniform series of waves made therein in planes parallel with
15 two sides of the bar, and a second series of waves made therein in planes parallel with the other two sides of the bar.

4. A reinforcing bar for concrete structures, comprising a bar of uniform quadrangular cross section having a series of 20 waves made therein in planes parallel with two sides of the bar, and a second series of waves made therein in planes parallel with the other two sides of the bar, the waves of one series being of different length than the 25 waves of the other series.

In testimony whereof I have hereunto subscribed my name in the presence of two witnesses.

DANIEL BAUM, JR.

Witnesses:

H. J. MCCARTHY,
W. A. EHLERS.