No. 862,254. PATENTED AUG. 6, 1907.

A. L. JOHNSON.

CORRUGATED BAR.

APPLICATION FILED NOV. 15, 1906.

Fig. 1.

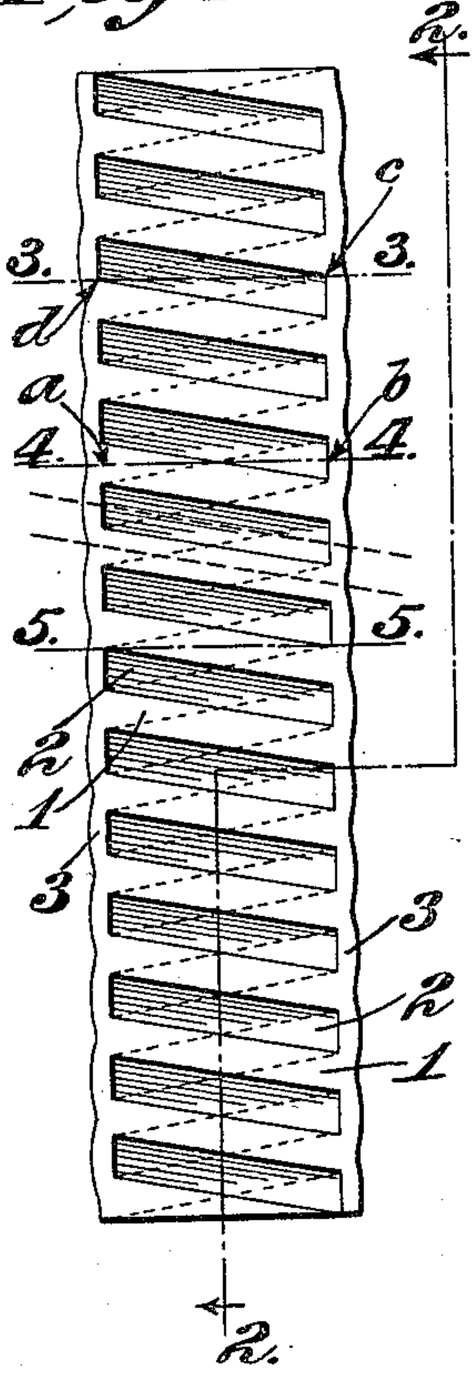


Fig. 2.

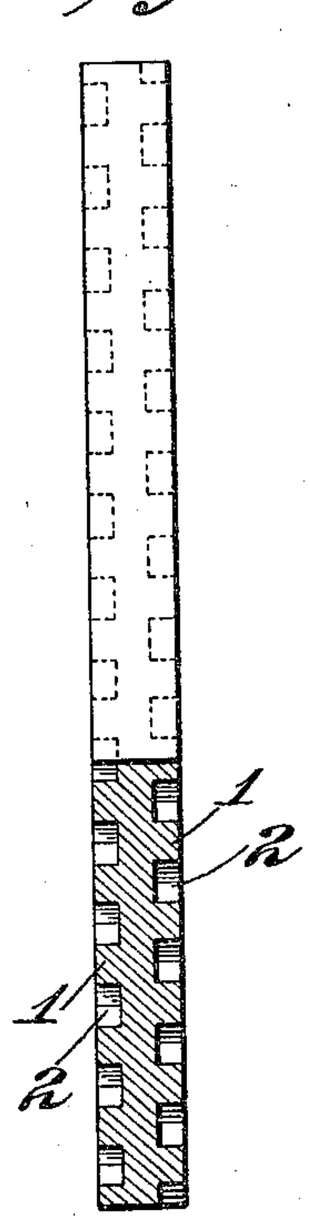


Fig. 6.

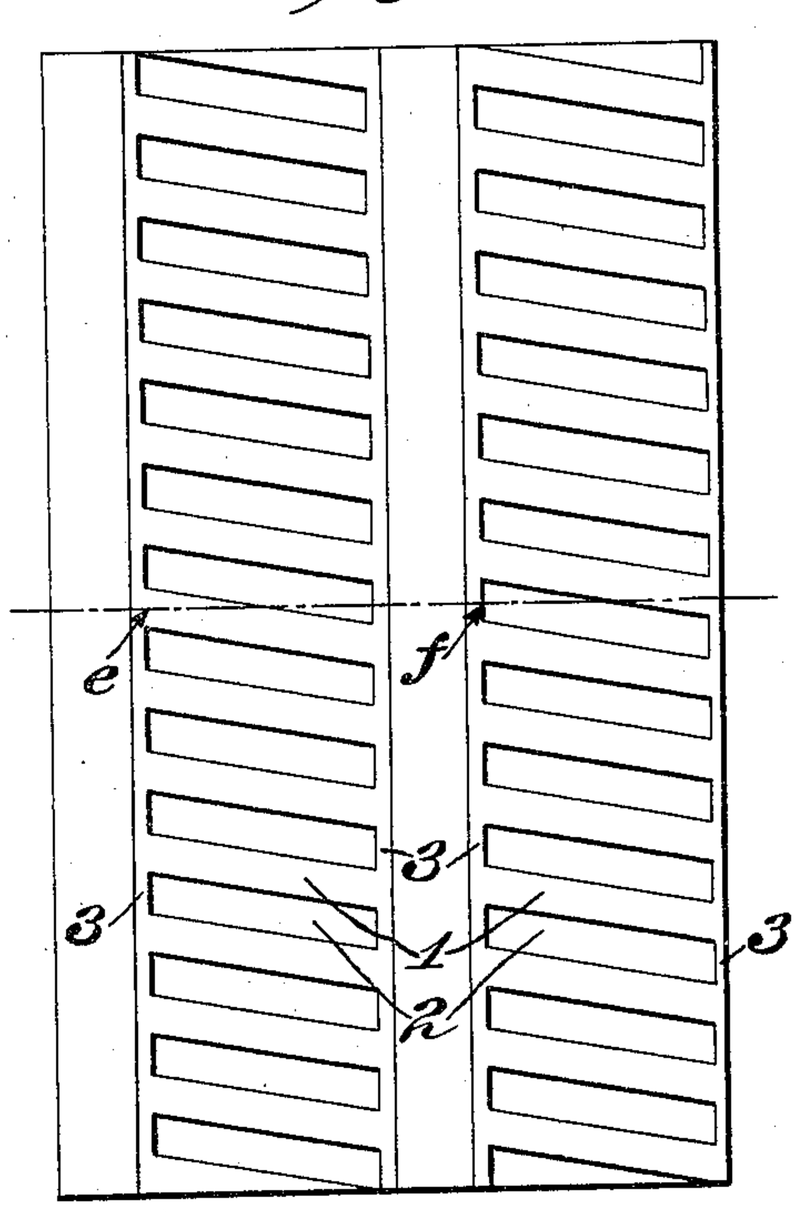


Fig. 3.

Fig. 4.

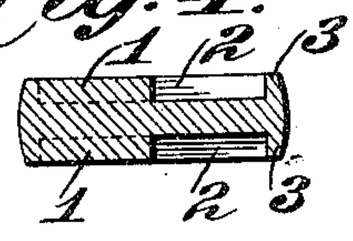
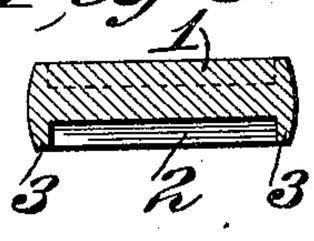


Fig. 5.



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UNITED STATES PATENT OFFICE.

ALBERT L. JOHNSON, OF ST. LOUIS, MISSOURI.

CORRUGATED BAR.

No. 862,254. Specification of Letters Patent. Patented Aug. 6, 1907.

Application filed November 15, 1906. Serial No. 343,549.

To all whom it may concern:

Be it known that I, ALBERT L. JOHNSON, a citizen of the United States, and a resident of the city of St. Louis and State of Missouri, have invented a new and useful Improvement in Corrugated Bars, of which the following is a specification.

In an application for patent, Serial No. 289,337, filed November 27, 1905, I have described a bar for reinforcing concrete, in which the face of the bar is provided with a series of alternate ribs and depressions so arranged and inclined that in any right section, the ribs and depressions of each face will reciprocally compensate and leave the area of the right section constant throughout the length of the bar. In that arrangement, the angle of inclination of the ribs is a function of the width of the ribs, the longitudinal displacement of a point at one end of the rib from the plane of the similar point in the other end being substantially equal to twice the width of the rib.

The object of the present invention is to decrease this angle of inclination so as to make the ribs lie more nearly perpendicular to the axis of the bar and still require that a plane passing through a depression in one face must pass through a rib in the opposite face. For this purpose, the series of alternating ribs and depressions on one side of the bar is definitely correlated to the series of alternating ribs and depressions on the opposite side of the bar, so that the reciprocal compensation of ribs and depressions required to produce a constant section is effected by the coöperation of such opposite series.

The invention consists in the arrangements and combinations of parts hereinafter described.

In the accompanying drawing, which forms part of this specification, and wherein like symbols refer to like parts wherever they occur, Figure 1 is a view of a wide face of a flat bar embodying my invention, with the ribs of the opposite face indicated in dotted lines; Fig. 2 is an edge view of the flat bar illustrated in Fig. 1, the lower portion of the bar being shown in section along the line 2—2 of Fig. 1; Figs. 3, 4 and 5, are cross sections on the lines 3—3, 4—4 and 5—5, respectively, of Fig. 1; Fig. 6 is a diagrammatic view or development of the surfaces of the four sides of the bar, which surfaces are assumed to be folded back into a single plane in order to illustrate the correlation of the ribs and depression of one face with the ribs and depressions of the opposite face.

In the present construction, each of two opposite sides or faces of the bar is provided with a series of alternate parallel ribs 1 and depressions or intervening spaces 2 arranged transversely but inclined at an angle to the axis of the bar. The ribs of each series are of equal width and are spaced apart a distance nearly equal to their width and are inclined at such an angle that the initial point (*a*) in the medial line of a rib shall lie in the same plane (4—4, Fig. 1) perpendicular to the axis of the bar as the final point *b* of the medial line of the next adjacent depression: or, in other words, the final point *c* of the rear shoulder of one rib shall lie in the same right section (3—3, Fig. 1) with the initial point *d* of the forward shoulder of the next adjacent rib. The ribs and depressions of one face have the same width as the ribs and depressions of the opposite face, and the angle of inclination of the two series of ribs has the same numerical value. The initial point *e* in the medial line of the shoulder of each of the ribs in one side or face is arranged in substantially the same transverse plane or right section as the final point *f* of the corresponding shoulder of the corresponding depression of the opposite face. By this arrangement, the ribs of one face are of the same size and shape as the spaces of the opposite face, and their arrangement is such that at whatever point a right section may be taken, the cross sectional area of the space in the one face is equal to the cross sectional area of the rib in the opposite face; or, in other words, the ribs in one face compensate for the spaces in the opposite face and vice versa, so that the right sectional area of the bar is substantially uniform throughout its length. It is noted, that so far as the cross-sectional area of a right section is concerned, the bars of one face may incline in the same direction or crosswise without changing the uniformity or constancy of the cross-sectional area. In either case, corresponding points in the medial lines of opposite ribs and depressions, that is, points in such medial lines equidistant from the ends thereof, lie in the same plane perpendicular to the axis of the bar. When the ribs of one face are inclined crosswise or inversely to the ribs of the opposite face, as indicated in dotted lines in Fig. 1, the forces tending to move the bar laterally are neutralized. For the purpose of resisting lateral movement, and also to strengthen the bar, it is desirable to make the depressions terminate short of the margins of the bar, whereby a fillet 3 is formed along such margin. In actual practice, the ribs should be made slightly wider than the spaces between them in order to guard against lack of precision in the process of manufacture. Otherwise, the two opposite faces of the bar are counterparts.

Obviously, the invention may be embodied in square bars or bars of other shapes, and I do not wish to be restricted to the construction illustrated.

What I claim as my invention and desire to secure by Letters Patent is:

1. A bar for reinforcing concrete having on each of two opposite faces a series of transversely inclined parallel ribs and depressions, the ends of the ribs on one face being opposite the ends of depressions in the opposite face and the ribs being slightly wider than the depressions, whereby the ribs on one face are arranged to compensate for the depressions in the opposite face, and whereby the cross-sectional area of the bar is substantially uniform throughout its length.

2. A bar for reinforcing concrete having on each of two opposite faces a series of transversely inclined parallel ribs and depressions, the ends of the ribs on one face being opposite the ends of depressions in the opposite face and the ribs being slightly wider than the depressions, whereby the ribs on each of said faces are arranged to compensate for the depressions in the opposite face, and the depressions terminating short of the margin of the bar.

3. A bar for reinforcing concrete having two opposite substantially counterpart faces, each of said faces having a series of parallel ribs and depressions, the initial point in the medial line of a rib being in the same plane perpendicular to the axis of the bar as the final point in the medial line of the next adjacent depression of the same face and as the final point of the medial line of the corresponding depression in the opposite face.

4. A bar for reinforcing concrete having two opposite substantially counterpart faces, each of said faces having a series of transversely inclined parallel ribs and depressions, the ribs on each face being slightly wider than the respective depressions in the opposite face, and corresponding points in the medial lines of opposite ribs and depressions lying in the same plane perpendicular to the axis of the bar.

5. A rectangular bar for reinforcing concrete having on each of two opposite faces a series of transversely inclined parallel ribs and depressions, the ends of the ribs on one face being opposite the ends of depressions in the opposite face and the ribs being slightly wider than the depressions, whereby the ribs on one face are arranged to compensate for the depressions in the opposite face, and whereby the cross-sectional area of the bar is substantially uniform throughout its length, the inclination of the ribs on one face being the same in amount as the inclination of the ribs on the opposite face but of inverse direction.

6. A rectangular bar for reinforcing concrete having on each of two opposite faces a series of transversely inclined parallel ribs and depressions, the ribs on one face being arranged to compensate for the depressions in the opposite face, the ribs on opposite faces having the same amount of inclination, and the initial points of the medial lines of a rib on one face and the corresponding depression in the opposite face being in the same plane perpendicular to the axis of the bar.

7. A rectangular bar for reinforcing concrete having two opposite substantially counterpart faces, each of said faces having a series of parallel ribs and depressions, the initial point in the medial line of a rib being in the same plane perpendicular to the axis of the bar as the final point in the medial line of the next adjacent rib of the same face and as the initial point of the medial line of the corresponding depression in the opposite face, the depressions terminating short of the margins of the bar.

8. A flat bar for reinforcing concrete having on each of two opposite faces a series of transversely inclined parallel ribs and depressions, the ends of the ribs on one face being opposite the ends of depressions in the opposite face and the ribs being slightly wider than the depressions, whereby the ribs on one face are arranged to compensate for the depressions in the opposite face, and whereby the cross-sectional area of the bar is substantially uniform throughout its length, the inclination of the ribs on one face being the same in amount as the inclination of the ribs on the opposite face but of inverse direction, the depressions terminating short of the margins of the bar.

Signed at Paris, France this 30th day of October 1906.

ALBERT L. JOHNSON.

Witnesses:

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Y. FAURANT.