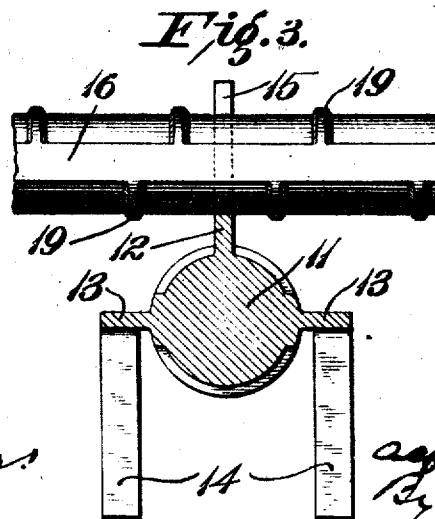
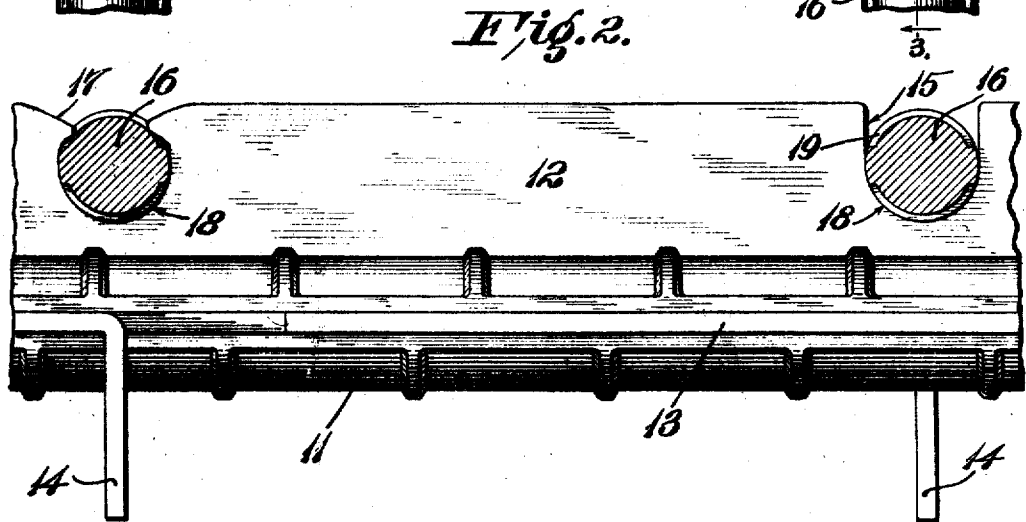
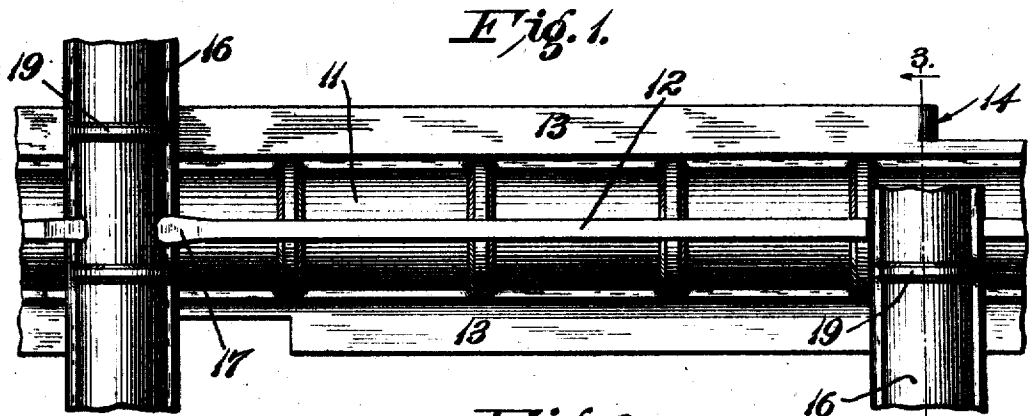


A. E. LINDAU.
METAL REINFORCING AND SPACING BAR.
APPLICATION FILED JAN. 25, 1911.

1,014,712.

Patented Jan. 16, 1912.

2 SHEETS—SHEET 1.



Witnesses:
Edgar T. Farmer,
Attest: [Signature]

Inventor:
A. E. Lindau,
By [Signature] Attys.

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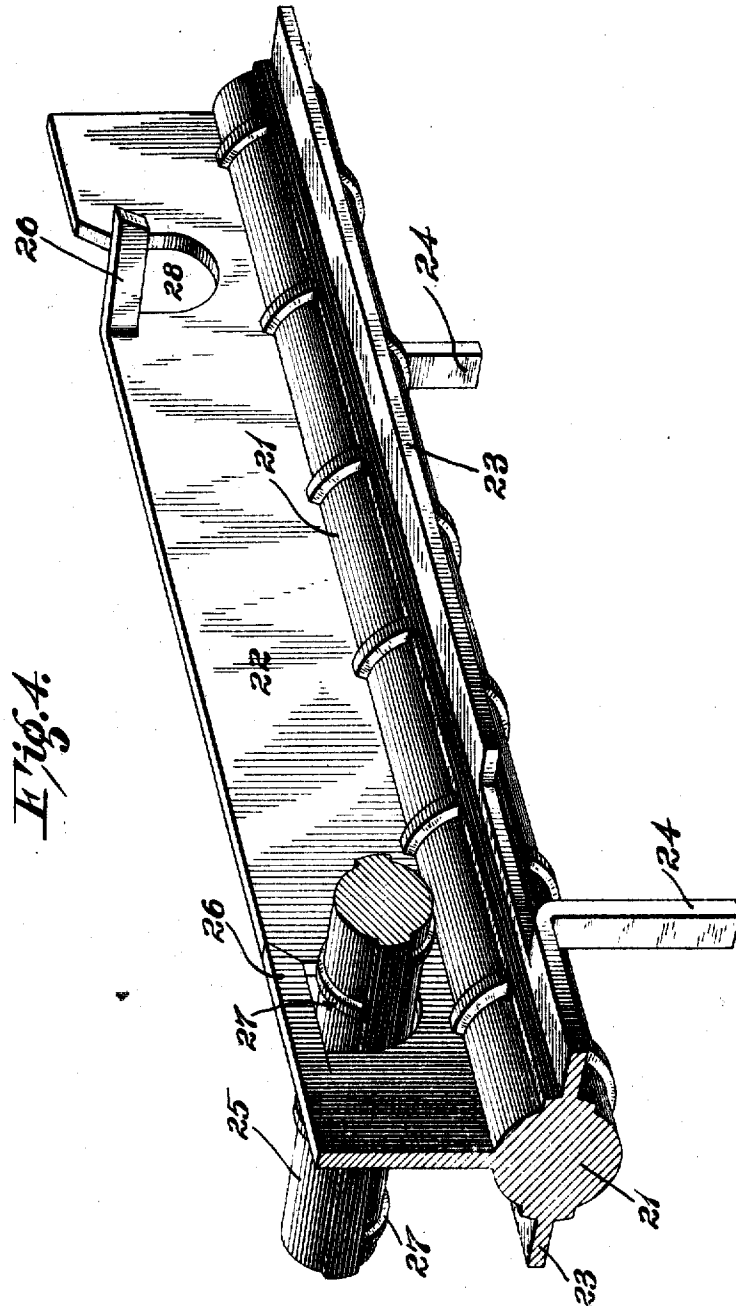


Fig. 4.

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UNITED STATES PATENT OFFICE.

ALFRED E. LINDAU, OF ST. LOUIS, MISSOURI, ASSIGNOR TO CORRUGATED BAR COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

METAL REINFORCING AND SPACING BAR.

1,014,712.

Specification of Letters Patent.

Patented Jan. 16, 1912.

Application filed January 25, 1911. Serial No. 604,691.

To all whom it may concern:

Be it known that I, ALFRED E. LINDAU, 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 Metal Reinforcing and Spacing Bars, of which the following is a specification.

My invention relates to improvements in reinforced concrete structures in which tension bars are used in spaced relation to each other, and consists in the provision of a combined tension bar and spacing member, for positioning the principal tension bars and at the same time taking any stresses transverse to the principal tension members.

In many concrete structures, particularly floor panels, walls and arches, it is necessary to make provision for taking care of tension stresses transverse to the direction of principal stress. It may be that the direction of the principal tension stress changes with a change in the distribution of the load, but in any case it is found that tension members running in more than one direction in substantially the same plane must be used to properly reinforce such structures. It is also of importance that the tension members be arranged in the structure in close proximity to the region of greatest tension stress, which is usually for the most part adjacent to a surface. Reinforcing bars cannot be securely bonded in the concrete at the surface of the structure, and so are usually placed entirely within the structure and as near the surface, or region of greatest stress, as is practicable. In erecting reinforced concrete structures where the reinforcement is arranged adjacent to a surface it is necessary to provide some means to space the reinforcement from the sides of the forms used, otherwise in placing and tamping the concrete there is liability of some of the various members of the reinforcement being misplaced and perhaps forced against the sides of the forms, which is highly undesirable.

My invention accomplishes both of these objects, comprising, as it does, a combined tension bar and spacing device, and in addition provides a simple means for mechanically securing together tension bars, spacing devices and other elements of metal reinforcement, either before or after placing in the forms.

Further objects of my invention appear in the accompanying drawings, forming a part of this specification, and will be more fully described in connection therewith, and particularly pointed out in the claims.

In the drawings, in which like numerals are used to designate like parts throughout the several views, Figure 1 is a partial plan view of my improved tension and spacing bar, showing parts of two tension bars in connection therewith; Fig. 2 is a partial side elevation of my improved bar, showing two tension bars used therewith in section; Fig. 3 is a section on the line 3—3 in Fig. 1, looking in the direction of the arrows; and Fig. 4 is a partial view in perspective of a modified form of tension and spacing bar, showing a part of a tension bar in connection therewith.

All of the reinforcing bars illustrated in the accompanying drawing comprise a body portion having longitudinal ribs on diametrically opposite sides thereof and transverse ribs extending across the surface of the reinforcing bars from one longitudinal rib to the other. Those of the reinforcing bars, which are intended to accomplish the function of framing together and positioning the various members of the reinforcement relative to each other and to the forms or centering, such as the bar 11 of Figs. 1 and 2 and the bar 21 of Fig. 4, have longitudinal flanges 13 and 23 on their longitudinal ribs. These flanges are sheared to partially sever portions thereof, and these sheared portions are bent at right angles, so as to form spacing or positioning members or supports 14 and 24. The bar 11 is also provided with a longitudinal flange 12 approximately midway between said first mentioned flanges, that is, in a plane perpendicular to the plane of the flanges 13 and at the side opposite that toward which the spacing members 14 extend. The flange 12 is provided with spaced notches 18 adapted to receive transversely arranged tension bars 16. The notches 18 are of greater depth than the thickness of the bars 16, so the corners 15 of the flanges adjacent thereto project above the section of greatest width of the bar 16 when positioned therein. These corners may be mashed down or bent in by a blow from a hammer to embrace and securely fasten the transverse bar 16 in the notches as shown at 17.

In the form of my device shown in Fig. 4 the tension bar 21, is provided with lateral flanges 23 having depending spacing members 24, and an upstanding longitudinal flange 22, similar to the device shown in Figs. 1 to 3. The flange 22 is provided with notches 28 adapted to embrace transverse tension bars 25, and one corner of the flange adjacent each notch is provided with a tongue 26 which may be bent across the notch over the bar 25 to retain the latter in position in the notch. The bars 16 and 25 are shown having transversely arranged raised ribs or corrugations 19 and 27, respectively, which corrugations prevent any longitudinal movement of the bars 16 and 25 in the notches in which they are secured greater than the distance between two corrugations. Thus my forms of securing means are peculiarly adapted for use with corrugated bars, though effective with plain bars. It is evident that these forms of securing means may be used to connect and secure together various parts of metal reinforcement, irrespective of the shape and size of the parts and particular place or arrangement in the structure.

I do not wish to limit my invention to the embodiments shown and described herein, but what I consider to be new and useful and of my invention and desire to secure by Letters Patent is as follows:

1. As a new article of manufacture, a bar for reinforcing concrete comprising a thick body portion having thinner longitudinal flanges on diametrically opposite sides and a third longitudinal flange midway between said first mentioned flanges, said third

flange having bar-seating notches in its edge, said first mentioned flanges being sheared to form spacing members which are bent outwardly in a direction opposite to that of said third flange.

2. As a new article of manufacture, a bar for reinforcing concrete comprising a body portion having longitudinal ribs on diametrically opposite sides and thinner longitudinal flanges on said ribs, said flanges being sheared to form spacing members, a third flange extending longitudinally midway between said first mentioned flanges and having notches in its edge constituting bar retaining seats.

3. In a metal reinforce for concrete structures, the combination of a reinforcing bar comprising a body portion having longitudinal ribs on diametrically opposite sides and thinner flanges on said ribs, said flanges being sheared and the sheared portions bent outwardly to form spacing members and having a third longitudinal flange midway between said first mentioned flanges and on the side opposite said spacing members and having notches in its edge constituting bar retaining seats, and another reinforcing bar provided with longitudinal and transverse ribs, said last mentioned bar being arranged in a notch of said first mentioned bar, and the corners of said notch being mashed down to overlap the longitudinal ribs and thereby hold the bar in place.

ALFRED E. LINDAU.

Witnesses:

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