B. WOLHAUPTER.

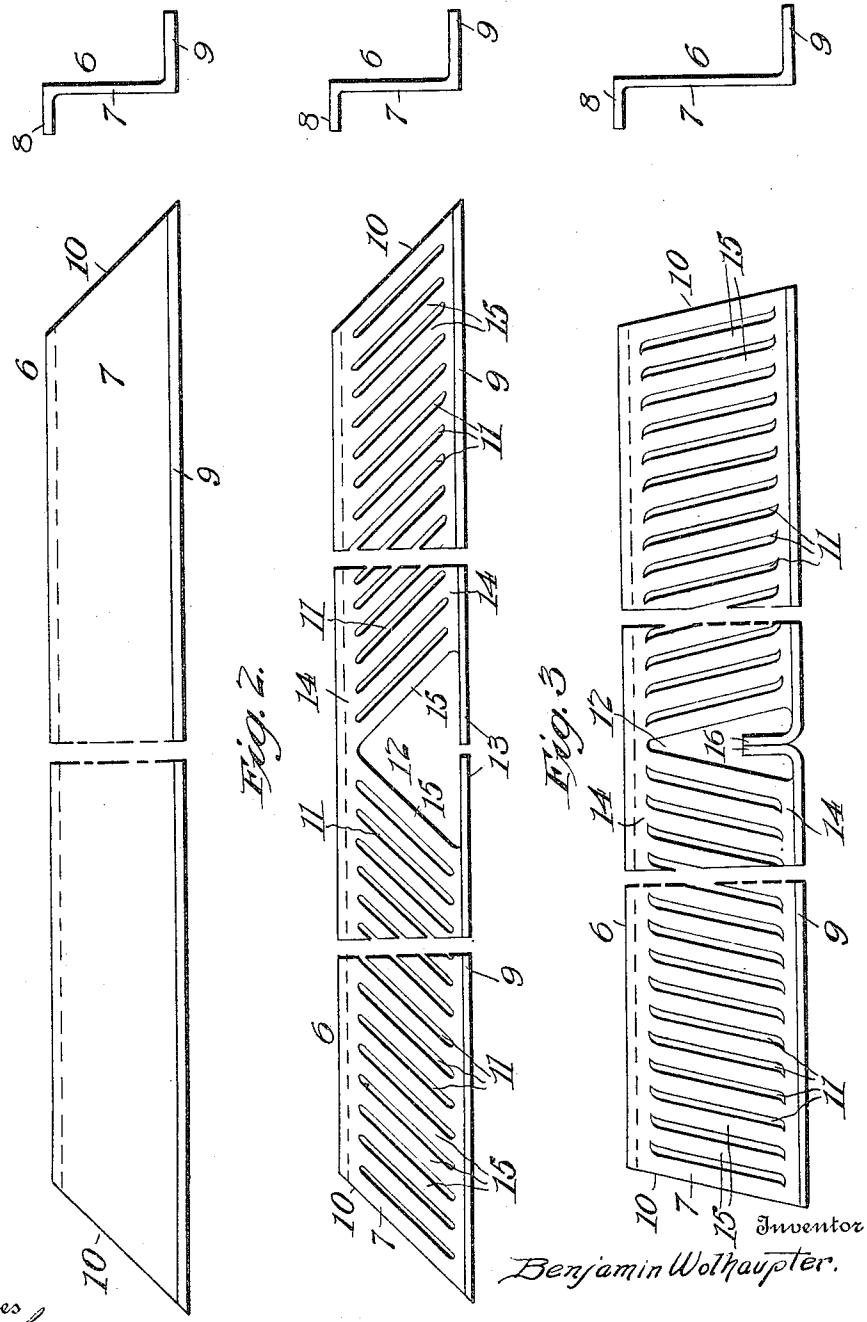
EXPANDED METAL REINFORCING STRUCTURE AND METHOD OF PRODUCING SAME.

APPLICATION FILED FEB. 10, 1910.

1,081,647.

Patented Dec. 16, 1913.

2 SHEETS—SHEET 1.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 4.

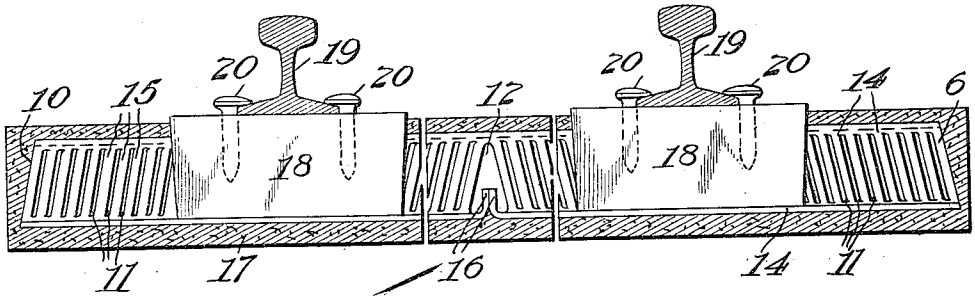
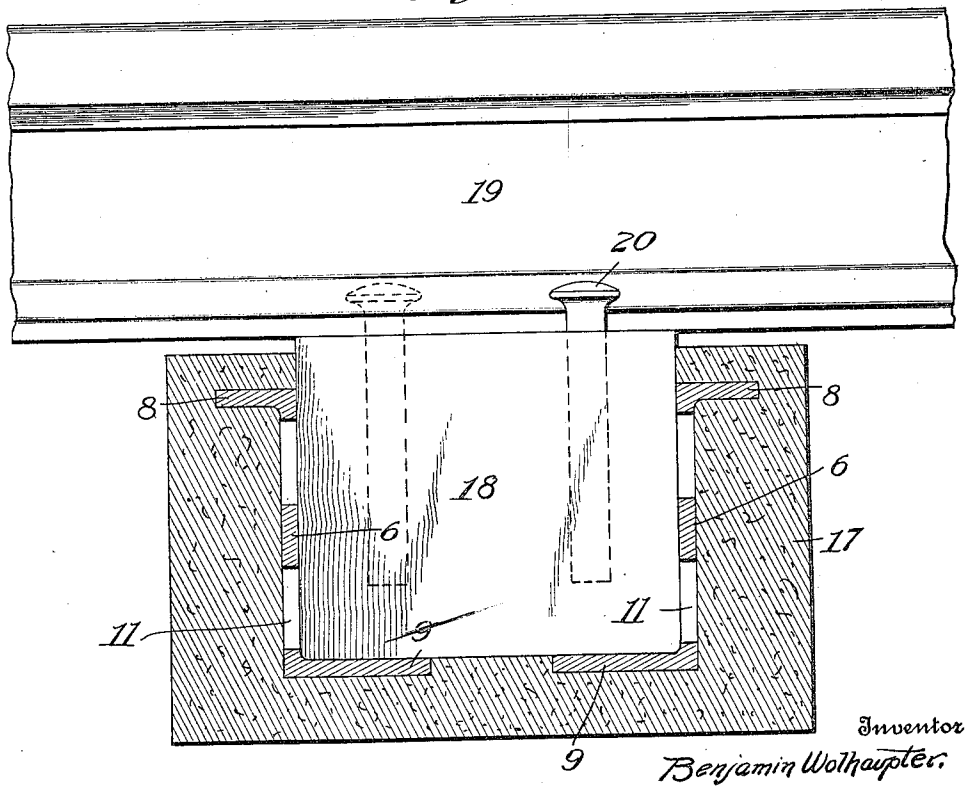


Fig. 5.



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EXPANDED-METAL REINFORCING STRUCTURE AND METHOD OF PRODUCING SAME.

1,081,647. Specification of Letters Patent. Patented Dec. 16, 1913.

Application filed February 10, 1910. Serial No. 543,132.

To all whom it may concern:

Be it known that I, BENJAMIN WOLHAUPTER, a citizen of the United States, residing at New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Expanded-Metal Reinforcing Structures and Methods of Producing Same, of which the following is a specification.

The present invention relates to expanded metal structures.

The object of the present invention is to provide an expanded metal truss structure, particularly useful for reinforcing concrete bodies, that is very light in weight, at the same time being strong and rigid and having the same strain-distributing and resisting characteristics as a truss.

Also, the invention provides for producing a metal structure, which, by being expanded, increases its depth and its strength without increase of its weight, thus rendering the same particularly available for the use indicated.

For illustrative purposes, a simple embodiment of the invention is disclosed in the accompanying drawings, wherein:

Figure 1 is a side and end elevation of a blank, from which the structure is formed. Fig. 2 is a similar view but showing the same after the openings have been cut therein. Fig. 3 is still another similar view showing the completed expanded article. Fig. 4 is a longitudinal sectional view through a concrete body in the form of a railroad tie reinforced by the improved expanded metal structure. Fig. 5 is a cross-sectional view therethrough.

Similar reference numerals designate corresponding parts in all the figures of the drawings.

In the embodiment disclosed, a plate, sheet or bar, preferably a flanged or Z-bar 6 is employed, comprising a body 7 and oppositely disposed longitudinal top and bottom flanges 8 and 9. The ends of the bar are oppositely beveled, as shown at 10. Each half of the bar body, that is from the middle to its ends, is pierced with a set of diagonally disposed elongated openings 11, the openings in each set being parallel to one another, and to the corresponding end 10, so that the opposite sets of said openings are disposed not only in angular relation, as will be obvious by reference to Fig. 2, but also in reverse relation. The central portion of the body between said opposite and opposing sets of diagonal openings is cut away to provide a triangular opening 12 having a bottom chord formed of sections 13 of the flange 9. It will thus be seen that a structure is provided having continuous longitudinal margins 14 connected by opposite sets of reversely disposed diagonally arranged webs 15. After the blank has been thus formed, the projecting end corners are pressed or displaced toward each other, thus causing the web portions 15 and the elongated openings 11 to assume more nearly a right angular relation to the longitudinal margins 14, and bringing said openings and webs toward a parallel relation. The chord sections 13 have their free terminals bent inwardly into the central opening 12, as shown at 16, and riveted or otherwise fastened together. By this arrangement, the bar is materially widened and its depth increased without being weakened, and its structure involves essentially the action and all the advantages of a truss. In this connection it will be observed that when the structure described is used as a reinforcing element for a composite tie construction, the chord 8 is under tension, while the chord 9 and the webs 15, 15, are in compression, the concrete which is packed into the center opening 12 and the diagonal openings 11, 11, forming the compression members of the truss.

While the structure may be employed in different relations and for various purposes, it is peculiarly adapted for reinforcing concrete, and as an exemplification of its use, in Figs. 4 and 5 it is shown as a reinforcing means for a composite tie of the type covered by my Patent, No. 937,132, dated Oct. 19, 1909. A concrete or cementitious body 17 is formed by any suitable means, and of any desired material. In this body, a pair of the Z-bar members 6 are embedded with the lower flanges of said members extending toward each other, the material of the body filling in the openings 11. Located in this body are the rail-bearing cushions 18 that rest upon the lower flanges 9, and preferably project above the body of the tie, in order that the rails 19 placed thereon and held by the fasteners 20 will be supported above said body.

From the foregoing, it is thought that the construction, operation and many advantages of the herein described invention will be apparent to those skilled in the art, with-

out further description, and it will be understood that various changes in the size, shape, proportion and minor details of construction, may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

Having thus particularly described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A metallic structure comprising a body having opposite sets of reversely disposed elongated diagonal openings therein, with an opening between the sets, and a chord connecting the portions of the body containing the separate sets of openings and comprising sections having inturned ends located in the intermediate opening.

2. A metallic structure comprising a flanged bar having oppositely beveled ends, elongated oppositely disposed sets of diagonal openings therein, the central portion of said bar having a triangular opening, and a chord bridging said opening and comprising sections having inturned terminals.

3. An expanded metal structure comprising a Z-bar having opposite reversely arranged sets of diagonally and regularly spaced web portions lying within the longitudinal plane of the body, the latter having a part of its web cut away to form a center opening between the said sets and being shortened longitudinally and widened laterally from its original dimensions, to bring the opposite sets of webs to a more nearly perpendicular position without displacing them from within the longitudinal plane of the body, the said body also having one of its marginal chords bridging the center opening.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

BENJAMIN WOLHAUPTER.

Witnesses:
GEO. W. WRIGHT,
WALTER S. OGILVY.