

June 17, 1924.

G. H. SEYBOLT ET AL

1,498,124

METAL STRUCTURE

Filed June 6, 1922

3 Sheets-Sheet 1

Fig. 1.

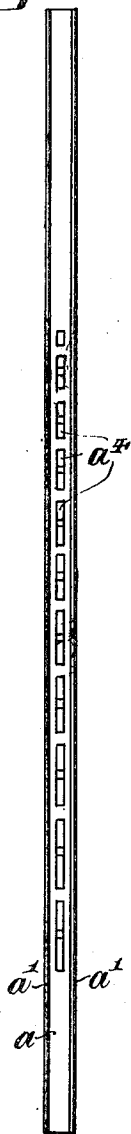


Fig. 2.

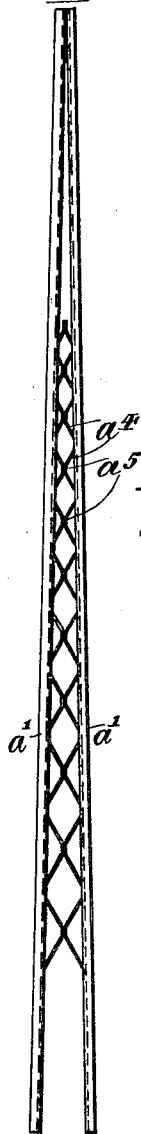


Fig. 3.

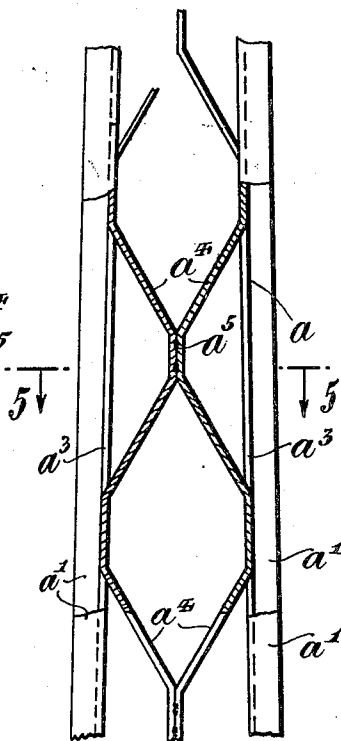


Fig. 4.

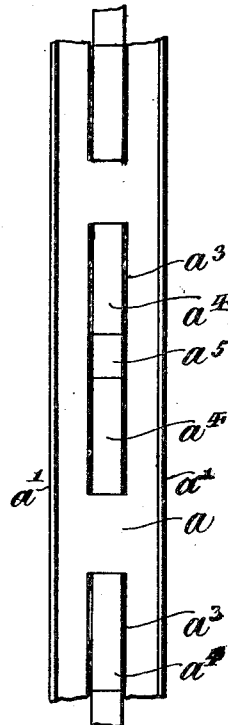
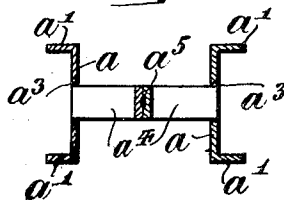


Fig. 5.



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Fig. 6. Fig. 7.

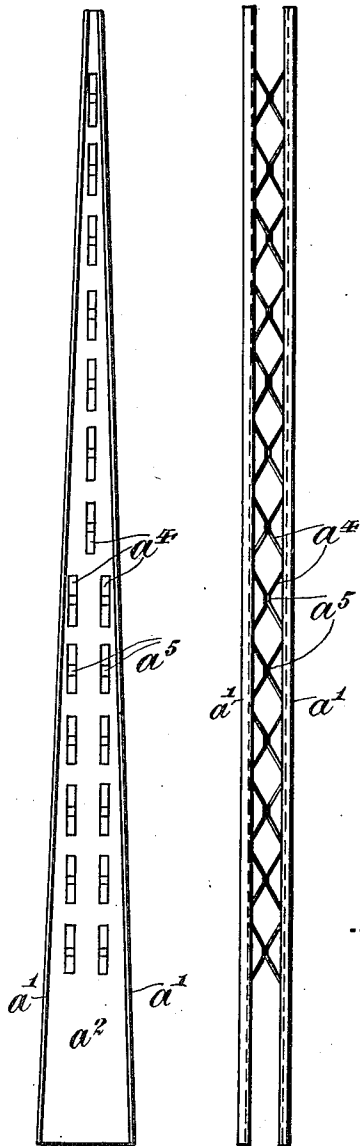
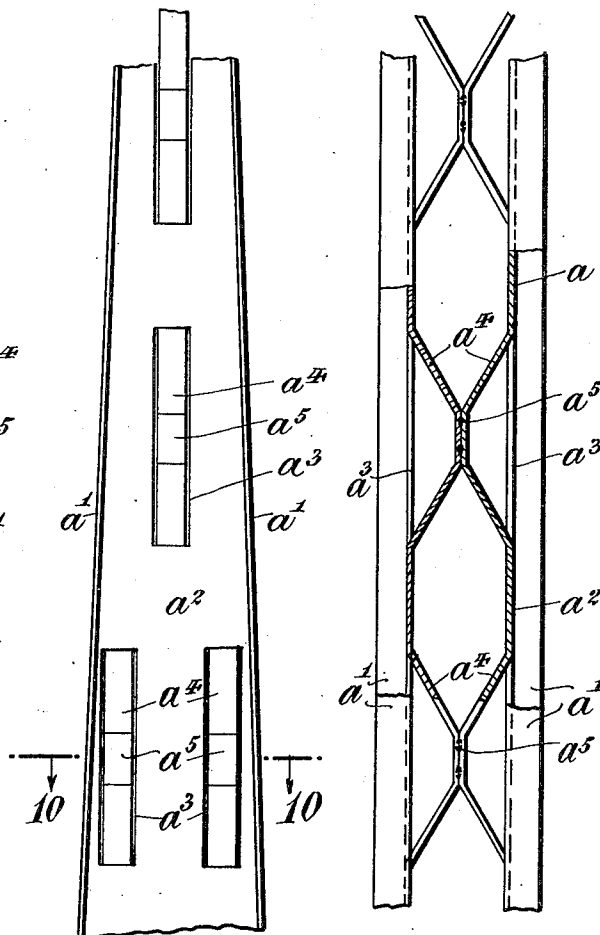
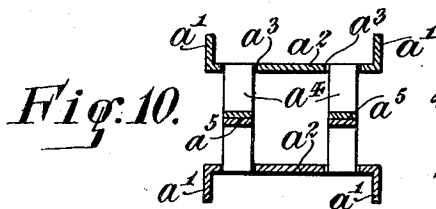


Fig. 8. Fig. 9.



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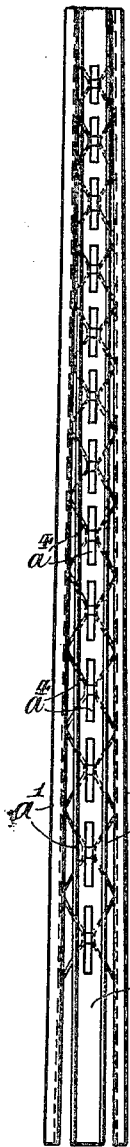
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Fig. 11.



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Fig. 12.

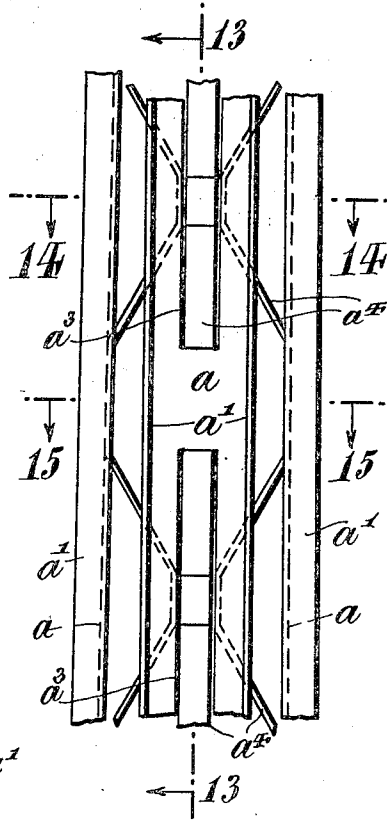


Fig. 14.

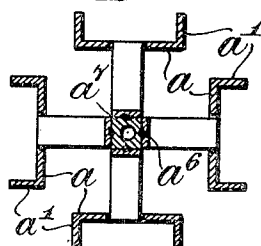


Fig. 13.

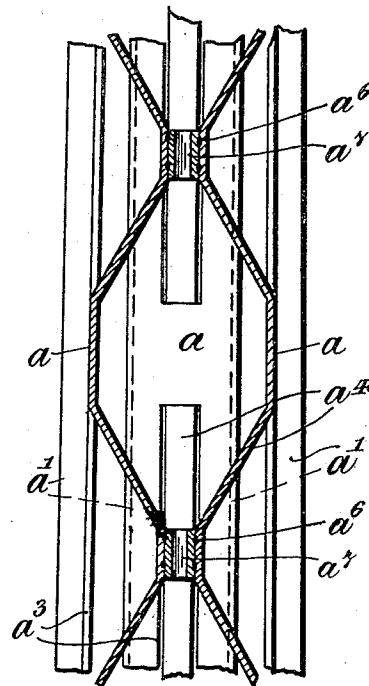
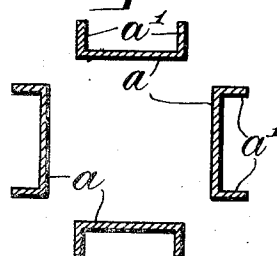


Fig. 15.



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UNITED STATES PATENT OFFICE.

GEORGE H. SEYBOLT, OF JERSEY CITY, NEW JERSEY, AND SAMUEL F. TAPMAN, JR., OF JAMAICA, NEW YORK, ASSIGNORS, BY MESNE ASSIGNMENTS, TO BRISTOL STEEL CORPORATION, OF DOVER, DELAWARE, A CORPORATION OF DELAWARE.

METAL STRUCTURE.

Application filed June 6, 1922. Serial No. 566,437.

To all whom it may concern:

Be it known that we, GEORGE H. SEYBOLT, and SAMUEL F. TAPMAN, JR., citizens of the United States, and residents, respectively, of Jersey City, in the State of New Jersey, and Jamaica, Long Island, in the State of New York, have invented certain new and useful Improvements in Metal Structures, of which the following is a specification, reference being had to the accompanying drawings, forming a part hereof.

This invention has been developed primarily with reference to the production of metal poles, such as telegraph poles, etc., but is applicable to the production of structural elements of metal, and may be regarded as consisting in an improved structural element, whether used for poles or for other purposes. In its most approved form for use as a pole, because the cross section of the element at any point in its length is proportioned to the load to be borne, the element is tapered in width and several such tapered elements might be combined and secured together in any convenient manner, as by riveting or spot welding, to form a tapered pole, but whether tapered or not, each element is preferably formed by shearing in parallel longitudinal lines a plate, such as an angle, beam, channel or flat plate which may be flanged, as a channel plate, while the relatively narrow sheared portions are stretched and displaced to form diagonal truss members. Two or more of such elements may be combined to form a pole or a beam by securing them together at the points of greatest displacement of the sheared members. The invention will be more fully explained hereinafter with reference to the accompanying drawings in which it is illustrated, and in which—

Figure 1 is a view in elevation of a pole or tapered beam formed in accordance with one feature of the invention and viewed from a point at right angles to one of the plates.

Figure 2 is a similar view of the same as seen from a point of view at right angles to that of Figure 1.

Figures 3, 4 and 5 are detail views, on a larger scale, of the structure shown in Figures 1 and 2, Figure 3 being a partial longitudinal section, Figure 4 a partial side elevation and Figure 5 a section on the plane

indicated by the broken line 5—5 of Figure 3.

Figures 6 and 7 are views similar to Figures 1 and 2, but illustrating the improvement in a tapered plate.

Figures 8, 9 and 10 are detail views, on a larger scale, of the construction shown in Figures 6 and 7, Figure 8 being a partial side elevation, Figure 9 being a partial longitudinal section and Figure 10 a section on the plane indicated by the broken line 10—10 of Figure 8.

Figure 11 is a view in side elevation of a quadrilateral structure made up of four elements.

Figures 12, 13, 14 and 15 are detail views, on a larger scale, of the structure shown in Figure 11, Figure 12 being a partial side elevation, Figure 13 a partial longitudinal section and Figures 14 and 15 being sections on the planes indicated by the broken lines 14—14 and 15—15 of Figure 12.

The improved structural element is formed of a plate of metal, of suitable thickness, which, to secure stiffness, may be flanged, like an ordinary channel element or otherwise. In the structure shown in Figures 1—5 the plate a is of uniform width from end to end and is rolled with a solid flat web and flanges a' . In the structure shown in Figures 6—10 the plate a^2 is tapered from end to end, so that its cross section at any point will be proportioned to the load to be carried and unnecessary weight, as at the upper end of a pole, be avoided. The plate a^2 may also be flanged at its edges, as at a' , as before. In the structure shown in Figures 11—15, each element is of uniform width, as shown in Figures 1—5, and is made up of a plate a with flanges a' .

In each of the structures represented in Figures 1—15 the plate is sheared longitudinally, as at a^3 , in parallel lines, a comparatively short distance apart, and the narrow strip a^4 between the sheared lines, is stretched and displaced as shown, so as to form the diagonals of a truss member. It will be noted that by reason of the stretching and displacement of the sheared strips, which remain united integrally at their ends with the body of the plate, there is no shortening of the length of the element or of the

compounded structure as compared with the original length of the elements, as must be the case in ordinary expanded metal structures. The number and disposition of the sheared portions a^4 will depend in each case upon the use to which the element is to be put. As shown in Figures 1-5 and in Figures 11-14, the sheared portions are arranged in a single longitudinal series, in a comparatively narrow plate, the length of the sheared portions being varied. In the structure shown in Figures 6-10 the sheared portions are arranged in parallel lines through the wider portion of the plate and in a single line through the narrower portion, the sheared portions being of uniform length.

The elements can be used in any desired manner. As shown in Figure 1-15 two of the sheared elements can be united to form a pole or truss by securing together, as by spot welding, as indicated at a^5 in Figures 3 and 5, the opposed sheared portions of two elements, at the points of greatest displacement of the sheared and stretched portions. In the construction shown in Figures 1-5, in which the sheared portions are progressively shorter, a pole or beam thus formed will be tapered in one plane, but the weight at any given cross section will be substantially the same. In the construction shown in Figures 6-10 two elements are united to form a tapered pole, with progressively reduced cross section, by uniting, in any convenient manner, as by spot welding, as at a^5 , the stretched sheared portions

at the points of the greatest displacement. In the construction shown in Figures 11-15, in which four elements are shown as combined to form a quadrilateral pole or beam, the several elements are shown as secured together to form a compound structure by having the sheared portions secured, as by spot welding, as indicated at a^6 in Figures 13 and 14, to a common block or filling piece a^7 . The structure shown in these figures is tapered by making the sheared portions progressively of reduced length.

Various modes of using the improved elements will suggest themselves and it is to be understood that, except as pointed out in the claims, the invention is not restricted to any particular combination of elements.

We claim as our invention:

1. A structural metal element consisting of a plate sheared in parallel lines and having the sheared portions integrally connected at both ends to the plate and stretched and displaced from the plane of the plate.
2. A metal structure consisting of a plurality of plate elements, each sheared in parallel longitudinal lines and having the sheared portions integrally connected at both ends to the plate and stretched and displaced from the planes of the plates, the several elements being secured together through the stretched and displaced portions.

This specification signed this 5 day of June, A. D. 1922.

GEORGE H. SEYBOLT.
SAMUEL F. TAPMAN, JR