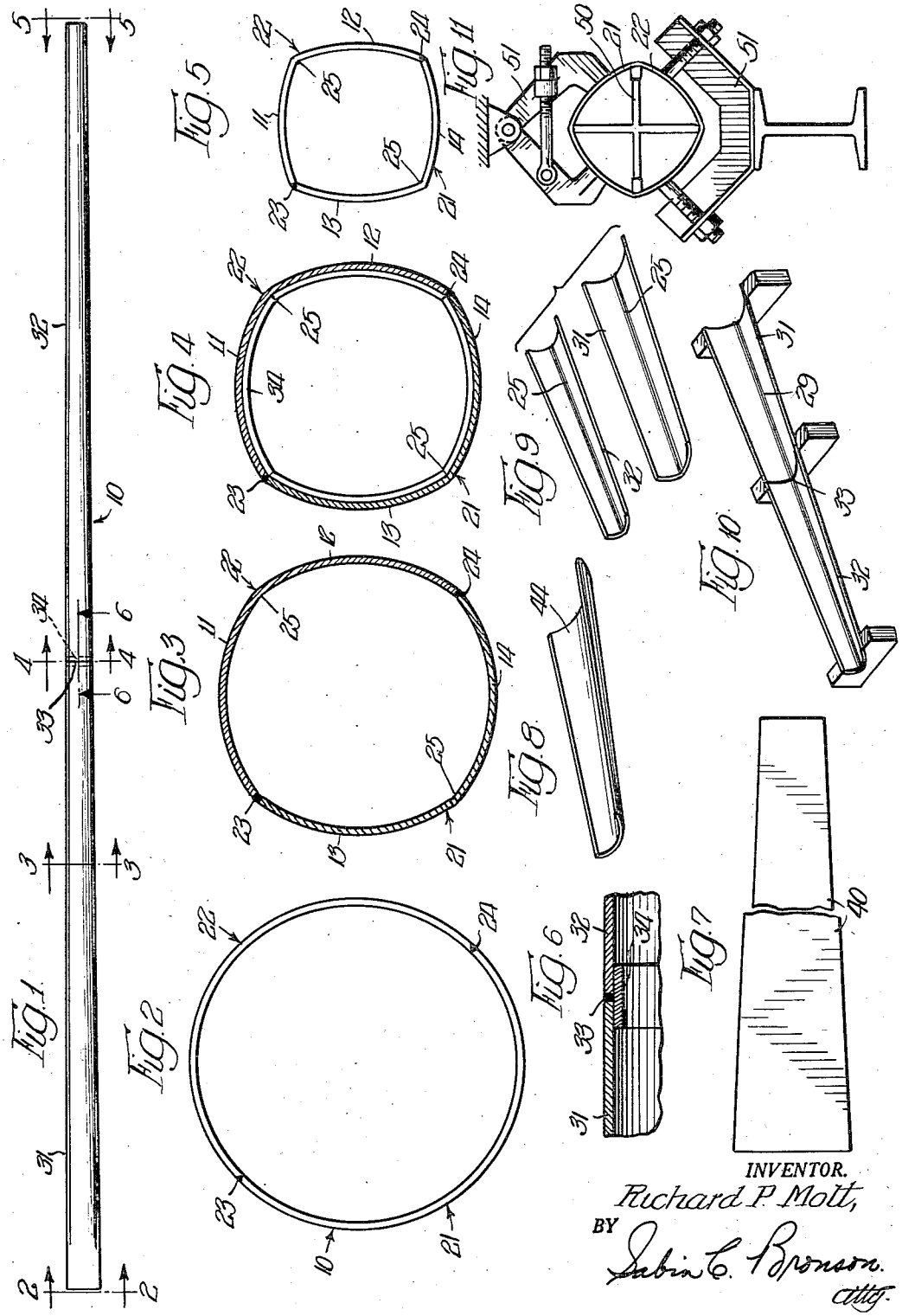
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TAPERED POLE AND PROCESS OF FORMING THE SAME

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TAPERED POLE AND PROCESS OF FORMING THE SAME

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6 Claims. (Cl. 189—23)

This invention relates as indicated to a structural member, and more particularly to an elongated taper metal unit suitable as a light pole and the like.

In the past light poles have been made by various methods. In one process of manufacture the pole is made by forming a blank of a suitable configuration into a truncated cone by bringing the marginal edges of the blank together and securing them by welding. This method is unsatisfactory because of distortion in the final product and the expenses involved.

It is an object of the present invention to provide an elongated structural unit that may be manufactured by a process that eliminates distortion in the finished article.

It is a further object of the invention to provide a structural unit of suitable rigidity for use as a light pole.

It is a still further object of the invention to provide a structural unit that is conveniently and inexpensively manufactured.

Further objects and advantages of this invention will become evident as the description proceeds and from an examination of the accompanying drawing which illustrates one embodiment of the invention and in which similar numerals refer to similar parts throughout the several views.

In the drawings:

Figure 1 is a view in elevation of a structural member embodying the invention;

Figure 2 is an enlarged end view taken along line 2—2 of Figure 1;

Figure 3 is an enlarged view in section taken along line 3—3 of Figure 1;

Figure 4 is an enlarged view in section taken along line 4—4 of Figure 1;

Figure 5 is an enlarged end view taken along line 5—5 of Figure 1;

Figure 6 is an enlarged fragmentary view taken along line 6—6 of Figure 1;

Figure 7 is a plan view of a blank that is used in the manufacture of a structural unit of the invention;

Figure 8 is a perspective view of the blank formed into a segment of a cylinder;

Figure 9 is a perspective view of two sections of cylindrical segment folded along the center line thereof so as to form a pair of wings;

Figure 10 is a perspective view showing a step of welding the top and bottom sections of the convex elements together;

Figure 11 is an end view showing the step of welding the convex members together.

Referring now to the drawings, reference numeral **10** indicates generally a device embodying the invention. As best shown in Figures 3 through 5, the structural unit is made up of four elements, **11, 12, 13** and **14**, all of which are cylindrical segments identical in shape and configuration. The elements progressively decrease in width along the lengths thereof so as to form a hollow tapered unit when assembled, as shown in Figure 1. All of the elements are joined together at their longitudinal

edges in a unit which is circular at the base end portion (Fig. 2) and polygonal at the apex end portion (Fig. 5). Two pairs of elements **11, 12**, and **13, 14**, are integrally joined at the longitudinal edges to make two convex members **21, 22**. The convex members are secured together at the meeting longitudinal edges into the structural unit of the invention, such as by welding.

The convex members **21, 22** are made by forming a segment of a cylinder which has the shape of a plane intercepting the cylinder at an angle to its axis (Fig. 8). The convex members are provided (Fig. 9) with a crease **25** parallel to, and preferably along, the center line thereof to form a pair of cylindrical segment wing elements **11, 12** and **13, 14** which are folded inwardly. The configuration of the wing elements **11, 12, 13**, and **14** is that of a segment of a cylinder. In the form shown in the drawings, the wing elements are folded until the angles formed by the wing elements are equal and the distance between the outer edges of the member is about twice the depth of the convex member. The axes of the wing elements progressively converge uniformly about and toward the longitudinal axis of the structural unit intersecting said axis at the circular base thereof.

As shown in Figures 1, 6, 9, and 10, each of the convex members may be made into two parts, a bottom section **31** and a top section **32**, which are secured together by welding around a strap **34**. It should be understood, however, that in some instances it may be desirable to make the convex members of a single piece.

In manufacturing the structural unit of the invention, a blank **40** is first shaped in the outline of a truncated isosceles triangle, shown in Figure 7. The blank is bent on a cylindrical mandrel into the segment **44** of a cylinder as shown in Figure 8. Because the blank is a truncated isosceles triangle, the segment will take the shape of one formed by a plane cutting the cylinder at an angle to its axis.

A crease is then formed on the cylindrical segment along the center line thereof, as shown in Figure 9, to divide the convex member into a pair of wing elements. It will be noted that in Figure 9, the convex member is shown in two parts, a bottom **31** and a top **32**. These sections are butt-welded together to form a single assembly, as illustrated in Figure 10, or the mating sections may first be assembled by longitudinal butt-welding and then the two units transversely butt-welded, to form the complete structure. A strap **34** is placed at the juncture of the top and bottom sections to reinforce it, when the butt-weld is made from the outside.

The two convex members **31, 32** are placed together with the opposite edges in juxtaposition about a back-up gauge **50** as best shown in Figure 11. The gauge maintains the opposite wing segments spaced equally. The wings of the convex members are then forced inwardly by clamps **51** while the welding operation takes place. The two convex elements are secured together by welding at **23, 24** along the longitudinal opposite edges thereof.

In the drawing and specification there has been set forth one embodiment of the invention, and although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation. Changes in form and in the proportion of parts, as well as the substitution of equivalents are contemplated, as circumstances may suggest or render expedient, without departing from the spirit or scope of this invention as further defined in the following claims.

I claim:

1. An elongated hollow tapered structural unit comprising at least three identical cylindrical segments, each of said segments progressively decreasing in width along the length, wherein each segment is joined to adjacent seg-

ments at the longitudinal edges, and wherein the angles formed between adjacent segments are equal, said unit having a circular end portion and a polygonal end portion, the axes of the respective segments intersecting the longitudinal axis of the structural unit at the circular end thereof.

2. An elongated hollow tapered structural unit comprising at least three identical cylindrical segments, each of said segments progressively decreasing in width along the length, wherein each segment is joined to adjacent segments at the longitudinal edges at least two segments of which are integrally joined, and wherein the angles formed between adjacent segments are equal, the axes of the respective segments progressively converging uniformly about and toward the longitudinal axis of the structural unit.

3. An elongated hollow tapered structural unit comprising four identical cylindrical segments, each of said segments progressively decreasing in width along the length, said segments being joined to adjacent segments at the longitudinal edges to form a hollow body, wherein two pairs are integrally joined, and wherein the angles formed between adjacent segments are equal, the axes of the respective segments intersecting the longitudinal axis of the structural unit at the base thereof.

4. An elongated, tapered structural unit comprising a plurality of longitudinally extending cylindrical surfaces welded together at the opposite longitudinal margins thereof, each of said surfaces having the configuration of a tapered segment of a right circular cylinder bent inwardly along an element of the cylinder into symmetrical wing elements, and each of said wing elements having the configuration of a segment of a cylinder, the axes of said wing elements progressively converging uniformly about and toward the longitudinal axis of the structural unit.

5. The method for forming an elongated tapered structural unit which comprises shaping a plurality of blanks each into the configuration of a truncated isosceles triangle, forming said blanks into convex members which are segments of a cylinder, folding said convex members along the respective centerlines thereof into symmetrical wing elements which are segments of a cylinder, and welding said convex members together at the meeting longitudinal edges thereof.

6. The method for manufacturing an elongated, tapered structural unit which comprises shaping a pair of blanks into the configuration of a truncated isosceles triangle, forming said blanks into convex members which are segments of a cylinder, folding said convex elements along the respective centerlines thereof into symmetrical wing elements the chords of which in cross section are perpendicular, and welding said convex members together at the meeting opposite longitudinal edges.

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