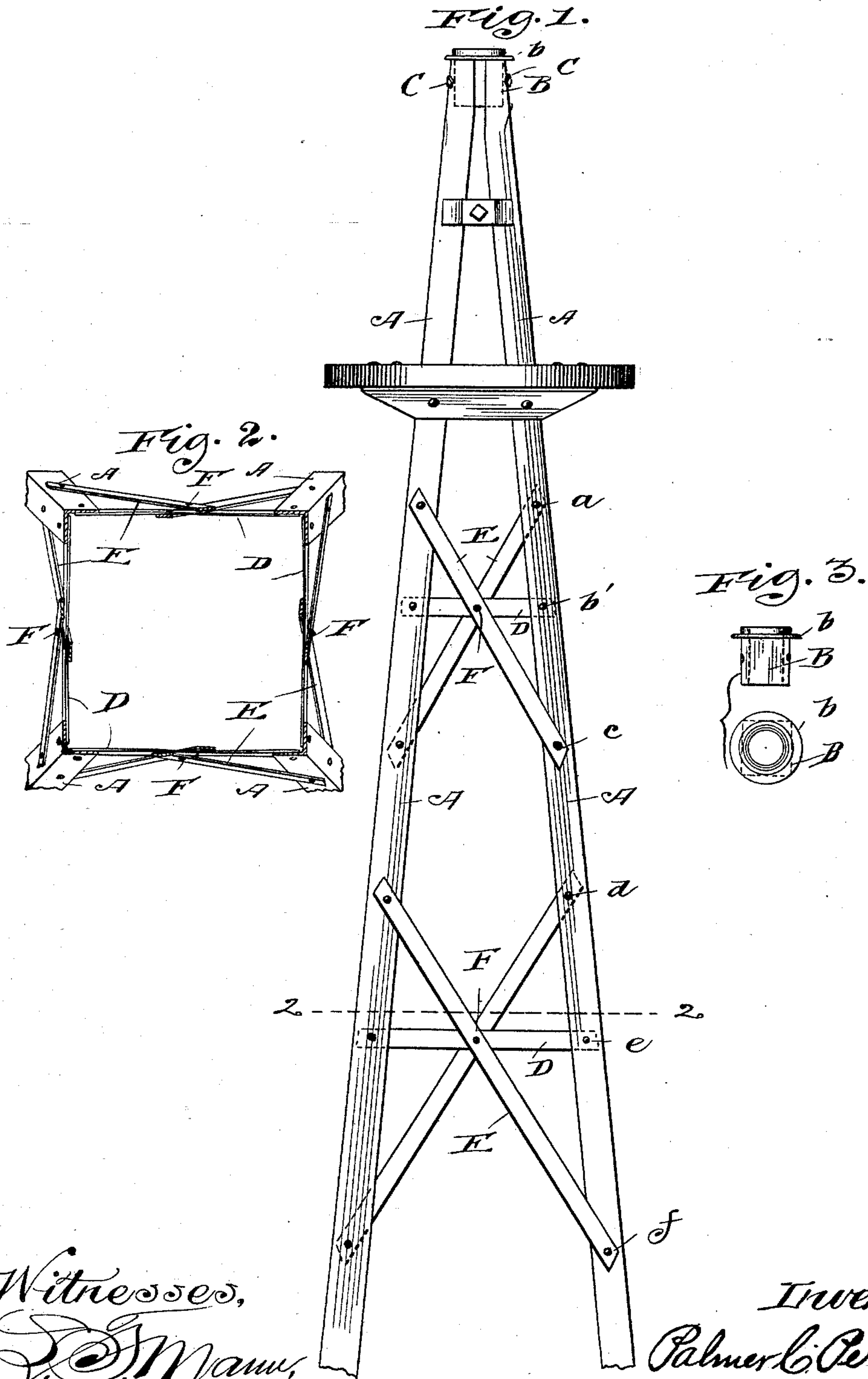


(No Model.)

P. C. PERKINS.  
METAL TOWER.

No. 485,879.

Patented Nov. 8, 1892.



Witnesses,  
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# UNITED STATES PATENT OFFICE.

PALMER C. PERKINS, OF MISHAWAKA, INDIANA.

## METAL TOWER.

SPECIFICATION forming part of Letters Patent No. 485,879, dated November 8, 1892.

Application filed May 26, 1892. Serial No. 434,399. (No model.)

*To all whom it may concern:*

Be it known that I, PALMER C. PERKINS, of Mishawaka, in the county of St. Joseph and State of Indiana, have invented certain new and useful Improvements in Metal Towers, of which the following is a specification.

My invention relates to a metal tower, and has for its object to improve that class of towers which are constructed from metal posts converging toward their tops and braced between their ends to render them suitably rigid.

The present methods of bracing are defective and permit the posts to bend between the points of connection of the braces with such posts.

In the accompanying drawings, Figure 1 is a side elevation of my improved tower. Fig. 2 is a sectional plan view below the line 2 2 of Fig. 1, and Fig. 3 is a detail view of a bearing for a vertical shaft to support the wind-engine.

In the drawings, A represents the tower-uprights, which are composed of angle-bars, which converge from the base to the top of the tower and which are secured at their upper ends to a bearing or turn-table B, apertured to receive the vertical shaft of the wind-engine. This bearing is composed of a casting having a flange *b*, which forms the turn-table, and the external form of the bearing above the flange *b* is circular, while the part below the flange is angular, so as to fit into the angle-bars forming the uprights, which are perforated for the securing-bolts C. This turn-table as constructed has a firm bearing on the ends of the several angle-bars forming the uprights, and the latter are securely tied thereto by the bolts, thus making a very strong and rigid construction. The bearing also serves as a space-block for the uprights.

As these towers are very often carried to considerable heights and support at their tops large wind-wheels whose rudders and other machinery are heavy and afford extended surfaces to catch the wind, the strain upon the structure, tending to overturn it and cause the tower members to bend or sag, is enormous, and hence it is desirable to provide the most thorough system of bracing obtainable, and it is to this feature my present invention principally appertains.

The present systems of bracing involve horizontal tie-bars and diagonal struts, the

ends of the tie-bars and struts being secured to the uprights of the tower at or near the same points. The result of this system is that the tower is braced at such long intervals that it is likely to sag and its members bend out of place in use. I obviate this difficulty by employment of a peculiar system of bracing, which is shown in the accompanying drawings, and comprises horizontal tie-bars D and the diagonal struts E, the struts crossing each other and the tie-bars between their ends and having their ends secured, respectively, above and below said tie-bars, whereby the structure is braced at a greater number of points than in the common construction. This will be rendered apparent by supposing the lower set of struts to be raised, so that their upper ends are connected with the uprights at the same point as the upper tie-bar is connected and the lower ends of said diagonal struts connected at the same points as the lower tie-bar is connected. A corresponding arrangement being carried on throughout the height of the tower, there would then be a space equal to that between the two tie-bars shown which would not be braced, and the tendency under a heavy strain would be for the posts to sag or bend at a point between the two lines of bracing. In my structure, however, it will be seen that the tower is braced on each post at points corresponding to the reference-letters *a b' c d e f*, or, in other words, at frequent intervals through its height, while in such old structures the bracing at the points *a, c, d*, and *f* would be omitted.

I prefer to rigidly connect the tie-bars and struts at the point where they cross by a single rivet or bolt, as at F; but the crossing-point of the struts may be either above or below the tie-bar and the struts may be connected together at their crossing and separately connected to the tie-bar at the points where they cross the latter. With the same number of braces as are used in the common method I can, therefore, materially add to the strength and stability of the tower without any increase in the cost and without adding any means which would tend to overload the tower or to weaken its uprights by puncturing them for the reception of bolts or rivets to secure the braces and tie-bars.

The structure herein shown is particularly



intended and designed for use as a windmill-tower; but the system of bracing may be applied to other similar structures.

Having thus described my invention, what  
5 I claim as new, and desire to secure by Letters Patent, is—

1. In a windmill-tower, the combination,  
with uprights composed of angle-bars con-  
verging toward their upper ends, of a com-  
10 bined bearing, turn-table, and spacing-block  
composed of a casting having an angular ex-  
terior to which the uprights are secured, a  
peripheral flange overlying the ends of the  
uprights to form the turn-table, and a verti-  
15 cal aperture to provide a bearing for the op-  
erating-rod of the mill, substantially as de-  
scribed.

2. In a tower of the class described, the  
combination, with a frame composed of metal  
20 posts or uprights, of bracing applied thereto  
and comprising horizontal tie-bars and diag-

onal struts, the tie-bars being secured at their  
respective ends to the uprights and the struts  
crossing each other and the tie-bars being se-  
cured to the uprights intermediate the con- 25  
nections of the diagonal struts thereto, sub-  
stantially as described.

3. In a tower of the class described, the  
combination, with a frame having uprights  
composed of angle-bars, of a system of brac- 30  
ing therefor comprising horizontal tie-bars  
and diagonal struts, the struts being secured at  
their respective ends to the uprights and the  
tie-bars being secured to the uprights interme-  
diate the points of securement of the struts 35  
and the tie-bars and struts being secured to-  
gether at their points of crossing, substan-  
tially as described.

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Witnesses:

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