

(No Model.)

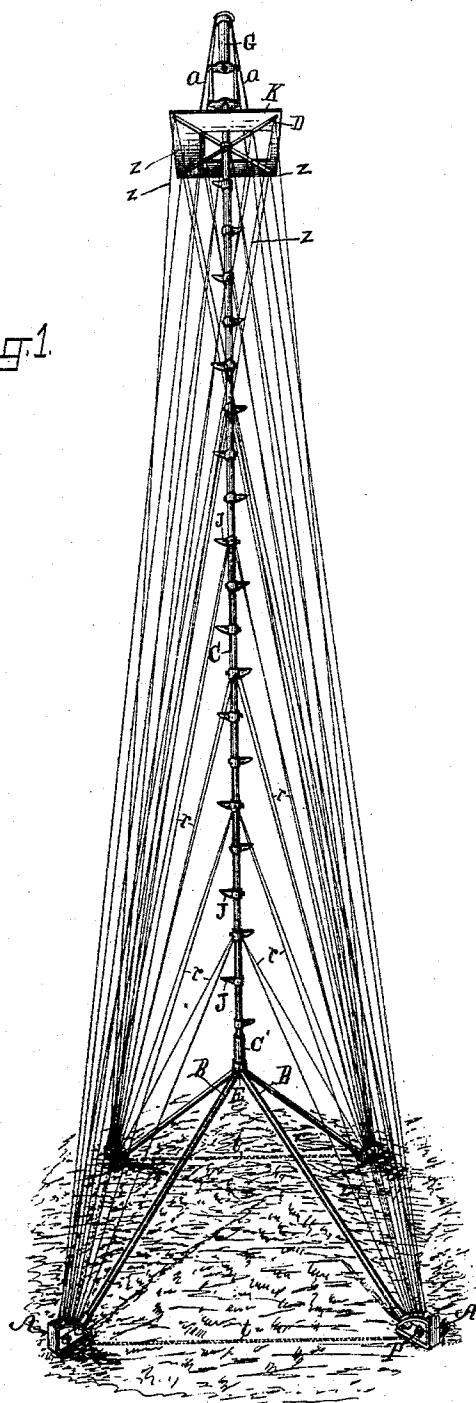
4 Sheets—Sheet 1.

G. P. YOUMANS.
WINDMILL TOWER.

No. 533,626.

Patented Feb. 5, 1895.

Fig. 1.



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(No Model.)

4 Sheets—Sheet 2.

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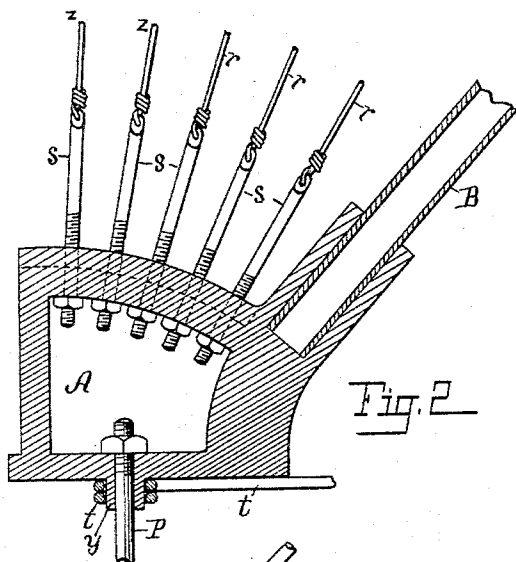


Fig. 2

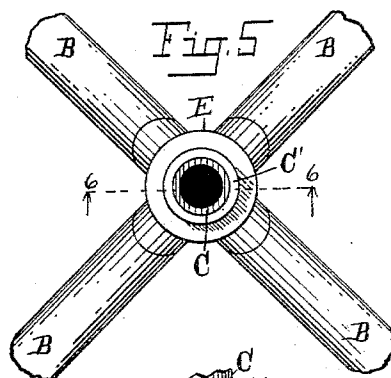


Fig. 5

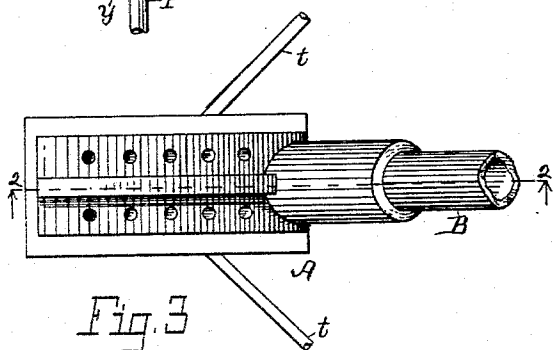


Fig. 3

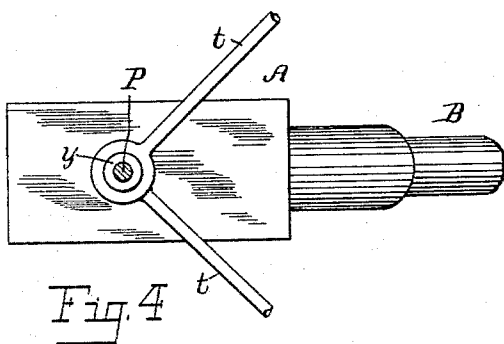


Fig. 4

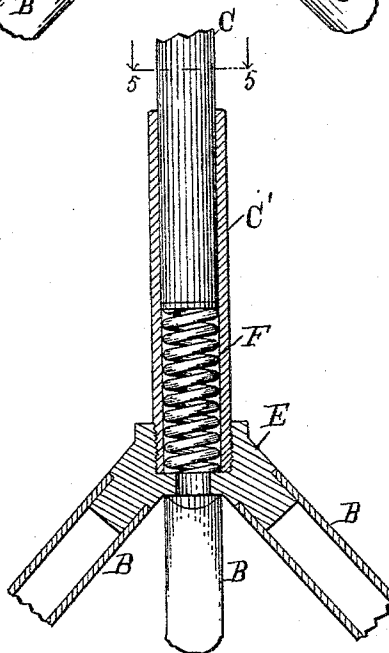


Fig. 6

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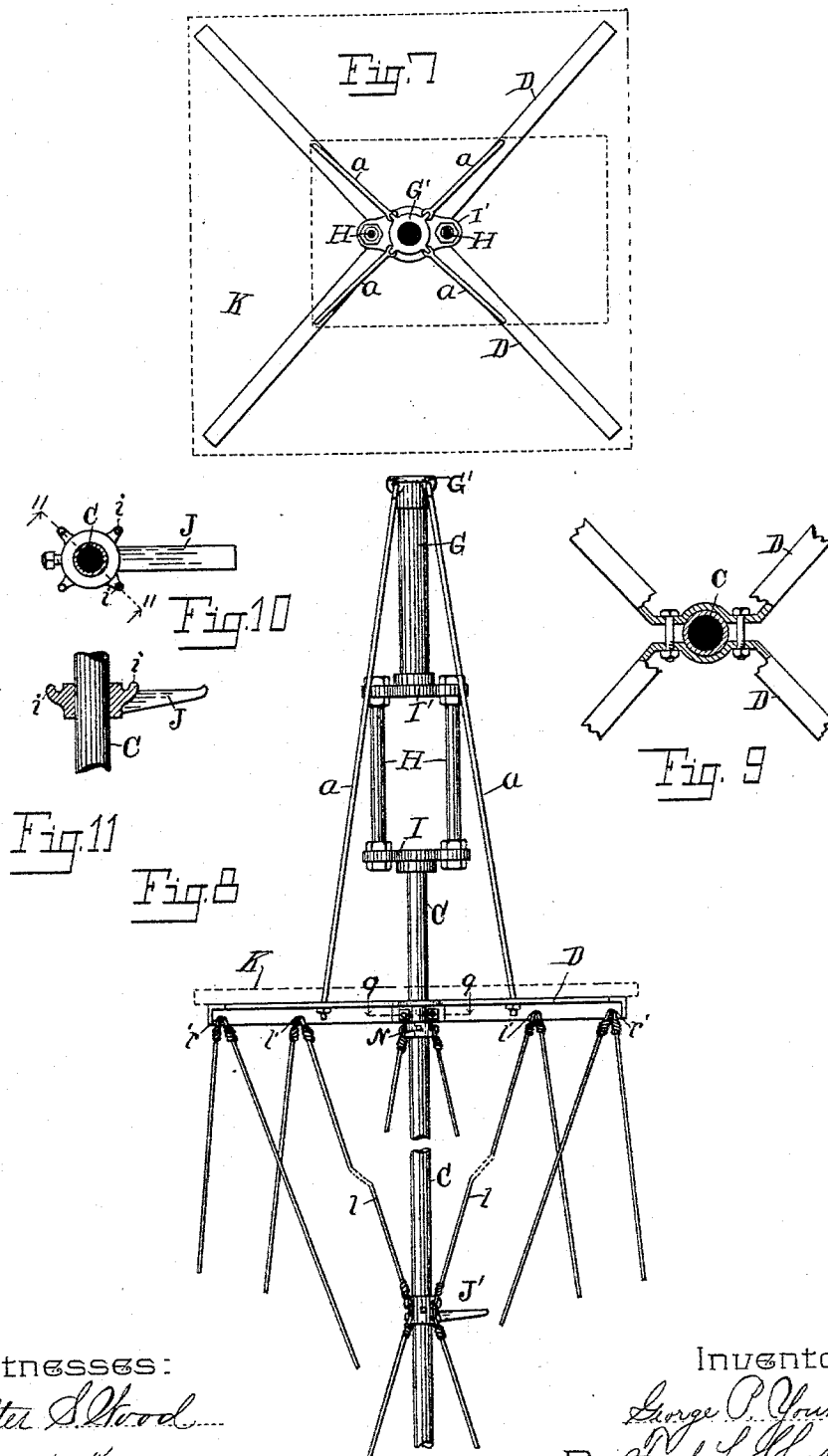
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WINDMILL TOWER.

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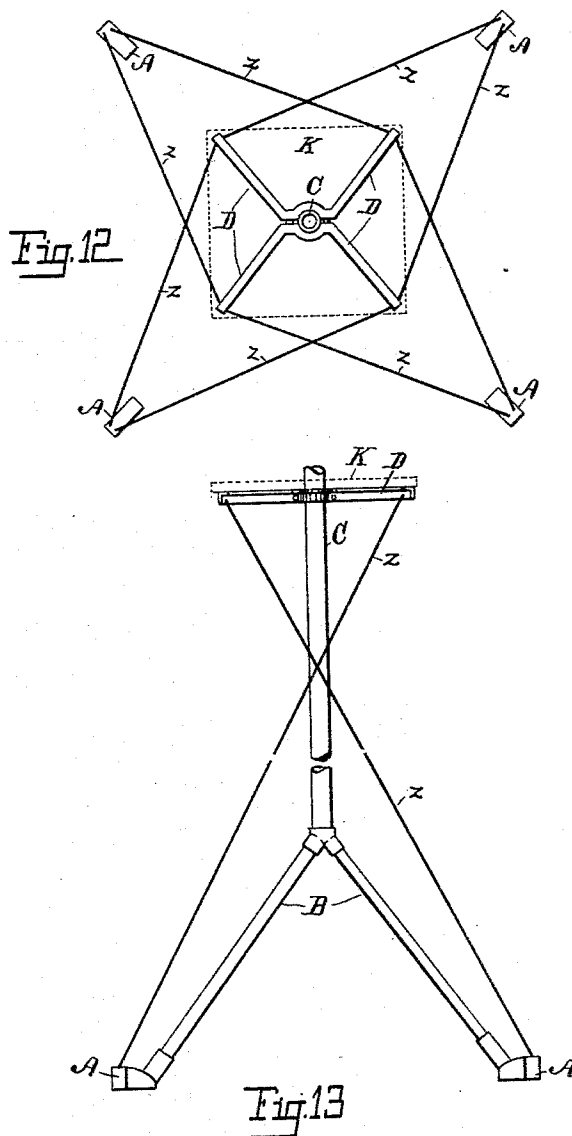
(No Model.)

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WINDMILL TOWER.

No. 533,626.

Patented Feb. 5, 1895.



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UNITED STATES PATENT OFFICE.

GEORGE P. YOUMANS, OF GALESBURG, ASSIGNOR OF ONE-HALF TO THE WILLIAMS MANUFACTURING COMPANY, OF KALAMAZOO, MICHIGAN.

WINDMILL-TOWER.

SPECIFICATION forming part of Letters Patent No. 533,626, dated February 5, 1895.

Application filed May 15, 1893. Serial No. 474,310. (No model.)

To all whom it may concern:

Be it known that I, GEORGE P. YOUMANS, a citizen of the United States, residing at the village of Galesburg, in the county of Kalamazoo and State of Michigan, have invented a certain new and useful Windmill-Tower, of which the following is a specification.

My invention relates to towers and more particularly to windmill towers.

10 The objects of my invention are, first, to provide a tower that can be constructed principally of wires and so not be conspicuous nor offer great resistance to the wind; second, to provide a tower that is easy to construct; 15 third, to use as little material as possible in the formation of a tower; fourth, to provide a tower that shall be complete in itself and that shall not depend entirely on the earth to hold any of the parts in their relative position; 20 fifth, to provide a tower that shall be easy of ascent. I accomplish these objects by the devices shown in the accompanying drawings, in which—

Figure 1, shows a view in perspective of my 25 complete tower in position. Fig. 2, is a detail sectional view of one of the corner supports on line 2—2 of Fig. 3. Fig. 3, is a plan view of the same with the wires removed. Fig. 4 is an inverted plan of Fig. 3. Fig. 5, is a detail 30 view of the central support on line 5—5 of Fig. 6, looking down. Fig. 6, is a sectional view on line 6—6 of Fig. 5. Fig. 7, is a plan view of the top of the tower and platform. Fig. 8, is a detail view of the front one half 35 of the top portion of the tower. Fig. 9, is a view partly in section on line 9—9 of Fig. 8. Fig. 10, is a detail top view of one of the steps and collars J, the pipe C being cut off. Fig. 11, is a sectional view on line 11—11 of Fig. 40 10. Fig. 12 represents a diagrammatical top plan view of my improved tower from the platform down showing the adjustment of the guys to prevent the platform from twisting. Fig. 13 is a front elevation of the same 45 in sections showing the manner of passing the guys from the anchor iron to the corner of the platform.

Similar letters of reference refer to similar parts throughout the several views.

50 My tower consists of a center column C supported on suitable legs B at the bottom, pref-

erably four in number. These legs B are equal and are secured at the bottom to corner irons A, being inserted in sockets on the same. To each corner support wires *z*, *z* and 55 *r* are attached by means of bolts *s*. On the center column C, which in this case is a gas pipe, are attached collars by means of set screws or other suitable means. Each collar bears step J for the purpose of assisting in 60 climbing the tower. At frequent intervals, these collars are provided with hooks *i* (as in Figs. 10 and 11) at equal distances apart on the collars, each hook coming directly over one of the legs B. The inside wire *r* from 65 each corner iron is attached to the lowest collar bearing hooks *i* to the hook directly opposite. The wire next to that is attached to the collar next above in like manner till the platform at the top of the tower is reached. 70 The two outside wires *z* which are attached to the anchored plates A pass up and attach to the corners of the platform, K, by the corners to each side of the corner directly above its particular anchored plate in order to pre- 75 vent twisting of the platform.

A boss *y* is cast on the under side of each corner iron A. These bosses pass through eyes in the ends of connecting rods *t* which unite the corners together and prevent their 80 spreading. The anchor bolts P pass up through the bosses and hold the corner irons in place and prevent a displacement of the connecting rods as well.

The anchor bolts P are secured in the 85 ground in any of the ways already known to those skilled in the art. With the corners of my tower thus secured it is clear that the first set of guy wires will prevent any lateral play of the center column C at the point of their 90 attachment, and that the second set will secure the next point and so on up thus making it possible to use a comparatively slender center column. In fact towers have been built to a height of forty feet in this way with 95 only an ordinary one inch gas pipe for a center column and have stood a strain much greater than that of an ordinary wind mill at the top.

The platform at the top of my tower is supported by two pieces of angle iron bent in the center (see Fig. 9) so that the ends stand at 100

right angles to each other. One limb of the angle iron projects down vertically and the other is horizontal on which the platform made in the usual form rests. In the middle
 5 the two pieces of iron are bent to fit the center column C, something like a collar and the two are clamped to the column securely by bolts above the collar N. Collar N has only
 10 hooks *i* without a step. Through the vertical limb of the angle irons D holes *l'* and *r'* are drilled to attach wires, two being drilled in each arm, one *r'* at the end and one *l'* in toward the center. A short wire *l* extends from a collar *J'* to the hole *l'* to stay the platform and
 15 brace the tower. The collar *J'* has four hooks above and four below to which are attached wires, those below running down to the corner supports of the tower. From near the outside of each corner iron A a wire runs to
 20 the hole *l'* of its corresponding arm of the platform support. From the outside of each corner iron A, two wires pass up and connect to the holes *r'* in the outer ends of the arms of the platform to each side of its corresponding
 25 corner to prevent the tower twisting from any cause.

The center column C projects above the platform and bears a cross piece I. From each end of this cross piece a column H projects and bears a cross piece I' at the top. On
 30 the top of this cross piece I' a hollow cylinder G in line with the center column C is placed. On top of this cylinder is a collar G' which is held by brace rods *a* that pass down and connect to the angle bars D and serve to stay the
 35 whole upper part of the tower. It will thus be seen that there is an open space just below cylinder G to afford an opportunity for securing a windmill to the top of the tower in the
 40 usual manner.

The center column C is made of gas pipe and is of course hollow. The opening thus left in the center of the tower affords a convenient place for the pump rod of a wind-
 45 mill. The lower end of the column C rests in a socket C' which is supported in the casting E to which the legs B are attached. The lower end of pipe C rests on a powerful coiled spring F which tends to support it.
 50 The spring F is to compensate for any unequal expansion or contraction that may take place in the various parts of my tower, and to relieve any sudden strains due to gusts of wind or other causes.

The method of attaching the wires is not material to my invention. I prefer to use the bolts S at the bottom so that it will be easy to draw them together. It would be possible to construct a tower without the connecting
 60 rods *t* but it is better to use them. Three legs B might be used instead of four or a greater number than four might be used. A smaller central column C can be used if more sets of wires are used and attached to collars
 65 nearer together on the column and if a larger

central column is used fewer sets of wires will be required, and if the column is very large only one set of wires will be needed. The tower will stand and be effective without spring F at the bottom of the central column, but is better with it. 70

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

1. A tower with a central column resting on suitable legs anchored at the corners, and sets of guy wires attached at short intervals to the central column and to the anchor plates at the corners, each set consisting of a wire for each leg, and all the wires of each set attaching to the column at the same height. 75

2. In a tower, the combination of the legs, B, with the central column, C, the anchor irons, A, and the wires, *r*, substantially as described. 80

3. In a tower, the anchor bolts, P, passing up into the anchored plates, in combination with the stay rods, *t*, and the tower above, substantially as described. 85

4. In a tower having a central column supported on four suitable legs, the central column being stayed by guys, the combination, with a square platform at the top, of diagonal guys as *z* passing from each corner of the platform to the anchor plates next adjoining to prevent twisting of the platform, substantially as described. 90

5. In a tower platform for a tower having a central column, the combination of the angle iron, D, bent to form a collar around the central column; the stay rods, *a*, passing to the top of the column and the guys, *l*, attached to the column below, substantially as described. 95

6. In a tower having a central column stayed by guys, the combination of a platform at the top with wires *z*, attached to the platform running in lines at oblique angles to a plane passing through the central column and from opposite sides of the plane to prevent the tower from twisting. 100

7. In a tower, the combination, of a central support, E, having a socket to receive the legs and a socket for the vertical, central standard; the legs, B, fitted in the sockets anchor irons, A, with sockets to receive the lower ends of said legs; a central standard, C, resting in its socket on the central support; a spring in said central socket under the standard to support the same; and guy wires, *r*, in sets attached to the standards, C, and anchor irons, A, substantially as described. 105

In witness whereof I have hereunto set my hand and seal in the presence of two witnesses. 110

GEORGE P. YOUMANS. [L. S.]

Witnesses:

M. B. WILLIAMS,
 EVELYN WESTBROOK.