(No Model.)

I. GATES.

IRON TOWER.

No. 411,432. Patented Sept. 24, 1889.

Fig. 1.

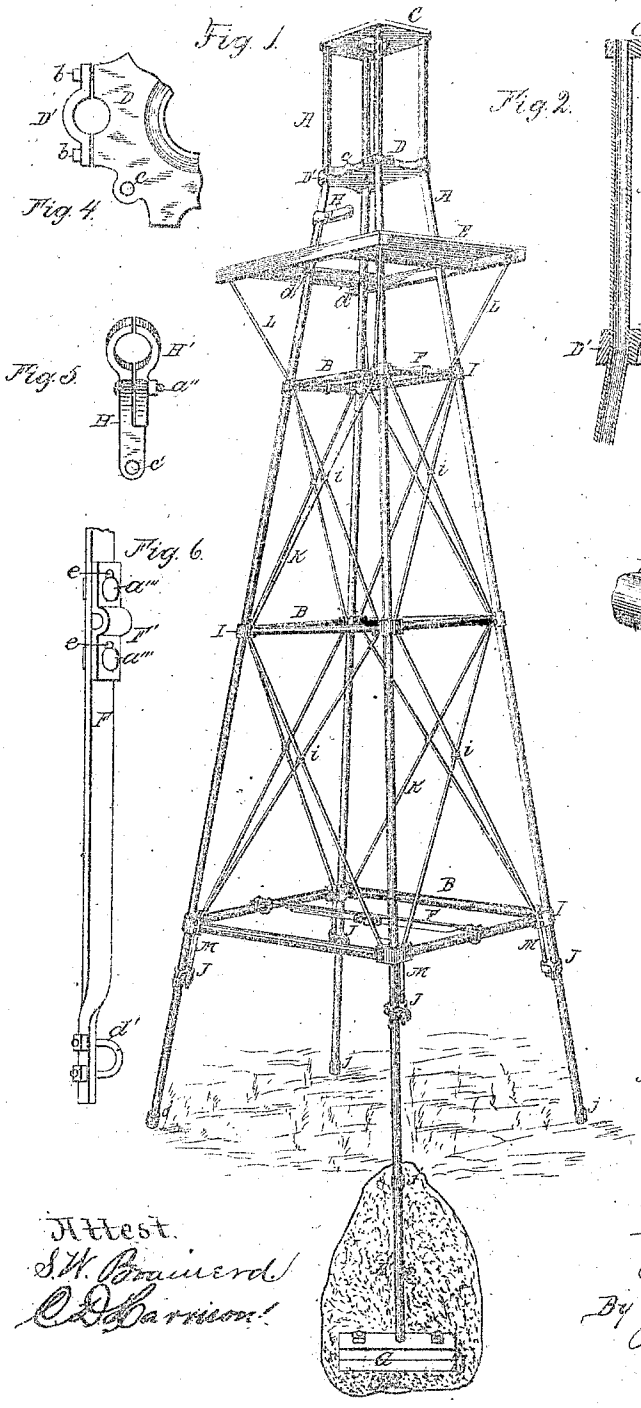


Fig. 2.

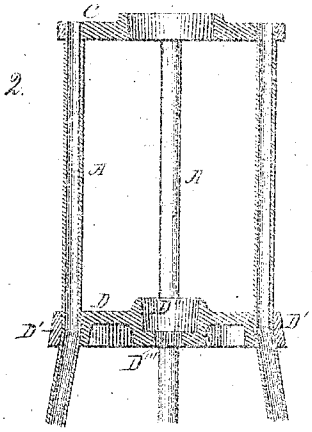


Fig. 4.

Fig. 5.

Fig. 6.

Fig. 3.

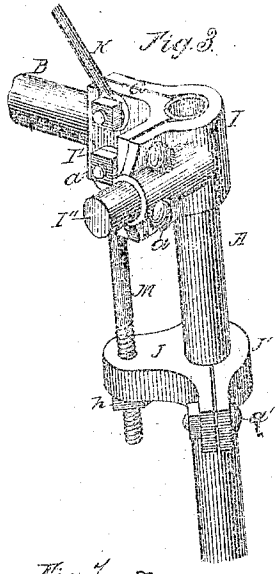
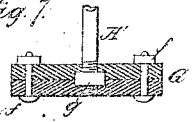


Fig. 7.



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IRON TOWER

SPECIFICATION forming part of Letters Patent No. 411,432, dated September 24, 1889.

Application filed July 24, 1888. Serial No. 280,868. (No model.)

To all whom it may concern:

Be it known that I, ISAAC GATES, a citizen of the United States, residing at Marion, in the county of Linn and State of Iowa, have invented certain new and useful Improvements in Iron Towers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to that class of towers in which the principal parts of the structure are composed of gas-pipe; and the object of my invention is to provide novel means for the connecting of the parts of the tower, for trussing and anchoring the same, and otherwise simplifying and improving its construction.

The invention consists in the combination, construction, and arrangement of parts, as hereinafter fully set forth and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is an elevation of the tower in perspective; Fig. 2, a vertical section of the upper part of the tower in a line drawn diagonally across the same; Fig. 3, an enlarged view of the corner-irons, tension device, and connected parts in perspective; Fig. 4, a fragmentary plan view of the step-plate; Fig. 5, a plan view of the guide for the shifting-rod; Fig. 6, a fragmentary view in perspective of the guide for the main connecting-rod of a windmill, and Fig. 7 a longitudinal section of the anchor for the tower.

Similar letters of reference indicate corresponding parts.

The tower, as a whole, is more especially designed for windmills; but the essential features of the main structure are equally applicable to towers for electric lights, signals, and the like.

Referring to the drawings, A A are corner-posts of iron tubing, as gas-pipe. These may be each a single piece or composed of any number of sections connected by the ordinary coupling *j*. Four of these corner-posts are commonly used; but a less or greater number may be employed, the requisite change being made in the angle of the corner-iron hereinafter to be described. At their upper ends these corner-posts screw into the corners of a top plate C, (or clamp thereto in the same manner as to the step-plate,) which in the case of a windmill-tower is provided with a suitable central hole to serve as a bearing for the vertical pivot of the windmill. (Not shown.) At a proper distance below this top plate, depending upon the length of the pivot above referred to, is a step-plate D, attached at its corners to the corner-posts by a clamp D′, similar to the half of a common journal-box, and adapted to be drawn tightly against the pipe A by means of bolts *b b*. In the center of this step-plate is a socket D″ for the lower end of the pivot, a smaller central hole D‴ being provided for the main connecting-rod of the windmill. In one side of the step-plate is a hole *c* to receive the shifting rod or cord of the windmill. The step-plate is preferably made of about the same size as the top plate, so that the corner-posts between those plates are practically parallel. Below the step-plate the corner-posts should of course spread outwardly to the bottom, and this is done by bending them, preferably before erection. At suitable intervals below the step the corner-posts are braced transversely by a series of struts B B B engaging with corner-irons I I I. The struts are simple sections of pipe, and are connected with the corner-irons by slipping their ends on studs I″ formed on the flaring extremities of the corner-iron. The corner-iron is composed of two parts I and I′, respectively, which are also in the nature of a journal-box, the halves thereof being provided with concave recesses for the sides of the corner-post A. The parts are adapted to clamp the corner-post tightly as drawn together by bolts *a a*.

A series of diagonal rods K K serve to bind and truss the whole frame firmly together. These are secured by the bolts *a a* to the corner-iron, being provided with eyes at the ends for that purpose. In practice I also secure the truss-rods together at their intersection by a simple coil of stout wire or the like, which has the effect of considerably increasing the strength of the truss.

The tension device consists of a clamp composed of the part J, with a perforated lug therein to receive a rod or bolt M, connected

by its eye to the corner-iron, and the part J', with suitable connecting-bolts a' a', and the tightening-bolt M, with its nut h, above referred to.

An improved anchorage for the tower is illustrated by the cutting away of part of the ground in Fig. 1. A′ is a pipe or rod coupling to the lower end of the corner-post A. The lower end of this rod is secured, as by an inclosed nut g, to anchor-blocks G, which may be of wood or metal, and are fastened together by bolts f f, thus holding the nut g in place. Near the upper end of the tower a platform E is shown secured to the corner-posts by clips d d. Braces L L, connecting with the corners of the platform and the corner-irons in the same manner as the truss-rods, hold the platform rigidly in position. F is a transverse bar, preferably of iron, secured by clips d' d' to opposite struts, and provided with a stirrup F′, secured to its side by bolts a''' a'''. Slots e e allow a limited movement of the stirrup for adjustment. The device serves as a guide for the main connecting-rod of the windmill—as, for example, the pump-rod. Under one side of the step-plate D, with its hole c' coinciding with the hole c in said step-plate, is a clamp-iron H H′, which acts as an additional guide for the shifting-rod of the windmill. It is attached to the corner-post in the same manner as the corner-irons by means of a bolt a''.

In the erection of a tower the parts are put together in the relative position shown in Fig. 1. The upper set of corner-irons and the clamp-iron J J′ are secured tightly to the corner-posts. Then by screwing up the nuts h under the clamp-iron the whole frame of the tower is drawn together, the diagonal truss-rods tending to draw the corners in upon the struts, which thus require no other fastening.

The separable corner-irons and clamps admit of the corner-posts being made of sections and put up in any way that may be most convenient. So also, the truss-rods being in sections, any one of them may be removed and replaced at will.

In practice the rod or pipe A′, one of which connects with each of the corner-posts, is galvanized for better preservation from rust when buried in the ground.

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

1. In an iron tower, the combination of tubular corner-posts, two-part corner irons adapted to be clamped tightly upon said corner-posts and having bolts therefor, and projecting studs to receive the ends of tubular struts, struts engaging with said corner-irons, brace-rods connecting with opposite corner-irons diagonally, and a tension device, substantially as described, adapted to draw the whole frame tightly together, the corner-irons at the opposite end of the tower being tight and the intermediate ones loose, as specified.

2. The combination, with the corner-post of an iron tower, of the pipe or rod A′, having a coupling j, and the anchor G, having the inclosed nut g engaging with the end of the corner-post, substantially as and for the purpose set forth.

3. In an iron tower, the combination of the corner-posts A A, and the step-plate D, having the corner clamp-irons D′ D′, the socket D″, and the hole D‴, substantially as and for the purpose set forth.

4. In an iron tower, the combination of the corner-posts A A, the top plate C, having a central hole therein adapted to form the bearing for the pivot of a windmill, and the step-plate D, secured to said corner-irons by clamp-irons D′ D′, and having a central socket for the bottom of the pivot, and a hole for the connecting-rod of a windmill, substantially as and for the purpose set forth.

5. In an iron tower, the combination of the corner-iron A and the clamp-iron H H′, having a hole c' for the shifting-rod of a windmill, substantially as set forth.

6. In an iron tower of the class specified, the combination, with the struts D D, of the transverse bar F, secured to said struts by clips d' d', and provided with the adjustable stirrup-iron F′, substantially as and for the purpose set forth.

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

ISAAC GATES.

Witnesses:
Z. V. ELSBERRY,
H. W. GATES.