

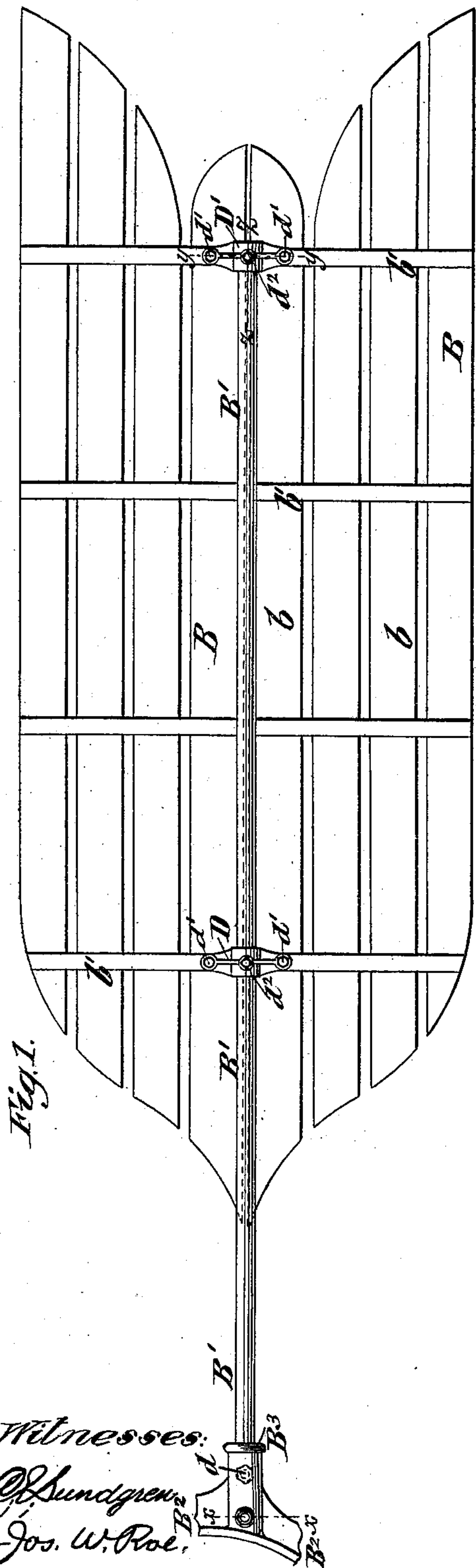
(No Model.)

A. J. CORCORAN.

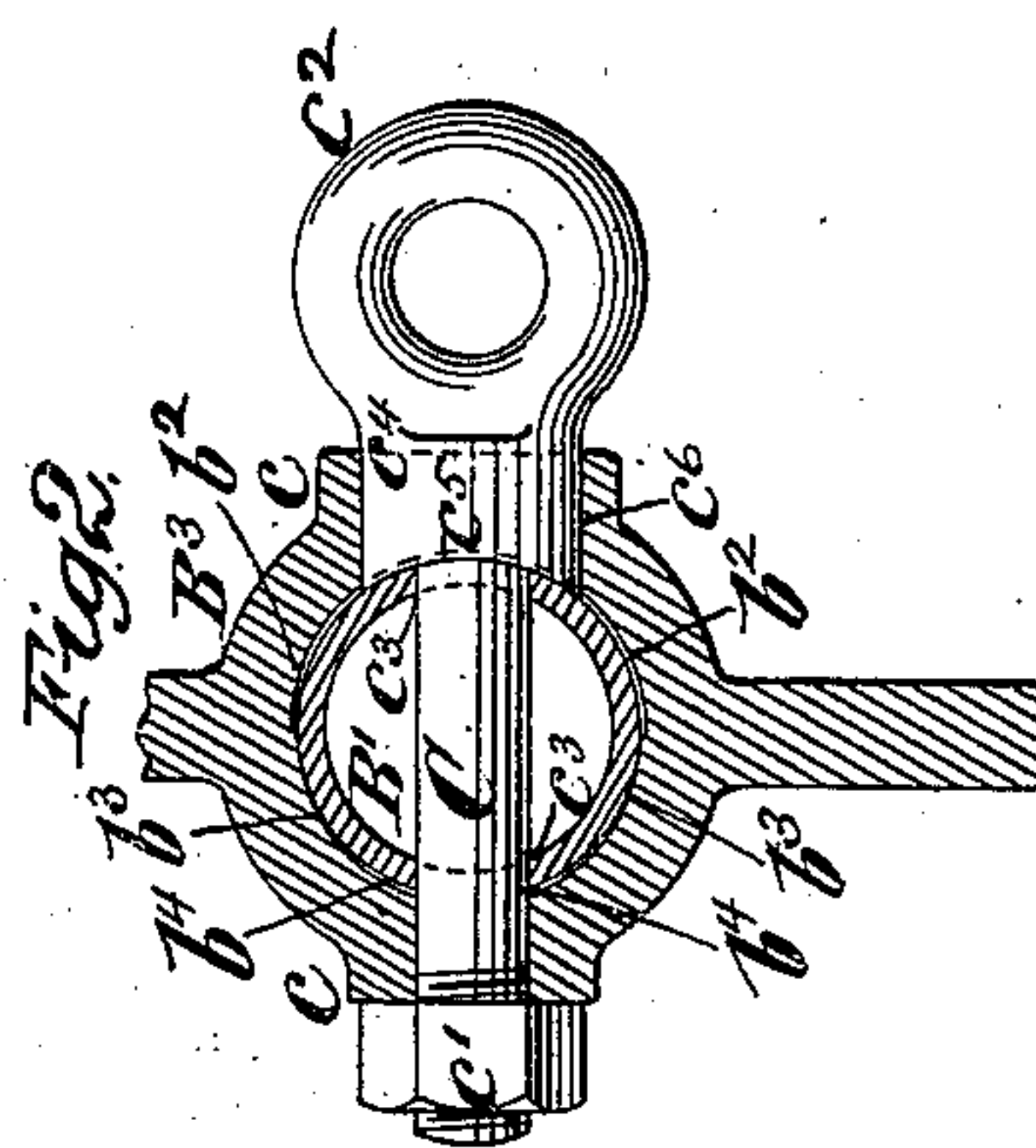
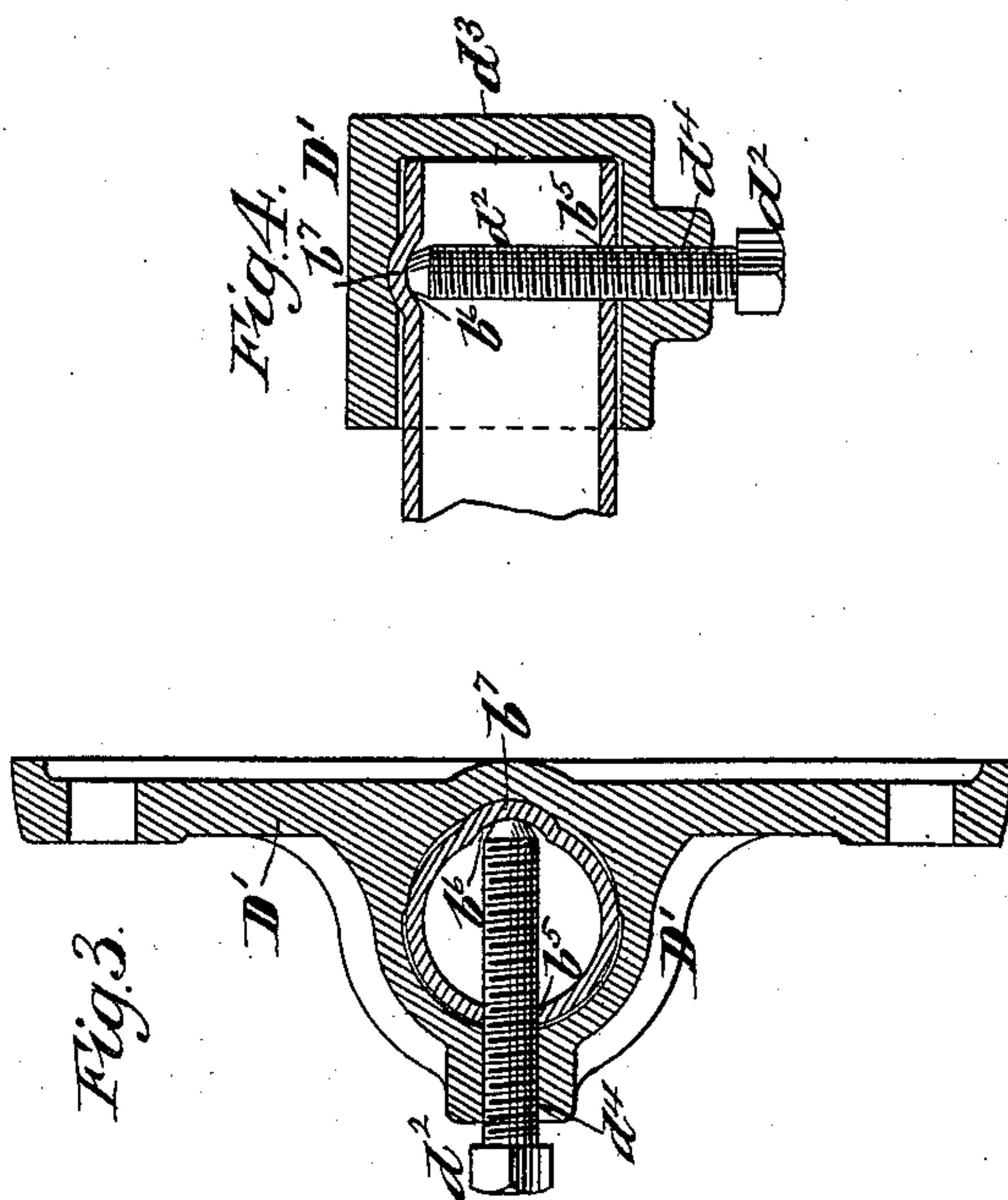
WINDMILL VANE.

No. 384,427.

Patented June 12, 1888.



Witnesses:  
O. Sundgren,  
Jos. W. Roe.



Inventor:  
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# UNITED STATES PATENT OFFICE.

ANDREW J. CORCORAN, OF JERSEY CITY, NEW JERSEY.

## WINDMILL-VANE.

SPECIFICATION forming part of Letters Patent No. 384,427, dated June 12, 1888.

Application filed March 19, 1888. Serial No. 267,600. (No model.)

*To all whom it may concern:*

Be it known that I, ANDREW J. CORCORAN, of Jersey City, in the county of Hudson and State of New Jersey, have invented a new and useful Improvement in Windmill-Vanes, of which the following is a specification.

In connection with a modern windmill—such, for example, as that forming the subject of my application for Letters Patent Serial No. 267,599, filed March 19, 1888—there is commonly employed a main vane, which is held in the direction in which the wind blows, and which constitutes during the time that the wind remains unchanged in direction a fixed part of the structure by which the movements of the wind-wheel are governed. This vane is commonly secured to a tail-bar, and the tail-bar is secured in a socket upon what is known in the art as a “tail-piece,” which is mounted so that it may be turned as the wind changes in direction. I make the tail-bar from a piece of tube or pipe, so as to conduce to lightness; and my invention relates to the means employed for securing the tail-bar in the socket of the tail-piece, and also to the clips whereby the vane is secured to the tail-bar, or at least to the outer clip, whereby the outer end of the vane is secured to the outer end of the tail-bar.

The invention will be hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a vane and a portion of a tail-piece embodying my invention. Fig. 2 is a transverse section through the socket of the tail-piece upon the plane indicated by the dotted line *xx*, Fig. 1. Fig. 3 is a sectional view through the tail-bar and clip whereby the vane is secured to it upon the plane indicated by the dotted line *yy*, Fig. 1; and Fig. 4 is a sectional view of the clip and a portion of the tail-bar in a plane lengthwise of the tail-bar and upon the plane indicated by the dotted line *zz*, Fig. 1.

Figs. 2, 3, 4 are upon a very much larger scale than Fig. 1, and similar letters of reference designate corresponding parts in all the figures.

B designates the vane, which may be composed of slats or strips of thin board, *b*, secured to cross-pieces *b'*.

B' designates the tail-bar, upon which the vane B is secured, and B<sup>2</sup> designates the tail-

piece, which may be constructed like that shown in my aforesaid pending application for patent, and which is designated by the same letter of reference as in that application. The tail-bar B' may consist of a piece of piping or tubing for the sake of lightness, and the tail-piece B<sup>2</sup> is constructed with a socket, B<sup>3</sup>, wherein the tail-bar is secured, as clearly shown in Fig. 2. The object of the means of securing the tail-bar in the socket B<sup>3</sup>, which I have shown, is to hold the tail-bar very rigidly in place and prevent it from working loose in the socket B<sup>3</sup> and from becoming detached therefrom at any time.

C designates a bolt, which is inserted directly through hubs or projections *c* upon the exterior of the socket B<sup>3</sup>, at opposite sides thereof, and has at one end a nut, *c'*, and at the other end, as here represented, has an eye, *c''*. This eye may be employed for connecting with the tail-piece a weighted lever, such as is shown in my aforesaid application. The bolt C is inserted directly through the socket B<sup>3</sup> and through holes *c''* formed in opposite sides of the tail-bar B'. As here represented, inward of the eye *c''*, the bolt has a cylindric neck, *c''*, which terminates in a shoulder, *c''*, and which fits within a bore, *c''*, formed in the socket B<sup>3</sup>. The nut *c'* bears against the exterior of the socket B<sup>3</sup> directly opposite the bearing which the shoulder *c''* has against the exterior of the tail-bar B'. As here represented, the portion *b''* of the bore of the socket B<sup>3</sup> which is upon the side of the tail-bar on which bears the shoulder *c''* is of larger curvature than the exterior of the tail-bar, and the portion *b''* of the bore of the socket which is at the side on which the nut *c'* bears is narrower or of smaller curvature than the tail-bar B', so that when the tail-bar is inserted into the socket a clearance between the tail-bar and socket is left at *b''*. After the tail-bar is inserted into the socket the bolt C is inserted into place and the curved shoulder *c''* comes to a bearing against the exterior of the tail-bar, and the nut *c'* is tightened. The shoulder of the bolt bearing against the tail-bar forces it into the narrower part, *b''*, of the bore of the socket and substantially fills up the clearance *b''* between the tail-bar and the bore of the socket, and thereby binds or holds the tail-bar B' very securely in the socket B<sup>3</sup>. For additional security a set-screw,



$d$ , inserted into the socket and bearing against the tail-bar, may be employed, as shown in Fig. 1.

For securing the vane B to the tail-bar B', I employ clips D D', which receive the tail-bar B', and are secured by bolts  $d'$  to the vane. To secure the tail-bar in the clips I make use of set-screws  $d^2$ , and the clip D' is closed at the end, as shown at  $d^3$  in Fig. 4, so as to form an end bearing for the tail-bar B'. The set-screw  $d^2$ , which is inserted in the outer clip, D', is threaded into a proper nut or hole,  $d^4$ , formed in the outer side of the clip, and passes directly through a hole,  $b^5$ , in the tail-bar and bears against the inner surface of the tail-bar on the opposite side at  $b^6$ , as shown in Fig. 4.

The bore of the clip on the side on which the set-screw  $d^2$  bears is made narrower and deeper than the curvature of the tail-bar B', and therefore forms a depression into which the set-screw  $d^2$  may force or bulge the tail-bar, and thereby there will be formed a protuberance,  $b^7$ , on the exterior of the tail-bar, which is forced into the depression of the clip, and thus serves to hold the clip very firmly upon the tail-bar. This protuberance or projection of the tail-bar into the clip I have shown somewhat exaggerated in Figs. 3 and 4, so that it may be more apparent. The set-screw  $d^2$ , which is inserted in the inner clip, D, may be simply threaded through the clip and bear against the outside of the tail-bar; or it may, if desired, pass into and across the tail-bar, like the set-screw shown in Figs. 3 and 4, and come to a bearing against the inner surface of the tail-bar.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with the tubular tail-bar on which the vane is secured, of the tail-piece having a socket, B<sup>3</sup>, receiving the end of the tail-bar, and a bolt, as C, inserted transversely through the socket and tail-bar and having a head or shoulder entering the socket and bearing against one side of the tail-bar, and a nut applied to the bolt and bearing against the exterior of the socket at the other side of the tail-bar, substantially as herein described.

2. The combination, with the tubular tail-bar B', and a tail-piece, B<sup>2</sup>, having a socket, B<sup>3</sup>, receiving the tail-bar, of the bolt C, having an eye,  $c^2$ , at the head and a shoulder,  $c^3$ , bearing directly against one side of the tail-bar, and a nut,  $c'$ , bearing against the exterior of the socket at the other side of the tail-bar, that portion of the bore of the socket on the side of said nut being of slightly smaller curvature than the exterior of the tail-bar, so as to cramp said bar thereinto, substantially as herein described.

3. The combination, with a vane and its tubular tail-bar, of a clip secured to the vane and having a socket receiving the bar, and a set-screw tapped into the outer side of the socket and passing transversely through one side of the bar and impinging against the inner surface of the bar at the opposite side, substantially as herein described.

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Witnesses:

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