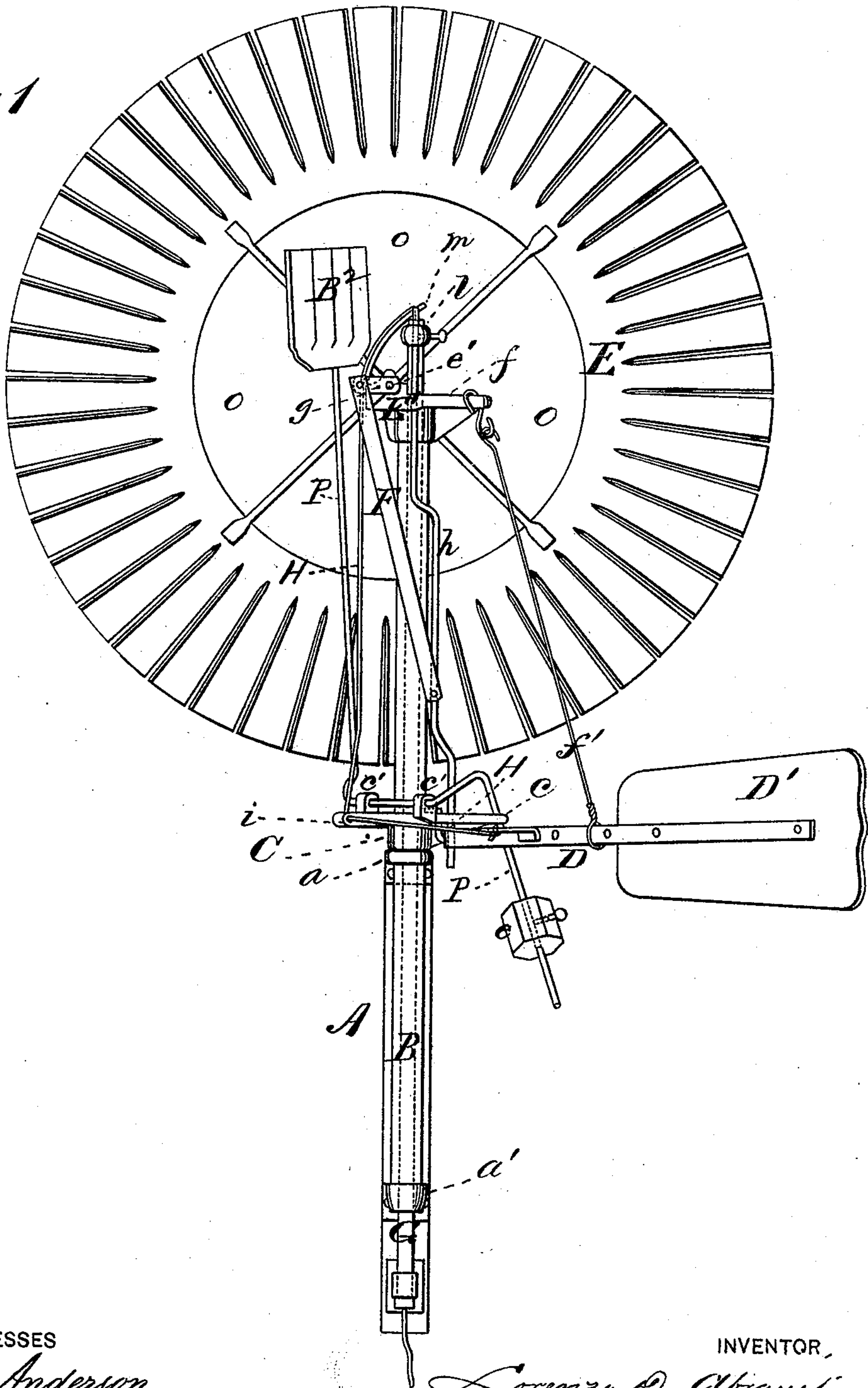


L. D. ABRAMS.
WIND MILL AND GOVERNOR.

No. 179,388.

Patented July 4, 1876.

Fig 1



WITNESSES

Villette Anderson.
E. J. Bates.

INVENTOR,

Lorenzo D. Abrams.
Chipman Hooper & Co.

ATTORNEYS.

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Fig 2

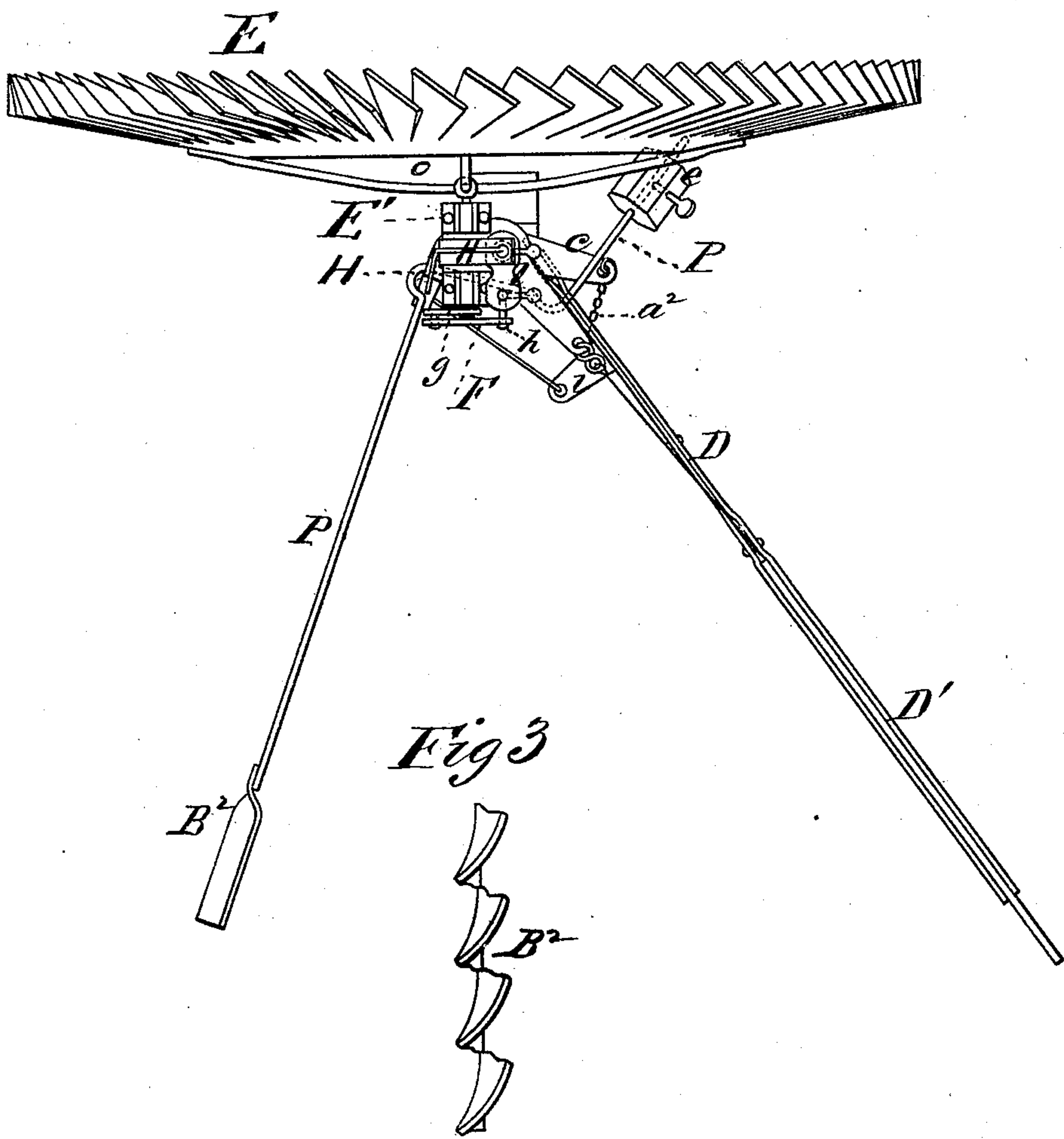


Fig 3

WITNESSES

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UNITED STATES PATENT OFFICE.

LORENZO DOW ABRAMS, OF TUSCOLA, ILLINOIS.

IMPROVEMENT IN WINDMILLS AND GOVERNORS.

Specification forming part of Letters Patent No. 179,388, dated July 4, 1876; application filed December 11, 1875.

To all whom it may concern :

Be it known that I, LORENZO D. ABRAMS, of Tuscola, in the county of Douglas and State of Illinois, have invented a new and valuable Improvement in Windmill and Governors; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a front view of my windmill, and Fig. 2 is an edge view of the same. Fig. 3 is a detail view thereof.

This invention has relation to improvements in windmills; and it consists in the arrangement and novel construction of the various devices used, and in their relation to each other, whereby a very great increase of power is obtained, as will be hereinafter more fully explained and claimed.

In the annexed drawings, the letter A designates a strong, preferably wooden, upright, having at its upper end a metallic plate, *a*, and at a certain distance below it a cup or socket, *a*¹, which affords bearings for a metallic pipe, B, which rotates freely therein. C represents a metallic collar, secured by means of a set-screw upon pipe B, at a point just above bearing *a*, having an arm, *c*, projecting therefrom, and perforated lugs *c*¹ in line therewith. Arm *c* affords bearings for a horizontally-vibrating rudder-arm, D, having upon its outer end a broad blade, D', which arm is connected to arm *c* by means of a chain, *a*², of sufficient length to permit rudder D' to vibrate in an arc of one hundred and eighty degrees. Lugs *c*¹ afford bearings for the bent stem P of a vertically-vibrating and automatically-adjusting rudder, B², the portion between the said lugs being at right angles to the part sustaining the blade B², and an adjustable weight, *e*, being applied upon its downwardly-bent end, for a purpose hereinafter explained. E represents a wind-wheel, of any of the usual well-known forms, which is keyed or otherwise secured upon a shaft, *e*¹, having its bearings in a metallic plate, E¹, on the upper end of tube B¹. This plate is pro-

vided with a projecting arm, *f*, from which the rudder-arm D' is suspended by means of a suitable rod, cord, or chain, *f*¹. *g* represents a crank-arm applied upon the end of the wind-wheel shaft, and connected in the usual manner to a pitman, F, the lower end of which is pivoted to a vertically-reciprocating rod, *h*, guided in plate E¹, and having upon its upper end a horizontal cross-head, *l*, to the free end of which is attached, in any suitable manner, a tubular reciprocating actuating shaft, G, extending through pipe B, through which motion is communicated to the mechanism to be operated. Rudder D' will of itself be sufficient to hold the wind-wheel into the wind, this being its sole function, owing to the fact that it has free motion relative to tube B; but when the force of the wind is such as to endanger the wheel or the mechanism actuated thereby, the wind, blowing through the open center O of the said wheel, will strike against the rudder-blade B², which, having no horizontal vibration, will vibrate vertically, and will cause the wheel to be thrown more or less edging to the wind, according to the force thereof, this result being automatically accomplished, as well as the return of the wheel into, or rather face to, the wind upon its subsidence.

The horizontally-vibrating rubber D' may be thrown into position by hand, for placing the wheel edge to the wind in the following manner, to wit: A rope or chain, H, is attached to the rudder-arm D, from which it extends to an arm, *i*, on collar C, passing through which it then extends upward to a convex guard-plate, *m*, at the upper part of bearing-plate E¹. It is then passed through an opening in the free end of the said plate down through the tubular actuating-rod G within reach of a person standing on the ground. By drawing forcibly downward on this rope or chain the rudder D' will be thrown with its flat surface exposed to the wind, and will be so held by fastening the rope to a belaying pin or cleat on upright A. The wind, acting upon this blade, will throw the wheel edge to the wind, when its motion will cease. The center of wind-wheel E¹ being open, as shown in Fig. 1, the wind will have free access to the blade E², which is thus made very sensitive,

and this sensitiveness will be increased or diminished by raising or lowering weight *e*, which is made adjustable for the purpose.

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

1. In combination with a cord for locking the main rudder *D'*, the collar *C* having arm *i*, the guard-plate *m*, and the tubular actuating-rod *G*, reciprocating in pipe *B*, substantially as specified.

2. In combination with wind-wheel *E*, oper-

ating crank-arm *g*, and pitman *F*, the vertically-reciprocating rod *h*, cross-head *l*, and tubular operating shaft *G*, guided in tube *B*, substantially as specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

LORENZO DOW ABRAMS.

Witnesses:

RICHARD WALMSLEY,

A. W. WALLACE.