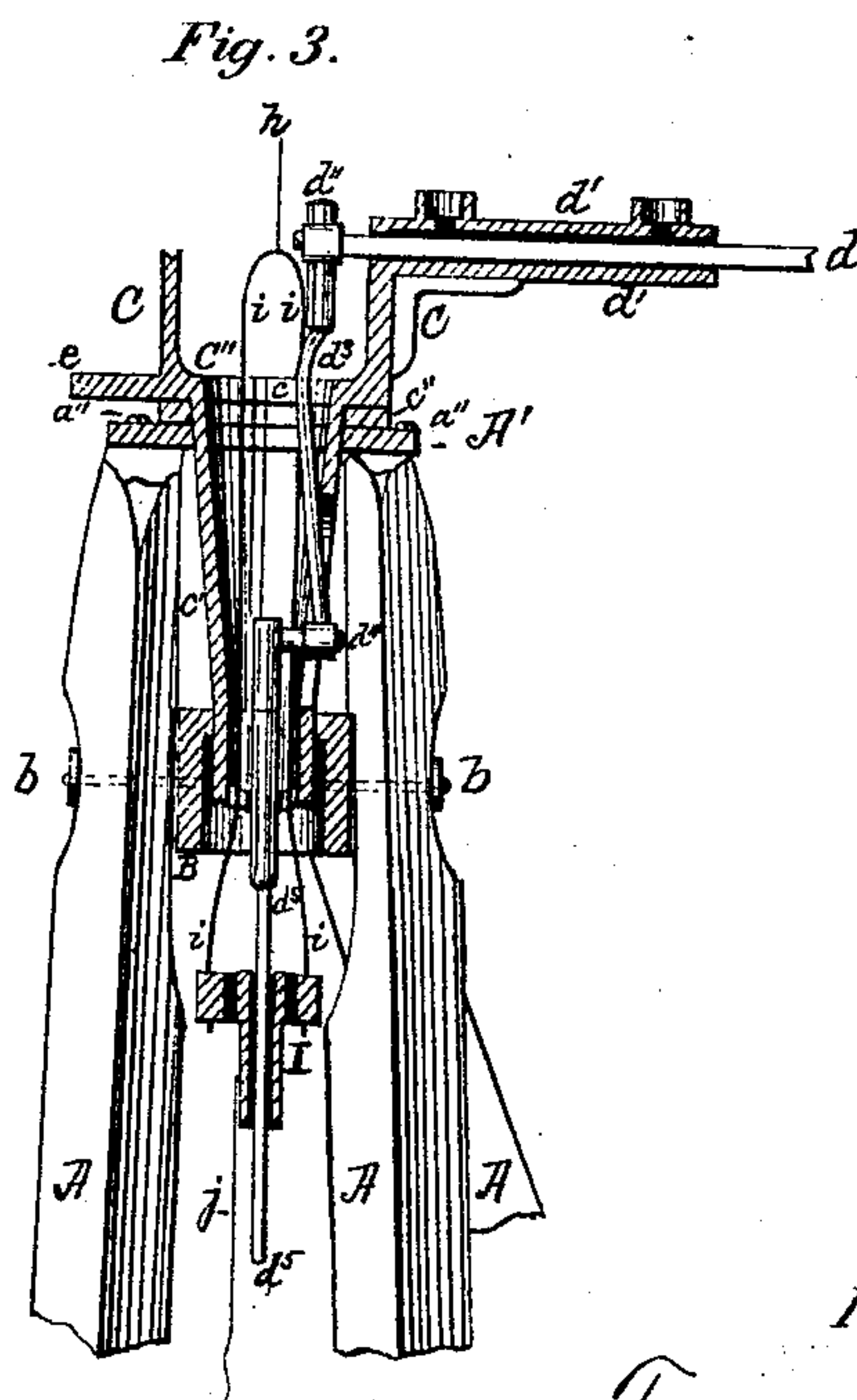
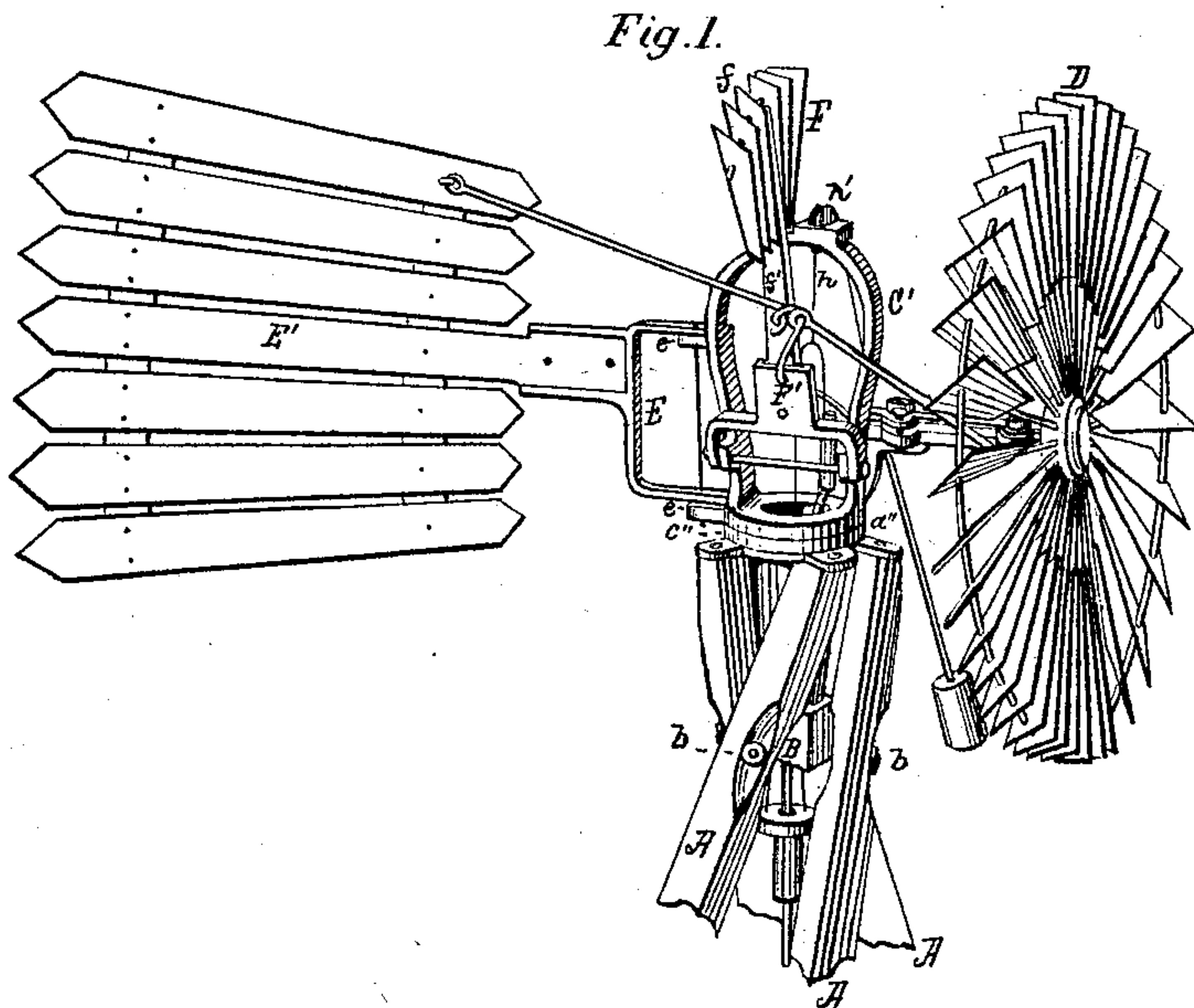


F. M. GOODHUE.
Wind-Mills.

No. 149,301.

Patented April 7, 1874.



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Fig. 2.

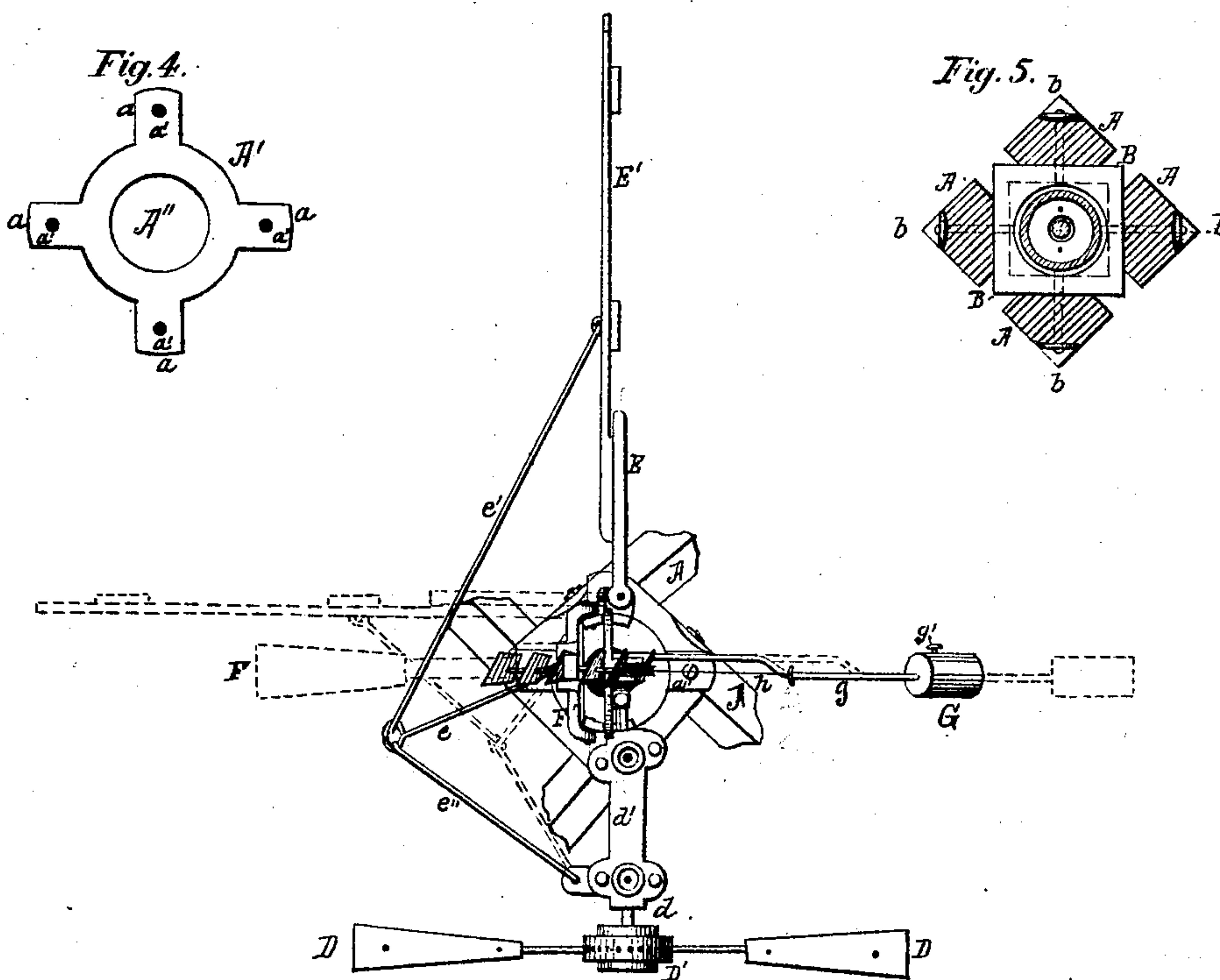


Fig. 4.

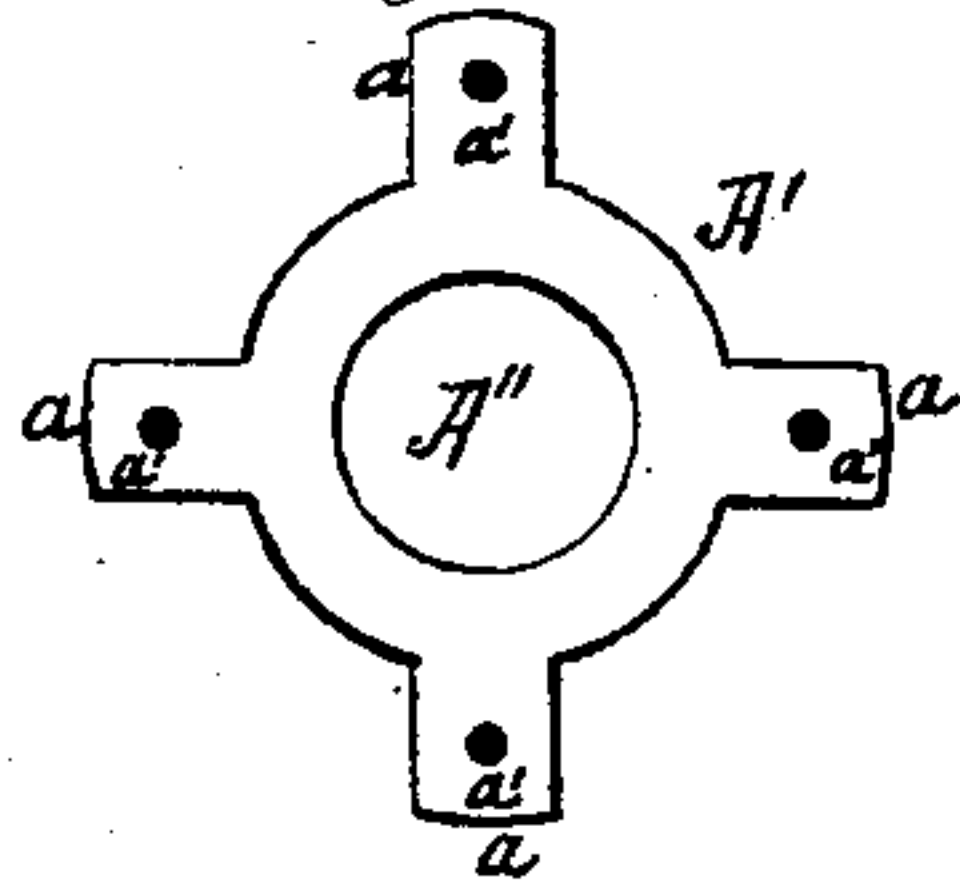
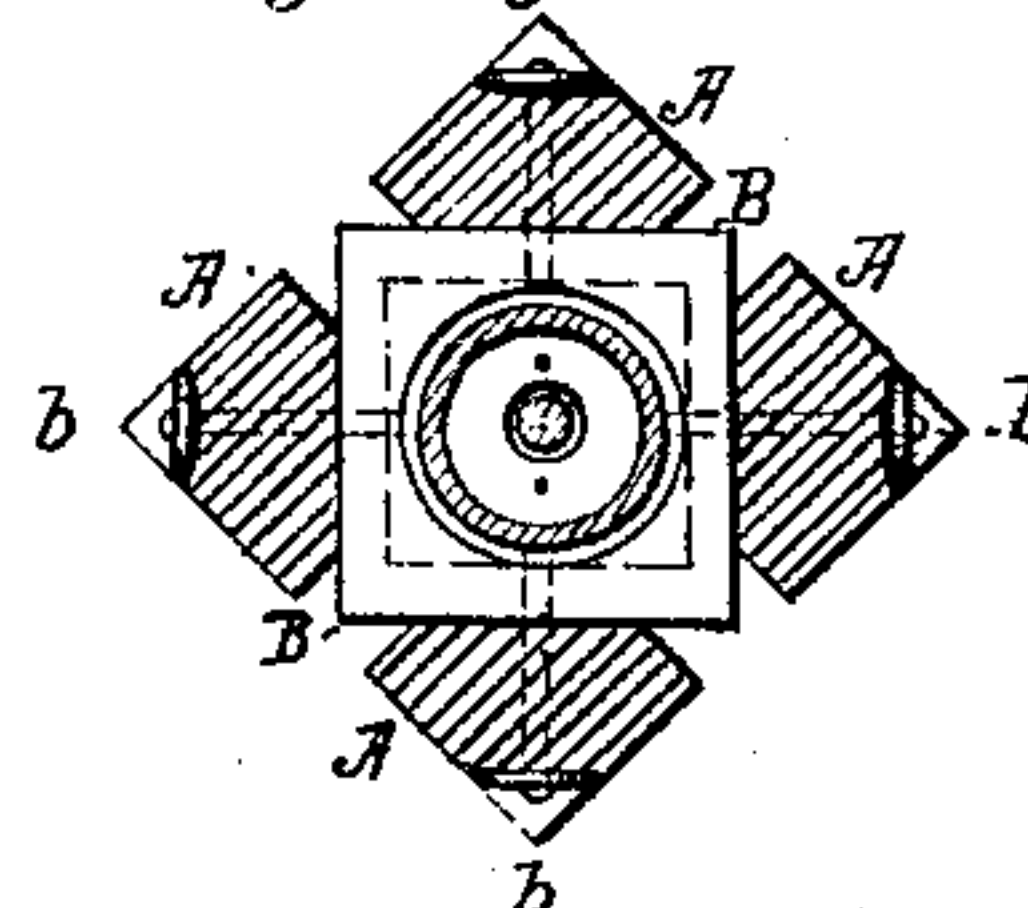


Fig. 5.



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UNITED STATES PATENT OFFICE.

FRANK M. GOODHUE, OF FREEPORT, ILLINOIS.

IMPROVEMENT IN WINDMILLS.

Specification forming part of Letters Patent No. **149,301**, dated April 7, 1874; application filed August 13, 1873.

To all whom it may concern:

Be it known that I, FRANK M. GOODHUE, of Freeport, in the county of Stephenson, in the State of Illinois, have made certain Improvements in Windmills, of which the following is a specification:

The invention consists in the construction, arrangement, and combination of the parts that enter into the machine, as will be more fully hereinafter described.

In the drawings, Figure 1 is a broken vertical view of the machine. Fig. 2 is a top view; Fig. 3, parts in section; and Figs. 4 and 5, enlarged details of parts.

A A A A represent four upright and inclined timbers, bolted to a square metal step, at a distance from their top ends, which are sawed in the same plane. A' is a metal cap-plate, having the four projections *a*, with bolt-holes *a'* therein, and bolts *a''* to secure the tops of timbers A rigidly in place at their top ends, and has a central circular opening, A'', to admit of a hollow revolving box to pass through it and between the upright posts or timbers A. B is a square metal step, to which the timbers A are firmly bolted in an oblique manner, one timber to each face, by cutting away one corner of the right-angled timbers to give a firm bearing upon the step. This step has a round vertical hole through it. *b b b b* are screw-bolts that attach the timbers to the step-block. C is a frame, of metal or other proper material, that supports the wind-wheel shaft and wheel, vanes, and other parts, and is formed, as seen in Fig. 1, with an upward-arched part, C', a circular base-plate, C'', having a central opening, *c*, and taper box *c'*, that extends downward, and the lower end enters the opening or center hole in step-box B, as seen in Fig. 3, and in which the box *c'* can revolve. The base C'' of this frame is a circle, and upon which the upper parts are attached, as well as the taper box that extends downward, and has a central opening to correspond with the hole in the taper box, and of which it forms a part. *c''* is a circular plate resting upon plate A', in which are placed several balls or spheres, so that the base-plate C'' of frame C, which rests upon the balls, can revolve whenever the course of the wind may cause such revolution, and thereby relieve the parts of friction. This plate forms

a kind of turn-table for the frame C, when necessary, or whenever the wind-current changes, so as to cause the wind-wheel to change its position or direction; and the long upright box *c'* being centered in the step-box B at its lower end, and its upper end revolving in plates A' and *c''*, the shaft of the wind-wheel will preserve its horizontality when the wind-wheel is in different positions. D is the wind-wheel, of ordinary construction, the radial arms or spokes of which are on a vertical plane to the shaft of the wheel. D', the hub, is made fast to and revolves with the horizontal shaft *d*, that is supported by and journaled in arm *d'* of frame C. Shaft *d* extends inward from its bearings, in which it revolves, over the opening in the base-plate C'', and terminates in a crank-arm that is attached to box *d''* on pitman *d³*. Pitman *d³* is connected by the arm *d⁴* to the reciprocating rod *d⁵*, which may be used for operating a pump or other machine requiring such motion. E is a swinging frame, pivoted or hinged to lugs *e* on frame C, and to which the wind-vane is attached. E' is the swinging wind-vane, attached to frame C, and can revolve horizontally therewith, is of the usual construction, and is used for keeping the wind-wheel in the proper condition to have the best effect of the force of the air or wind upon the wheel, as well as to be moved to check or stop the motion of the wheel, when desired; or the motion of the wheel may be regulated by the operator by actuating the contrivances for such purpose, and so as to agree with the force of the wind upon the wheel necessary to propel whatever is attached to and to be operated by it. F is an upright and governor vane, having the usual inclined wings or flights *f*, secured to rods that are rigidly fast to arm *f'* on frame F', that is hinged to the side of arch-frame C', as seen in Fig. 1, and allow the vane F freedom to turn from the frame C, and change its upright position to a horizontal; and when in a horizontal position the wind-wheel will necessarily stop its revolution, by reason of the wind-wheel being brought to be on a line parallel with the place or side of the vane E', and is produced by the wind when it has force enough to act on the inclined wings of vane F to cause it to assume a horizontal position; or it can be made to assume this horizontal posi-

tion by the operator, or any intermediate position, as may be desired, in order to regulate the power to the work to be done by the motion of the wind-wheel. *e* is a lever-rod fast to the side of the hinged frame *F'*, and extends a distance from in an upwardly-inclined direction to where it is connected, by a swivel or other joint, to rod *e'*, that has its other end fast to an eyebolt in vane *E'*, and to rod *e''*, that has its other end fast to a clip or other connection with the journal-bearing arm *d'* of frame *C*. On the opposite side of hinged frame *F'*, and firmly attached thereto, is a bent and weighted lever, *g*; and at the outer end, and sliding thereon, is an adjustable weight, *G*, held in such position on lever *g* as may be desired by the holding-screw *g'*. *h* is a cord or chain attached to lever *g*, thence passing upward over pulley *h'* that is attached to the top of arch-frame *C'*, and thence downward to connect with a connecting rod or rods, *i*, that passes down through the hollow taper box *c'* to, and connects with, the sliding guide-box *I* that is on the reciprocating rod *d'*, and freely slides thereon. *j* is a cord or chain attached to guide-box *I*, and extends downward to within reach of the operator, and by which the said operator can draw down the box *I* and raise the weighted lever *g*, and thereby cause the wind-wheel to be more or less edge to the wind, or completely edge to the wind, when the mo-

tion will cease, as the passing wind will have no power on the wheel to revolve it.

By this construction of tower for the wind-wheel, and bolting the timbers to the square step-block much nearer the top than the base, gives a wide spread to the timbers, and forms a secure support for the tower, wind-wheel, and other parts of the mill.

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

1. The upright governor-vane *F*, having inclined wings *f* oscillating from a perpendicular to a horizontal position, in combination with the hinged rudder-vane *E'* and wind-wheel *D* through the flexible connection made by the rods *e*, *e'*, and *e''*, substantially as described.

2. The combination of the cord or chain *j*, guide-box *I*, rods *i*, cord or chain *h*, weighted lever *g*, vane or rudder *E'*, and wind-wheel *D*, constructed and operating substantially as described.

3. The tower composed of the four timbers *A*, bolted cornerwise and obliquely to the outsides of the rectangular hollow step-box *B*, in the manner substantially as and for the purposes described.

FRANK M. GOODHUE.

Witnesses:

JAMES I. NEFF,
J. M. GOODHUE.