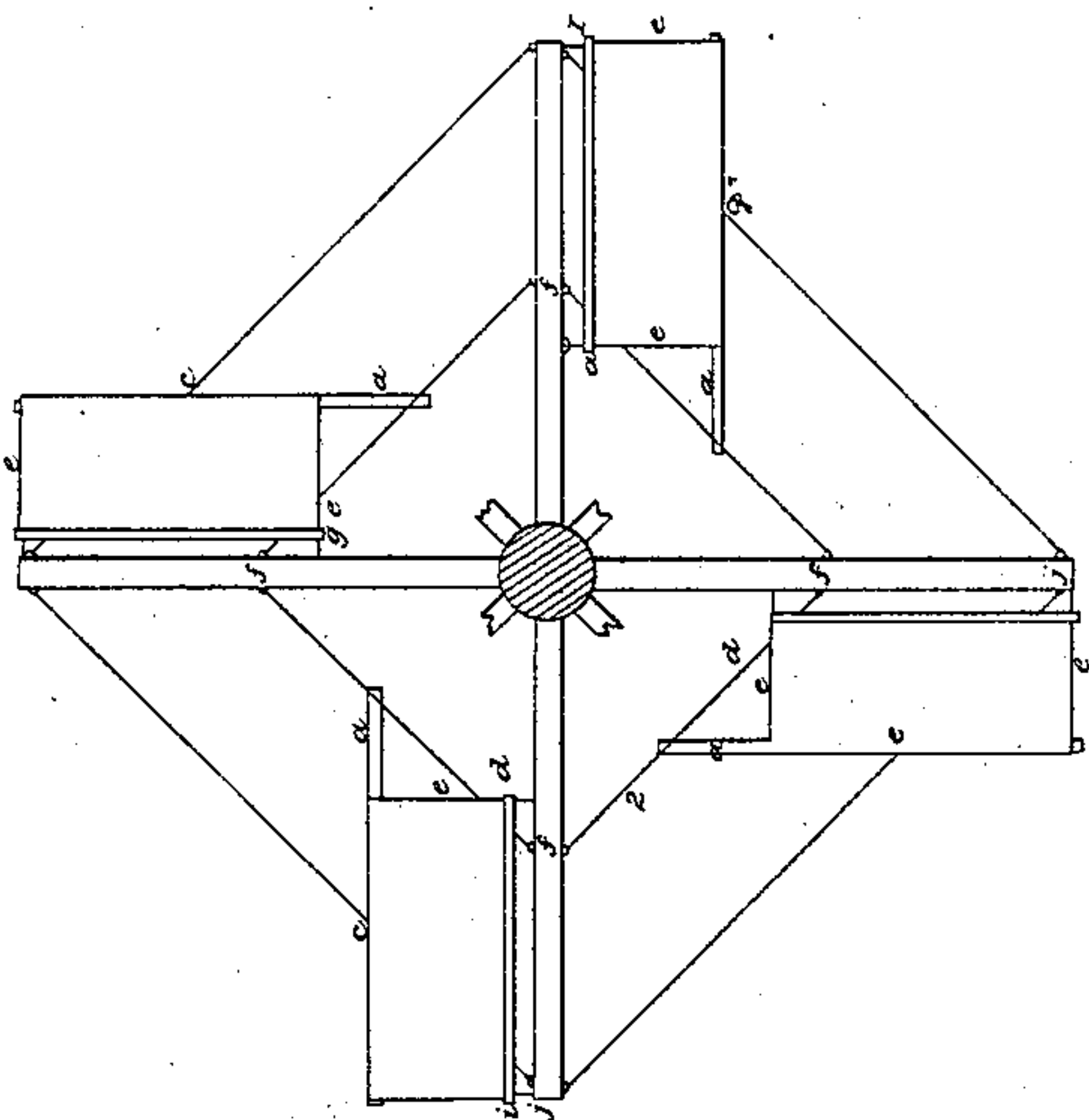


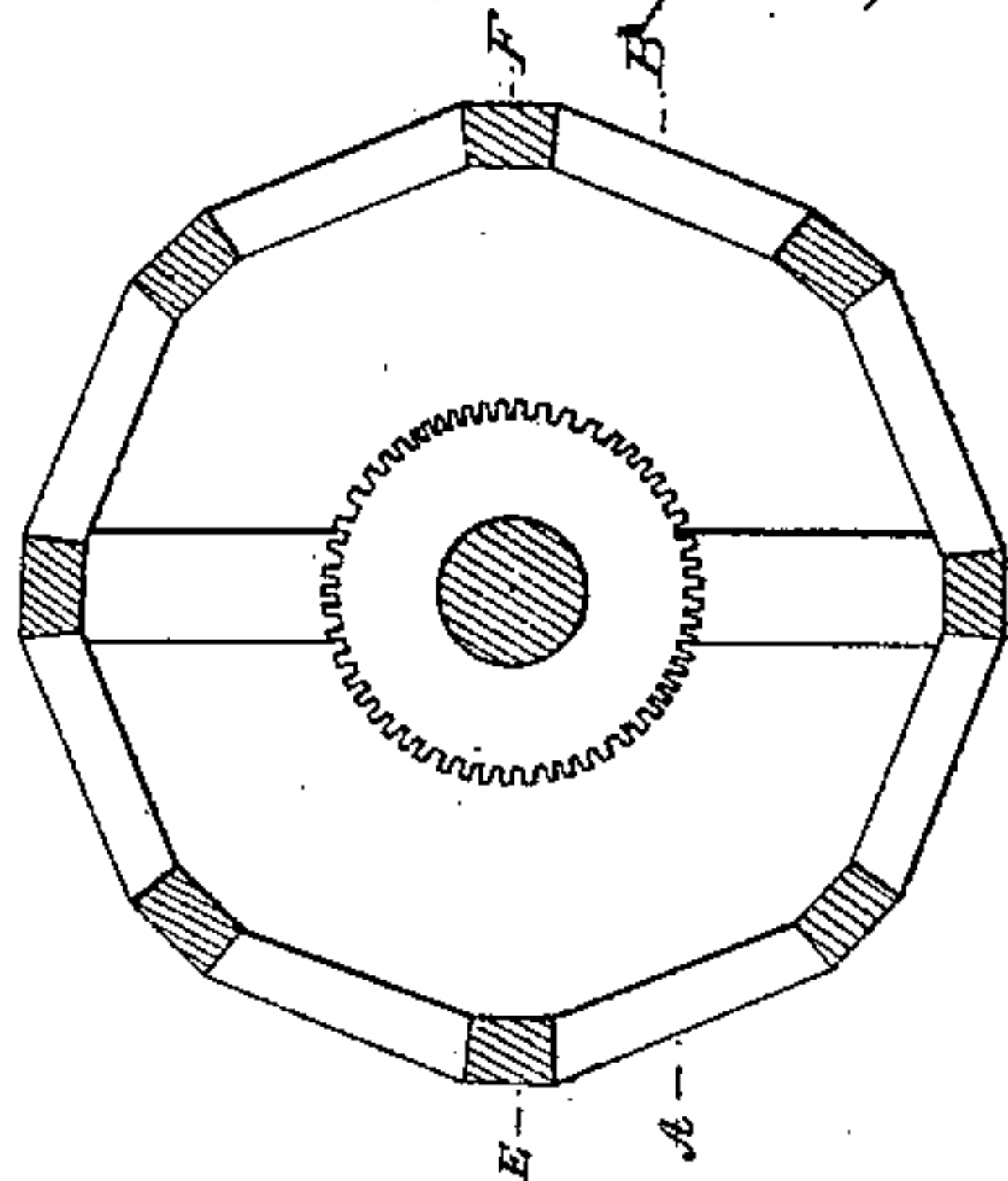
*Wind Wheel,*

N<sup>o</sup> 6,571.

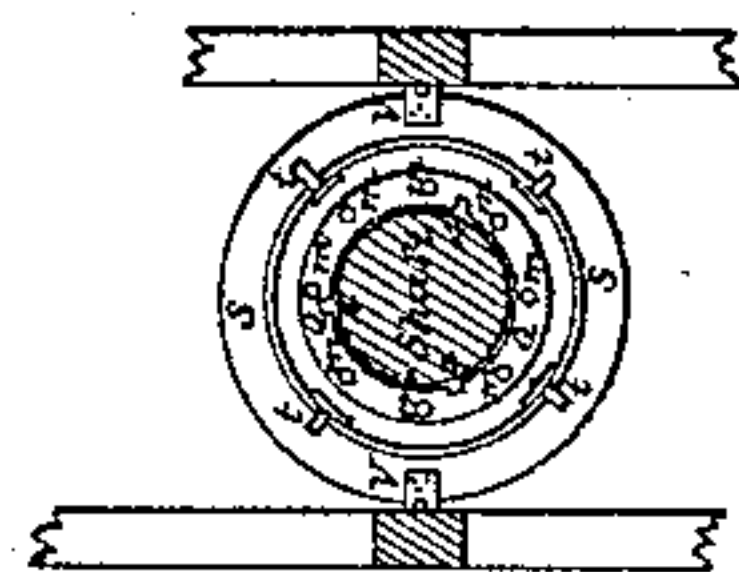
*Patented July 3, 1849.*



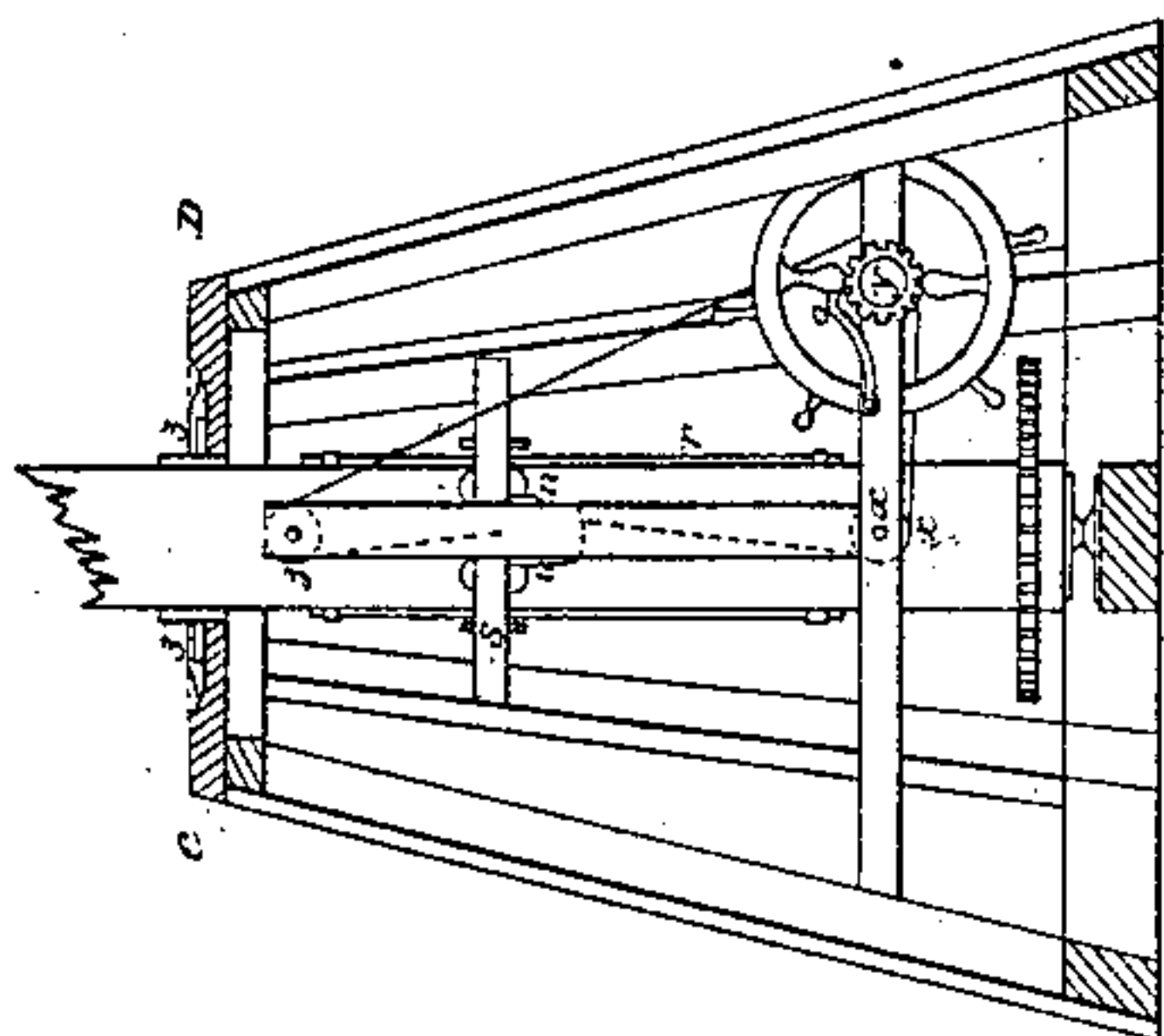
*Top View of upper Set of Sails*



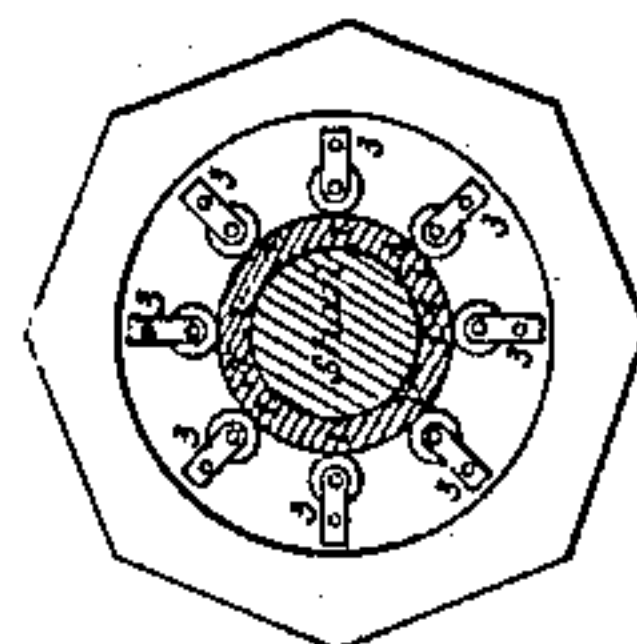
### Ground Plan Driving Wheel



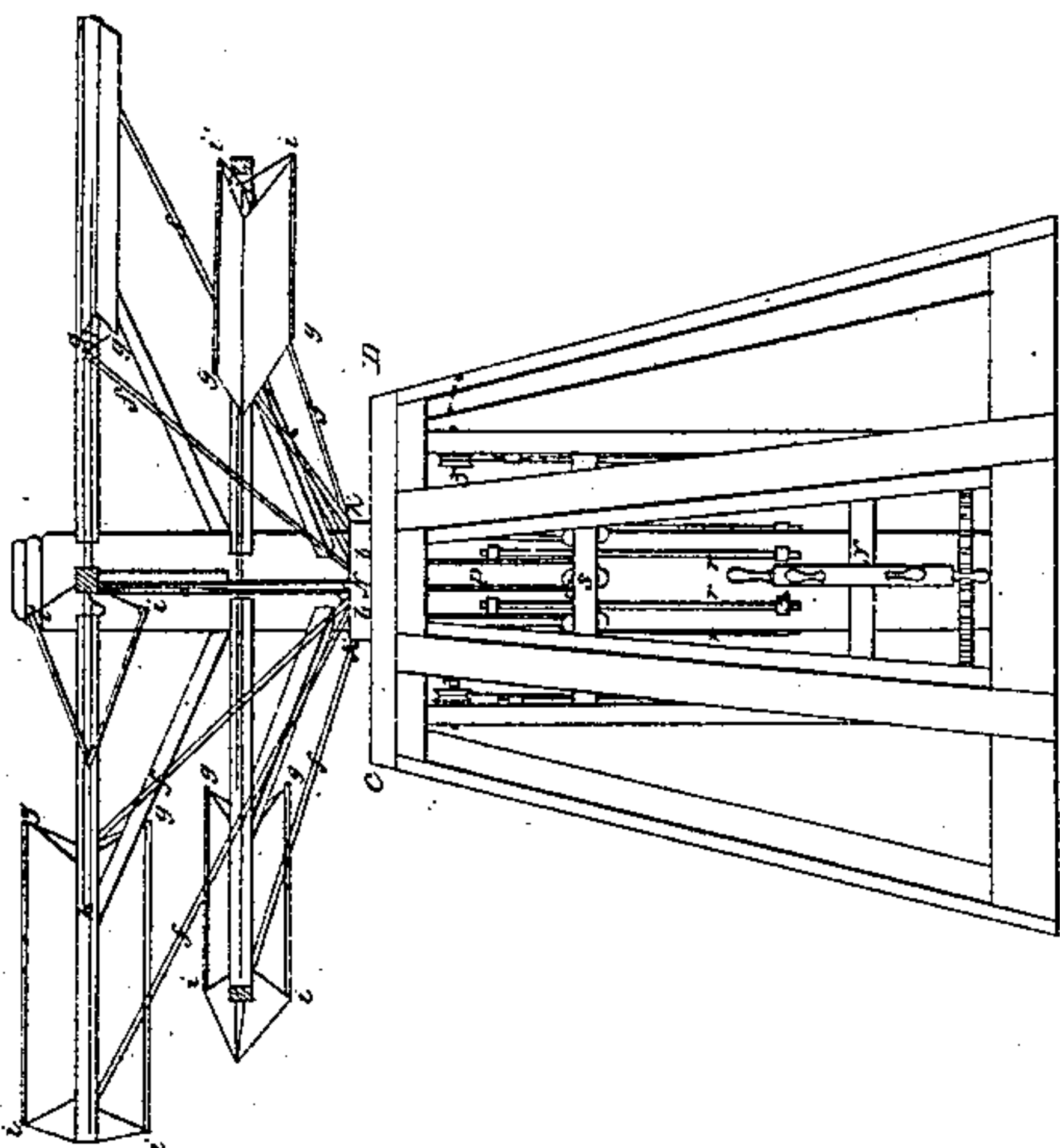
*Top of Flange*



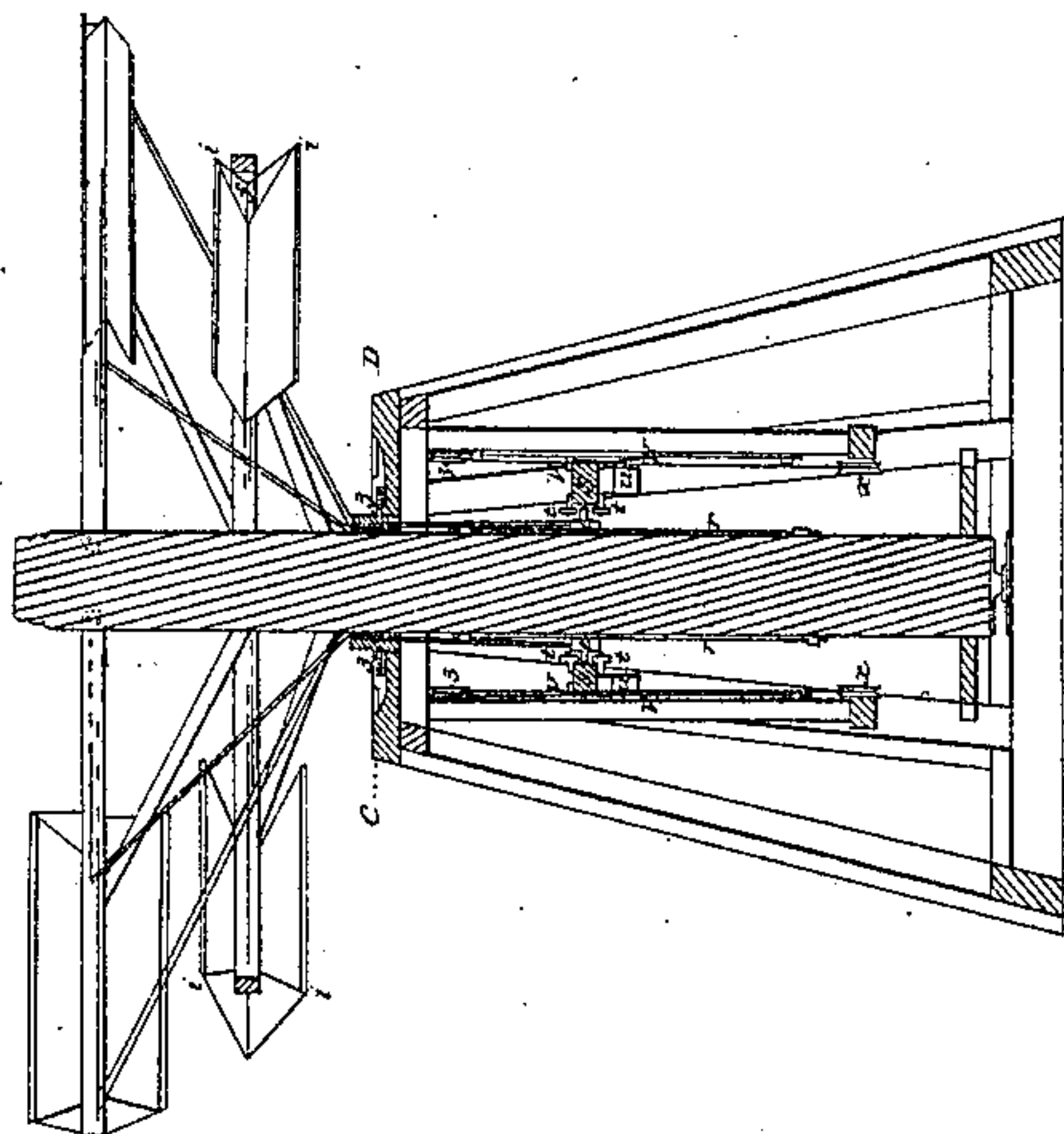
*Section at A. B.*



Top of Frame  
Section at C.D.



*Side View*



*Section through centre of Shaft (at E.F.)*



# UNITED STATES PATENT OFFICE.

EMORY GORE AND EMERSON GORE, OF CHARLESTON, IOWA.

## IMPROVEMENT IN WINDMILLS.

Specification forming part of Letters Patent No. 6,571, dated July 3, 1849.

*To all whom it may concern:*

Be it known that we, EMORY GORE and EMERSON GORE, of Charleston, in the county of Lee and State of Iowa, have invented a new and Improved Mode of Propelling Machinery by Wind and Water; and we do hereby declare that the following is a full and exact description.

The nature of our invention consists in propelling machinery by wind or water by means of horizontal expanding and closing sails or wings which may be regulated to any force of wind, which will in a great measure do away with the present expensive mode of steam.

To enable others skilled in the art to make and use our invention, we will proceed to describe its construction and operation, first by describing the tower, which is composed of eight posts framed together by sills and girts, making it eight square, tapering toward the top, (see ground plan and side view,) in the center of which tower we place an eight-square shaft, running above the top of the tower sufficiently high to admit of two sets of arms, four in each, which are supported by braces, one set to be inserted into the shaft at a proper distance above the bearing (or top of the tower) to admit of their being braced, the other set to be inserted or framed into those squares unoccupied by the lower ones at a proper distance above to give the sails sufficient room to expand. Each set of arms are stayed by two circles of ropes or large wires. (See Figs. 1 and 2 in top view of upper set of sails.) The outside circle passes through the back of each sail at *c* and is fastened to the end of each arm, as seen at *j*. The inner circle passes between the folds of each sail at *d* and is made fast at each arm at *f*. *a* represents a rod in the back of each sail permanently affixed to these circles, around which rod the sails fold and to which they are attached, as seen in the drawings. These circles not only serve to stay the arms, but to keep the sails in their position. Ropes or wires are also used to stay the rods in the back part of the sails, as seen at *e* and *e*.

It will be observed that the sails lie in a horizontal position and are spread by means of rods durably affixed around their edges. Other strengthening-rods may also be applied to the sails, if necessary. The construction of

these sails is such that when in motion, it makes no difference from what direction the wind blows, it will continue to expand the sails on one side, forcing them around, while it closes them on the opposite side of the shaft, as seen in side view. *f* in the same view represents a loop or rope, one end of which is made fast to the upper wing near the inside corner, the other end fastened to the lower wing. (See *g* and *g*.) The loop is then drawn through a ring inserted into the arm at *H*. A rope or loop of the same description is fastened in like manner to the other end of the sail at *i* and *i* and likewise drawn through a ring at *j*. These loops are then brought down and connected to a single rope at the point *K*. This rope is drawn through an opening at *l* in a collar or bearing *N*, which collar is around the shaft at the top of the tower. (See top of frame or section *C D* and side view.)

*P* represents the rope drawn down and connected to a staple *m*, (see side view,) which staple is in the ring or flange *Q*. (See top of flange.) We have described the manner in which the regulating-ropes are attached to one of these sails. The others are fixed in the same manner.

*N* represents the collar or bearing around the shaft, inside of which there are eight openings or passages, through which the regulating-ropes are drawn, as seen at *l*. This collar should be cast in two pieces and secured around the shaft with bolts or otherwise.

There are eight friction-rollers running in slides or boxes, which are let into and bolted to timbers around the shaft upon the top of the tower, which rollers work against the collar or bearing for the purpose of doing away with friction. The slides are composed of two pieces each, the top pieces being let into the lower ones, with a mortise in the middle, through which they are bolted. (See Fig. 3, top of frame-section at *C D*.) This mortise should be of sufficient length to admit of their being moved to or from the bearing.

*Q* represents a metal ring, around which projects a flange which runs between eight friction-rollers, four above and four below. (See *Q* in top of flange and also in section through center of shaft.) *m* represents eight staples inserted into the top of this ring at an



equal distance from each other, to which the regulating - ropes are attached. (See ring Q.) There are also three grooves cut across the inside of this ring (see Fig. 4, top of flange) for the purpose of sliding upon metal bars, which are bolted vertically upon the shaft, the lengths of which bars are governed by the size of the sails and the distance which they expand. (See  $r$  in side view, section through center of shaft, and section at A B.)

S represents a rim around the flange Q, which should be large enough to admit of the flange turning within it without obstruction, as seen in the view last mentioned and top of flange. There are eight spindles, four of which are let into and bolted on the upper side of the rim S at an equal distance from each other and also four bolted in like manner to the under side of the rim between those of the upper side. Upon these spindles the friction-rollers work, as seen at  $t$  in top of flange and section through center of shaft, between which rollers the flange turns with the shaft, keeping the regulating-ropes straight and thus holding the flange in its proper position while it is carried up and down by the rim S to regulate the sails. U represents two arms framed into the lower side of this rim, being even with it at the outside, one placed opposite to the other, which should be long enough to hold the rim steady. (See section through center of shaft.)

V represents four metal slides, one of which is bolted upon the outside of each arm U at the lower end, and also one directly above each of these at the top of the rim, as seen at V, which slide upon two bars similar to those upon the shaft, being enough longer to admit the sliding of the arms U. These bars are bolted to posts standing each side of the shaft. At the end of each arm U we fasten a rope by a staple or otherwise, which is brought down around a pulley at  $x$  and then attached to the regulating-shaft  $y$ . (See section at A

B.) There are also two other ropes made fast in like manner to the upper side of the rim S directly above those described on the lower end of the arms running over pulleys above the bars at  $z$  for the purpose of raising the rim. From these pulleys they are brought down and connected to the regulating-shaft  $y$ , which lies in a horizontal position in front of the pulleys  $z$  and  $x$ , (seen in section at A B,) upon which shaft we place a wheel with handles inserted into the rim, by which it is turned either way for the purpose of regulating the sails. It will be observed that by turning this wheel one way it winds up the ropes on one side of the shaft  $y$ , raises the rim, and slackens the regulating-ropes of the sails, which allows the wind to expand them, while turning it the other way lowers the rim and closes the sails, the regulating - ropes from all the sails being brought down through the openings in the bearings N and attached to the staples in the flange Q.

On one end of the shaft  $y$  we place a ratchet-wheel, through which, by means of a ratchet or dog dropping into it, the sails are held at any particular pitch which the stage of the wind may require in order to drive machinery regular. (See O section at A B.) These sails or wings are designed to run upon the same principle by water also.

What we claim as our invention, and desire to secure by Letters Patent, is—

The horizontal expanding and closing sails or wings as applied for the purpose of propelling machinery by wind or water, in combination with the mode by which they are regulated, as described in the foregoing, and shown by the drawings.

EMORY GORE.  
EMERSON GORE.

Witnesses:

EBENEZER GORE,  
PETER SLINGERLAND.