(No Model.) 3 Sheets—Sheet 1.

M. SCHOU.

WIND ENGINE.

No. 508,990. Patented Nov. 21, 1893.

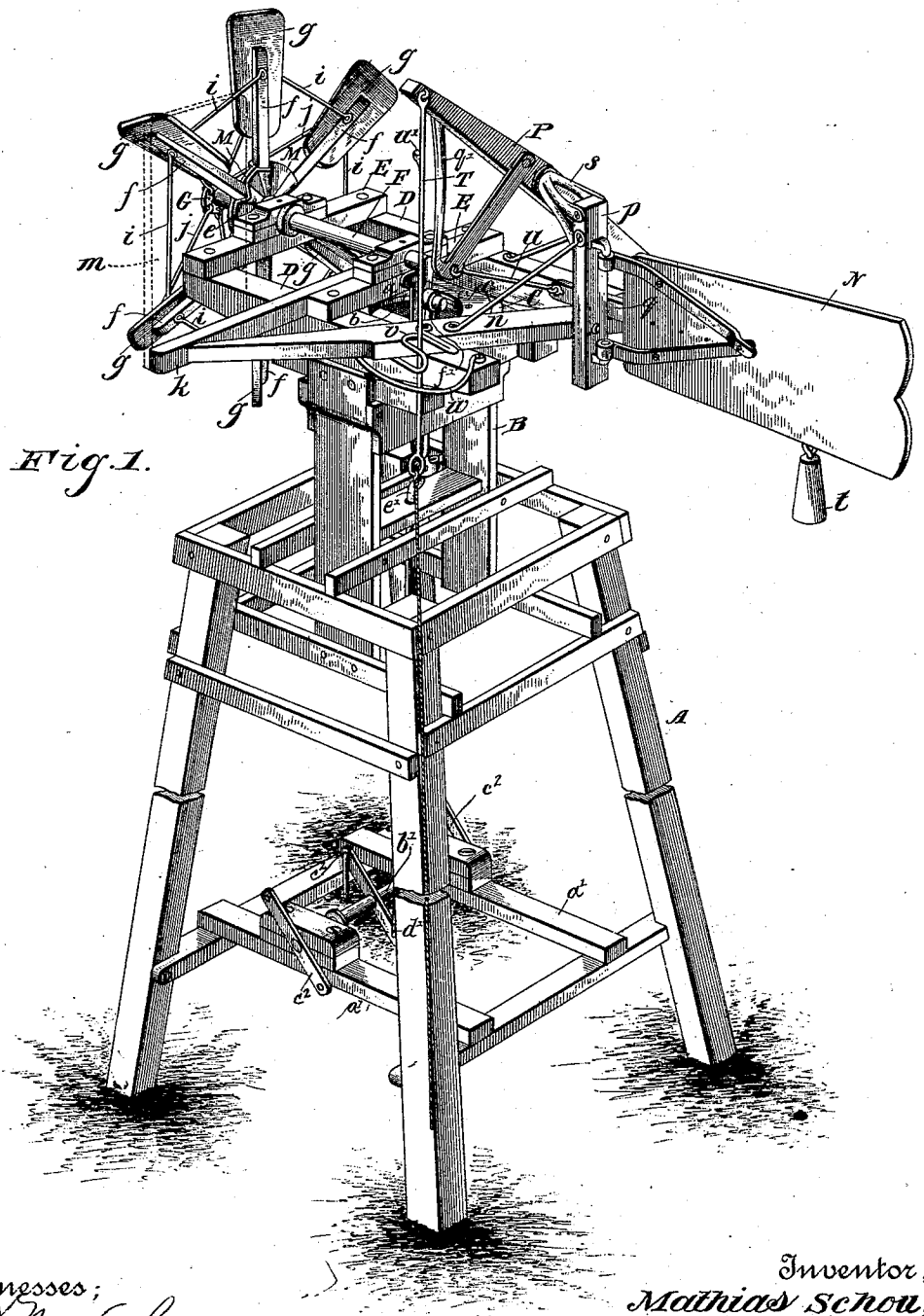

Fig. 1.

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(No Model.)

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Fig. 2.

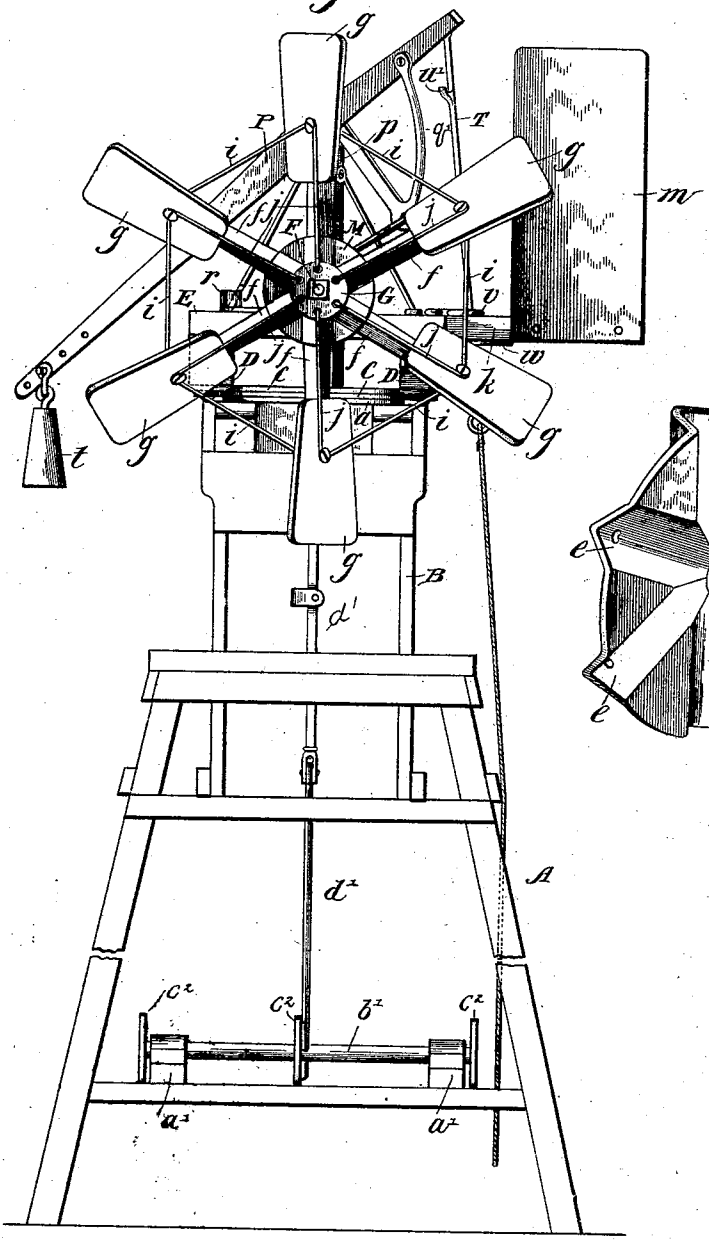
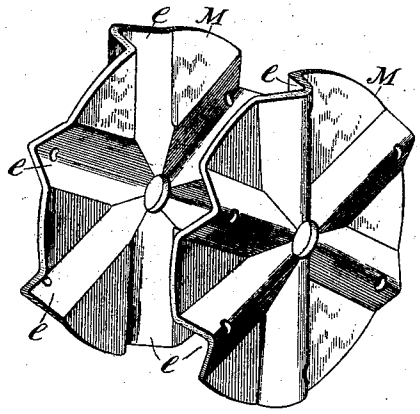


Fig. 5.



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3 Sheets—Sheet 3.

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Fig. 3.

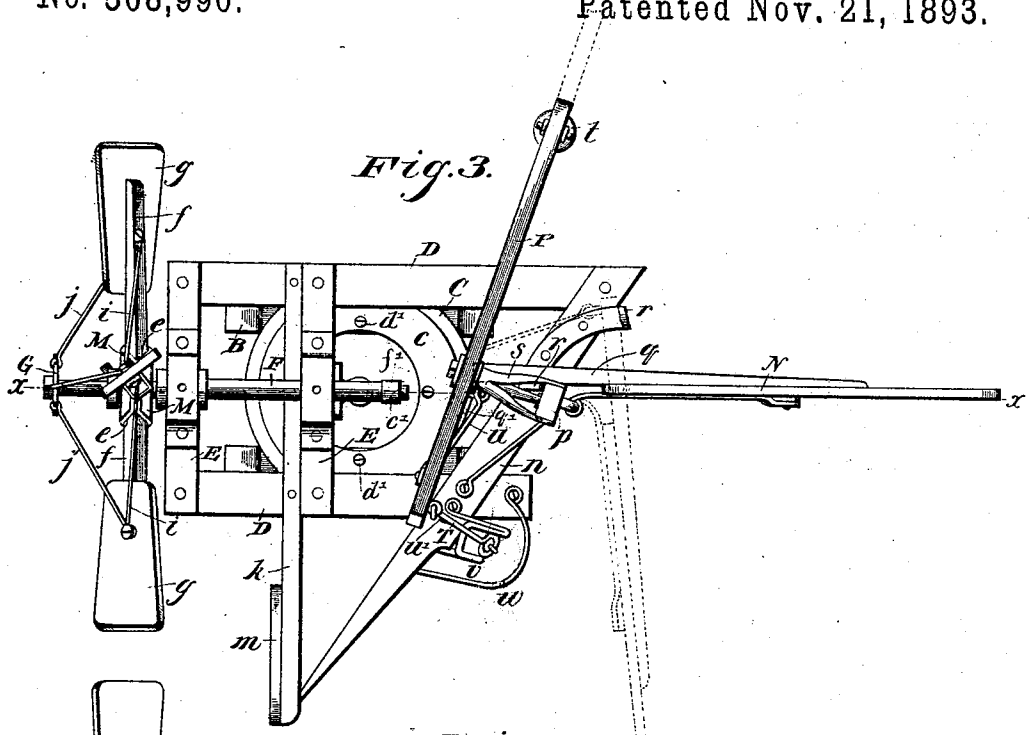
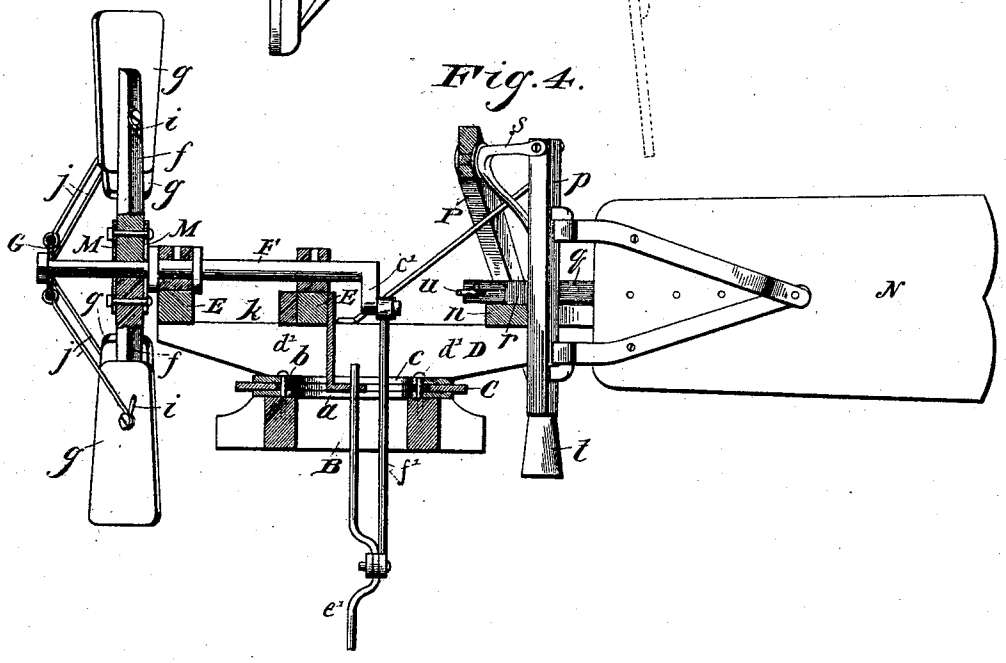


Fig. 4.



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UNITED STATES PATENT OFFICE.

MATHIAS SCHOU, OF KINSLEY, KANSAS.

WIND-ENGINE.

SPECIFICATION forming part of Letters Patent No. 508,990, dated November 21, 1893.

Application filed January 19, 1893. Serial No. 459,307. (No model.)

To all whom it may concern:

Be it known that I, MATHIAS SCHOU, a citizen of the United States, residing at Kinsley, in the county of Edwards and State of Kansas, have invented certain new and useful Improvements in Wind-Engines, of which the following is a specification, reference being had to the accompanying drawings.

The object of my invention is to produce a practically efficient wind engine that may be made strong and durable at a comparatively small cost.

In the accompanying drawings, Figure 1 is an oblique rear perspective of my engine. Fig. 2 is a front elevation thereof. Fig. 3 is a top plan view of the engine, detached from its support. Fig. 4 is a central vertical section taken in the plane indicated by *x*, *x*, Fig. 3; and Fig. 5 is a perspective view of the two hub-disks, detached.

Referring to the figures on the drawings, A indicates a tower of ordinary construction, and B the head thereof. The tower-head carries a platform composed of a metal annulus *a*, a superimposed narrow flat annulus *b*, a broad annulus C surrounding the annulus *b* and extending beyond the periphery thereof.

c indicates a top annulus.

The several parts are secured to the tower head in suitable manner, as by bolts *d'*. The annuli *a*, *b*, and *c*, as shown clearly in Fig. 4, afford a sort of grooved box, within which the annulus C is free to rotate. By this construction I secure a strong bearing for the beams D, which are firmly secured to the annulus C, and which are fastened together to form a rigid frame by the cross beams E.

F indicates a wheel-shaft carried in suitable bearings in the cross-beams E, and is provided in its inner end with a crank *c'* adapted to actuate a reciprocatory rod *e'* by means of a pitman *f'*. Upon its outer end it carries a wind-wheel of suitable construction.

I have illustrated a preferred form of wheel composed of hub-disks M having opposite radial indentations *e*, preferably angular in cross section, in which the correspondingly shaped spokes *f* are inserted. As illustrated the angular indentations of the hub-disks, when united, form recesses rectangular in cross section. The purpose of these parts in this connection is to afford convenient means of changing the lateral inclination of the spokes readily, and without impairing in any way the security of their connection with the shaft. For this reason the number of angles in the indentations may be increased, so that smaller degrees of angle of the spokes in their sockets may be effected.

G indicates the blades of the vanes attached to the spokes in any suitable manner.

j indicates radial braces fastened at one end to a disk G on the outer end of the shaft F, and at their other end to the blades *g*.

i indicates transverse braces connecting each pair of adjacent blades.

k indicates an arm secured to the upper side of the beams D, and preferably extending alongside of the inner cross-beam E. Upon its outer end the arm *k* carries a vertical emergency vane *m*. It extends somewhat beyond the periphery of the wheel, and is designed to receive the impact of the wind and at times turn the frame upon its platform, thereby preventing damage to the engine in high winds.

n indicates an oblique cross-arm secured to the beams D, and at one end to the arm *k*. It carries in the line of the shaft F a vertical arm *p*, to which is hinged the vane N.

q indicates an arm secured at one end to the vane, and at the other end pivoted to the link *u* which is pivoted at its other end to the bell-crank lever *q'* that is fixedly secured to a lever P pivoted to a bracket-support *s* fixed to the upper end of the vertical arm *p*. The lever P carries at one end an adjustable counterweight *t*, and is adapted to be operated at its opposite end by a pull-rod T. The pull-rod T is provided with a hook *u'* adapted to engage with the catch-loop *v* and hold the lever P depressed in opposition to the counterweight *t*.

w indicates a retaining band or guard surrounding the rod T and the loop *v*.

r indicates vertical stops or projections adapted to receive the impact of the arm *q* and limit its rotatory motion.

Mounted in suitable bearings upon cross pieces *a'* in the lower part tower is a shaft *b'*, which carries a plurality of cranks c^2. The middle crank c^2 is connected with the rod *d'*

of the engine, and is operated by it. By this arrangement I am able to run a plurality of pumps at the same time.

In operation the wheel is rotated in the ordinary manner, the spokes and blades having been adjusted at the desired angle. If, while the vane is in the wind, the wind should suddenly rise, the emergency vane *m* will act promptly and prevent injury to the engine, which might occur before the vane N could operate. The vane N is controlled by the lever P and the pull-rod T. A pull upon the latter will throw the vane at right angles to the shaft *f*, as illustrated in dotted lines in Fig. 3 of the drawings, the movements of the vane being limited by the striking of the arm *q* against the stop *r*. The vane may be fastened in this position by hooking the rod T upon the loop *v*. As soon as the rod is released the counterweight *t* depresses the lever P and throws the vane again into the wind. The horizontal movement of the engine is controlled by the vane, which is prevented from offering too rigid a resistance to the force of the wind by the counterweight *t*, which yieldingly holds it against the wind. The leverage of the counterweight may be regulated by its adjustment upon the nut of the lever P.

While I have described and illustrated specific mechanism, I do not wish to limit myself to the exact details of construction, but to reserve the right to modify and vary them at will within the scope of my invention.

What I claim is—

1. In a wind engine, the combination with a rotatory frame, of an oblique arm carried thereon, a vertical arm fixed to the oblique arm, a vane horizontally pivoted to the vertical arm, a vertically pivoted counterweighted lever operatively connected with the vane, a loop upon the oblique arm, and a hooked pull-rod pivoted to the lower end of the lever, and depending in the path of the loop, substantially as and for the purpose specified.

2. The combination with a fixed tower provided with a continuous grooved box, of a rotatory frame provided with a continuous projection or annulus adapted to move within the grooved box whereby a circular bearing and a continuous guide for said rotatory frame is produced, substantially as specified.

In testimony of all which I have hereunto subscribed my name.

MATHIAS SCHOU.

Witnesses:
A. J. HATCH,
A. C. DYER.