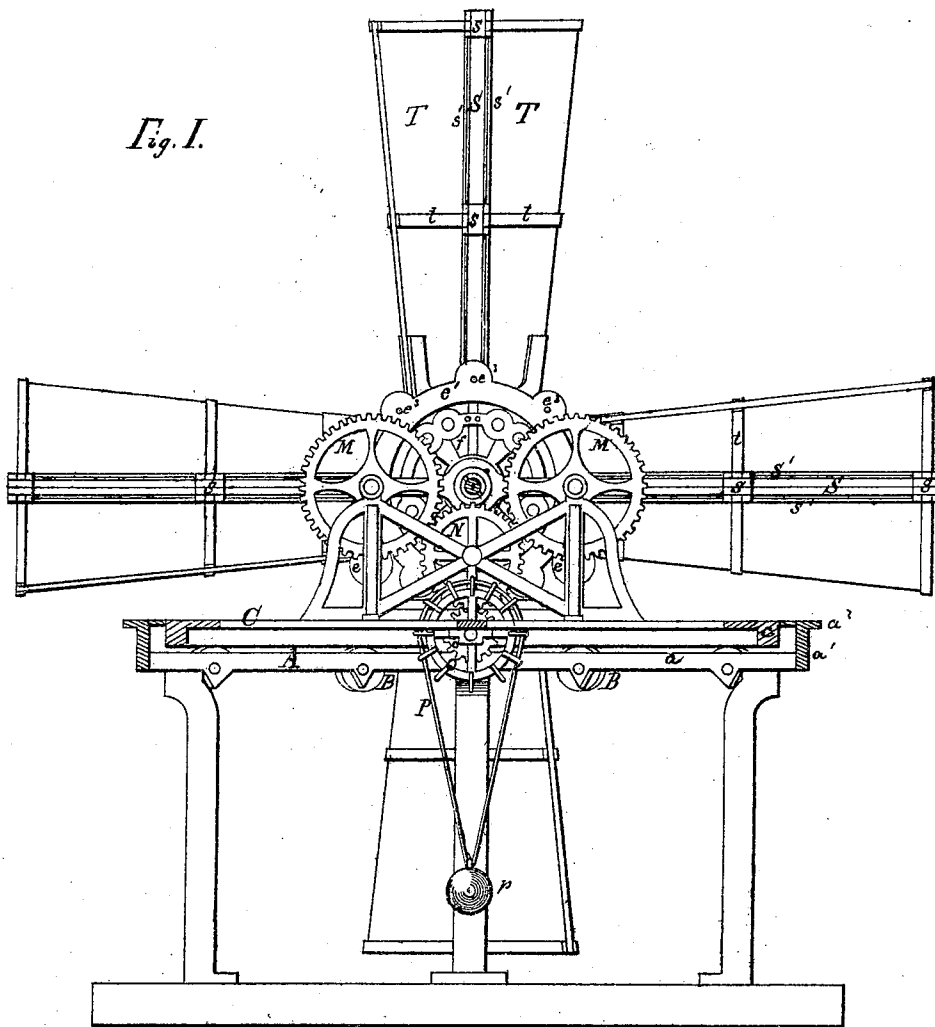


S. F. STOWE.
Wind-Mills.

No. 141,827.

Patented August 12, 1873.



Witnesses.

Chas. B. Steele

E. A. Bates

Inventor.

Samuel F. Stowe

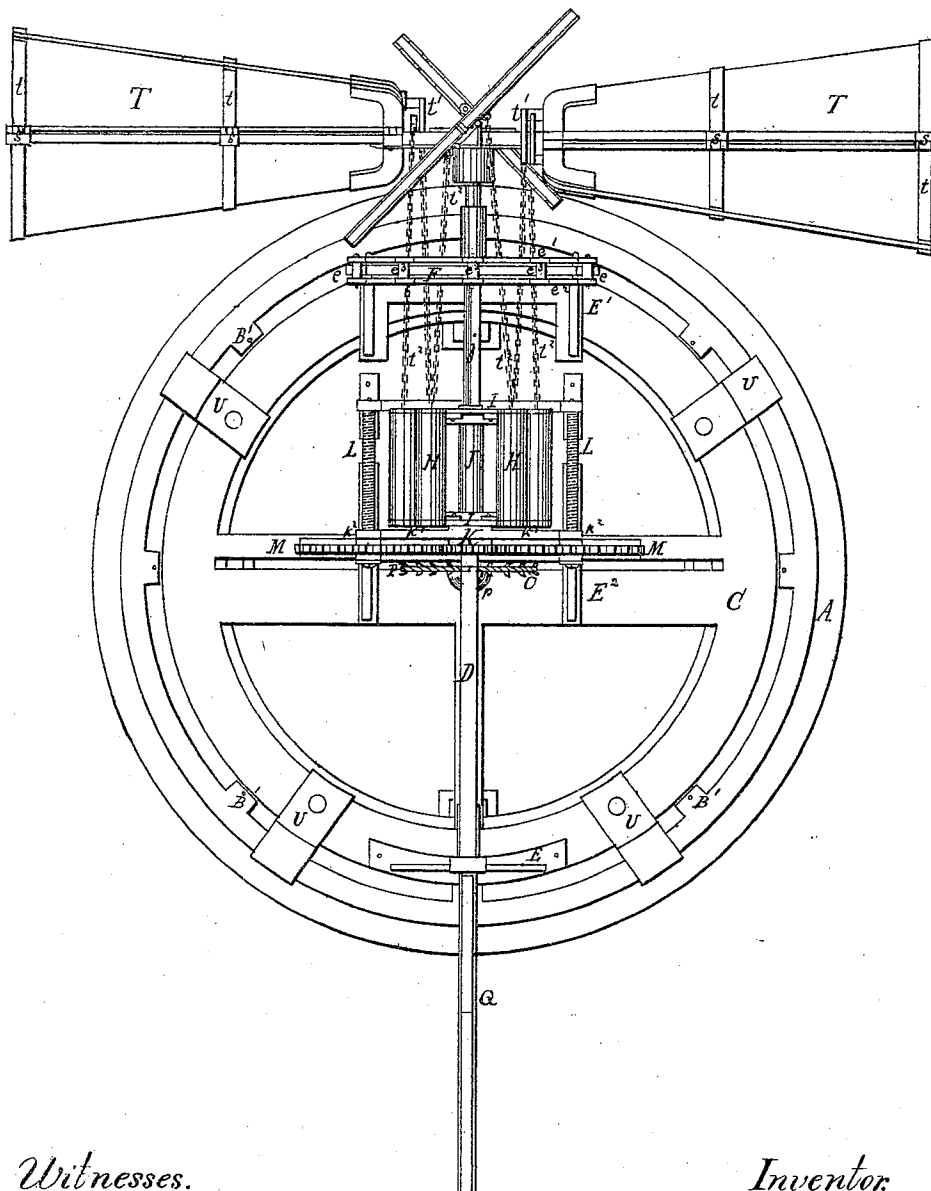
Oliver W. Sumner & Co.
Attys

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Fig. 2.



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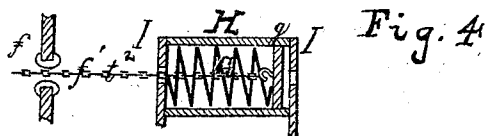
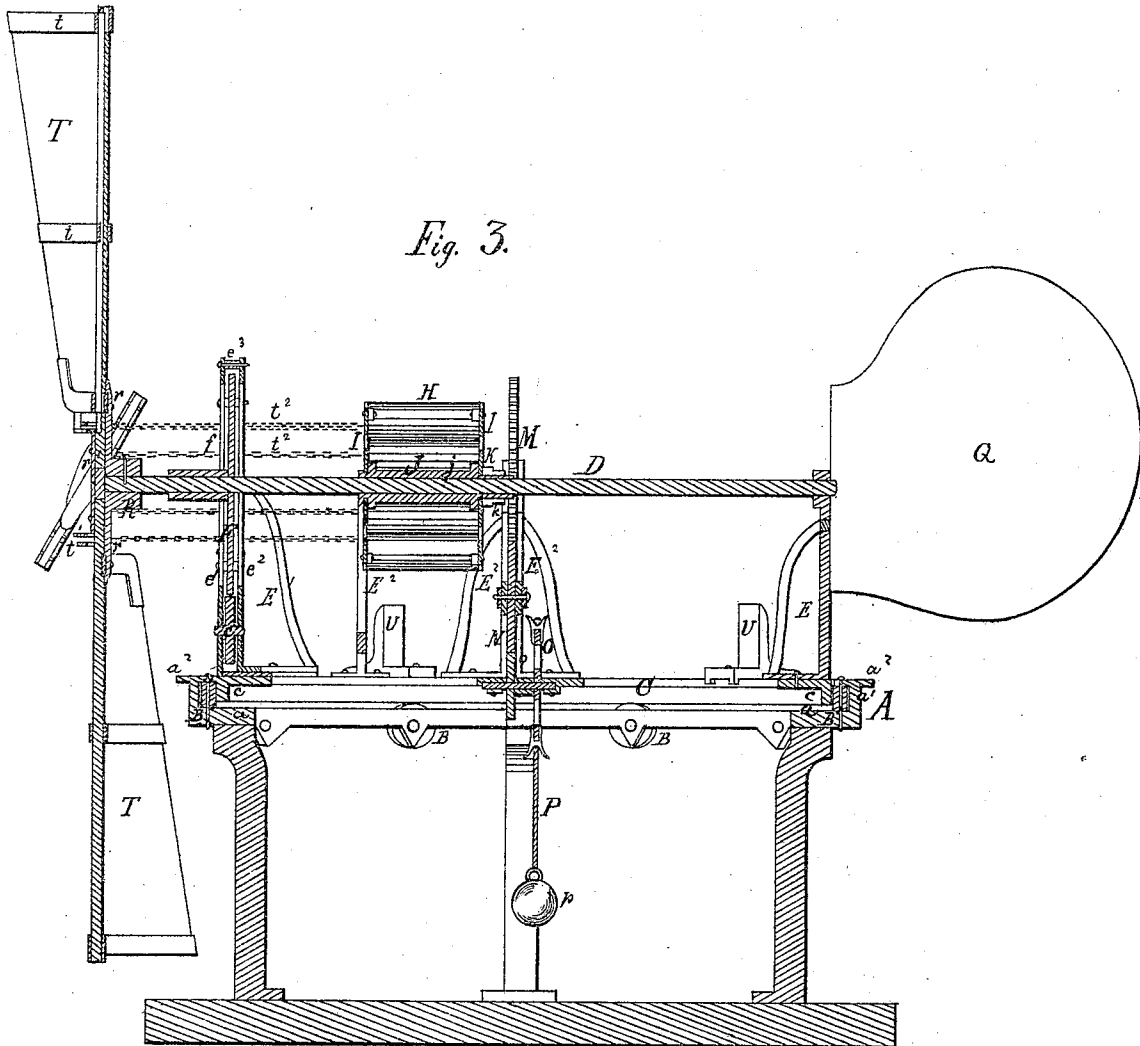
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Inventor.

Samuel F. Stowe
 Clifton and Son & Co.
 Attys.

UNITED STATES PATENT OFFICE.

SAMUEL F. STOWE, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR OF ONE-HALF HIS RIGHT TO SAMUEL G. TRIPPE, OF SAME PLACE.

IMPROVEMENT IN WINDMILLS.

Specification forming part of Letters Patent No. 141,827, dated August 12, 1873; application filed May 31, 1873.

To all whom it may concern:

Be it known that I, SAMUEL F. STOWE, of Providence, in the county of Providence and State of Rhode Island, have invented a new and valuable Improvement in Windmills; 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 my improved windmill by a back view. Fig. 2 is a top view of the same. Fig. 3 is a vertical central section of the same. Fig. 4 is a detail view.

My invention relates to windmills; and it consists of a novel method of regulating the revolutions of a windmill-shaft by halving the fans and hinging the same longitudinally to the arms of the shaft, and by keeping them in position by spring-power attached to the shaft and revolving with it, and so constructed that they may be worked with more or less resistance to the direct force of the wind by moving the said spring-power closer to or further from the fans. The object of my invention is to make the regulation of the speed of a windmill-shaft, by the tilt or pitch of the fans, automatic for a certain average pressure of the prevailing wind, and to regulate the operation of the parts constructed for that purpose by hand to suit the average pressure of the changing winds.

In the drawings, A represents the platform of a windmill, to which the head-gear of the same is attached. It consists of a fundamental plate, *a*, and an annular L-shaped rim, *a*¹, with a horizontal top rim, *a*², which forms a projection over the vertical part *a*¹. The platform A is provided with anti-friction rollers B at the bottom, and with the same class of rollers B' on its inner circumference, so that they form bottom and side bearings for a revolving platform, C, which consists of an L-shaped ring, *c*, and a number of horizontal braces. The platform C supports the shaft D by standards E E' E², of which E furnishes the bottom and side bearings for a wheel, F, which is fastened

to the shaft D and bears between the circular bearing-plates *e*¹ *e*², and on rollers *e*. The said rollers have their bearings in the plates *e*¹ *e*², which are fastened together by step-bolts *e*³ or other suitable means. The spaces between the arms of the wheel F are closed by panels *f*, into which metal eyes *f*¹ are inserted for the passage of tension rods or chains, which connect the halved fans of the windmill with the tension-springs G in a number of cylinders, H, arranged in pairs around the shaft D, and fastened endwise between two parallel disks, I. The disks I are fastened to the flanges of a hub, J, which is made to slide on the shaft D longitudinally by means of a straight key, *j*, and which is moved in the described direction by a yoke, K, which encircles the body of the hub J, and is confined between the rear disk I and a collar, *k*, with a set-screw. The yoke K is provided with two horizontal arms, *k*¹, with heads *k*² at their ends, through which two screws of equal pitch, L, are passed. The screws L have their bearings between the standards E², and have each a gear-wheel, M, at the end, which are moved by an intermediate gear, N, which again is moved by a pinion, *o*, and sprocket-wheel O on the shaft *o*'. An endless rope, P, stretched by a weighted pulley or similar device, *p*, serves to accommodate the moving of the sprocket-wheel by hand. The end or thrust bearing of the shaft D is in the standard E, to which also a vertical radial fan, Q, is fastened, which serves to steer the rotating platform C into the direction of the air-course. The front end of the shaft D is provided with a head, R, which has four flanged arms, *r*, and an end or face plate, *r*¹, between which the arms S are fastened. The arms S are square within their fastenings, and outside of the same they are reduced to a triangular shape, and provided with a number of hinge-plates, *s*, which are matched to an equal number of hinge-bands, *t*, on the fans T, and are secured together by rods *s*'. Each fan T is provided at the end near the shaft with a return-lever, *t*¹, to which a bar or chain, *t*², is attached, which passes through an eyelet, *f*¹, into one of the cylinders H, through a spiral spring, G, and fastens to a disk, *g*, behind the

spring G, which, being inserted by force and with a certain tension, keeps the spring against the end of the cylinder H, and thereby keeps the fans T flush. If, by means of the wheels O N M, the screws L are moved, and the yoke K, with the hub J, and cylinders H are brought near the fans, the tension of the chains t^2 becomes slackened, and vice versa. The rotating platform C is provided with a number of circumferential standards, U, which lap over the horizontal top rim a^2 , and thereby prevent the upsetting of the rotating platform C by heavy gales. They serve, also, for fastening a covering or roof to their vertical sides.

The halved fans T, under ordinary pressure of wind, are flush or present each pair an even surface. Any gust or increase of pressure in the air-current serves to swing back the fans T on their axes or hinges s' , whereby their area of resistance is diminished and an increase of speed prevented. As the speed of the wind and its pressure increases the deflection of the fans becomes more, and the more the said increase is continued the more unreliable the operation of the mill becomes on account of the more frequent moving or flapping of the fans. The operator, therefore, with aid of the rope P, turns the sprocket-wheel O, and thereby moves the cylinders H away from the fans, which increases the tension of the chains t^2 , and secures a steadier movement of the shaft D. If the fans T are too stiff and cause the shaft D to change its speed with the slightest variation of wind, the cylinders H are moved closer to the fans by turning the sprocket-wheel in the opposite direction until it is noticed that the fans give way to an overpressure.

The merits of this construction are that it

can be very speedily and easily regulated during the operation and within the mill, and that the working parts are not exposed to the influence of weather.

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

1. The combination of a windmill-shaft with the revolving disks I, hub J, spring-cases H, springs G, disks g , and tension-chains t^2 , arranged substantially for the purpose mentioned.

2. The combination of the sliding hub J, the yoke K, and the screws L, whereby the regulation of the tension-chains is effected in the direction of the axis of the windmill-shaft.

3. The combination, with a windmill-shaft and halved and hinged fans T, of the return-levers t^1 , chains t^2 , and tension devices H, arranged as and for the purpose mentioned.

4. The front support of a windmill-shaft, consisting of the wheel F, the side bearings e^1 e^2 , and rollers e as circumferential bearings, as specified.

5. In combination with the adjustable tension devices, the halved swinging wings and the device for manipulating the same, consisting of the gear-wheels M on the screw L, the intermediate gear N, wheel o , and sprocket-wheel O, with the hand-rope P and weighted pulley p , substantially as specified.

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

SAMUEL F. STOWE.

Witnesses:

CHARLES A. NEWTON,
HENRY MARTIN.