I. Keyes,

Wind Wheel,

No. 918. Patented Sep. 14, 1838.

Fig 2.

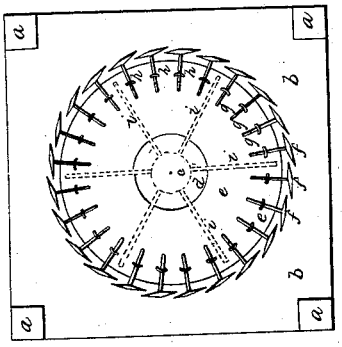
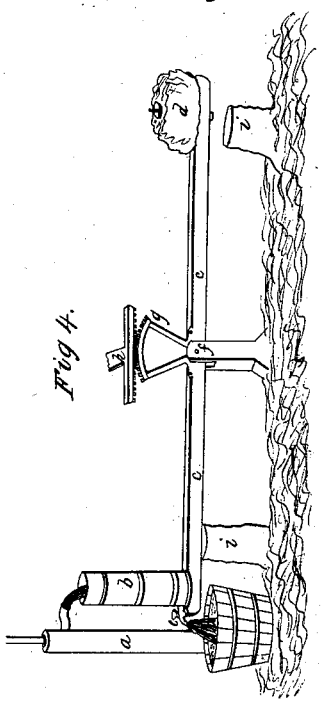


Fig 4.



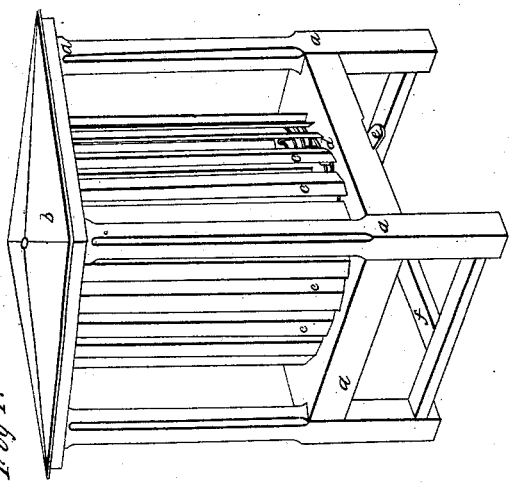
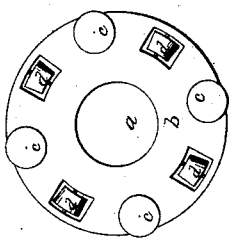


Fig 1.

Fig 3.



Witnesses.
Jon^a D. Beadly
Wm Hawkins

Inventor
Israel Keyes

UNITED STATES PATENT OFFICE.

ISRAEL KEYES, OF PUTNEY, VERMONT.

IMPROVEMENT IN THE MODE OF REGULATING WINDMILLS.

Specification forming part of Letters Patent No. **918**, dated September 14, 1838.

To all whom it may concern:

Be it known that I, ISRAEL KEYES, of Putney, in the county of Windham and State of Vermont, have invented a new and Improved Windmill; and I do hereby declare that the following is a full and exact description thereof.

One evil attendant on the use of wind as a propelling power is its variableness. In the ordinary windmill much labor and watchfulness are necessary to compensate its changes by increasing and diminishing the surface exposed to the wind, and even then only an unsteady and comparatively useless motion is procured. To remedy these defects I construct my windmill as follows: Instead of increasing and diminishing the surface of the floats or arms I increase and diminish the amount of air which acts upon them, and instead of using for this purpose the exertions and vigilance of a miller I make the machine propel its own regulator and by its own increased velocity shut off the superfluous wind. To effect this I construct a round cupola of blinds. Each slat of these blinds stands perpendicularly. In the center of this cupola or chamber is a perpendicular shaft, to which are attached about six floats, as large as can conveniently swing clear in the interior of the cupola. Now, when the blinds are all partly open, or, in other words, when they all incline equally one way, the wind, from whichsoever direction it comes, will be admitted freely to the floats on one side of the shaft and will be glanced off from the blinds on the other side, and as each slat of the blind turns on its perpendicular axis they are capable of being more or less closed and of thereby diminishing more or less the current admitted to the floats. In order to shut these blinds as the velocity is too much increased and open them when it is diminished, I apply what is called by machinists the "regulator." The regulator itself is so well understood and so frequently applied to govern the velocity of water-wheels and steam-engines that a particular description is not deemed necessary here. Its action on the blinds may be as follows: At the lower end of each slat of the blinds near where its axis enters the floor of the cupola a stiff metallic rod is firmly attached to each slat, so as to stand from the slat inward horizontally along the floor of the cupola toward its middle. When the inner end of one of these rods describes a portion of a circle, it necessarily opens the slat to which it is fastened, and when this motion is reversed the blind is closed, and to give this motion simultaneously and alike to all these rods I use the following method: I remove a circular portion of the floor of the cupola and insert a movable floor annular in shape. This movable ring rests on four friction-rollers beneath it and is furnished with four more horizontal friction-rollers at its periphery, so that it will turn freely and yet allow the main shaft to pass through its central aperture without touching it. Now to this movable ring of floor each of the rods above described is confined by a staple, which strides it so that whenever the ring performs a small part of a revolution the rods are all carried one way and the blinds are all closed, and when this motion is reversed each staple moves its rod and each rod its slat in the opposite direction and the blinds are all opened. It will be convenient that this ring of floor be halved into the orifice which receives it, and that its thickness and strength should be sufficient to allow the cutting away of some of its substance to let in the friction-rollers. To the lower surface of this movable floor a lever or bar is firmly attached, so that when this bar is moved horizontally one way and the other the ring moves with it and the blinds are opened and closed. The main shaft extends down through the floor of the cupola, and to this shaft the regulator is banded, and the regulator being also geared to the above-named lever or bar it opens the blinds as the velocity is diminished and closes them as the motion is accelerated.

When the regulator is of the kind ordinarily used in steam-engines—that is, acting by the centrifugal force of two weights at the ends of arms—only the ordinary gearing to convert a perpendicular into a horizontal motion will be requisite in order to apply the motion of the regulator to the lever or bar which turns the ring of floor. When, however, the windmill is used for the pumping of water, a convenient regulator may be constructed, governed not directly by the velocity of the shaft, but by the quantity of water delivered. To do this the reservoir which receives the water

from the pump is placed on one end or arm of a balance-beam, and a weight which will balance the reservoir when partly full on the other end. The orifice to deliver the water from the bottom of this reservoir is so gaged as to keep it only partly full when the pump works with a medium velocity. When this velocity is increased, the water accumulates in the reservoir and that end of the beam preponderates, and, as this beam has near its central pivot or fulcrum a pinion which acts on a rack attached to the above-described lever which shuts the blinds, this accumulation of water will shut off the wind, and when less water is delivered the other end of the beam preponderates and more wind is admitted to the floats.

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

The application of a regulator to the windmill by means of a cupola of blinds, the slats of which are movable on their axes, the whole being combined and operating as herein described.

ISRAEL KEYES.

Witnesses:
CHIPMAN SWAIN,
J. D. BRADLEY.