No. 637,736. Patented Nov. 21, 1899.

A. HÉRISSON.

WINDMILL REGULATOR.

(Application filed May 16, 1899.)

(No Model.) 2 Sheets—Sheet 1.

Fig.1.

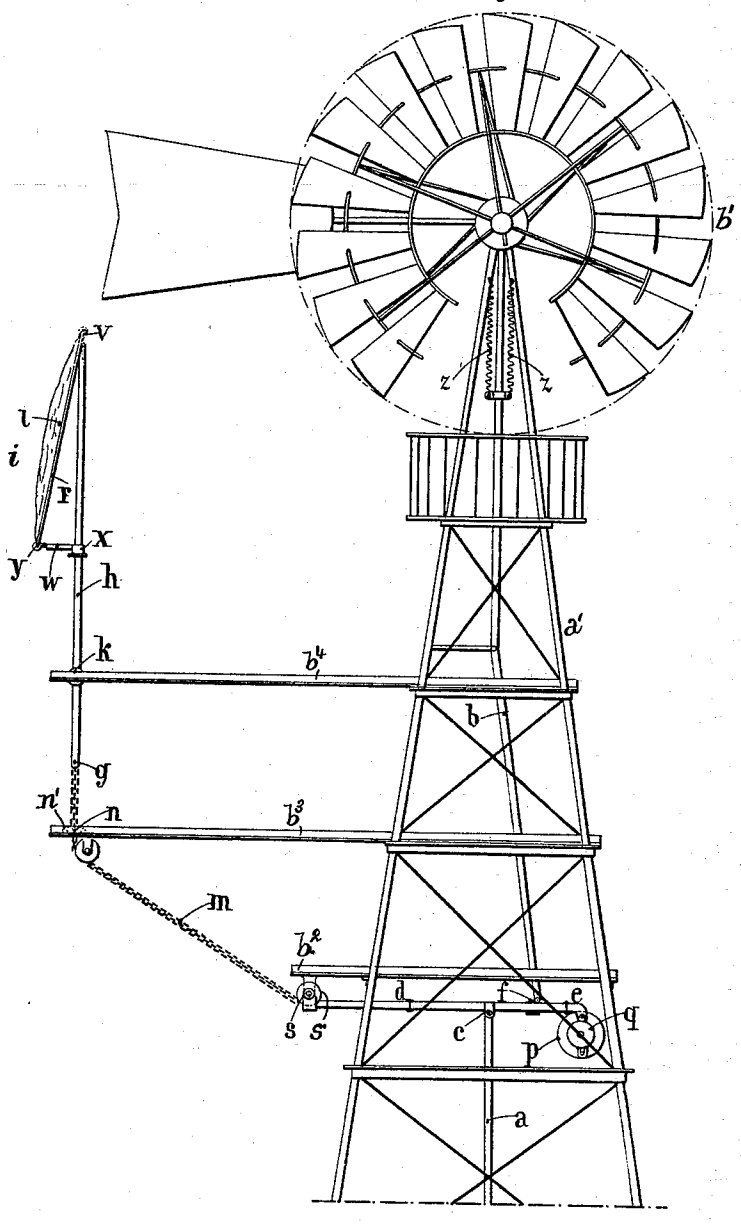


Fig.4.

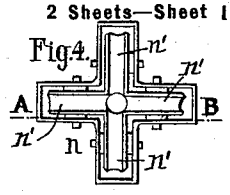


Fig.5.

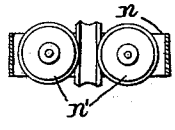
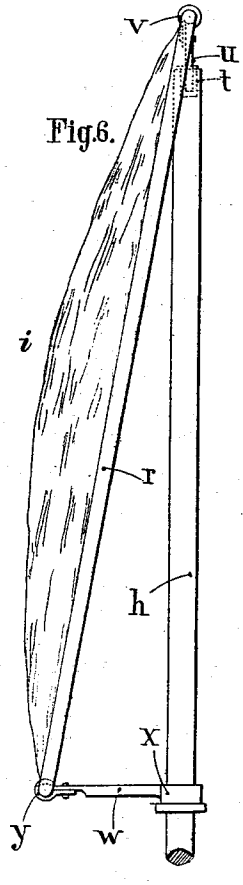


Fig.6.



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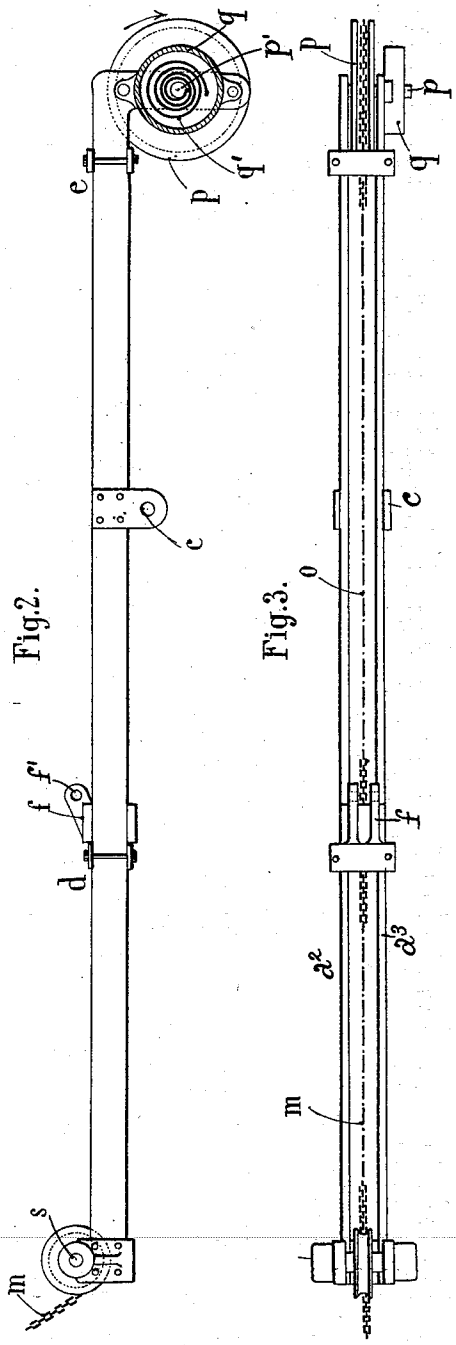
No. 637,736. Patented Nov. 21, 1899.

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WINDMILL REGULATOR.

(Application filed May 16, 1899.)

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UNITED STATES PATENT OFFICE.

ALBERT HÉRISSON, OF PARIS, FRANCE.

WINDMILL-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 637,736, dated November 21, 1899.

Application filed May 16, 1899. Serial No. 717,083. (No model.)

To all whom it may concern:

Be it known that I, ALBERT HÉRISSON, a citizen of France, residing at Paris, France, have invented certain new and useful Improvements in Windmill-Regulators, of which the following is a specification.

This invention relates to windmills designed for working a pump; and the chief object of the invention is to provide new and improved means for varying the strokes of the pump-piston as the velocity of the wind increases and diminishes. This object is accomplished by the mechanism hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 is a side elevation of sufficient of a windmill and my regulating mechanism to enable the same to be clearly understood. Fig. 2 is a sectional side elevation of the lever for operating the pump-piston. Fig. 3 is a top plan view of the same. Fig. 4 is a detail plan view of the cruciform guide-roll holder and the chain-guide rolls therein. Fig. 5 is a sectional view taken on the line A B, Fig. 4; and Fig. 6 is a detail side view of the regulating-vane and a portion of the vertical spindle on which it is mounted.

In order to enable those skilled in the art to make and use my invention, I will now describe the same in detail, referring to the drawings, wherein—

The letter a' indicates the tower, b' the wheel, and b the connecting-rod, of any desired construction of windmill. The tower is constructed or provided with three horizontal projecting frames b^2, b^3, and b^4 for purposes which will hereinafter appear.

The outer end of the frame b^2 is provided with a suspended axle or shaft s, carrying a grooved pulley s' and constituting the fulcrum-pivot of a horizontally-arranged lever located between the connecting-rod b and the piston-rod a of a pump. The lever is composed of two parallel side bars a^2 a^3, between which a slide f is movable from the point e to the point d of the lever, and conversely. The piston-rod a is pivotally connected to the lever by a clip c, and the lower end of the connecting-rod b is pivotally connected to a part of the slide f, as at f'. The outer end of the frame b^3 carries a cruciform guide-roll holder n, (best seen in Figs. 4 and 5,) and the outer end of the frame b^4 carries a universal joint k, supporting a vertical spindle h. The lower end g of the spindle is attached to a cable or chain m, passing between guide-rolls n' under the pulley s' between the side bars a^2 a^3 and connected to the slide f. This slide is connected by a chain o, Fig. 3, with a grooved pulley p, having its axle p' arranged in bearings on the inner end of the slide-carrying lever and connected to one end of a helical spring q', the other end of which is secured to a casing q, attached to the lever.

The spindle h carries a regulating-vane i, composed of a suitable textile or other fabric, secured at its edges to a frame r, having a tube v at its top provided with a pivot-pin u, fitting a bearing or socket t in the upper end of the spindle. The lower end of the frame r is connected by a clip or tube y with an arm w, having a sleeve x loose on the spindle h. The pivot-pin u and sleeve x pivotally mount the vane, so that it can turn in a circle on the spindle h as a center, and as the wind acts on the center of the vane the latter will always be placed in correct position. The arm w holds the vane in an inclined plane relative to the vertical spindle h. The shifting of the spindle from a perpendicular position causes the cable or chain m to pull the slide f toward the point d of the lever, while the spring q' tends to pull the slide toward the point e of the lever. When the wind is comparatively weak, the spindle h is approximately vertical and the slide f lies at or near the point e and the strokes of the pump-piston are at the minimum. When the velocity of the wind increases, the spindle h, acted on by vane i, is shifted out of perpendicularity and the chain m pulls the slide f toward the point d, thereby increasing the strokes of the pump-piston. The variations in the velocity of the wind cause the slide to move from e to d or conversely, and obviously the strokes of the pump-piston are thereby increased or diminished.

As the lever is very heavy and its weight coöperates with that of the connecting-rod b and with the pressure of the water on the pump-piston, the mill would ordinarily be difficult to start, because it rests, when the wind is weak, where the pump-piston is at the half of its upstroke, at which instant the re-

sistance is the greatest. It is therefore advisable to provide the mill with devices for reducing the strain required to put the mill in rotation when it is in the position stated. These preferably consist of long springs *z*, fixed at their upper ends to the tower and at their lower ends to the connecting-rod *b*. The springs are capable of exerting on the connecting-rod *b* a pull equal to one-half the power necessary to set the mill in motion when the slide *f* is at the point *e*.

Having thus described my invention, what I claim is—

1. The combination with a windmill having a connecting-rod, and a piston-rod, of a pivoted lever connected with the piston-rod, a slide movable longitudinally on the lever and connected with said connecting-rod, a regulating-vane, and devices connecting the vane with the slide to automatically shift the latter on the lever, substantially as described.

2. The combination with a windmill having a connecting-rod, and a pump-piston, of a pivoted lever connected with the piston-rod, a slide movable longitudinally on the lever and connected with the connecting-rod, a regulating-vane, connections between the vane and the slide for automatically shifting the latter in one direction, and means for moving the slide in the opposite direction, substantially as described.

3. The combination with a windmill having a connecting-rod, and a piston-rod, of a pivoted lever connected with the piston-rod, a slide movable longitudinally on the lever and connected with the connecting-rod, a regulating-vane, a support on which the vane is pivotally mounted, a connection between said support and the slide, and a spring-turned pulley mounted on the lever and connected with said slide, substantially as described.

4. The combination with a windmill having a connecting-rod, and a piston-rod, of a pivoted lever, a slide movable longitudinally of the lever, a vertical spindle, a universal joint supporting the latter, a regulating-vane pivotally mounted on the spindle, a connection between the spindle and the slide to move the latter in one direction, and means for moving the slide in the opposite direction, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ALBERT HÉRISSON.

Witnesses:
EDWARD P. MACLEAN,
ALFRED FREY.