

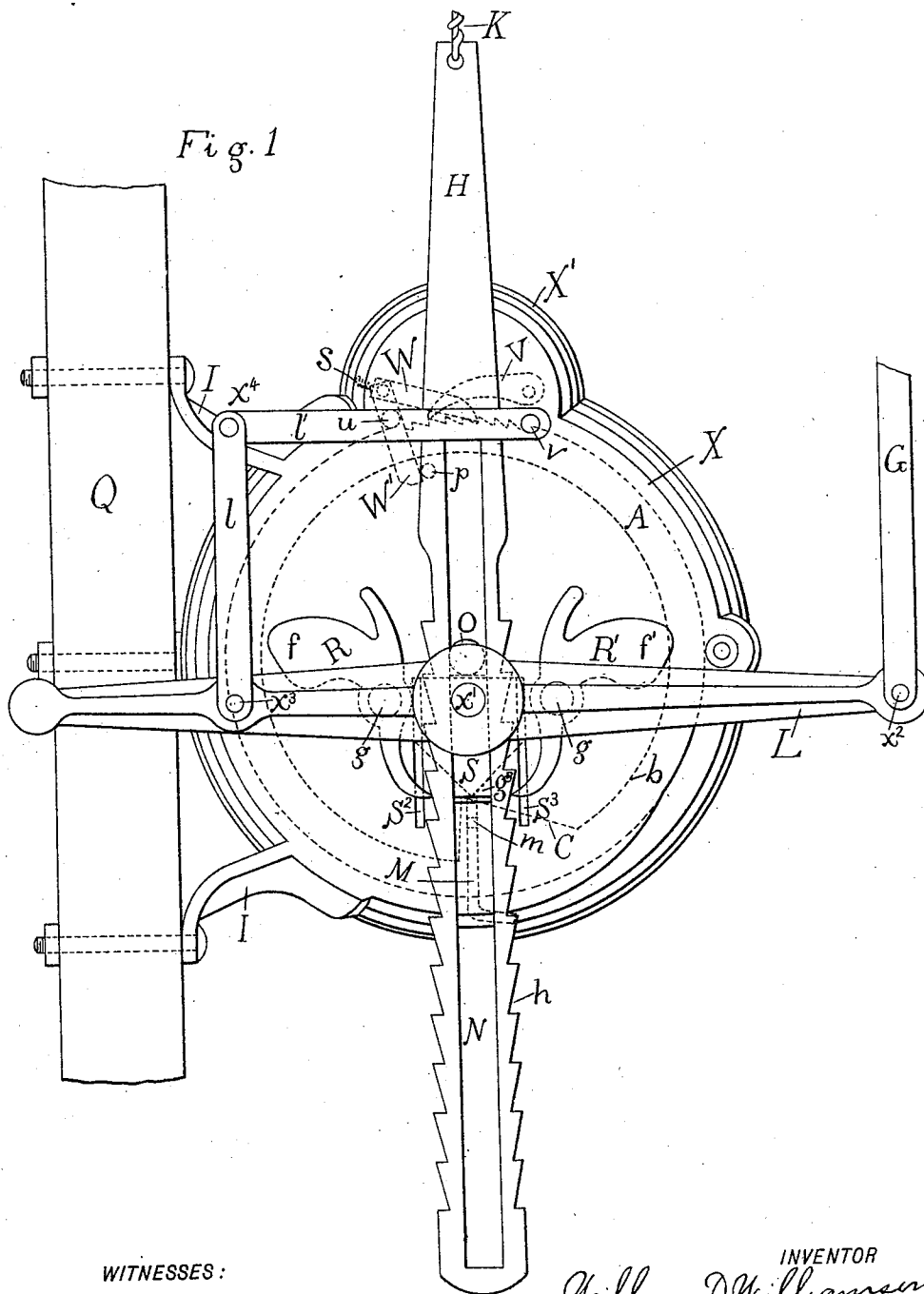
(No Model.)

3 Sheets—Sheet 1.

W. D. WILLIAMSON.
AUTOMATIC STOPPING DEVICE FOR WINDMILLS.

No. 579,854.

Patented Mar. 30, 1897.



WITNESSES:
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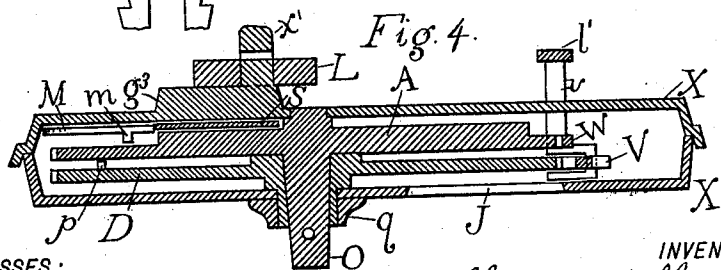
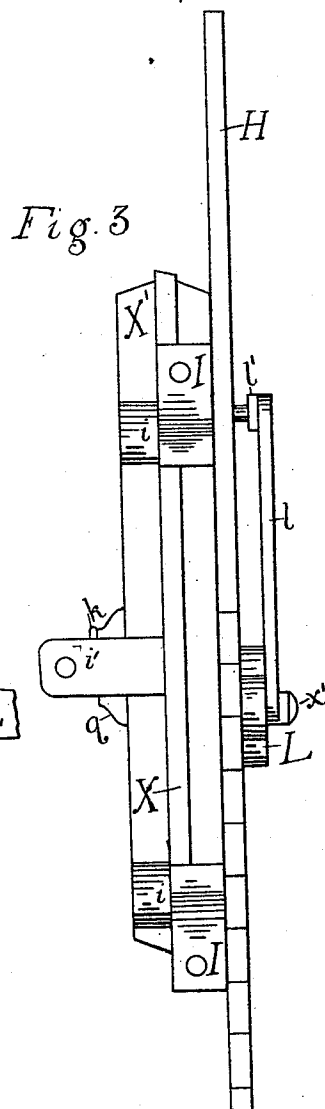
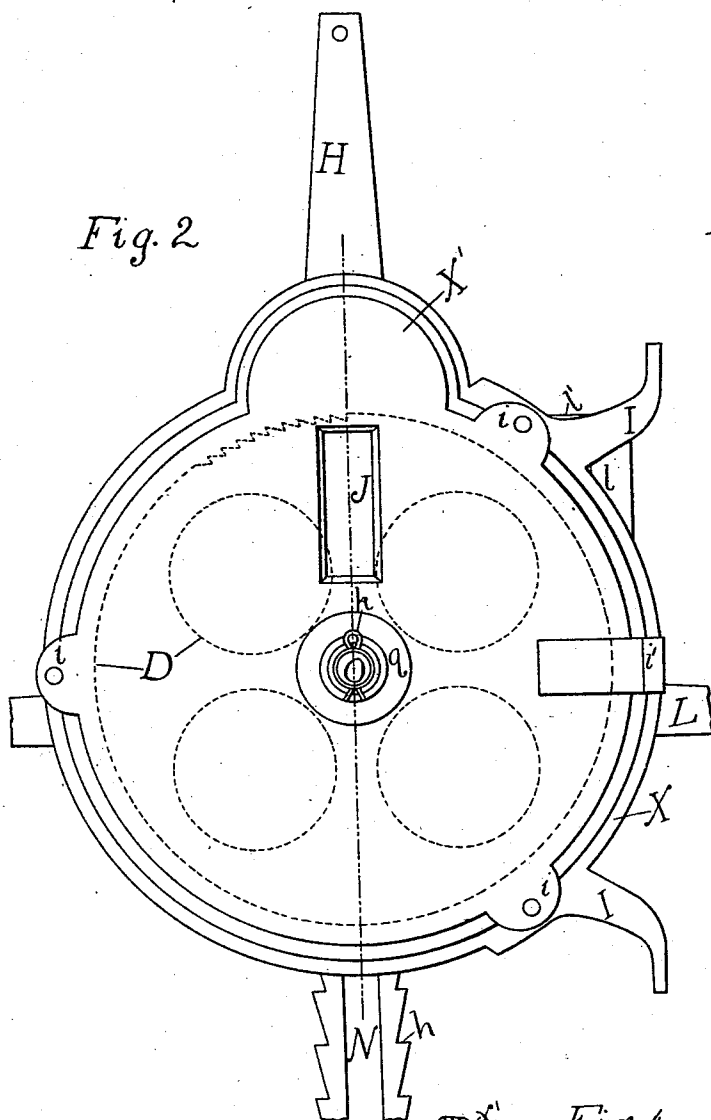
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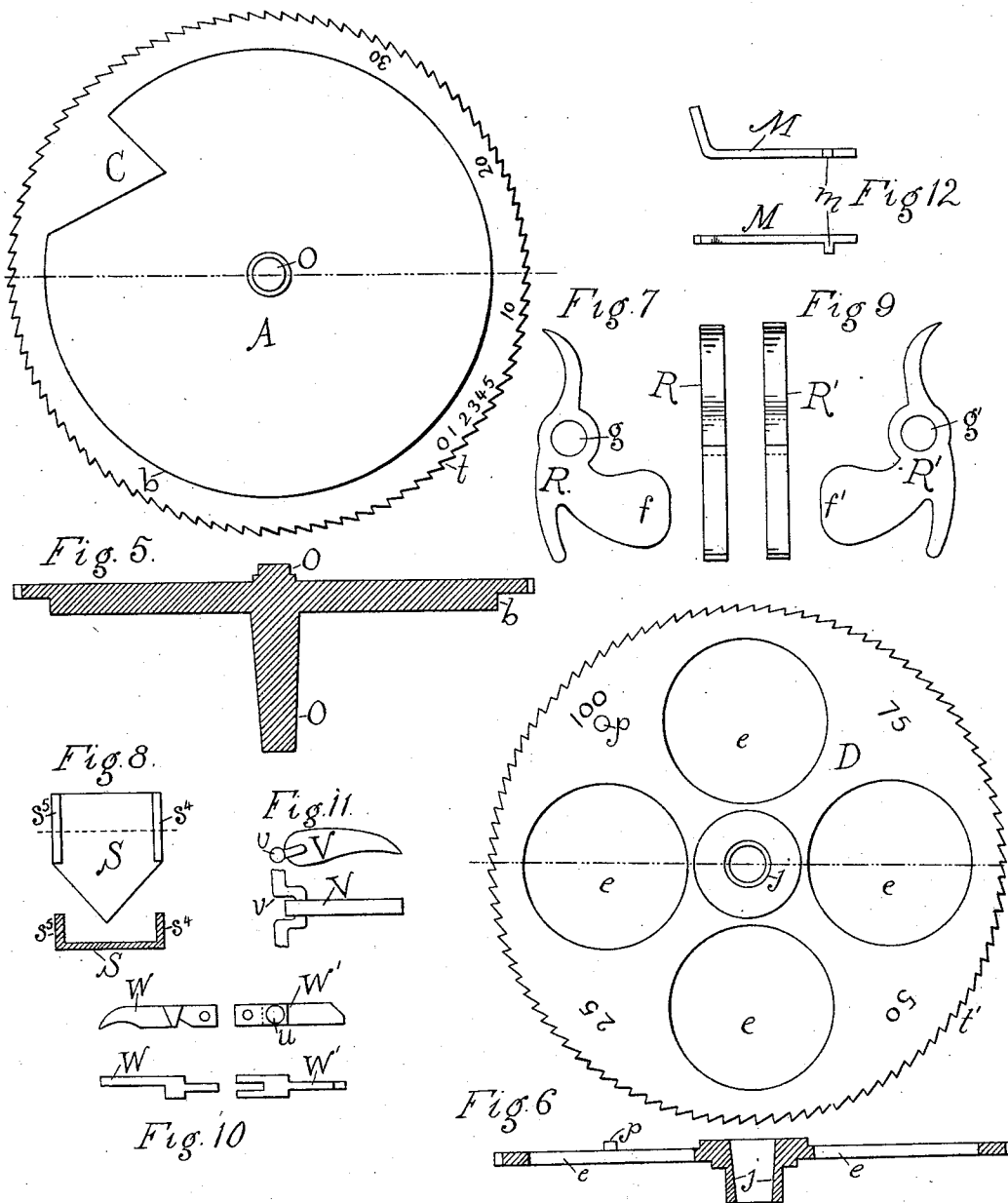
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3 Sheets—Sheet 3.

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Patented Mar. 30, 1897.



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WILLIAM D. WILLIAMSON, OF MADISON, WISCONSIN.

AUTOMATIC STOPPING DEVICE FOR WINDMILLS.

SPECIFICATION forming part of Letters Patent No. 579,854, dated March 30, 1897.

Application filed June 24, 1895. Serial No. 553,918. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM D. WILLIAMSON, of Madison, in the county of Dane and State of Wisconsin, have invented a new and Improved Automatic Stopping Device for Windmills, of which the following is a specification.

My invention relates to windmill-stopping devices, and is comparatively simple and durable in construction, effective and automatic in operation, and more especially designed for use on windmills to turn the wind-wheel out of the wind as soon as the windmill has given a predetermined number of strokes to the pump-rod.

My invention consists of the combination of a lever which actuates upon a ratchet-wheel which in turn actuates upon a ratchet-lever actuating upon a ratchet-wheel which regulates the position of the stop, and a notched rack which is actuated by two pawls which are rendered operative or inoperative by the position of the stop, the whole device being adapted to be actuated from the pump-rod of a windmill, and its object being to render the mill inoperative after a certain predetermined number of strokes have been made by the pump-rod.

The invention also consists in certain parts and details and combinations of the same, as will be hereinafter fully described, and then pointed out in the claim.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the views.

Figure 1, Sheet I, represents all the parts assembled, front view. Fig. 2, Sheet II, represents a rear elevation of the instrument. Fig. 3, Sheet II, represents a vertical side view, right-hand side of Fig. 2. Fig. 4, Sheet II, shows a sectional elevation of the improvement. Sheet III shows the different parts in detail, of which Fig. 5 is a face view of one of ratchet-wheels, which is provided with a shoulder, as indicated in the sectional view given below and on one point of the circumference of which a notch is found. Fig. 6 is a face view of a ratchet-wheel with ratchet-teeth in reversed order to those in Fig. 5 and is also provided with circular openings and provided with a plug, shown on the sectional

view given below and also indicated on the face view. Figs. 7 and 9 show a pair of pawls in face and side views. Fig. 8 is a device which may be designated as a "stop," it being U-shaped, so as to allow its two sides to slide freely in slots found in the case of the device. It is shown in vertical face and sectional views. Fig. 10 is a ratchet-lever, shown in its parts in side and top views. Fig. 11 is a ratchet connected to a double crank at the wrist, shown in side and top views. Fig. 12 is a straight steel spring, shown in face and top views.

The improved stopping device for windmills is provided with a suitably-constructed frame or case X X', within which the mechanism is inclosed and provided with lugs I, by means of which it may be fastened to a beam of the windmill-frame Q, or it may be the pump itself. On the outside of the case X is found a system of levers L, l, and l', that transmit the motion of the pump-rod G to the internal mechanism of the improvement.

The pump-rod G is connected with the lever L at x^2 , and lever L is fulcrumed on the axle x' , which rises from the case X, so that on each up-and-down stroke of the pump-rod a reciprocating motion is imparted to the lever L.

In Fig. 1, fore view, the pump-rod G is represented as being at the end of the down-stroke. When the rod G ascends, the pivot x^2 rises, (as a consequence of the rocking motion of the lever L,) causing the pivot x^3 to descend, which carries down with it (as a consequence of the link motion represented in Fig. 1 by l and l') the pivot x^4 , resulting in the turning of the lever l' on the fulcrum v, Sheet II, Fig. 4. The lever l', being fastened securely to one end of the axle of the double crank v, (shown in Sheet III, Fig. 11,) gives the pawl V a forward movement and causes it to engage with a tooth of the ratchet-wheel D, causing it to revolve on its axle O', which is journaled in the case X X'.

At the descending motion of the pump-rod G all of the above-described operations are reversed, which results in the recovery of the pawl V to its former position, and the above-described operation is then repeated at each upward motion of the pump-rod.

As shown on the views, Figs. 1 and 2, ratchet-

pawl V and also pawl W are found in a semi-circular pocket or ear of the case X and X', and their bearings or axles *v* and *u* are journaled therein.

5 Once in every complete revolution of the ratchet-wheel D a plug *p*, which projects from its surface, comes into contact with the lever-ratchet W W', Fig. 1, Sheet I, the same being fulcrumed about the pivot *u*, and at the next
10 succeeding upward stroke of the pump-rod the wheel D, moving forward the distance of one tooth, carries with it the plug *p*, which presses the lever-ratchet W' at its lower extremity and causes the upper arm W to move
15 forward and engage with a tooth of the ratchet-wheel A, which in turn causes the ratchet-wheel A to move forward in reversed direction to wheel D one tooth. After the plug *p* has advanced sufficiently so as to release the lever
20 of the ratchet the coil-spring *s* (whose ends are attached, respectively, to the case X and the end of the ratchet W) is allowed to act and causes the ratchet-lever to recover itself. When the ratchet-wheel A has progressed far
25 enough so that the notch C comes opposite to the straight steel spring M, (which is attached to the case X at one end and free to move at the other,) the same is released and allowed to take the position as shown in Fig. 1, and
30 better shown in Fig. 4, Sheet II. The normal position of spring M is when the projection *m*, Fig. 12, is in contact with the shoulder *b* of ratchet-wheel A. When the spring M is released as a consequence of the break of the
35 continuity of the shoulder *b*, it comes in contact with the stop S and raises the same, the stop being free to move in the slots S² and S³, found in the case X. The normal position of the stop is at the lower ends of the slots S²
40 and S³ and in which position it is held by its own weight. When the spring M has raised the stop, as shown in Fig. 1, the two pawls R and R' are permitted to act. These pawls R and R' are found on the outside of the case
45 X, being between the lever L and outside of case X, and are journaled to the rocking lever L at the pivot *g*. These pawls R and R' are also furnished with counterweights *f* and *f'*, Fig. 1, Sheet I, for the purpose of keeping
50 their extremities in contact with the ratchet-teeth *h* of the rack II, so that when the rocking lever L is operated by means of the pump-rod G they act alternately on the teeth of the ratchet-rack H, (which is also an external
55 member of the improvement,) thus causing the rack to descend, drawing with it the chain or wire connection K, which renders the windmill inoperative. On the contrary, when the stop S is in its normal position, as described,
60 the extremities of the pawls R and R' slide up and down without effect against the faces *s*⁵ and *s*⁴ of the stop S, which project through the slots S² and S³.

The ratchet-rack H is designed so as to admit of free vertical movement between the slot N and the lug *g*³, Figs. 1 and 4, which is on the face of the case X.

The ratchet-wheels A and D are provided with a certain number of teeth, and these are enumerated so as to permit of being set
70 so that a predetermined number of strokes of the pump-rod must be given before the shut-off device is rendered automatically operative.

Wheel A contains one hundred and one
75 ratchet-teeth on its circumference. These teeth are numbered successively from "0," which is diametrically opposite the notch C, to "100," inclusive, these numbers representing hundreds of upward strokes of the pump-
80 rod.

Wheel D contains one hundred ratchet-teeth numbered at four points on its circumference, designated "25," "50," "75," and
85 "100," respectively.

In the case X is found a rectangular opening J (shown in Figs. 2 and 4, Sheet II) for the purpose of making the numbers on the
90 ratchet-wheels visible, the circular opening *c* in wheel D being made to give a view of the numbering on wheel A. On Sheet III, Figs. 5 and 6, these enumerations are represented, but in the actual instrument they will be on the opposite faces of the wheel to those shown
95 in the figures.

The possible range of this improvement of the pump-strokes is from one to ten thousand
one hundred, and it can be easily set for any intermediate number of strokes by revolving the wheels independently by applying force
100 by means of the fingers on the axle *x* to revolve wheel A and on the collar *q* to revolve wheel D, Fig. 4, Sheet II.

It may be added that the ratchet-wheels A and D lie in parallel planes and that the
105 axle of wheel D is journaled in the case X and X'. While wheel D is journaled on the axle of wheel A, Figs. 5 and 6, the whole are provided with shoulders around their axles, so that they do not come into contact and
110 permit of space between them to give free play to the ratchet-lever W. It may also be added that after the windmill is thrown out of the wind the instrument is again rendered
115 operative by revolving wheel A so that the spring leaves the notch C and resumes its normal position against shoulder *b*. A wire fastened above K, leading to a common lever found usually on all windmills, is used to
120 throw the wheel into the wind, and the wire K ascending draws up the rack II.

In the views several letters are given to which no reference has been made, and I will now explain their meaning.

k represents a pin or bolt through axle *x'*
125 to hold collar *q* in place.

i represents lugs and bolts which hold the case X and X' together.

t and *t'* are teeth of the ratchet-wheels.

I am aware that prior to my invention numerous devices for stopping a windmill auto-
130 matically have been made. I am also aware that a rack similar to the one employed by me has been used, but I believe the manner

in which I operate the same has never been employed. Therefore

What I claim is—

5 The combination with a rack-bar connected to the pull-cord of a windmill, of a lever actuated by the pump-rod and carrying pawls for working the rack-bar, a pair of ratchet-wheels, actuating-pawls therefor and links connecting said pawls to the pump-rod-actuated lever, and a stop controlling the ratchet-

pawls and itself controlled by the ratchet-wheels substantially as and for the purpose set forth.

In testimony whereof I have signed this specification in the presence of two subscrib- 15
ing witnesses.

WILLIAM D. WILLIAMSON.

Witnesses:

A. E. PETTENGILL,
O. S. NORSMAN.