

(No Model.)

2 Sheets—Sheet 1.

A. S. CLARK.
WINDMILL REGULATOR.

No. 530,985.

Patented Dec. 18, 1894.

Fig. 1.

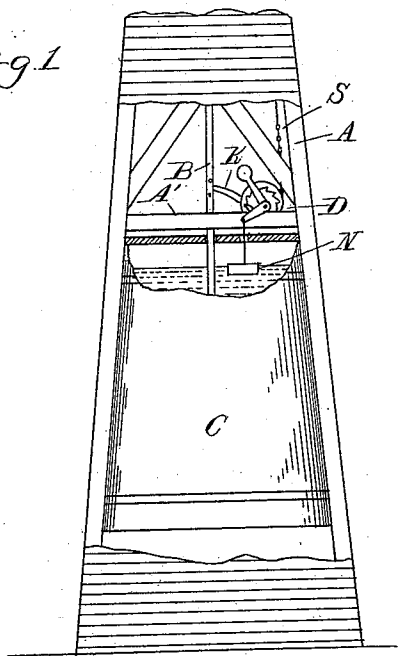


Fig. 2.

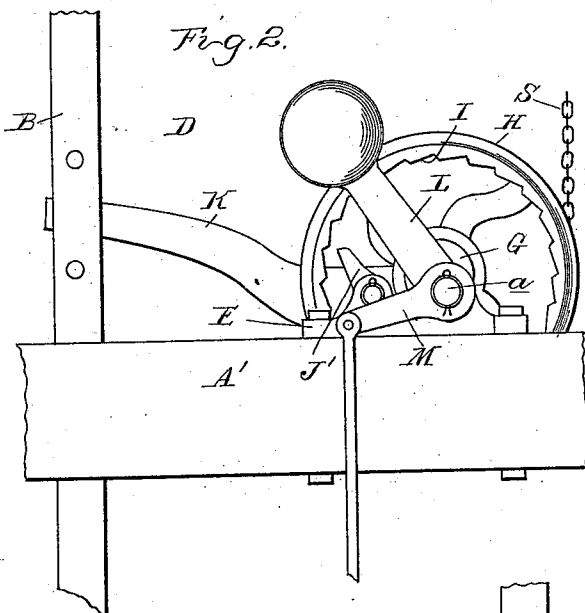
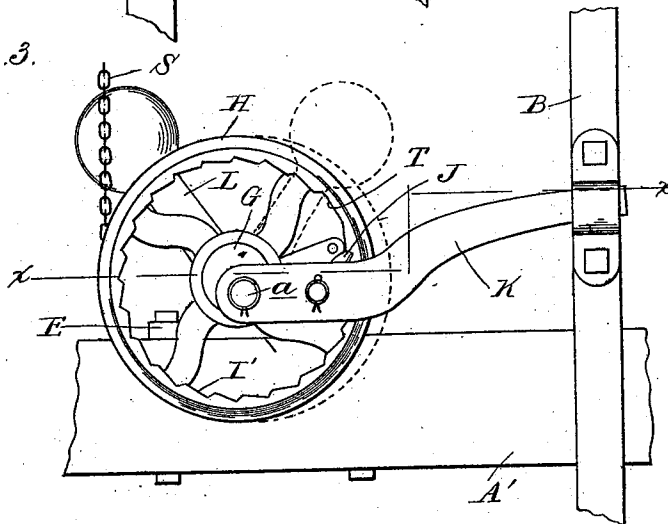


Fig. 3.



Witnesses

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(No Model.)

2 Sheets—Sheet 2.

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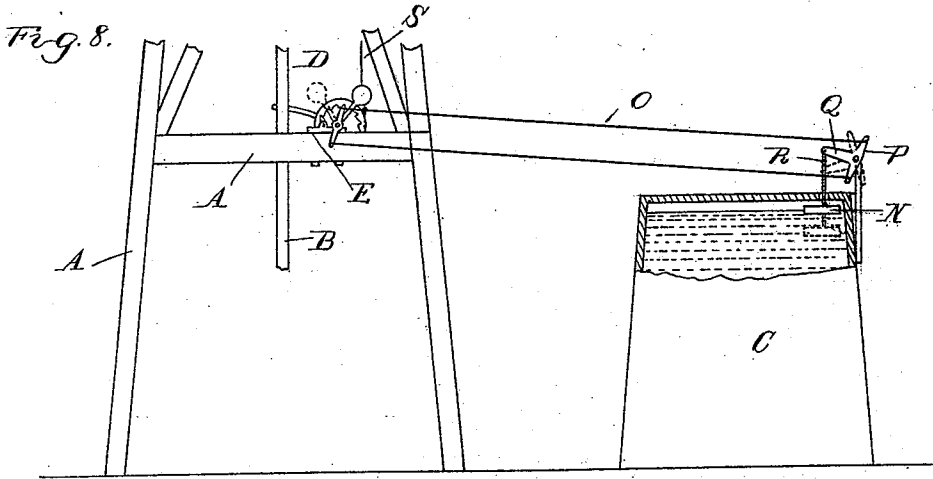


Fig. 6.

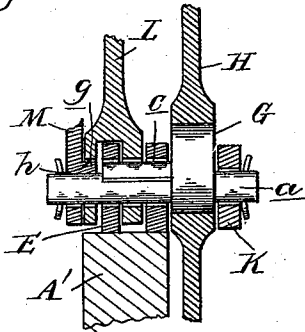


Fig. 5.

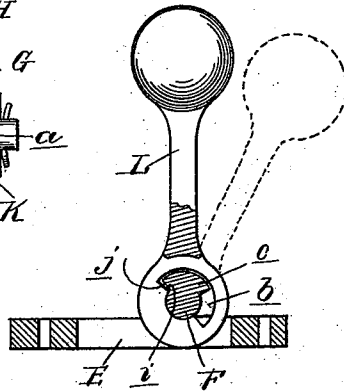


Fig. 4.

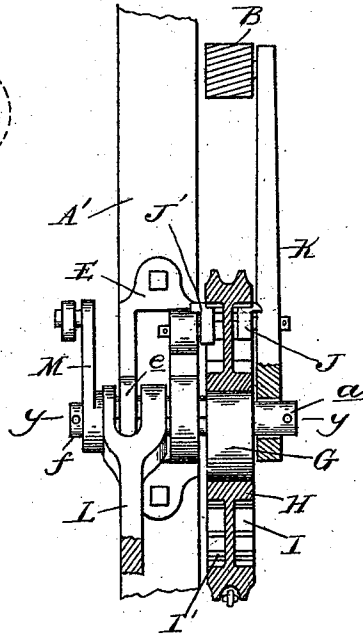
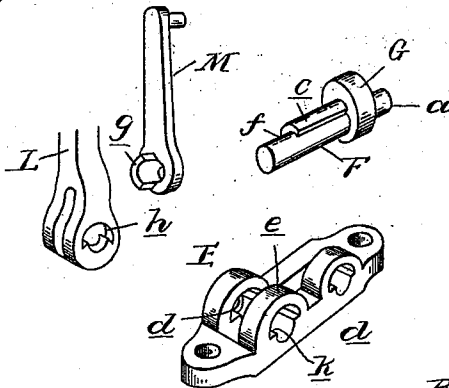


Fig. 7.



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UNITED STATES PATENT OFFICE.

ARTHUR S. CLARK, OF SALINE, MICHIGAN.

WINDMILL-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 530,985, dated December 18, 1894.

Application filed February 10, 1894. Serial No. 499,731. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR S. CLARK, a citizen of the United States, residing at Saline, in the county of Washtenaw and State of Michigan, have invented certain new and useful Improvements in Windmill-Regulators, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention consists in the peculiar construction of a ratchet wheel having a holding pawl and an operating pawl moved by the windmill with mechanism controlled by the float for shifting the ratchet wheel in and out of engagement with the pawls.

The invention further consists in the peculiar construction, arrangement and combination of the various parts.

In the drawings, Figure 1 is a diagram elevation of the derrick of a windmill to which my regulator is applied. Fig. 2 is an enlarged elevation of the regulator, showing the parts in the position when the mill is out of the wind. Fig. 3 is an elevation looking from the opposite side showing in full lines the parts in their operative position, or where the mill is being thrown out of the wind. Fig. 4 is a horizontal section substantially on line *x x* Fig. 3. Fig. 5 is a vertical section through the weighted lever. Fig. 6 is a cross-section on line *y y* Fig. 4. Fig. 7 is a detached perspective view of some of the parts of the regulator. Fig. 8 is a diagram similar to Fig. 1 but with the tank away from the derrick.

A is a windmill derrick, B the pump rod, C the tank, and D the regulator, which is of the following construction:

E is a bracket supported in any suitable way in proximity to the pump rod, such as by securing it to the cross-bar A' of the derrick.

F is a shaft journaled in the bracket E and provided with an eccentric hub G, on which is journaled the wheel H. The rim of this wheel is provided on its inner face on either side of the spokes with the ratchet teeth I and I', in which the pawls J and J' secured respectively to the lever K and bracket E are adapted, under certain conditions, to engage.

The lever K is preferably fulcrumed to an extension *a* of the shaft F, and at its free end is attached in any suitable way to the pump rod B. L is a weighted lever secured upon

the shaft F, so as to have a limited rotary play thereon, preferably by providing the lever with a segmental slot *b*, in which the key *c* on the shaft F engages. The key *c* preferably extends far enough along the shaft to engage in segmental slots *d* in the ears *e* of the bracket.

M is another lever journaled preferably upon the extension *f* of the shaft F, and having a lost motion connection with the lever L, preferably formed by the lug or finger *g* on the lever M, engaging in a segmental slot *h* in the lever L.

The lever M is connected with a float N in the tank C either as shown in Fig. 1, in which the tank is shown within the derrick, or where the tank is away from the derrick. In the latter case I preferably make the lever M a double lever and connected by the rods or cords O to the lever P, fulcrumed above the tank and having an arm Q attached by the rod R to the float.

S is a rope or chain connected to the throw-out lever of the mill, which passes around in a groove in the rim of the wheel H, to which it is attached at one end.

The parts being thus constructed, their operation is as follows: When the mill is pumping the regulator is in the position shown in Fig. 2, with the pawls J and J' out of engagement with the ratchets on the wheel H, and the lever K free to move up and down with the pumping rod. Now as the water rises in the tank C the float is lifted, rocking the lever M and through the connections described, the weighted lever L, until the latter is carried from an inclined to a vertical position (as shown in full lines in Fig. 5), the segmental slot *b* allowing the lever to move thus far without turning the shaft F. As soon, however, as the weight on the lever L has passed over the center it will fall by its own gravity into the dotted position (Fig. 5) and the shoulder *i* on the lever striking against the shoulder *j* on the key *c*, will turn the shaft F, rocking the eccentric hub and carrying the wheel H into the position shown in full lines in Fig. 3, the shoulder *k* on the bracket E preventing further movement. In this position the pawls J and J' are brought into engagement with the ratchet teeth I I', so that the movement of the lever K will rotate the wheel

H, the pawl J holding the wheel from turning back while the pawl J' is moving down for a new hold. The wheel in turning will wind up the chain S and throw the mill out of the wind, and to prevent danger of turning too far by the momentum of the mill I preferably omit one of the ratchet teeth I, leaving a blank T which when reached by the pawl J will allow the latter to move up and down without turning the wheel. As the float lowers the lever M is reversely rocked thereby rocking the lever L in the opposite direction, and carrying the ratchet wheel out of engagement with the pawls J and J', and allowing the wheel to be again thrown into the wind.

What I claim as my invention is—

1. In a windmill regulator, the combination of a ratchet wheel, a stationary pawl, a pawl operated by the windmill, and devices controlled by the float for shifting the ratchet wheel in and out of engagement with the pawls, substantially as described.

2. In a windmill regulator, the combination of a ratchet wheel, a hub upon which it is journaled, an eccentrically arranged supporting shaft therefor, a stationary pawl, a pawl operated by the windmill, and means controlled by the float for rocking the hub, whereby the ratchet wheel is moved in and out of engagement with the pawls, substantially as described.

3. In a windmill regulator, the combination of the ratchet wheel having a holding pawl and an actuating pawl operated by the wind-

mill, of an eccentric for shifting the wheel, a weighted lever for rocking the eccentric and a connection to the float for operating the weighted lever, substantially as described.

4. In a windmill regulator, the combination of a ratchet wheel having a holding pawl, an actuating pawl operated by the windmill, an eccentric for shifting the wheel, a weighted lever for rocking the eccentric, a lever connected to the float for operating the weighted lever, the parts being arranged with a lost motion between the float operated lever and the weighted lever, and between the weighted lever and the eccentric, substantially as described.

5. In a wind-mill regulator, the combination of a bracket, a shaft pivoted therein, a lever pivoted at one end, connected to the windmill pump rod, an eccentrically arranged hub upon the shaft and having stops to limit its movement a ratchet wheel journaled thereon, a pawl on the said lever adapted to engage said ratchet wheel, a stationary pawl beside the wheel and engaging the same, a weighted lever pivoted on the shaft, and a lever pivoted beside the weighted lever having a limited play in relation to the weighted lever, and operated by the float, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

ARTHUR S. CLARK.

Witnesses:

JAMES WHITTEMORE,
M. B. O'DOHERTY.