

No. 692,158.

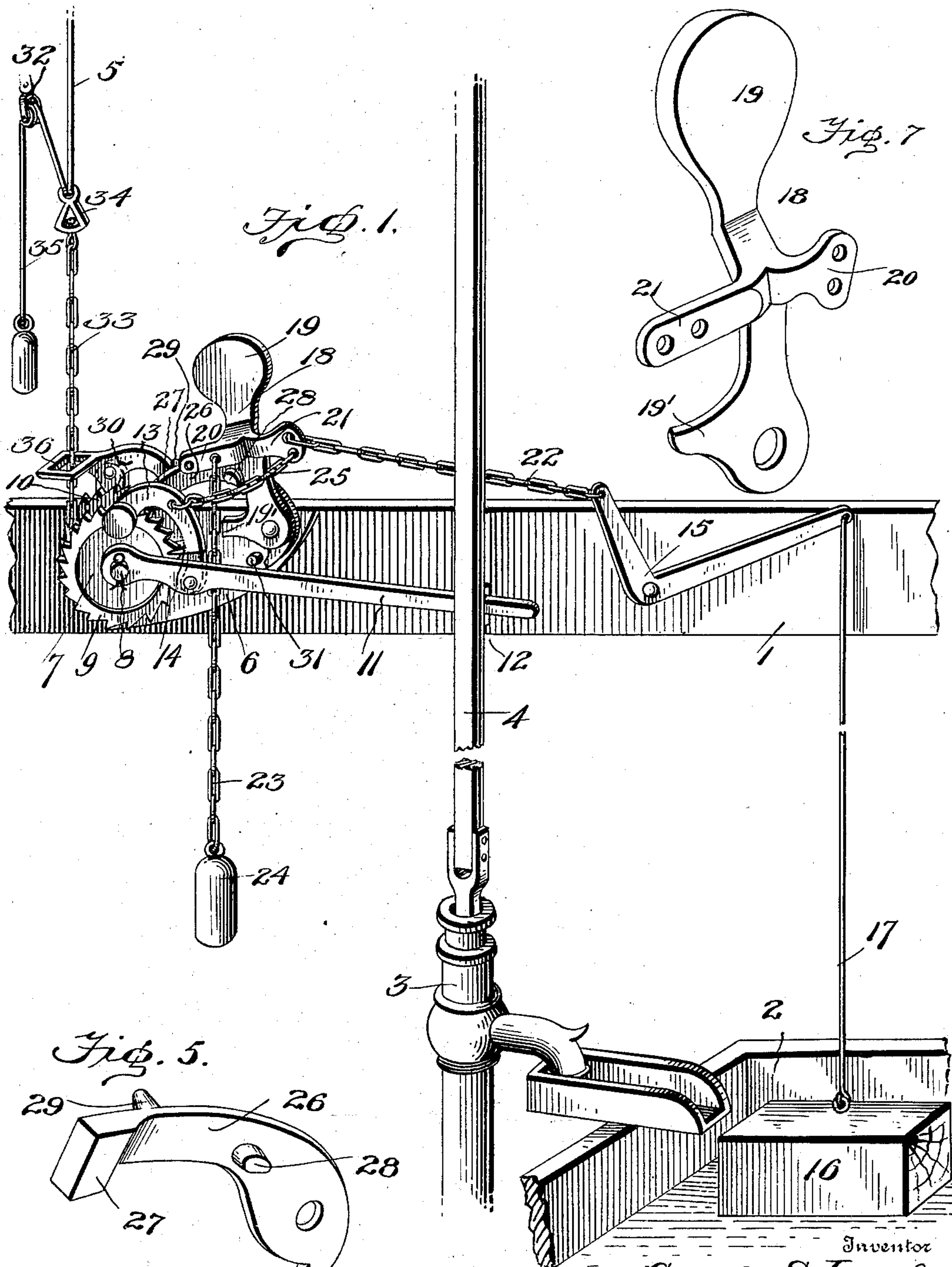
Patented Jan. 28, 1902.

G. S. LONG.
WINDMILL REGULATOR.

(Application filed May 6, 1901.)

(No Model.)

2 Sheets—Sheet 1.



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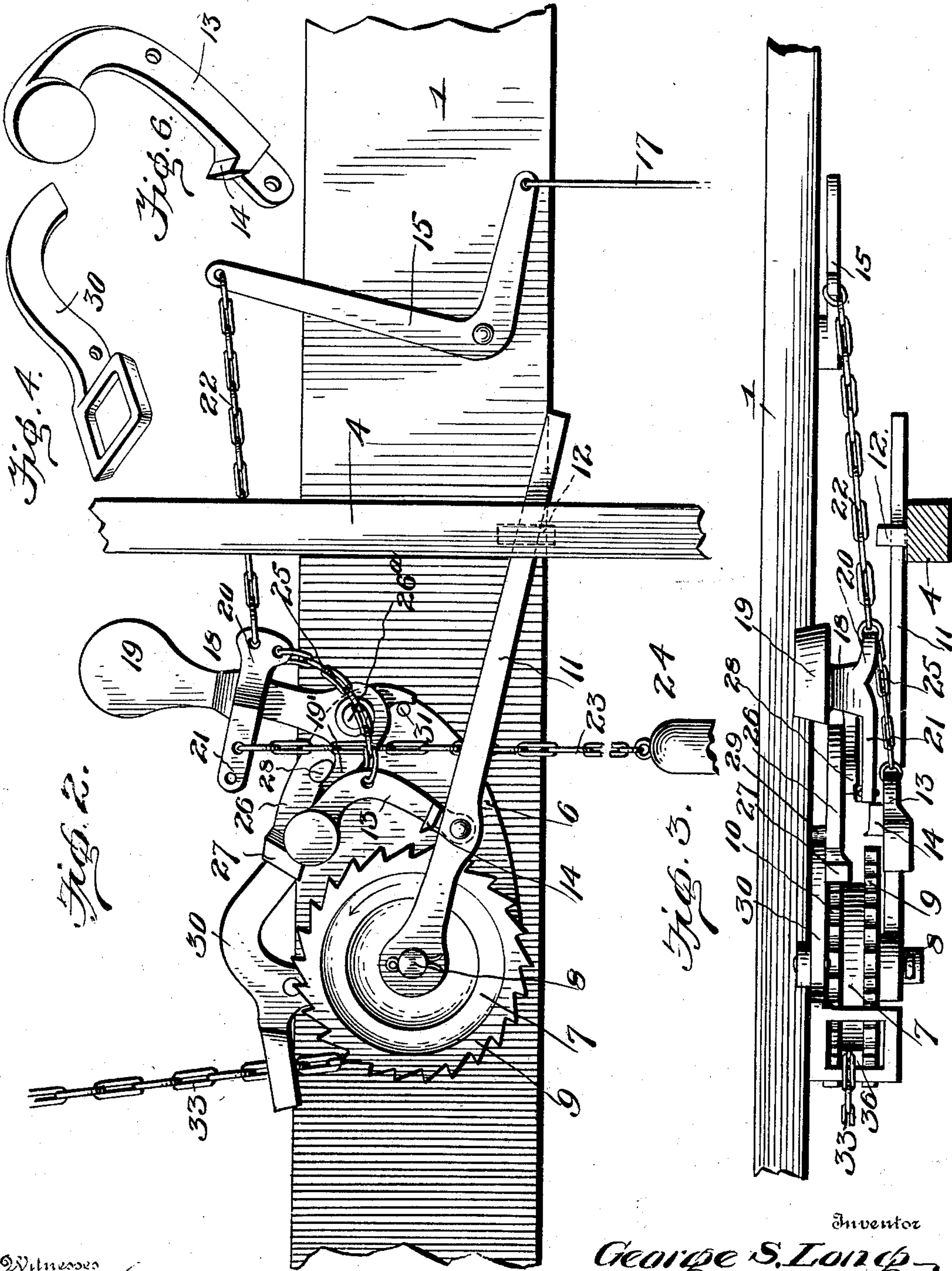
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UNITED STATES PATENT OFFICE.

GEORGE SILAS LONG, OF DEKALB, ILLINOIS.

WINDMILL-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 692,158, dated January 28, 1902.

Application filed May 6, 1901. Serial No. 58,930. (No model.)

To all whom it may concern:

Be it known that I, GEORGE SILAS LONG, a citizen of the United States, residing at Dekalb, in the county of Dekalb and State of Illinois, have invented certain new and useful Improvements in Windmill-Regulators; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to windmill-regulators.

The object of the invention is to provide a device of this character which shall be simple of construction, durable in use, comparatively inexpensive of production, and efficient in its action of automatically throwing the face of the wheel out of the wind when the water has reached a predetermined level in the tank and of throwing the face of the wheel to the wind when the water lowers in the tank, thus maintaining a practically uniform level within the tank and preventing the overflow from and exhaust of water in the tank.

With these and other objects in view the invention consists of certain novel features of construction, combination, and arrangement of parts, which will be hereinafter more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a perspective view of a fragment of the water-tank, pump, and windmill-tower, illustrating the application of my invention, the parts of the regulating device being shown in position to operate the wheel-controlling rod or cord to throw the edge of the wheel to the wind, and thus stop the rotation of the wheel. Fig. 2 is an enlarged front view of the device shown in the position it assumes when the face of the wheel is to the wind and the wheel in action. Fig. 3 is a top plan view of the device with the parts in the position shown in Fig. 2. Fig. 4 is a perspective view of part 30. Fig. 5 is a perspective view of the locking-dog 26. Fig. 6 is a perspective view of the operating-pawl 13, and Fig. 7 is a perspective view of part 18.

Referring to the drawings, 1 denotes the cross-beam of a windmill-tower; 2, the water-tank; 3, the pump-stock; 4, the pumping-rod, connected to the wheel-shaft to be reciprocated in the usual way, and 5 the wheel-controlling rope or rod, connected to the wheel in the usual manner and designed to throw the wheel into and out of operative position.

6 denotes a supporting-frame suitably secured to the beam 1, and 7 denotes a ratchet-wheel journaled upon the lateral stud 8 and provided with two sets of ratchet-teeth 9 and 10.

11 denotes an operating-lever pivoted to the stud 8 and having its free end projecting through a slotted bracket 12, secured to the pump-rod.

13 denotes an operating-pawl which is pivoted to the lever intermediate its ends and is designed to engage the ratchet-teeth 9 to rotate the ratchet-wheel in the direction indicated by the arrow shown in Fig. 2. This pawl has its free end weighted to normally hold its toe 14 into engagement with the ratchet-teeth.

15 denotes a suitably-pivoted bell-crank lever, and 16 a float located in the tank and connected to one limb of the bell-crank lever by the chain or wire 17.

18 denotes a suitably-pivoted trip having a weighted end 19 and two laterally-projecting arms 20 and 21, the former being connected by a chain or wire 22 to the opposite limb of the bell-crank lever and the latter being connected by a chain or wire 23 to a weight 24. A chain 25 is also connected to the arm 20 and to the operating-pawl.

26 denotes a locking-dog pivoted to the bolt 26^a, that pivotally connects the trip 18 to the beam 1, the toe 27 of which is adapted to engage the ratchet-teeth 10. This locking-dog will prevent retrograde movement of said wheel while being rotated in one direction by the operating-pawl, and when the wheel has been rotated the desired amount or distance this dog will lock said wheel against a reverse movement. The dog is provided with an inwardly-projecting stud 28, arranged within the path of movement of the weighted trip and its toe 19', and with an outwardly-projecting stud 29, arranged within the path of movement of a lever 30, pivoted to a stud 30^a. The movement of the upper end of said dog is limited by a stop-stud 31, arranged within the path of movement of the lower end of said dog.

32 denotes a suitably-supported pulley.

33 denotes a chain or cable having one end secured to the ratchet-wheel by a cross-pin and adapted to be wound in the groove formed between the two sets of ratchet-teeth and connected at its other end to a swiveled block 34, which is in turn connected to the operating rope or rod 5 and to the weighted rope 35, rove through the pulley 32. The rope 33 passes up through an aperture 36, formed in the lever 30. This aperture is of such size that the block 34 cannot pass through it.

The operation of the device is as follows: The parts being in the position shown in Fig. 2, the tank filled with the desired amount of water, and the float raised to its predetermined height, the weight 24 throws the trip from the position shown in Fig. 2 to that shown in Fig. 1, which movement throws the locking-dog into engagement with the ratchet-wheel and permits the weighted operating-pawl to move into engagement with its coacting ratchet-teeth. The continued reciprocatory movement of the rod 4, moving with it the operating-lever, will cause the operating-pawl to rotate the ratchet-wheel tooth by tooth and wind the chain or cord 33 around said ratchet-wheel, thus drawing downward the block 34, which being connected to the regulating cord or rod 5 operates said cord or rod to throw the edge of the wheel to the wind, and thus stop the rotation of the wheel and movement of the pumping-rod. As the ratchet-wheel continues to wind up the rope or chain 33, the block 34 is brought into engagement with the aperture end of the lever 30 and draws that end of the lever downward, thus elevating the opposite end of the lever, which coming in contact with a rearwardly-projecting lug of the locking-dog releases said locking-dog from its coacting ratchet-teeth, preventing the winding up of the chain any more than is necessary to just pull the mill out of the wind. The disengagement of the locking-dog with its ratchet-teeth does not release said ratchet-wheel to permit of its return, for said wheel is now being held against retrograde movement by the operating-pawl, and not until the water within the tank has lowered and the float sinks with it and overcomes the weighted trip to throw it to the position shown in Fig. 2 will the operating-pawl be disengaged from its coacting ratchet-teeth. In this position the toe 19' of the weighted trip will engage the lug 28 of the holding-dog and hold said dog out of engagement with its ratchet-teeth while the chain is being unwound, due to the swinging of the vane in a position to hold the face of the wheel to the wind. If this toe were not provided, the instant the block 34 freed itself from contact with the apertured end of the lever 30 the opposite end of said lever would lower, thus allowing the locking-dog to engage the ratchet, and in that event the ratchet would be locked against

movement and would prevent the vane from swinging around at right angles to the face of the wheel. When disengaged from its coacting ratchet-teeth, the vane of the wheel will swing around to its proper position to hold the face of the wheel to the wind and permit of the rotation of said wheel and the refilling of the tank by the pump, and when the tank is refilled the device automatically acts to cut off the water-supply by throwing the edge of the wheel to the wind in the manner above explained.

From the foregoing description, taken in connection with the accompanying drawings, the construction, mode of operation, and advantages of my invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion, and minor details of construction may be made within the scope of the invention without departing from the spirit or sacrificing any of the advantages thereof.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a device of the character described, the combination with a ratchet-wheel, of a flexible connection connected to the wheel and the controlling-rope, a float, a pivoted lever, an operating-pawl pivoted to said lever and designed to coact with the ratchet-wheel, a bell-crank lever, a trip, a flexible connection between one limb of the bell-crank lever and the float, a flexible connection between the trip and the other limb of the bell-crank lever, a locking-dog actuated by said trip and designed to coact with the ratchet-wheel, and a second pivoted lever to automatically disengage said locking-dog from the ratchet to prevent further winding of the wheel, substantially as set forth.

2. In a device of the character described, the combination with a ratchet-wheel, of an operating-lever, an operating-pawl to engage said ratchet-wheel and connected to said operating-lever, a locking-dog to engage said ratchet-wheel, a float-controlled trip for actuating said locking-dog, a second lever for freeing said dog from engagement with the ratchet-wheel, and a chain adapted to be connected to the wheel-controlling rope or rod and provided with a block, said chain being connected to said ratchet-wheel and when wound up by the same to draw its block against the end of said lever, to elevate its other end and thereby automatically disengage the locking-dog from the ratchet-wheel, substantially as set forth.

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

GEORGE SILAS LONG.

Witnesses:

A. G. KENNEDY,
B. HOWLAND.