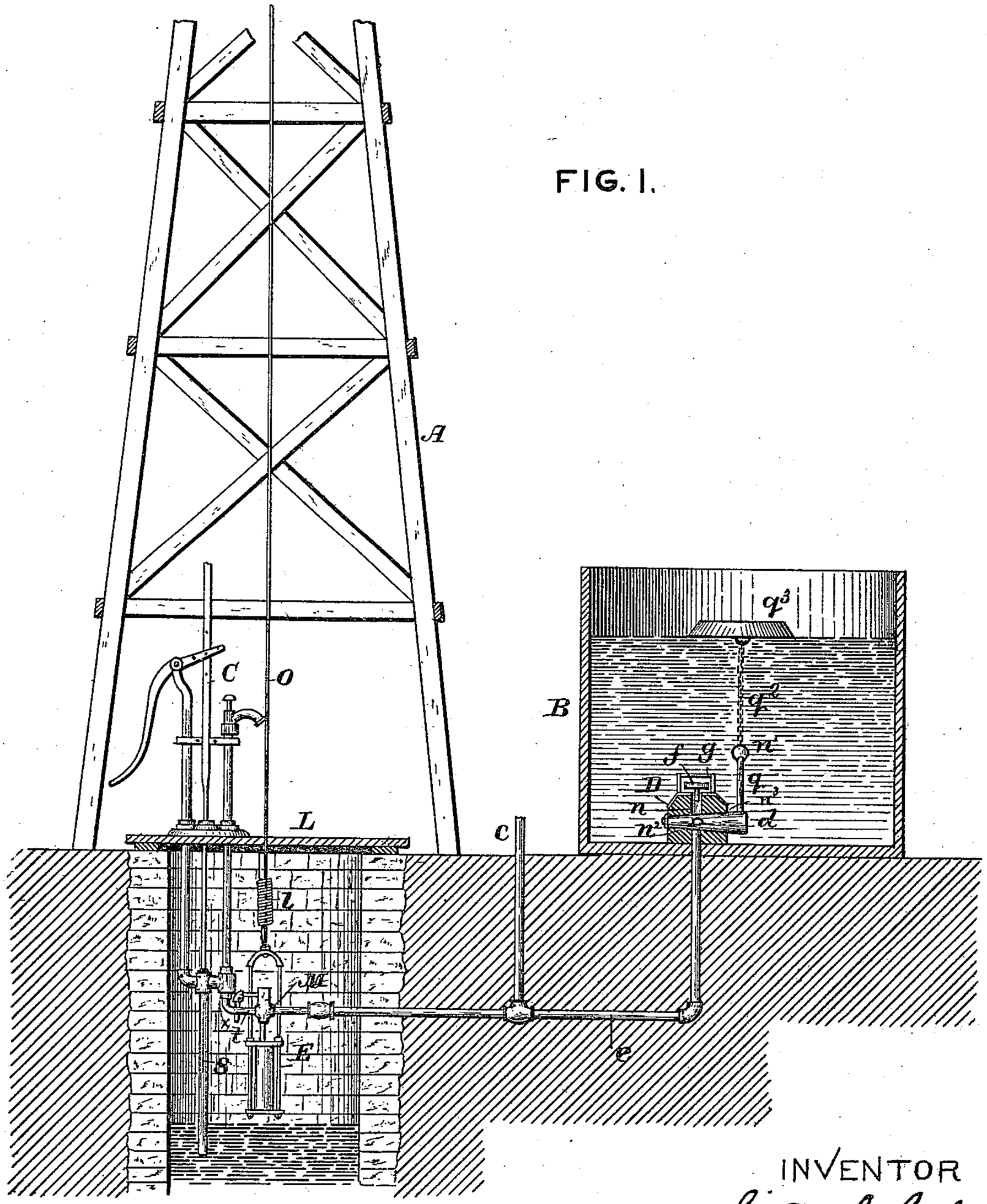
(No Model.) 2 Sheets—Sheet 1.

S. S. GIBSON.

WINDMILL REGULATOR.

No. 441,296. Patented Nov. 25, 1890.

FIG. 1.



INVENTOR
Scott S. Gibson

ATTEST
J. Henry Kaiser
Chas E. Hunt.

(No Model.) 2 Sheets—Sheet 2.

S. S. GIBSON.

WINDMILL REGULATOR.

No. 441,296. Patented Nov. 25, 1890.

FIG. 2.

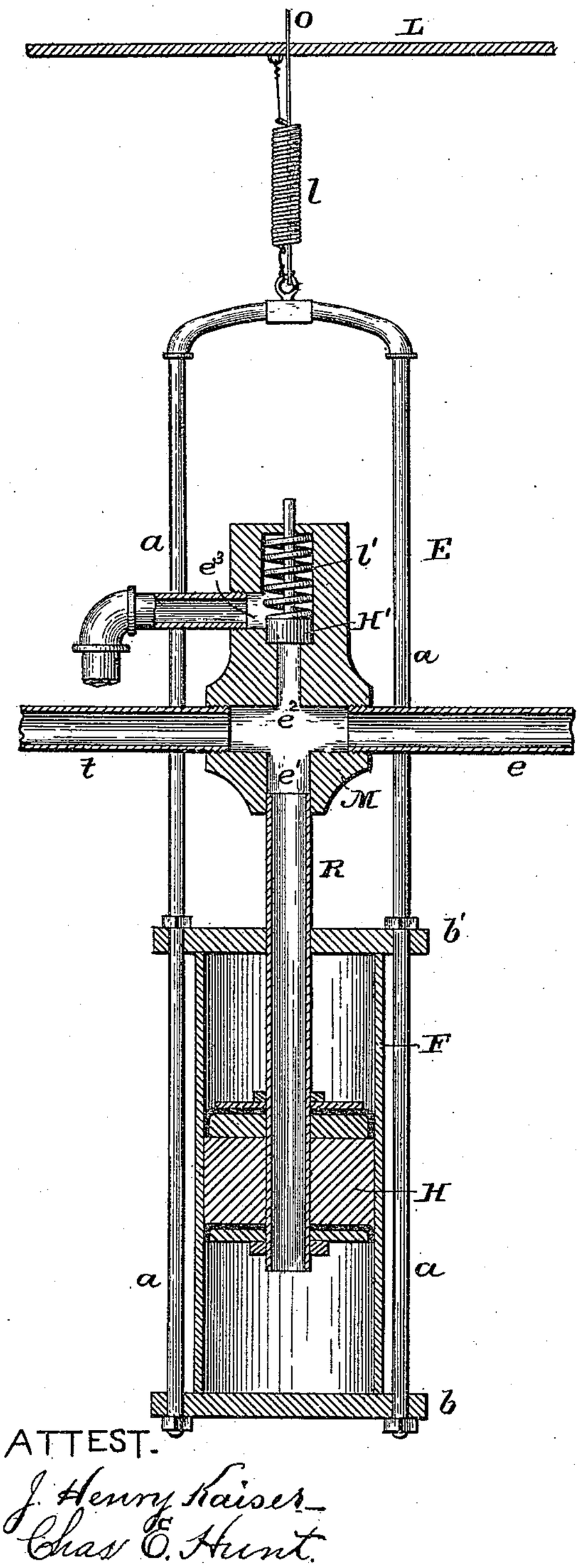
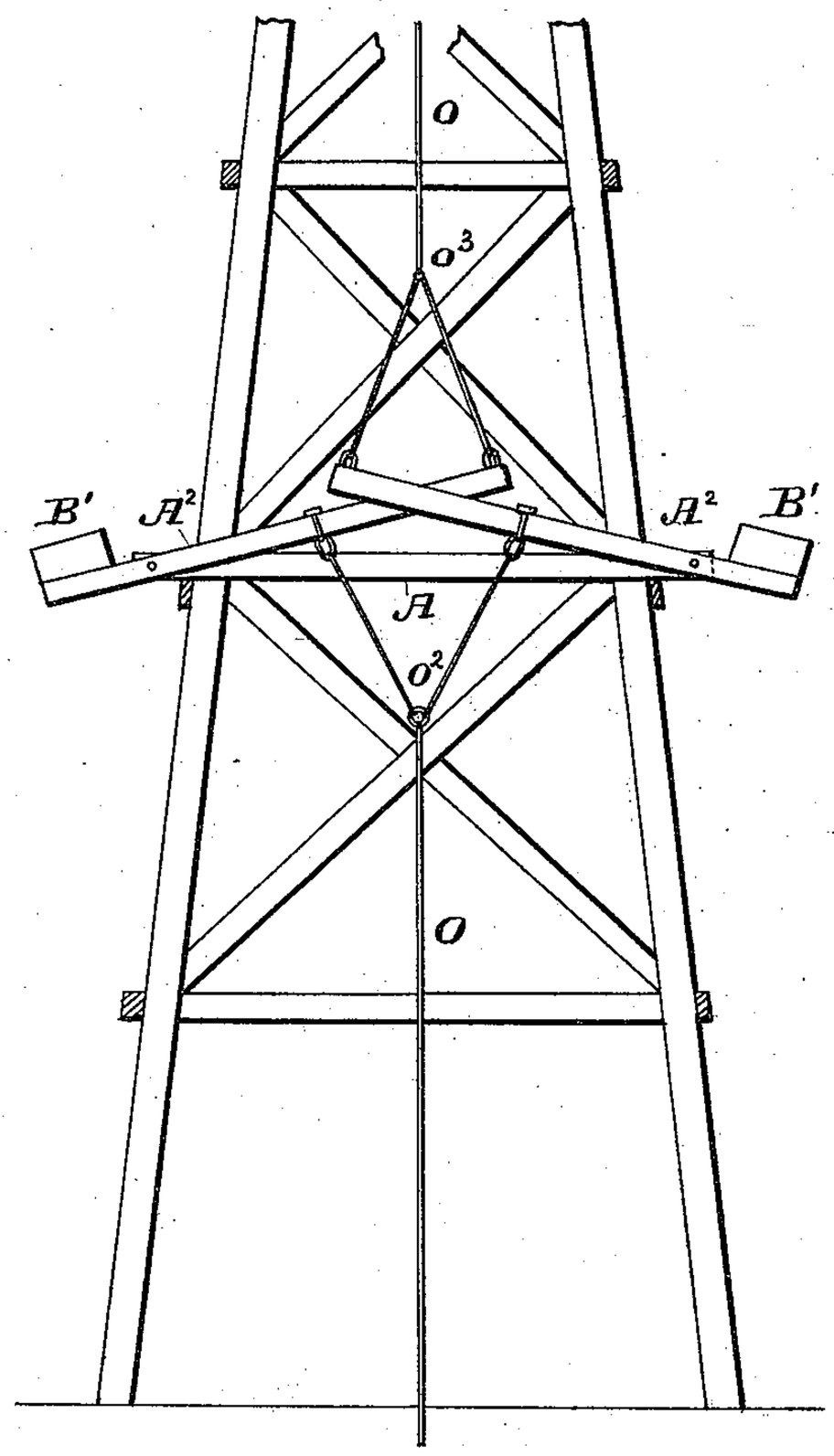


FIG. 3.



ATTEST.

J. Henry Kaiser
Chas C. Hunt.

INVENTOR.

Scott S Gibson

UNITED STATES PATENT OFFICE.

SCOTT S. GIBSON, OF WHITING, KANSAS.

WINDMILL-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 441,296, dated November 25, 1890.

Application filed March 21, 1889. Serial No. 304,095. (No model.)

To all whom it may concern:

Be it known that I, SCOTT S. GIBSON, of Whiting, in the county of Jackson and State of Kansas, have invented certain new and useful Improvements in Automatic Regulators for Windmills, of which the following description and claims constitute the specification, and which is illustrated in the accompanying two sheets of drawings.

The object of my invention is to provide simple and effective means for turning the wheel of a windmill to and from the wind and to thus automatically regulate the quantity of water in the tank.

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

Referring to the drawings, Figure 1 represents a vertical sectional view of a tower, tank, and well and showing the regulator and pump in side elevation. Fig. 2 is a central vertical section of my improved regulator. Fig. 3 is a modification to be described.

Referring now to Fig. 1, A represents a windmill-tower, C a force-pump of any approved construction, and E the regulator.

The water is taken from the well through the pipe *s* and forced through the lead-off pipe *e* into any suitable receptacle. In this instance I have shown a tank B, somewhat enlarged, to more clearly show the details of construction. The pipe passes up through the bottom of the tank and is provided at its upper end with a check-valve. The valve which I have devised for this purpose consists of a block D, having a vertical port *n*, through which the water passes. A gravity-valve *f*, inclosed in a frame *g*, closes the port *n* and prevents any backflow of the water contained in the tank.

It is often desirable to use the water from the same well both for stock and household purposes. It therefore becomes necessary to provide a valve which will effectually prevent any backflow from the tank, as it would pollute the water in the well. To attain this end I form a conical-shaped recess n^3 in the block D at right angles with and interrupting the port *n*. Into this recess I fit a correspondingly-shaped core *d*, having an elongated opening n^2, and to the projecting end of which is attached the arm *q*, provided at its free end with the small weight n'. The said core *d* is adapted to partially rotate in the recess to bring its opening n^2 in and out of line with the port *n*. This is accomplished by means of the weighted arm above described and the float q^3, which is attached to the said arm by means of the chain q^2. When the water is consumed from the tank, the weighted arm *q* rotates the core until the said opening coincides with the said port *n*, thus allowing the water to flow freely. When, however, the tank becomes nearly full of water, the float will have been raised to the position shown, and, owing to its connection with the weighted arm by means of the chain q^2, the said arm will also have been raised and the supply of water cut off.

It is of importance that the water be quickly cut off when the tank becomes nearly full, and for that reason I have made the opening n^2 in the core elongated, in order that it may perform its function by turning a less distance than would be necessary if the opening were round.

All the parts above enumerated, with the exception of the check-valve, are common and well known and need no further detailed description.

When the water is arrested at the tank, the back-pressure, acting through the regulator, will pull the wheel "out of wind," and the pump will then come to rest.

I will now proceed to describe my improved regulator by which I accomplish this result, reference being had to Fig. 2. Secured to the frame *a a* is the cylinder F, having the heads *b b'*, which extend slightly beyond the cylinder to provide bearings for the said frame. The frame and cylinder are firmly secured together in any suitable manner. The frame *a a* is suspended from the pump-platform L by the spring *l*. The lead-off pipe *e* and a pipe *t*, connecting with the discharge-pipe of the pump, meet in opposite parts of a coupling M, which has, in addition to the main passage-way leading directly through from *e* to *t*, a passage *e*, leading downward at right angles to the passage to a pipe R, secured in the lower part of the passage *e* of the coupling, the pipe R passing centrally through the head *b'* of the cylinder F. To the lower end

of this pipe, within the said cylinder F, is secured the stationary piston H, which fits snugly in the said cylinder and is provided with rubber packing to prevent the water from passing above the same. When the water is arrested at the tank and has no further outlet in that direction, it is forced down through the pipe R into the cylinder below the piston H, and by reason of the said piston being stationary the cylinder and frame are forced down against the tension of the spring *l*. The regulating-wire O, suspended from the operative parts of the windmill, is attached centrally to the upper part of the frame *a a*, and consequently when the frame is forced down, as just described, the wire O will likewise descend and pull the wheel out of wind.

It will be observed that the regulator is so arranged with relation to the operative parts of the wheel, which, it will be understood, are always located centrally at the top of the tower, that a direct downward strain is exerted when the wheel is operated by the regulating-wire. In order to show this arrangement more clearly, I have shown in Fig. 1 the pump slightly at one side of the center of the tower. In practice the pump is substantially in the center of the tower. I consider this a very important feature, inasmuch as any sidewise strain on the wire is always attended with more or less wear at the point of deflection, which will soon render a new one necessary. It often happens, moreover, that owing to the inaccessibility of the wire high up in the tower for inspection when subject to a sidewise strain it will wear entirely through, in which case irreparable damage is liable to occur to the pump or regulator. By my improvement the liability of a break is reduced to a minimum. However, to guard against damage arising from the cause above mentioned by reason of any unforeseen accident to the wire I have provided a safety-valve in connection with the regulator, which I will now describe. This valve during the normal operation of the pump remains closed; but should an abnormal pressure occur in the regulator it will open, allowing the water to escape therethrough. It consists of a plunger H′, located in a recess formed in an upward extension of the coupling M. Surrounding the stem of the said plunger is a strong spring *l′*, which normally presses the plunger to its seat. The relative strength of the springs *l* and *l′* is such that the latter will always hold its plunger to its seat during the normal operation of the pump; but should the wire break the back-pressure of the water would first depress the regulator, as described, and then force up the plunger H′, allowing the water to escape and flow back into the well through the ports e^2 e^3.

It will of course be understood from the above description that when the check-valve at the tank is opened the resiliency of the spring *l* will cause the regulator to resume its elevated position, thus forcing the water contained in the cylinder up through the pipe R.

In certain kinds of windmills now in use the wheel can only be thrown out of wind by a downward pull ranging from fifteen to thirty inches. It is not desirable to make the regulator-cylinder long enough to accomplish this result, owing to the increased expense.

I have devised means whereby a wheel of the kind just mentioned can be pulled out of wind without enlarging the regulator, which I will now describe, reference being had to Fig. 3. Pivoted to a bar A′, centrally supported in the tower, are the levers A^2 A^2, carrying at their outer ends the weight-boxes B′ B′. The levers are relatively so arranged that their inner ends overlap or pass beyond each other. The regulating-wire extending upwardly from the regulator branches a short distance below the levers, as at o^2, the ends being attached, respectively, to the said levers intermediate their fulcra and their ends. The portion of the regulating-wire extending downwardly from the operative parts of the windmill also branches a short distance above the levers, as at o^3, the ends being attached at or near the inner ends of the respective levers. In practice the branching ends of the wire are adjustably secured to the levers A^2 A^2. By this mechanism the lower portion of the wire which connects the regulators and the levers near their fulcra, when caused to move down a short distance, will, through the said levers, pull down the upper portion of the said wire, which connects the operative parts of the windmill and the levers near their inner ends, a greater distance. The difference between the downward movement of the upper and lower portions of the regulating-wire may be varied at will by simply changing the adjustment of the wires, as described, at the points of attachment to the levers A^2 A^2. By adopting these means I am enabled to use a comparatively small regulator with the various kinds of wheels.

When water is to be used for household purposes, the check-valve at the tank is closed and the water is conducted through the pipe *c* to any desired place.

Having now fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a windmill-regulator, the combination of the following elements: a cylinder F, having frame *a a* attached thereto, spring *l*, for controlling the regulating-cylinder, regulating-wire O, inlet-pipe R, having the piston H affixed thereto, cock *d*, and the safety-valve located in the lead-off pipe above the cylinder, substantially as described.

2. In regulator attachments for windmills, the regulator, regulating-wire O, and spring *l*, combined with the safety-valve consisting of the ports e^2 e^3, piston H′, and spring *l′*, the resistance of the spring *l′* being greater than the resistance of the spring *l*, whereby the

piston H′ is firmly held to its seat during the normal operation of the pump.

3. In regulator attachments for windmills, the weighted levers A^2 A^2, pivoted to a cross-piece A′, centrally supported in the tower, in combination with the regulating-wire O, branched at o^2 and o^3, the branched ends of the upper portion of the wire being attached, respectively, at or near the inner ends of the levers A^2 A^2, and the branched ends of the lower portion of the said wire being attached, respectively, to the said levers intermediate their ends and fulcra, substantially as described.

In testimony whereof I have signed my name in the presence of two witnesses.

SCOTT S. GIBSON.

Witnesses:
N. H. GLENN,
JOHN SMACK.