

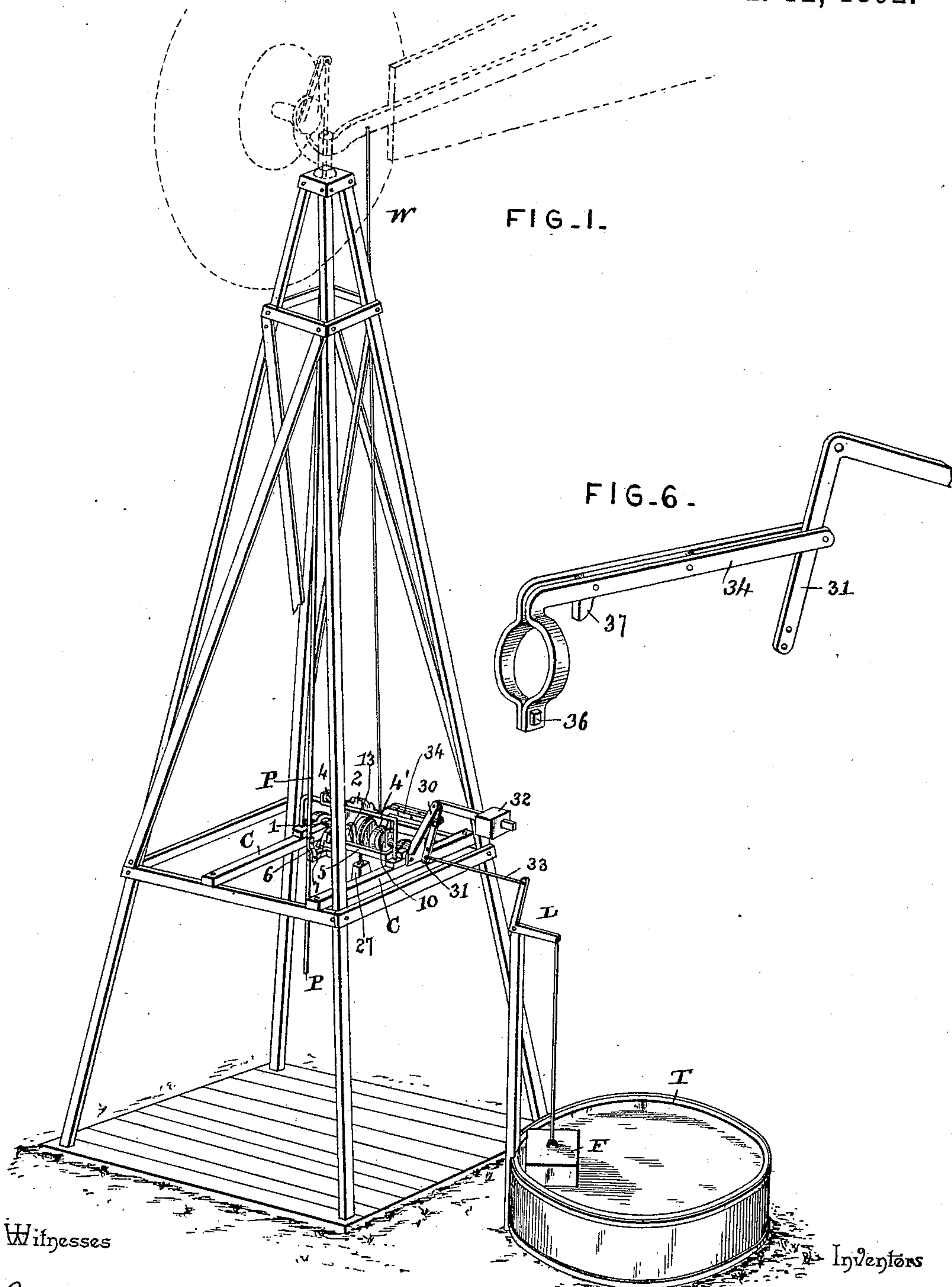
(No Model.)

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WINDMILL REGULATOR.

2 Sheets—Sheet 1.

No. 467,057.

Patented Jan. 12, 1892.



Witnesses

Inventors

Jas. H. McLaughlin  
N. F. Riley

By their Attorneys,

Clarence Silvester  
Winfred Silvester

C. A. Snow & Co.

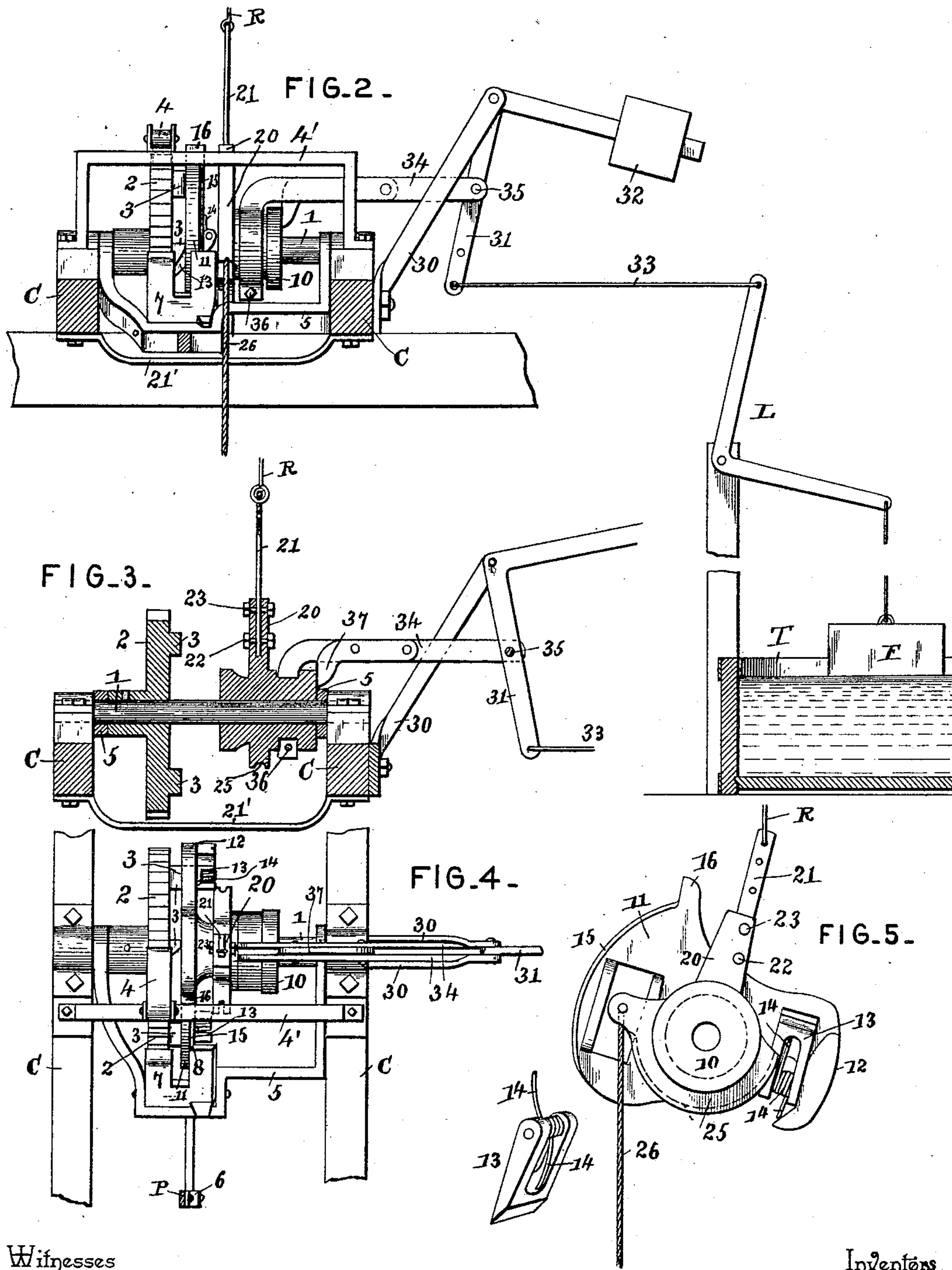
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# UNITED STATES PATENT OFFICE.

CLARENCE SILVESTER AND WINFRED SILVESTER, OF WINDOM, KANSAS.

## WINDMILL-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 467,057, dated January 12, 1892.

Application filed August 27, 1891. Serial No. 403,908. (No model.)

*To all whom it may concern:*

Be it known that we, CLARENCE SILVESTER and WINFRED SILVESTER, citizens of the United States, residing at Windom, in the county of McPherson and State of Kansas, have invented a new and useful Windmill-Regulator, of which the following is a specification.

This invention relates to wind-wheels and more especially to the automatic regulators therefor; and the object of the same is to effect certain improvements in devices of this character.

To this end the invention consists in the construction hereinafter more fully described and claimed, and as illustrated on the two sheets of drawings, wherein—

Figure 1 is a perspective view of a windmill with our improved regulator attached, the wheel being indicated in dotted lines. Fig. 2 is a front elevation of the regulator and the tank full of water, the pump-rod being omitted to better show the parts. Fig. 3 is a transverse section of the regulator, showing the position of the parts just after the wind-wheel has been thrown into the wind. Fig. 4 is a plan view of the regulator device, with the U-shaped pawl just commencing to engage the ratchet-wheel. Fig. 5 is a detail view of the double segment, showing one of its spring-actuated pawls or catches removed and illustrating the arm thereof as in position to keep the regulator-wire tight. Fig. 6 is a perspective detail of the shifting devices.

In the said drawings, the letter W designates a frame-work or tower supporting a wind-wheel. P is the pump-rod, reciprocated by said wheel for pumping water into a tank T, and the latter has a float F therein, which is connected by wires leading through a bell-crank lever L with our improved automatic regulator, which is mounted on a cross-bar C within the tower, all these parts being of the well-known and usual construction and forming no part of the present invention, except in so far as they are used in connection therewith.

The construction of our improved regulator is preferably as follows:

On a transverse shaft 1 is mounted a ratchet-wheel 2, having projections 3 on one face, and 4 is a retaining-pawl pivoted on an arch 4',

rising from the frame and preventing the backward movement of the wheels. 5 is a yoke pivotally mounted at its end on the said shaft and connected at its center by a link 6 with the pump-rod P, and 7 is a U-shaped pawl, one arm of which is adapted to normally engage the ratchet-wheel, while the other arm is beveled, as at 8, the body of the pawl being pivoted in the yoke 5. Hence the reciprocation of the pump-rod will cause the rotation of the ratchet-wheel in one direction as long as the pawl 7 is in engagement therewith.

Mounted loosely on the shaft 1 is a double segment whose hub has a flange 10 and whose segment-faces 11 and 12 stand against the projections 3 of the ratchet-wheel when the tank is full of water. In these segments are pivotally mounted catches 13, which are borne by springs 14 normally into position to engage said projections, although if the tips of the catches should strike the projections when the double segment is borne toward the ratchet-wheel the catches are permitted by their springs to yield, as will be clear. The segment-face 11 has a beveled corner 15, adapted to engage the bevel 8 of the U-shaped pawl, and this segment also has an ear 16, adapted to strike against some stationary member, as the support for the retaining-pawl 4, to limit the movement of the double segment in what we will call its "backward direction."

20 is a box projecting from the hub of the double segment, the front side of this box being open, and 21 is an arm pivotally mounted on a bolt 22 near the bottom of this box while its body is adapted to be connected therewith by another bolt 23, passing through the box near its outer end, as seen in Fig. 3. The regulator-wire R is connected to the outer end of this arm, as shown, and if such wire is slack, as is sometimes the case, the bolt 23 is withdrawn to allow the arm to fall slightly forward, so as to keep up the slack in the wire. However, the latter is preferably tight in a perfect machine and the bolt 23 should then be used.

Diametrically opposite to the box 20 is a small segment 25, mounted on and concentric with the hub and preferably having a grooved face, and secured to the front end of this seg-



ment is a chain or rope 26, leading to a weight 27. With this construction, when the double segment is turned forward by engaging with the ratchet-wheel, the arm 21 will be borne down until it strikes a cross-bar 21' on the frame, thus drawing on the regulator-wire R and throwing the wind-wheel out of the wind to stop its motion in a well-known manner; but when the double segment is disengaged from the ratchet-wheel the weight 27 will turn it backward so as to raise the arm 21, slacken the wire R, and allow the wheel to move again into the wind.

The mechanism for moving the double segment longitudinally on the shaft is of the following construction: 30 is a bracket in which is pivoted the angle of a bell-crank lever 31, whose outwardly-projecting arm is provided with a weight 32 and whose downwardly-projecting arm is connected at its lower end, as by a wire 33, with the float F in the tank T through suitable connections L, as shown. 34 are two arms pivoted at 35 to the depending arm of the lever 31, extending thence through the bracket 30, turned down, passing loosely around the hub of the double segment and connected, as at 36, beneath said hub, and 37 is a finger, whose body is bolted between the arms 34 and whose tip stands against the outer face of the flange 10. By this means, when the tank is full of water the wire 33 is slack and the weight 32 has caused the shifting devices to move the double segment toward the ratchet-wheel, as seen in Fig. 2; but as the float descends with the falling of the water in the tank the double segment is drawn away from the ratchet-wheel, as will be understood.

The operation of this device is as follows: The wheel being in motion and the pump-rod P reciprocating when the tank has been filled, the double segment will be at the position indicated in Fig. 2, and at this time the beveled corner 15 of the segment-face 11 will be moved under the bevel 8 of the U-shaped pawl 7. The latter is thus permitted to fall against the ratchet-wheel, and the reciprocation of the pump-rod then turns the ratchet-wheel forwardly, as above described. As the double segment is at this time connected with the wheel, it also turns forwardly, raises its weight 27, draws downwardly on the arm 21, pulls on the regulator-wire, and throws the wheel out of the wind. The latter result of course checks the reciprocation of the pump-rod and cuts off the flow of water to the tank, which is now full; but it often occurs that the wheel will make several revolutions at this time through its momentum or from other causes. When the double segment is thus in forward position, its rear segment-face 12 stands under the U-shaped pawl 7 and holds the tip of this pawl out of engagement with the ratchet-wheel. Hence a few additional revolutions of the wind-wheel will not turn the ratchet-wheel and segment farther forward and will not draw any farther on the

regulator-wire. With the parts in this position, supposing the water to be drawn out of the tank, the float F will fall and the bell-crank lever 31 will be turned by the wire 33, and this motion will draw on the shifting devices and slide the double segment on the shaft until it is completely disengaged from the ratchet-wheel, when the weight 27 will cause it to turn backward to its original position until its ear 16 limits its further movement and the regulator-wire is thereby slackened, so that the wind-wheel resumes its rotary motion, the pump-rod is reciprocated, and the tank is gradually filled. At this time the segment-face 11 will hold the U-shaped pawl completely raised, as seen in dotted lines in Fig. 4; but as the float rises this segment-face will slowly move to the full-line position in this figure, at which time the engaging-bevels will allow the tip of the pawl to engage the ratchet-wheel, as shown. During any of such motions of the double segment the regulator-wire will be drawn on only when the arm 21 turns around its pivot and strikes the bottom of the box 20, and hence if this wire becomes too slack it should be tightened, as will be clear.

We do not limit ourselves to the precise details of construction, as considerable change may be made therein without departing from the spirit of our invention.

What is claimed as new is—

1. In a windmill-regulator, the combination, with a ratchet-wheel mounted on a shaft and having projections, a yoke pivoted at its ends on said shaft and connected with the pump-rod, and a U-shaped pawl pivoted in the yoke with one of its ends normally in engagement with the ratchet-wheel, of a segment mounted loosely on the shaft and having catches adapted to engage the projections on said wheel, an arm projecting from said segment and connected with the regulator-wire, means for turning the segment in a direction to slacken said wire, the segment-face being shaped to raise said pawl when the regulator-wire is drawn down and when the segment is disconnected from the wheel, but to permit the falling of the pawl at other times, a float in a tank, and connections between said float and segment for moving it toward the ratchet-wheel as the tank is filled, substantially as described.

2. In a windmill-regulator, the combination, with a ratchet-wheel having projections, a U-shaped pawl therefor connected with the pump-rod, a segment on the shaft of said wheel, having catches adapted to engage said projections and with its segment-face lifting said pawl, connections between said segment and the regulator-wire, and a flange on the hub of the segment, of a lever pivoted in a bracket and connected with a float in a tank, arms pivoted to said lever, extending over said flange and around the hub and connected beneath the same, and a finger whose body is secured between the arms and its tip engag-



ing the side of the flange, as and for the purpose set forth.

3. In a windmill-regulator, the combination, with a wheel adapted to be turned by the movement of the pump-rod, a segment adapted to engage said wheel and be turned therewith, and connections between the float and segment for moving the latter into or out of engagement, of a box projecting radially from the hub of said segment and open at its front side, an arm pivoted at its lower end in said box and connected at its outer end with the regulator-wire, and a bolt removably inserted through the box and the body of the arm, as and for the purpose set forth.

4. In a windmill-regulator, the combination, with a segment and mechanism for turning the same around a shaft, of a box projecting radially from the hub of said segment and open at its front side, an arm pivoted at its lower end in said box and connected at its outer end with the regulator-wire, and a bolt removably inserted through the box and the body of the arm, as and for the purpose set forth.

5. In a windmill-regulator, the combination, with a ratchet-wheel having projections on one face, and means for rotating said wheel, of a segment loosely mounted on the shaft of said wheel, a catch pivoted in said segment, a spring throwing the catch normally outward and into the path of one of the projections, means for moving the segment longitudinally of the shaft, and connections between the segment and the regulator-wire, as set forth.

6. In a windmill-regulator, the combination, with a ratchet-wheel having projections on one face, a U-shaped pawl one end of which engages the teeth of the wheel and the other end of which has its inner corner beveled, and connections between said pawl and the pump-rod, of a segment loosely mounted on the shaft of said wheel and adapted to be engaged by said projections, the corner of this segment being beveled so as to permit the engagement of the pawl with the ratchet-wheel when the segment is engaged with the projections, means for moving the segment longitudinally of the shaft, and connections between the segment and regulator-wire, as set forth.

7. In a windmill-regulator, the combination, with a ratchet-wheel having projections on

one face, a U-shaped pawl one end of which engages the teeth of the wheel and the other end of which has its inner corner beveled, and connections between said pawl and the pump-rod, of a double segment, its hub loosely mounted on the shaft of said wheel and its sides adapted to be engaged by said projections, means for moving the hub longitudinally of the shaft, connections between said hub and regulator-wire for drawing on the latter when the hub turns forward, and a weight carrying a chain and wound on a grooved segment projecting from said hub, one of the segment-faces holding the U-shaped pawl raised, and the other segment-face also holding it raised except when the segments are engaged with said projections, substantially as hereinbefore described.

8. In a windmill-regulator, the combination, with a segment and mechanism for turning the same around a shaft, of a box projecting radially from the hub of said segment and open at its front side, an arm pivoted at its lower end in said box and connected at its outer end with the regulator-wire, and a cross-bar on the frame which the body of the arm strikes, as and for the purpose set forth.

9. In a windmill-regulator, the combination, with a ratchet-wheel having projections on one face, a U-shaped pawl one end of which engages the teeth of the wheel and the other end of which has its inner corner beveled, an arch on the frame to which the body of the pawl is pivoted, and connections between said pawl and the pump-rod, of a segment loosely mounted on the shaft of said wheel and adapted to be engaged by said projections, the corner of this segment being beveled so as to permit the engagement of the pawl with the ratchet-wheel when the segment is engaged with the projections, means for moving the segment longitudinally of the shaft, and an arm adjustably connected at its inner end to the segment and at its outer end to the regulator-wire, as set forth.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in presence of three witnesses.

CLARENCE SILVESTER.  
WINFRED SILVESTER.

Witnesses:

GEO. P. HALL,  
ALEX. S. HENDRY,  
LUCIEN EARLE.