(No Model.)

2 Sheets—Sheet 1.

# E. T. CROWE.

## AUTOMATIC WINDMILL REGULATOR.

No. 480,399. Patented Aug. 9, 1892.

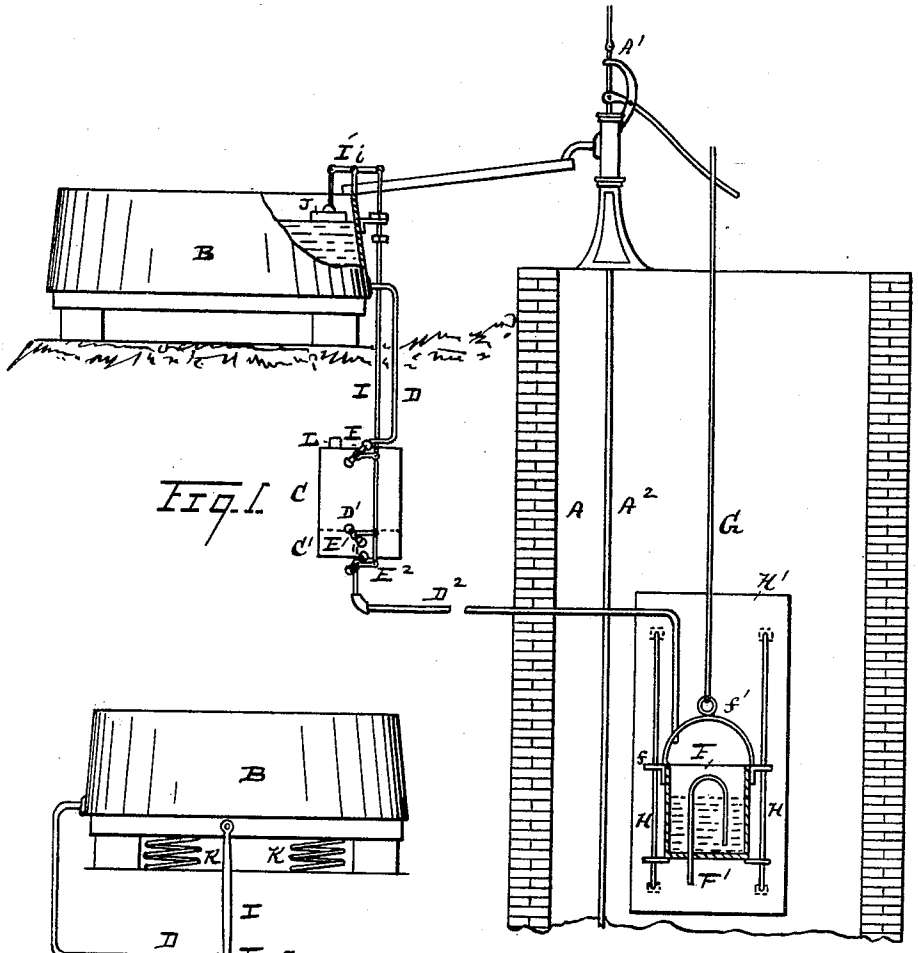


Fig. 1.




Fig. 5.

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John F. Miller.

Inventor
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(No Model.) 2 Sheets—Sheet 2.

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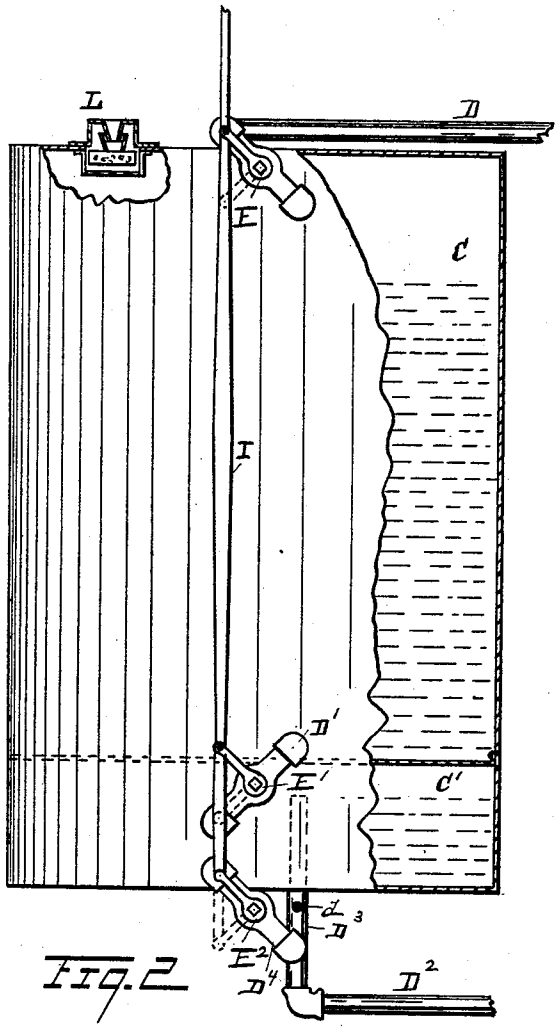



Fig. 2

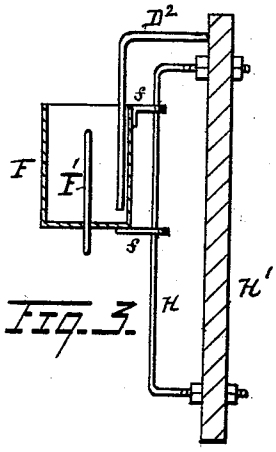
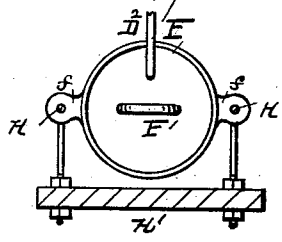



Fig. 3.

Fig. 4.




Witnesses
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John F. Miller.

Inventor
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# UNITED STATES PATENT OFFICE.

EUGENE T. CROWE, OF DELRAY, MICHIGAN.

## AUTOMATIC WINDMILL-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 480,399, dated August 9, 1892.

Application filed January 25 1892. Serial No. 419,113. (No model.)

*To all whom it may concern:*

Be it known that I, EUGENE T. CROWE, a citizen of the United States, residing at Delray, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Automatic Siphon Wind-Wheel Regulators; and I 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, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to a certain new and useful automatic wind-wheel regulator; and it consists of the devices and appliances, their construction, combination, and arrangement, hereinafter described and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a diagram view illustrating my invention, showing parts in section. Fig. 2 is an enlarged view of the main and auxiliary reservoirs and their immediate connections. Fig. 3 is a view in section. Fig. 4 is a view in section on the line *y y*, Fig. 1. Fig. 5 shows certain modifications of portions of the device.

The desirability of an automatic windmill-regulator which shall be simple and economical in construction and certain and efficient in its operation is well understood.

It is the object of my invention to accomplish these ends in a satisfactory and superior manner.

I accordingly carry out my invention as follows: A indicates a well, and A′ the pump-rod of a windmill. $A^2$ is the tube of a pump.

B denotes a stock water-tank supplied by the pump.

C denotes a main reservoir, with which the stock-tank communicates, as by a pipe D, provided with a controlling-valve E.

C′ denotes an auxiliary reservoir, with which the main reservoir C communicates, as through a pipe D′, provided with a controling-valve E′.

F is a siphon counterbalance-bucket, with which the auxiliary reservoir C′ communicates, as by a pipe $D^2$, emptying into said bucket, having an open arm $D^3$, projecting into the reservoir, and an arm $D^4$, provided with a controlling-valve $E^2$.

The bucket F is provided with a siphon F′ for discharging water therefrom when the bucket has been suitably filled to charge the siphon. To this end one extremity of the siphon-tube extends downward within the bucket adjacent to the bottom thereof, while the siphon extends upward to a desired height, the opposite extremity conducting the water outside the bucket to discharge it therefrom wherever desired. The bucket F has a reciprocatory movement vertically and is connected to the regulating-rod G of the wind-wheel to throw the windmill into and out of gear as the rod is moved upward and downward by the action of the bucket connected therewith.

As my invention does not pertain to any specific construction of the wind-wheel nor to any specific mechanism for throwing the wheel into and out of gear, I do not show herewith a wind-wheel construction nor any regulating mechanism connected therewith save the customary operating or regulating rod G, which is commonly employed, leading to the regulating mechanism.

My invention, it will be observed, respects simply the automatic means and mechanism here shown and described to vertically move said regulating-rod G upward and downward to accomplish the desired result. Accordingly my invention will thus be made clear without further illustration.

To insure the proper vertical movement of the bucket and to hold it properly in place and under the pipe leading thereto from the auxiliary reservoir, I provide guide-rods H H, properly secured in place, as may be desired—as, for example, to a wall H′—the bucket being provided, as shown, with ears *f*, engaged with the guide-rods. I do not limit myself, however, to this manner of guiding the bucket. The bucket may be provided with a bail *f*′, by which it is connected with the regulating-rod G.

The valves E E′ $E^2$ may be operated in any suitable manner to control the passage of water through the respective pipes in which they are located. As shown in the drawings, all of said valves are connected with an op-

erating-rod I, so as to be simultaneously operated, the valve E′, however, being arranged to open and close in a manner opposite to the opening and closing of the valves E $E^2$. This may readily be accomplished by reversing the direction of the movement of the valve E′, as shown. In this manner when the valve E′ is open the valves E $E^2$ are closed, and when the valves E $E^2$ are open the valve E′ is closed, the reason for which will be apparent in a further description of the operation of the device hereinafter.

As shown in Fig. 1, A, the rod I is connected with a float J in the stock-tank B. This may be done in any desired manner if the float is used. As shown, the rod I and the float are connected at opposite extremities to a lever-bar I′, fulcrumed intermediate its ends, as shown at *i*. As so connected, it is obvious that when the float rises the rod I will move downward, and when the float descends the rod I will be lifted, operating the connected valves E E′ $E^2$ in a corresponding manner.

As shown in Fig. 1, B, the rod I is connected at its upper end with the stock-tank itself, the tank in this instance resting on springs K, the water in the tank when it has reached sufficient heft depressing the tank, and thereby moving downward the rod I. When the tank has been sufficiently relieved of water therein, the springs again elevate the tank and lift the rod, thereby operating the valves accordingly.

L denotes an air-valve in the reservoir C. We are now prepared to understand the operation of the various features of the device hereinbefore described. The main reservoir C is preferably located above the auxiliary reservoir C′ and is of sufficient capacity at least that the weight of water therein when discharged into the counterbalance-bucket F will throw the wind-wheel out of gear. This main reservoir may be connected with the stock-tank or with the pump or with any suitable water-head. Water is admitted to the main reservoir C through the pipe D when its valve E is open and passes thence through pipe D′ into the auxiliary reservoir C′ when the valve E′ is open. The water is held, however, in the main reservoir by the closed valve E′ until such time as it is desired to throw the wind-wheel out of gear, and thereby stop the working of the pump. When the float has risen sufficiently to open the valve E′, where the float is employed, the valve in the pipe D is closed, stopping the flow of water into the main reservoir. At the same time that the valve $E^2$ is closed, stopping the flow of water through the arm $D^4$, the water is then let out of the main reservoir C into the auxiliary reservoir through the pipe D′. The water in the auxiliary reservoir passes out therefrom through the arm $D^3$, entering the top of said arm, and passes thence to the counterbalance-bucket. The surplus of water in the main reservoir over the capacity of the auxiliary reservoir up to the top of the pipe-arm $D^3$, when discharged into the counterbalance-bucket, is designed to be of sufficient weight to throw the wheel out of gear. In this condition of affairs we have, then, the wheel out of gear and water in the auxiliary reservoir up to the top of the pipe-arm $D^3$, which is held there until it is desired to start the wheel to work again, which will be when the water in the stock-tank carries the float downward and operates the valves again to open the valves E $E^2$ and closing the valve E′. The same result would obviously take place if the spring-supsorted tank were used instead of the float. This action lets water out of the auxiliary reservoir through the pipe-arm $D^4$ into the counterbalance-bucket. The amount of water thereby discharged into the counterbalance-bucket in addition to that already therein will be enough to prime the siphon and in consequence empty the bucket. The bucket, being thus relieved of its weight of water, ascends and allows the wheel to go in gear again and resume pumping. The opening of the valves E $E^2$ lets water into the main reservoir, where it is held by the closed valve E′, as above explained. The counterbalance-bucket is designed to be of essentially the same capacity as the main reservoir.

I do not limit myself to locating the counterbalance-bucket in the well alone. It is obvious that the pipe $D^2$ may be carried to any suitable distance.

This device is obviously simple and not liable to get out of order. It is positive in its action, the action of the rod A′ being controlled by gravitation. It can be attached to any kind of a pump and can be used with any kind of a tank, wherever the tank may be located. It can be made of any desired capacity, according to the size of the wind-wheel and the weight required to control its action. The counterbalance-bucket, it will be seen, is suspended on the rod G.

I would have it understood that the wind-wheel connection G to throw the wheel into and out of gear may be a rod or any other desired connection for accomplishing this purpose.

I do not limit myself to any specific construction of the valves here shown, nor to any specific number and location of them, nor to the use of the valves alone, as my invention contemplates any means of controlling the desired water communications interposed between the stock-tank or water-head and the bucket.

What I claim as my invention is—

1. In a wind-wheel regulator, the combination of the movable counterbalance-bucket, reservoirs communicating one with another and with said bucket, means to control said communications, and a wheel-operating connection G, by which said bucket is suspended, substantially as described.

2. In a wind-wheel regulator, the combination of the counterbalance-bucket, a wheel connection suspending said bucket, an aux-

iliary reservoir communicating with said bucket, a main reservoir communicating with the auxiliary reservoir, a water-inlet pipe leading into the main reservoir, valves controlling said communications, and the valve controlling the communication between the reservoirs, arranged to close when the other valves are open, and vice versa, substantially as described.

3. In a wind-wheel regulator, the combination of the siphon-bucket, a wheel connection suspending the bucket, an auxiliary reservoir, a pipe $D^2$, leading from said reservoir to said bucket, a main reservoir communicating with the auxiliary reservoir, a water-inlet pipe leading into the main reservoir, valves to control the communication through the water-inlet pipe and between said reservoirs, the pipe $D^2$, provided with a pipe-arm $D^3$, projecting upward toward the top of the auxiliary reservoir, and a pipe-arm $D^4$, provided with a controlling-valve, and means for operating said valves, substantially as described.

4. In a wind-wheel regulator, the combination of the suspended bucket, an auxiliary reservoir communicating with the bucket, a main reservoir communicating with the auxiliary reservoir, and simultaneously-operated valves to control said communication, substantially as and in the manner described.

5. In a wind-wheel regulator, the combination of the suspended bucket, the auxiliary reservoir communicating therewith, the main reservoir communicating with the auxiliary reservoir, a stock-tank communicating with the main reservoir, and valves controlling said communications, said valves automatically operated by the quantity of water in the stock-tank, substantially as and in the manner described.

In testimony whereof I sign this specification in the presence of two witnesses.

EUGENE T. CROWE.

Witnesses:
N. S. WRIGHT,
J. F. MILLER.