(No Model.)

F. RICE.

WINDMILL REGULATOR.

No. 556,772. Patented Mar. 24, 1896.

Fig. 1.

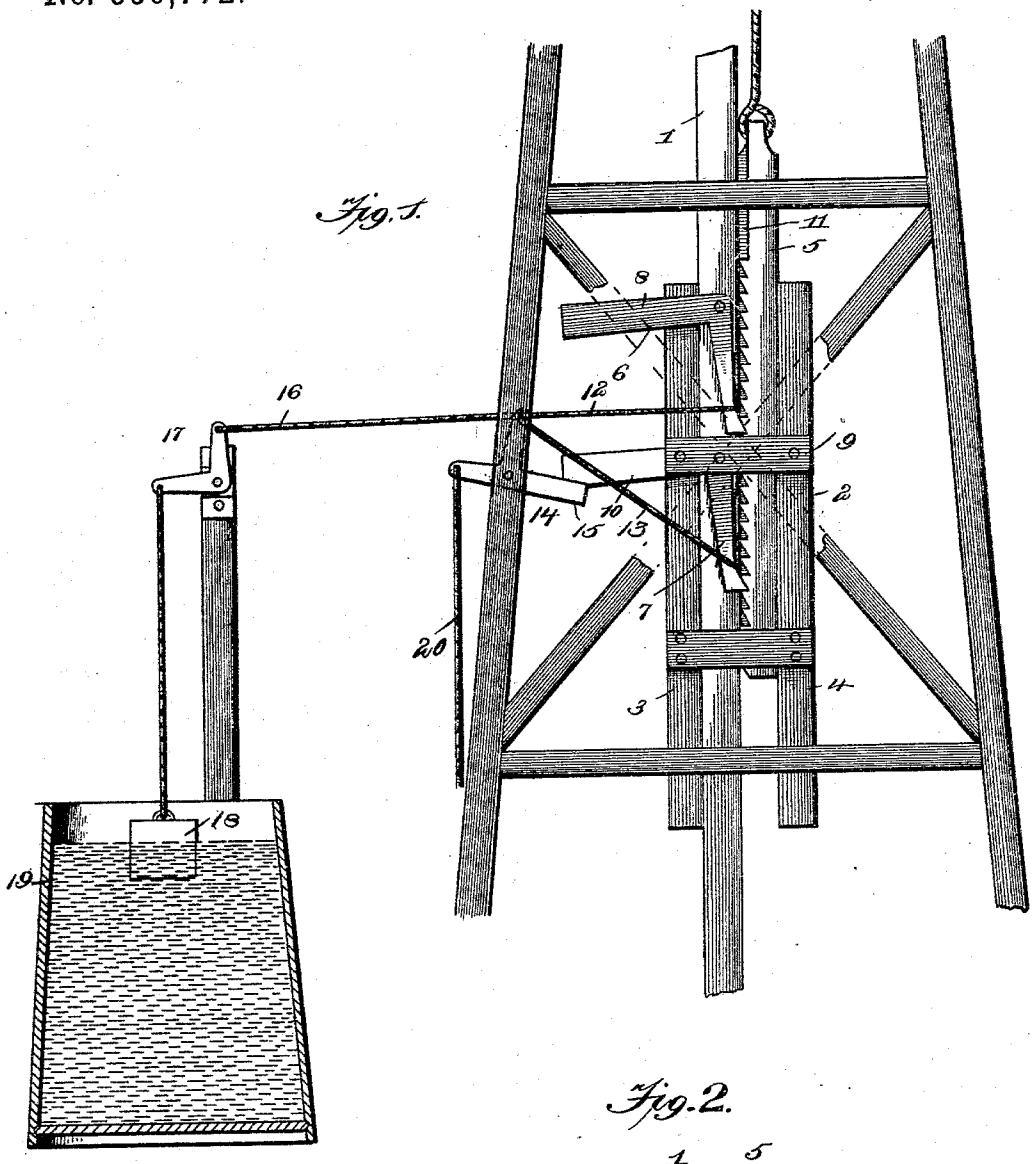
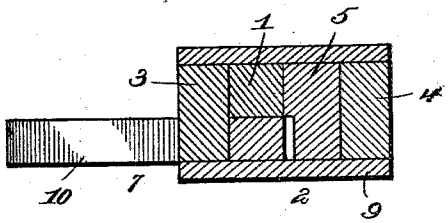


Fig. 2.



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UNITED STATES PATENT OFFICE.

FRED RICE, OF SHOPIERE, WISCONSIN.

WINDMILL-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 556,772, dated March 24, 1896.

Application filed June 20, 1894. Serial No. 515,187. (No model.)

To all whom it may concern:

Be it known that I, FRED RICE, a citizen of the United States, residing at Shopiere, in the county of Rock and State of Wisconsin, have invented a new and useful Windmill-Regulator, of which the following is a specification.

The invention relates to improvements in windmill-regulators.

The object of the present invention is to improve the construction of windmill-regulators and to provide a simple, inexpensive, and efficient one, adapted to be readily applied to an ordinary windmill and capable of automatically throwing the windmill out of the wind to stop the pumping when the tank is full and to start the pumping automatically when the contents of the tank have been consumed.

A further object of the invention is to enable a windmill to be readily started when the tank is full and after it is stopped by the regulator.

The invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claim hereto appended.

In the drawings, Figure 1 is an elevation of a windmill-regulator constructed in accordance with this invention and shown applied to a windmill, the tank being in section. Fig. 2 is a detail sectional view illustrating the manner of guiding the pump-rod and the rack-bar.

Like numerals of reference indicate corresponding parts in both figures of the drawings.

1 designates a windmill pump-rod designed to be connected at its upper end in the usual manner with a wind-wheel shaft and at its lower end with a pump, and it is mounted in a tower of any suitable construction and is guided by a frame 2. This guide-frame 2 is composed of vertical side bars 3 and 4 and connecting cross-pieces, and it receives and guides a rack-bar 5, which is designed to be connected at its upper end with the weighted arm of the windmill, whereby when the rack-bar is moved downward by means hereinafter described the weighted arm or lever of the windmill will be operated to throw the wind-wheel out of the wind.

The rack-bar is provided with a series of teeth shouldered on their upper faces and arranged to be engaged by an actuating-pawl 6 for forcing the rack-bar downward and a check-pawl 7 to prevent upward movement of the rack-bar. The actuating-pawl 6 is pivotally mounted on the pump-rod and is provided with a horizontally-disposed outwardly-extending weighted arm 8, which normally holds the tooth of the pawl in position to engage the rack-bar. This upper pawl is approximately L-shaped and is pivoted at its angle, and the lower pawl, 7, is L-shaped. It is pivoted at its upper end to a cross-piece 9 of the guide-frame and has its weighted arm 10 disposed horizontally. The weighted arm holds the check-pawl normally in engagement with the rack-bar.

When the pawls are free to engage the rack-bar, the upper pawl, which is pivotally mounted on the pump-rod, at each downward stroke of the latter engages the rack-bar and forces the same downward. The check-pawl, which continually engages the rack-bar, prevents the same from moving upward while the upper pawl is being lifted by the pump-rod on its upward stroke. By this arrangement the rack-bar is continually forced downward until the wind-wheel is thrown out of the wind by the complete lifting of the weighted arm or lever.

The rack-bar is provided above the teeth with a smooth upper portion 11, to permit the pump-rod to have free movement when the wind-wheel is thrown out of the wind to permit a corresponding movement of the latter, to prevent any liability of straining or breaking the parts.

The upper and lower pawls are connected by cords, ropes, or wires 12 and 13, or the like, with a bell-crank lever 14, provided with a weighted arm 15 forming a continuation of one of the arms of the lever, and making the latter substantially T-shaped. The upper arm of the T-shaped lever is connected by a short cord 16, or the like, with a bell-crank lever 17, to which is also connected a float 18. The float 18 is located in a tank 19, and is of sufficient weight to withdraw the pawls from engagement with the rack-bar when the tank is emptied, to cause the windmill to start automatically. As soon as the rack-bar is released,

the weighted arm or lever of the windmill will throw the wind-wheel into the wind, as will be readily understood.

When it is desired to start the windmill, after it has been stopped by reason of the tank being full, the pawls may be withdrawn from engagement with the rack-bar by an operating rope or cord 20, connected with one of the arms of the T-shaped lever.

It will be seen that the regulator is simple and comparatively inexpensive in construction, and that it is positive, reliable and automatic in its operation.

The rack-bar 5 is toothed on one side only, and the teeth do not extend entirely across its face or side, thereby providing a toothed and a plane surface which extend in parallel relation. The pump-rod 1 is located opposite the plane surface and is guided in its vertical movements by the same guide-frame 2 in which operates the rack-bar. By disposing the parts in the manner shown and described a compact arrangement is attained, and it is not necessary to provide independent guides for the rack-bar and pump-rod, and no intermediate connections are required to operatively attach the actuating-pawl with the pump-rod, thereby resulting in an economical and durable regulator.

Changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

What I claim is—

In a windmill-regulator, the combination of a guide-frame, a rack-bar mounted in the guide-frame and having teeth on one side only and adjacent to one edge, forming a toothed and a plane surface, a pump-rod placed in the guide-frame and located opposite to the plane surface of the rack-bar, an L-shaped actuating-pawl pivoted at its angle directly to the pump-rod and having its vertical arm constructed to engage with the teeth of the rack-bar, an L-shaped detent in vertical alignment with the actuating-pawl and pivoted at its angle to the guide-frame, and having its vertical arm disposed to engage with the teeth of the rack-bar, a T-lever under the control of the operator and having an arm connected with the vertical arm of the detent and the actuating-pawl, and a float having connection with the said T-lever, whereby the latter and the parts connected therewith are automatically operated, substantially in the manner set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

FRED RICE.

Witnesses:
JOHNSON DUNN,
DUANE CROTSENKUG.