

No. 685,716.

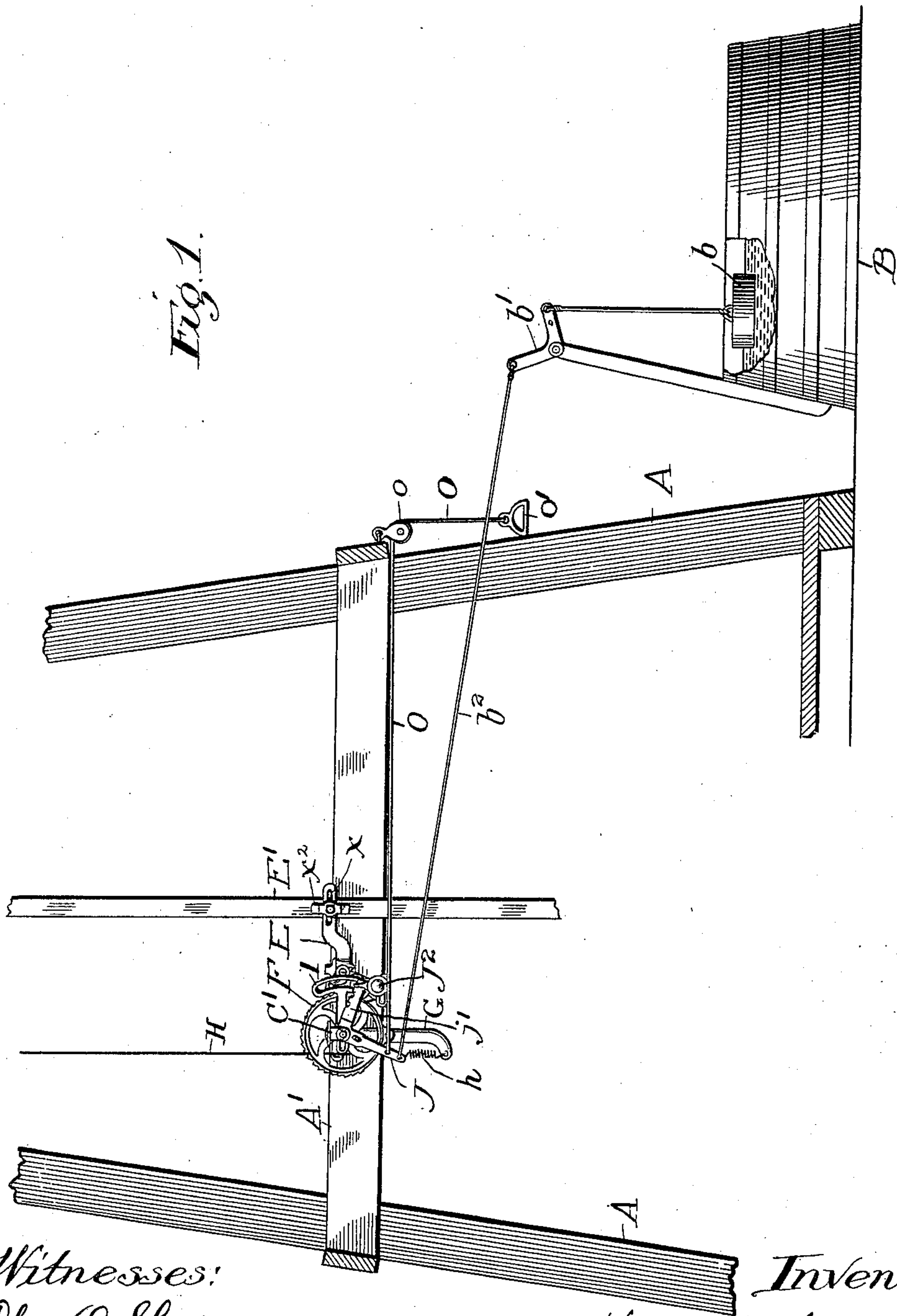
Patented Oct. 29, 1901.

H. L. FERRIS.
WINDMILL REGULATOR.

(Application filed May 14, 1901.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses:
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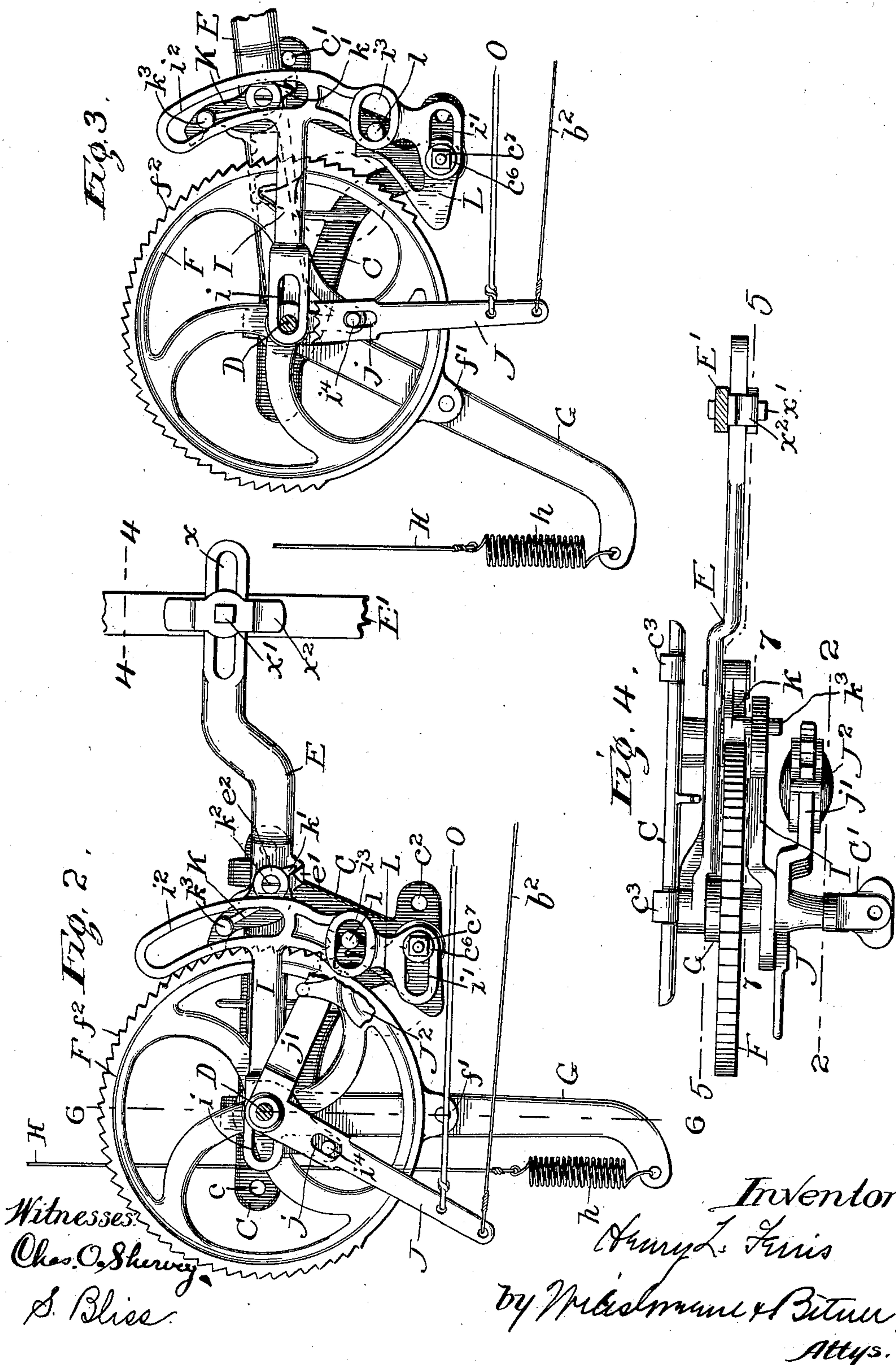
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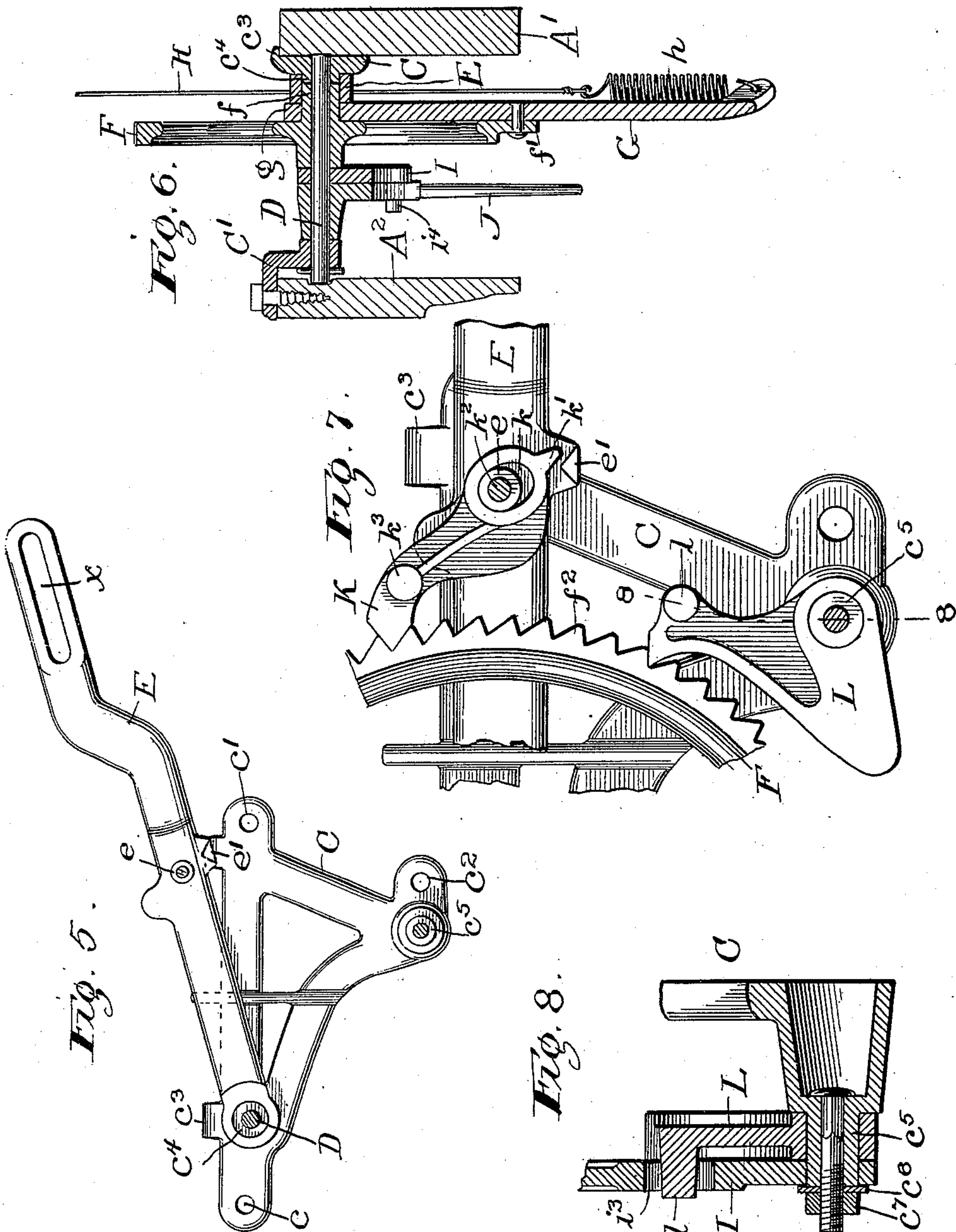
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3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

HENRY L. FERRIS, OF HARVARD, ILLINOIS, ASSIGNOR TO HUNT, HELM, FERRIS & COMPANY, OF HARVARD, ILLINOIS, A FIRM COMPOSED OF CHARLES E. HUNT, NATHAN B. HELM, HENRY L. FERRIS, AND ELZO B. HUNT.

WINDMILL-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 685,716, dated October 29, 1901.

Application filed May 14, 1901. Serial No. 60,791. (No model.)

To all whom it may concern:

Be it known that I, HENRY L. FERRIS, a citizen of the United States of America, residing at Harvard, in the county of McHenry and State of Illinois, have invented certain new and useful Improvements in Windmill-Regulators, of which the following is a specification.

My invention relates to certain improvements in windmill-regulators, by means of which the wind-wheel may be automatically thrown out of the wind when the water has reached a predetermined level in the tank and be automatically thrown into the wind when the water falls below said level, thus maintaining a constant supply of water in the tank.

To such end my invention consists in certain novel features of construction and arrangement, a description of which will be found in the following specification and the essential features pointed out in the claims.

In the drawings furnished herewith, Figure 1 is a fragmentary side view of a portion of a windmill structure, partly in vertical section, and a tank with the regulator in its preferred form applied to the structure. Fig. 2 is a side view of the regulator with certain parts in front of the line 2 2 in Fig. 4 removed. Fig. 3 is a similar view with a bell-crank and an operating-lever partly broken away. Fig. 4 is a plan view of the parts seen in Fig. 2 with the pump-rod cut away in line 4 4 of Fig. 2. Fig. 5 is a side view of the supporting-frame and operating-lever, the parts in front being cut away in line 5 5 of Fig. 4. Fig. 6 is a vertical cross-section in line 6 6 of Fig. 2. Fig. 7 is a detail side elevation of a portion of the parts seen in Fig. 2 with certain parts cut away in line 7 7 of Fig. 4, and Fig. 8 is a detail cross-section in line 8 8 of Fig. 7.

Referring to Fig. 1, A A represent the uprights, and A' a horizontal member of a windmill structure of ordinary construction, and B a tank adjacent thereto. Within the tank is suspended a weighted float b from a bell-crank lever b' , which is connected to a bell-crank lever J of the regulating mechanism by the rope or wire b^2 , as is usual in devices of this class.

The regulating mechanism is mounted upon the horizontal member A' of the windmill structure by means of a main supporting-frame C, Fig. 5, said frame being provided with holes c c' c^2 , through which bolts are passed to fasten it to the windmill structure. From the upper edge of the frame project hooks c^3 , adapted to rest upon the horizontal member A', Fig. 6. From the frame projects a shaft D, upon which most of the operating parts of the device are journaled, and a stirrup C' is secured upon the end of the shaft and rests upon another horizontal member A², parallel with the member A' and spaced slightly away therefrom.

The operating-lever E is pivoted adjacent to the frame C upon a boss c^4 , projecting from the frame C, Fig. 6, and upon the hub f of a ratchet-segment F, the latter being journaled upon the shaft D, which is concentric with the boss c^4 . The free end of the operating-lever is connected to the pump-rod E' by means of a slot x , in which is confined a bolt x' , secured in the pump-rod and holding a plate x^2 against the rod to prevent lateral movement of the lever. An arm G is secured to the ratchet-segment by seating one end g upon the hub f and riveting it between its ends to a lug f' , projecting from the periphery of the ratchet-wheel segment. The free end of this arm is connected to a spring h , from which extends a cable H, which is connected to the wind-wheel in the ordinary manner, so that when the cable is pulled downwardly the wind-wheel will be thrown out of the wind.

Adjacent to the ratchet-segment F is a shifter I, adapted to actuate a certain pawl and detent, hereinafter described, and between said shifter and the stirrup C' is the weighted bell-crank lever J, connected by the cord b^2 to the bell-crank b' and adapted by the movement of the float to connect or disconnect the operating-lever E from the ratchet-wheel segment F.

The ratchet-wheel segment is provided with teeth f^2 upon a portion of its periphery, adapted to be engaged by a pawl K, pivoted upon a boss e on the lever E, Fig. 7. The pawl K is capable of a slight longitudinal movement upon the boss e by reason of a slot k

and a lug k' and is adapted by engagement with a lug e' upon the lever E to lock the pawl either into engagement with the ratchet-wheel segment or out of engagement therewith. A screw k^2 and washer e^2 keep the pawl upon its pivot.

A weighted detent L is pivoted upon the frame and engages the teeth f^2 to prevent backward movement of the segment while it is being turned by the lever E. Said detent is pivoted upon the frame by means of a boss c^5 , Fig. 8, and is kept in place by the shifter I, before referred to, which is provided with horizontal slots i i' , embracing the shaft D and lug c^5 , respectively, to guide its movement in a horizontal direction, a washer c^6 and bolt and nut c^7 serving to keep it in place. The shifter is provided with an arc-shaped slot i^2 , in which moves a lug k^3 upon the pawl K, and also with a slot i^3 , encircling a lug l upon the detent L. By lateral movement of the shifter the pawl and detent are thrown into or out of engagement with the teeth f^2 of the ratchet-wheel segment, and said lateral movement of the shifter is caused by the bell-crank lever J, the latter containing a radial slot j , in engagement with a pin i^4 upon the shifter. Upon one arm j' of the bell-crank lever J is hung a weight J^2 , Fig. 1, of less weight than the float b and adapted when the water raises said float to move the shifter from the position seen in Fig. 3 to that seen in Figs. 1 and 2. Fig. 2 illustrates the position assumed when the water has reached the predetermined level and the windmill thrown out of the wind, and Fig. 3 illustrates the position assumed when the water falls below the level and the pawl and detent are thrown out of gear with the ratchet-segment, the devices connected with the wheel at this time turning the segment back and throwing the wind-wheel into the wind, thus again reciprocating the pump-rod E' and filling up the tank.

As shown in Fig. 1, a rope O is connected to the bell-crank lever J above the rope b^2 , extending over a pulley o , beyond which it is provided with a handle o' , by means of which the wheel can be thrown into the wind when the tank is full whenever desirable.

I am aware that more or less variation of the details of construction is possible, and I do not therefore desire to limit myself except as pointed out in the following claims.

I claim as new and desire to secure by Letters Patent—

1. In a windmill-regulator, the combination with a frame and a ratchet-wheel segment journaled thereon, of an operating-lever, a pawl pivoted upon said lever and engaging said segment, a suitably-pivoted detent also engaging the segment and a shifter guided upon the frame to move radially of the ratchet-wheel segment and containing

slots, in which the pawl and detent respectively may travel, bodily movable to throw said pawl and detent out of engagement with the segment; substantially as described.

2. In a windmill-regulator, the combination with a suitably-journaled ratchet-wheel segment, of an operating-lever, a pawl pivoted thereon, and engaging the ratchet-segment, a detent also engaging the segment, a shifter containing slots adapted to engage the pawl and detent and a weighted bell-crank lever engaging the shifter and adapted by its oscillation to throw the pawl and detent into or out of engagement with the segment; substantially as described.

3. In a windmill-regulator containing a ratchet-wheel segment, an operating-lever, a shifter for operatively connecting said lever with the ratchet-wheel segment, having slots, i , i' , to guide the shifter, and a bell-crank engaging the shifter to actuate the latter; substantially as described.

4. In a windmill-regulator, a suitably-journaled ratchet-wheel segment, an operating-lever and a pawl fulcrumed thereon having a limited amount of longitudinal movement on its fulcrum, a lug upon the pawl and a lug upon the lever in the path of the lug upon the pawl to lock the pawl into or out of engagement with the ratchet-segment; substantially as described.

5. In a windmill-regulator, the combination with a suitably-supported frame, of a shaft secured therein and extending laterally therefrom, a ratchet-wheel segment journaled on the shaft, a shifter guided on said shaft, a bell-crank lever for actuating the shifter journaled on said shaft, an operating-lever and a pawl pivoted upon the lever and engaging the ratchet-wheel segment, and adapted to be thrown out of gear by the shifter; substantially as described.

6. In a windmill-regulator, the combination with a ratchet-segment and its operating-lever bearing a suitable lug and pivot, of a segment-actuating pawl provided with a hole for the pivot and a lug adapted to engage that upon the lever, the slot in the pawl being elongated in the direction of its lug and the two lugs being so shaped as to slide freely one upon another and from one side to the other and the lugs being so located with reference to the pawl as to be normally held in contact by gravity; substantially as described.

In witness whereof I have hereunto set my hand, at Harvard, in the county of McHenry and State of Illinois, this 6th day of May, A. D. 1901.

HENRY L. FERRIS.

Witnesses:

WILL HANSON,
L. EUGENE NORTON.