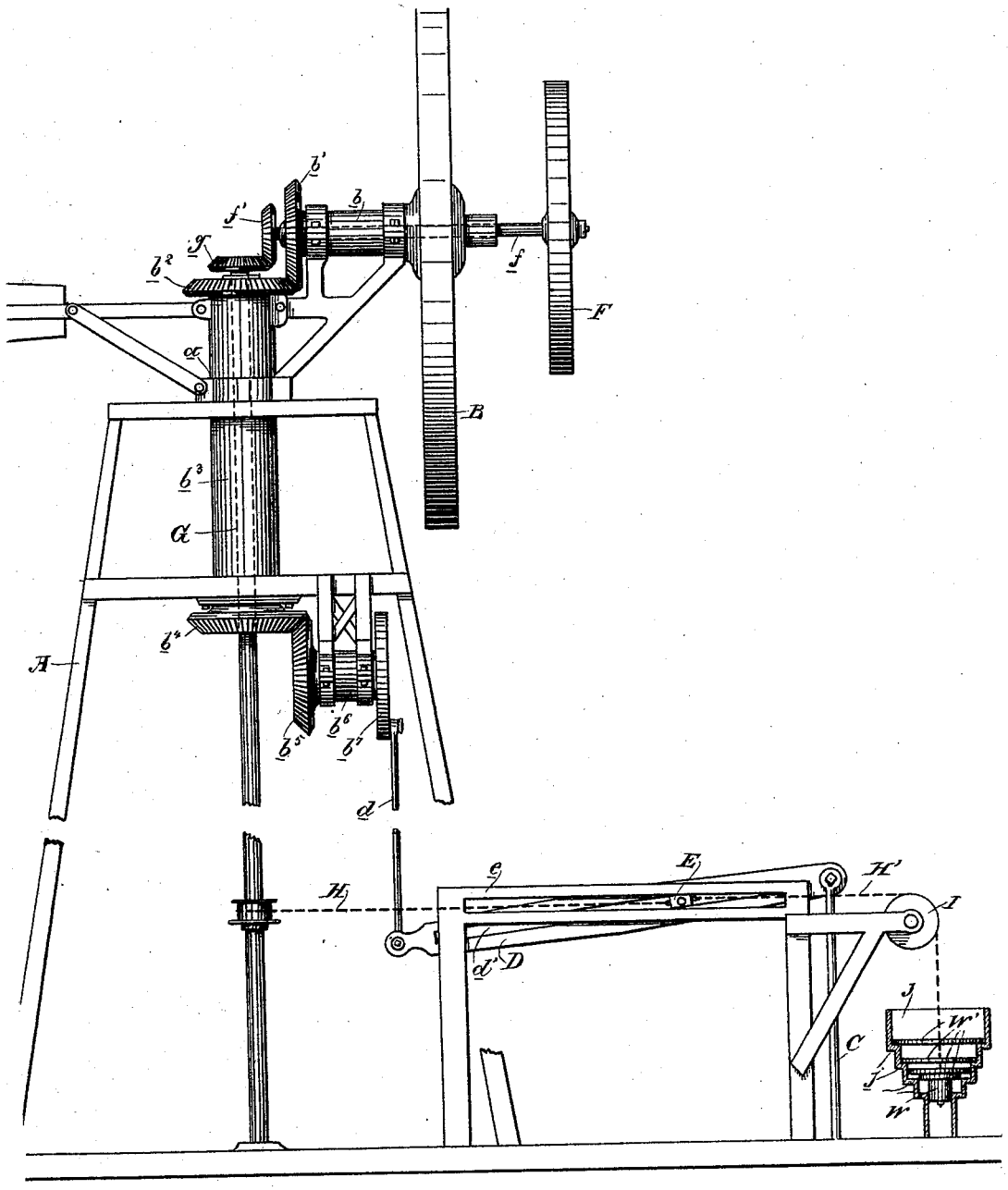
(No Model.)

# A. J. SALISBURY.

## WINDMILL GOVERNOR.

No. 418,877. Patented Jan. 7, 1890.

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# UNITED STATES PATENT OFFICE.

ALFRED J. SALISBURY, OF HUENEME, CALIFORNIA.

## WINDMILL-GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 418,877, dated January 7, 1890.

Application filed March 13, 1889. Serial No. 303,162. (No model.)

*To all whom it may concern:*

Be it known that I, ALFRED J. SALISBURY, of Hueneme, in the county of Ventura and State of California, have invented an Improvement in Windmill-Governors; and I hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to the class of windmills and to the governing mechanism therefor; and my invention consists in the constructions and combinations of devices which I shall hereinafter fully describe and claim.

Referring to the accompanying drawing, the figure is an elevation of a windmill and connections, showing the application of my governor thereto.

A is the windmill-tower, having turn-table *a*. B is the main wheel, mounted upon a shaft *b*. C is the pump-pitman. Power is transmitted to this pitman as follows: The wheel-shaft *b* carries a bevel-gear $b'$, which meshes with a bevel-gear $b^2$ on a vertical shaft $b^3$, the lower end of which carries a bevel-gear $b^4$, which engages a bevel-gear $b^5$ on a shaft $b^6$, which carries a crank-wheel $b^7$. From this crank-wheel extends a connecting-rod *d*, the lower end of which is attached to one end of a walking-beam D, the other end of said walking-beam being attached to the pump-pitman C. These devices represent any ordinary or suitable windmill mechanism, and their operation is obvious.

Now, to govern the windmill so that it will operate properly in winds of different velocities, and to utilize the full power of any given wind, whether light or strong, I have the following mechanism: The pivotal center of the walking-beam D is made variable by being mounted in an elongated slot $d'$ in said beam and carried by a sliding block E, fitted to and adapted to travel in suitable fixed guides *e*. By sliding this block in either direction the stroke of the pump is varied. F is a supplementary wind-wheel, the shaft *f* of which passes through the shaft *b* of the main wheel B, and has on its inner end a bevel-pinion $f'$. This engages with a bevel-pinion *g* on the upper end of a vertical shaft G, which passes down through the vertical shaft $b^3$ and is suitably stepped below. To this shaft G is attached a cord H, which is adapted to be wound up thereon and unwound therefrom. The other end of the cord is attached to the sliding fulcrum-block E. To this block is attached another cord H′, (or the same cord H may be extended,) and said cord extends over a guide-pulley I and suspends a weight W, the power of which in a calm is sufficient to pull and hold the sliding block E over to its extreme limit nearest the pump-pitman, whereby the stroke is shortened to its minimum. J is a fixed vessel or receptacle, having within it a graduated series of steps *j*, upon which rest the vertical series of graduated weights W′. The cord H′ passes freely down through these weights, and the normal weight W hangs just under under the lowermost of the series.

The operation of the governor is as follows: When there is no wind, the weight W holds the variable fulcrum of the walking-beam over to one end, so that the movement of that end is reduced to the minimum and the stroke of the pump is nothing. When a light wind springs up, the supplementary wheel F rotates, and through its connections winds up cord H, so as to pull the sliding block over in the other direction, thereby changing the fulcrum of the walking-beam and giving a stroke to the pump. The position of the fulcrum is limited and defined by the first of the series of weights W′, which, being picked up by the normal weight, counteracts the wind force and holds the beam-fulcrum at the point proper for the power of the wind. The stroke of the pump being short the light wind is thereby utilized. When the wind increases, the supplementary wheel is turned farther, thereby winding up cord H to a greater extent and pulling the sliding block farther over and increasing the pump-stroke. A second weight of the series W′ is now picked up and the position of the variable fulcrum again defined. The same operation proceeds as the wind further increases until the maximum stroke has been attained and all the controlling-weights picked up. As the wind decreases the reverse of the operation takes place. It will thus be seen that by means of this governor any wind may be utilized, giving each velocity of wind only such work as it can do.

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

1. The combination, with the wind-wheel and the pump-pitman, of a supplementary wind-wheel and connection, substantially as described, whereby the length of the stroke of the pump-pitman is regulated by the speed of the supplementary wheel.

2. In a windmill, and in combination with its main wheel and power-transmitting connections, substantially as specified, to the pump-pitman, a supplementary wind-wheel on the face of the main wheel, and having power-connections, substantially as set forth, passing through the main-wheel shaft and connected as described to the power-transmitting connections of said shaft to vary the stroke of the pump-pitman.

3. In a windmill, and in combination with its main wheel, a vibrating walking-beam attached to the pump-pitman, and connections, substantially as set forth, between said wheel and beam, the supplementary wind-wheel, a sliding fulcrum for said walking-beam, and power-connections, substantially as specified, between said supplementary wind-wheel and sliding fulcrum, whereby the position of the fulcrum may be changed to vary the stroke of the pump-pitman.

4. In a windmill, and in combination with its main wheel, the vibrating walking-beam attached to the pump-pitman and having a variable fulcrum, whereby the stroke of said pitman may be varied, and power-connections, substantially as specified, between the wheel and walking-beam, the supplementary wind-wheel connections, substantially as set forth, between it and the variable fulcrum of the walking-beam, whereby said fulcrum is changed and graduated, power-connections, substantially as described, with said fulcrum opposing the power of the supplementary wheel, whereby the position of said fulcrum is limited and defined.

5. In a windmill, the main wheel, the walking-beam attached to the pump-pitman and having a sliding fulcrum, and power-connections, substantially as described, from the wheel to operate the walking-beam, in combination with a supplementary wind-wheel, power-connections, substantially as specified, from said wheel to the sliding fulcrum of the walking-beam, whereby the stroke of the pump-pitman may be varied, and a series of weights adapted successively to be connected with the sliding fulcrum, whereby its position is limited and defined.

6. In a windmill, the main wheel and the pitman-operating walking-beam connected with said wheel and having a sliding fulcrum-block, in combination with the supplementary wind-wheel connected with the sliding fulcrum-block for changing its position, the cord H′, connected with the fulcrum-block, the vessel or receptacle J, and the vertical series of weights of varying sizes supported therein and adapted to be successively picked up by the cord, whereby the position of the fulcrum-block is limited and defined, substantially as described.

7. In a windmill, the main wheel and the pitman-operating walking-beam connected with said wheel and having a sliding fulcrum-block, in combination with the supplementary wind-wheel, the vertical shaft operated thereby, and the cord winding on said shaft and connected with the sliding fulcrum-block, the opposing cord connected with said block, and the series of weights W′, adapted to be successively picked up by said cord, substantially as described.

In witness whereof I have hereunto set my hand.

ALFRED J. SALISBURY.

Witnesses:
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