

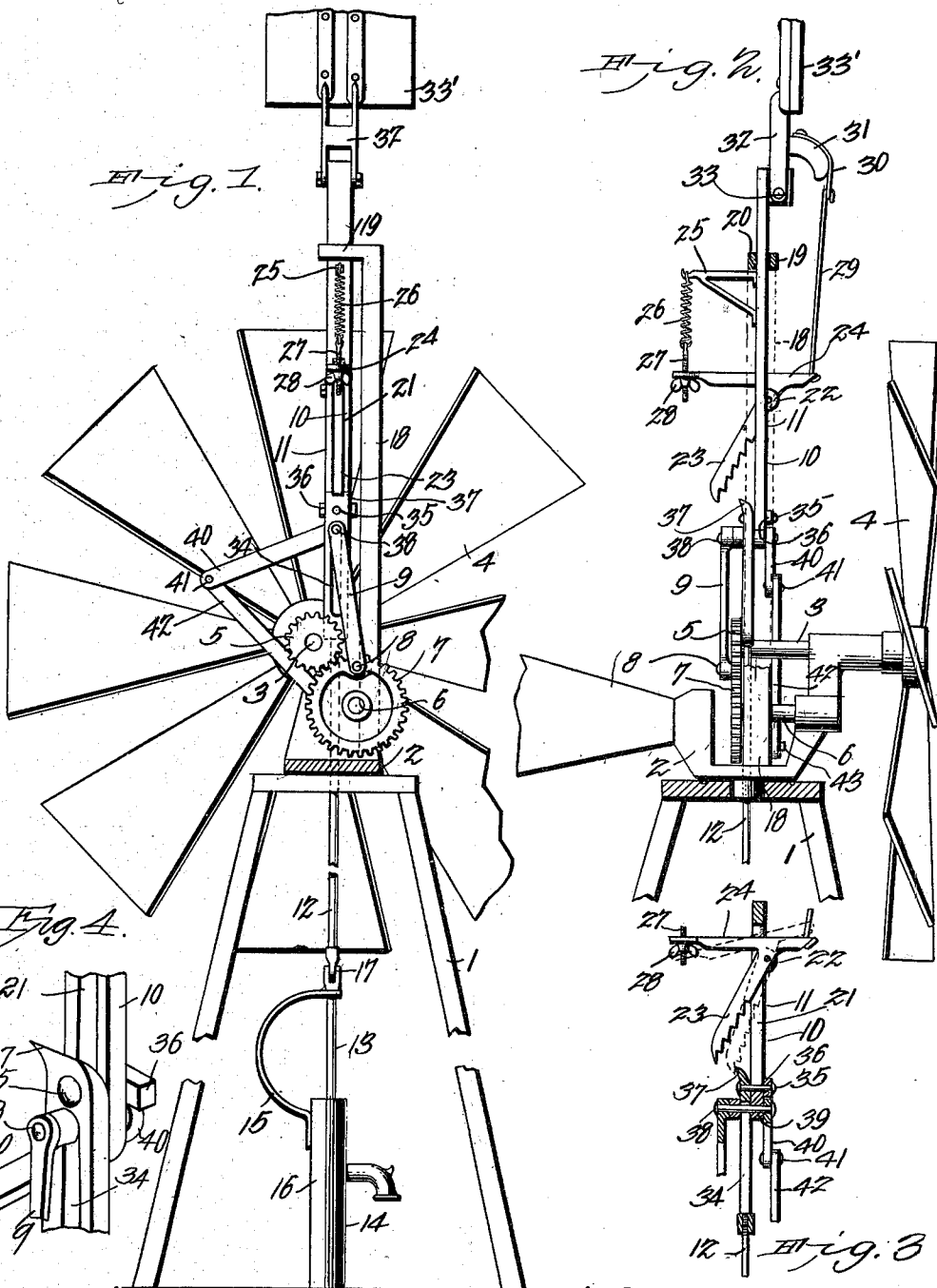
No. 733,009.

PATENTED JULY 7, 1903.

J. COATES.  
WINDMILL.

APPLICATION FILED JUNE 9, 1902.

NO MODEL.



Witnesses  
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# UNITED STATES PATENT OFFICE.

JOHN COATES, OF HEMET, CALIFORNIA.

## WINDMILL.

SPECIFICATION forming part of Letters Patent No. 733,009, dated July 7, 1903.

Application filed June 9, 1902. Serial No. 110,873. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN COATES, a citizen of the United States, residing at Hemet, in the county of Riverside and State of California, have invented a new and useful Windmill, of which the following is a specification.

This invention relates to windmills; and it is an improvement on the device for which Letters Patent of the United States, No. 605,079, were granted to me on the 7th day of June, 1898.

The object of the invention is to provide a simple and effective mechanism whereby the length of the stroke of the pump-rod may be automatically regulated, so as to provide for a short stroke when the wind is light and for a stroke of increasing length with the increasing velocity of the wind. To accomplish this purpose, I avail myself of the mechanism which will be hereinafter more fully described, and particularly pointed out in the claims.

In the drawings hereto annexed, Figure 1 is a rear elevation showing a windmill equipped with my improved regulating mechanism. Fig. 2 is a side view of the same, showing, however, only the upper portion of the windmill-tower supporting the mill and regulating mechanism. Fig. 3 is a vertical sectional view showing details of the regulating mechanism. Fig. 4 is a perspective detail view showing the connection between the upper and lower members of the pump-rod.

Corresponding parts in the several figures are indicated by like characters of reference.

1 designates the tower which supports the windmill. The latter of which, 2, designating a cast-iron head or turn-table, may be of any suitable well-known construction which shall lend itself to the application of my improved regulating device. In the drawings I have shown the said turn-table provided with bearings for the main shaft 3, carrying the wind-wheel 4 and the pinion 5, and for a shaft carrying the gear-wheel 7, having the wrist-pin 8, which is connected by means of the pitman 9 with the pump-rod and the regulating mechanism carried by the latter.

The pump-rod, which as a whole is designated by 10, may be described as being composed of two separate parts or sections—the upper one, 11, and the lower one, 12. The

lower end of the section 12 is connected by a suitable joint or coupling with the valve-stem 13 of the pump 14.

15 designates a semicircular steel spring, one end of which is suitably attached to the pipe or pump body 16 or to any other suitable stationary point of attachment, while its opposite or upper end extends under the joint or coupling 17, whereby the valve-stem is connected with the lower end of the lower section 12 of the pump-rod. This spring 15 thus serves to support the weight of the valve-stem and pump-rod and prevents the same from descending unless actuated or compelled to do so by the operating mechanism, which I shall now proceed to describe.

The head or turn-table 2 is provided with an upright 18, having at its upper end a laterally extending bracket 19, in which is formed a slot 20 for the passage of the upper section 11 of the pump-rod, which is guided and supported in the said slot. The pump-rod section 11 consists of an elongated plate provided at its lower end with an elongated slot 21. At the upper end of said slot the plate 11 is provided on one of its sides with ears or lugs 22, between which is pivotally mounted a ratchet-bar 23, which is provided just above its pivotal point with the cross-head 24, extending through the slots 21 on either side of the plate 11. The latter is provided on one of its sides with a bracket 25, the outer end of which is connected by means of a spring 26 with an eyebolt 27, mounted in the rear end or arm of the cross-head 24, which is provided with a perforation for the reception of the eyebolt. The latter is provided with a thumb-nut 28, bearing against the under side of the cross-arm and serving for the purpose of adjusting the tension of the spring. The opposite or front end of the cross-arm 24 is connected by means of a wire, cord, chain, or other connecting means with a flexible strap 30, having permanent attachment to the upper side of a curved bracket 31, secured to the front side of an arm 32, which is mounted pivotally between ears or lugs 33 upon the front side of the plate 11 at the upper end of the latter. The arm 32 carries a vane 33, which faces the wind in like manner as does the wind-wheel 4. It will be seen that when subjected to the action

of the wind the vane 33 will lean back, thus raising or elevating the curved bracket 31, which through the connecting means already described serves to actuate the ratchet-bar 23 against the tension of the spring 26. The lower section 12 of the pump-rod consists of an elongated plate provided near its upper end with a slot 34. Above the said slot the plate 11 is provided with a transverse bolt 35, extending through the slot 21 in the plate 11 and carrying in front of the latter a cross-piece or cleat 36, whereby the upper end of the plate 12 is held in contact with the lower end of the plate 11 and prevented from being sprung away therefrom. The importance of this connecting means will be understood when it is seen that the upper end of the plate 12 is bent in a rearward direction, so as to form a tooth 37, adapted to be engaged by the teeth of the ratchet-bar 23 when the latter is thrown into operation by the action of the wind upon the vane 33, with which it is connected.

38 designates the main connecting-bolt, which extends through a perforation 39 in the lower end of the upper section 11 of the pump-rod, through the slot 34 in the lower section 12 of the same, and which serves to connect the said pump-rod sections with each other and with the pitman 9, as well as with one end of a link 40, the opposite end of which latter is pivotally connected by a bolt 41 with another link 42, the opposite end of which has pivotal connection at 43 with some stationary part of the turn-table. The arms or links 40 and 42 serve as braces to steady the motion of the pump-rod when the device is in operation.

The operation of this invention will be readily understood from the foregoing description, taken in connection with the drawings hereto annexed.

When the mill to which my invention has been applied is exposed to the action of the wind, the vane 33, carried at the upper end of the pump-rod, receives the impact of the wind in like manner and with like force, proportioned to its area, as the wind-wheel 4. When the wind is light, the vane 33 will be caused to lean back only slightly, and the extent to which the ratchet-bar 23 is thrown against the tension of the spring 26 will be correspondingly slight. The tooth 37 at the upper end of the lower pump-rod section 12 will thus be engaged by one of the upper teeth of the said ratchet-bar, whereby it will be forced in a downward direction for a short distance only, thus making the stroke of the pump-rod correspondingly short. The upper pump-rod section 11 obviously has a sliding movement upon the lower section 12 until the connection between the two is effected by the ratchet-bar 23 coming into engagement with the tooth 37. When the wind is strong or of increasing velocity, it will be one of the lower teeth of the ratchet-bar 23 that comes into engagement with the tooth 37 of the lower pump-rod

section, the length of the stroke of which is thus correspondingly increased.

It sometimes happens that the wind for days together is too light to cause any effective work to be performed by the pump. At such times it frequently happens that a strong breeze of comparatively short duration will spring up, and when this is the case my improved regulating mechanism is always ready to throw the operating mechanism of the pump into operation without manual attention of any kind, so that the full power derived from such occasional breezes will be utilized.

By properly adjusting the tension of the spring 26 by means of the eyebolt 27 and thumb-nut 28 the device may be "set" so as to cause the pump-rod to perform a stroke of greater or less length, according to the capacity of the wind-wheel with relation to the work to be performed.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a device of the class described, the combination with the pump-rod composed of an upper and a lower section connected slidingly with each other, of a ratchet-bar connected pivotally with one of said pump-rod sections and adapted to engage a tooth upon the other section, a spring arranged to hold said ratchet-bar normally out of engagement with said tooth, a vane connected pivotally with the pump-rod section having the pivoted ratchet-bar, and means connecting the latter with the vane for actuating the said ratchet-bar when the vane receives the impact of the wind, substantially as set forth.

2. In a device of the class described, the combination of the pump-rod composed of an upper and a lower section connected slidingly with each other, a ratchet-bar mounted pivotally in a slot in the upper section and adapted to engage a tooth formed at the upper end of the lower section, a spring arranged to hold said ratchet-bar normally out of engagement with said tooth, a vane mounted pivotally at the upper end of the upper pump-rod section and having a curved bracket, connecting means between said bracket and the ratchet-bar whereby the latter shall be thrown into engagement with the tooth at the upper end of the lower section when the vane is actuated by the impact of the wind, the pitman having one end connected with the wrist-pin of a wheel or disk, and a bolt connecting said pitman with the upper and lower pump-rod sections, said connecting-bolt having a sliding movement in an elongated slot in the lower pump-rod section, substantially as set forth.

3. In a device of the class described, the pump-rod consisting of upper and lower plates or sections, each section having a slot, a bolt extending through the upper end of the lower plate or section and through the slot of the upper section, a cross-piece upon the end of said bolt and bearing against the rear side of

said upper section, a bolt extending through the lower end of the upper plate or section and through the slot in the lower section, a pitman connection between said bolt and the  
 5 crank-disk, a tooth formed at the upper end of the lower section, a ratchet-bar mounted pivotally in the slot of the upper section, a spring arranged to hold the said ratchet-bar normally out of engagement with said tooth,  
 10 and means operated by the impact of the wind for throwing said ratchet-bar into engagement with said tooth, against the tension of said spring.

4. In a device of the class described, the  
 15 pump-rod composed of the upper and lower plates or sections, said lower section being provided with a tooth at its upper end and said upper section being provided with a ratchet-bar adapted to engage said tooth, a  
 20 spring to hold said ratchet-bar normally out

of engagement with said tooth, and means adapted to be actuated by the impact of the wind for throwing the said ratchet-bar into engagement with said tooth, in combination  
 25 with means whereby the said sections are connected slidingly with each other, a connecting-bolt having a sliding movement in the slot in the lower pump-rod section and connecting the upper pump-rod section pivotally with the  
 30 pitman and with one of a pair of connected bracing-links, and a spring arranged to support the weight of the pump-rod and its attachments, substantially as herein set forth.

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

JOHN COATES.

Witnesses:

JOHN H. BOTTERELL,  
 W. C. HOSKING.