

No. 739,948.

PATENTED SEPT. 29, 1903.

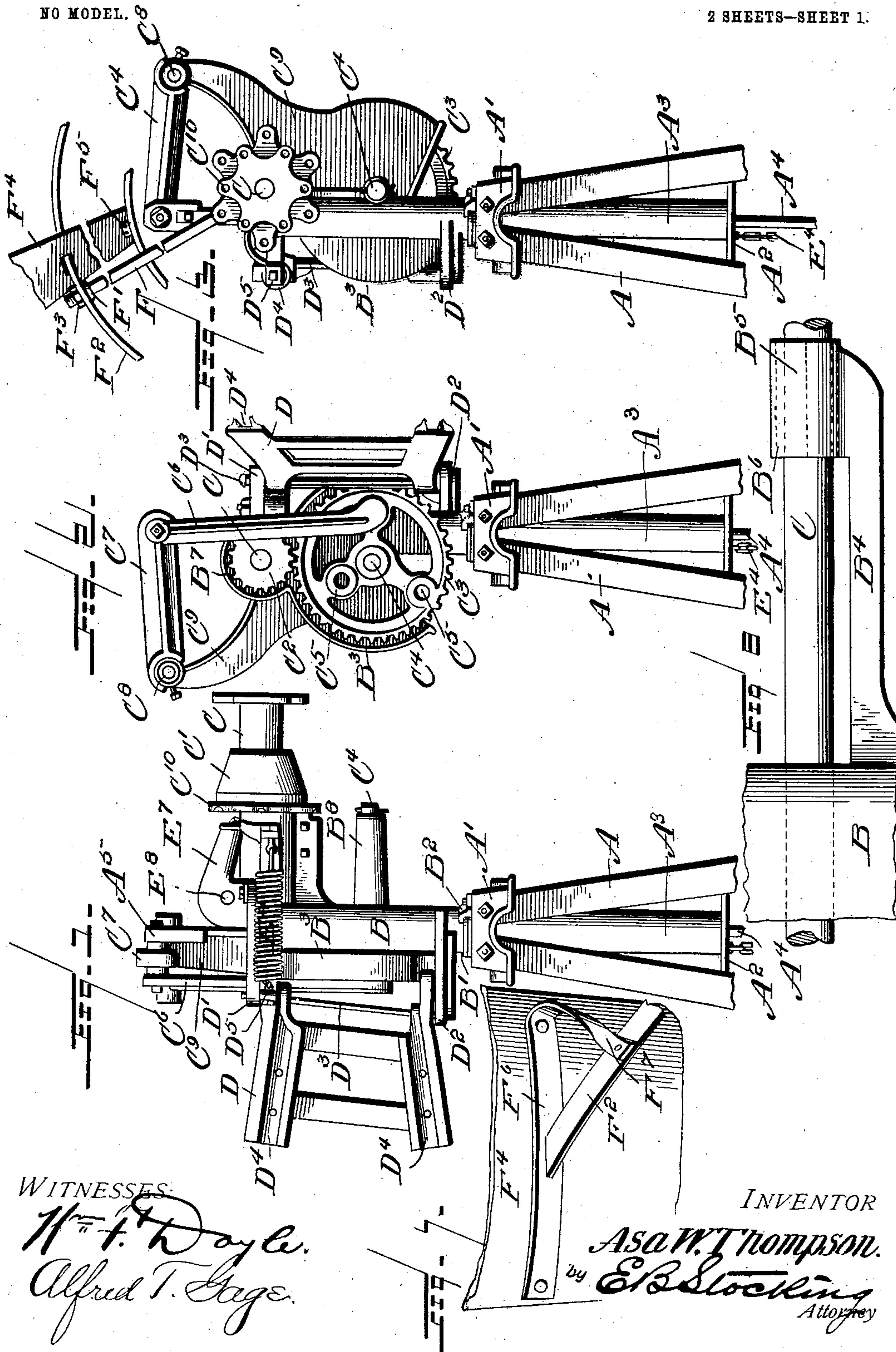
A. W. THOMPSON.

WINDMILL.

APPLICATION FILED JAN. 16, 1903.

NO MODEL.

2 SHEETS--SHEET 1.



WITNESSES

~~Wm. F. Doyle.~~
Alfred T. Gage.

INVENTOR

Asa W. Thompson

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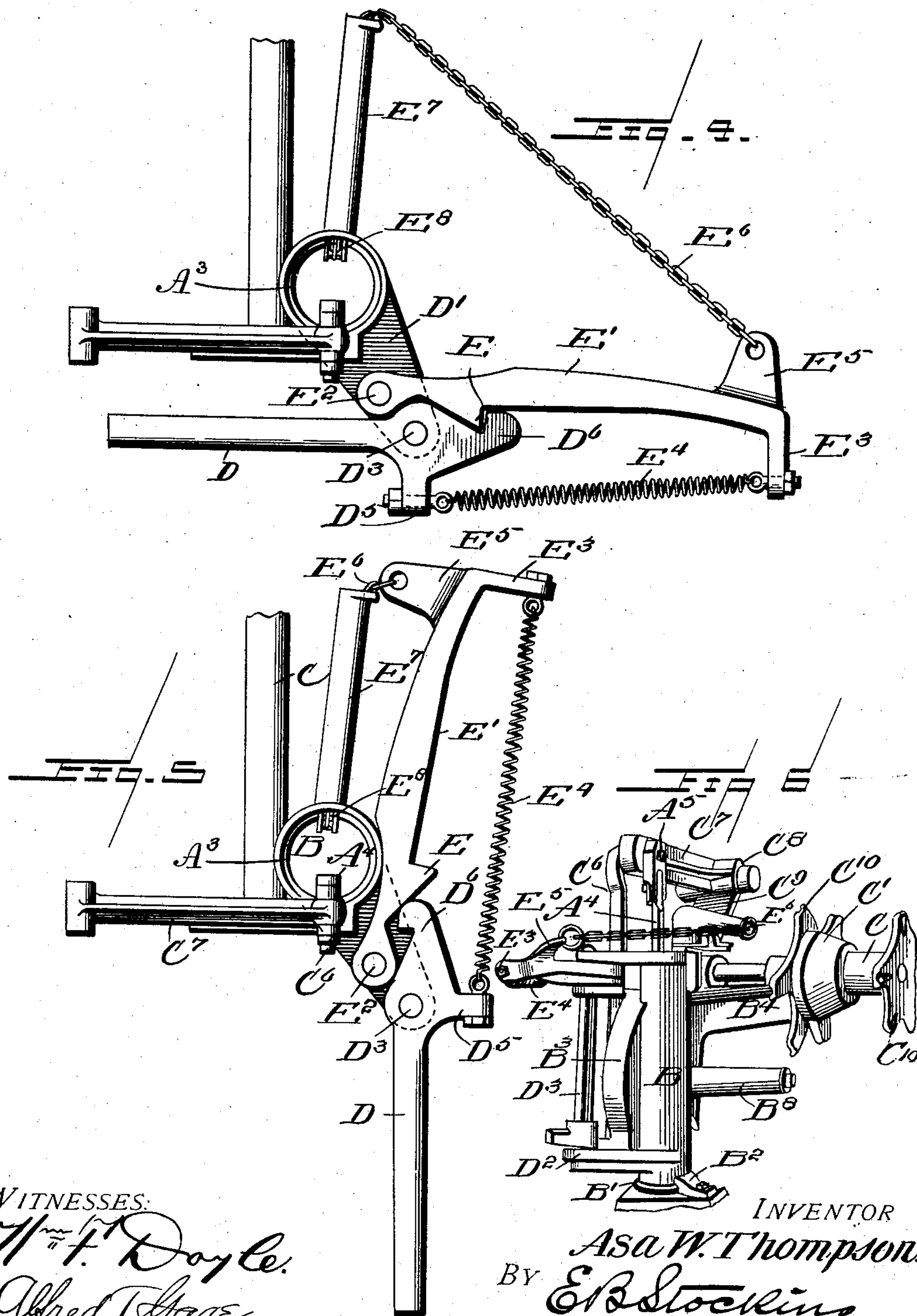
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UNITED STATES PATENT OFFICE.

ASA W. THOMPSON, OF ATCHISON, KANSAS.

WINDMILL.

SPECIFICATION forming part of Letters Patent No. 739,948, dated September 29, 1903.

Application filed January 16, 1903. Serial No. 139,310. (No model.)

To all whom it may concern:

Be it known that I, ASA W. THOMPSON, a citizen of the United States, residing at Atchison, in the county of Atchison, State of Kansas, have invented certain new and useful Improvements in Windmills, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to windmills, and more particularly to the head or gearing thereof, where the vane is thrown into or out of the wind.

The invention has for an object to provide an improved latching device for retaining the furl-lever controlling the movement of the vane in its adjusted positions.

A further object of the invention is to improve the construction and arrangement of the driving-gear by which motion is conveyed from the wheel to the reciprocating pump-rod and also the manner of mounting the spokes of the wheel and attaching the fan-blades thereto.

Other and further objects and advantages of the invention will be hereinafter set forth and the novel features thereof defined by the appended claims.

In the drawings, Figure 1 is a side elevation of the windmill; Fig. 2, an elevation of the left end of Fig. 1; Fig. 3, a similar view of the right end of Fig. 1 with a portion of the wheel attached thereto; Fig. 4, an enlarged plan of the furl-lever and latch therefor when the vane is out of the wind; Fig. 5, a similar view with the vane in the wind; Fig. 6, a perspective of the mill-head; Fig. 7, a detail perspective of the means of attaching the wheel-blades to their supporting-arms, and Fig. 8 is a detail elevation of the bearing for the wheel-shaft.

Like letters of reference refer to like parts in the several figures of the drawings.

The letter A designates the tower structure, which may be any desired configuration and is provided at its upper end with a cap A', suitably secured thereto and upon which the body B of the main casting rests. Below this cap A' a cross-plate A² is provided, upon which is secured a tubular support A³, which extends up through the cap A' and also through the body B of the main casting and serves as a guide or support, around which

the main casting and parts attached thereto revolve or are turned by the changing winds. At one side of the main casting a bracket B⁴ extends and is provided at its outer end with a bearing-sleeve B⁵, adapted to receive the main driving-shaft C, which carries the hub C' for the wind-wheel. This sleeve is adapted to receive a Babbitt metal or other wearing-surface B⁶, (see Fig. 8,) and the bracket between the sleeve and the main casting is open or cut away to permit the free introduction of this Babbitt metal. The inner end of the main shaft C is provided with a bearing in the guard-casing B⁷ and with a driving-pinion C², adapted to mesh with the gear C³, disposed within the casing B⁸. The shaft C⁴ of this gear is disposed within a suitable bearing-sleeve B⁸, extending laterally from the main casting, and the gear is provided with connecting-sockets C⁵, spaced at different distances from its shaft, so as to permit an adjustment of the length of throw given the pitman C⁶, which extends upward from the gear to the rock-arm C⁷. This arm is pivotally connected to the pitman at one end and at its opposite end C⁸ is pivoted to a standard C⁹, extending upward from the main casting. The pump-rod A⁴ extends upward through the main casting and is pivotally connected at its upper end A⁵ with the free end of the rock-arm C⁷ at the point of connection with the pitman C⁶. It will thus be seen that a vertical oscillation of this arm reciprocates the pump-rod A⁴.

The vane-bracket D is pivotally mounted at one side of the main casting by means of lugs D¹ and D² above and below the bracket, respectively, and a pivoting-rod D³, which extends diagonally to a vertical line through the casting, permits an oscillation in a rising and falling path to secure a movement of the vane by gravity in one direction. This is due to the fact that the pivot D² is outside of the vertical line through the pivot D¹ and causes the vane to rise from a horizontal plane when being drawn into the wind and to drop from such a plane when going out of the wind. The vane-bracket D is provided with suitable socket D⁴ to receive the supporting-arms for the vane, and extending at an angle thereto is a lug D⁵, (see Figs. 4 and 5,) while at the rear of the pivot D³ a projec-

tion D⁶ is provided with a recess or socket to receive a projecting tooth E', carried by a furl-lever E', which is pivotally mounted upon the upper bracket D' at one side of the pivot of the vane-bracket, as shown at D², and provided at one side of its free end with an angle-arm E³, from which a tension-spring E⁴ extends to the lug D⁵ to normally hold the parts in the position shown in Fig. 4 when the vane is out of the wind. Upon the opposite side of this furl-lever E' is a projection E⁵, from which the furl-chain E⁶ extends and is carried through a guide E⁷, thence over a pulley or bearing E⁸, downward through the main casting B to the base of the tower, where it is suitably secured. When tension is applied to this chain, the furl-lever E' will be shifted into the position shown in Fig. 5, thus disengaging the tooth E from the socket in the projection D⁶ and placing the spring E⁴ under tension as the vane is drawn or brought into the wind.

The hub C' of the wheel is provided with flanges C¹⁰, having sockets therein adapted to receive the inner ends of the spokes or arms of the wheel, the outer ends of which are provided with a shoulder F' to bear against the under side of the rim F² and pass through an aperture in said rim. Upon the threaded end of the spoke F a nut F³ is applied to bear upon the opposite or outer face of the rim, while extending from the rims are a series of blades F⁴, disposed in the usual manner and secured at their inner ends to one of the rims by a bracket F⁵. The outer end of the blade F⁴ is apertured, and the rim F² passes therethrough and through a securing-brace F⁶, bolted to the blade and having an angularly-disposed portion F⁷, secured to the rim F² at a point removed from the blade, as shown in Fig. 7.

The operation of the windmill is very simple and effective. When the vane is in the wind, as shown in Figs. 1, 2, 3, and 5, the rotation of the wheel through the pinion and gear causes a reciprocation of the pump-rod in the usual manner, and the furl-chain holds the vane under tension. The vane being pivoted upon an angle to the perpendicular with its lower pivot out of line with its upper pivot is caused to incline and rise from a horizontal position when drawn into the wind, so that when the furl-chain is released the vane drops by gravity and immediately swings around out of the wind, while the furl-lever is drawn by the tension-spring into the position shown in Fig. 4, thus securely latching the vane and preventing its being blown into the wind until drawn therein by means of the furl-chain. It will be seen that when tension is applied to this chain the furl-lever connected thereto will be drawn into a position parallel with the chain-guide and at right angles to the wheel, and with it the spring and vane. The lever first receives the power applied to the chain and is released from its engagement with the projection from

the vane bracket and then shifts this bracket, placing the spring under tension, which tends to restore the parts to their position out of the wind when the chain is again released. The gear and pinion are protected by the guard-plates, so as to prevent extraneous objects clogging the same and causing the breakage thereof, while the construction of bearing for the main wheel-shaft permits the renewal of the bushings from time to time without disconnecting any of the parts. The construction of spoke or arm and means for applying the fan-blades thereto presents an improved construction, securing stability of the parts, while the construction of latching device effectually holds the vane out of the wind and prevents any accidental movement of the same.

It will be obvious that changes may be made in the details of construction and configuration without departing from the spirit of the invention as defined by the appended claims.

Having described my invention and set forth its merits, what I claim, and desire to secure by Letters Patent, is—

1. In a windmill, a driving-shaft, a wheel thereon, a pivotally-mounted vane, a latching projection carried by said vane at the rear of its pivot, a furl-lever pivoted parallel to said projection and having a tooth to engage the same, and means for operating said lever in one direction; substantially as specified.

2. In a windmill, a driving-shaft, a wheel thereon, a pivotally-mounted vane, a latching projection carried by said vane at the rear of its pivot, a furl-lever pivoted parallel to and at the rear of the vane-pivot and having a tooth to engage said projection, means for operating said lever in one direction, and a spring extending between the free end of said lever and a lug at the pivot of the vane to operate the lever in an opposite direction; substantially as specified.

3. In a windmill, a driving-shaft, a wheel thereon, a pivotally-mounted vane, a latching projection carried by said vane at the rear of its pivot, a furl-lever pivoted parallel to and at the rear of the vane-pivot and having a tooth to engage said projection, means for operating said lever in one direction, a spring extending between the free end of said lever and a lug at the pivot of the vane to operate the lever in an opposite direction, and a diagonally-disposed pivoting-rod for said vane arranged to cause the same to rise and fall in its oscillatory movement; substantially as specified.

4. In a windmill, a head-casting, a driving wheel and shaft mounted thereon, a pump-rod operatively connected to said shaft, a vane-bracket pivoted at one side of said casting and having a recessed latch member at the opposite side of its pivot from the bracket, a furl-lever pivoted parallel to said latch member and having a projection to engage said

recess when the vane is out of the wind, a spring extending from one side of the free end of said furl-lever, and a furl-chain extending from the opposite side of the free
5 end of said lever for withdrawing the same from contact with said bracket; substantially as specified.

5. In a windmill, a head-casting, a driving wheel and shaft mounted thereon, a pump-rod operatively connected to said shaft, a vane-bracket pivoted at one side of said casting and having a recessed latch member beyond its pivot, a furl-lever pivoted adjacent to said bracket and having a projection to engage said recess when the vane is out of the
15 wind, a furl-chain extending from said lever for withdrawing the same from contact with said bracket, a lateral projection from said bracket, a lateral projection from said furl-lever, and a tension-spring extending between said projections to normally hold the parts in latched position; substantially as
20 specified.

6. In a windmill, a head-casting, a driving wheel and shaft mounted thereon, a pump-rod operatively connected to said shaft, a vane-bracket pivoted at one side of said casting and having a recessed latch member beyond its pivot, a furl-lever pivoted adjacent
25 to said bracket and having a projection to engage said recess when the vane is out of the wind, a furl-chain extending from said lever for withdrawing the same from contact with said bracket, a lateral projection from said
30 bracket, a lateral projection from said furl-

lever, a tension-spring extending between said projections to normally hold the parts in latched position, a central passage through the head-casting, a chain-guide extending to said passage, and a rotatable support for said
40 casting upon the upper portion of a tower; substantially as specified.

7. In a windmill, a head-casting having a central aperture, a shaft-bracket extended from one side thereof at its upper portion and
45 provided with a bearing-box adapted to receive a removable bushing, a driving wheel and shaft mounted in said bracket, a bearing-sleeve upon the same side of the casting beneath said shaft-bearing, a gear having its
50 shaft in said bearing-sleeve, a supporting-standard extending above the shaft-bearing, a pump-rod connection mounted on said standard and connected to said gear, a gear-casing provided upon said casting, vane-
55 brackets extended laterally from the casting upon the opposite side from the shaft-bearing, a vane pivotally mounted on said brackets, a latching projection carried by said vane at the rear of its pivot, a furl-lever pivoted
60 parallel to said projection and having a tooth to engage same, and means for operating said lever in one direction; substantially as specified.

In testimony whereof I affix my signature 65
in presence of two witnesses.

ASA W. THOMPSON.

Witnesses:

E. C. THOMPSON,
J. H. ARMSTRONG.