

No. 765,010.

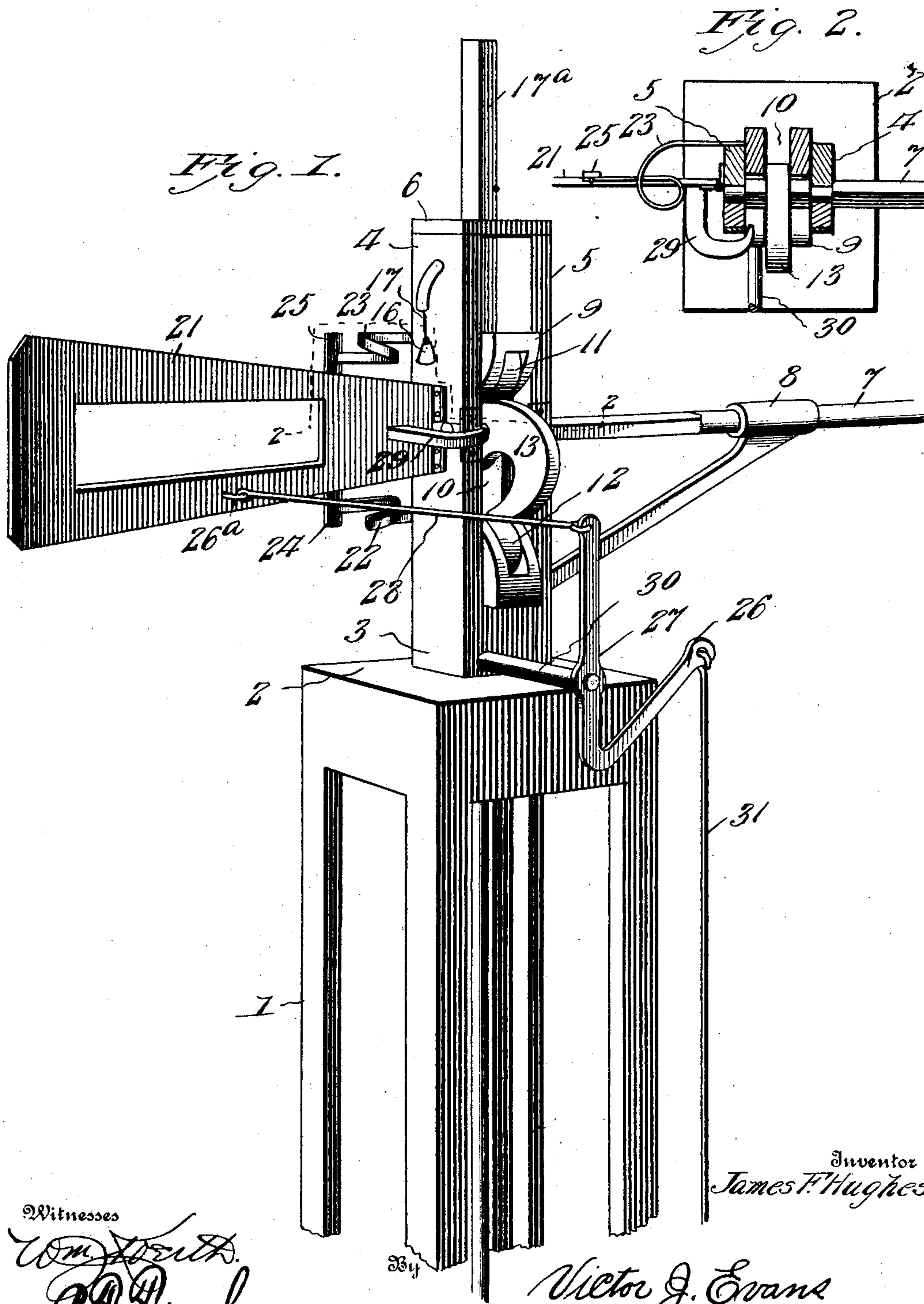
PATENTED JULY 12, 1904.

J. F. HUGHES.  
WINDMILL.

APPLICATION FILED JAN. 21, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses

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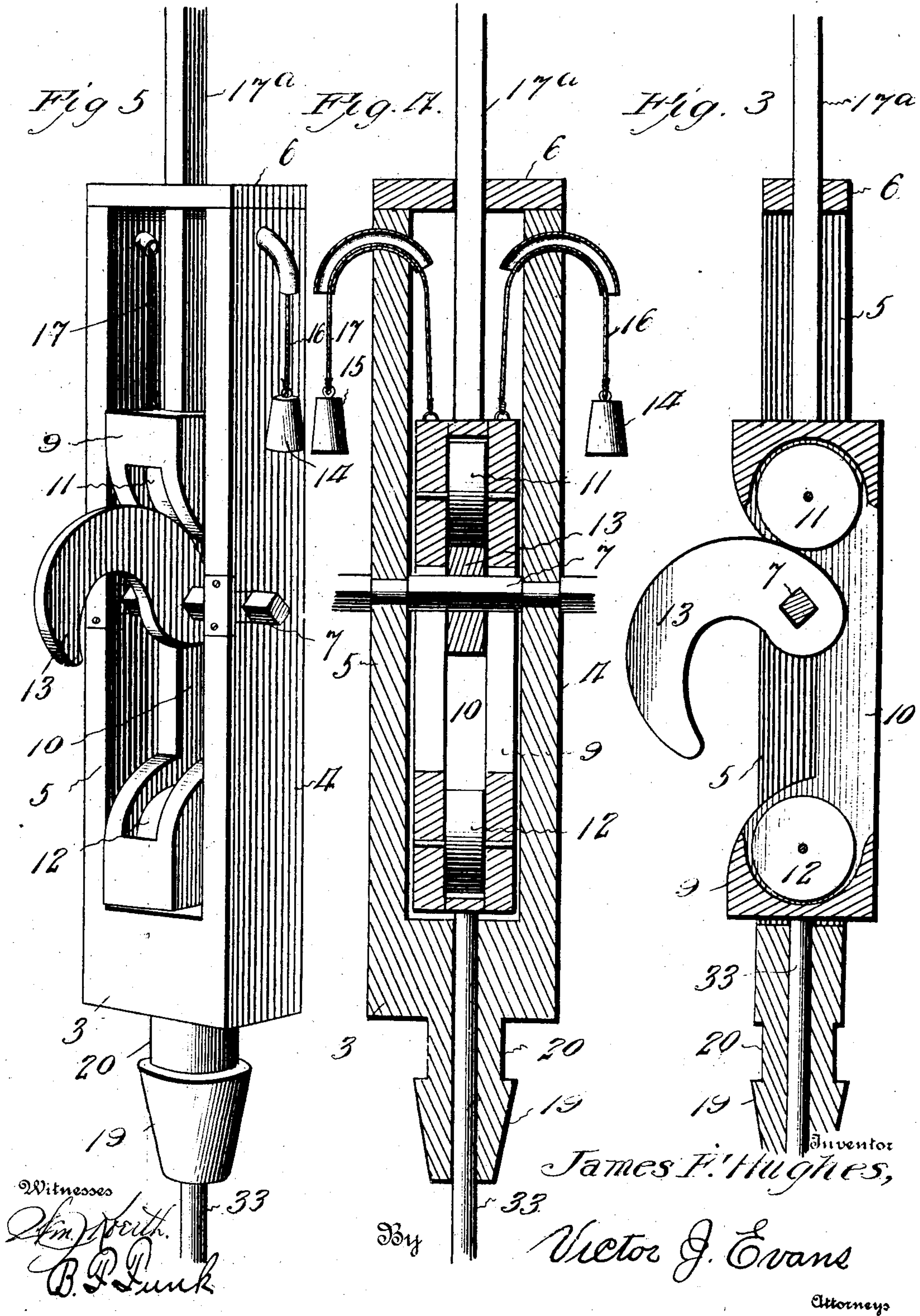
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2 SHEETS—SHEET 2.





# UNITED STATES PATENT OFFICE.

JAMES F. HUGHES, OF LONEGROVE, TEXAS.

## WINDMILL.

SPECIFICATION forming part of Letters Patent No. 765,010, dated July 12, 1904.

Application filed January 21, 1903. Serial No. 139,988. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES F. HUGHES, a citizen of the United States, residing at Lonegrove, in the county of Llano and State of Texas, have invented new and useful Improvements in Windmills, of which the following is a specification.

This invention relates to windmills, but more particularly to an operating mechanism for the pitman.

One of the principal objects of the invention is to provide an efficient and durable construction of mechanism for converting a rotary movement into a reciprocating movement.

Another object is to provide a conveniently-operated brake for retarding the rotation of the operating-shaft.

Other objects, as well as the novel construction of the device and the manner of operating it, will be specifically described hereinafter, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of a windmill constructed in accordance with my invention. Fig. 2 is a cross-sectional view through the support of the mechanism, taken on the line 2 2 of Fig. 1. Fig. 3 is a vertical enlarged sectional view through the support and cam movement. Fig. 4 is a vertical longitudinal sectional view through the same, and Fig. 5 is a perspective view of the cam movement and its accessories.

The reference-numeral 1 designates a windmill tower or support provided at its top with a platform 2. Revolvably mounted on this platform is a head or block 3, from which projects two parallel vertically-extending arms 4 and 5. These arms are connected at their upper extremities by a plate 6.

7 designates a rotary shaft on one end of which can be secured a wind-wheel of any preferred construction. This shaft is journaled intermediate its ends to a supported bearing 8, and one end extends through the side arms 4 and 5, the said arms constituting the support therefor. From a point adjacent to the bearing 8 toward the extremity of the shaft 7 entering the support said shaft is angular except for a portion of its length resting in the jour-

nals carried in the arms 4 and 5. Thus the shaft can rotate freely in the three journals provided therefor when pressure is applied to the wheel.

The reference-numeral 9 designates a vertically-reciprocating cam-bar, which is provided with an elongated slot 10 running longitudinal thereof, and adjacent to the respective ends of the slot are journaled antifriction-rollers 11 and 12. Positioned between the arms or standards 4 and 5 and rigidly fastened to the shaft 7 is a cam 13, adapted to rotate with the shaft 7 when it is driven by suitable means. This cam moves within the slot 10 and successively engages the antifriction-rollers 11 and 12. In order to compensate for the resistance of the pump-piston on the end of the pitman 33, which is secured to the cam-bar and projects through the head 3, I provide auxiliary devices secured to the upper part of the cam-bar. These devices consist of weights 14 and 15, which are arranged on either side of the standards or arms 4 and 5, being attached to the cords or flexible connections 16 and 17, which pass through the upper part of the respective standards and are then connected by suitable means to the upper part of the cam-bar 9. These weights will be sufficiently heavy to assist in raising the water and relieve the strain caused by the resistance of the piston. Then the motive force exerted by the shaft 7 will be sufficient to impart motion to the cam in a light wind.

In order to retain the bar in its proper relative position, I provide at its top an upwardly-extending guide-bar 17, which projects through the plate 6 on the standards 4 and 5. It will be noticed that the cam-bar 9 is cut away intermediate its ends to provide for the insertion of the shaft 7 through the standards 4 and 5, the end of the bar being enlarged to form heads in which the rollers 11 and 12 are journaled. The head or block 3 is held in relative engagement with the platform 2 by the enlarged head 19 on the lower extremity of the restricted neck 20. This permits the support to rotate, but effectually prevents an accidental displacement thereof.

It will be apparent that by permitting the shaft 7 to rotate the cam will be carried with



it, and by alternately coming in contact with the rollers 11 and 12 a reciprocating movement will be imparted to the pitman.

That the wheel (not shown) may always be in proper position to be acted upon by the wind, I provide a horizontal vane 21, which is hinged to one of the standards and is normally held in a plane parallel with the side of the shaft 7 and at right angles to the surface of the wheel by means of springs 22 and 23. These springs comprise flat strips which at one end are secured to the head 4 and are bent intermediate their ends to form loops or convolutes, the free ends being rigidly secured to arms or bars 24 and 25, extending below and above the longitudinal edges of the vane 21 and secured thereto and to one of the standards. These springs will be sufficient to normally retain the vane in the position shown in Fig. 1.

When it is deemed desirable to throw the wheel out of operative position, this can be accomplished by exerting a downward pull upon the arm 26 of the bell-crank lever 27, thereby causing the vertical arm of the lever to be moved away from or in an opposite direction to the vane 21. As the arm 26<sup>a</sup> is connected to the vane by a link-rod 28, the vane can be swung around at right angles to the shaft, thereby throwing the wheel out of engagement with the wind. Free movement of the shaft will be stopped or retarded by means of the hook-shaped brake 29, which is formed rigid with the vane and the free end of which is designed to engage the angular portion of the shaft by frictional contact, causing further rotation to cease.

It will be observed that the lever 27 is pivotally secured to the head 3 on a stub-shaft 30, so that the lever-vane and the remaining mechanism are carried by the supporting standards and head 3. The bell-crank lever 27 can be operated from the ground by the rod or suitable connection 31, so that the ro-

tation of the shaft 7 can be governed in a convenient manner.

From the foregoing description it will be readily apparent that I provide an efficient and durable mechanism for converting a rotary movement into a reciprocating movement and that the invention is adapted for use particularly on windmills and like devices. In order to illustrate the application of the device, I have shown it as applied to a windmill, although it is obvious that it may be used for a multiplicity of purposes where it is desired to convert a rotary movement into a reciprocating movement.

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

1. In a device of the character described, the combination of a pair of standards connected at their respective ends, a reciprocating cam-bar arranged between the standards, means on the respective ends of the cam-bar and projecting in opposite directions to retain the cam-bar in proper relation with the standards, a cam for actuating the cam-bar, and a compensating device secured to the cam-bar and designed to relieve the strain on the bottom of the cam-bar.

2. In a windmill, the combination with standards, of a reciprocable bar arranged between the standards, a rotatable shaft journaled on the standards, means on the shaft for reciprocating the bar, a pivoted vane provided with arms and springs comprising flat strips bent intermediate their lengths to form convolutes and secured at one end to the standards and at the other end to the arms on the vane.

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

JAMES F. HUGHES.

Witnesses:

L. G. JACKSON,  
A. CROCKER.