

No. 670,805.

Patented Mar. 26, 1901.

R. A. NICHOLL.

WINDMILL.

(Application filed Oct. 24, 1900.)

(No Model.)

Fig 1

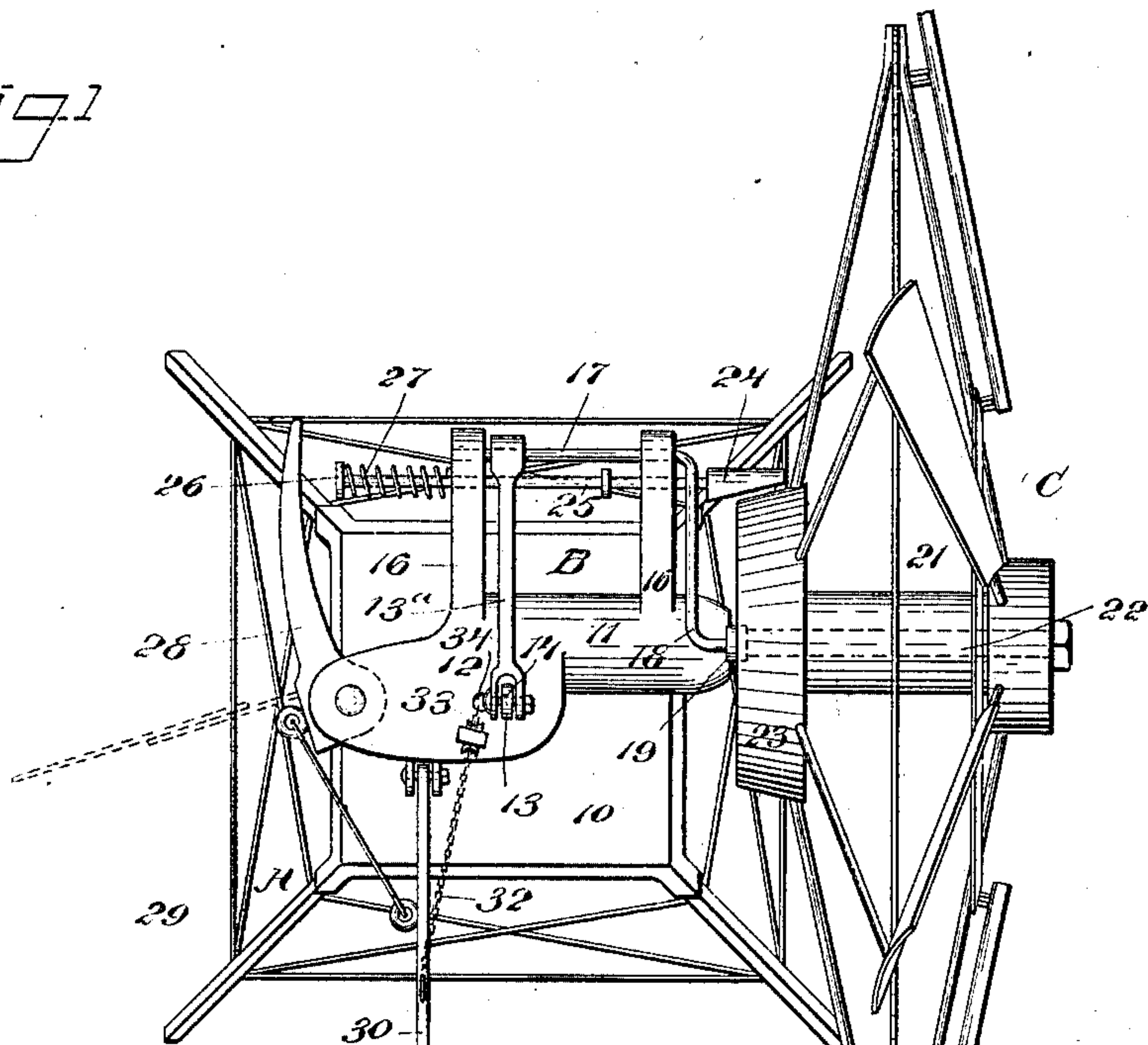
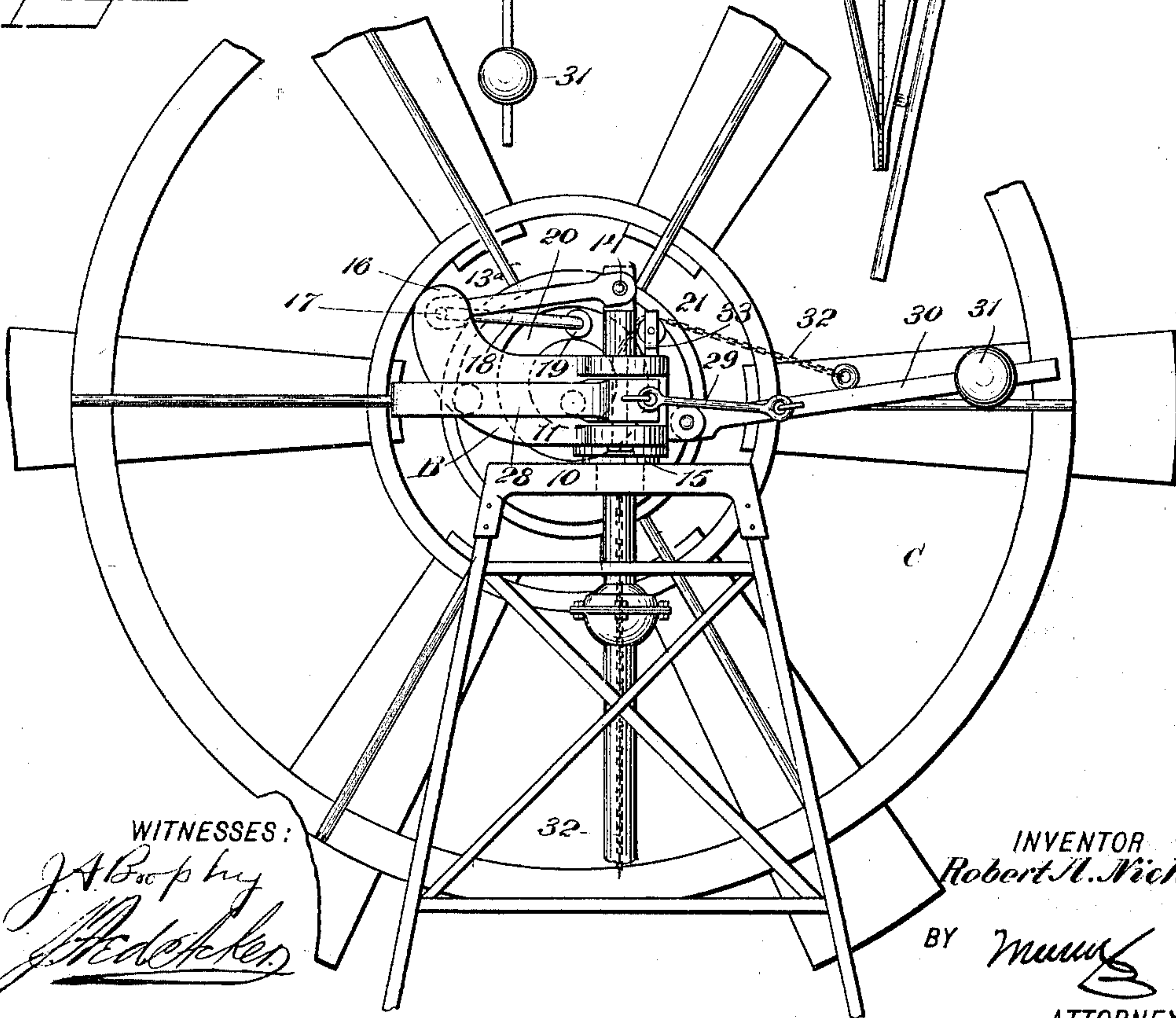


Fig 2



WITNESSES:

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ROBERT ADAM NICHOLL, OF MARLETTE, MICHIGAN.

WINDMILL.

SPECIFICATION forming part of Letters Patent No. 670,805, dated March 26, 1901.

Application filed October 24, 1900. Serial No. 34,146. (No model.)

To all whom it may concern:

Be it known that I, ROBERT ADAM NICHOLL, a citizen of the United States, and a resident of Marlette, in the county of Sanilac and State of Michigan, have invented a new and Improved Windmill, of which the following is a full, clear, and exact description.

The purpose of the invention is to construct a direct-stroke windmill, and also to provide a means whereby the wheel may be instantly stopped or checked in speed, as occasion may demand, and to so construct and combine the several parts of the windmill that said parts will be strong yet light and the arrangement of the parts be exceedingly simple.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in both figures.

Figure 1 is a plan view of the improved windmill. Fig. 2 is a side elevation of the upper portion of the tower and the wind-wheel and adjacent parts, a portion of the wind-wheel being broken away.

A represents the tower, which is provided with the usual table 10, and B represents the head-block, mounted to turn on the table. As is particularly shown in Fig. 1, this head-block comprises a body 11, an arm 12 at one side and end portion of the body, and two arms 16 at the opposite side of the body, the arm 12 being substantially flat on the top, while the arms 16 are curved in an upward direction. The arm 12 near its inner end loosely receives the upper portion of a tube 13, which is secured to the table 10 and receives a pump-rod 14. The head-block turns around the pipe or tube 13 on roller-bearings 15, as shown in Fig. 2. A shaft 17 is mounted to turn in the outer ends of the arms 16 of the head-block, and at the end of the shaft 17 which is adjacent to the wind-wheel C a crank-arm 18 is formed, and at the free end of the said crank-arm a roller 19 is located, which roller enters a cam or eccentric groove 20 produced in the hub 21 of the wind-wheel. This wind-wheel C is mounted to turn on a spindle 22, fixed to one end of the body 11 of the head-block, and the

said spindle is at one side of or out of alignment with the opening or tube in which the pump-rod has movement.

The pump-rod 14 is pivotally attached to one end of an arm 13^a, and the other end of the arm is attached to the shaft 17, so that as the wind-wheel C turns the shaft 17 is given a rocking motion and the pump-rod arm 13^a is moved up and down, imparting vertical movement to the said pump-rod. The hub of the wind-wheel is provided with a tapering flange 23 at its inner end, and a brake-shoe 24 is adapted to engage with this flange either to entirely stop the revolution of the wheel C or to check the speed thereof. This brake-shoe 24 is secured to one end of a rod 25, held to slide in the arms 16, and at the end of this rod, opposite that at which the brake-shoe 24 is placed, a head 26 is formed, and a spring 27 is coiled around the rod, having bearing against the head 26 and one of the arms 16, as is shown in Fig. 1. This spring serves to normally hold the brake-shoe 24 out of engagement with the flanged or braking surface 23 of the wheel C. The brake-shoe is carried to an engagement with this flange 23 through the medium of an actuating-arm 28, pivoted at the outer end of the arm or extension 12 of the head-block, the free end of which actuating-arm is adapted to engage with the head 26 of the brake-rod and force the rod inward or in direction of the wheel. This actuating-arm is connected by a link 29 with a tail-bar 30, the latter being pivoted to the forward edge of the arm extension 12 of the head-block, and the said tail-bar is provided with a weight 31, which serves to normally hold the actuating-arm 28 from engagement with the brake-rod. When the brake is to be applied, a chain 32 is drawn upon. This chain is attached to the tail-bar and passes over a pulley 33 on the head-block and down through an opening 34 in the head-block and table of the tower to a convenient point near the ground.

By reason of the spindle 22, on which the wind-wheel is mounted, being at one side of the center of the pipe through which the pump-rod passes the wheel C is able to govern itself, as when the wind reaches a certain height the wheel will swing around out of the wind.

It may here be remarked that the arm 28

serves two purposes. It is not only a brake, but it serves as a medium for carrying the tail or vane. The member 30 is practically a weighted arm, and when the weight is lifted by means of the chain 32 it serves to swing the tail or vane around, which tail or vane is usually connected with the arm 28, as illustrated by dotted lines in Fig. 1, and at the same time the weighted arm 30 crowds the brake against the flange of the wheel and prevents the wheel from running when out of gear.

Ordinarily the wind-wheel has six arms, which are fastened to the end of the hub nearest the cam or eccentric, and each arm is fastened by a brace-rod to the outer end of the hub. The said wind-wheel in ordinary construction is provided with two rims and thirty fans.

It may be further remarked that a ball-and-socket swivel is preferably produced in the pump-rod below the turn-table to allow the mill to turn, as the wind changes, without twisting or straining the pump-rod.

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

1. In a windmill, a head-block, a support on which the head-block turns, a spindle secured to the head-block at one side of its longitudinal center of rotation, a wind-wheel mounted to turn on said spindle, having an eccentric groove in its hub, a crank-shaft mounted on the head-block, a member of which enters the said groove in the wheel-hub, a pump-rod located at the center of rotation of the head-block, and an arm attached to the crank-shaft and connected with the pump-rod, for the purpose set forth.

2. In a windmill, a head-block, a support on which the head-block turns, a spindle secured to the head-block at one side of its center of rotation, a wind-wheel mounted to turn on said spindle, having an eccentric groove in its hub, a crank-shaft mounted on the head-block, a rolling member of which enters the said groove in the wheel-hub, a pump-rod located at the center of rotation of the head-block, an arm attached to the crank-shaft and connected with the rod, a brake-shoe carried by the head-block, a tapering flange formed on the hub of the wind-wheel, with which the tapering surface of the brake-shoe engages, means for normally holding the brake-shoe from engagement with the said flange, and devices manipulated from a point below the head-block for operating the brake-shoe, as and for the purpose set forth.

3. In a windmill, the combination, with the table of the tower, a head-block mounted to turn on said table, the head-block being pro-

vided with an opening at its center of rotation, a pump-rod having movement in said opening, a spindle fixed at one end of the body portion of the head-block, and a wind-wheel mounted to turn on said spindle, the hub of which wheel is provided with an eccentric groove at one end and an inclined exterior surface at its grooved end, of a crank-shaft mounted to rock upon the head-block, a member of the crank-arm of said shaft extending into the said eccentric groove, an arm attached to the crank-shaft and connected with the pump-rod, a spring-controlled rod mounted to slide on the head-block, a brake-shoe carried by the said rod, adapted for engagement with the inclined surface of the wheel-hub, an actuating-arm for the brake-rod pivoted on the head-block, a weighted tail-bar, a link connection between the tail-bar and actuating-arm, and means for raising the tail-bar, as set forth.

4. In a windmill, the combination, with a table, a support for the same, a head-block mounted to turn upon said table, having a projection from a side of its body, in which projection an opening is made which connects with an opening in the table, a pump-rod capable of vertical movement in said opening in the head-block, a spindle secured to the end of the head-block at a point rearward of the opening through which the pump-rod passes, and a wind-wheel mounted to turn on said spindle, the hub of which is provided at one end with an eccentric groove and at the same end with an inclined exterior surface, of a shaft mounted to turn in supports carried by the head-block, a crank-arm at one end of said shaft, a member of which crank-arm enters the eccentric groove in the hub, an arm attached to the said shaft at a point between its bearings, which arm is pivotally connected with the pump-rod, a spring-controlled brake-rod mounted to slide in the head-block, a brake-shoe carried by said rod, adapted to engage with the inclined outer surface of the wheel-hub, which shoe is normally out of engagement with said inclined surface of the wheel, a tail-bar also carried by the head-block, an actuating-arm operated by the tail-bar and carried by the head-block, the actuating-arm being adapted to force the brake-shoe in direction of the wind-wheel, and means for operating the tail-bar, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ROBERT ADAM NICHOLL.

Witnesses:

D. STUART MCCLURE,
R. A. KILGOUR.