

A. F. BARROW.

WINDMILL.

APPLICATION FILED AUG. 17, 1910.

985,498.

Patented Feb. 28, 1911.

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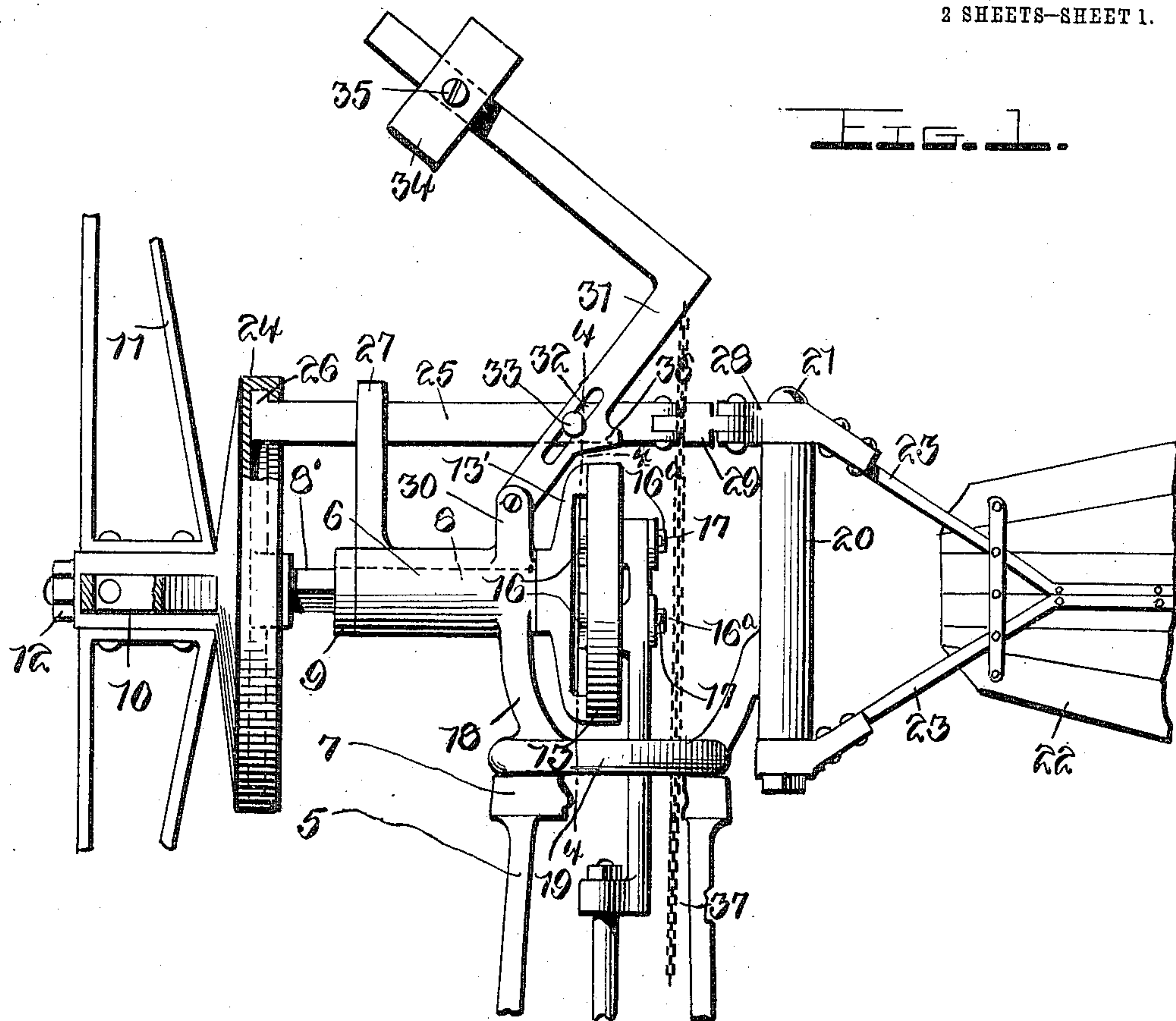
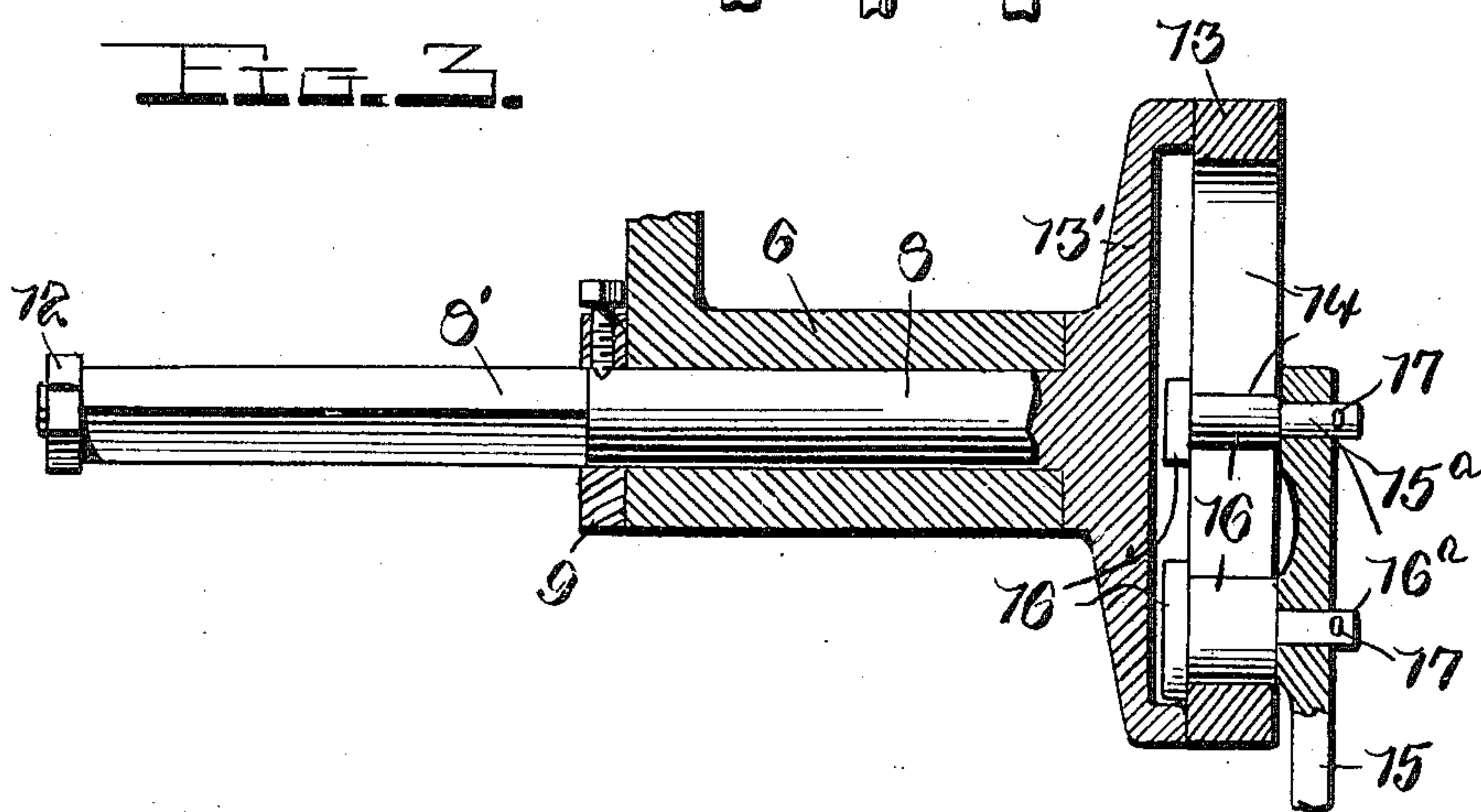


FIG. 2.



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Witnesses

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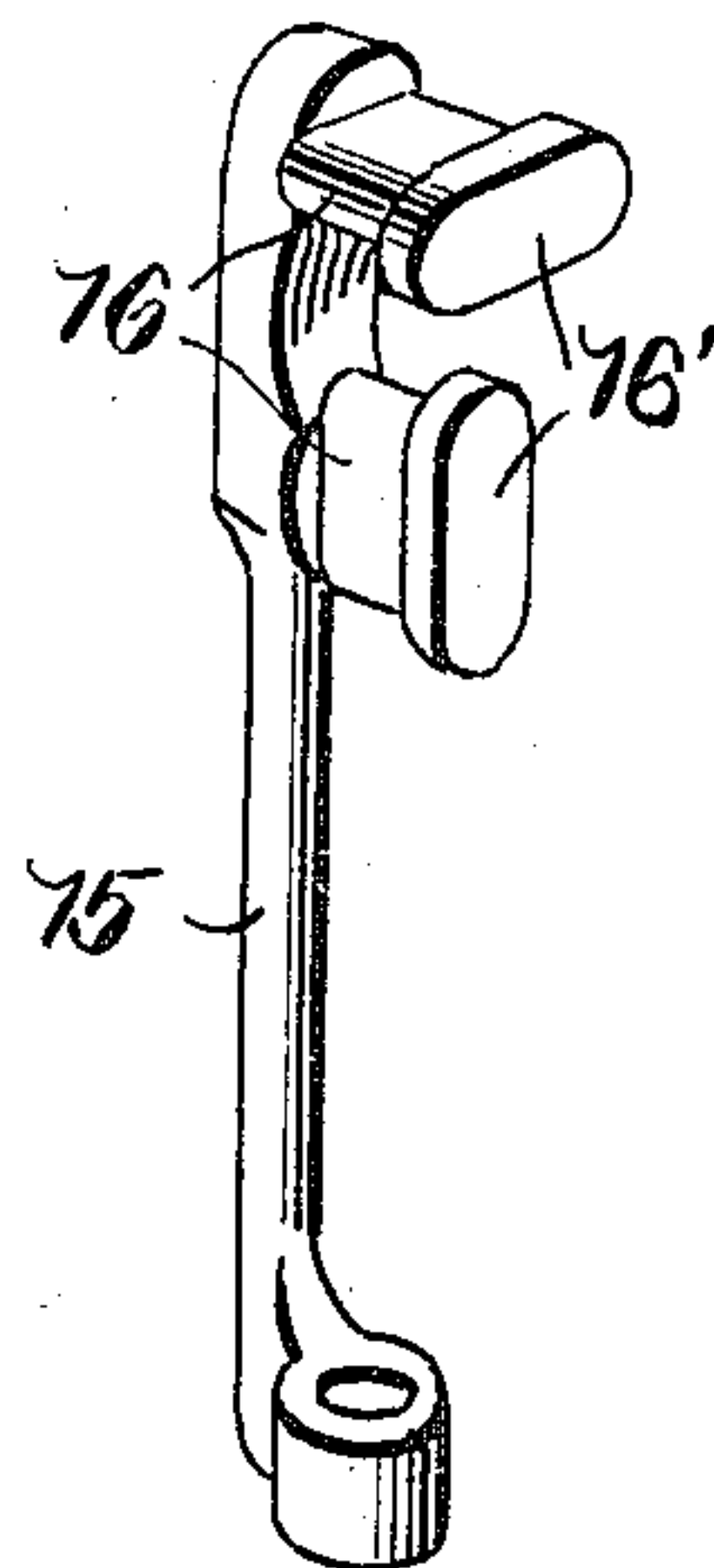
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2 SHEETS—SHEET 2.



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# UNITED STATES PATENT OFFICE.

ALFRED F. BARROW, OF NEW HAVEN, INDIANA.

WINDMILL.

985,498.

Specification of Letters Patent.

Patented Feb. 28, 1911.

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*To all whom it may concern:*

Be it known that I, ALFRED F. BARROW, a citizen of the United States, residing at New Haven, in the county of Allen and State of Indiana, have invented certain new and useful Improvements in Windmills, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to improvements in windmill gearing and has for its primary object to provide a very simple and efficient mechanism whereby the pump rod actuating means is automatically rendered inoperative upon the occurrence of heavy wind storms thereby obviating the liability of serious damage to the gearing.

A further object of my invention is to provide means for reciprocating the pump rod when there is only a light wind, and with a minimum expenditure of power.

A still further object resides in the provision of a longitudinally movable windwheel and movable connections between the windwheel and a rudder vane, said connections being adapted to actuate a weighted arm which acts as a brake for the pump rod and operating gearing to stop the same, said rudder vane being simultaneously moved to a position in parallel relation to the windwheel.

With these and other objects in view, the invention consists of the novel features of construction, combination and arrangement of parts hereinafter fully described and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a windwheel, pump rod gearing and brake mechanism embodying my invention; Fig. 2 is a top plan view thereof; Fig. 3 is an enlarged detail longitudinal section taken on the line 3—3 of Fig. 2; Fig. 4 is a section taken on the line 4—4 of Fig. 1; and Fig. 5 is a detail perspective view of the connecting rod.

Referring in detail to the accompanying drawings 5 designates a mast or standard which is rigidly mounted in a tower of any approved construction, (not shown). A bearing 6 is horizontally mounted upon the upper end of the mast 5 and has an annular head plate 7 integrally formed with said mast on which the bearing is arranged.

A shaft or arbor 8 is rotatably mounted in the cylindrical bearing 6. A collar 9 is

longitudinally adjustable on the arbor into engagement with the end of the bearing 6, and is adapted to overcome any tendency of the arbor to move longitudinally in said bearing. The end portion of the arbor 8 is square in cross section as shown at 8'. This squared end portion of the arbor is received in the similarly shaped bore of a bearing sleeve 10. The sleeve 10, it will be observed, is of considerably less length than the squared portion 8' of the arbor 8 so as to provide a space between the collar 9 and the end of the sleeve 10. The sleeve 10 forms the hub of the windwheel 11. This wheel may be of any approved construction and forms no part of the present invention. The extremity of the shaft 8 on the squared portion thereof is reduced and screw threaded to receive a nut 12 which is of greater diameter than the shaft 8 and acts as a stop to limit the outward sliding movement of the wheel hub or sleeve 10.

Upon the end of the cylindrical portion of the shaft or arbor 8 which is mounted in the bearing 6, a circular head plate or wheel 13 is carried. As shown in the drawings this wheel has formed therewith the arms 13' which extend from a central body portion securely threaded or otherwise fixed upon the end of the shaft 8. The wheel 13 is formed with right angularly extending intersecting slots 14 and in these slots the guide members 16, carried by the connecting rod 15, are adapted to move. As shown in detail in Fig. 5 the guide members 16 are in the form of elongated blocks each having a head 16' formed on one end and a cylindrical stud 16<sup>a</sup> on the other end. These studs which are formed on the guide members are rotatably disposed in openings provided in the enlarged upper end portion of the connecting rod 15. Suitable keys 17 extend through the extremities of these studs so as to retain the same in said openings.

The lower end of the connecting rod 15 may be connected to the pump rod of the mill in any approved manner, and it will be obvious that as the windwheel is rotated, the rotation of the wheel 13 will cause the guide members 16 to move in the guide slots 14 of said wheel. With each half revolution of the wheel said members reverse their direction of movement in the slots. Thus it will be seen that upon each revolution of the wheel 13 there will be two complete strokes



of the pump rod. In this manner the rod is reciprocated by a very light current of wind acting upon the windwheel and with a minimum expenditure of power. The center, or  
 5 connecting point between the rod 15 and the wheel 13 is constantly changing, while with the usual crank or eccentric connections, the pivotal point is stationary. It will therefore be obvious that by means of my im-  
 10 proved gearing a very great reduction in the power necessary to reciprocate the pump rod is effected.

An arm 18 is integrally formed upon the end of the bearing 6 and depends therefrom.  
 15 A horizontally positioned annular ring 19 is mounted upon ball bearings on the upper end of the mast 5. In this manner friction is reduced to a minimum in the rotation of the windwheel upon the mast. At a point  
 20 diametrically opposite to the arm 18, a second arm is integrally formed with the annular member 19 and a vertically disposed sleeve 20 is formed upon the upper end thereof. A pivot rod 21 is mounted to ro-  
 25 tate in the sleeve 20 and to the opposite ends of this rod the diverging arms 23 of a rudder vane 22 are rigidly secured.

A channel ring 24 is disposed in concentric relation to and is supported upon the  
 30 hub 10 of the windwheel. A rectangular longitudinally movable bar 25 has one of its ends upturned and disposed in the channel of the ring 24 as indicated at 26. This bar 25 is movably supported by a vertical  
 35 arm 27 formed upon one end of the bearing 6. The pivot rod 21 extends above the upper end of the sleeve 20 and has secured thereon an angular arm 28. The horizon-  
 40 tal portion of this arm is bifurcated to receive the end of a T-shaped knuckle member 29 the other end of which is pivoted to the end of the bar 25. The members 28 and 29 are loosely connected for relative pivotal  
 45 movement, the diverging arm 23 of the rudder vane 22 being rigidly secured to the member 28. A lug 30 is also formed upon the bearing 6 and to this lug one end of an L-shaped bar 31 is pivoted. Adjacent to  
 50 its pivoted end the bar 31 is longitudinally slotted as shown at 32 and in this slot a roller 33 mounted upon a stud fixed to the bar 25 is adapted to move. Upon the other  
 55 leg of the L-shaped bar 31 a weight 34 is longitudinally movable and is secured in its adjusted position by means of a set screw 35. Between the pivoted end of the bar 31  
 60 and the slot 32, a lug 36 is formed upon the edge of said bar. This lug is adapted to engage upon the periphery of the wheel 13 in the operation of the mechanism and acts as a brake for said wheel as will now be more fully described.

It is believed that from the above description the manner of assembling the va-  
 65 rious elements will be readily understood

and in the operation of the device, the bar 31 is normally disposed in the position indicated in the drawings, the weight 34 main-  
 taining said bar in such position and over-  
 coming any tendency of the bar 25 to move  
 70 longitudinally in the arm 27. However, should a gale or heavy wind storm arise, the windwheel will be moved longitudinally upon the square portion 8' of the arbor 8,  
 75 a space being provided as hereinbefore noted between the end of the hub 10 and the collar 9 to permit of such sliding movement. It will be obvious that upon this movement  
 of the windwheel the bar 25 will also be moved and through the connecting knuckle  
 80 29 between said bar and the member 28, the rudder vane 22 will be swung into a position in parallel relation to the windwheel thereby preventing to a great extent the bodily ro-  
 85 tation of the wheel and the gearing upon the mast 5. This movement of the bar 25 it will be observed, will also throw the bar 31 out-  
 wardly, overcoming the weight 34. The lug or extension 36 carried by said bar will thus be forced downwardly into frictional  
 90 engagement upon the periphery of the wheel 13, the roller 33 moving in the slot 32 of said bar. A chain 37 is connected to the bar 31 at one end and passes over a guide  
 95 pulley 38 mounted on the annular member 19 whereby the brake device may be manually actuated if desired to stop the reciproca-  
 tion of the pump rod. The braking action thus induced upon the wheel 13 will gradu-  
 100 ally overcome the rotative movement of the wheel and stop the reciprocatory movement of the pump rod. Thus the mechanism is rendered inoperative and danger of break-  
 age of the various parts owing to the violence of their action caused by heavy winds,  
 105 is entirely overcome.

From the foregoing it is believed that the construction and operation of my improved windmill gearing will be readily understood. The mechanism is comparatively simple and  
 110 it is also extremely efficient and highly durable in practical use.

While I have shown and described the preferred construction and arrangement of the various parts, it will be understood that  
 115 the invention is susceptible of a great many minor modifications without departing from the essential feature or sacrificing any of the advantages thereof.

Having thus described the invention, what  
 120 is claimed is:—

1. The combination of a windwheel shaft, a windwheel longitudinally movable on one end of said shaft, pump rod actuating means on the other end of said shaft, a disk carried  
 125 by the windwheel having an annular channel therein, a longitudinally movable bar engaged at one end in said channel and adapted to be moved by the longitudinal move-  
 ment of the windwheel on said shaft, and a  
 130



pivotaly mounted brake device loosely connected to said bar to be moved by the longitudinal movement of said bar into engagement with said actuating means.

2. The combination of a windwheel shaft, a windwheel longitudinally movable on one end of said shaft, pump rod actuating means on the other end of said shaft, a pivotaly mounted rudder vane, a slidably supported bar coöperatively connected to said rudder vane, a disk carried by the windwheel provided with an annular channel to receive one end of said bar, a friction brake device engageable with the pump rod actuating means connected to said bar to be moved thereby, the longitudinal movement of the windwheel sliding said bar and engaging the brake device with said actuating means and simultaneously moving the rudder vane into parallel relation with the windwheel.

3. The combination of a windwheel shaft, a windwheel longitudinally movable on one end of said shaft, pump rod actuating means on the other end of said shaft, a friction brake device engageable with the actuating means, and means movably connected to said brake device adapted to be actuated by the longitudinal movement of the windwheel to engage said brake device with the actuating means.

4. The combination of a windwheel shaft having a squared end portion, a windwheel longitudinally movable thereon, pump rod actuating means on the other end of said shaft, a brake device engageable with said actuating means, a longitudinally movable bar connected to said brake device and engaged at one end with the windwheel, a rudder vane, means connecting said vane and the other end of said bar, the longitudinal movement of the windwheel moving said bar to engage the brake device with said actuating means and move the rudder vane into parallel relation with the windwheel.

5. The combination of a shaft, a windwheel longitudinally movable on said shaft, pump rod actuating mechanism on the other end of said shaft, a longitudinally movable bar connected at one end to the windwheel for movement therewith, a support for said bar, a brake device engageable with the actuating mechanism, and means movably connecting said bar and the brake device to engage said device with the actuating mechanism upon the longitudinal movement of the wheel.

6. The combination of a shaft, a windwheel longitudinally movable on one end thereof, a channel ring carried by said wheel, pump rod actuating mechanism on the other end of the shaft, a bar supported above said shaft, one end of said bar being

engaged in the channel ring whereby said bar is moved upon the movement of the windwheel, a weighted bar movable with relation to said first named bar, a brake lug formed on said bar for frictional engagement with the pump rod actuating mechanism, a movable rudder vane, connections between said vane and the end of the longitudinally movable bar, the movement of said windwheel on the shaft engaging said brake lug with the actuating mechanism and moving the rudder vane into parallel relation to the windwheel.

7. The combination of a shaft, a windwheel longitudinally movable on said shaft, a connecting rod connecting the other end of the shaft to the pump rod of a mill, means for preventing oscillatory movement of the pump rod, a channel ring carried by the windwheel, a bar engaged at one end in said ring and longitudinally movable with the wheel, a pivot rod, a rudder vane connected to said rod, and means loosely connecting said pivot rod to the other end of said bar whereby the longitudinal movement of the windwheel will move said rudder vane into parallel relation with the windwheel.

8. The combination of a shaft, a windwheel longitudinally movable thereon, pump rod actuating mechanism on the other end of the shaft, an angular bar pivotaly mounted at one end, a brake lug formed on said bar engageable with the actuating mechanism, an adjustable weight on the other end of said bar normally holding said lug in its inoperative position, and means connected to said windwheel for longitudinal movement therewith and movably associated with said bar to engage said lug with the pump rod actuating mechanism upon the longitudinal movement of the windwheel.

9. The combination of a windwheel shaft, a windwheel longitudinally movable thereon, pump rod actuating mechanism on the other end of the shaft, a weighted angular bar, a lug formed on said bar for frictional engagement with the actuating mechanism, a movably supported rudder vane, means connected to the windwheel for longitudinal movement therewith to engage said lug with the actuating mechanism and to move the rudder vane into parallel relation with the windwheel, and means for manually moving said angular bar to engage said lug with the actuating mechanism.

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

ALFRED F. BARROW.

Witnesses:

JACOB H. BUTLER,

W. L. McDONALD.