No. 695,443. Patented Mar. 18, 1902.

S. E. BURKE.

WINDMILL.

(Application filed June 27, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

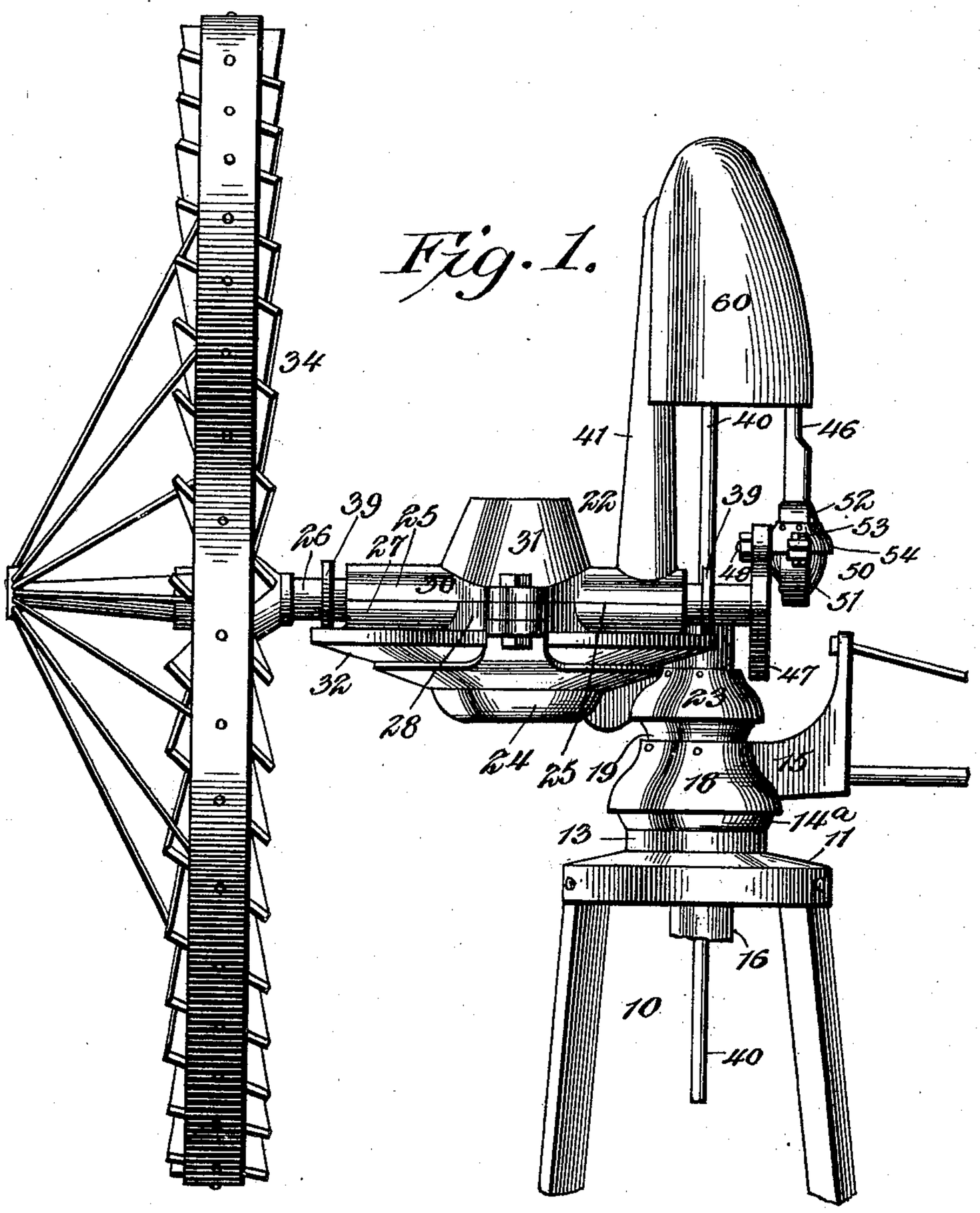


Fig. 4.

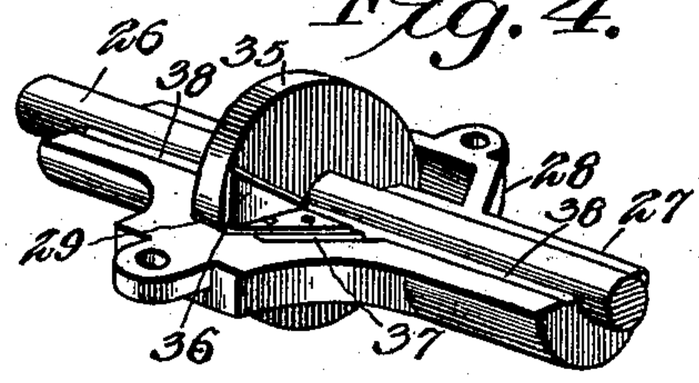
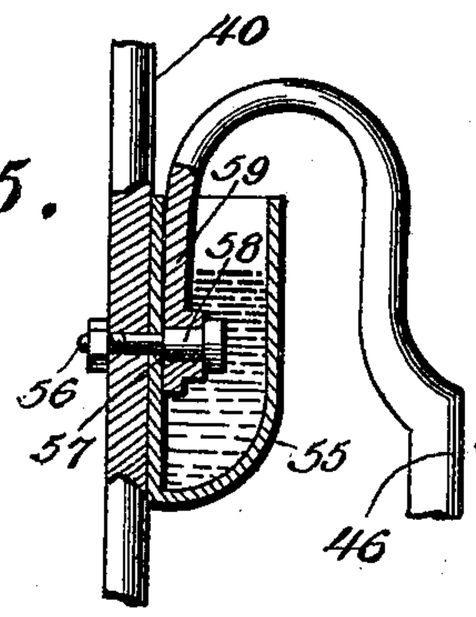


Fig. 5.



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(No Model.) 2 Sheets—Sheet 2.

Fig. 2.

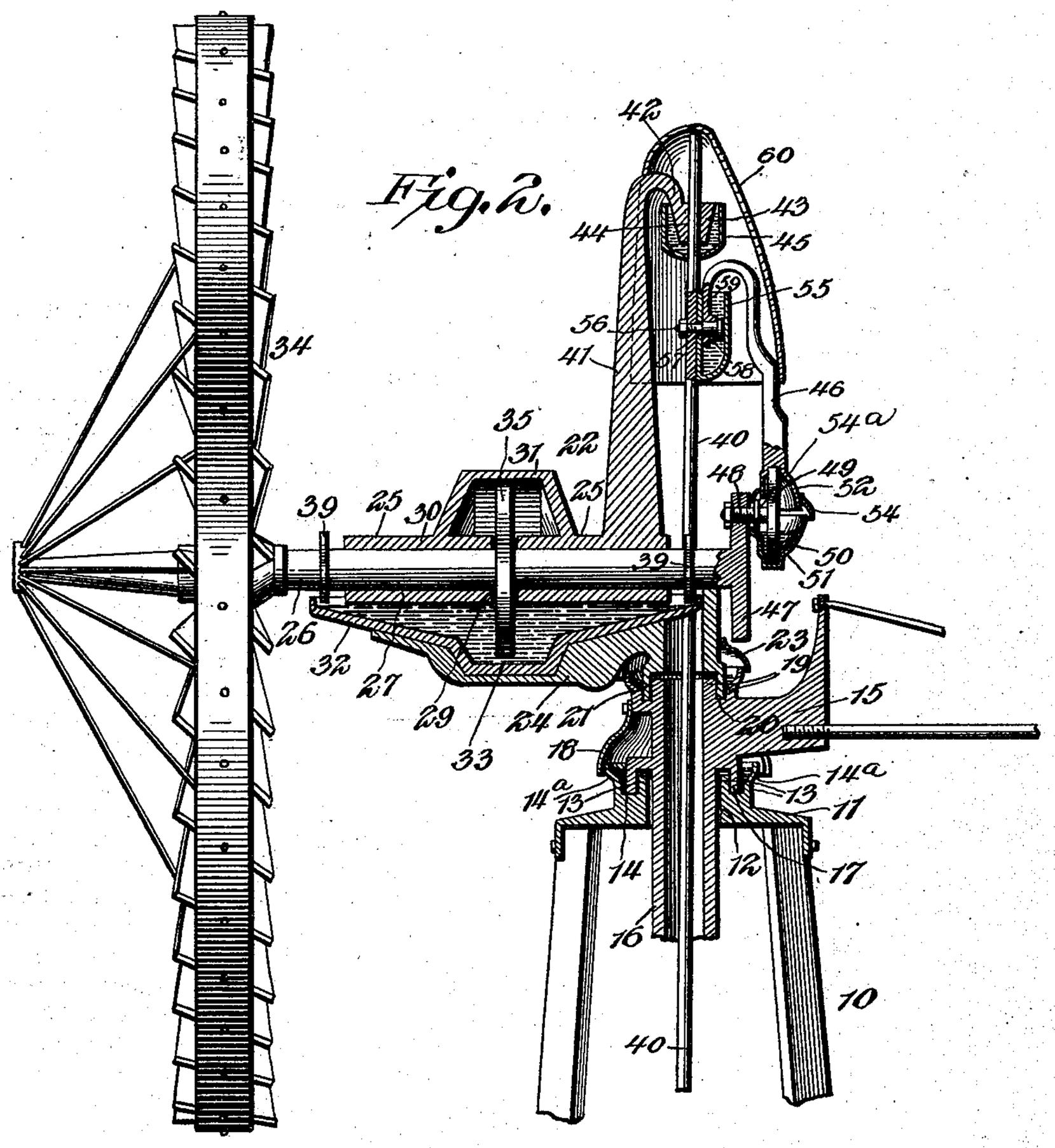


Fig. 6.

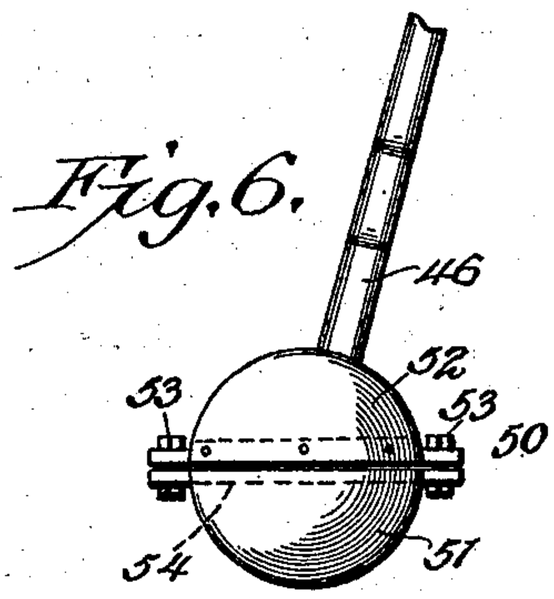
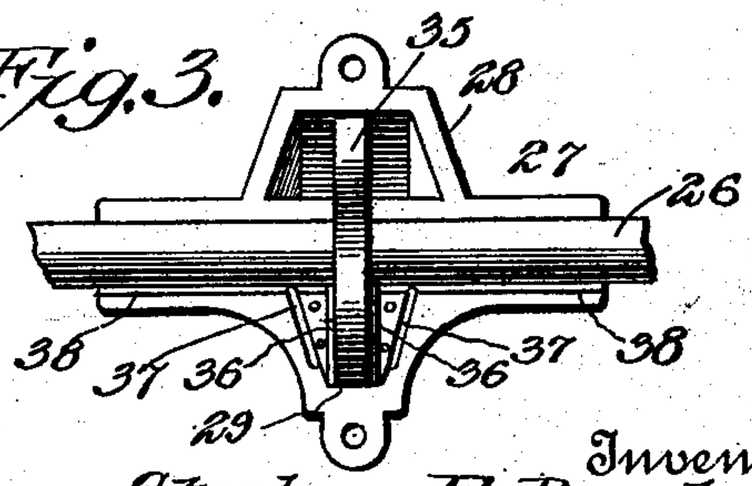


Fig. 3.



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UNITED STATES PATENT OFFICE.

STEPHEN E. BURKE, OF EDON, OHIO.

WINDMILL.

SPECIFICATION forming part of Letters Patent No. 695,443, dated March 18, 1902.

Application filed June 27, 1901. Serial No. 66,274. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN E. BURKE, a citizen of the United States, residing at Edon, in the county of Williams and State of Ohio, have invented a new and useful Windmill, of which the following is a specification.

The present invention relates to windmills; and the object thereof is to improve this class of machines, and especially the bearings thereof.

More particularly, one object of the invention is to construct a windmill in such a manner that the several bearings will be supplied with lubricant, which lubricant will be automatically and continuously applied by the movement of the mill itself, and to provide means whereby no lubricant will be wasted or lost, but will be used over and over again.

A further object is to construct the mechanism so that a comparatively large quantity of lubricant will be carried by the bearings, thus obviating the necessity of frequent attention. In connection with this last object another important feature resides in means for protecting the bearings and the oiling devices from the elements.

In carrying out the above objects the embodiment shown in the accompanying drawings and described in the following specification is at present considered preferable to any other; but it will be understood that the invention is not to be limited to the exact construction shown and described, but is open to such changes and modifications as are within the scope of the appended claims.

In the drawings, Figure 1 is a side elevation of a mill embodying the improvements. Fig. 2 is a vertical longitudinal sectional view through the same. Fig. 3 is a top plan view of the driving-shaft bearing with the cap removed therefrom. Fig. 4 is a perspective view of the same. Fig. 5 is a sectional view, on an enlarged scale, of the connection between the pitman and the reciprocating rod. Fig. 6 is a detail view of the connection between the pitman and the crank-wheel.

Similar numerals of reference designate corresponding parts in all the figures of the drawings.

In the practical embodiment of the invention a suitable supporting-frame is provided, the upper end of which is shown and designated 10. Upon this frame is secured the base-plate 11 of the vane turn-table, said base-plate being provided with a central opening 12 and a pair of spaced upstanding annular walls 13, forming an intermediate annular groove 14. The upper portion of the outer wall is preferably flared, as shown at 14^a. The turn-table body 15 of the vane is rotatably mounted upon the base-plate, having a hollow depending shank or stem 16, that passes through the central opening 12. An annular downwardly-disposed bearing-flange 17, carried by the body, fits in the groove 14 of the base-plate. This groove is arranged to be filled with oil, so that the bearing-flange is thus thoroughly lubricated and an easy movement provided for. A cap 18, detachably secured to the body, covers the walls 13 and the bearing-flange, and thus protects this bearing from the weather. The upper face of the body is constructed in a manner similar to the base-plate, being provided with the spaced walls 19, forming the oil-receiving groove 20, in which fits the depending annular flange 21 of the wheel-supporting bracket, (designated as a whole by the reference-numeral 22.) This connection is also covered by a cap 23.

The bracket 22 preferably consists of a casting having a cup-shaped offstanding arm 24, to which are secured the bearings 25 of the driving-shaft 26. Two of these bearings are provided, spaced a suitable distance apart and being preferably made of a pair of castings, the lower of which, 27, has an enlarged central portion 28, provided with a slot 29. The upper section 30 forms the caps for the bearings and is provided with an enlarged central portion 31, located over the transverse slot 29 of the lower section. An oil-receptacle 32 is fitted in the arm 24 and is located beneath the bearings 25. This receptacle preferably extends a slight distance beyond the outer ends of the bearings and is provided with a centrally-disposed well 33, which is arranged beneath the transverse slot 29 of the casting 27.

The driving-shaft 26 is rotatably mounted in the bearings and carries at its outer end the wind-wheel 34, which may be of any suitable or desired construction. This shaft is provided with an oil-conveyer disk 35, arranged between the spaced bearings and pass-

ing through the transverse slot 29 of the lower casting, thereby having its lower portion located in the well 33 of the oil-receptacle. Scraper-blades 36, mounted upon the lower casting 27 contiguous to the transverse slot 29, rest against the opposite side faces of the conveyer-disk 35 and scrape the oil carried by the disk from the same. Oil-conducting grooves 37 lead from the bases of the blades to longitudinally-disposed channels 38, arranged alongside the portions of the shaft passing through the bearings. Stop-collars 39 are secured to the shaft at the outer ends of the bearings and are located above the opposite ends of the oil-receptacle and contiguous to the walls thereof.

The manner in which the shaft is lubricated will be easily understood. As said shaft is rotated the oil-conveyer disk passing through the lubricant will carry the same around with it until it comes into contact with the scraper-blades. These blades will remove it from the disk, whereupon it will gravitate into the conducting-grooves and flow into the longitudinally-disposed channels, thus lubricating the bearings. As the oil works through it will drop back into the receptacle and gradually return to the well to be utilized over again. Any portions which may tend to travel along the shaft will be stopped by the collars 39, and as the lower portions of these collars are located closely to the end walls of the receptacle any small drops that may accumulate thereon will be brought against the receptacle, and thus drop back into the same. In this manner not only are the bearings thoroughly lubricated, but the oil is not wasted and is automatically returned to be utilized again and again.

The construction employed in mounting the upper end of the pump-rod 40 is as follows: An upright standard 41 projects above the shaft-bearings and is provided at its upper end with an overhanging arm 42, having a depending head 43, which has a vertical opening 44. The upper end of the pump-rod 40 is slidably mounted in the opening 44. An oil-cup 45 is secured to the rod 40 below the head 43 and has its side walls spaced from the same. This cup is arranged to receive a considerable quantity of oil, and it will be seen that as the cup is moved up and down during the reciprocation of the rod the head will be plunged into the lubricant, or, more strictly, the lubricant will be carried up about the head, and thus the bearing will be lubricated at every reciprocation. At the same time the cup will catch any oil that may drip from the head or rod, so that there will be none wasted at this point.

Connecting the reciprocating pump-rod 40 and the driving-shaft 26 is the pitman 46. For this purpose the rear end of the shaft is provided with a crank-wheel 47, to which is secured the wrist-pin 48. The outer end of this wrist-pin has a bearing-disk 49, and the lower end of the pitman carries a boxing 50, that surrounds the same. This boxing is made of detachable sections, the lower one, 51, constituting an oil-cup, that is located beneath the disk and is wholly or partially filled with oil, as clearly indicated in Fig. 1, the side walls of said section being spaced from the adjacent faces of the disk to form a comparatively large reservoir. The upper section 52 is preferably made integral with the pitman and is secured to the lower section by means of bolts 53. This upper section has its lower edge located within the edge of the lower section, so that any oil that may drip down the inner face of the same will fall within the lower section and not drip on the outside of the same. A sleeve 54, secured to the upper section, covers the joint between the two, and a collar 54ª prevents the oil working along the pin to the wheel 48. An oil-cup 55 is secured upon the reciprocating pump-rod 40 below the cup 45. The manner of fastening this cup in place is clearly shown in Fig. 5. A bolt 56 passes through the rod and the adjacent wall of the cup and has a shoulder 57, that bears against the inner face of said wall. A portion 58 of the bolt projects within the cup and forms a pivot for the depending offset upper end 59 of the pitman 46, that passes down through the upper end of the oil-cup. A hood 60 is secured to the standard 41 and entirely covers the connection between said standard and the rod and the connection between the pitman and the rod, thus entirely protecting these connections from the elements.

By the above construction it will be seen that all the bearings are thoroughly lubricated and protected from the weather, that a sufficiently large quantity of lubricant may be placed in the bearings to last a considerable length of time—for instance, a year or more—and such lubricant will be continuously fed to the bearings. The result is a mill requiring but little attention and operative in light winds.

From the foregoing it is thought that the construction, operation, and many advantages of the herein-described invention will be apparent to those skilled in the art without further description, and it will be understood that various changes in the size, shape, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

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

1. In a windmill, the combination with a rotary shaft, of a bearing for the shaft having an enlarged portion located upon one side of said shaft, an oil-conveyer disk carried by the shaft and located adjacent to the enlarged portion of the bearing, a scraper secured at its lower end to the enlarged portion of the bearing and having its upper end resting against the disk, said bearing being provided

with an oil-conducting channel leading from the lower end of the scraper to the portion of the shaft passing through the bearing.

2. In a windmill, the combination with a rotary shaft, of spaced bearings for the shaft, an oil-receptacle located beneath the shaft, an oil-conveyer disk secured to the shaft between the bearings and passing through the oil-receptacle, and scraper-blades mounted upon the bearings and having their upper ends resting against the opposite faces of the disk, each bearing being provided with an oil-conducting channel that leads from the lower portion of the scraper to the portions of the shaft located in said bearing.

3. In a windmill, the combination with a rotary shaft, of a bearing for the shaft having a transverse slot, an oil-receptacle arranged below the slot, an oil-conveyer disk secured to the shaft and located in the slot of the bearing, and a scraper secured at its lower end to the bearing on one side of the slot and having its upper end resting against the disk, said bearing having an oil-conducting channel leading from the lower end of the scraper to the portion of the shaft passing through the bearing.

4. In a windmill, the combination with a rotary shaft, of a bearing for the shaft having a transverse slot intermediate its ends, an oil-receptacle arranged below the slot, an oil-conveyer disk secured to the shaft and located in the slot, and scraper-blades secured at their lower ends to the bearing on both sides of the slot and having their upper ends resting against the opposite side faces of the disk, said bearing having oil-conducting channels leading from the lower ends of the scraper-blades to the portions of the shaft that are located on opposite sides of the slot.

5. In a windmill, the combination with a rotary shaft, of a bearing for the shaft having an enlarged central portion provided with an intermediate slot that extends transversely across the bearing, an oil-reservoir arranged beneath the bearing and extending beyond the ends thereof, an oil-conveyer disk secured to the shaft and located in the transverse slot of the bearing, scraper-blades secured at their lower ends to the enlarged portion of the bearings on opposite sides of the slot thereof and having their upper ends resting against the opposite side faces of the conveyer-disk, said bearing having oil-conducting channels leading from the lower ends of the scraper-blades to the portions of the shaft arranged on opposite sides of the slot, and oil-stop collars secured to the shaft contiguous to the ends of the bearing, said collars having their lower ends located in the oil-reservoir.

6. In a windmill, the combination with a support having an upright bearing, of a reciprocating element having a sliding engagement with the bearing, and an oil-cup carried by the reciprocating element beneath the bearing, said cup being movable with the element and being carried upwardly thereby, so that portions of the bearing are immersed in the lubricant contained in the cup upon the reciprocation of said element.

7. In a windmill, the combination with a support having an upright bearing, of a reciprocating element having a sliding engagement with the bearing, an oil-cup carried by the reciprocating element and located beneath the bearing, said cup being movable with the element and being carried upwardly thereby, so that portions of the bearing are immersed in the lubricant contained in the cup upon the reciprocation of said element, and a hood covering the bearing and the portion of the reciprocating element carrying the cup.

8. In a windmill, the combination with a supporting-standard having an offset depending head provided with a substantially vertically disposed opening, of a reciprocating rod having a portion slidably mounted within the opening of the head, and an oil-cup carried by the reciprocating rod and located beneath the head, said cup being movable with the rod and being carried upwardly thereby so that portions of the head are immersed in the lubricant contained in the cup during the reciprocation of said rod.

9. In a windmill, the combination with a supporting-standard having an offset depending head provided with a substantially vertically disposed opening, of a reciprocating rod having a portion slidably mounted within the opening of the head, an oil-cup carried by the reciprocating rod and located beneath the head, said cup being movable with the rod and being carried upwardly thereby so that portions of the head are immersed in the lubricant contained in the cup during the reciprocation of said rod, and a hood secured to the standard and covering the head, the portion of the rod passing therethrough, and the oil-cup.

10. In a windmill, the combination with a rotatable shaft, of a reciprocatory rod, an oil-cup arranged upon the rod, a bolt passing through the cup and rod and securing the same together, a portion of said bolt projecting into the cup, and a pitman connecting the shaft and rod, said pitman having a connection with the projecting portion of the bolt.

11. In a windmill, the combination with a rotatable shaft, of a reciprocatory rod, a wrist-pin having an eccentric connection with the shaft and provided with a bearing-disk, a pitman connected to the reciprocatory rod, and a sectional boxing secured to the pitman and surrounding the bearing-disk, one of said sections having its side walls spaced from the adjacent faces of the disk and constituting an oil-cup said section being located beneath the disk.

12. In a windmill, the combination with a rotatable shaft, of a reciprocatory rod, a wrist-pin having an eccentric connection with the shaft and provided with a bearing-disk, a pitman connected to the reciprocatory rod, and

a sectional boxing secured to the pitman and surrounding the bearing-disk, one of said sections constituting an oil-cup and being located beneath the disk, and another section being located over the disk and having its lower edges located within the upper edges of the lower section.

13. In a windmill, the combination with a rotatable shaft, of a reciprocatory rod, a wrist-pin having an eccentric connection with the shaft and provided with a bearing-disk, a pitman connected to the reciprocatory rod, a sectional boxing secured to the pitman and surrounding the bearing-disk, one of said sections constituting an oil-cup and being located beneath the disk, and another section being located over the disk and having its lower edges located within the upper edges of the section, and a guard-sleeve secured to the upper section and covering the joint between the two.

14. In a windmill, the combination with a supporting-frame, of a turn-table base located upon the frame and provided with spaced upstanding annular walls forming an intermediate annular oil-groove, a turn-table body rotatably mounted upon the base and having a depending annular bearing-flange that is located in the oil-groove of said base, and a cap or hood detachably secured to the turn-table body and covering the walls and groove of the base.

15. In a windmill, the combination with a rotatable shaft, of a reciprocatory rod, a wrist-pin having an eccentric connection with the shaft at one end and a bearing-disk at the other, a pitman connected to the reciprocatory rod and having a boxing surrounding the disk, said boxing constituting an oil-receptacle, and an oil-stop collar secured to the wrist-pin and located within the boxing.

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

STEPHEN E. BURKE.

Witnesses:
J. M. TONER,
D. COREY.