No. 648,442. Patented May 1, 1900.

O. F. SCOTT.

WINDMILL.

(Application filed Sept. 12, 1899.)

(No Model.) 2 Sheets—Sheet 1.

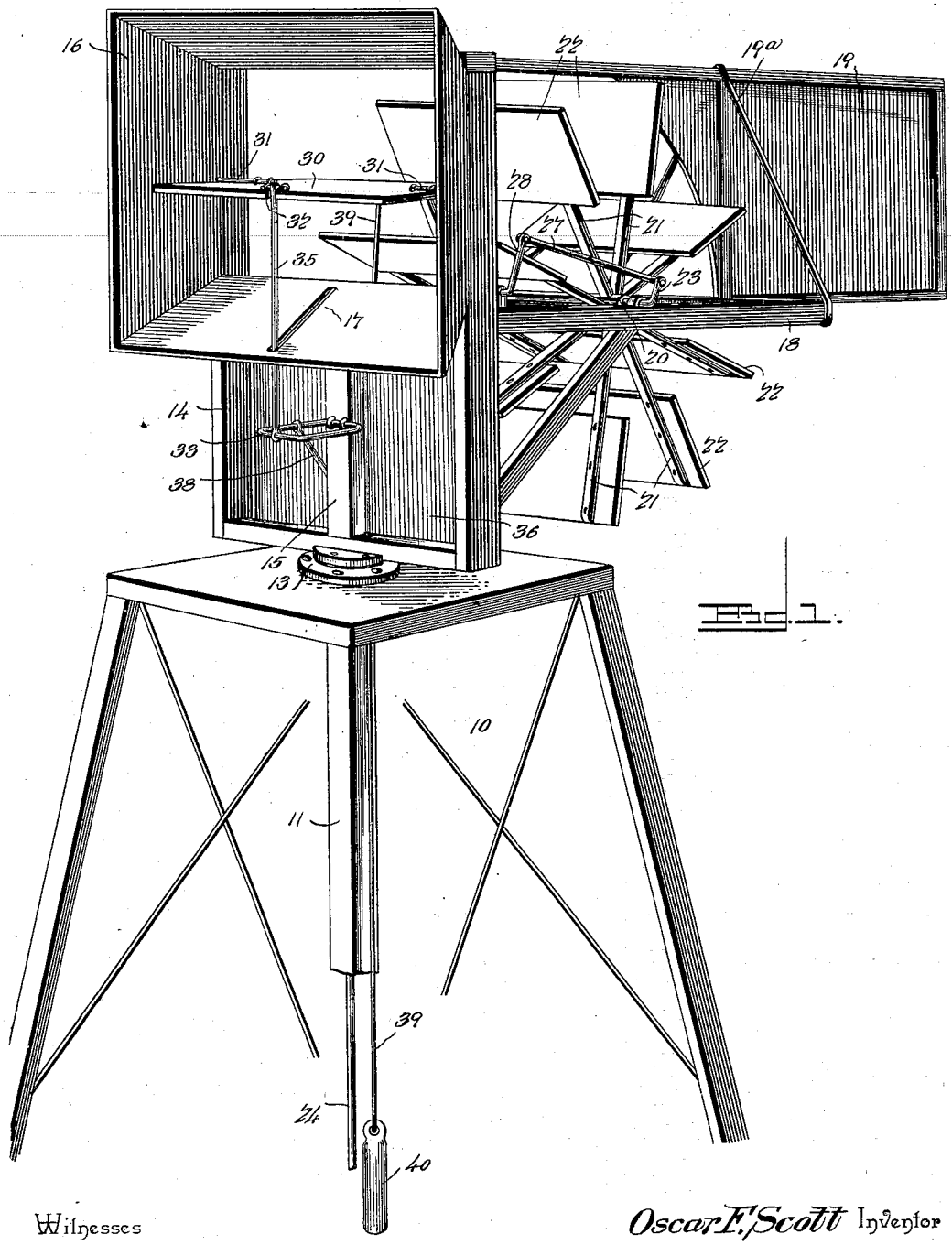

Fig. 1.

Witnesses

E. F. Stewart.

H. J. Bennehoff

Oscar F. Scott Inventor

By his Attorneys.

C. A. Snow & Co.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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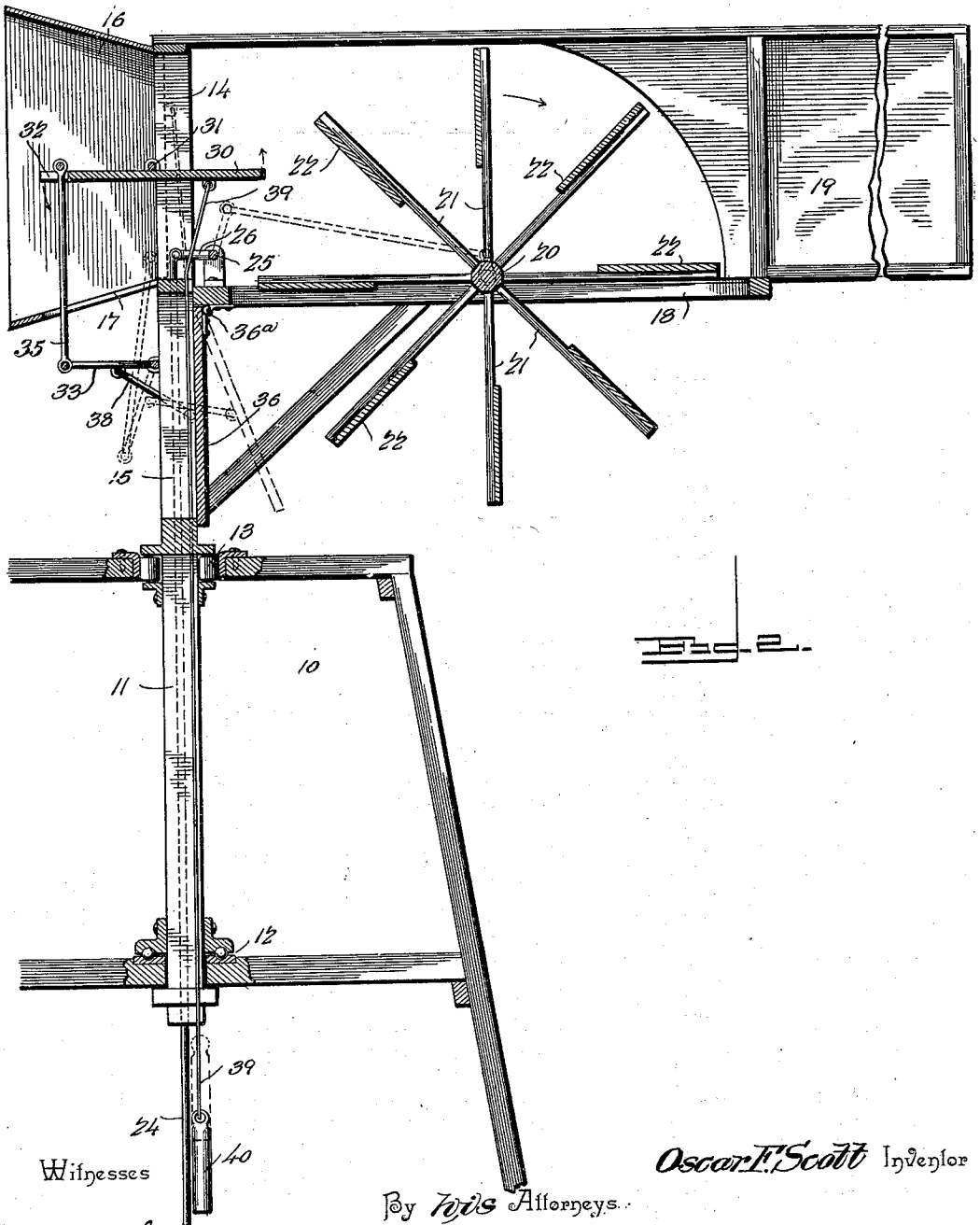

Fig. 2.

Witnesses

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UNITED STATES PATENT OFFICE.

OSCAR F. SCOTT, OF ANDERSON, OKLAHOMA TERRITORY.

WINDMILL.

SPECIFICATION forming part of Letters Patent No. 648,442, dated May 1, 1900.

Application filed September 12, 1899. Serial No. 730,259. (No model.)

To all whom it may concern:

Be it known that I, OSCAR F. SCOTT, a citizen of the United States, residing at Anderson, in the county of Pottawatomie and Territory of Oklahoma, have invented a new and useful Windmill, of which the following is a specification.

My invention relates to improvements in windmills; and one object in view is to provide an automatic governor mechanism controllable by the force of the wind in opposition to a counterpoise for regulating the speed of the wheel and the consequent power of the mill, such governor mechanism including a wind-hood and appliances by which the hood and the wheel may be kept normally in the wind.

A further object is to provide a simple structure which is not liable to get out of order and is efficient in operation, the mill having an improved power-transmitting appliance between the wheel-shaft and the pump-rod.

With these ends in view the invention consists in the novel combination, construction, and arrangement of parts, which will be hereinafter fully described and claimed.

In the drawings, Figure 1 is a perspective view of a windmill constructed in accordance with my invention. Fig. 2 is a vertical sectional elevation thereof.

The same numerals of reference are used to indicate like and corresponding parts in both figures of the drawings.

10 designates an ordinary windmill-tower, and 11 is a vertical mast which is mounted in the tower to turn freely in a horizontal direction therein. Any suitable means may be employed for supporting the mast in said tower; but in Fig. 2 I have shown the lower part of the mast as supported by a roller step-bearing 12, while another roller-bearing 13 supports said mast in the upper part of the tower. The upper protruding end of the mast carries a vertical frame 14, the lower part of which below the hood is provided with a vertical strut 15. Said vertical frame has firmly secured to its front side a wind-directing hood 16, the same being essentially funnel-shaped and lying in a horizontal position on the front side of the frame and mast. In the lower inclined wall of this funnel-shaped hood is a longitudinal slot 17, adapted to permit a pitman or link forming a part of the regulator to play freely therethrough, as will hereinafter appear.

A horizontal frame 18 is secured firmly to the vertical frame 14 and the hood 16 to lie on the rear side of said vertical frame, and at its rear extremity this horizontal frame supports the vane or tail 19, the latter being of the usual or any preferred construction. If desired, suitable braces, as 19ª, may be employed between the rear part of the horizontal frame and the vane to strengthen the latter.

The wind-wheel is of a type well known to the art, the same being arranged within the horizontal frame 18 and between the hood and the vane. This wheel consists of a horizontal shaft 20, two series of radial arms 21, secured firmly to said shaft, and the radial blades 22, attached to the arms. The wheel-shaft is journaled in suitable bearings on the horizontal frame to present the upper half of the wheel in line with the hood 16, so that the wind passing through the hood will act on the blades at the upper side of the wheel. At one end this wheel-shaft is formed with a short crank-arm 23, adapted to be connected operatively with a pump-rod 24, the latter passing freely through a longitudinal passage of the vertical mast 11. The means which I prefer to employ between the wheel-shaft and the pump-rod is a rock-shaft 25, arranged in a horizontal position close to the vertical plane of the mast and journaled in proper bearings on the horizontal frame. At one end this rock-shaft has a crank-arm 26, the radius of which is greater than the crank 23 of the wheel-shaft. A pitman 27 is connected at its rear end to the short crank-arm of the wheel-shaft, while its front end is connected to the long crank-arm of the rock-shaft, and owing to the difference in the lengths of the two crank-arms the crank of the wheel-shaft is adapted to rotate when the wheel is driven by the wind acting against the same; but the rock-shaft is only turned or oscillated back and forth in its bearings by the pitman, thus imparting the proper reciprocating motion to the pump-rod 24. This rock-shaft is connected with the upper end of the pump-rod through the medium of a crank 28, the same being fast or integral with the shaft 25 and

having a pivotal connection with the pump-rod, as shown by Fig. 2.

One of the peculiar features of my invention is the automatic regulator arranged for operation in connection with the hood to vary the volume of air which may act on the wheel, said regulator serving on an increase in the pressure of the wind to reduce the volume of wind which may act on the wheel. One element of this regulator is a cut-off valve 30, which is pivotally mounted within the hood 16 and is adapted to turn on a horizontal axis therein in order to vary the area of the wind-passage through said hood. This cut-off valve is in the form of a flat board which is provided near its sides with the pintles or rods 31, adapted to support the valve pivotally within the middle part of the hood. When normal conditions prevail, the pivoted valve occupies a horizontal position in the hood, as shown by full lines in Fig. 2, so that the valve will offer minimum resistance to the wind and permit the full force of the latter to act against the upper half of the wheel; but an increase in the pressure of the wind above a certain point determined by the ponderosity of a counterweight will actuate devices presently described that serve to turn the valve to an inclined or vertical position, whereby the volume of wind passing through the hood will be reduced to effect a corresponding diminution in the speed of the wheel. In the front edge of the pivoted valve is formed a notch 32, through which passes the upper part of a link 35, said upper end of the link having a pivotal connection with the valve in advance of its pivotal support in the hood. On the strut 15 of the vertical frame, which is carried by the mast, is arranged a bail or clevis 33, the same having pivotal connection at its rear end with said strut of the frame, and to the front end of this bail or clevis is pivoted the lower end of the link 35, whereby the valve and the bail or clevis are operatively connected by the link.

36 designates a wind-pressure board, which is normally disposed in the vertical position in front of the lower half of the wind-wheel and below the hood 16. The upper end of this pressure-board has a hinged connection at 36^a with the horizontal frame 18, said hinge being located in rear of the frame 14, so as to support the pressure-board in a position for it to be moved rearwardly toward the wheel, as indicated by dotted lines in Fig. 2, when the wind acts with considerable pressure against said board. This pressure-board has operative connection with the pivoted valve through the medium of the bail or clevis 33, and as a means for connecting the pressure-board to the bail a short link 38 has its rear end pivoted to the pressure-board at a point below its hinge, the front end of said link being connected to the bail or clevis at a point intermediate the length of the latter.

39 designates a cable or rod which passes in a downward direction and alongside of the vertical mast. The upper part of this cable is fastened to the pivoted valve 30 on the opposite side of the pivot from the connection of the link 35 therewith, and to the lower end of this cable is fastened detachably in any suitable way a drop-weight or counterpoise 40, said weight adapted to be easily removed from the cable and to be replaced by another weight of different ponderosity.

Assuming that the counterpoise holds the pivoted valve normally in a horizontal position and that the pressure-board is normally in a vertical position, as shown by full lines in Fig. 2, the wind is free to pass through the hood and act on the blades of the wheel to rotate the latter in the direction indicated by the arrow, thus making the rock-shaft reciprocate the pump-rod. An increase in the pressure of the wind acts against the pressure-board, forcing the latter rearwardly and making the link 38 draw the bail or clevis in a downward direction, so that the link 35 will be drawn upon to move the pivoted valve to an inclined position against the weight of its counterpoise; but a decrease in the pressure of the wind against the pressure-board causes the counterpoise to return the valve to its horizontal position, and thereby actuate the bail through the links to return the pressure-board to its normal position. It is evident that excessive pressure of wind against the board will move the pivoted valve to a vertical position to entirely cut off the passage of air through the hood, thus preventing the wind from acting against the wheel; but the speed of the wheel may be regulated by the interchange of counterpoises of different weights, as will be readily apparent. The two frames 14 18, the wheel, the regulator, and the vane being mounted upon the mast, the latter is free to turn in the tower when the wind shifts and blows sidewise against the vane. Hence the mill may be kept in the wind.

Changes may be made in the form and proportion of some of the parts while their essential features are retained and the spirit of the invention embodied. Hence I do not desire to be limited to the precise form of all the parts as shown, reserving the right to vary therefrom.

Having thus described the invention, what I claim is—

1. In a windmill, the combination with a wheel revoluble on a horizontal axis, of a hood arranged in a horizontal plane above the axis of the wheel, a counterpoised cut-off within said hood, a pressure-board hung on a horizontal axis and disposed below the axis of the wheel and in front of the lower part thereof, and operative connections between said pressure-board and the cut-off to automatically shift the position of the latter within the hood, substantially as described.

2. In a windmill, the combination with a wheel, of a vertical hood situated in front of the wheel and above the horizontal axis there-

of, a cut-off pivoted within the hood, a pressure-board hung on a horizontal axis below the hood and the axis of the wheel and disposed in advance of the lower part of the wheel, the counterpoise having a flexible connection with said cut-off, and a lever or clevis having individual operative connections with the free end of the cut-off and with the pressure-board for automatically shifting the position of the cut-off within the hood, substantially as described.

3. A windmill comprising a revoluble mast carrying the vertical and horizontal frames, a hood secured to the vertical frame, a wind-wheel journaled on the horizontal frame in rear of the hood, a movable pressure-board hung beneath the hood, in front of the lower portion of the wind-wheel, a cut-off located within the hood, and connections between the pressure-board and the cut-off, substantially as described.

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

OSCAR F. SCOTT.

Witnesses:
J. F. GILBERT,
A. TOUPIN.