(No Model.) 2 Sheets—Sheet 1.

O. E. PETERSON & G. L. CURTIS.

WINDMILL.

No. 561,914. Patented June 9, 1896.

Fig. 1.

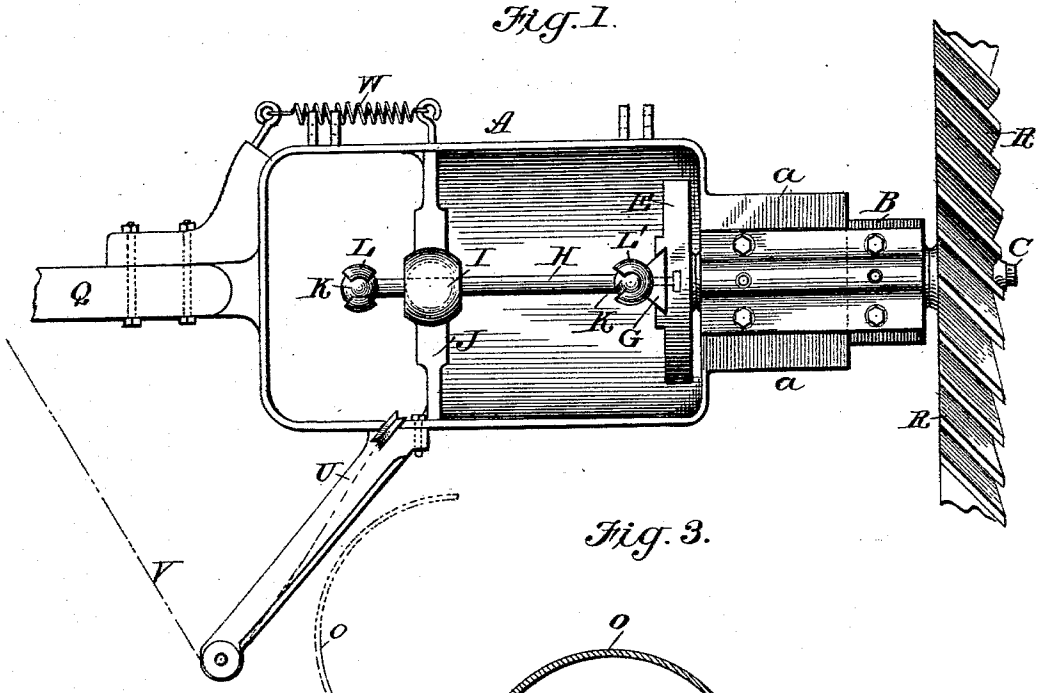
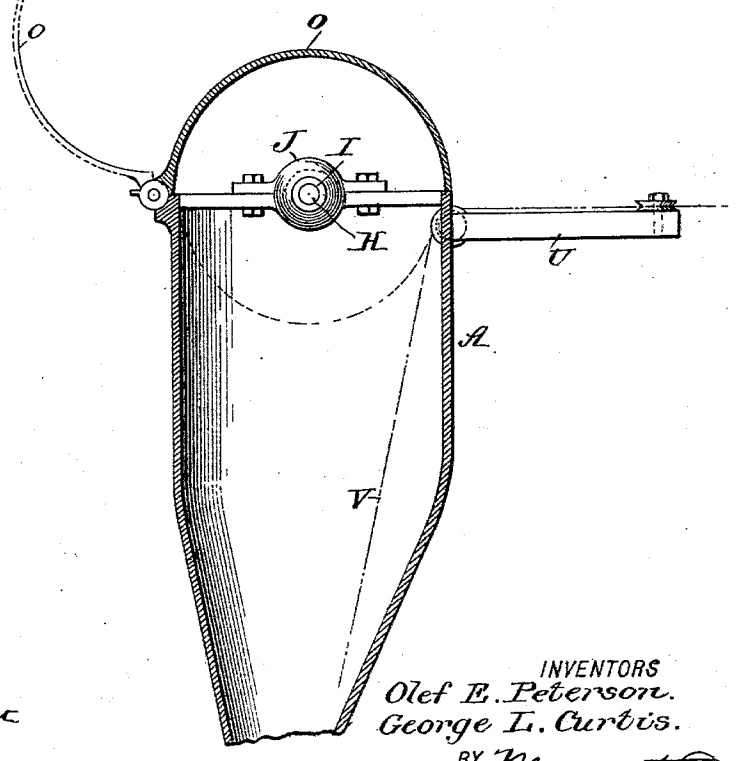


Fig. 3.



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(No Model.) 2 Sheets—Sheet 2.

O. E. PETERSON & G. L. CURTIS.

WINDMILL.

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Fig. 2.

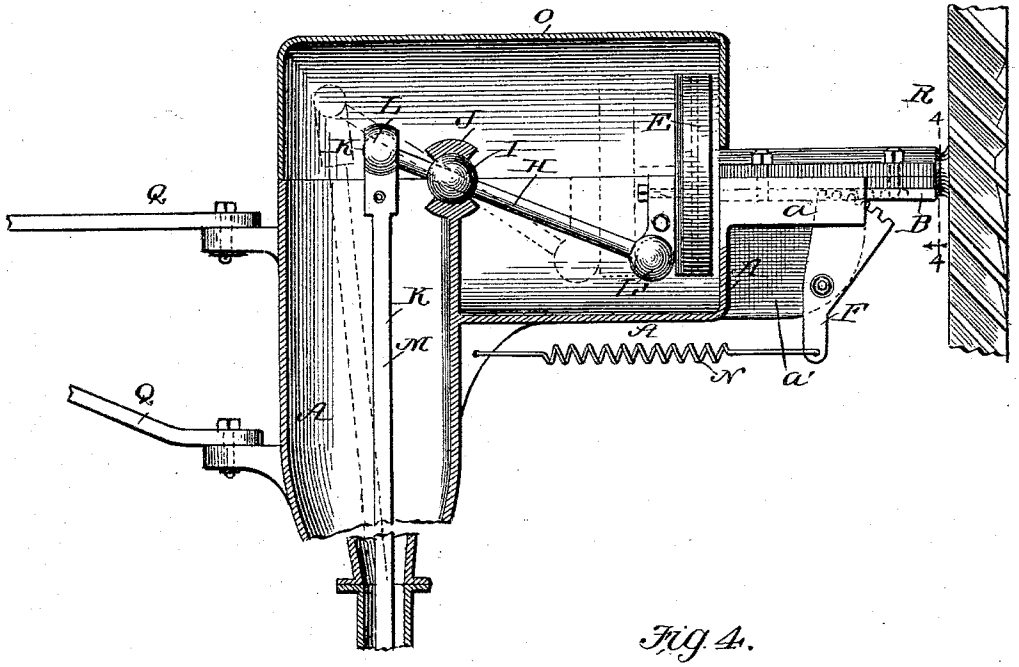
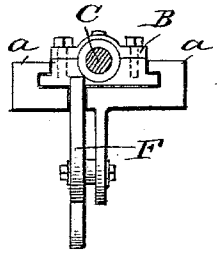


Fig. 4.



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ATTORNEYS.

UNITED STATES PATENT OFFICE.

OLEF E. PETERSON AND GEORGE L. CURTIS, OF LOGAN, UTAH, ASSIGNORS TO BRIGHAM C. THATCHER, OF SAME PLACE.

WINDMILL.

SPECIFICATION forming part of Letters Patent No. 561,914, dated June 9, 1896.

Application filed May 21, 1895. Serial No. 550,153. (No model.)

To all whom it may concern:

Be it known that we, OLEF E. PETERSON and GEORGE L. CURTIS, of Logan, in the county of Cache, Utah Territory, have invented a new and useful Improvement in Windmills, of which the following is a specification.

Our invention is an improvement in the class of windmills having a variable crank—that is to say, a crank which is slidable longitudinally—such movement or adjustment being regulated by the force of the wind on the wheel, so that the work done is automatically graduated to correspond with the power applied.

The novel construction and combination of parts are hereinafter set forth.

In the accompanying drawings, two sheets, Figure 1 is a horizontal section of our windmill. Fig. 2 is a vertical central longitudinal section of the same. Fig. 3 is a vertical transverse section showing, mainly, the box or casing of the windmill. Fig. 4 is a vertical section on line 4 4, Fig. 2.

The vertical wheel R is keyed on the horizontal shaft C, rotating in a box B, which is slidable in a bracket or arm *a*, projecting from one end of the cast-iron box or casing A, which incloses the crank-and-lever mechanism. This rotary shaft C is connected with and reciprocates the pump-rod M, that works vertically in the casing A, by means of crank-and-lever mechanism now to be described. On the inner end of the wheel-shaft C, within said casing A, is fixed a crank-disk E, having a diametrical dovetail groove, in which is held a crank-arm G. The latter is slidable in said groove, but held fixed in any desired adjustment by means of a clamp-bolt. It is thus adapted to be placed and secured at different distances, radially, from the center of the disk E for the purpose of practically varying the length of the crank to change the stroke without changing the leverage. The straight lever H has spherical ends K, one of which fits in a ball-socket L on the outer end of the crank-arm G and the other in a like socket L on the upper end of pump-rod M. The lever H has a spherical or ball fulcrum I, through which it is adapted to slide freely. Such fulcrum I is confined, but adapted to rotate in a socket or box J, formed of upper and lower segmental portions, as shown in Figs. 2 and 3, the lower portion being integral with the casing A.

The position of the wheel R and connected parts when the wind is light is shown by full lines, Fig. 2. As a means for holding the wheel against the pressure of the wind we employ the toothed sector-lever F and spring N, Figs. 2 and 4. Said lever is pivoted on a pendent arm *a'* of the bracket *a*, Fig. 4, and its toothed upper end meshes with a rack formed on the under side of the slidable box B, while the spring N connects its lower end with the casing A. Since the wheel R, its shaft C, and the crank-disk G all slide together with the journal-box B of said shaft it is apparent the lever H must also slide through the ball-fulcrum I and that the length of the stroke of the pump-rod M is varied correspondingly; and it is further apparent that this movement of parts and the variation of stroke and work done will coincide with the pressure of the wind against the wheel R. Thus with a light wind the arm of the lever H, between the fulcrum I and crank-disk E, is of maximum length, as shown by full lines, Fig. 2, so that the power of the windmill is also at its maximum. On the other hand, with a strong wind the wheel and its directly-connected parts are forced back, and the lever H consequently shifted lengthwise through its fulcrum I, as shown by dotted lines, Fig. 2, so that the length of the lever between the fulcrum I and crank-disk E is shortened, and the power of the same correspondingly lessened. In other words, the leverage is always so adjusted as to be inversely to the force of the wind, so that the work which the pump has to do is automatically graduated to correspond with the power applied.

In Figs. 1 and 2 we illustrate means for holding the wheel in the wind—namely, a hinged frame or "tail-bone" Q for carrying the vane, and a spring W, that holds it in normal position. The vane is provided with a "pull-out" chain V, that runs on pulleys supported by a lateral arm U. The box or casing A is substantially funnel-shaped in its vertical portion and turns on the flanged head

of the tube S, which is in practice fixed in the framing of the windmill. (Not shown.) It has a hinged top O, that permits convenient access to the interior.

What we claim is—

1. In a windmill of the class hereinbefore specified, the combination, with the casing or rotatable support, of the slidable journal-box, the wind-wheel and its shaft which is rotatable in and movable longitudinally with such journal-box, a crank keyed on the inner end of said shaft, and the pump-rod lever which is slidable in its fulcrum and has a universal-joint connection with said crank, and means for holding the wheel against the pressure of the wind substantially as shown and described.

2. In a windmill of the class hereinbefore specified, the combination, with the casing, having a lateral arm, a journal-box slidable in said arm, the wind-wheel shaft journaled in and movable with such box, the crank-disk keyed on the inner end of said shaft, being thus movable with it, a crank-arm attached to such disk and having a ball-socket, a lever having spherical ends, one of which fits rotatably in such socket, a ball-fulcrum which is rotatable in a fixed socket, or box, and through which said lever is free to slide, a pump-rod having a ball-socket, for connection with the lever, and the pivoted sector-lever and spring for holding the wheel against the pressure of the wind, as shown and described.

3. In a windmill of the class hereinbefore specified, the combination, with the slidable wind-wheel shaft and journal-box, and the pump-rod lever having a fulcrum through which it slides, of the crank-disk fixed on and movable with said shaft, and the crank-arm which is adjustable radially on the disk, for varying the throw of the lever, and has a ball-and-socket connection with said lever as described.

OLEF E. PETERSON.
GEORGE L. CURTIS.

Witnesses:
DAVID A. REAVILL,
JOSEPH QUINNEY.

Correction in Letters Patent No. 561,914.

It is hereby certified that the name of the assignee in Letters Patent No. 561,91[illegible] granted June 9, 1896, upon the application of Olef E. Peterson and George L. Curtis, [illegible] Logan, Utah, for an improvement in "Windmills," was erroneously written and printe "Brigham C. Thatcher," whereas said name should have been written and printe *Brigham G. Thatcher;* and that the said Letters Patent should be read with this co rection therein that the same may conform to the record of the case in the Pate Office.

Signed, countersigned, and sealed this 30th day of June, A. D. 1896.

[SEAL.]

JNO. M. REYNOLDS,
Assistant Secretary of the Interior.

Countersigned:

S. T. FISHER,
Acting Commissioner of Patents.