

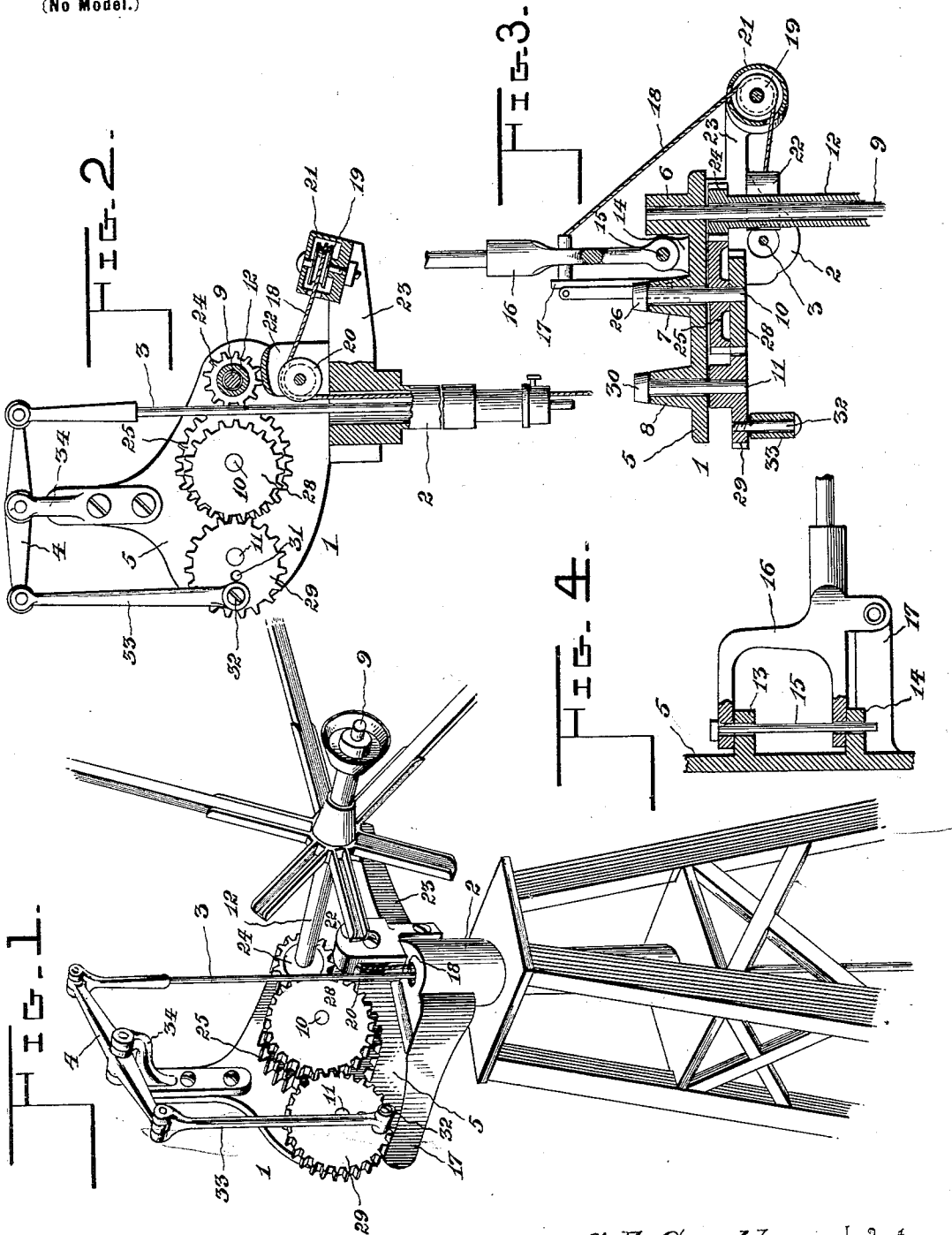
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Patented Sept. 26, 1899.

C. E. SMITH.
GEARING FOR WINDMILLS.

(Application filed June 17, 1899.)

(No Model.)



Witnesses

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CHARLES E. SMITH, OF NAPOLEON, OHIO.

GEARING FOR WINDMILLS.

SPECIFICATION forming part of Letters Patent No. 633,619, dated September 26, 1899.

Application filed June 17, 1899. Serial No. 720,945. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. SMITH, a citizen of the United States, residing at Napoleon, in the county of Henry and State of Ohio, have invented a new and useful Gearing for Windmills, of which the following is a specification.

The invention relates to improvements in gearing for windmills.

10 The object of the present invention is to improve the construction of windmill-gearing and to provide a simple and comparatively inexpensive one capable of affording great power or leverage on the upstroke of the pump-rod and adapted to be readily adjusted to permit the length of the stroke of the pump-rod to be regulated.

15 The invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended.

20 In the drawings, Figure 1 is a perspective view of a portion of a windmill provided with gearing constructed in accordance with this invention. Fig. 2 is a vertical sectional view of the same, taken at right angles to the windmill-shaft and showing the gearing in side elevation. Fig. 3 is a horizontal sectional view on line 3 3 of Fig. 2, the gearing being shown in plan view. Fig. 4 is a detail view illustrating the manner of hinging the vane.

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

1 designates a frame or bracket forming a turn-table and provided with a depending tube 2, designed to be journaled in suitable bearings of a windmill-tower and receiving a reciprocating pump-rod 3, which is pivotally connected at its upper end to a walking-beam or lever and which is designed to be connected with a pump in the ordinary manner. The rotary frame or turn-table 1 is provided with a vertical portion 5, having bearings 6, 7, and 8 for a wind-wheel shaft 9 and for stub-shafts 10 and 11 of gear-wheels hereinafter described. The horizontal wind-wheel shaft 9 is preferably fixed in the bearings 6, and the hub 12 of the wind-wheel ro-

tates on the shaft and is located at one side of the vertical portion of the rotary frame. Lugs 13 and 14 extend from the opposite side of the vertical portion of the rotary frame and are perforated for the reception of a vertical pintle 15, which hinges a vane-casting 16 to the lugs. The vane, which is arranged at right angles to the plane of the wind-wheel when the windmill is in operation, swings between the vertical portion of the rotary frame and an arm 17, which extends from the lower portion thereof and which is adapted to form a stop against which the vane abuts when it is arranged at right angles to the plane of the wind-wheel. Any suitable means may be employed for holding the vane normally at right angles to the plane of the wind-wheel, and it is swung around to a position parallel with the plane of the wind-wheel by a suitable operating wire or rope 18 or other flexible connection secured to the vane and extending around pulleys 19 and 20. The operating wire or rope extends downward through the depending tube of the rotary frame, and the guide-pulleys 19 and 20 are housed within suitable casings 21 and 22, mounted upon the rotary frame, on an extension or arm 23 thereof, and at a point adjacent to the upper end of the depending tube.

30 The hub of the wind-wheel has a pinion 24 fixed to it, and this pinion meshes with a gear-wheel 25, that is keyed or otherwise secured to the stub-shaft 10. The short shaft 10, which extends through the horizontal bearing 7, is provided at its rear end with a head 26, and the gear-wheel 25 is located at the other end of the short shaft 10. The shaft 10 also carries an elliptical gear 28, which meshes with an elliptical gear 29 of the shaft 11, and the latter is mounted on the rotary frame similar to the shaft 10, being provided at its outer end with a suitable head 30. The elliptical gear 29 is provided with a radial series of perforations 31, adapted to permit an eccentrically-arranged wrist-pin 32 to be adjusted to vary the stroke of the pump-rod. The wrist-pin 32 pivots the lower end of a pitman 33 to the outer elliptical gear 29, and the upper end of the pitman is pivoted to the adjacent end of the beam or lever 4. The walking-beam or lever 4, which is located above

the gearing, is fulcrumed at its center in a substantially L-shaped bracket 34, which is bolted or otherwise secured to the upper portion of the rotary frame and which is provided at its horizontal arm with perforated ears to form bearings for the pivot of the beam or lever 4. As the gearing rotates the pump-rod will be vertically reciprocated, and the elliptical gears are arranged to give great leverage on the upstroke of the pump-rod and to produce a quick return stroke, whereby a maximum power is obtained.

It will be seen that the gearing for connecting the pump-rod with the wind-wheel is exceedingly simple and inexpensive in construction, that it possesses strength and durability, and that it enables the stroke of the pump-rod to be readily regulated. It will also be apparent that the gearing affords great leverage at the upstroke of the pump-rod, where the power is required, and that a quick return stroke is produced.

Changes in the form, proportion, size, and the minor details of construction within the scope of the appended claims may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

What is claimed is—

1. In a device of the class described, the combination with a frame, and a wind-wheel, of a walking-beam or lever fulcrumed between its ends on the frame, a pump-rod connected with one end of the beam or lever, elliptical gears meshing with each other, a pitman connecting one of the elliptical gears with the walking-beam or lever, and gearing connect-

ing the other elliptical gear with the wind-wheel, substantially as described.

2. In a device of the class described, the combination of a rotary frame, a wind-wheel, a walking-beam or lever fulcrumed on the frame, a pump-rod connected with the walking-beam or lever, elliptical gears meshing with each other, a pitman eccentrically connected with one of the elliptical gears and extending therefrom to the walking-beam or lever, the gear-wheel 25, connected with the other elliptical gear, and a pinion meshing with the gear-wheel 25, and connected with the wind-wheel, substantially as described.

3. In a device of the class described, the combination of a rotary frame provided with horizontal bearings 6, 7 and 8, a wind-wheel shaft mounted in the bearing 6, short shafts extending through the bearings 7 and 8 and provided at their outer ends with heads, elliptical gears mounted on the short shafts, a gear-wheel 25 fixed to the short shafts 10, a pinion mounted on the wind-wheel shaft and meshing with the gear-wheel 25, a walking-beam or lever fulcrumed on the frame and connected with one of the elliptical gears, and a pump-rod connected with the walking-beam or lever, 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.

CHARLES E. SMITH.

Witnesses:

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H. C. HAGUE.