

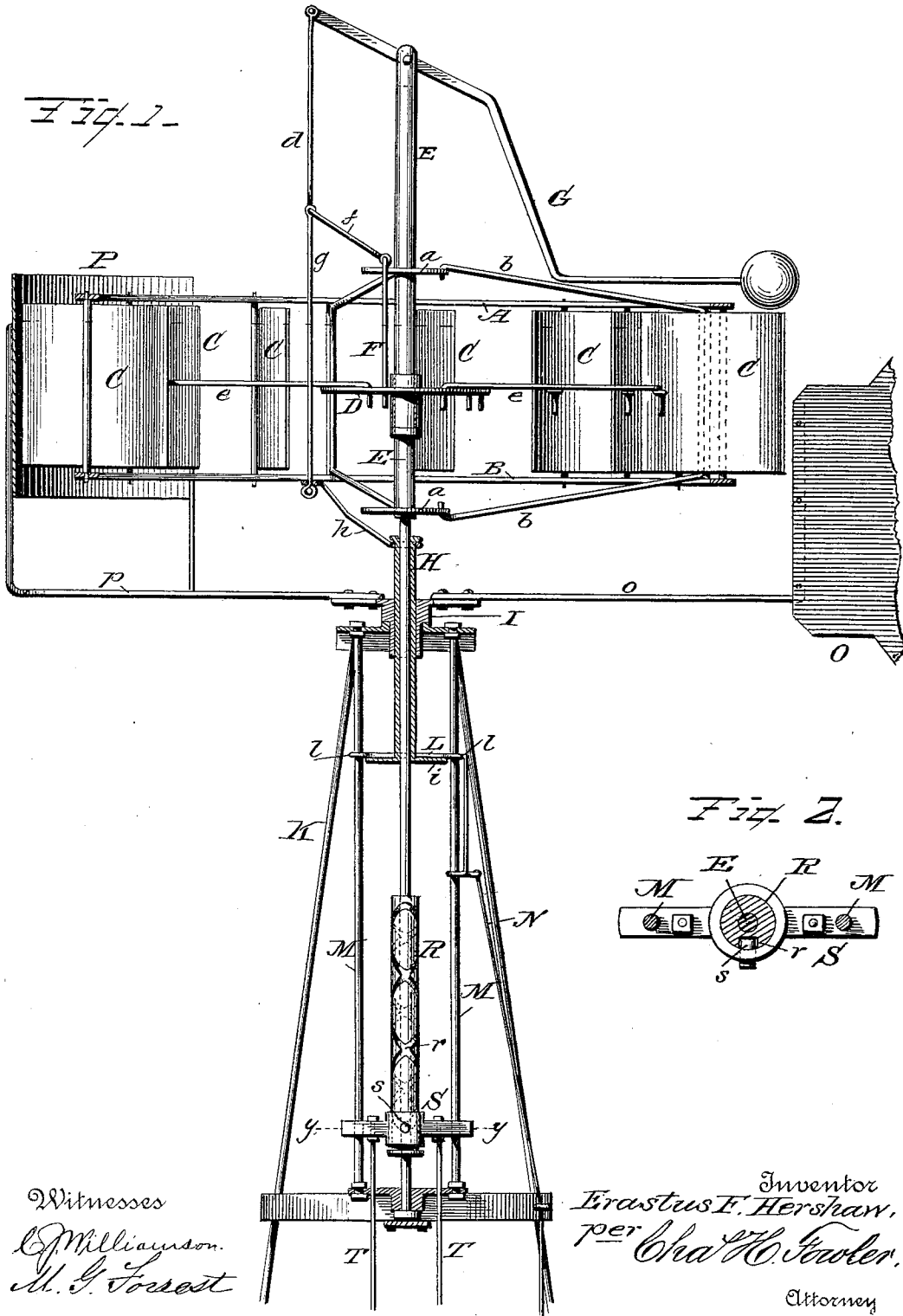
No. 615,019.

Patented Nov. 29, 1898.

E. F. HERSHAW.  
MOTION CONVERTING DEVICE FOR WINDMILLS.

(Application filed June 17, 1897.)

(No Model.)



Witnesses  
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# UNITED STATES PATENT OFFICE.

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## MOTION-CONVERTING DEVICE FOR WINDMILLS.

SPECIFICATION forming part of Letters Patent No. 615,019, dated November 29, 1898.

Application filed June 17, 1897. Serial No. 641,109. (No model.)

*To all whom it may concern:*

Be it known that I, ERASTUS F. HERSHAW, a citizen of the United States, residing at Abingdon, in the county of Knox and State of Illinois, have invented certain new and useful Improvements in Windmills; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters of reference marked thereon.

The present invention has relation to certain novel improvements in a motion-converting device for windmills; and it consists in the several details of construction, substantially as shown in the drawings and herein-after described and claimed.

Figure 1 of the drawings is a side elevation of a windmill, showing my improved motion-converting device connected therewith; Fig. 2, a detail horizontal section taken on line *y y* of Fig. 1.

In the accompanying drawings I have shown a wind-wheel, which may be one of many forms to which my invention is applicable, in order to better illustrate the mechanism embodying the converting motion and its connections.

In the drawings, A B represent two circular bands, between which the concavo-convex sails C are suitably pivoted, said bands forming the skeleton frame of the wheel. The sails C at their inner ends have pivotally connected thereto suitable rods *e*, the opposite ends of the rods being similarly connected to rotatable disk D, whereby the movement of the disk will operate the sails to close or open or partially close them. The disk is loosely mounted on the central shaft E, and above and below said disk are similar disks *a*, to which suitable brace-rods are connected. A crank-rod F connects with the disk D to move and operate it, said rod being pivoted to the upper one of the disks *a*, and to the crank end of the rod is loosely connected the lower end of the coupling-rod *d*, which latter rod connects with a weighted lever G. A coupling-rod *g* connects with the rod F, the lower end of said coupling-rod connecting with a coupling-rod *h*. The rod *h* connects with a tubular sleeve H, which sleeve is

adapted to vertically slide on the smaller diameter of the shaft E, the sleeve passing down through an opening in the rotatable head I, which head is supported upon the upper end of a suitable tower K of the windmill.

The sleeve H has a bearing-plate *i*, over and upon which extends a pressure-arm L, provided with eyes *l* at its ends to encircle the guide-rods M.

The pressure-arm L connects with a suitable wire N, which wire is of suitable length to be in convenient reach of a person on the ground.

When the wire N is pulled down upon, the pressure-arm L will force down the tubular sleeve H, and through the medium of the coupling-rods hereinbefore described the weighted end of the lever G will be raised, and through the crank-rod F the sails will be acted upon.

The wheel is provided with the usual vane O, which connects with the rotatable head I through the medium of the arm *o*, and a suitable hood P may be used to shield part of the wheel from the wind, said hood connecting with the head I by means of the rod or arm *p*.

The wind-wheel, with its attachments, as above described, is simply shown in detail to illustrate a complete windmill with all its parts, that it may better and more clearly show a more complete and practically-operating windmill in all its parts in connection with the motion-converting device which constitutes the essential feature of the invention. I therefore wish it understood that the wind-wheel and its attachments above described may be modified or changed without departing from the principle of the invention, the essential features of which I will now proceed to describe.

A cylinder R is suitably keyed to the shaft E, which may be of any preferred diameter, said cylinder having a double spiral groove *r*, which extends in opposite directions, and engaging this spiral groove is a projection or stud *s*, which extends from the inner side of a yoke S, and through the ends of this yoke extends the guide-rod M.

Suitable rods T are connected at their upper ends to the yoke S and connect in any

suitable manner with the pump-operating mechanism.

As the shaft E rotates it carries with it the cylinder R, and by means of the double spiral groove *r* and the projection or stud *s* engaging therewith the yoke S will have imparted to it a vertical reciprocating motion, and through its connection with the pump the latter is operated.

A very simple and effectual attachment to a windmill is provided by which rotary motion can be converted to a vertical reciprocating motion through the connections with the horizontally-movable wheel of the windmill.

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

In a windmill, a horizontal wind-wheel, a central vertical shaft to which the wheel is secured, and a double-grooved cylinder placed on the lower end of the shaft, combined with the yoke provided with a stud or projection which engages one of the grooves in the cylinder, the pump-rods, and the guide-rods which extend parallel with the vertical shaft, substantially as and for the purpose set forth.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

ERASTUS F. HERSHAW.

Witnesses:

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