

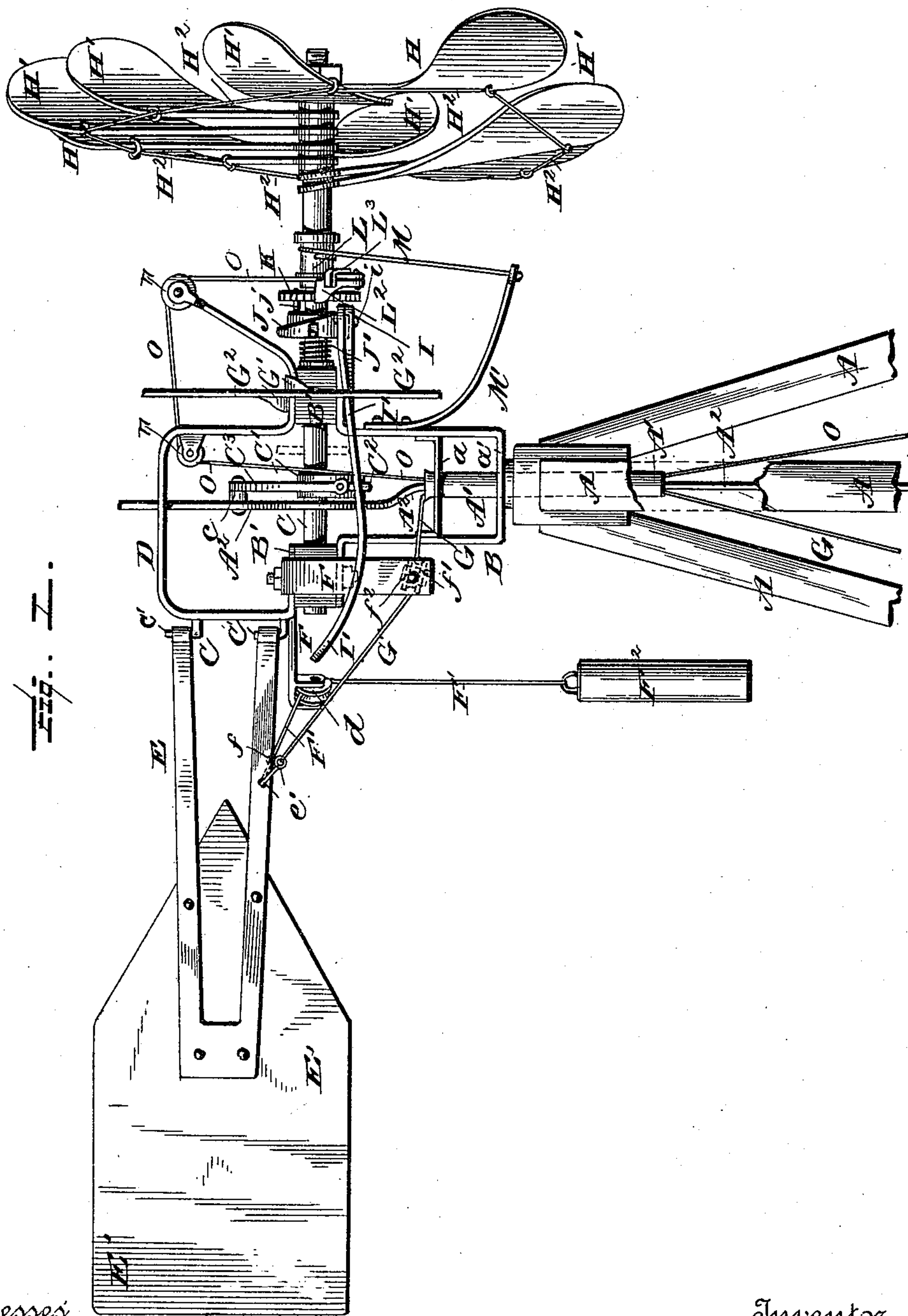
(No. Model.)

2 Sheets—Sheet 1.

A. WALLACE.  
WINDMILL.

No. 441,519.

Patented Nov. 25, 1890.



Witnesses

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# UNITED STATES PATENT OFFICE.

AMOS WALLACE, OF LITTLE ROCK, IOWA.

## WINDMILL.

SPECIFICATION forming part of Letters Patent No. 441,519, dated November 25, 1890.

Application filed April 3, 1890. Serial No. 346,383. (No model.)

*To all whom it may concern:*

Be it known that I, AMOS WALLACE, a citizen of the United States, residing at Little Rock, in the county of Lyon and State of Iowa, 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.

This invention relates to certain new and useful improvements in wind-wheels, and it has for its object to improve generally this class of devices and to make a strong and durable wheel, the parts being all of metal.

The novelty resides in the peculiar combinations, and the construction, arrangement, and adaptation of parts, all as more fully hereinafter described, shown in the drawings, and then particularly pointed out in the appended claims.

The invention is clearly illustrated in the accompanying drawings, which, with the letters of reference marked thereon, form a part of this specification, and in which—

Figure 1 is a side elevation of a wind-wheel constructed in accordance with my invention. Fig. 2 is a top plan with the wheel removed. Fig. 3 is an edge view of the wheel closed. Fig. 4 is a face view of one of the blades of the wheel. Fig. 5 is a detail of the ratchet mechanism. Fig. 6 is a detail of a portion of the clutch device.

Like letters of reference indicate like parts throughout the several views.

I wish to remark here that all of the parts of my wheel are of metal.

Referring now to the details of the drawings by letter, A designates the tower, which may be of any of the known forms of construction.

A' is a guide-tube supported at the upper end of the tower and through which the pump-rod A<sup>2</sup> passes, as shown in Fig. 1.

B is a yoke sleeved on the guide-tube and free to revolve thereon, having two cross-bars a and a', as shown in Fig. 1, to give great strength thereto. At the upper end of this yoke there are boxes or bearings B' in which the main shaft C is supported. This main shaft passes through a slot in the upper por-

tion of the pump-rod, and carries an eccentric C', which works in a ring C<sup>2</sup> on the hanger C<sup>3</sup>, attached to the pump-rod at c, whereby the revolution of the shaft gives the reciprocating motion to the pump-rod.

D is an upper yoke supported on the lower yoke or on the boxes, as shown in Fig. 1, and moves with the lower yoke. On the upright portion of the upper yoke there are provided hooks c', as shown in Fig. 1, on which the tail-vane support E is hinged, and carries at its outer end the tail-vane E'. At this same side of the mill there is a horizontal arm F, which at one end carries a hanger in which is journaled a pulley d, over which passes a cord or chain F', which at one end carries a weight F<sup>2</sup> and at the other end is connected to the tail-vane support, as at f. The other end of this arm F is curved, as shown in Fig. 2, and is provided with a hanger f', in which is journaled a pulley f<sup>2</sup>, over which passes the chain G, one end of which is attached to the tail-vane support E, at e', and the other end passes downward through the guide-tube to within convenient reach from the ground. Pulling on this cord throws the tail-vane out of the wind. On the opposite box or bearing of the yoke there is secured a horizontal arm G', which carries the side vane G<sup>2</sup>, as seen best in Fig. 2.

On the outer end of the main shaft there is secured one of the blades. H and H' are a plurality of blades similar in shape, and each in shape resembling the mold-board of a plow, the remaining blades being loosely sleeved upon the main shaft and free to turn thereon. All the blades near their outer edge are connected together by a chain H<sup>2</sup>, which connects them to the outer blade, which is fixed to the shaft. Hence when the shaft is turned, the outer blade being fast thereon turns with it, and the other blades being connected to the outer one, they necessarily turn with it.

On the under side of the box nearest the wheel there is a lateral arm I, to which is pivoted on a vertical pivot i an arm I', the long arm of which is arranged so as to be struck by the tail-vane when it is thrown round, as shown by dotted lines in Fig. 2. The short arm is curved, as shown in Fig. 2, and is designed to actuate a clutch mechanism as the tail-vane strikes the long arm



This clutch mechanism consists of the sleeve J, having an outer cam-face and normally forced outward by the spring J' on the main shaft, as seen in Fig. 1. This sleeve is adapted to revolve with the main shaft and carries a lateral pin *j*, adapted to engage one of the holes *k* in the ratchet-disk K, (seen best in Fig. 5,) which disk is loosely sleeved upon the main shaft. The sleeve is also capable of endwise movement on the shaft. When the pin of the sleeve is in engagement with the hole of the disk the parts revolve together, but when the clutch is separated the revolution of the wheel does not operate the sleeve. The inner blade is attached to the sleeve, rigid with the ratchet-disk.

L is a sleeve mounted upon the before-mentioned sleeve on the main shaft, provided with an arm L', to which is pivoted the pawl L<sup>2</sup>, an arm L<sup>3</sup> being provided to prevent the pawl from falling down too far. To this sleeve is connected one end of a chain M, the other end of which is attached to the spring-arm M', attached to the yoke, as shown best in Fig. 1.

O is another chain secured at one end to this sleeve, and after passing over suitable guide-rollers *n* passes downward through the guide-tube within convenient reach from the ground. Pulling on this chain causes the pawl to engage the ratchet-disk and turn the shaft so as to turn all the blades of the wheel into the position in which they are shown in Fig. 3, the tendency of the spring-arm and the chain connecting the same with the sleeve being to keep the blades in operative position.

In operation the rotation of the wheel reciprocates the rod A<sup>2</sup> vertically through the medium of the eccentric C', ring C<sup>2</sup>, and hanger C<sup>3</sup> in a manner which will be readily understood. As the wheel acquires abnormal speed the tail-vane is thrown round into contact with the arm I' and causes it to operate the clutch to throw the wheel out of the wind. When the wind decreases in power the spring causes the clutch and the arm I' to resume their normal positions.

As above described, the chain O runs over the pulleys *n* and down to and is connected with the hollow shaft or sleeve L with pawl or dog L<sup>2</sup>. When pulling on the cord or chain O it rolls up the dog L<sup>2</sup> and catches in the notch of the wheel K, and raises the arm of the first sail or blade H, which brings up the next sail or blade, and so on till it comes to the last arm of the blades or sails, which is fastened to the main shaft. When the wheel is up, the two parts of the clutch lock by being crowded forward by the spiral spring J'. The spring-arm M' returns, by chain or cord M, the hollow shaft or sleeve L, and holds it while the mill is running, and leaves the dog or pawl L<sup>2</sup> open ready for the next time. It

must be borne in mind that the sleeve that carries the first or inner blade and arm is fastened on the hollow shaft or sleeve slipped over the main shaft, and the sleeve L slipped over that.

What I claim as new is—

1. The combination, with the main shaft and the folding wheel, of the tail-vane pivoted as shown, a clutch on the main shaft, and the arm arranged with one end in the path of the tail-vane and the other to actuate the clutch, and the connections between the folding wheel and the clutch, substantially as specified.

2. The combination, with the axle and folding wheel, of the tail-vane pivoted on vertical pivots, the clutch on the main shaft, the lateral arm pivoted on a vertical pivot with one end arranged in the path of the tail-vane and the other adapted to engage one portion of the clutch, and a spring for forcing outward said portion, and the connections between the folding wheel and the clutch, as set forth.

3. The combination, with the main shaft and the clutch, of the folding wheel, the sleeve on the shaft, the pawl carried by the sleeve and adapted to engage the loose portion of the clutch, and a cord connected with the sleeve and extending to within convenient reach from the ground, substantially as specified.

4. The combination, with the main shaft and the clutch, of the folding wheel, the sleeve on the shaft, the pawl carried by the sleeve and adapted to engage the loose portion of the clutch, a chain connected with the sleeve and extending to within convenient reach from the ground, and a spring-connection acting in opposition to said chain, substantially as specified.

5. The combination, with the main shaft and the folding wheel, of the sleeve on the shaft and provided with a pin, the disk loose on the shaft and having a toothed periphery, the sleeve on the shaft and carrying a pawl adapted to engage the toothed periphery of the disk and means for rotating said sleeve when desired, as and for the purpose specified.

6. The combination, with the main shaft and the folding wheel, of the sleeve on the shaft and provided with a pin, the disk loose on the shaft and carrying a pawl adapted to engage the toothed periphery of the disk, means for rotating said sleeve when desired, and the spring-arm on the support of the shaft and connected with the loose sleeve, substantially as and for the purpose specified.

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

AMOS WALLACE.

Witnesses:

ALFRED B. ANDERSON,  
J. D. ROBERTS.