(No Model.)

H. CROFT, Jr.

WIND ENGINE.

No. 261,535. Patented July 25, 1882.

Fig. 1.

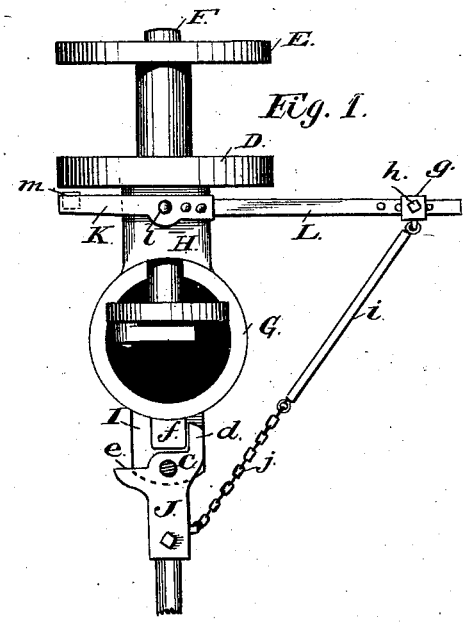


Fig. 2.

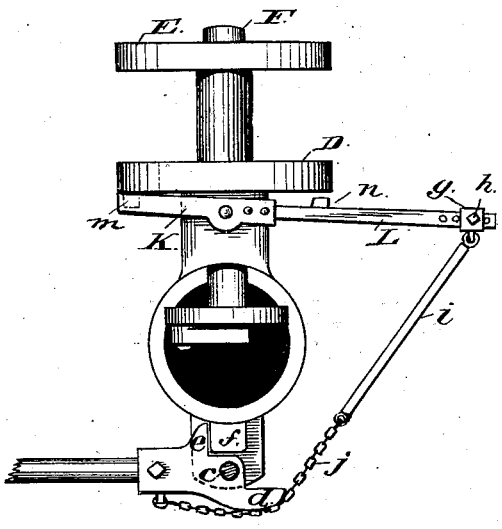
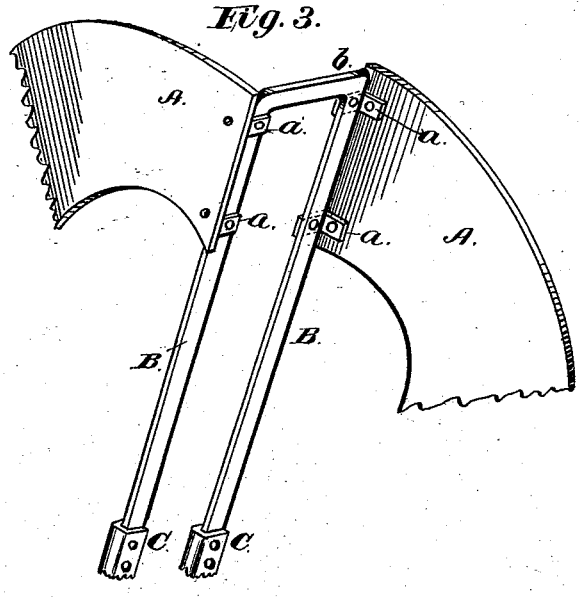


Fig. 3.



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UNITED STATES PATENT OFFICE.

HENRY CROFT, JR., OF SPRINGFIELD, OHIO.

WIND-ENGINE.

SPECIFICATION forming part of Letters Patent No. 261,535, dated July 25, 1882.

Application filed May 20, 1882. (No model.)

To all whom it may concern:

Be it known that I, HENRY CROFT, Jr., a citizen of the United States, residing at Springfield, in the county of Clarke and State of Ohio, have invented certain new and useful Improvements in Wind-Engines, of which the following is a full, clear, and exact description.

My invention relates to that class of wind-engines having vertical wind-wheels which are used for pumping purposes and running light machinery.

The improvement consists in an automatic brake for locking the wheel whenever the hinged tail-vane is brought around at right angles, or substantially so, to the axis of the wind-wheel, the object of both features of my invention being to secure lightness of construction, combined with the greatest strength and efficiency.

The novelty consists in the construction and application of an automatic brake which is actuated by the tail-vane or its hinge to lock and stop the wind-wheel whenever it is thrown out of the wind, all as will be herewith set forth and specifically claimed.

In the accompanying drawings, Figure 1 is a plan view of so much of a wind-engine as is necessary to illustrate my invention, and showing the parts in running position—that is, with the tail-vane in line with the axis of the wind-wheel. Fig. 2 is a corresponding view with the tail-vane at right angles to the axis of the wind-wheel and the brake locked thereby. Fig. 3 is a perspective view of a portion of the wind-wheel, showing the application of the sail-supporting arms.

The same reference-letters refer to like parts in all the figures.

A A, Fig. 3, represent the sails of the wind-wheel, which are in the form of segments, and made of sheet metal, stiffened, if desired, by a rim or transverse ribs applied to their backs in any suitable manner. These sails are bolted or riveted by means of bracket-lugs *a* to the inverted-U-shaped radial arms B, in the manner shown, though I do not limit myself to the method of attachment.

The arms B are formed of flat comparatively thin bar-iron—say of an inch and a quarter by five-sixteenths in size—bent in the form shown, so as to have their radial portions substantially parallel, and with the transverse or connecting portion *b* at right angles thereto. Each of these arms is secured in a socket, C, projecting from disks D and E, keyed or otherwise fastened upon the axis or wheel-spindle F. The construction of these disks or hubs is immaterial, further than that they should have means of attachment for the lower ends of the arms B. If desired, additional brace-rods or ties may be used to further stiffen the frame-work of the wheel; but for ordinary usages these would not be required.

G represents any suitable turn-table, having the socket-extension H for the wheel shaft or spindle F, and having the rear bracket-lugs, I, between which the tail-vane socket J is hinged. This socket, which is hinged in the usual or any suitable manner at *c*, is provided with shoulders *d* and *e*, which take against or come in contact with the division-wall *f*, or any portion of the turn-table to form stops in the ordinary manner for both extreme positions of the tail-vane, one of which is shown in Fig. 1, the other in Fig. 2.

Upon the extension H is pivoted at *l* a horizontal arm, K, preferably of metal, with a socket at one end, into which is fitted an extension-piece, L, preferably of springy wood, though, if desired, both pieces might be of the same material, either wood or metal, in one piece. In the side of this pivoted lever, at or near its end, is a recess into which is fitted a block, *m*, of rubber, wood, or other material, which, when the lever is operated, comes in contact with the disk D, either on its face or periphery, and acts, by frictional contact, as a brake to lock the disk and prevent the revolution of the wind-wheel when the same is thrown out of the wind. To accomplish the automatic locking of this brake, the arm L should extend out somewhat beyond the periphery of the disk D, as shown, and upon its outer end is adjustably secured a sliding block, *g*, held at any desired position by the set-screw *h*. From this block extends a link or rod, *i*, which is connected by means of a cord, wire, or chain, *j*, to the side of the hinged socket J, or to any part of the tail-vane, as may be desired. Now, when the tail-vane is in line with the axis of the wind-wheel, as shown in Fig. 1, there is considerable slack in the chain *j*,

and the brake is out of contact with the disk D; but whenever the tail-vane is brought around at right angles, or substantially so, to the axis of the wind-wheel the slack of the chain *j* is taken up, and the adjustment of the parts is such that as the shoulder *e* comes nearly into contact with the stop *f* the brake-lever will be actuated and the block *m* will be tightly locked against the disk D. It will be seen that there must be some elasticity somewhere, or else the sudden swinging of the tail-vane would be apt to break one or more of the parts if there were no yielding. I get this elasticity either in the springing of the extension L, when it is of wood or springy metal, or else in the block *m*, when it is of rubber, or in both ways, if desired.

It is an essential feature that the chain or connecting device *j* should be attached to the tail-vane or socket J at a point in the rear of its pivot *c*, so that in taking up the slack and actuating the brake the shoulder *d* of the socket J, or some other portion of the swinging parts, becomes a fulcrum, and thus creates a very powerful compound leverage, as will be clearly seen in Fig. 2. This would not be the case if the chain were not drawn around the hinge of the tail-vane.

Instead of using the sliding block *g*, the chain or connecting-link might be secured in holes in the arm L, so as to regulate the amount of slack at any time.

It may also be found desirable to use a stop, *n*, or equivalent device, to prevent the brake-lever from swinging too far back when the lock is released.

Having thus fully described my invention, I claim—

1. The combination, with a wind-wheel and its hinged or pivoted tail-vane, of a pivoted brake arm or lever arranged substantially parallel to the wheel-hub, extending beyond the same, and having its end directly connected to the tail-vane at a point in rear of its pivot by means of a chain or equivalent device, whereby in automatically actuating the brake the chain or equivalent device is drawn around the hinge of the tail-vane and a compound leverage secured thereby, substantially as described.

2. The combination, with the pivoted brake-lever and the tail-vane, of the link *i* or equivalent device made adjustable upon the brake-lever, for the purpose specified.

3. The pivoted brake-lever K L, having a yielding or elastic part in its construction, in combination with the adjustable link *i*, chain *j*, and tail-vane J.

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Witnesses:
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