

N. BUCK & F. A. SMITH.

### Wind-Mill.

No. 126,871.

Patented May 21, 1872.

Fig. 1

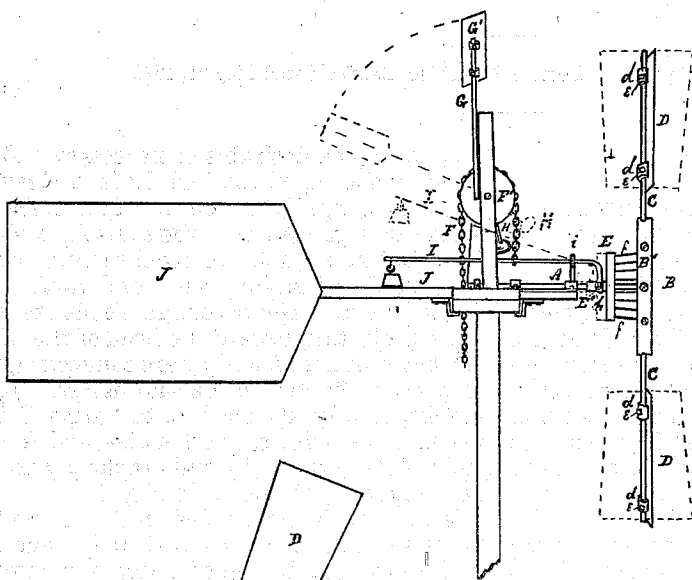


Fig. 2.

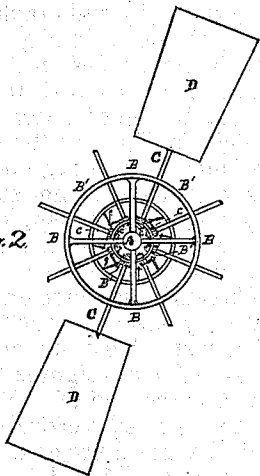
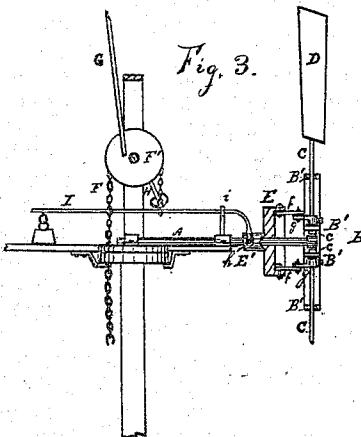


Fig. 3.



WITNESSES

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# UNITED STATES PATENT OFFICE.

NELSON BUCK AND FRED A. SMITH, OF GENOA, ILLINOIS.

## IMPROVEMENT IN WINDMILLS.

Specification forming part of Letters Patent No. 126,871, dated May 21, 1872.

### SPECIFICATION.

*To all whom it may concern:*

Be it known that we, NELSON BUCK and FRED A. SMITH, of Genoa, in the county of DeKalb and State of Illinois, have invented certain new and useful Improvements in Windmills, of which the following is a full, clear, and exact description which will enable others skilled in the art to which my invention appertains to make and use the same, reference being had in so doing to the accompanying drawing forming a part hereof, in which like letters of reference indicate like parts, and in which—

Figure 1 represents a side elevation of a windmill provided with our improvements; Fig. 2, a front elevation of a portion of the same; and Fig. 3, a side elevation of a portion of the same, showing certain parts in a central vertical sectional view.

Our invention relates to that class of windmills wherein the wings are supported on radial arms; and it consists in supporting the radial arms on pivoted bearings and in attaching the wings thereto in such a manner that the diameter of the fan may be readily increased or diminished, and the wings turned to or from the wind. It also consists in the means we employ for turning the wings to or from the wind.

In the drawing, A represents the driving-shaft, and B B' the head-piece or frame, rigidly attached thereto. The rims or rings B' of the head-piece are perforated, as shown in Fig. 1, and C C are the radial arms, passing freely through the said perforations. The arms C C are provided with a male screw-thread on their inner end, and *c c* are nuts run thereon to prevent the arms from falling from their position as the fan revolves. D D are the wings of the mill, and *d d* are perforated loops, rigidly attached thereto. The perforations of these loops are provided with a female screw-thread, and the wings with the loops attached thereto are inserted over the arms C and secured thereon by means of set-screws *e e* passing through the said perforations, as shown in Fig. 1. By attaching the wings to the radial arms in this manner the former are readily set at any desired position on the latter, so as to increase or diminish the diameter and power of the

fan, as may be desirable or necessary. E is a circular sliding block, and E' is a sleeve to which it is rigidly attached. This block and sleeve are arranged upon the shaft A, as shown in Figs. 1 and 2, and are fitted thereto so as to be capable of sliding back and forth. The block E has a rim or flange about its outer edge, projecting toward the head of the wheel, as shown in Fig. 3, and *f f* are connecting-rods or pitmen, pivoted to the said flange. *g g* are cranks, rigidly attached to the arms C C by means of set-screws, or otherwise, and the free ends of the pitmen *f f* and cranks *g g* are pivoted together, as shown in Fig. 3.

From the foregoing description it will be perceived that the rods C C and wings D D will be turned in the direction indicated by the dotted lines in Fig. 1 by the sliding movement of the block E; it being understood that this sliding movement is not sufficient to allow the pitmen *f f* and cranks *g g* being brought into a "dead-center" line, but such that the wings may be shifted so as to set more or less against the wind. This shifting movement is performed automatically by means of the following-described mechanism: *h* is a pin, projecting from the sleeve E'. I is a weighted lever, having a bearing at *i*. One end of this lever is bent downward and slotted vertically, and so arranged that the pin *h* projects into the said slot, as shown in Figs. 1 and 2. F is a chain, attached to the lever I, and F' is a pulley over which it passes. G is an arm or lever, rigidly attached to a pulley, F', and G' is a wing rigidly attached to the upper end of the lever G. H is also a weighted arm or lever, rigidly attached to the pulley F'. As the wind strikes the wing G' with sufficient force it is blown down to the position shown by the dotted lines in Fig. 1. The pulley F' is by this means turned so that its weighted lever H is raised, and the friction of the pulley upon the chain F raises the weighted lever I, so that the weights occupy the position shown by the dotted lines at H and I in Fig. 1. In moving thus the slotted lever I acts on the pin *h* and draws the block E and its attachments so that the wings D D are turned from the wind. As the pressure upon the wing G' ceases the weighted lever H sinks and throws the wing G' and pulley F' in the opposite direction, thus releasing the lever

I, and the weight thereon operates it so that the wings D D are set to the wind. The wings D D are thus automatically turned to or from the wind, and the movement of the mill thereby regulated and made uniform and even when operated upon by an irregularly-blowing wind.

The chain F may be looped over small pins on the periphery of the pulley F, or weighted so as to make its operation more certain; and it may also extend to convenient reaching distance so as to be operated by hand, when desirable.

J is the vane, to which all the parts above described are either directly or indirectly attached.

The driving-shaft A may be connected to any operating gearing by means of a pitman or other suitable device.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The pivoted radial arms C C provided with wings D D longitudinally adjustable there-

on, the said arms and wings being arranged to form the driving-fan of a windmill, all substantially as and for the purposes specified.

2. In combination, the pivoted radial arms C C, wings D D longitudinally adjustable thereon, cranks *g g* rigidly attached to the said arms, connecting-rods or pitmen *f f*, and sliding block E, all substantially as and for the purposes specified.

3. In combination, the weighted lever I, chain F, pulley F', and wing G', all constructed and arranged substantially as shown and described, and for the purpose of automatically operating the sliding block E, in the manner specified.

The foregoing specification signed by us this 15th day of January, A. D. 1872.

NELSON BUCK.  
FRED A. SMITH.

Witnesses:

F. F. WARNER,  
F. H. BROWN.