H. A. SAWYER.

WIND-MILL.

No. 173,676. Patented Feb. 15, 1876.

Fig. 4.

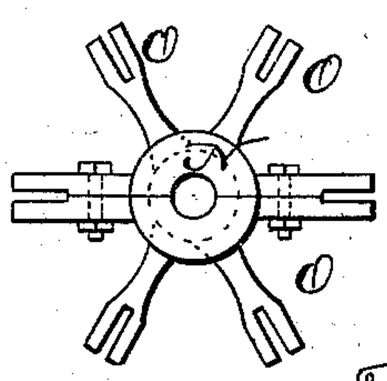


Fig. 5.

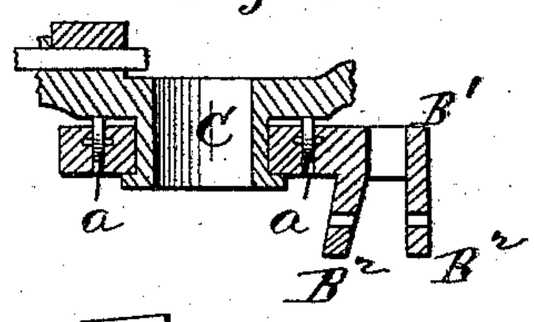


Fig. 1.

Fig. 2.

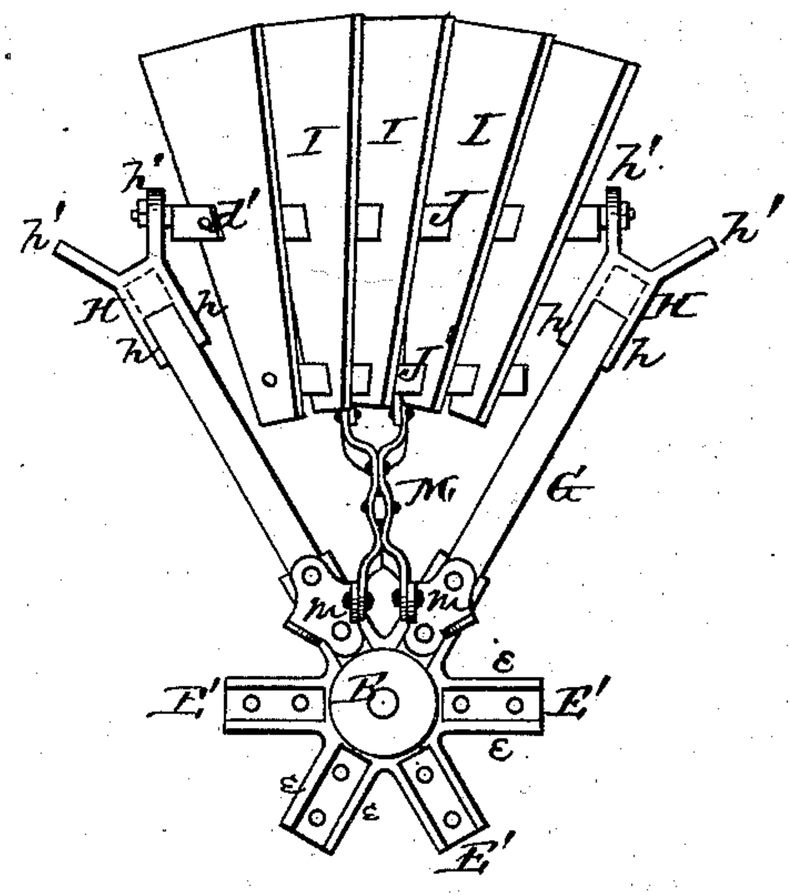
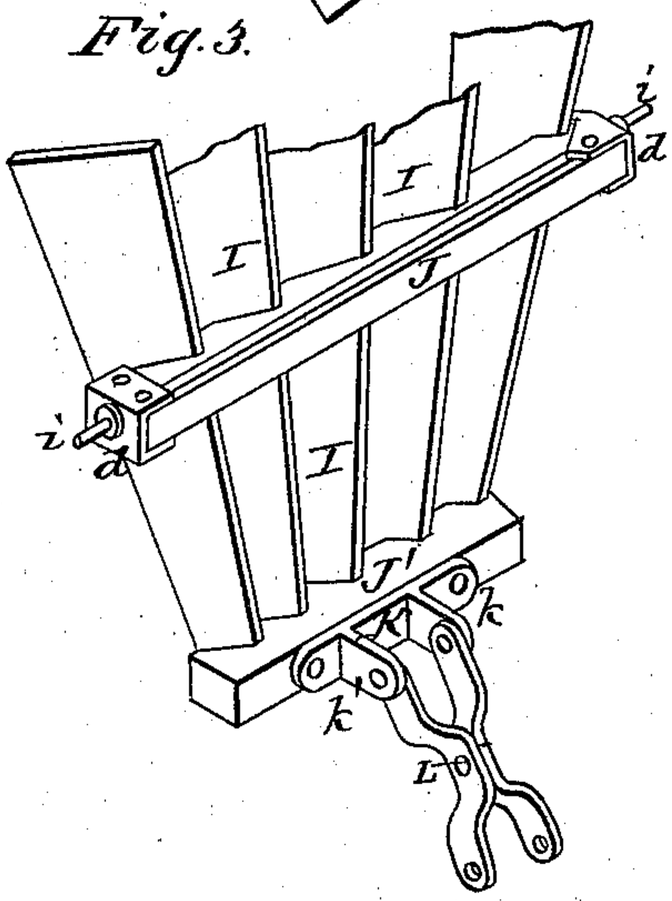


Fig. 3.



WITNESSES

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HENRY A. SAWYER, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN WINDMILLS.

Specification forming part of Letters Patent No. **173,676,** dated February 15, 1876; application filed February 9, 1876.

To all whom it may concern:

Be it known that I, H. A. SAWYER, of Chicago, in the county of Cook and in the State of Illinois, have invented certain new and useful Improvements in Windmills; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing, and to the letters of reference marked thereon, making a part of this specification.

My invention relates to windmills; and it consists, essentially, in the construction and arrangement of the wind-wheel and the devices for throwing the fans of the wheel in and out of the wind, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawing, in which—

Figure 1 is a side elevation of a windmill embodying my invention, the wheel being in section. Figs. 2 and 3 are views of one of the series of fans, with devices connected thereto. Figs. 4 and 5 are detached views of parts of my invention.

A represents the upright post or tower on which the windmill is supported. On the upper end of this post is placed the circle B, carrying the turn-table C. The circle B has on one side a slotted arm or projection, B^1, with downward-projecting flanges B^2 B^2, as shown in Fig. 2. The upper end of the post A is formed with a tenon, A′, to fit in between the flanges B^2 and into the slot in the arm B^1, after which the flanges are firmly bolted to the post. The circle B is then supported and held by means of braces B^4 on each side. The circle and turn-table are thus outside of the post, for the free passage of the pitman or connecting-rod. In the circle B are inserted rollers *a a*, upon which the turn-table C moves, said turn-table being on one side provided with the ordinary tail-vane D. On the opposite side are the usual bearings for the horizontal wind-wheel shaft *b*. On the outer end of this shaft is secured a metallic hub, E, having a series of short radial arms, E′, provided with side flanges *e e*, as shown. To each of these arms is secured a wooden arm, G, fitting between the flanges *e e*, and fastened by bolts. On the outer end of each of the wooden arms G is secured a metallic socket, H, fitting over the end of the arm, and provided with inwardly-projecting flanges *h h*, which lie close to the sides of the arm, and through which bolts are passed for securing the socket to the arm. At the outer end of the socket H are inclined ears or flanges h′ *h′* to form bearings for the wings of the wheel. What I here term a wing is composed of a series of tapering fans, I I, set in an inclined position in slots in two cross-bars, J J′, as shown. The outer cross-bar J has a metal clip, *d*, at each end, the clip at one end forming a lip, *d′*, to lap over the side of the end fan, as shown in Fig. 2. In the upper side of the cross-bar J is embedded a rod, *i*, the ends of which pass through the clips *d d* and through holes in the ears *h′* of the adjoining arms of the wheel, forming the pivots upon which the wing turns. On the back of the lower or inner cross-bar J′ is secured a clip, K, having two projecting ears, *k k*. To these ears are pivoted a pronged arm, L, the other end of which is also pronged and pivoted to the pronged end of a connecting-arm, M. The other end of this arm is also pronged, and these prongs pivoted to clips *m m* secured on the inner ends of the wooden arms G of the wheel. The pronged arms L and M may be cast in proper form, or each made of two metal strips united together in the center and having their ends bent to form the prongs. On the wheel-shaft is placed a sliding-collar hub, N, provided with a series of radial arms, O O, which are slotted at their outer ends and connected by straps P P with the connecting-arms M M above described.

The collar or hub N is made in two parts, as shown in Fig. 4, and fastened by bolts. This allows the collar to be cast far easier with the required circumferential groove, and also admits of easy removal in case of either of the arms being broken without the necessity of taking the mill apart. The collar is moved on the shaft *b* by means of a lever or combination of levers, and adjusted by a weighted governing-lever, as is usual in this class of mills.

It will be noticed that the connecting devices between the pivoted wings and arms of

the wheel have all double bearings, making them strong and durable, and not liable to vibrate in a heavy wind.

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

1. The circle B, provided with the arm or projection B^1, having flanges B^2, in combination with the braces B^4 and the post A, having tenon A′, substantially as and for the purposes herein set forth.

2. The combination, in a wind-wheel, of the metallic hub E, having radial arms E′, with side flanges *e e*, and the wooden arms G, secured to said radial arms, and wings pivoted between the outer ends of the arms G, as shown and described.

3. The metallic socket H, provided with flanges *h h* and inclined ears *h′ h′*, all cast in one piece, in combination with the arm G and wing, pivoted in said ears, as herein set forth.

4. The combination of the tapering inclined fans I I, cross-bars J J′, clips *d d*, one of which embraces the outer fan of each wing, rod *i*, extending entirely across the bar, and inclined ears *h′* on the sockets H, substantially as and for the purposes herein set forth.

5. The combination, with the pivoted wings of a wind-wheel, of the clips K, pronged arms L and M, clips *d*, connecting-straps P, and a sliding collar on the shaft, as and for the purposes herein set forth.

6. The collar or hub N, cast in two parts, with a series of radial arms, O, slotted at their outer ends, for the purposes herein set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 24th day of January, 1876.

HENRY A. SAWYER.

Witnesses:

E. L. SMITH,

THOS. W. OGDEN.