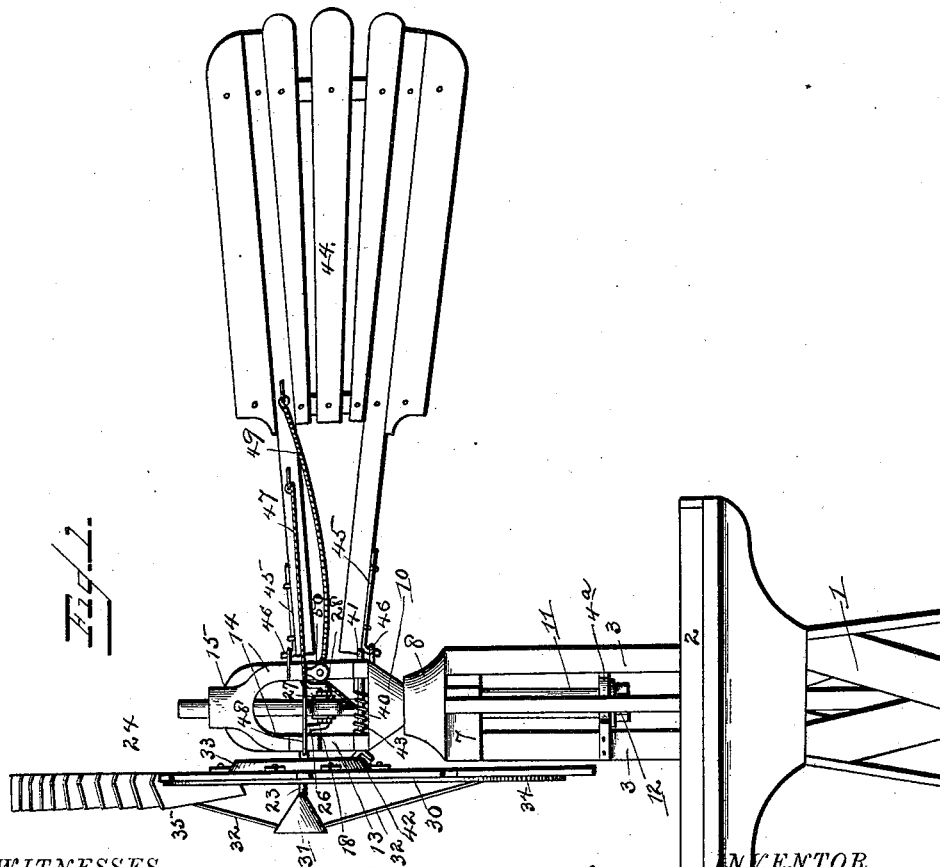
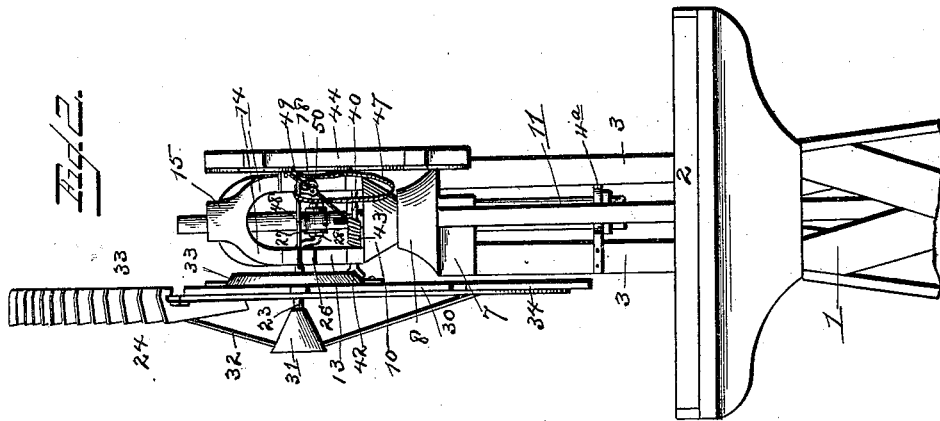


3 Sheets—Sheet 1.

No. 420,824.

Patented Feb. 4, 1890.



WITNESSES

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(No Model.)

3 Sheets—Sheet 2.

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WIND ENGINE.

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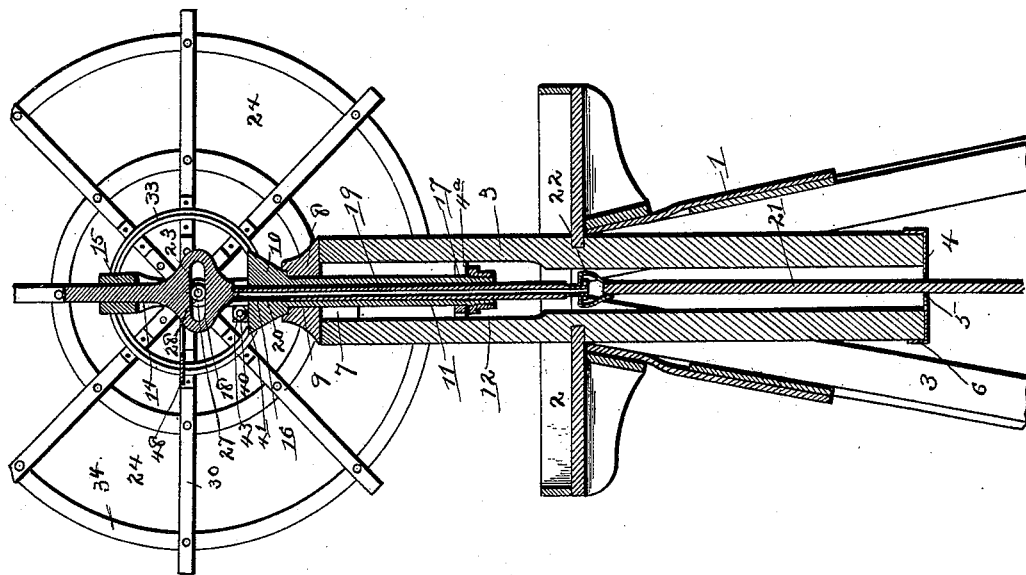


Fig. 2.

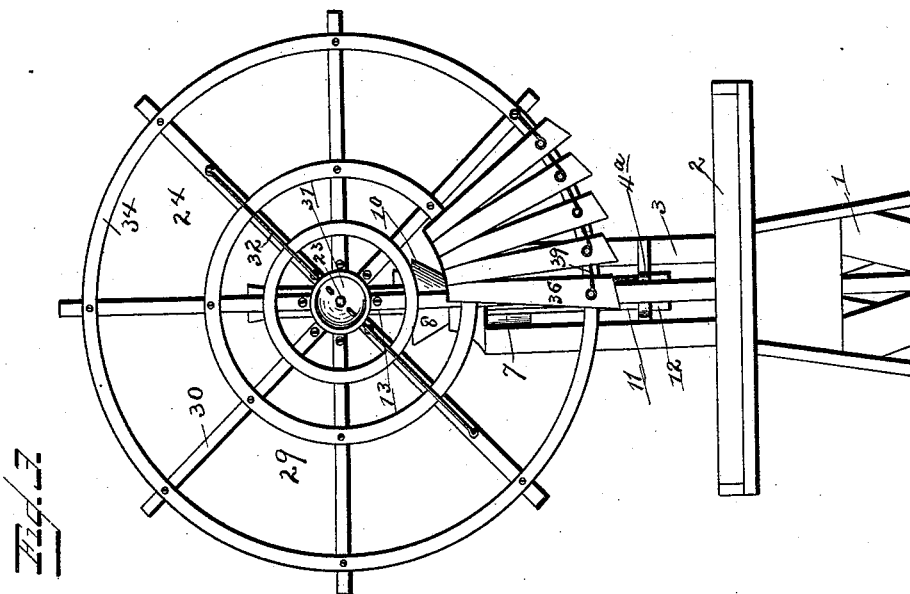


Fig. 3.

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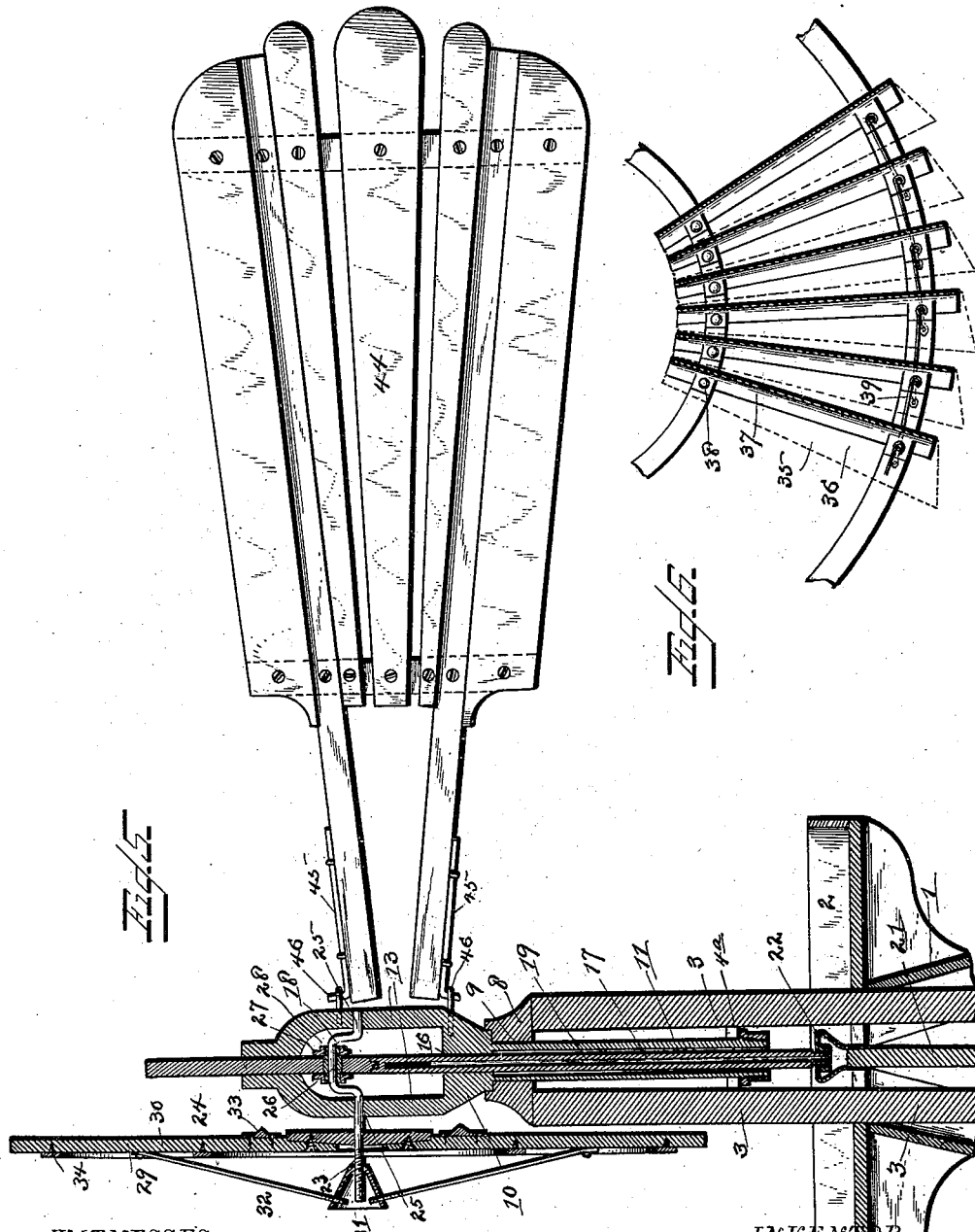
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UNITED STATES PATENT OFFICE.

WILLIAM BRENTON McCALLA, OF GALION, OHIO.

WIND-ENGINE.

SPECIFICATION forming part of Letters Patent No. 420,824, dated February 4, 1890.

Application filed March 7, 1888. Serial No. 266,448. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM BRENTON McCALLA, a citizen of the United States, and a resident of Galion, in the county of Crawford and State of Ohio, have invented certain new and useful Improvements in Wind-Engines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a side view of my improved wind-engine. Fig. 2 is a similar view showing the guide-vane drawn around to set the brake and to set the edge of the wheel toward the direction of the wind. Fig. 3 is a front view of the engine. Fig. 4 is a vertical sectional view of the same, taken through the shaft. Fig. 5 is a similar view taken at a right angle to the former view; and Fig. 6 is a perspective detail view of a part of the wheel, illustrating the manner of fastening the vanes in the wheel.

The same numerals of reference indicate the same or corresponding parts in all the figures.

This invention has relation to wind-engines; and it consists in the improved construction and combination of parts of a wind-engine having a brake for stopping the wheel when turned edge to the wind by the steering or guiding vane being drawn around, and having sheet-metal vanes secured by their rear edges to the concentric frame-rings of the wheel, as hereinafter more fully described and claimed.

In the accompanying drawings, the numeral 1 indicates the upper part of the supporting frame or tower of the engine, which is preferably formed with a platform 2, or similar horizontal frame, to which the four uprights 3 are secured. The lower portions of these uprights, which are arranged at points at right angles to each other, are connected by a casting or frame 4, having a central round portion 5 and four arms 6 secured to the sides of the uprights, and the upper ends of the uprights are secured to four lips 7, projecting from the under side of a truncate conical casting 8, having a central bore 9, concentric

with and registering with the opening in the central round portion of the lower casting. The conical base portion 10 of the revolving frame having the bearings for the wheel-shaft is journaled with its lower end in a bearing formed in the upper casting 8, and a sleeve 11 projects from the cut-off apex of the conical base portion 10 of the revolving frame, and is journaled in an apertured bearing-block 4^a, secured to the lower portions of the uprights 3, a nut 12 being screwed upon the lower end of the sleeve and holding it in place, keeping the narrow end of the base portion in its seat in the bearing of the upper casting by bearing against the under side of the bearing-block. Two side pieces 13 project upward from the base-piece and are connected at their upper ends by a top piece 14, having a vertical bearing 15 concentric with and registering with the bearing 16 in the base-piece.

The drive-rod 17 reciprocates in the bearings in the top and base pieces of the upper frame and in the sleeve of the base piece or portion, and the rod is provided with a horizontally-slotted cross-piece or yoke 18 in the space between the top and base, and has the portion below the cross-piece formed tubular, as shown at 19, having a vertical slot or aperture 20 in the side near the said cross-piece. The lower drive-rod 21 is secured to the lower end of the tubular portion of the upper rod by a swivel-joint 22, and is suitably connected to the mechanism or mechanisms to be driven at the lower end.

The shaft 23 of the wheel 24 is journaled horizontally in bearings 25 in the side pieces of the upper frame, and is formed with a double crank 26 between the side pieces, which crank has a sleeve 27, having reduced ends revolving upon it, which fits and slides or revolves in the slot of the cross-piece of the drive-rod, and is provided with flanged nuts 28 upon its ends bearing against the faces of the cross-piece. The wheel consists of the usual spider 29, in which the radiating arms 30 are secured, and which is secured upon the end of the shaft, and a nut or disk 31 is secured upon the outermost end of the shaft and has brace-rods 32 secured to it and to the arms, for the purpose of bracing the wheel against the pressure of the wind act-

ing against its face. A ring 33, V-shaped in cross-section, is secured to the rear sides of the arms near the spider, and two or more concentric rings 34 are secured to the arms, 5 connecting them at their outer portions.

The vanes 35 consist of the oblique driving portions 36 and the rearwardly-projecting flanges 37, which are cut out at the concentric rings to form lips 38, which are bolted 10 to the rings, and small inclined brace-rods 39 are secured to the inclined faces of the vanes and to the outer ring, serving to keep the vanes at their proper incline. A brake-rod 40 slides in horizontal bearings 41 in the side 15 pieces of the upper frame immediately above the base portion, and the forward end of this rod is provided with a head having a V-shaped notch 42 in its forward face, which notch may engage the inner ring and bear 20 against the same, acting as a brake, and a coiled spring 43 around the rod serves to keep the brake out of engagement with the rim, excepting when the rod is pushed forward.

25 The steering-vane or guide-vane 44 is hinged or pivoted with pivots 45 at its inner end in lips 46 upon the rear side pieces of the upper frame, so as to swing in a horizontal plane, and a cord or chain 47, secured to the vane 30 and to a laterally and horizontally projecting frame or bracket 48 upon the upper frame, serves to keep the vane normally in a plane at right angles to the face of the wheel. Another cord or chain 49 is secured to the side 35 of the vane and passes over a pulley 50 upon the bracket, whereupon it passes into the tubular portion of the drive-rod, through the slot in the same, and passes out at the lower end of the tube above the swivel-joint, depending down through the tower within reach 40 of persons below. It will be seen that the angle at which the face of the wheel is set to the wind may be adjusted by drawing the cord or chain so as to set the guide-vane at 45 the desired angle to the wheel, and when it is desired to stop the wheel the vane is drawn around in a plane parallel with the wheel, when the side of its inner portion will bear against the rear end of the brake-rod, forcing 50 the brake against the ring, so that the wheel

will be positively stopped from revolving. When it is desired to again start the wheel, the cord or chain is released and the spring upon the brake-rod will withdraw the brake and release the wheel. 55

The vanes may be very easily constructed out of strips of sheet metal, and will be very securely fastened to the wheel-frame by their lips and by the flanges straddling the rings with their cut-out and lipped portions. A 60 greater braking-surface is produced upon the inner ring of the wheel by making it V-shaped in cross-section, and the head of the brake-rod may likewise be made proportionally smaller on that account by having the V- 65 shaped notch in its face. The sleeve upon the double crank of the wheel-shaft will serve to reduce the friction between the crank and the slot in the cross-piece of the drive-rod, as the sleeve will practically serve as a roller 70 traveling in the slot.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

In a wind engine or mill, the casting hav- 75 ing the arms and central opening, the uprights secured at their lower ends to said arms, the truncated conical casting having the depending lips secured to the upper ends of the uprights, and also having the central 80 opening, the revolving frame having the conical base portion bearing in the truncated conical casting and having a depending sleeve, the apertured block in which said sleeve bears, the drive-rod comprising the 85 two sections, the upper one connected to the wheel-shaft bearing in the truncated casting and the lower one passing through the opening of the frame connected to the uprights, all of said parts being arranged as shown, and 90 operating in the manner and for the purpose described.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

WILLIAM BRENTON McCALLA.

Witnesses:

ABRAHAM UNDERWOOD,
JAMES H. FULLER.