(No Model.)

2 Sheets—Sheet 1.

T. ROGERS.

WIND ENGINE.

No. 511,969. Patented Jan. 2, 1894.

Fig. 1.

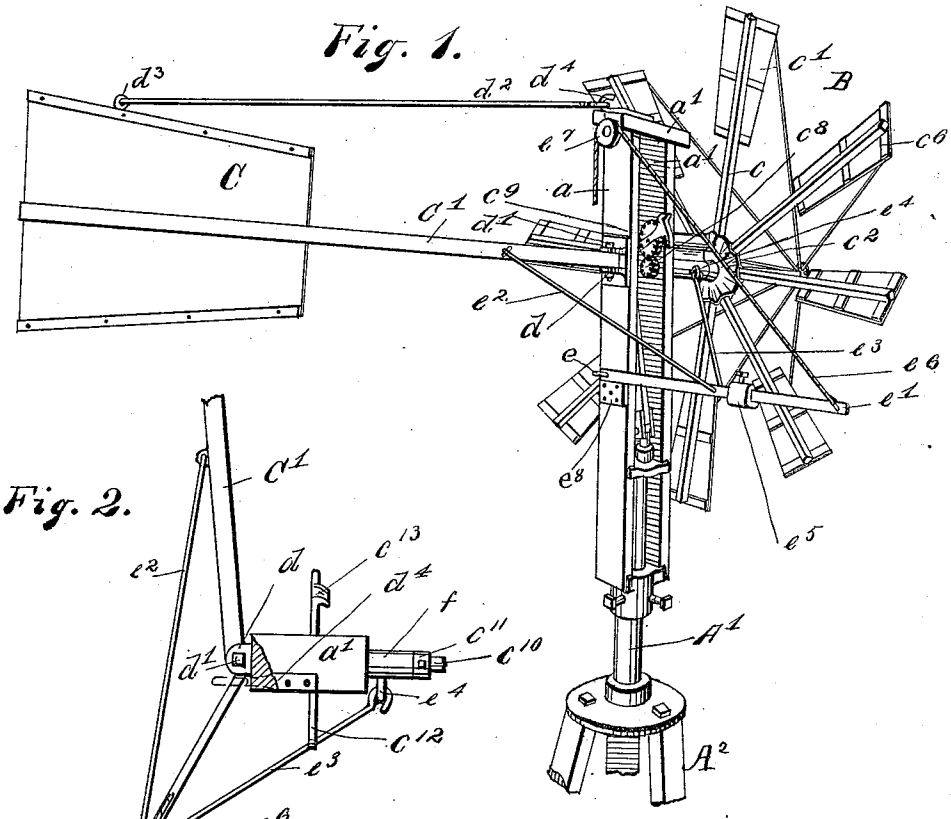

Fig. 2.

Fig. 3.

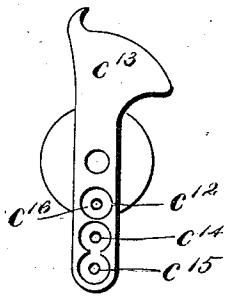

Fig. 4.

WITNESSES:
H. O. Coker.
Frank Watt.

INVENTOR
Timothy Rogers
BY Stetson and Shepherd
ATTORNEYS

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 5.

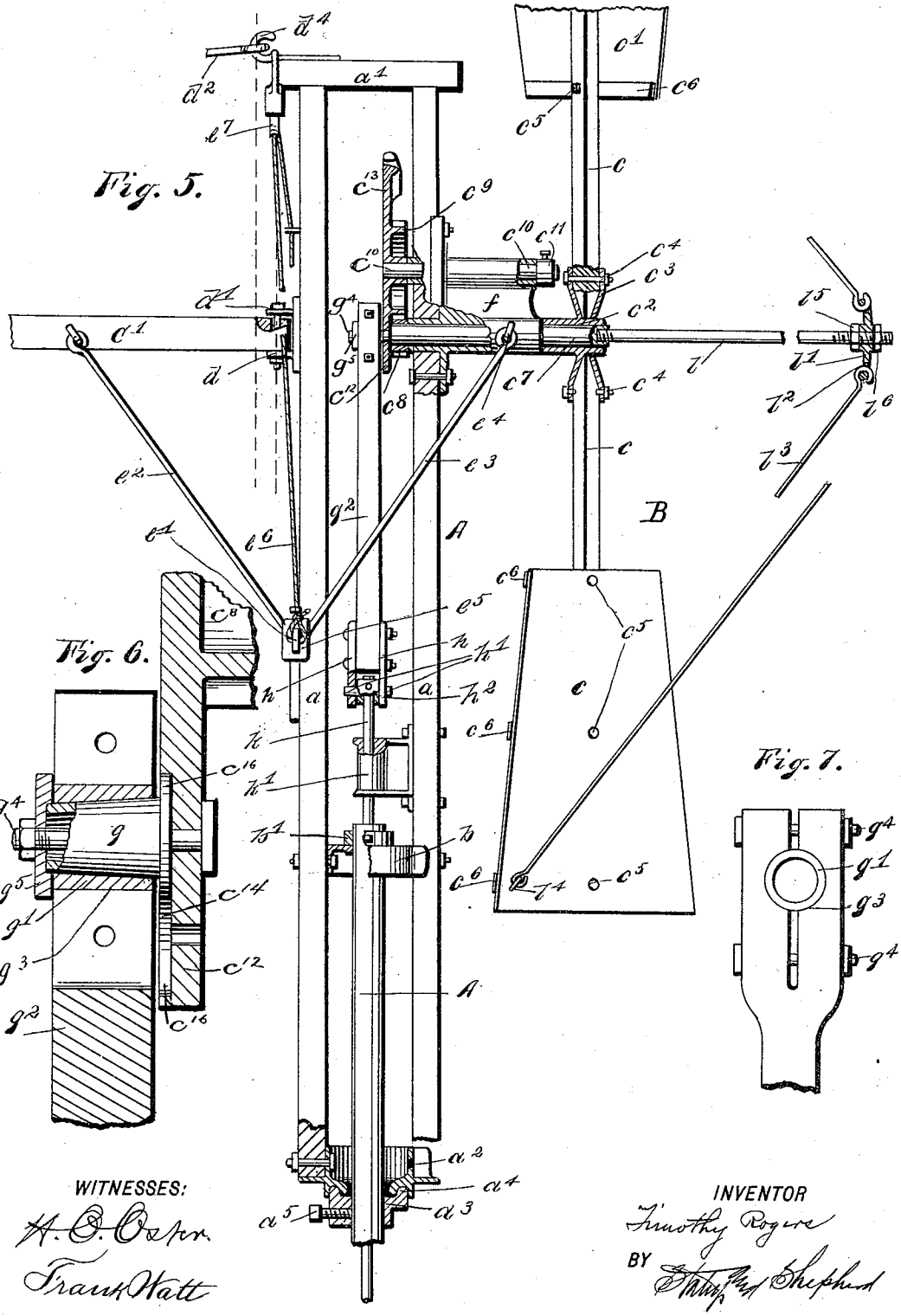

Fig. 6.

Fig. 7.

WITNESSES:

A. D. Capron.

Frank Watt

INVENTOR

Timothy Rogers

BY Pattison & Shepherd

ATTORNEYS

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

TIMOTHY ROGERS, OF SPRINGFIELD, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, OF ONE-HALF TO THE OHIO FENCE COMPANY, OF INDIANAPOLIS, INDIANA.

WIND-ENGINE.

SPECIFICATION forming part of Letters Patent No. 511,969, dated January 2, 1894.

Application filed July 23, 1892. Serial No. 441,009. (No model.)

To all whom it may concern:

Be it known that I, TIMOTHY ROGERS, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Wind-Engines, of which the following is a specification.

My invention relates to improvements in wind engines, and the object of my invention is to provide a simple and effective engine, especially adapted for farm use, that can be cheaply constructed, and shall be durable and effective in operation. I attain these objects by the constructions shown in the accompanying drawings, in which—

Figure 1 is a perspective view of a device embodying my invention. Fig. 2 is a partial plan view of a portion of the same, shown partly in section. Fig. 3 is a detail view of the crank head and locking device. Fig. 4 is a detail view showing the construction of the wings or blades. Fig. 5 is a side elevation with some of the parts broken away and other parts shown in section. Figs. 6 and 7 are detail views of the pitman connection.

Like parts are represented by similar letters of reference in the several views.

In the said drawings A, represents the frame or supporting head of the machine.

B, is the wind-wheel and C, the tail.

The frame or head A, consists essentially of two vertical beams a, preferably of wood, connected at the top by a cap a', and at the bottom by a connecting and supporting plate a^2.

The frame or head A, is adapted to be supported on a tubular column A', which consists preferably of ordinary wrought iron pipe. This column preferably forms the derrick on which the engine is supported, said column being supported in a suitable manner at the requisite height. It may, however, be secured to a base A^2, which is mounted on any suitable support at the height desired.

Secured to the column A', immediately below the supporting plate a^2, is a collar a^3, having at the top a bearing ring a^4, and secured to said tubular column preferably by means of set screws a^5.

The bearing plate a^2, is provided with a corresponding annular recess adapted to fit over the bearing ring a^4, and furnish a bearing seat on which the head is supported and on which it is adapted to turn. The tubular column extends upwardly through the bearing plate a^2, and is journaled at or near the upper end in a guiding plate b, also connected to the respective beams a a, a collar b' being secured to the tubular column immediately above the guiding plate b, and in close proximity thereto.

The wind-wheel B, consists essentially of projecting arms c, preferably of wood, carrying at their outer extremities the blades or wings c'. The arms c, are preferably formed square in cross section and are seated in and secured to a metallic hub c^2, which is formed with corresponding depressions or recesses arranged at an angle to the plane of said hub and adapted to receive the projecting ends of said arms, the hub being preferably formed in two parts, the outer part being in the nature of a retaining ring c^3, the respective parts being adapted to be held together by fastening bolts c^4, which pass through said parts and through the inner end of the arms c. The wings or blades c', are preferably formed of wood and are made quite thin to secure a certain amount of flexibility and the proper lightness of construction. They are secured to the outer ends of the arms c, preferably by bolts c^5, which pass through said arms and blades, the blades being further provided with interposed cleats c^6, which serve the double purpose of strengthening said blades and removing them slightly from the arms c. The tail C, is also preferably formed of wood and is hinged directly to the head or frame A, by a bifurcated metallic piece d, bolted or otherwise secured to one of the beams a, and adapted to loosely embrace the arm C', of the tail C, which is pivoted thereto by a pin or bolt d', which passes loosely through said arm and the extending ears of the bifurcated piece d. The tail is further supported by means of a supporting rod d^2, connected to the said tail by an eye d^3, and at the other end to a hook d^4, secured to the cap a', of the frame A. The straight portion of the hook d^4, on which the connecting rod d^2, is adapted

to pivot, is so placed on the cap a', as to occupy a position in a different vertical plane from the pin d', which forms the pivot for the arm C', as indicated by dotted lines in Figs. 2 and 5, the result of this construction being to elevate the end of the tail slightly, and cause it to return to its normal position by gravity when it is swung around so as to assume a position parallel with the wind-wheel, as hereinafter described, the slight elevation of the tail necessary to produce this result being permitted by the loose connections between the arm and the bifurcated piece d.

Pivoted to the frame or head A, preferably by means of a hook-shaped connecting bolt e, is a lever e', which is also pivotally connected to the arm C', by a rod e^2, and by a rod e^3, to a stationary hook or eye e^4, on the bearing of the wind-wheel B. The lever e', is provided with a sliding weight e^5, and is also connected at its outer extremity to a rope e^6, which passes over a suitable pulley or sheave e^7, hung from the hook d^4, and thence down to any desired position in the reach of the operator. The hub c^2, of the wind-wheel is connected directly to a shaft c^7, journaled in a suitable bearing and provided at its opposite end with a spur pinion c^8, which engages with a spur gear c^9, secured on the end of a shaft c^{10}. The respective shafts c^7 c^{10}, are each journaled in suitable bearings in a bearing head f, which is formed integral with projecting flanges to engage the frame beam a, with the bearing portions adapted to extend entirely through said beam in suitable openings formed for this purpose, so that the hubs of the respective gears c^8, and c^9, rest directly against the ends of said bearings, and thus prevent all lateral movement of the respective shafts, the shaft c^{10}, being provided with a collar c^{11}, on the outside of the bearing head f. The spur gear c^9, is formed integral with a crank-arm c^{12}, on one side and with an eccentric and locking plate c^{13}, on the opposite side, the parts being adapted to counterbalance each other. The crank arm c^{12}, is preferably provided with depressions c^{14}, c^{15} and c^{16}, adapted to receive the end of a hollow cone-shaped trunnion g, adapted to fit into a correspondingly shaped sleeve g', in a pitman g^2, this pitman g^2, being preferably of wood with a split or open bearing g^3, adapted to receive the sleeve g'.

In assembling the parts the sleeve g', is inserted in the open bearing of the pitman and clamped therein by suitable clamping bolts g^4; the trunnion of the crank-arm is inserted therein; a collar g^5, placed on the end of the trunnion, and the fastening bolt passed through the arm, sleeve and collar so as to hold the parts all firmly together. The lower end of the pitman is preferably provided on opposite sides with connecting plates $h\,h$ each perforated at its lower end to receive trunnions h', on opposite sides of a collar h^2, which embraces and is slightly fastened to an actuating rod k, which reciprocates in a suitable bearing k', secured to the frame piece a, and passes through the tubular column A', to the point at which the power is to be applied.

Connected to the front of the wind-wheel and preferably screwed directly into the shaft c^7, on which said wheel revolves, I provide an extended rod l, screw-threaded at its outer end and provided with a movable collar l', having about its periphery suitable openings l^2, into which will hook the ends of brace rods l^3, which extend from said collar to the inner rear corner of the respective wings or blades c', to which they are connected by an eye l^4. The screw-threaded rod l, is provided with nuts l^5, l^6, arranged on opposite sides of the movable collar l', so that said collar may be moved outwardly or inwardly on said rod, and thus bring the proper tension on the brace rods. These brace rods l^3, and movable collar l', serve the double purpose of bracing the wings or blades c', and giving to said blades a certain amount of torsion, causing them to assume, to a slight degree, a helical or screw-shape, which adds to their effectiveness in catching the wind and discharging the same.

The operation of the device, it is thought, will be understood from the above description. The angular shape of the wings or blades, caused by the angular arrangement of the arm c, within the hub c^2, causes the wheel to revolve in the wind in the ordinary way. The hinged tail serves the purpose of bringing and maintaining the wheel in the wind, while the weighted lever serves the purpose of a governor, to permit the wheel to move more or less out of the wind, when the velocity of the wind is increased. When the lever is raised, by means of the rope attached thereto, the tail is brought parallel with the wind, thus throwing the wheel entirely out of the wind. At the same time the connecting rod e^3, is brought in a position across the path of the eccentric locking lever e', which impinges thereon and gradually brings the wheel to a stop, when it is securely locked against further revolution by the hook-shaped lug formed on said locking plate c^{13}.

It will be seen that by the constructions above described a wind engine is provided which is extremely simple in its construction and effective in operation.

The parts are readily detachable and adjustable and require no accuracy in fitting up.

By the construction of the head or frame an easily operating and durable head is provided without the usual weight employed therein, while the bearing parts are protected and are not liable to undue wear.

The construction of the wind-wheel, with the projecting arms and the interposed cleats, forms an open space between the arms and blades, which permits the water to pass off and at the same time allows a free circulation of the back currents of air between the said blades and arms.

It should be noted that the pivoted lever e',

rests in its normal position against a stop-block e^8, secured to the side of the supporting beam *a*, said lever being thus supported in the proper position to retain the tail piece in a plane at right angles to the plane of the wind-wheel, with the supporting arm of said tail piece in line with the axis of said wind-wheel.

It is obvious that the construction herein described may be modified. I do not, therefore, limit myself to the exact constructions shown and described, but

I claim as my invention—

1. In a wind engine, the combination with the tubular supporting column, of the head formed of the parallel supporting beams, surmounted by a cap, as described, and connected at the bottom by a bearing plate, a supporting collar on said tubular column, and annular bearing surfaces on said collar and bearing plate respectively, and a guiding plate arranged above said bearing plate and connected to said beams, said bearing plate being perforated to receive said tubular column, substantially as specified.

2. The combination of the tubular column of the main frame or head consisting essentially of parallel beams connected together, as described, a bearing plate at the bottom of said head forming one of the connections between said beams, an adjustable supporting collar on said tubular column, said collar having a raised annular bearing adapted to fit in correspondingly formed groove in said bearing plate, substantially as specified.

3. In a wind engine, the head, formed, as described, the parallel supporting beams connected together at suitable intervals by a bearing plate and a guiding plate, each of said plates being perforated to receive a cylindrical supporting column, an adjustable supporting and retaining collar at the top and bottom, respectively, of said plate, substantially as specified.

4. The combination, with the tubular supporting column and the frame or head formed of the parallel supporting beams, connected together, as described, of a bearing plate formed with projecting wings or flanges to receive and support said beams, and an inwardly projecting annular flange having a grooved bearing adapted to fit over an upwardly projecting bearing ring on a supporting collar, said supporting collar being adapted to be secured to said tubular column, a guiding plate also connected to said beam and provided with a central bearing to fit over said tubular column, and a retaining collar above said guiding plate, substantially as and for the purpose specified.

5. The combination with the pivoted arm, the frame and wind-wheel, as described, a pivoted lever connected to said frame, a brace rod from said lever to said arm, a crank shaft operated by said wind-wheel and an eccentrically arranged stop projection on said crank shaft, adapted to come in line with said pivoted brace rod, to form a stop for said crank shaft, when said rod is elevated to operate said projecting arm, substantially as specified.

6. The combination with a wind-wheel, its supporting frame and the hinged tail piece, as described, of an operating lever pivoted at one end to said frame and connected by angularly arranged brace rods to said tail piece and frame respectively, so that an upward movement of said lever produces a swinging movement of said tail piece, and stop mechanism, as described, adapted, when said lever is elevated, to engage with one of said rods and stop the wheel, substantially as specified.

7. The combination with the main frame and the supporting bearing head connected thereto, the wind-wheel mounted on a shaft journaled in said bearing head, a counter shaft connected to said wind-wheel shaft having a crank arm and an oppositely projecting stop projection, a pivoted lever on said frame and a hinged connection from said lever to said bearing head, a swinging tail piece also connected to said lever by a pivoted link connection, and means for operating said lever so that the pivoted frame connection thereof shall come in line with said stop projection, and form a stop for said wind-wheel, when the wheel is turned out of the wind, substantially as specified.

8. The combination with the frame, the wheel and the pivoted tail piece, as described, of a hinged operating lever having an adjustable weight thereon, of a connection from opposite sides of said lever to the tail and frame piece respectively, a brace connection from said tail piece to said frame, said brace connection being hinged to said frame in a different parallel plane from the hinged connection of said lever, an operating rope from said lever said rope passing over a supporting sheave attached to the hinged connection of said tail brace rod, substantially as specified.

In testimony whereof I have hereunto set my hand this 5th day of July, A. D. 1892.

TIMOTHY ROGERS.

Witnesses:
ROBERT C. RODGERS,
FRANK WATT.