(No Model.)

J. W. CURRIE.

WINDMILL.

No. 342,736. Patented May 25, 1886.

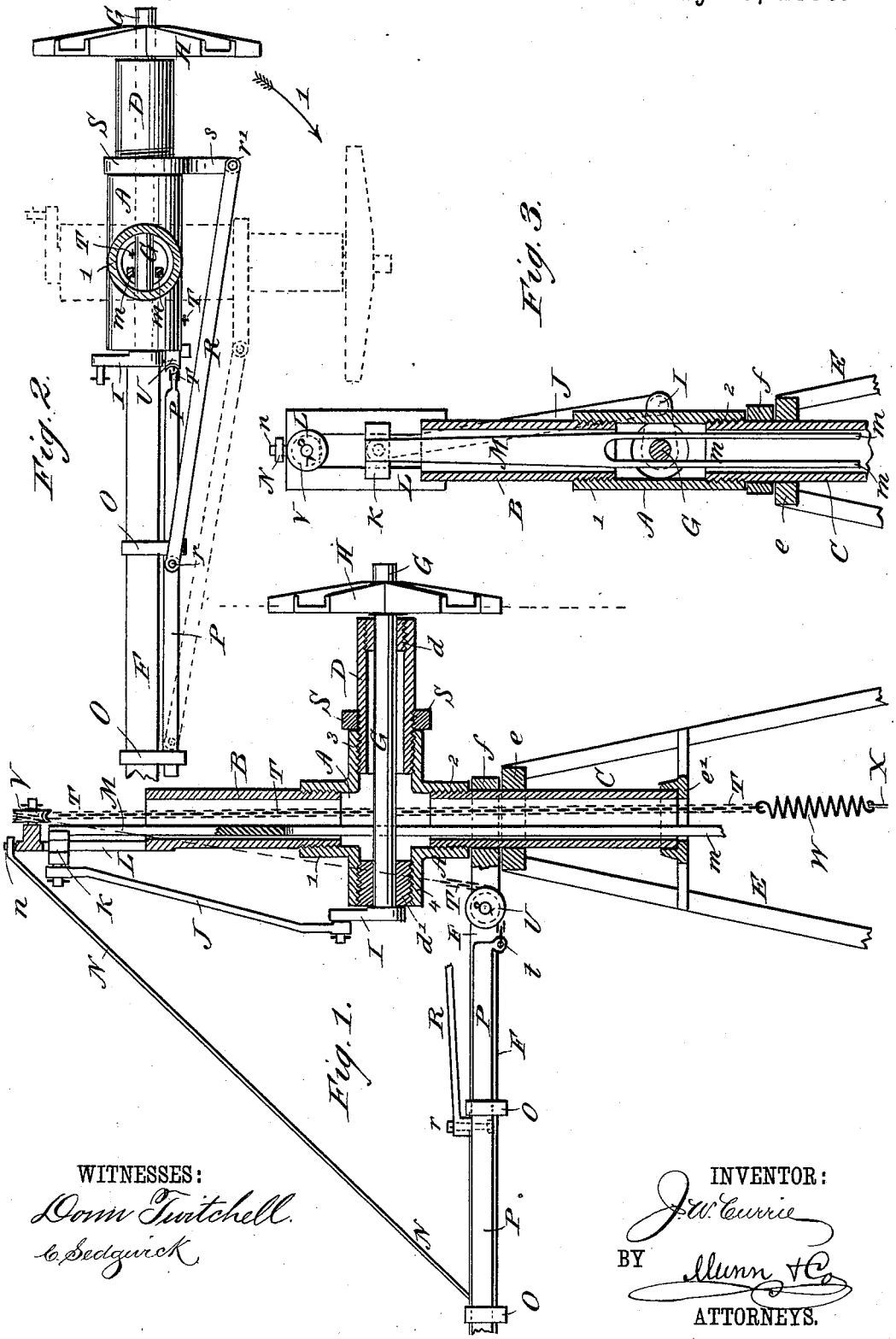

Fig. 2.

Fig. 3.

Fig. 1.

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JOHN W. CURRIE, OF SOLOMON CITY, KANSAS.

WINDMILL.

SPECIFICATION forming part of Letters Patent No. 342,736, dated May 25, 1886.

Application filed March 8, 1886. Serial No. 194,434. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. CURRIE, of Solomon City, in the county of Dickinson and State of Kansas, have invented a new and Improved Windmill, of which the following is a full, clear, and exact description.

My invention relates to windmills, and has for its object to provide an inexpensive, strong, and durable mill, which may readily be thrown into and out of gear, and is self-regulating when in gear.

The invention consists in certain novel features of construction and combinations of parts of the windmill, all as hereinafter fully described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters indicate corresponding parts in all the figures.

Figure 1 is a vertical sectional side elevation of the head portion of a windmill made in accordance with my invention, the wind-wheel sails being removed and parts being broken away. Fig. 2 is a plan view, partly sectional, and shows in full lines the relative positions of the wind-wheel shaft and vane when the mill is in gear; and shows in dotted lines the position of the wind-wheel when the mill is out of gear, and Fig. 3 is a vertical sectional elevation taken at right angles to the same parts shown in Fig. 1.

The head of the mill consists, mainly, of a four-way wrought-iron pipe-coupling, A, commonly known as a "cross," opposite wrought-iron tubes B C, threaded into the screw-necks 1 2 of coupling A, and a third wrought-iron tube, D, threaded into the screw-neck 3 of the coupling and extending at right angles to the tubes B C. The tube C is journaled in the head-piece *e* of the mill-tower E, and is stepped in a bearing, *e'*, on the tower. The arm F of the vane is swiveled by its eye *f* on the tube C, between the neck 2 of coupling A and the tower.

The wind-vane is not shown in the drawings; but it may have any approved construction and be attached to the arm F in any approved way.

In a plug, *d*, fitted into the outer end of the tube D, and in a plug, *d'*, fitted into the opposite neck, 4, of the cross-coupling A, there is journaled the wind-wheel shaft G, to which is fixed the hub or spider H of the wind-wheel, and at the opposite end of the shaft is fixed a crank-arm, I, to which is connected one end of a pitman, J, the other end of which is attached to a cross-head, K, which is fitted to slide in a slotted standard or guide, L, fixed in any approved way to the top of the tube B, and to said cross-head K is attached the upper end of the pump-rod M, which passes through the tubes B C, and is slotted or divided into two parts or limbs, *m m*, which pass, respectively, at opposite sides of the windmill-shaft and thence downward to connect with the pump or other machine or gearing to be driven by the mill. A brace-rod, N, connected at one end to the vane-arm F, is pivoted or hung at its upper end on a pin, *n*, fixed to the cross-head standard L, and supports the vane therefrom while allowing it to swing around freely with the wind.

To the vane-arm F there are fixed a couple of straps, O O, which have slots forming guides, in which a bar, P, is fitted to slide at the side of the vane-arm, and about at the center of the bar P there is pivoted at *r* one end of a rod, R, the other end of which is pivoted at *r'* to an arm, *s*, which projects from a collar, S, attached to the mill-head, which supports the wind-wheel, and it may be by screwing it onto the exterior threads of the tube D before the tube is screwed into the cross-coupling A. A chain, T, is attached at *t* to the end of the bar P, and thence runs under a guide sheave or pulley, U, journaled on the vane-arm F, and thence passes upward to and over a guide sheave or pulley, V, journaled at the top of the cross-head guide L, and thence passes downward through the tubes and couplings B A C, as in Fig. 1. A spiral spring, W, is attached to the lower end of the chain T, and to this spring is connected a wire or rod, X, which extends down to or near the floor of the mill-tower within reach of an attendant.

The operation is as follows: When the attendant draws the rod X downward, the chain T will draw the bar P endwise toward the mill-head, and thereby carry the rod R outward and swing the mill-head around with the wind-wheel shaft G about in line with the

vane on the arm F, and thus throw the mill into gear, and the rod X will be fastened in any way by the attendant. The rod R acts as a brace or stay to prevent the wind-wheel from swinging too far around by contact of the end of rod R next its pivot *r* with the inner collar O, and as will be understood from Figs. 2 and 3 of the drawings. Should the wind blow too hard or in sudden gusts, the wheel will be blown around more or less in the direction of the arrow 1 in Fig. 2, thereby forcing the rod R and bar P outward or backward and pulling on the chain T and expanding the spring W more or less, and the tension of the spring will cushion the resistance of the wind-wheel and regulate its speed by holding more or less of the area of the wind-wheel sails to the wind, the spring also preventing jar and shock of the parts of the mill. As the wind force decreases the wheel will gradually swing back again full face to the wind, as when first started.

To throw the mill out of gear, it only is necessary to unfasten the rod X and the wind will swing the wheel around parallel with the vane as the rod R and bar P are moved backward, and, as indicated in dotted lines in Fig. 2, the end of rod R next the pivot *r* then striking the outer collar O on the vane arm to prevent the wind-wheel from swinging against the vane. It is evident that when the mill is out of gear no strain is brought on the speed-regulating spring W, which then hangs loosely with the chain T and rod X; consequently the elasticity of the spring will not be impaired during such time.

The mill-head, made of wrought-iron cross-coupling A and tubes B C D, is less expensive to make and very much stronger than many styles of cast-iron heads, and with it a long wind-wheel shaft may be used, thereby facilitating the easy, steady working of the mill and promoting its durability.

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

1. In a windmill, the mill-head made of a wrought-metal tubular cross-coupling and tubes fitted therein, and adapted to receive the wind-wheel shaft and give passage for the pump-rod and gear pull chain or cord, substantially as shown and described.

2. In a windmill, the mill-head made of a wrought-metal tubular coupling, A, wrought-metal tubes B C D, fitted therein, plugs *d d'*, fitted, respectively, in the tube D and in the opposite neck 4 of the coupling A, the wind-wheel shaft G, journaled in said plugs *d d'*, and said tube C, journaled and stepped in the mill-tower, substantially as herein shown and described.

3. In a windmill, the combination of a head consisting of a tubular cross-coupling, A, tubes B C D, fitted therein, plugs *d d'*, fitted, repectively, in the tubes D and in the opposite neck 4 of coupling A, the wind-wheel shaft G, journaled in plugs *d d'*, and said tube C, journaled and stepped in the mill-tower, a crank, I, on shaft G, a connecting-rod, J, a cross-head, K, connected to rod J, a guide, L on tube B for cross-head K, and a rod, M, connected to the cross-head and extending downward through the tubes and coupling B A C, substantially as set forth.

4. In a windmill, the combination, with a supporting-tower, as at E, and a head consisting of a tubular cross-coupling, A, metal tubes B C D, fitted therein, a shaft, G, journaled in plugs *d d'* in the tube D and coupling A, respectively, a crank, I, rod J, cross-head K, guide L, and rod M, arranged substantially as specified, a vane-arm, F, pivoted on tube C between the neck 2 of coupling A and the tower E, and a brace, N, connected to arm F and hung pivotally to the top of the mill-head, substantially as herein shown and described.

5. In a windmill, the combination, with a supporting-tower, a head journaled therein, a wind-wheel journaled to the mill-head, and a wind-vane hung to the head, of a bar, P, fitted to slide on the vane-arm, an arm, as at *s*, on the mill-head near the wind-wheel, a rod, R, connecting the bar P and arm *s*, and a chain or cord, T, connected to the bar P and passed over guide-pulleys U V on the vane-arm and mill-head, respectively, and a pull-rod connected to chain T, substantially as herein set forth.

6. In a windmill, the combination, with a supporting-tower, a head journaled thereon, a wind-wheel journaled on the mill-head, and a wind-vane journaled on the head, of a bar, P, fitted to slide on the vane-arm, an arm, as at *s*, on the mill-head near the wind-wheel, a rod, R, connecting the bar P and arm *s*, a chain or cord, T, connected to the bar P, a spring, W, connected to chain T or in a pull cord or rod by which the mill is thrown into gear, substantially as herein set forth.

7. A windmill constructed and arranged substantially as shown and described, and consisting of a head formed of a cross wrought-iron coupling having its vertical arms lengthened by short tubes, the lower extension-tube being stepped and journaled in the mill-tower, and the upper tube carrying the operating mechanism, a wind-wheel shaft journaled in the horizontal arms of the coupling, a vane-arm held to swing on the lower extension-tube, a bar held to slide on the vane-arm, a shifting-chain extending from said sliding bar into the mill-tower, a brace-arm pivoted at one end to said sliding bar and at its other end to an arm on the forward arm of the coupling or a short extension-tube of the same, as set forth.

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