(No Model.)

G. M. TAYLOR.

WINDMILL.

No. 300,161. Patented June 10, 1884.

Fig. 1

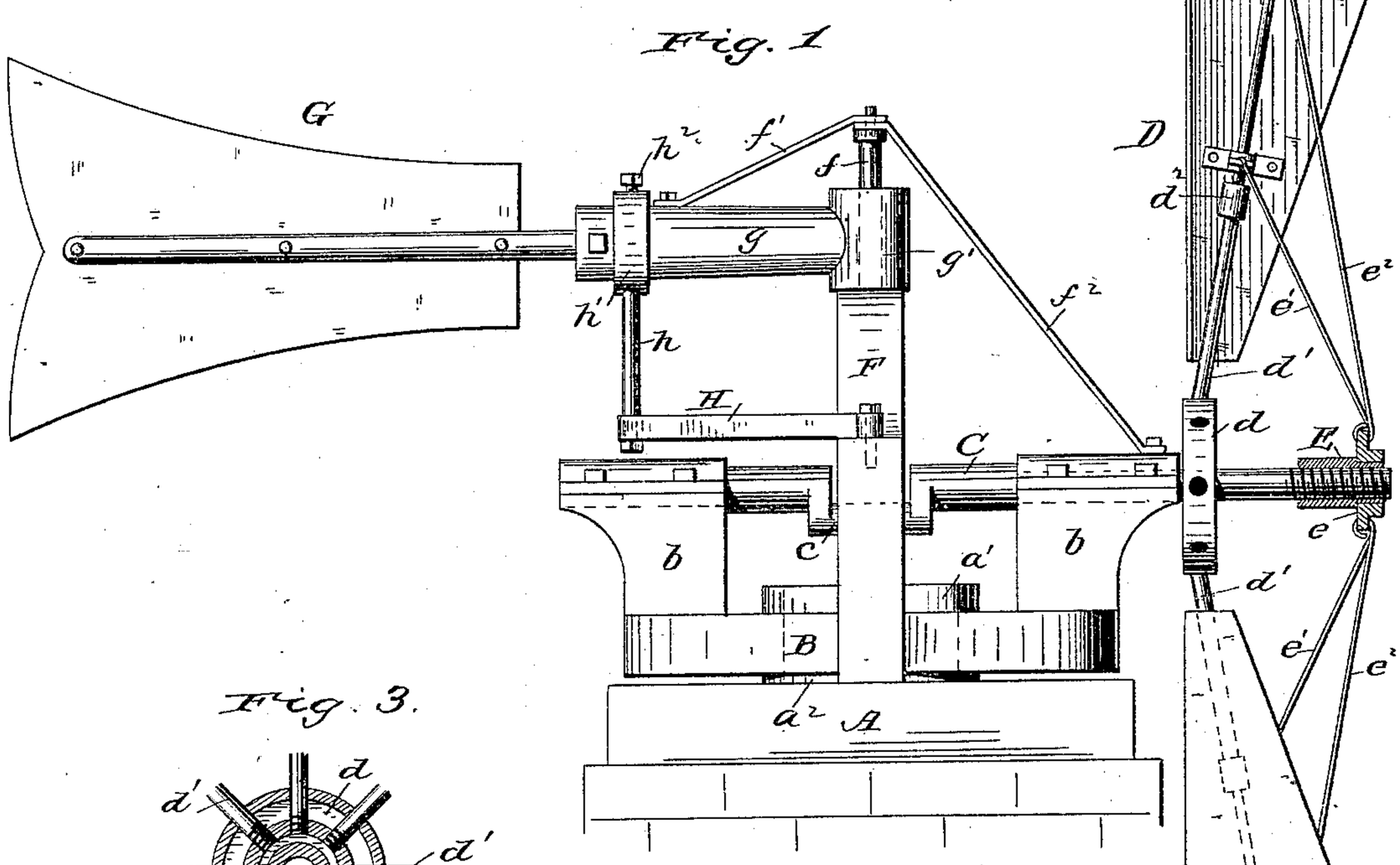
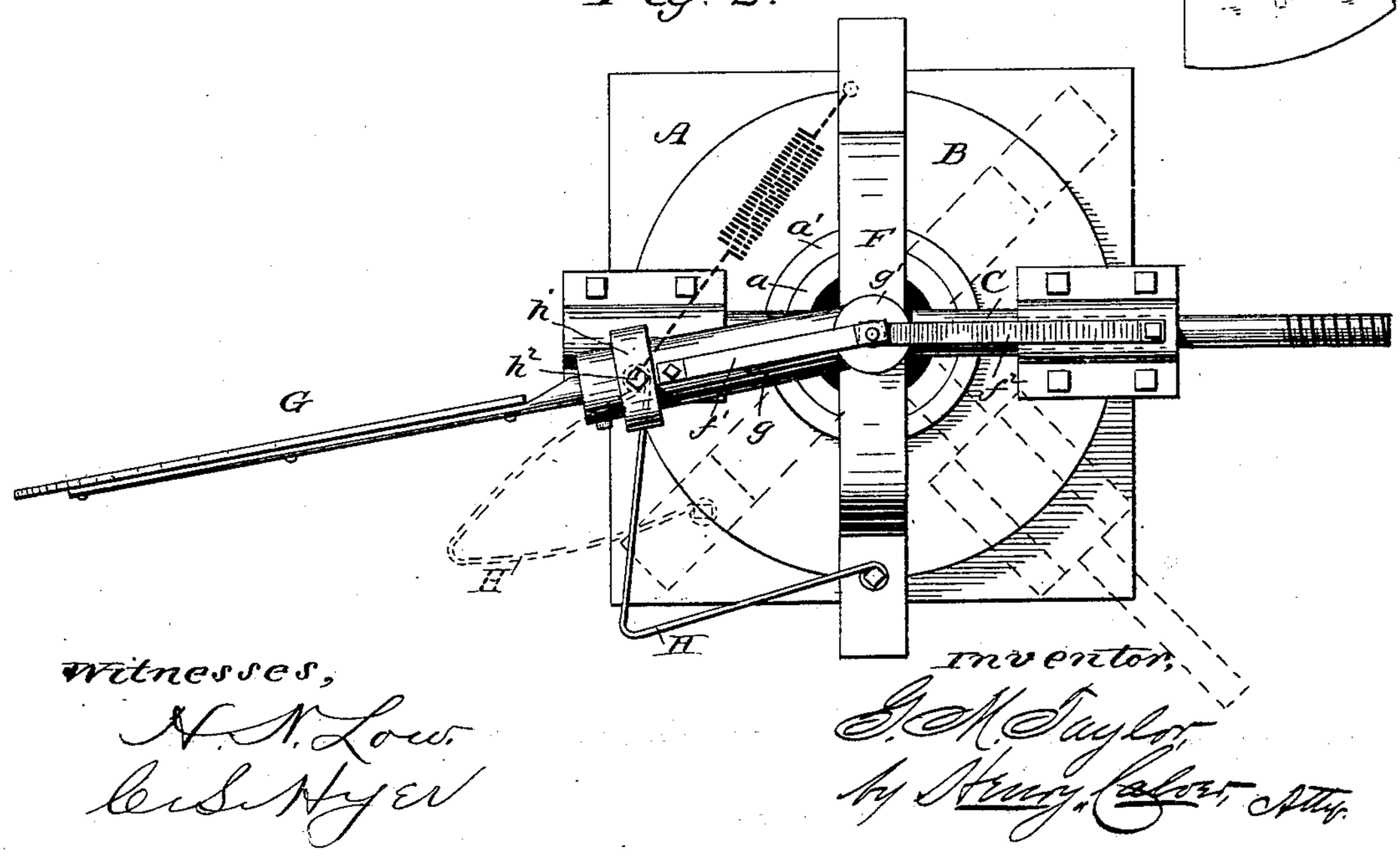


Fig. 3.

Fig. 2.



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UNITED STATES PATENT OFFICE.

GEORGE M. TAYLOR, OF CHICAGO, KANSAS.

WINDMILL.

SPECIFICATION forming part of Letters Patent No. 300,161, dated June 10, 1884.

Application filed November 9, 1883. (No model.)

To all whom it may concern:

Be it known that I, GEORGE M. TAYLOR, a citizen of the United States, residing at Chicago, in the county of Sheridan and State of Kansas, have invented certain new and useful Improvements in Windmills, of which the following is a specification, reference being had therein to the accompanying drawings.

The principal object of my invention is the production of a windmill of simple construction, that will be automatically adjusted according to the varying force of the wind, so that when the velocity of the wind exceeds a certain predetermined limit the wind-wheel will be turned more or less out of the wind, that the force of the latter may be less directly exerted against the fans or blades of said wheel. My invention also relates to certain details of construction, as will be hereinafter more fully indicated.

In the accompanying drawings, in which like letters indicate corresponding parts in the several figures, Figure 1 is a side elevation of a windmill embodying my invention, part of the fans or blades of the wind-wheel being omitted for clearness of illustration. Fig. 2 is a plan view of my windmill, and Fig. 3 is a detail sectional view of the hub of the wind-wheel.

A is the base or support constituting the bed sustaining the turn-table B, said base or bed being provided at its center with an upwardly-projecting hollow post, *a*, fitting a central circular orifice or opening in the turn-table. To the hollow post *a*, above the turn-table, is secured a collar, *a'*, which holds the turn-table to the base or bed, the latter, it will be understood, forming the top of the tower or other support of the windmill. To enable the turn-table B to move easily on the base or bed A, the latter may have an annular shoulder, as a^2, surrounding the hollow post *a*, said shoulder forming a reduced bearing for the turn-table.

C is the crank-shaft journaled in standards *b*, secured to or formed integral with the turn-table B, said shaft being provided near its center with a crank, *c*, arranged over the hollow post *a*.

D is the wind-wheel, the hub *d* of which is fastened to the shaft C in any suitable manner. The hub *d*, being of metal, is preferably cast with two concentric recesses in one face, said recesses forming three annular flanges, as shown in Fig. 3. The arms *d'*, which are preferably of gas-pipe, pass freely through holes in the outer flange, and are screwed into threaded holes in the central flange, which is formed of sufficient thickness to support them; or, if desired, said arms may also pass into the inner flange. I make each of the arms *d'* of two pieces of gas-pipe, the outer piece being of lesser diameter than the inner one, the two portions of the arms being connected by an internally-threaded sleeve or thimble, d^2. To the arms *d'* are fastened suitable cross-pieces or other securing devices, to which the fans or blades d^3 of the wind-wheel are attached by screws, bolts, or rivets.

To strengthen the wind-wheel, and to permit its arms to be adjusted outward or away from the tower, thus making said wheel slightly dishing or hollowing, the shaft C is extended for some distance beyond the hub *d*, the extended portion of said shaft being screw-threaded to receive a threaded sleeve, E, on which is swiveled a hub or smaller sleeve, *e*. To the sleeve *e* are attached two sets of braces, *e'* and e^2, the braces *e'* being fastened to the arms of the wind-wheel near their centers, and the braces e^2 being attached to said arms near their outer extremities; or, if desired, one set of braces only may be used. With this construction it is obvious that by screwing the threaded sleeve E outward or away from the hub *d*, the braces *e' e²* will be tightened, thus springing the arms *d'* slightly outward.

To the turn-table B is secured an arch, F, supporting the vane G. Said vane is pivoted to said arch by means of an upwardly-projecting post, *f*, on the latter, passing through a hole in the hub *g'* on the stock or arm *g*, to which the vane proper is attached. The vane is yieldingly connected with the arch, and through the latter with the turn-table B by a spring rod or bar, H, bent into an angular form, as shown, said rod or bar H being preferably connected with the stock of the vane by a rod, *h*, fastened to a collar, *h'*, by a set-screw, h^2. The rod or bar H serves as a yielding connection between the vane and turn-table, holding the wind-wheel and vane normally, nearly, but not quite, at right angles to each other; or, in other words, normally hold-

ing the vane a little out of line from the crank-shaft, as shown in Fig. 2, said rod or bar being preferably of the proper strength to hold the parts in their normal position until the wind reaches a velocity of about twenty-five miles per hour, when the force of the spring will be overcome and the wind-wheel will be turned more or less out of the wind or toward the vane, as indicated in dotted lines in Fig. 2, the turn-table turning with the wheel, but the vane retaining a constant position relative to the direction of the wind. This result is due to the angle at which the wind will strike the blades of the wind-wheel, and the fact that the wind-wheel and vane are normally held not quite at right angles to each other. When the force of the wind decreases to a sufficient degree, the turn-table and wind-wheel will be caused to assume their normal positions by the force of the spring rod or bar H, which, from the function that it performs, may very properly be termed a "spring-governor."

It will be noticed that the construction just above described enables me to dispense with the side vanes employed in many windmills for turning the wind-wheels aside in high winds. Instead of the spring-rod or bar H, formed as shown, for yieldingly connecting the vane and the wind-wheel through the arch and the turn-table, this connection might be made by one or more strong spiral springs connecting the vane with the arch, the position of such a spring being indicated by dotted lines in Fig. 2.

To prevent the vane from dropping, a brace or stay rod, f', is fastened to the stock of the vane, and to the post f on the arch F, the post being steadied by a counter-brace, f^2, connected with one of the standards b on the turn-table. These braces have a pivotal connection with the post f, to admit of free independent movements of the vane and turn-table.

Instead of making each of the arms of the wind-wheel of two connected pieces of gas-pipe, it is obvious that they may be made of a single piece.

It will be understood that a pitman-rod for conveying motion to any desired mechanism will be connected to the crank c in the ordinary manner.

By constructing the hub of the wind-wheel in the form shown I avoid weakening the arms by screw-threads at their outer bearings in the hub or at the points of greatest strain on said arms.

While I have provided for but eight fans or blades in the form of wind-wheel shown, it will be understood that a larger number may be employed, twenty being the number which I prefer.

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

1. The combination, with the turn-table, arch, crank-shaft, wind-wheel, and vane, of a spring-governor normally holding the vane a little out of line from the crank-shaft and yieldingly connecting said vane and wind-wheel through the arch, turn-table, and crank-shaft, whereby the wind-wheel may automatically adjust itself toward said vane according to the varying force of the wind, substantially as set forth.

2. The combination, with the turn-table B, arch F, crank-shaft C, wind-wheel D, and vane G, of the angular spring-governor H, normally holding the vane a little out of line from the crank-shaft and yieldingly connecting said wind-wheel and vane, substantially as set forth.

3. The combination, with the arch F and vane G, of the collar h', mounted on the stock of the vane, the rod h, fastened to said collar, and the angular spring-governor H, fastened to said rod and the arch F, substantially as described.

4. The combination, with the shaft C, having a threaded extension, and the wind-wheel D, mounted on the said shaft, of the internally-threaded sleeve E, adapted to said threaded extension, the hub or sleeve e, swiveled on the threaded sleeve E, and braces connected with the hub or sleeve e and the arms of the wind-wheel, substantially as described.

5. The combination, with the turn-table B and the arch F, having the post f, of the vane G, pivoted to said post, and the brace or stay rods f' f^2, also having a loose or pivotal connection with said post, substantially as described.

6. The combination, with the flanged hub d, of the arms d', passing freely through the outer flange and screwed into an inner flange, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE M. TAYLOR.

Witnesses:
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