(No Model.)

M. D. SAGGAU.

WINDMILL.

No. 420,921. Patented Feb. 4, 1890.

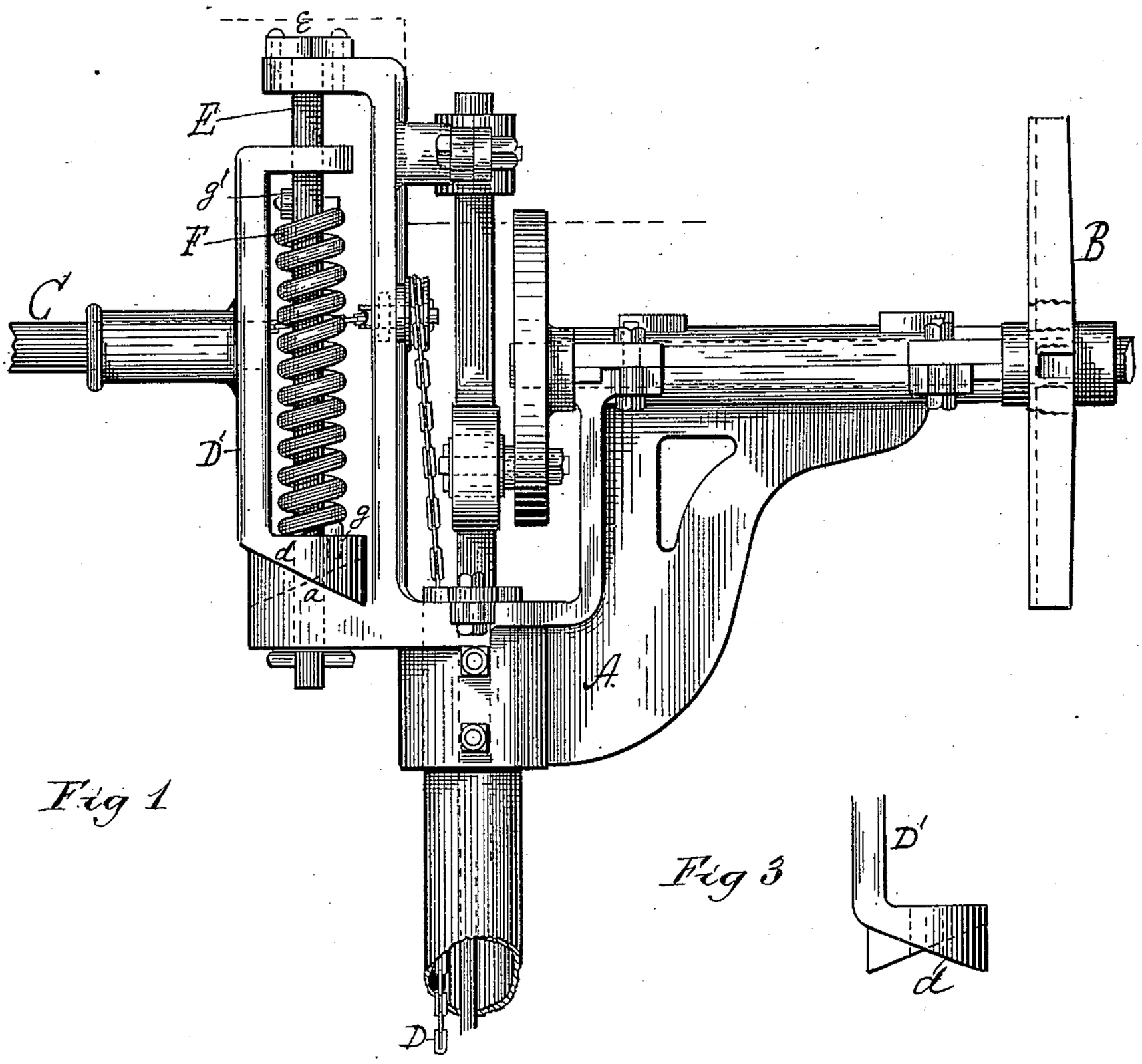


Fig 1

Fig 3

Fig 2

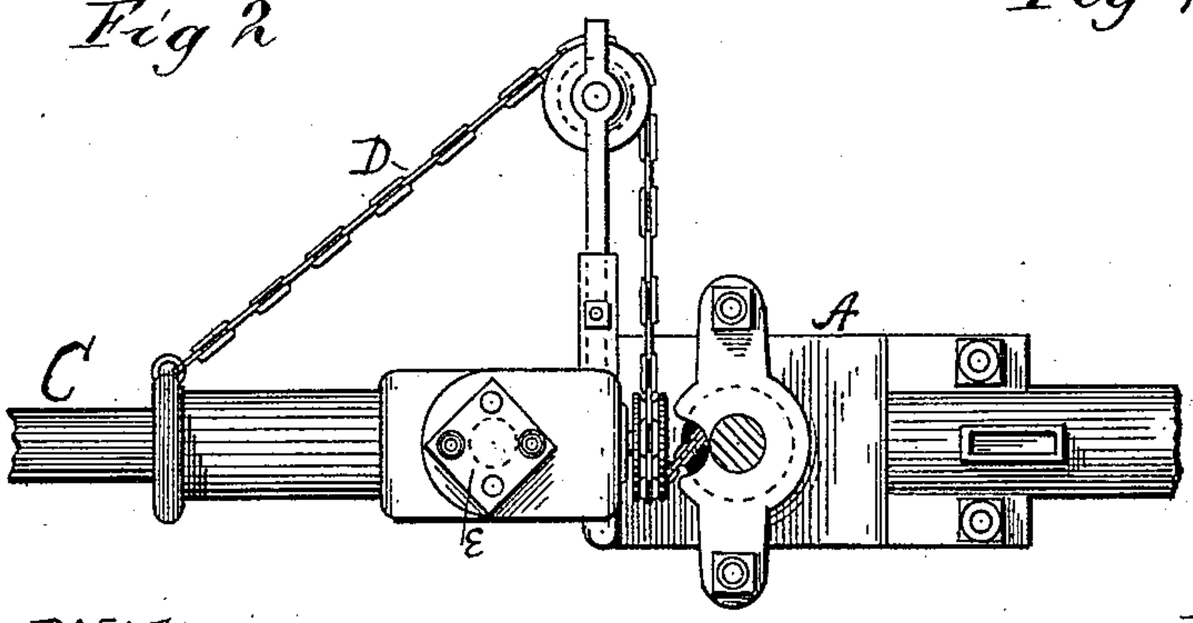
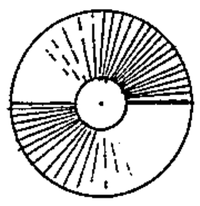


Fig 4



Witnesses

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UNITED STATES PATENT OFFICE.

MARX D. SAGGAU, OF DELAVAN, WISCONSIN.

WINDMILL.

SPECIFICATION forming part of Letters Patent No. 420,921, dated February 4, 1890.

Application filed December 31, 1887. Serial No. 259,455. (No model.)

To all whom it may concern:

Be it known that I, MARX D. SAGGAU, a citizen of the United States of America, residing at Delavan, in the county of Walworth and State of Wisconsin, have invented certain new and useful Improvements in Windmills, of which the following is a specification.

Referring to the accompanying drawings, in which similar reference-letters indicate the same mechanical parts, Figure 1 is a side elevation of the mill; Fig. 2, a top plan of the same, and Figs. 3 and 4 detail views of the inclines.

This invention relates to that class of windmills termed "solid-head" mills, and to the sub-class thereof in which the lateral deflection of the wind-wheel "out of the wind" is opposed by a resistance that increases in proportion to the extent of deflection. Heretofore weights of both equal and varying resistance have been used in a variety of forms, and springs of varying resistance have also been used in different forms to oppose the lateral deflection of the wheel. As distinguished from such old structures, my invention consists in applying the combined forces of gravity and a spring to oppose the lateral deflection of the wheel out of the wind with a force which increases in proportion to the extent of such deflection.

In the drawings, A is the head or turn-table of the mill; B, the wind-wheel; C, the tail-vane, and D the usual chain or cord for deflecting the wind-wheel by hand.

The head A is provided with an incline *a*, upon which rests a block, frame, or casting D′, to which the tail-vane is rigidly affixed, said block D′ having an inclined lower surface *d*, which fits and rests upon the incline *a*, the casting D′ being centered upon a suitable pivot E, around which it partially rotates. The inclines *a d* are preferably double, as shown in Figs. 3 and 4, and will be recognized as substantially similar to those heretofore used extensively in self-closing gates and window-shutters. A coiled spring F is arranged so as to force the casting D′ down upon the incline *a*, thereby, in conjunction with the gravity of the vane and its support, tending to normally hold the vane in line with, or nearly in line with, the shaft of the wind-wheel and thus keep the wheel to the wind. The direct force of the spring F increases as the spring is compressed by the rising of the casting D′ upon the incline *a*, thereby causing its resistance to be varied in proportion to the deflection of the wind-wheel.

In order to combine the direct and torsional forces of the spring to aid in varying said resistance, I make the coiled spring F of suitable length and anchor one end of it to the casting D′ and the other end to some part of the head or other fixed support independent of the casting, whereby the turning of the vane and its casting D′ as the wheel deflects will coil the spring more tightly, and thus bring its torsional force into action to resist such deflection. A convenient mode of thus attaching the spring is to fasten the pivot E so that it cannot turn in the head, and then stick one end of the spring into a hole in the casting D′, as shown in dotted lines at *g*, and the other end through a hole in the pivot, as shown at *g′*. With this construction the rising of the casting D′ on the incline *a* both compresses and coils the spring, and thus its direct and torsional forces combine to resist the deflection of the wheel and to vary such resistance in proportion to the extent of deflection.

The advantage of my improved construction is that as the resistance is divided between spring force and gravity the spring can be made smaller and lighter than when a spring alone is employed, and the combined force is greater than when gravity alone is employed. The action of gravity is not adjustable; but the force of the spring can be adjusted at will—for example, by turning the pivot-bolt E in its bearings and locking it in different positions by means of a nut *e* or a pin passing through the head of the pivot-bolt into the casting. The result is a structure at once more compact, efficient, adjustable, and shapely than prior constructions for the same general purpose.

I claim as my invention—

1. In a windmill, the combination of the wind-wheel with a mill-head having the incline *a*, a tail-vane having the incline *d*, and a

spring arranged to force the incline *d* down upon the incline *a*, substantially as described.

2. In a windmill, the combination of the wind-wheel with a mill-head having the incline *a*, a tail-vane having the incline *d*, and a coiled spring F, arranged to force the incline *d* down upon the incline *a*, and having one of its ends secured to the mill-head and the other to the tail-vane, so that it will be put under both torsional and vertical strain by the lateral deflection of the wind-wheel with relation to the tail-vane, substantially as described.

MARX D. SAGGAU.

In presence of—
R. H. MILLS,
A. H. KENDRICK.