(No Model.)

2 Sheets—Sheet 1.

G. GARSIDE.

WIND ENGINE.

No. 260,970. Patented July 11, 1882.

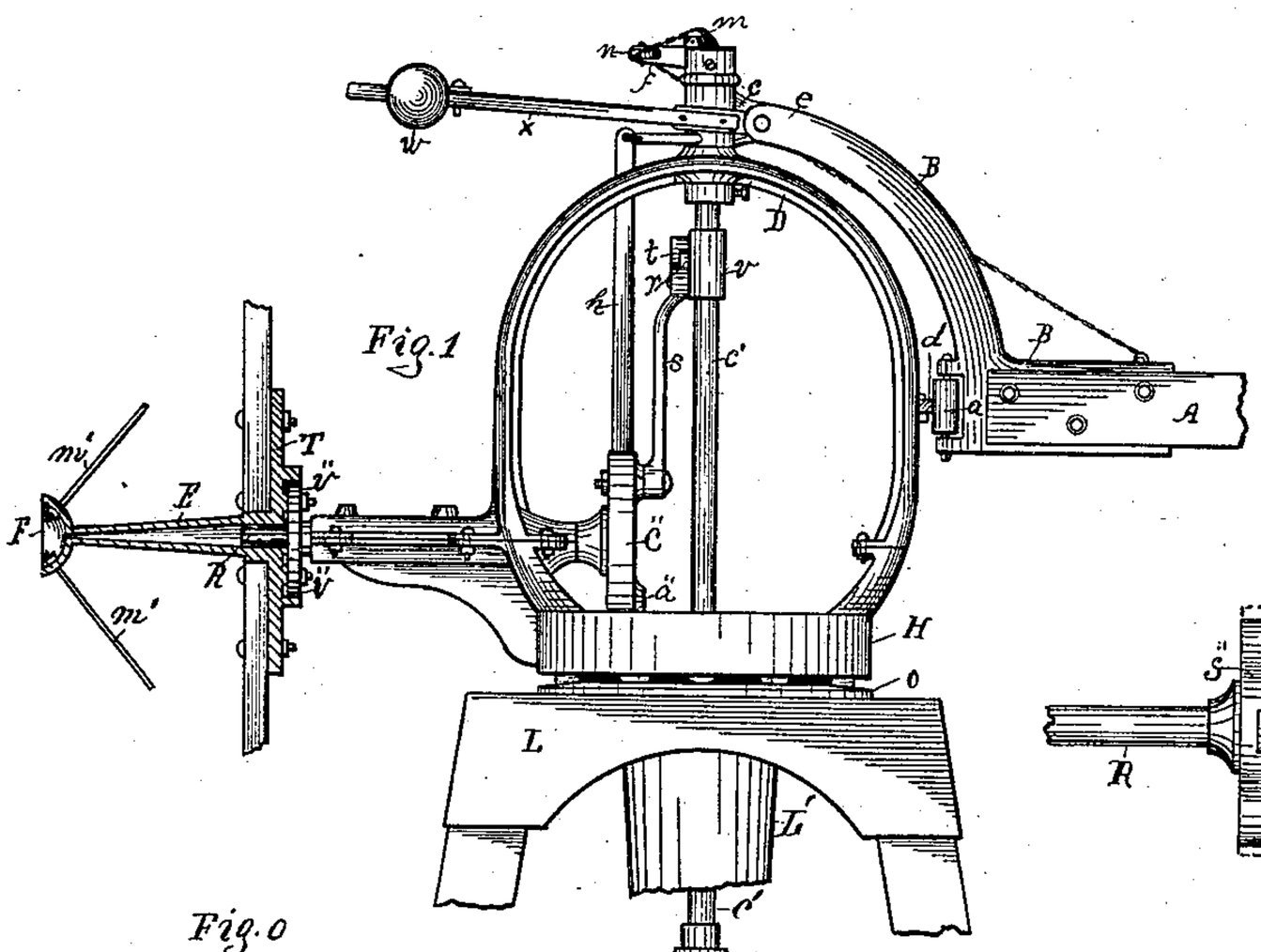

Fig. 1

Fig. 00

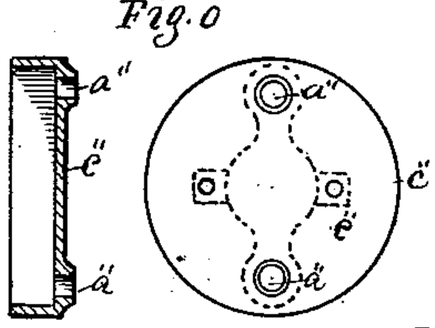

Fig. 0

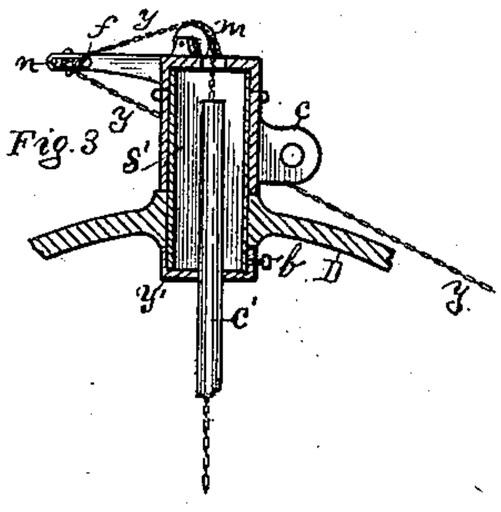

Fig. 3

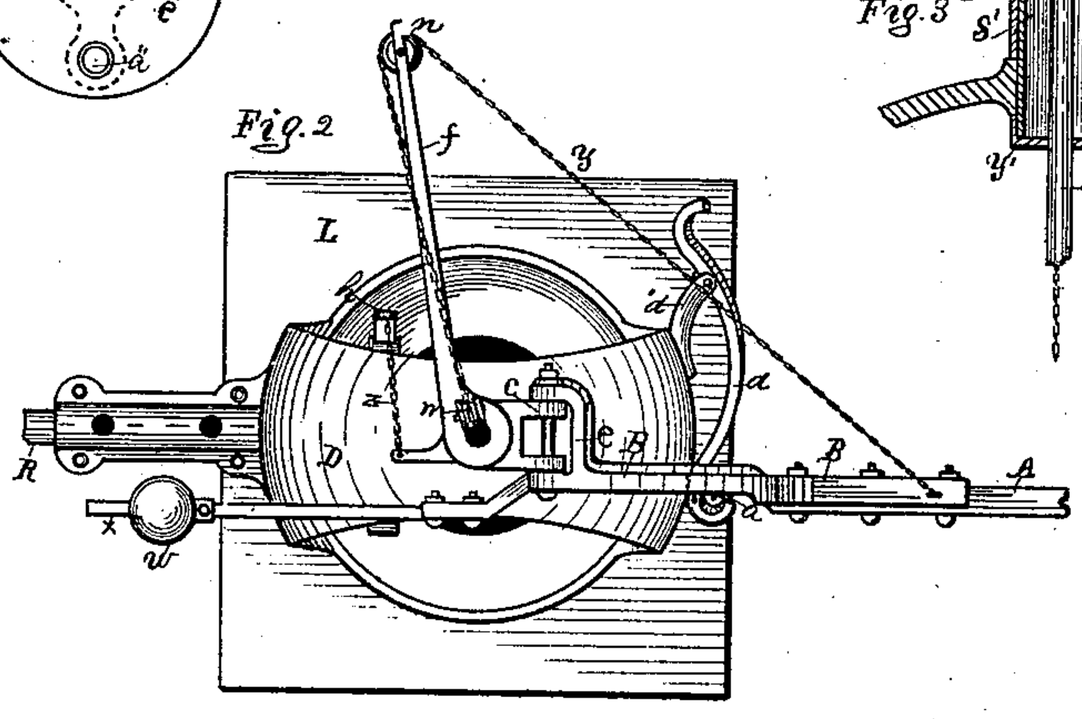

Fig. 2

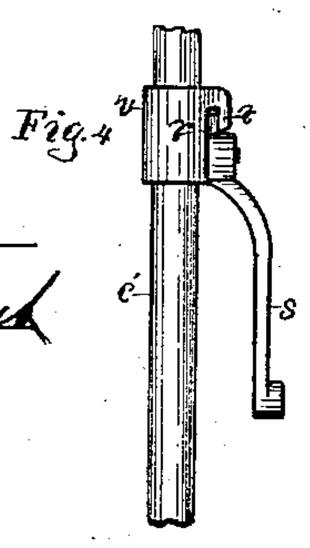

Fig. 4

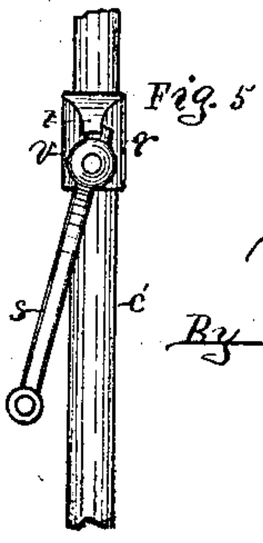

Fig. 5

Witnesses.

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(No Model.) 2 Sheets—Sheet 2.

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WIND ENGINE.

No. 260,970. Patented July 11, 1882.

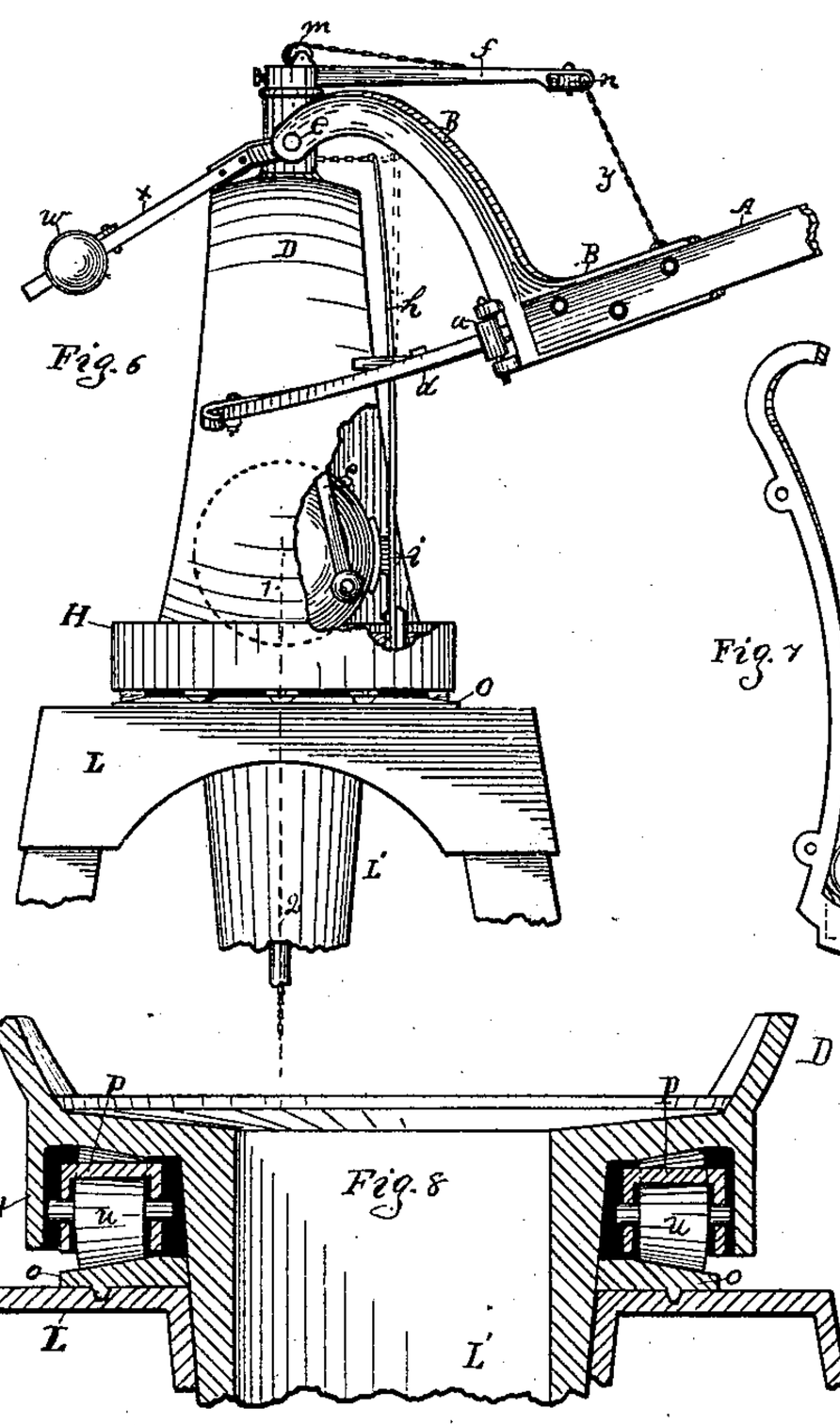

Fig. 6

Fig. 7

Fig. 8

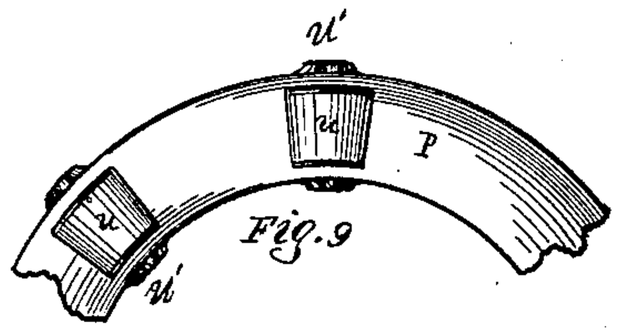

Fig. 9

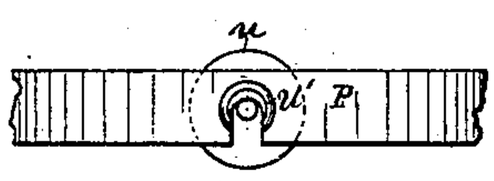

Fig. 10

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UNITED STATES PATENT OFFICE.

GEORGE GARSIDE, OF KALAMAZOO, MICHIGAN.

WIND-ENGINE.

SPECIFICATION forming part of Letters Patent No. 260,970, dated July 11, 1882.

Application filed March 18, 1882. (No model.)

To all whom it may concern:

Be it known that I, GEORGE GARSIDE, a citizen of Canada, residing at Kalamazoo, county of Kalamazoo, State of Michigan, have invented a new and useful Wind-Engine, of which the following is a specification.

My invention has for its object certain improvements in such devices, the novelty and utility of which are pointed out in the following description.

In the annexed drawings, forming a part of this specification, Figure 1 is a side elevation, partly in section; Fig. 2, a top view of same, both figures showing the position of parts with the wheel in the wind; Fig. 3, a section on a line near *m* D in Fig. 6; Figs. 0 and 00, details of the wheel-shaft, hereinafter explained; Fig. 6, rear view with wheel out of the wind; Fig. 7, portion of Fig. 6, enlarged; Fig. 8, section on line 1 2 in Fig. 6, and Figs. 9 and 10 details of parts located between the cap and head.

D is the head of the engine, and L the cap to the derrick. In the top of the head is secured a tubular casting, *s'*, Fig. 3.

c is a hinging-eye located around tube *s'* above head D in a manner to turn laterally in either direction. This eye has a horizontal projecting portion, with which the casting B of vane A is hinged in a manner to swing vertically from a horizontal upward to an oblique angle.

Above the eye *c* arm *f* is secured by a set-screw in the collar of said arm. The top of said collar is perforated in the center, and is provided with wheel *m*. The end of arm *f* is also provided with wheel *n*. Chain *y*, after connecting with the vane, passes around these pulley-wheels, thus being at an angle to swing the vane laterally when pulled down upon in the usual manner from below.

d is an eccentric cam, secured to head D in a position that wheel *a* of arm B of the vane will play against its outer edge, for the purpose below explained.

Secured to the hinged end *e* of vane A is the weighted arm X, thus being on a horizontal line parallel with vane A when the wheel is running, as in Fig. 1. A vane thus terminating with a weighted arm and having a hinged fulcrum between the weight and vane constitutes, when associated with the specified accompaniments, a self-governing lever in controlling the vane with reference to the wheel's relation to the wind, frequently described as "varying resistance," and well understood without an explanation being needed here.

In the operation of throwing the wheel out of the wind by pulling down on chain *y*, vane A swings laterally, and by means of the inclined eccentric cam *d* also raises or swings vertically to an oblique angle, as before stated, Fig. 6, wheel *a* having traversed the length of cam *d*. It will be thus observed that the incline of cam *d* has no effect in raising the vane at said angle, but is thus inclined to throw it in position to engage wheel *a* in its oblique ascension. This camway needs no cover, because the wheel plays against its edge vertically, and hence snow and ice cannot materially affect the action, as in the case of inclined spiral ways, the upper surface of which is traversed by the friction-wheel.

In an engine thus constructed the parts work with great ease and promptness, as there is much less friction than in other devices, especially those effecting these results by a vertical play of the head or vane on hinging bearings or rods.

In Fig. 7 the form of cam *d* is more clearly shown. Both ends are curved, forming a stop, limiting the swing of the vane vertically. The end J in this Fig. 7 is provided with a pocket containing a rubber cushion to receive the shock when the vane swings down suddenly from the position shown in Fig. 6 to that in Figs. 1 and 2. In swinging to this position it will be observed that the weight tends to retard instead of assisting it, as in some devices. Hence the varying resistance above referred to.

h is a brake consisting of a spring-bar, secured at the lower end rigidly to the head and provided with brake-shoe *i*. The upper end connects with a chain, *z*, said chain being secured to the eye *c*. By this means I produce a cheap brake, having a yielding engagement with the crank-wheel, which brakes the wheel by the same operation which throws the wheel out of the wind, Figs. 1, 2, and 6.

c' is a tubular well-pipe, with which the crank-pitman is connected. I am not the first to use a tubular pump-shaft; but, so far as I know, I am the first to extend it entirely the vertical length of the head, with guide-bear-

ings above and below, which is a great improvement, aside from the object hereinafter stated. *y'* is a collar receiving the upper end of said shaft and centering it in tube *s'*. This collar is held secure to said tube by set-screw *b*, Fig. 3. Chain *y*, after passing over wheel *m*, is entered directly into the tubular shaft, and extends vertically through it its entire length. My improvement in this respect is that the chain passes through the vertical center of the head and is shielded its entire way through. It is thus less liable to become entangled with the mechanism, and the pump-shaft at its upper end does not conflict with it in its vertical movement, thus wearing it as in prior devices. To this shaft is secured collar *v* above the crank, said collar being formed with the recessed projection *t*. The upper end of pitman *s* has a projection, *r*, adapted to fit loosely in said recess of projection *t*, Figs. 4 and 5. The collar *v* also is provided with a stud, on which the pitman is loosely pivoted. It will be observed that such a construction admits of the pitman's freely playing in its connection with the pump-shaft, and that by uncoupling it from the crank it can be swung around and readily detached when desired to repair it or replace with a new one.

R is the wheel-shaft, the same as in prior devices, so far as its location in relation to the wheel and crank-plate is concerned; but I form this shaft of cast-steel, making it and crank-plate *s''* and disk *v''* integral with each other. The shaft is turned down to fit its bearing, as shown.

T is the wheel-spider or hub. I form this and the brace-arm E, having cup end F, with which braces *m' m'* are connected, integral with each other. The advantage of this construction over former devices is that the parts are more cheaply and conveniently made, and the spider T, being detachably bolted to disk *v''*, in lieu of keying it on in the old way, obviates the labor and expense of nicely fitting the parts.

c'' is a friction rim or cap, secured to the crank-plate *s''* by means of bolts passing through said cap and projections *a'' a''* of said plate. This rim *c''* is made of chilled metal, and is designed for the shoe *i* of the brake to play upon or engage in braking the wheel.

In Figs. 00 a front and edge view of the crank-plate is shown, and Fig. 0 shows a front and sectional view of the friction cap or rim *c''*. At *a''* the crank-bolt connects. When this friction-cap *c''* becomes worn it can be readily detached and replaced with a new one.

In Fig. 8, showing friction-wheels between the cap L and head D, my improvement consists of a detachable chilled rim, *o*, of a size to receive and form a bearing to the tubular extension L'. The hole in this rim is a little smaller than the hole through cap L'. Said rim is held to place by lugs on the under face countersunk into the cap. A like rim may be used above the wheels *u u*. When it becomes worn it can be replaced with a new one, thus keeping the engine-head in a true upright position.

P is a circular guide-rim to keep the wheels distributed evenly around the track and to keep them from conflicting with rim H or tube L'. It is made with flanges or sides. The top is perforated at regular intervals and the sides slotted, as shown in Figs. 9 and 10. The wheels *u u* have axial projections, the same being located in the slots and the wheels in the perforations, both loosely, as shown. Around the slots, at the sides of rim P, are ribs or projections *w'*, guarding the axial projections from conflicting with other parts.

Having thus described my invention, what I claim is—

1. In a wind-engine, a vane provided with a weighted extension beyond the point of hinging, said vane hinged in a manner to swing vertically in an oblique angle and also laterally in a horizontal angle, and provided with the friction-wheel, in combination with the cam-way, presenting such a configuration of its front edge for the engagement therewith of said friction-wheel as will cause the rear end of said vane to swing upward at an oblique angle during its lateral swing, substantially as set forth.

2. The combination of the brake-shoe with the friction-disk detachably secured to the crank-plate, substantially as described.

3. A pump-shaft provided with a collar having the recessed projection and a pivot, in combination with the pitman detachably pivoted to said collar and having the projecting end adapted to play in said recess, all substantially as described and shown.

4. The combination, with the wheel-shaft having the integral disk, of the wheel-spider provided with the integral brace-arm and detachably bolted to said disk, substantially as as set forth.

5. In a wind-engine, the combination of the cap and head with the chilled rim-plate having the countersunk lugs, said rim forming both a track for the friction-wheels and a bearing for the tubular extension of the head and adapted for being replaced, substantially as stated.

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