

(No Model.)

2 Sheets—Sheet 1.

A. ZWIEBEL.
HORIZONTAL WINDMILL.

No. 274,541.

Patented Mar. 27, 1883.

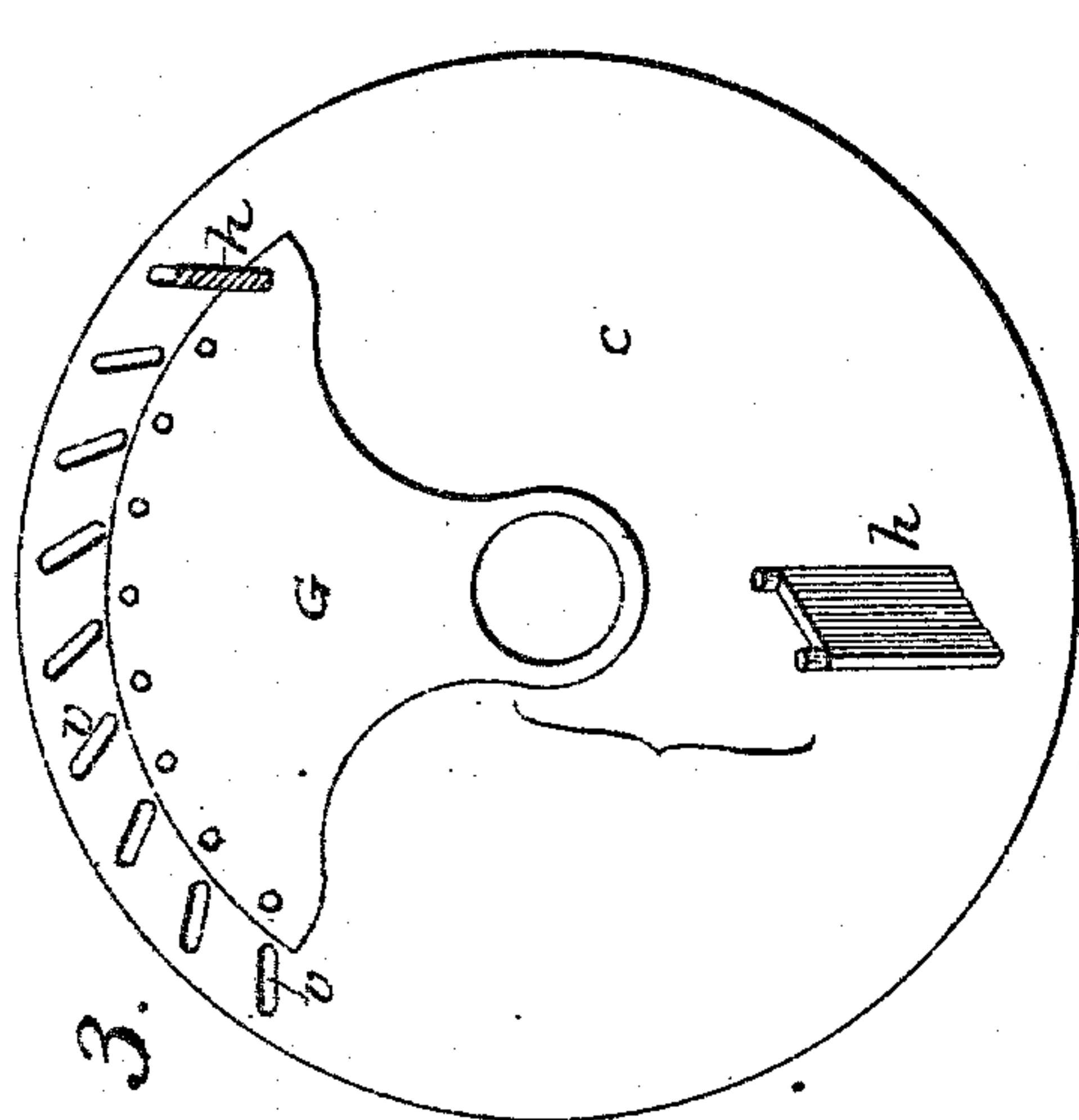


Fig. 3.

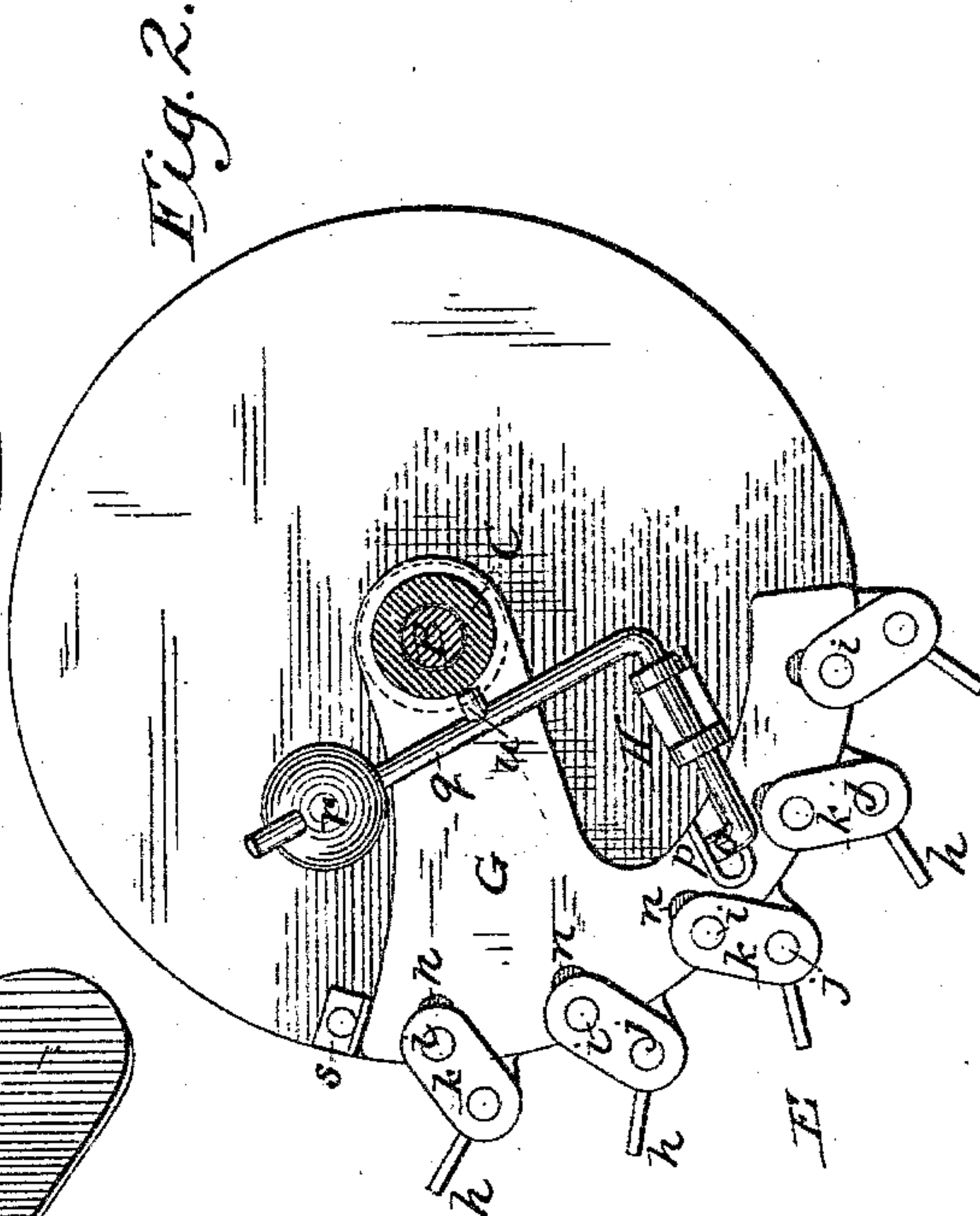


Fig. 2.

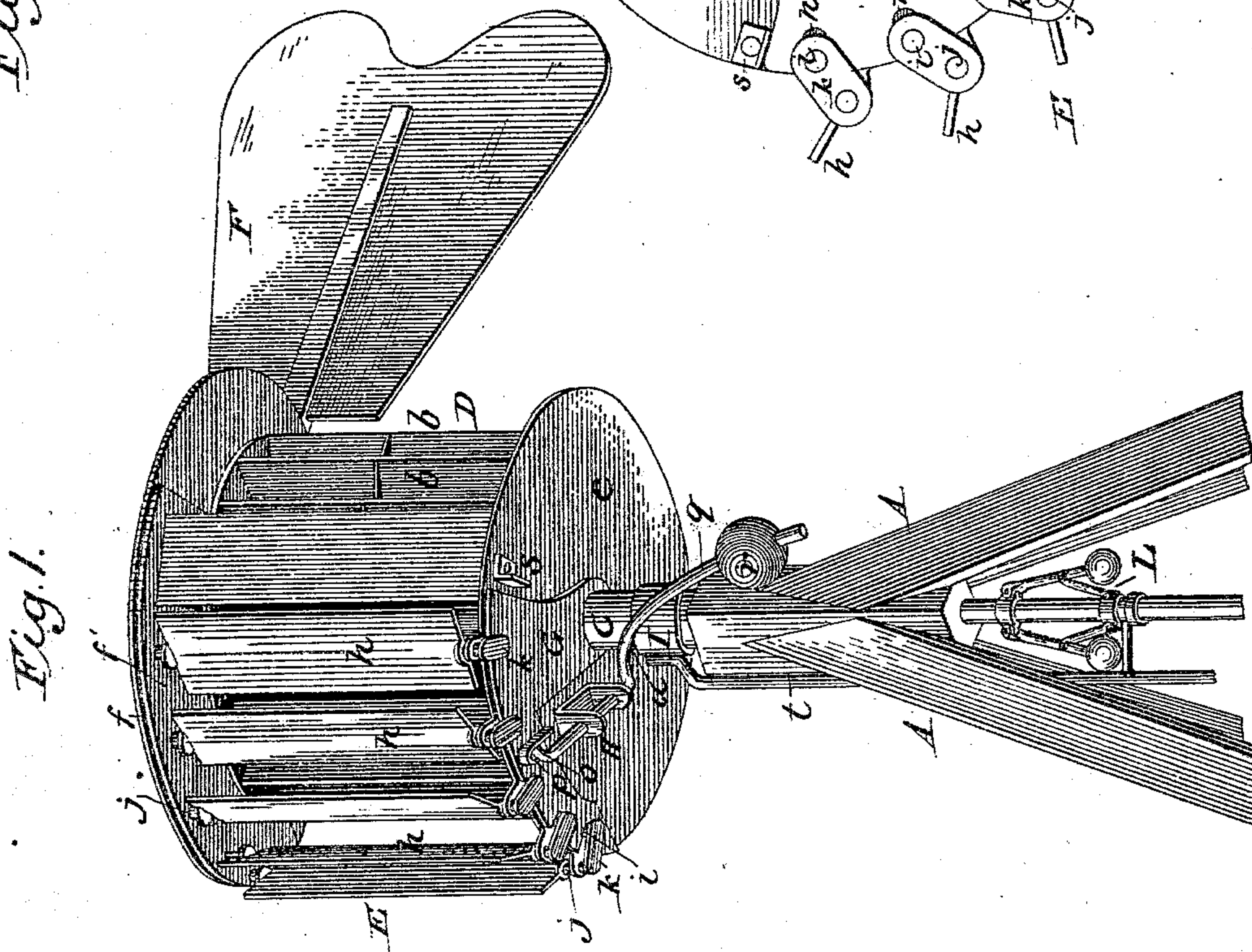


Fig. 1.

Attest.

Sidney P. Hollingsworth
Walter S. Dodge.

Inventor.

Anton Zwiebel,
by Dodge & Son,
Attys.

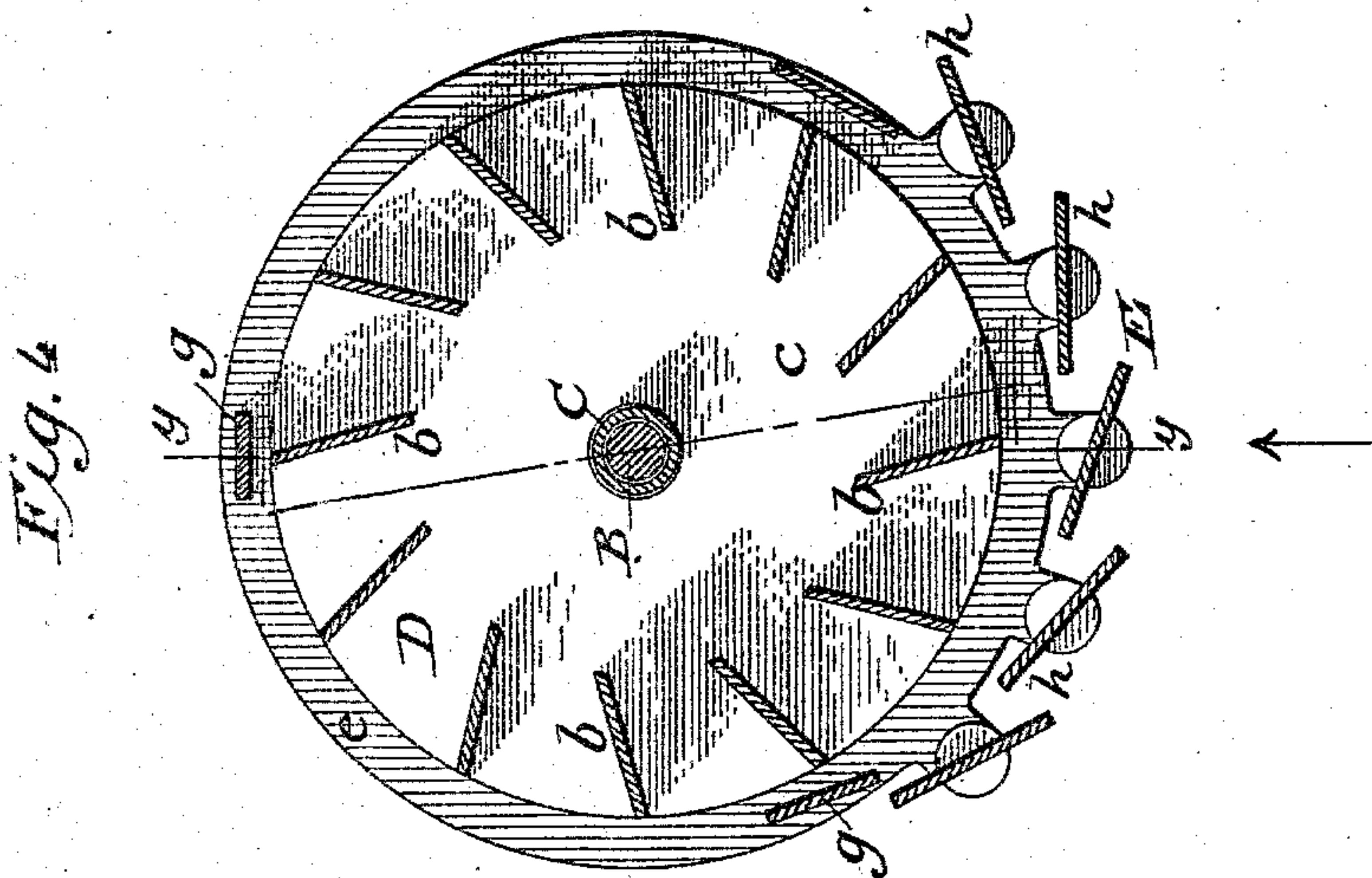
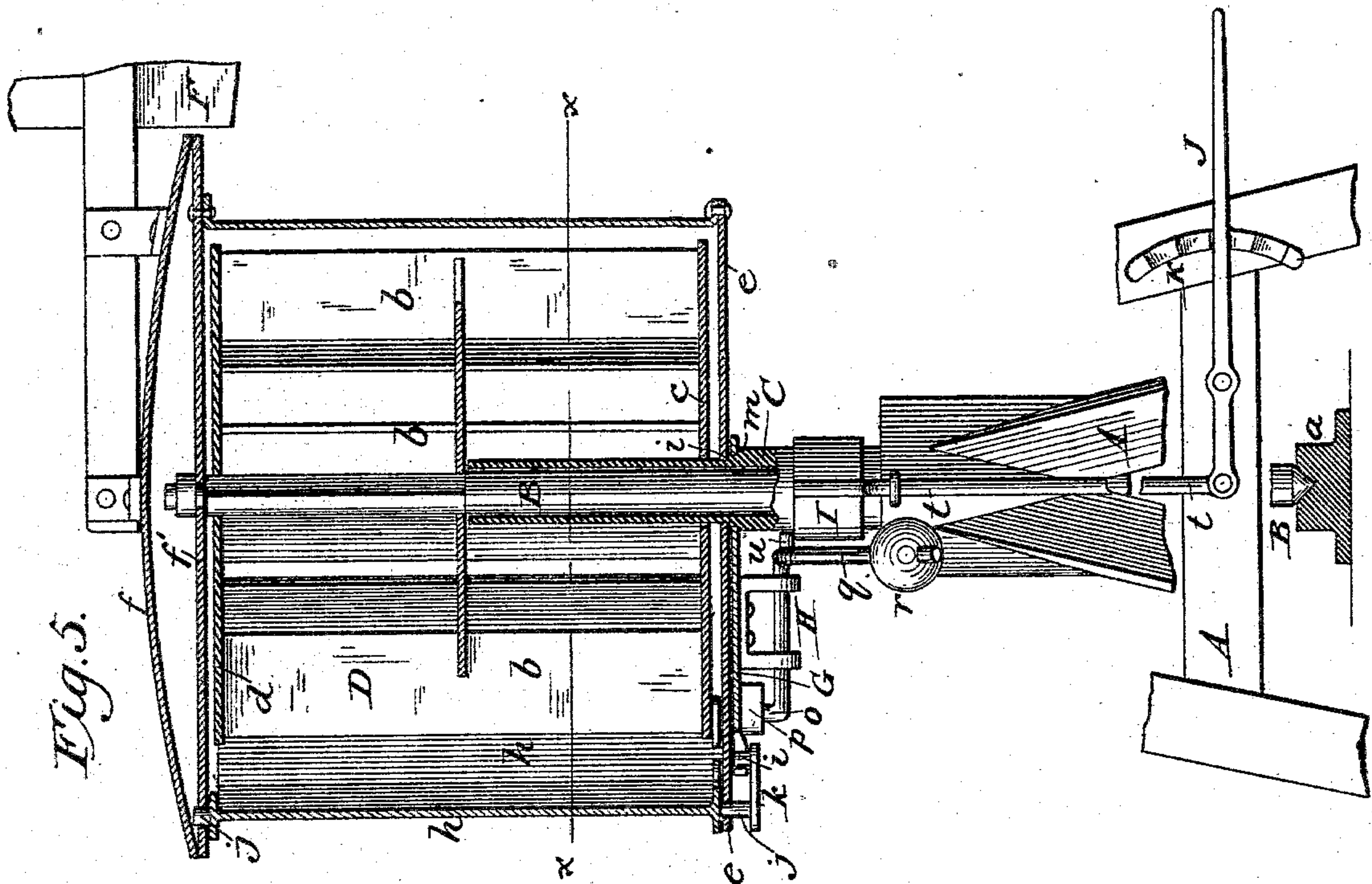
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UNITED STATES PATENT OFFICE.

ANTON ZWIEBEL, OF BURLINGTON, WISCONSIN.

HORIZONTAL WINDMILL.

SPECIFICATION forming part of Letters Patent No. 274,541, dated March 27, 1883.

Application filed February 1, 1883. (No model.)

To all whom it may concern:

Be it known that I, ANTON ZWIEBEL, of Burlington, in the county of Racine and State of Wisconsin, have invented certain Improve-
5 ments in Horizontal Windmills, of which the following is a specification.

My invention relates to horizontal windmills; and it consists in a novel arrangement of the guard-shutters and their operating de-
10 vices, and in other features hereinafter fully explained.

In the accompanying drawings, Figure 1 represents a perspective view of my improved mill, looking from below; Fig. 2, a bottom plan
15 view of the same; Fig. 3, a similar view, illustrating a slight modification in the manner of mounting the guard-shutters; Fig. 4, a horizontal section on the line $x x$ of Fig. 5, and Fig. 5 a vertical section of the mill.

20 Windmills of this general type have been made for many years; but the present improvements enable me to construct the wheel in a durable manner at a small cost and to utilize a very large percentage of the force of the wind.

25 In the drawings, A represents a tower, of any approved construction, which is broken off in the drawings for want of room, and B a vertical spindle extending centrally through the tower, supported at its lower end in a suitable
30 step or block, a , and steadied at its upper end by a tubular upright or extension, C, carried above the tower proper. Upon the spindle or shaft B is secured the wind-wheel D, consisting of a series of rigid vertical tangentially-
35 arranged blades, b , extending from a circular horizontal bottom plate or head, c , to similar top plate or head, d , and braced at an intermediate point or points by a similar plate or plates, preferably extending outward only to
40 about the middle of the blades. The upper part of the shaft is squared to prevent the wheel from turning thereon, while the portion within the tubular neck or upright C is cylindrical, as shown.

45 E represents a revolving shell or casing, consisting of a bottom or floor, e , and a top or roof, $f f'$, connected by vertical bars or braces g , and carrying between the roof and the floor a series of pivoted shutters, h , which may be
50 opened or closed to any extent required, to regulate the admission of wind to the wheel, the shutter covering from about one-quarter to

one-third of the body of the wheel D, as more plainly indicated in Fig. 4. These shutters serve not only to control the admission of the
55 wind to the wheel, but also to give direction thereto, the shield or shutter being held on that side of the wheel from which the wind blows by means of a vane or rudder, F, placed
60 on the top or roof of the revolving shell E, as shown, so that it may be readily acted upon by the wind, and not be shielded therefrom by the body of the wheel or the turning shell or casing. The shell or casing E is supported at
65 the top by the upper end of shaft or spindle B and at the bottom upon a shoulder, i , formed upon the tubular neck or upright C, and is therefore well sustained, while permitted to turn freely and easily as required. The shut-
70 ters h are formed with a pintle or journal, j , at each end, midway between its edges, which are seated in or passed through circular openings in the top and bottom plates or floor and ceiling e and f' of revolving shell or casing E,
75 those at the lower end extending below the floor, and being furnished with radial arms k , each having a vertical stud or pin, l , at its outer end.

G represents a sector-plate, having a circular opening at its inner or central portion to fit
80 around the tubular sleeve or upright C, which is formed with a second shoulder, m , for the inner end of the plate to rest upon, the outer edge or periphery of the plate being provided with slots or notches n , to receive the studs or
85 pins l of the arms k , upon the upper side of which arms the plate rests and is supported, thus avoiding all danger of its dropping down or of getting out of place. It will be seen that
90 under this construction, if the plate G be swung about the sleeve or upright C, the head or guard E being at the same time held stationary by the vane or rudder, the shutters h will be opened or closed, according to the direction
95 of the movement, the notched plate acting upon the pin l of arms k , which latter turn the shutters upon their pivots j . The shutters are held normally open by means of a rock-shaft, H, hav-
100 ing a projecting arm or finger, o , which enters a slot, p , and serves to move the plate about the central sleeve or upright, C, as the shaft is rocked, said shaft being also furnished with a longer arm, q , upon which is secured a weight, r , which tips and holds the rock-shaft in the

proper direction to hold the shutters open, a stop, *s*, being provided to limit the movement of the plate.

In time of high winds, or when there is no work to be done by the mill, it is desirable to throw it out of action, for which purpose the shutters are closed, thereby covering up the front of the wheel and shutting out the wind therefrom. To effect this closing of the shutters, I provide a sliding collar or band, *I*, which encircles the upright or sleeve *C*, and is furnished with a rod, *t*, which passes down to a point within easy reach from the ground, where it is in some cases attached to a hand-lever, *J*, which serves to raise or lower the rod, and may be locked at any desired point to a segmental rack, *K*, over which it moves, and thereby hold the rod at any desired adjustment. A governor, *L*, is, however, preferably employed to move rod *t*, said governor being arranged upon or driven by shaft *B*, and connected with collar *I* in any convenient manner.

Upon the upper edge of the collar rests a stud or lug, *u*, projecting from the side of arm *q* of rock-shaft *H*, as indicated in Fig. 5, so that when the rod and its collar or ring *I* are raised the rock-shaft is turned and caused to move plate *G*, which turns the shutters, as explained. The stud or lug *u* will preferably carry an anti-friction roller in practice, in order that when the shell or casing *E* rotates to bring the guard or shield to the wind the lug may travel freely around upon the collar.

If preferred, the shutters may be arranged as shown in Fig. 3, each shutter *h* being formed with two pintles or journals at each end, one at either edge, as shown, and the outer pintles at the top and bottom being arranged in slots *v* in the floor and ceiling of the shell or casing *E*, while the inner pintles or journals are fitted in circular openings in the sector-plate *G*, which latter is in such case arranged above instead of below the floor, and may be made with a collar passing down through the same around the upright or sleeve *C*, to enable it to be turned as required, or may be otherwise arranged. The movement of the sector-plate under such arrangement would cause the shutters to change their angle of inclination in essentially the same manner as before explained, the outer studs or pintles moving in the slots *v*. The construction first described is, however, preferred. The shaft or spindle *B* will of course be furnished with a gear or band wheel, a crank, or other common device for giving motion to other machinery.

It will be seen that with the governor arranged as shown and described an increase of speed will cause the arms of the governor to rise and elevate the collar *I*, thereby closing the shutters *h* more or less, their position be-

ing thus regulated exactly in accordance with the speed of the wheel, which is thus kept at a uniform rate.

Having thus described my invention, what I claim is—

1. The herein-described windmill, consisting of tower or support *A*, wheel *D*, carried by vertical spindle *B*, revolving shell, supported and revolving upon said spindle, and provided with shutters *h* and vane *F*, sector-plate *G*, connected with the shutter-arms, substantially as shown and described, and rock-shaft *H*, provided with weight *r*, and arranged to operate said plate, substantially as set forth.

2. In a horizontal windmill, the combination of a wheel, a shell outside of the wheel, provided with shutters having radial arms, and a sector-plate connected with said arms, substantially as shown and described.

3. In combination with a horizontal wind-wheel and a shell provided with pivoted shutters, a sector-plate connected with said shutters substantially as shown and described, a rock-shaft having an arm working in a slot in said plate, and provided with a weighted arm having a lateral projection, and a sliding collar concentric with the wheel, and arranged to engage with said lateral projection, and thereby to turn the rock-shaft when raised, substantially as and for the purposes specified.

4. In a horizontal windmill substantially such as described, the combination of a tower or support provided with a tubular sleeve or upright at its top, a wind-wheel having its shaft or spindle carried through said sleeve, and an outer shell swiveled upon the shaft or spindle and also upon the sleeve or upright, substantially as shown and described.

5. In a windmill, the combination of a tower or support, *A*, having tubular extension *C*, provided with shoulders *i* and *m*, wind-wheel *D*, having shaft or spindle *B* passing through tubular extension *C*, shell *E*, supported upon the end of shaft *B* and shoulder *i*, sector-plate *G*, supported upon shoulder *m* and shutter-arms *k*, and rock-shaft *H*, connected with the sector-plate, substantially as shown.

6. In a horizontal windmill, the combination of a wind-wheel, an outer shell or casing provided with shutters, a sector-plate connected with said shutters, a rock-shaft connected with the sector-plate, a collar concentric with the wheel and extending beneath an arm or stud projecting from the rock-shaft, an upright rod connected with said collar, and a hand-lever connected with the rod and adapted to be held at any desired adjustment, as explained.

ANTON ZWIEBEL.

Witnesses:

FREDERICK S. PERKINS,
H. WAMBOLD.