

W. D. Walker,

Wind Wheel.

N^o 27,325.

Patented Feb. 28, 1860.

Fig. 3.

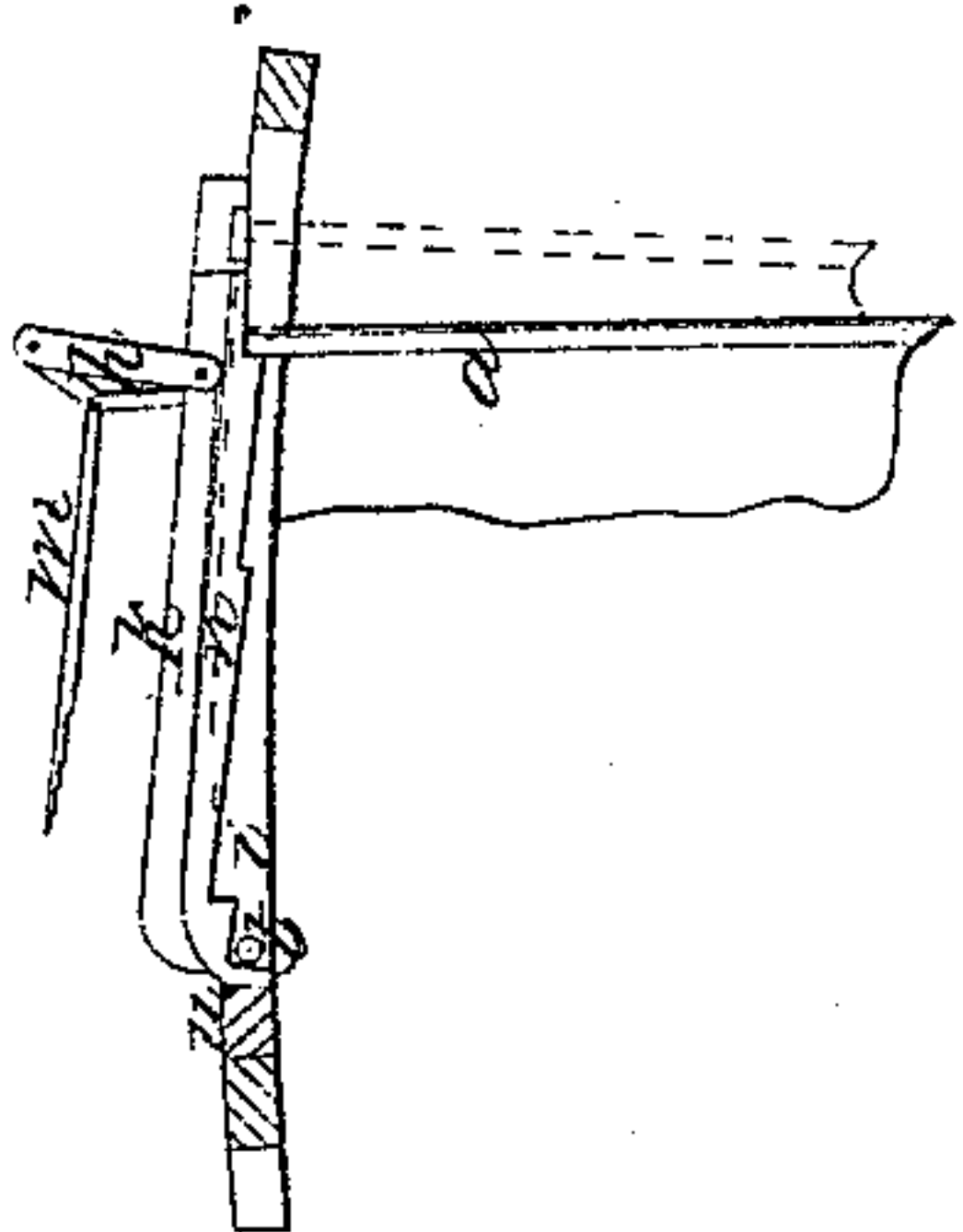


Fig. 4.

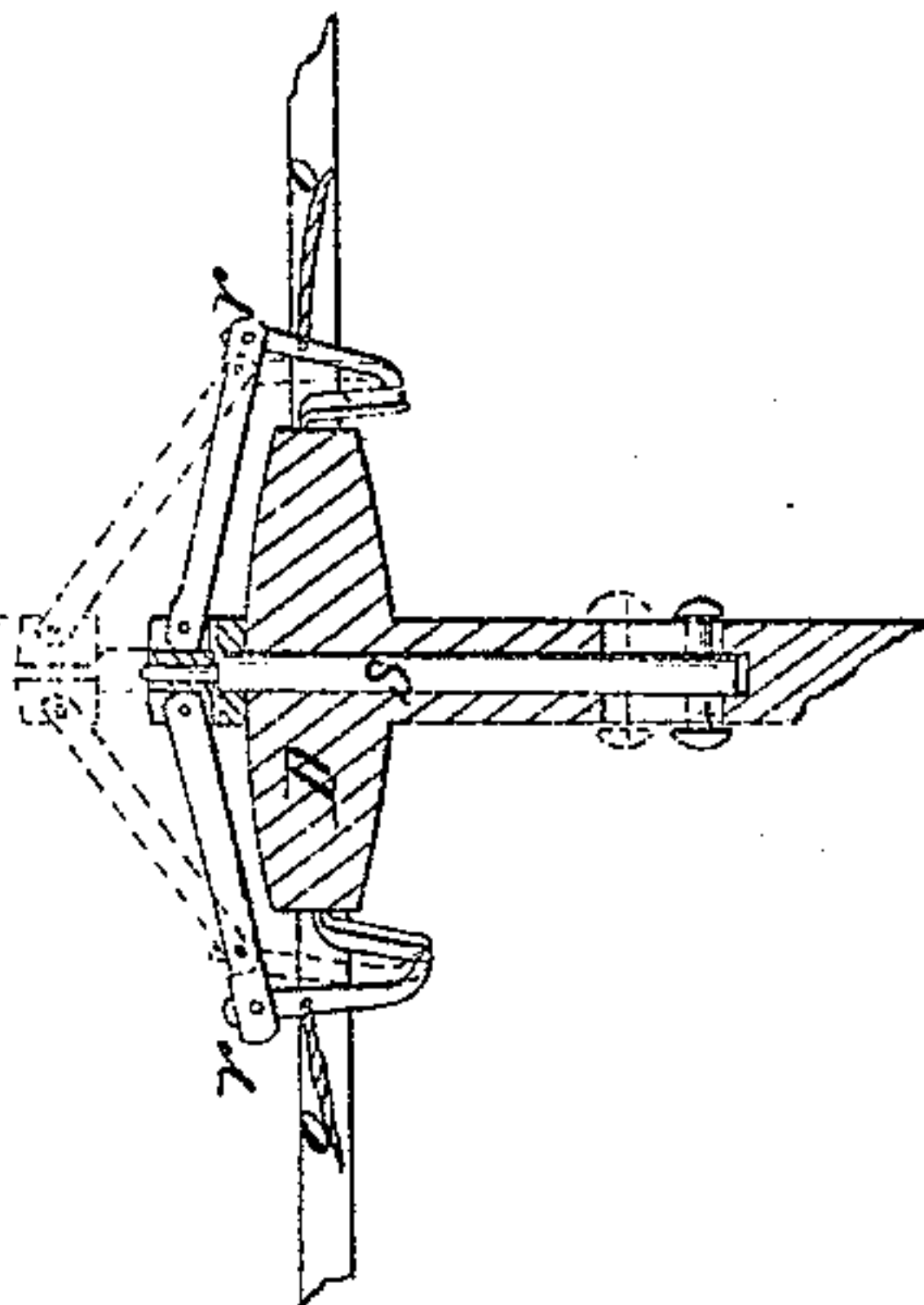


Fig. 2.

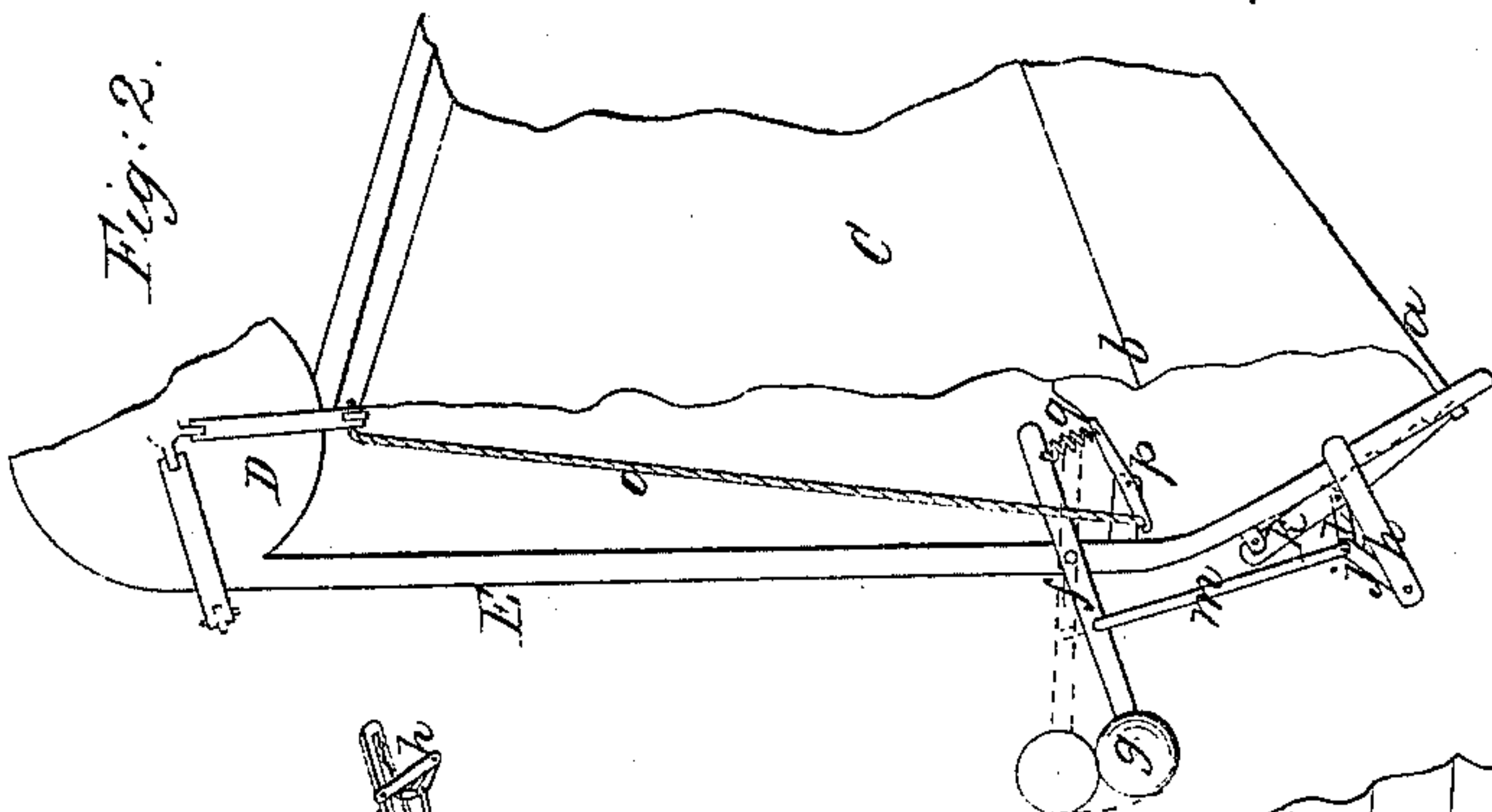
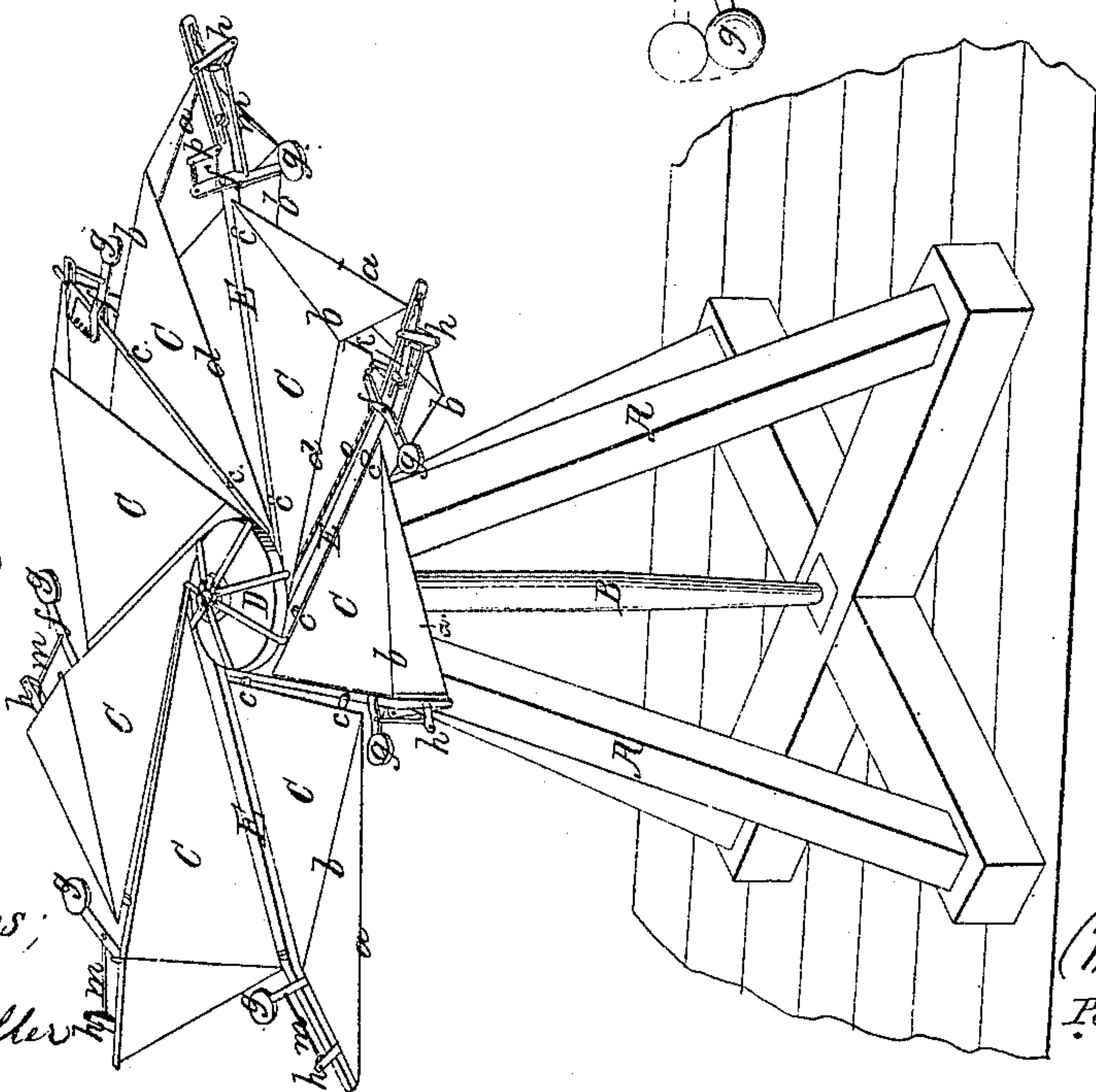


Fig. 1.



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WILLIAM D. WALKER, OF LIVONIA, NEW YORK.

IMPROVEMENT IN METHODS OF REGULATING WIND-WHEELS.

Specification forming part of Letters Patent No. 27,325, dated February 28, 1860.

To all whom it may concern:

Be it known that I, WILLIAM D. WALKER, of Livonia, in the county of Livingston and State of New York, have invented a new and useful Improvement in Wind-Wheels; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 is a general perspective view thereof. Fig. 2 is a detached plan view of the device for regulating the sails. Fig. 3 is an enlarged view of the end of one of the arms E, in section, showing the ratchet-bar *k* and plate *n*. Fig. 4 is a vertical section of the head D and portion of the shaft B, the other parts being broken away.

Similar letters refer to corresponding parts in all the figures.

My invention consists in the peculiar devices which I employ for equalizing the speed of the wheel during variable winds and rendering it controllable to the required rate of motion.

As represented in the drawings, A is the frame-work, and B the vertical shaft on which the sails C are arranged, being situated radially around a central head D, which crowns the shaft. From this head the arms E extend, and the jointed frame-work of the sails is attached to them fixedly near the head, but adjustably at the extremity, where the end of the rib *a* extends through and plays freely in a slot *i* in the end of each arm. The two intermediate ribs *b b*, together with *a*, are hinged to the next adjoining arm at *c*, and form, with the jointed front rods *d d* and *e e*, two wings or sections to each sail, which are covered with cloth, canvas, or other suitable elastic fabric, and which open as their mouths receive the wind, forming a funnel-shaped sail, but close together when their motion is toward it.

To regulate the speed of the wheel and keep it equal under the varying influence of the wind, a governing device is attached, consisting of the cross-lever *f*, pivoted to and at right angles with the arm E and carrying on its outer or longest extremity the ball *g*. From the slotted extremity of E the short arm *h* extends at right angles, at the end of which a short bar *j* is pivoted, to which, also, another short bar *l* connects it with the ratchet-

bar *k*. At the joint between the pieces *j* and *l* is attached the rod *m*, which connects them with the lever *f*. The bar *k* has a ratchet-faced slide *n*, which plays into the slot *i*, the bar itself being pivoted at one end to the arm E, so that it swings outward when the ball *g* moves toward the center of the wheel, or is forced inward when the ball gravitates from the center. The ratchet-teeth are used to form stops or catches for the end of the sail-rod *a* and hold it in the different positions to produce the required speed.

The operation is as follows: As the wind expands the sails the rods *a* are drawn in nearer the center by their opening, and to prevent their expanding too much the end of the rod is caught by one of the ratchet-teeth, as in Fig. 3, and there held till a partial rotation of the wheel brings the point of the sail to the wind and closes it. The movements of the ratchet-bar are governed by the ball *g*, which is hung in such a way that as the speed of the wheel increases the centrifugal force carries it outward, which pushes the bar *k* in through the intervention of the connecting parts *j*, *l*, and *m*, and brings the ratchet-teeth into connection with *a*, thus preventing the farther expansion of the sail. If the speed is too much diminished, the ball gravitates toward the center again and releases *a* a notch or two, giving more extent of sail. This is its action as a self-regulator to equalize the speed where the force of the wind varies; but when it is desired to increase or diminish the general rate of speed further mechanism is employed, consisting of the cord *o*, which acts on the opposite end of the cross-lever *f* through the medium of the short swing-lever and spring *p q*. If the cord is drawn upon, it acts against the centrifugal force, throwing the ball back and the ratchet out of gear, thereby allowing the sails to expand. The cord is connected with jointed knee-levers *r*, Fig. 4, which surround the head D and connect with a sliding spindle *s* in the center of the shaft B. By raising this spindle the knees *r* contract and tighten the cords, holding back the balls until their accumulated centrifugal force becomes sufficient to overcome the force of the spring *q*, when they again act to close the ratchet and prevent too great an expansion of the sail. By drawing

down the spindle *s* the cords are relaxed and the balls are left to actuate the ratchet, as previously described, and check the speed of the wheel. Rigid rods may be employed in place of the cords by dispensing with the parts *p q* and produce a like result.

The slide *n* in the ratchet-bar has its end turned so as to hook upon the pivot *t*, and a piece of india-rubber or other spring is placed back of it to form an elastic cushion and destroy the shock occasioned by the sudden striking of *a* against the ratchet-stops. This gives an easier transition to the change and prevents noise.

The application of the apparatus described to each of the arms *E* produces a very light

yet powerful and well-regulated wind-wheel. I do not claim, broadly, governing wind-wheels by the use of balls or weights acting by centrifugal force; but

I claim as my invention and desire to secure by Letters Patent—

The combination and arrangement of the balls *g*, compound sliding ratchet-bar *k*, hand-regulator *s*, *r*, and *o*, as described, with the sails *C*, substantially in the manner and for the purposes herein set forth.

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