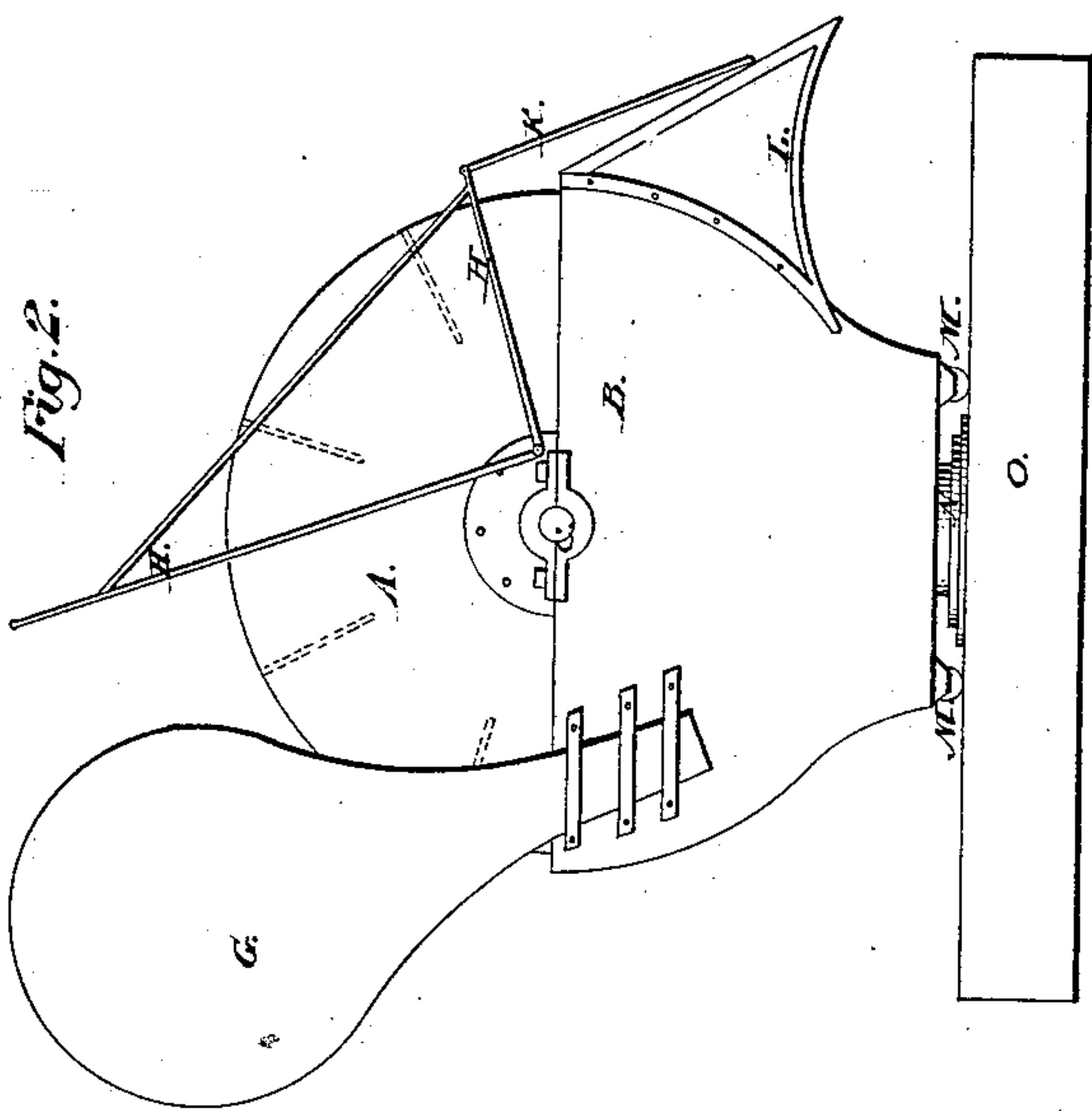


*E. F. Hough,*

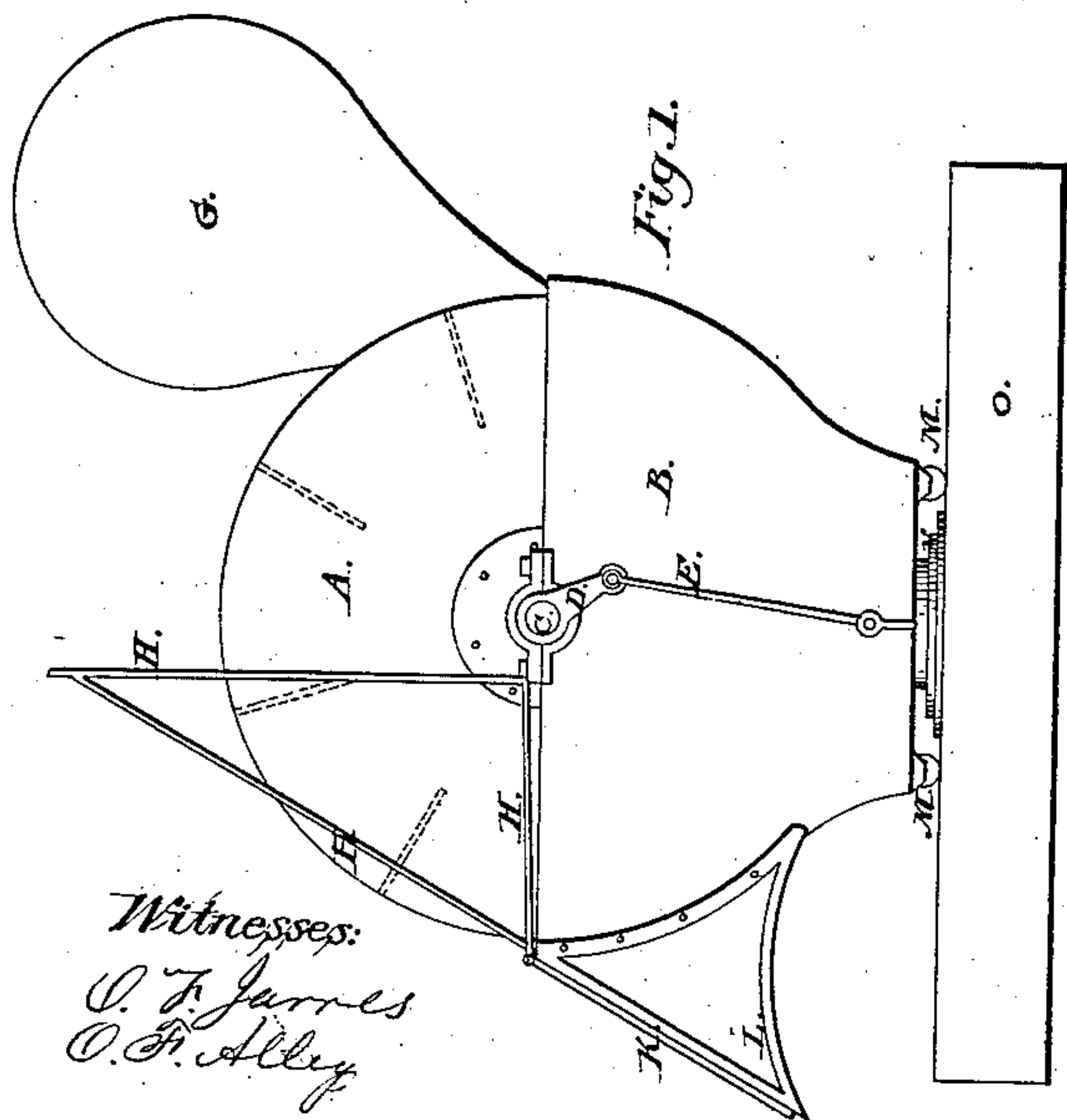
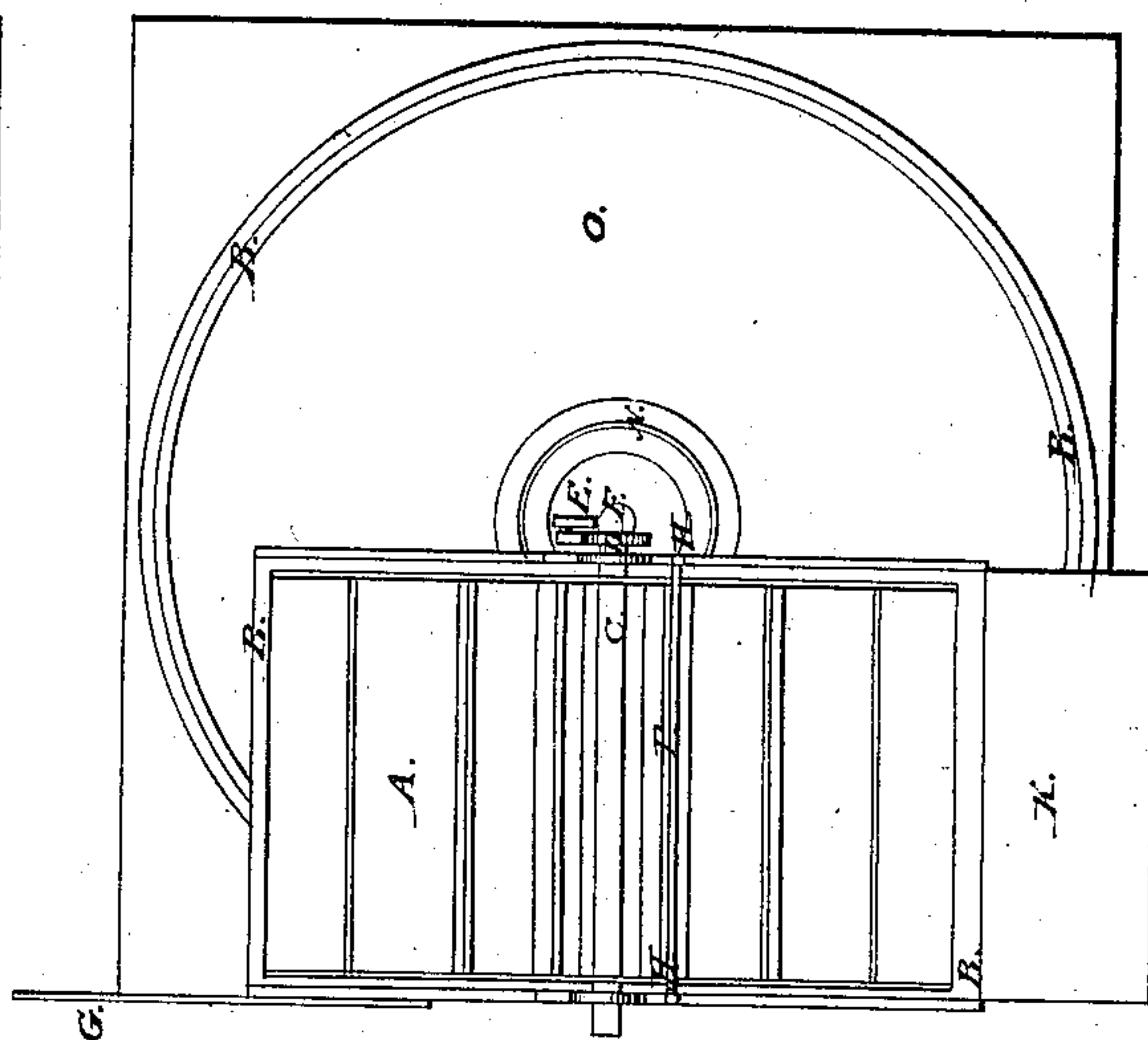
*Wind Wheel,*

*N<sup>o</sup> 50,825.*

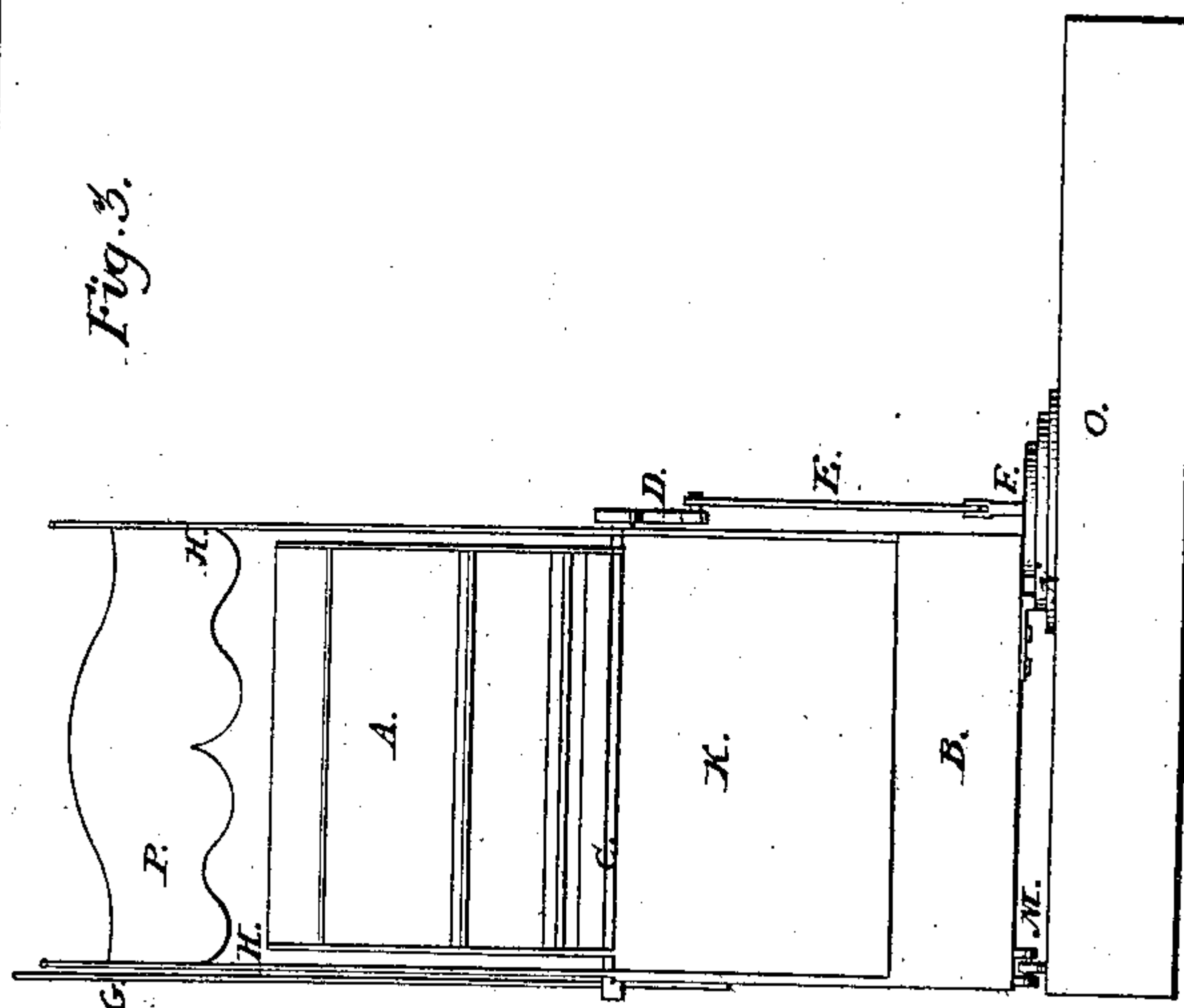
*Patented Nov. 7, 1865.*



*Fig. 4.*



*Fig. 3.*



*Witnesses:*  
*O. F. James*  
*O. P. Alley*

*Inventor:*  
*Charles F. Hough*

# UNITED STATES PATENT OFFICE.

EARL F. HOUGH, OF MARTINEZ, CALIFORNIA.

## IMPROVEMENT IN WIND-WHEELS.

Specification forming part of Letters Patent No. 50,825, dated November 7, 1865.

*To all whom it may concern:*

Be it known that I, EARL F. HOUGH, of Martinez, county of Contra Costa, State of California, have invented certain new Improvements in Windmills; and I do hereby declare that the within is a full, clear, and exact description of the construction and operation of the same, reference being had to the drawings which accompany this specification.

In the drawings, Figure 1 represents a side elevation. Fig. 2 is also a side elevation, showing the apron partially raised. Fig. 3 is an end view. Fig. 4 is a top view.

The nature of my invention consists in providing a windmill with a rotary wheel so arranged by means of an apron and wind-board as that the force of the wind blowing against the wind-board shall raise the apron, shutting off the wind from the wheel and regulating its speed.

To enable others skilled in the art to make use of my improvement, I will proceed to describe its construction and operation.

In Figure 1 A represents the side of wheel. B is the box which partially incloses the wheel. C is the shaft. D is the cam or eccentric connected to the pump-rod F by means of the arms E. G is the vane or tail which guides the wheel, keeping it to the wind's eye. H H are arms to which the apron is attached. I is a cord or rod for strengthening the arms. K represents the apron. L is a frame or brace upon which the apron rests when the wheel is not in action. M M are casters or rollers by which the wheel is carried around upon the track upon the platform. N is a swivel turn-table, which is connected to the box upon which the wheel is placed. O represents the platform.

Fig. 3: P represents the wind or storm board in position.

Fig. 4: R R represent a circular track.

Like letters upon Figs. 3 and 4 represent like parts herein described.

I construct my tank in the usual manner, placed upon timbers or otherwise supported, covering it with two-inch plank. This serves for a foundation upon which to place my wheel.

I use a common overshot or rotary wheel, with twelve fans (more or less) placed horizontally from side to side. One-half of my

wheel I inclose in a box. The other half is exposed to the wind. A horizontal shaft runs through it and rests upon bearings upon each side of the box. To one end of this shaft is attached an eccentric with an arm, which is connected to the pump rod. This pump-rod passes down through the center of a swivel turn-table, upon which one end of the box is fastened, and which supports the wheel and box by means of it and arms extending across the bottom of the box. At the extremity of these arms are placed casters or rollers, which allow the wheel or mill to revolve upon a track made of half-round iron or a flat metallic circular way.

Upon one end of the wheel-box, at opposite sides from the wind-vane, is placed an apron with braces underneath to sustain it, and upon which it rests when the wheel is not in action. This apron is attached to arms by means of hooks. These arms are fastened at their elbows to the box, near the bearings, and rise vertically above the wheel. Across these vertical arms I place a wind-board about a foot wide (more or less) and about one foot above the wheel, which acts as a regulating-guide. I place a rod or cord extending from the perpendicular arms to the apron. This acts as a strengthening-rod for each arm. I also attach a vane or tail of the desired size, constructed of iron or other material, to the side of the wheel or box which is opposite to the swivel turn-table. This serves to bring the wheel to the wind's eye.

The operation of my mill is as follows: The vane or tail serves to keep the wheel to the wind's eye, where it strikes the apron and passes up against or to the wind-board, which is attached to the apron by means of arms at right angles. The wind, blowing against the wind-board lightly, causes it to fall back slightly, and raises the apron but little, and as the wind increases it raises it still higher, until, by its violence, it shuts down the wind-board entirely and raises up the apron to its full extent, and leaving but a small portion of the top of the fans of the wheel exposed to the wind, thus regulating itself.

In order to stop the wheel entirely I attach a cord to the apron and pass it over the wind-board, and by drawing down upon it the apron is raised up and rests upon the wheel, and



thus forming a perfect brake, which stops the motion of the mill entirely.

It is confidently asserted that for durability and power this mill exceeds all others, and with a wheel eight feet in diameter and four feet wide, with two and one-half foot fans, will give nearly three-horse power and four-inch stroke, there being but little friction; and it is not liable to be blown down, for the reason that it is not necessary to elevate it so high to obtain the action of the wind, while the cost is only about one-half of the wind-mills now in use. Not only on account of its simplicity of structure, but because it can be placed directly over the tank and no extra tim-

bers are needed to sustain it, is this wheel desirable.

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

The combination and arrangement of the apron K with the wind or storm board P, together with the wheel-box B, attached to the swivel turn-table N and revolving upon the track R R by means of rollers M M, substantially as and for the purposes set forth.

EARL F. HOUGH.

Witnesses:

O. F. ALLEY,

O. F. JAMES.