

(No Model.)

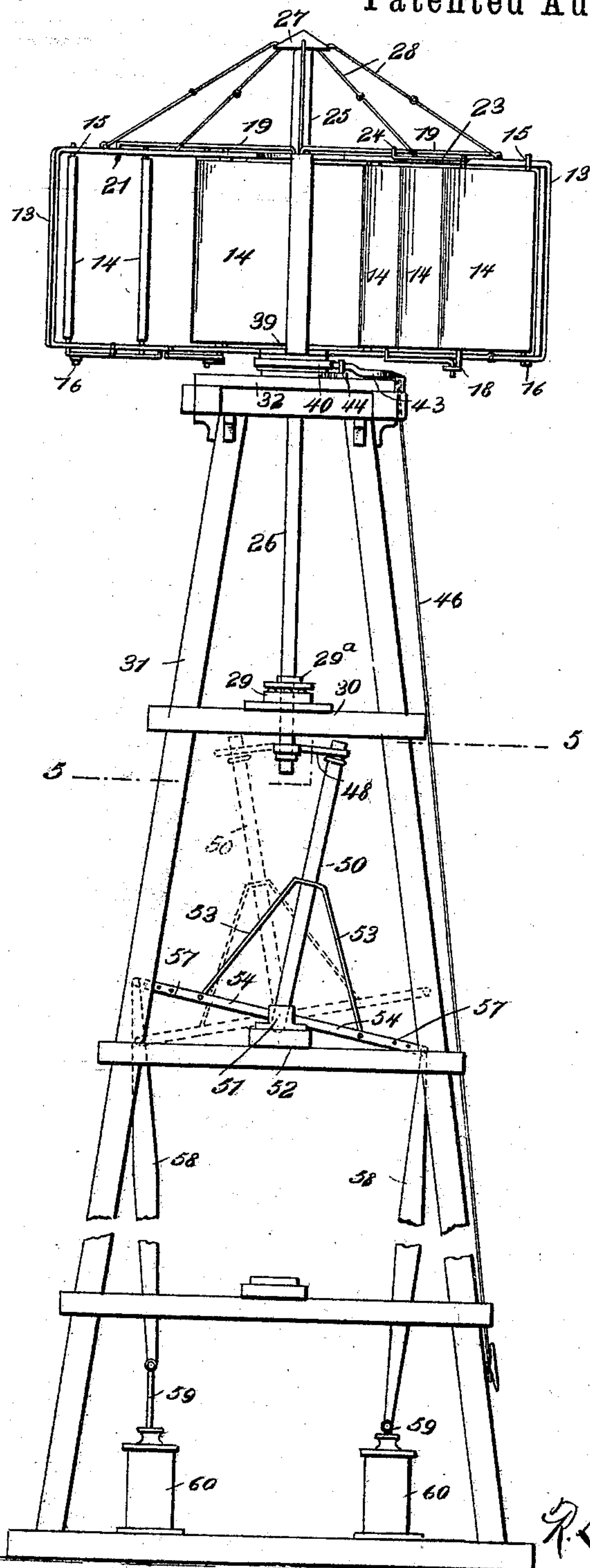
R. LUNDQVIST.
WIND MOTOR.

3 Sheets—Sheet 1.

No. 544,922.

Patented Aug. 20, 1895.

Fig. 1.



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H. O. Hutchinson

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R. Lundqvist

BY

Munn & Co

ATTORNEYS.

(No Model.)

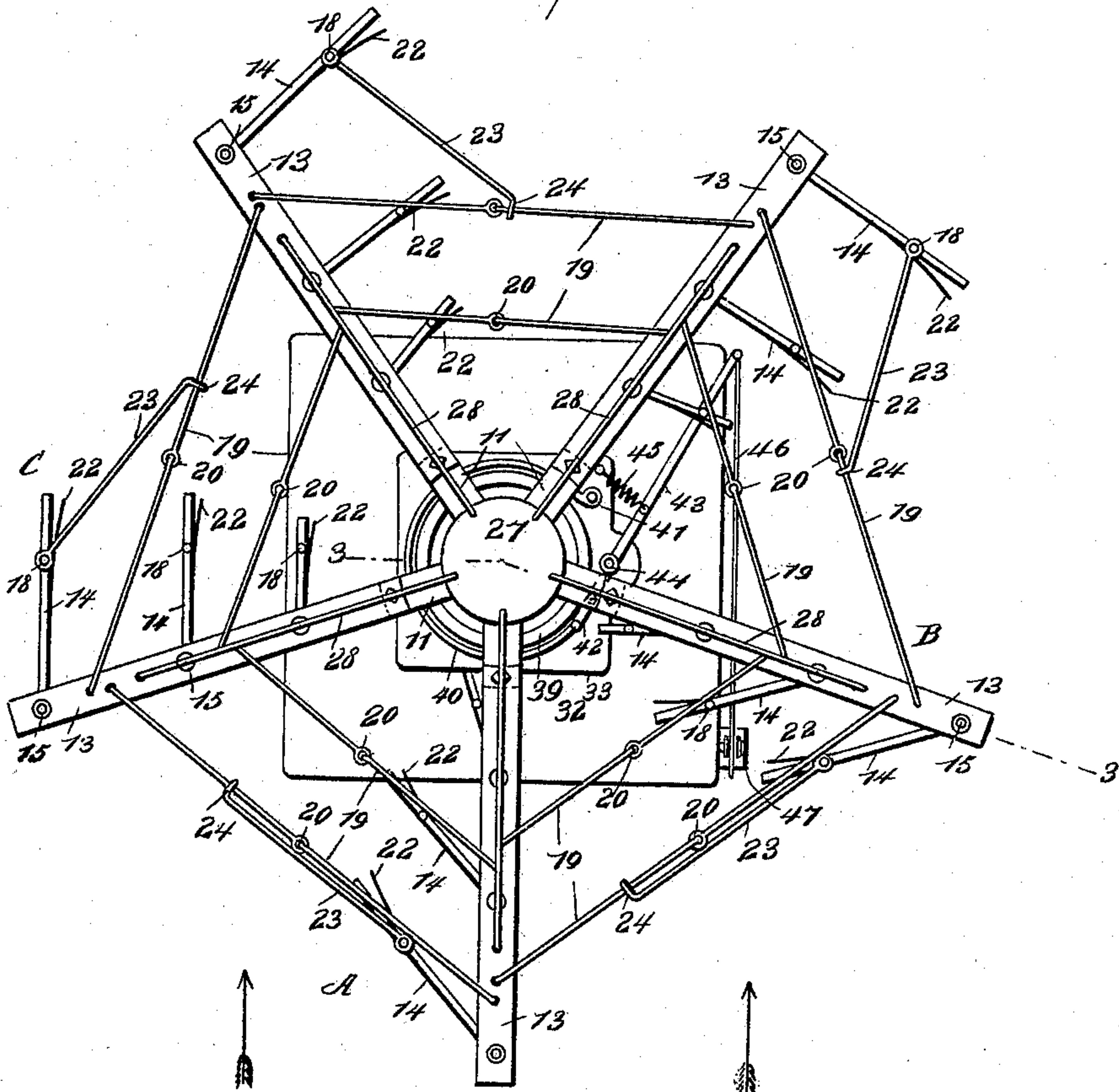
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Fig. 2.



Eq. 4.

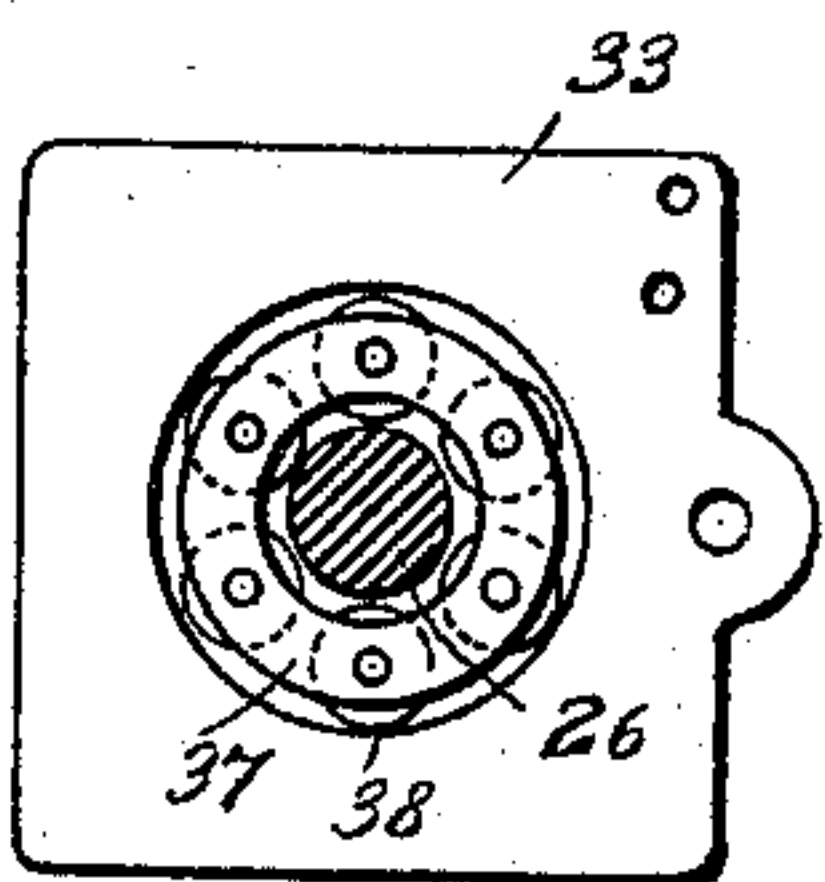
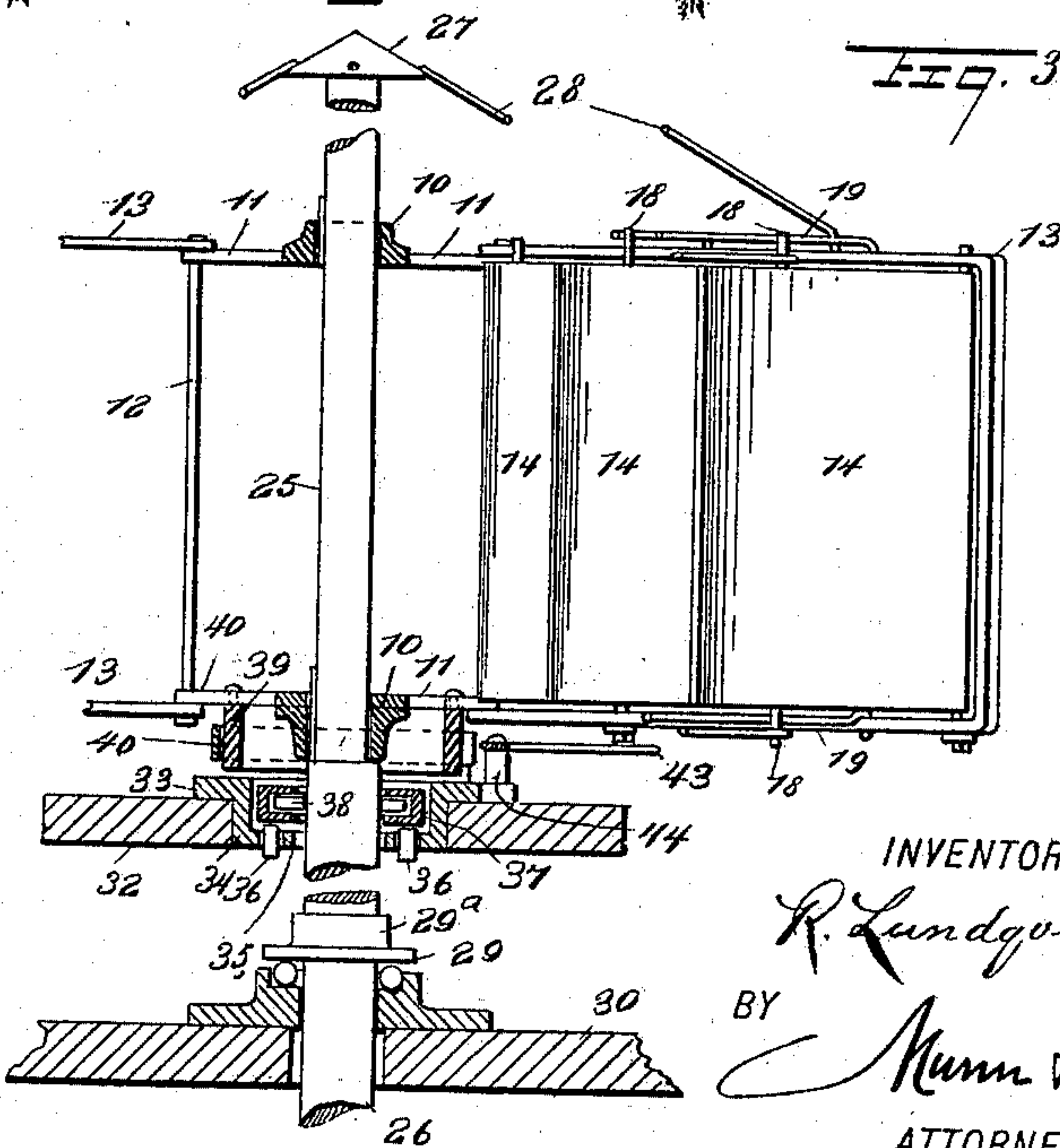


Fig. 3.



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Fig. 5.

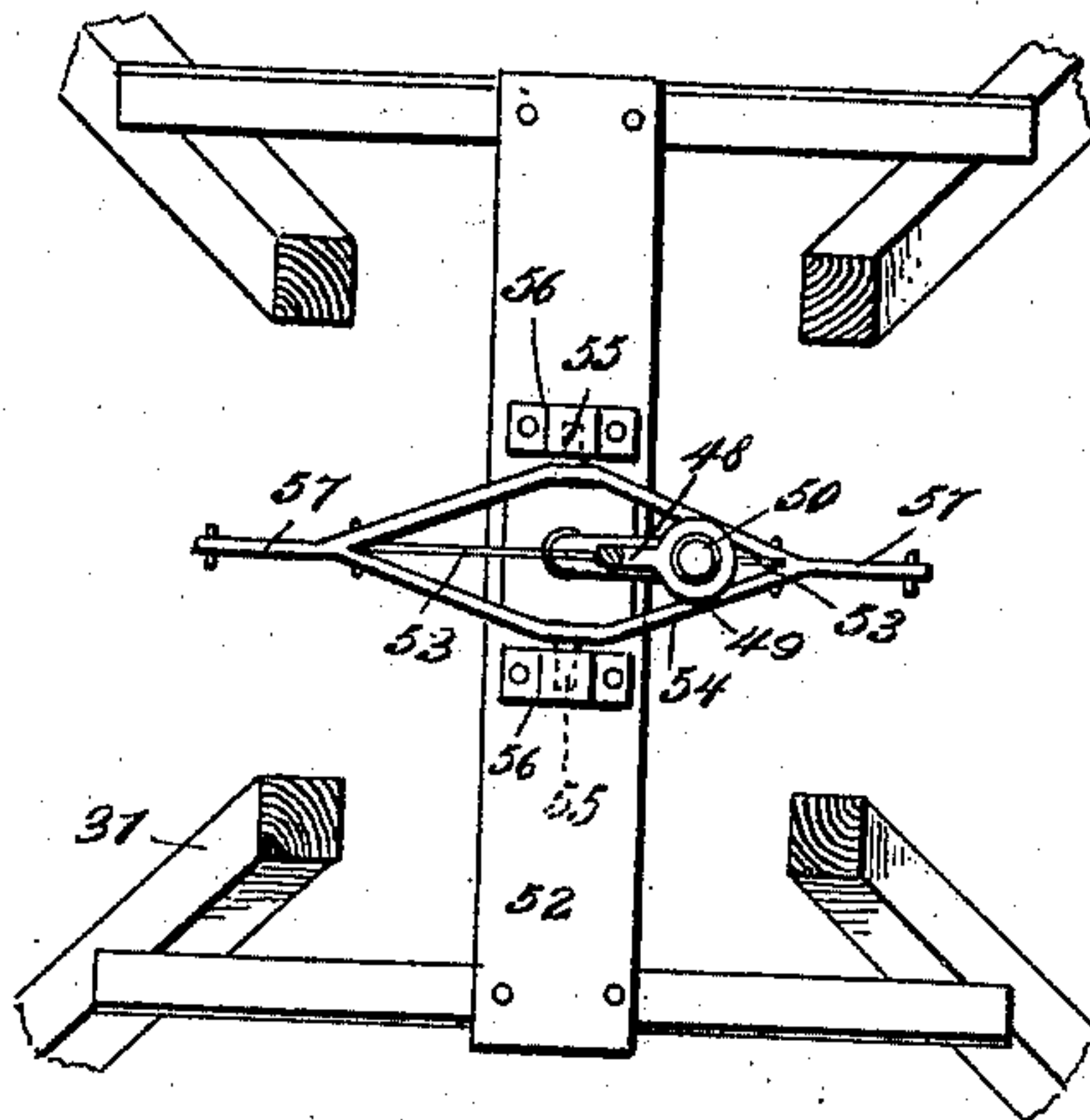


Fig. 7.



Fig. 6.

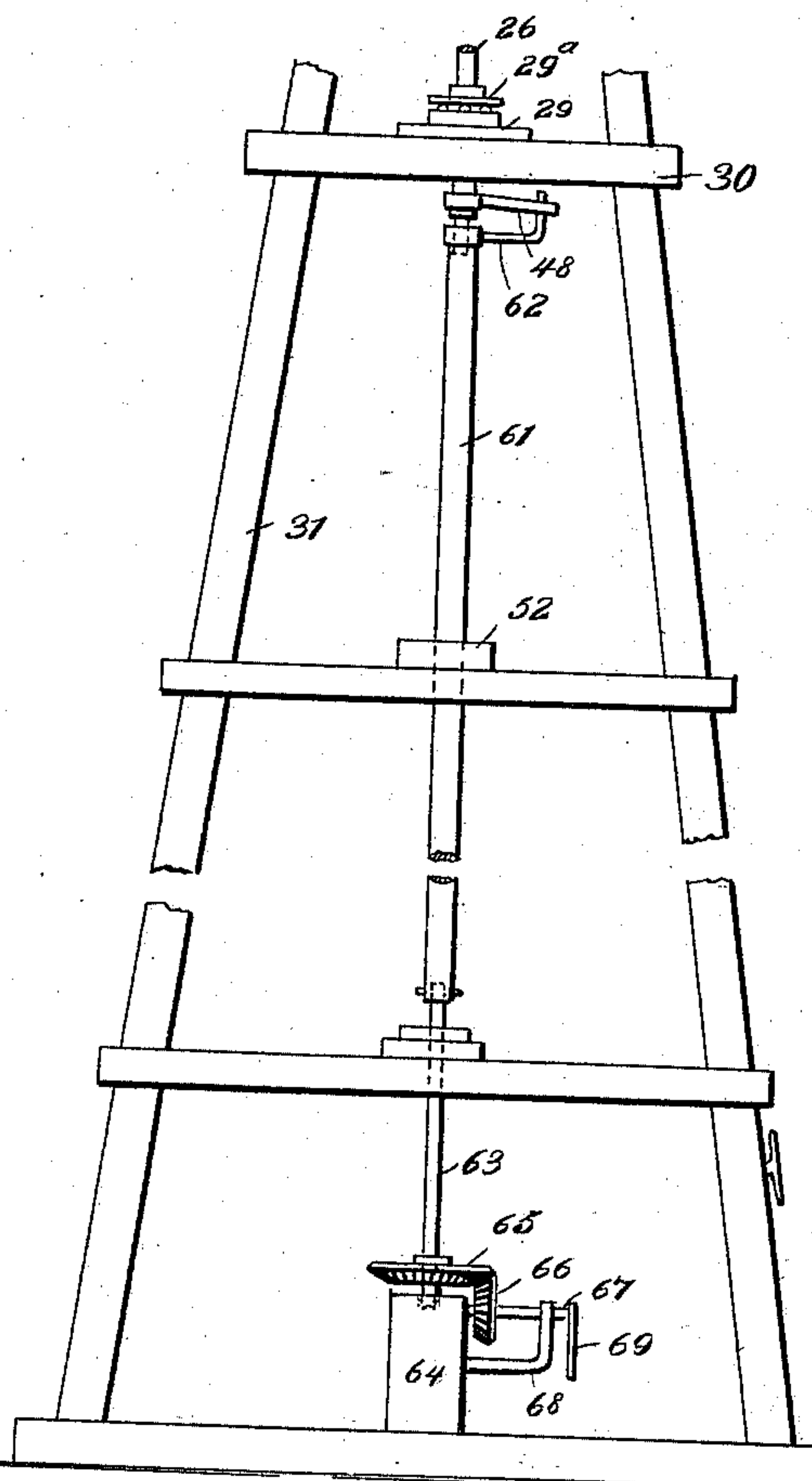
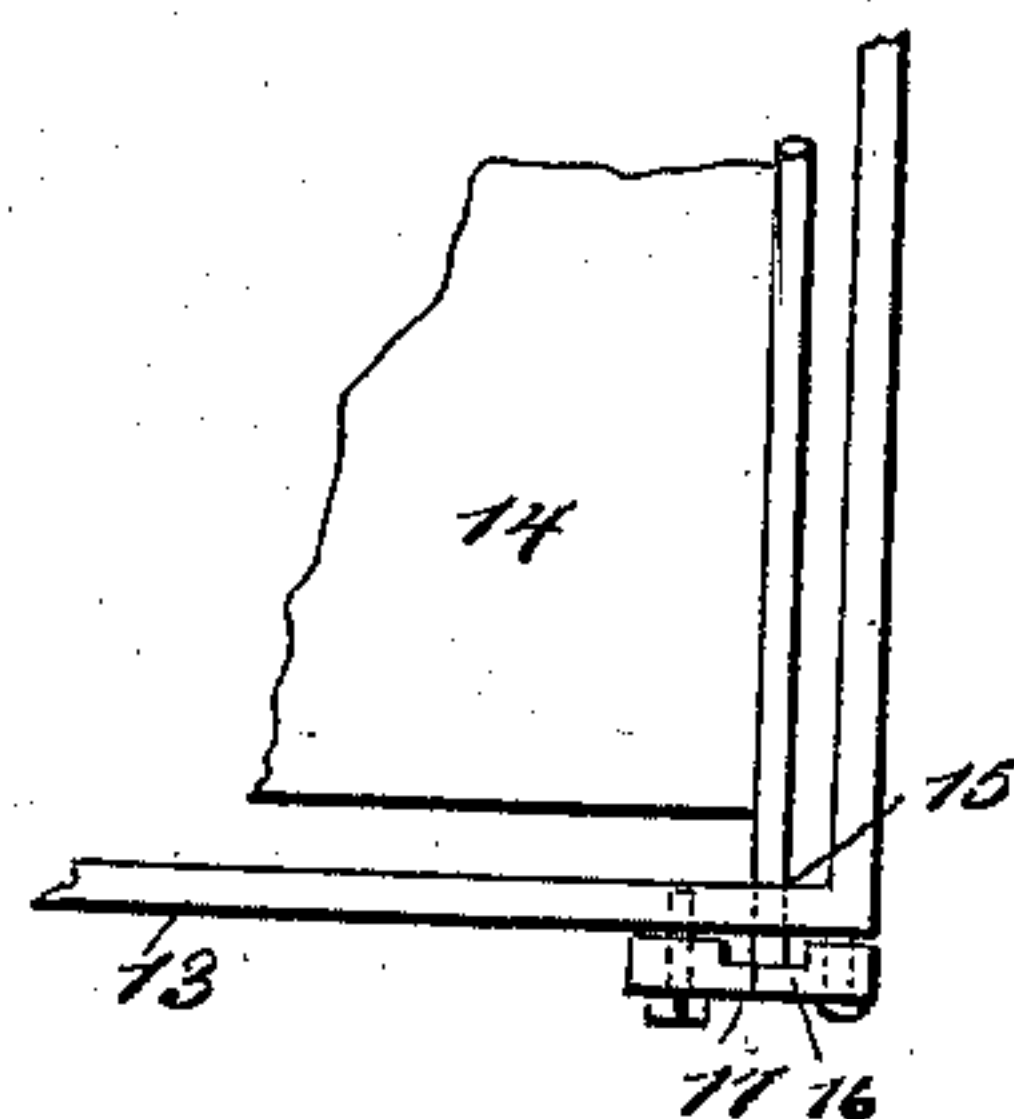


Fig. 8.



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UNITED STATES PATENT OFFICE.

RICHARD LUNDQVIST, OF LAGUNA DE TERMINOS, MEXICO.

WIND-MOTOR.

SPECIFICATION forming part of Letters Patent No. 544,922, dated August 20, 1895.

Application filed September 10, 1894. Serial No. 522,561. (No model.)

To all whom it may concern:

Be it known that I, RICHARD LUNDQVIST, of Laguna de Terminos, Mexico, have invented a new and Improved Wind-Motor, of which the following is a full, clear, and exact description.

My invention relates to wind-motors having wheels of the horizontal class; and the object of my invention is to produce a simple, strong, and easily-controlled wind-motor having a wheel arranged to turn horizontally and with blades adapted to get the full force of the wind and to feather nicely when returning through it; also to provide a very strong, simple, and convenient means for transmitting power from the wind-wheel to a pair of pumps, a single pump, or other mechanism, as desired.

To these ends my invention consists of certain features of construction and combinations of parts, which will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures and letters of reference indicate corresponding parts in all the views.

Figure 1 is a broken side elevation of the wind-motor embodying my invention. Fig. 2 is a plan view of the same. Fig. 3 is a broken vertical section on the line 3 3 of Fig. 2. Fig. 4 is a sectional plan on the line 4 4 of Fig. 3, showing in detail the roller-bearing for the main shaft. Fig. 5 is a sectional plan on the line 5 5 of Fig. 1. Fig. 6 is a broken side elevation showing a modified means of transmitting power from the main shaft. Fig. 7 is a detail of one of the boxes used in the transmitting-gear, and Fig. 8 is a broken detail view showing the manner of supporting the pivots of the several fans of the wind-wheel.

The motor is provided with a horizontal wind-wheel, comprising in its construction the two hubs 10, having radial arms 11 and the radially-arranged U-shaped frames 13, the ends of which are secured to the arms 11 by the long bolts 12, extending from the arms of one hub to those of the other, as clearly shown in Fig. 3. This construction of the wind-wheel frame enables it to be very easily put together or taken apart, if desired. Ar-

ranged in a vertical position on the frame are the fans 14, there being a series of fans on each frame 13, and the fans are pivoted at one edge, as shown at 15, the pivot-pin of each fan extending downward through the lower member of the frame and resting on a button 16, which is pivoted on the under side of the frame and is provided with a socket 17 to receive the pivot-pin. When it is necessary to remove a fan, the button may be turned to one side and the fan dropped, so as to permit the upper end of the pin 15 to swing from the upper member of the frame 13, and thus the fan may be easily removed. The movement of the fans 14 is limited by stops 18, projecting from the upper and lower edges of the fans and adapted to engage the cross-braces 19, which extend from one frame 13 to another, and which are preferably jointed in the middle, as shown at 20, and each brace is provided with a hook 21 at one end to engage the frame. The joints 20 between the sections of the cross-braces 19 are formed by interlocking-eyes at the ends of said sections, as indicated in Fig. 2 of the drawings. The stops of the outer fans 14 can only limit the inner movement of the said fans, and hence means to be presently described are employed to limit their outward movement. Each fan has also on its back a spring 22, which, in case the fan is suddenly and violently slammed inward, strikes the next fan and prevents excessive shock. The outward movement of the outer fans 14 is limited by links 23, which are pivoted to the upper stops 18 of the said fans, and which are provided with eyes 24 to slide on the braces 19, and when the fans are moved inward the links slide to a position substantially parallel with the braces, but when the fans move outward the links extend at an angle to the braces and so prevent the fans from swinging out too far. The joints 20 in the cross-braces 19 are enlarged and form stops adapted to be engaged by the eyes 24 on the links 23, so as to limit the movement of said links and the fans to which they are attached.

The wind-wheel turns horizontally and is secured to the reduced end 25 of the main shaft 26, which is arranged vertically and

terminates at the top in a cap 27, from which extend braces 28, connecting with the several frames 13 of the wind-wheel.

The shaft 26 is mounted in a ball-bearing 29, which is supported on cross-bars 30 of the tower 31, and the shaft is provided with a suitable flange 29^a, which rests on the ball of the bearing, as shown clearly in Fig. 3. The tower may be of any usual construction, or the shaft may be supported on any structure strong enough to sustain it. The shaft 26 extends through the top plate 32 of the tower, and in the center of the top plate is a bearing-ring 34, which encircles the shaft, and has at the top a flange 33 to rest on the plate 32, and at the bottom an inwardly-projecting flange 35 to support the bearing-rollers 36, which turn vertically (see Fig. 5) and on which runs the bearing-ring 37, carrying horizontal rollers 38, which bear against the shaft 26, and prevent the lateral movement of the shaft and still permit it to run very easily.

The wind-wheel has on its under side an annular flange 39, around which extends the strap 40 of an ordinary strap-brake, which strap is fixed at one end as shown at 41 in Fig. 2, and at its other end is connected by a link 42 with one end of a horizontally-swinging lever 43, which is fulcrumed on a stud 44 on the flange 33 of the bearing-ring and is provided with a spring 45, adapted to normally hold the strap in engagement with the flange 39. The outer end of this lever 43 is connected to a cable 46, which extends downward over a suitable guide-pulley 47, as shown in Fig. 2, to a point where it may be reached from the ground, and by pulling on the cable the lever 43 is tilted and the strap 40 drawn away from the flange 39, so as to start the wind-wheel.

The main shaft 26 projects downward through the bearing 29 and is at its lower end provided with a crank 48, having a terminal eye 49, (see Fig. 5,) which receives the upper end of an inclined rock-shaft 50, which at its lower end is stepped in a suitable bearing 51, supported on a cross-piece 52, and thus when the shaft 26 revolves the shaft 50 is turned around and around, its upper end describing a comparatively large circle, as shown by dotted lines in Fig. 1.

The shaft 50 is connected by a brace 53 with a yoke 54, which straddles the foot of the shaft and is on opposite sides provided with trunnions 55, journaled in boxes 56, which are secured to the cross-piece 52, and at opposite ends of the yoke are projecting arms 57, which are pivotally connected to the upright connecting-rods 58, which are also pivoted at their lower ends to the pump-rods 59 of the pumps 60. It will be seen that the movement of the shaft 50 causes the yoke 54 to rock on the trunnions 55, and the oscillation of the yoke moves the connecting-rods up and down, and thus simultaneously operates both pumps; but if it is desired to operate but one pump,

one of the connecting-rods may be dispensed with and a counterbalance fastened to that end of the yoke 54. If it is desired to operate other mechanism than the pumps, the shaft 50 and the connections below it are dispensed with and a shaft 61 arranged vertically in suitable bearings beneath the shaft 26, the shaft 61 having at its upper end a crank 62 to interlock with the crank 48, as shown in Fig. 6, and at its lower end the shaft 61 is coupled to a shaft 63, which is stepped in a suitable bearing 64 and is provided with a gear-wheel 65, driving a gear-wheel 66 on the horizontal shaft 67, which is journaled in a bracket 68 and is provided with a crank 69, which may be utilized to drive other machinery, or power may be taken from the shaft 67 in any ordinary and convenient way.

The action of the wind-wheel in turning will be clearly understood by reference to Fig. 2. Supposing the wind to be blowing in the direction indicated by the arrows in the said figure, it strikes a set of fans 14 at A and so turns the wheel to the right, the wind also striking strongly against the fans at B; but as the fans turn around to the left they gradually swing outward into the wind until, as shown at C, they come edgewise through it, thus affording very little resistance to it, and as the wind strikes them almost full on one side it will be seen that the wheel is turned with comparative ease.

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

1. In a wind motor, the wind-wheel comprising a frame having radially arranged members placed one above the other, cross-braces connecting the several members, a series of fans to engage the cross-braces, and links pivoted to the outer fans and arranged to slide on the cross-braces, substantially as described.

2. In a wind wheel the combination of a frame having two members provided with aligned apertures, one of which extends through the member in which it is formed, a fan located between said frames and having pins at opposite edges adapted to enter the respective apertures, and a button pivoted on the side of the member having the aperture extending through it opposite to the fan and adapted when turned on its pivot to close said aperture, substantially as set forth.

3. In a wind motor, the combination of a bearing ring having a flange projecting from its inner side near its bottom, a series of rollers journaled vertically in said flange, and an inner bearing-ring mounted to turn on said rollers and adapted to encircle the shaft, said inner bearing-ring being provided in its interior with a series of rollers journaled to rotate in horizontal planes and adapted to bear on the periphery of the shaft, substantially as set forth.

4. A wind wheel having a series of radial

frames each provided with an upper and a lower member, said frames being connected to one another by cross-braces having enlargements, fans pivoted at one edge in the
5 frames and adapted to play between said braces, and links pivoted to the fans and having eyes to engage and slide on said braces,

the enlargements of said braces forming stops to limit the sliding movement of the links, substantially as set forth.

RICHARD LUNDQVIST.

Witnesses:

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C. SEDGWICK.