

No. 741,660.

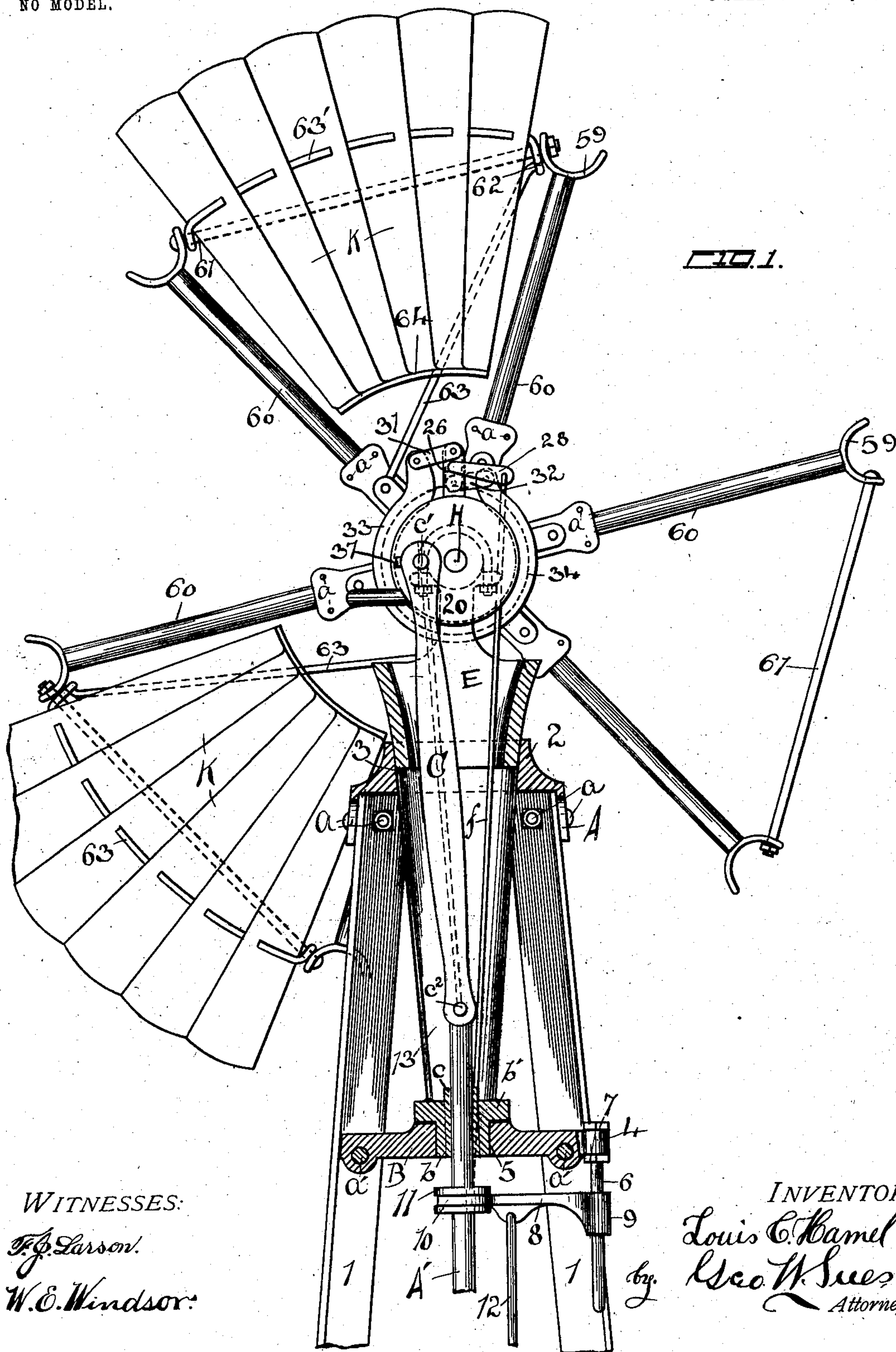
PATENTED OCT. 20, 1903.

L. C. HAMEL.
WINDMILL.

APPLICATION FILED JAN. 27, 1903.

NO MODEL.

3 SHEETS—SHEET 1.



WITNESSES:
F. G. Larson.
W. E. Windsor.

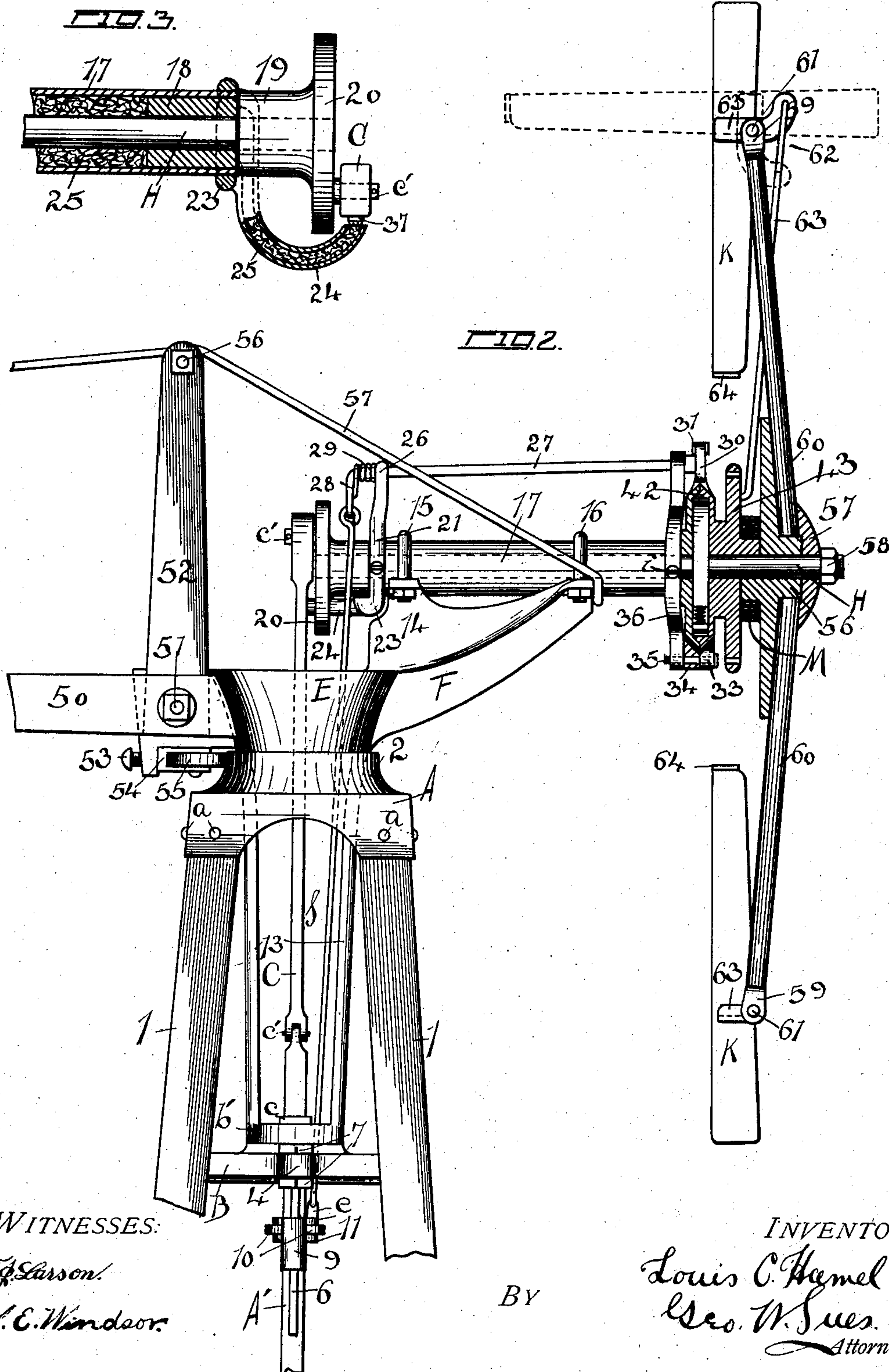
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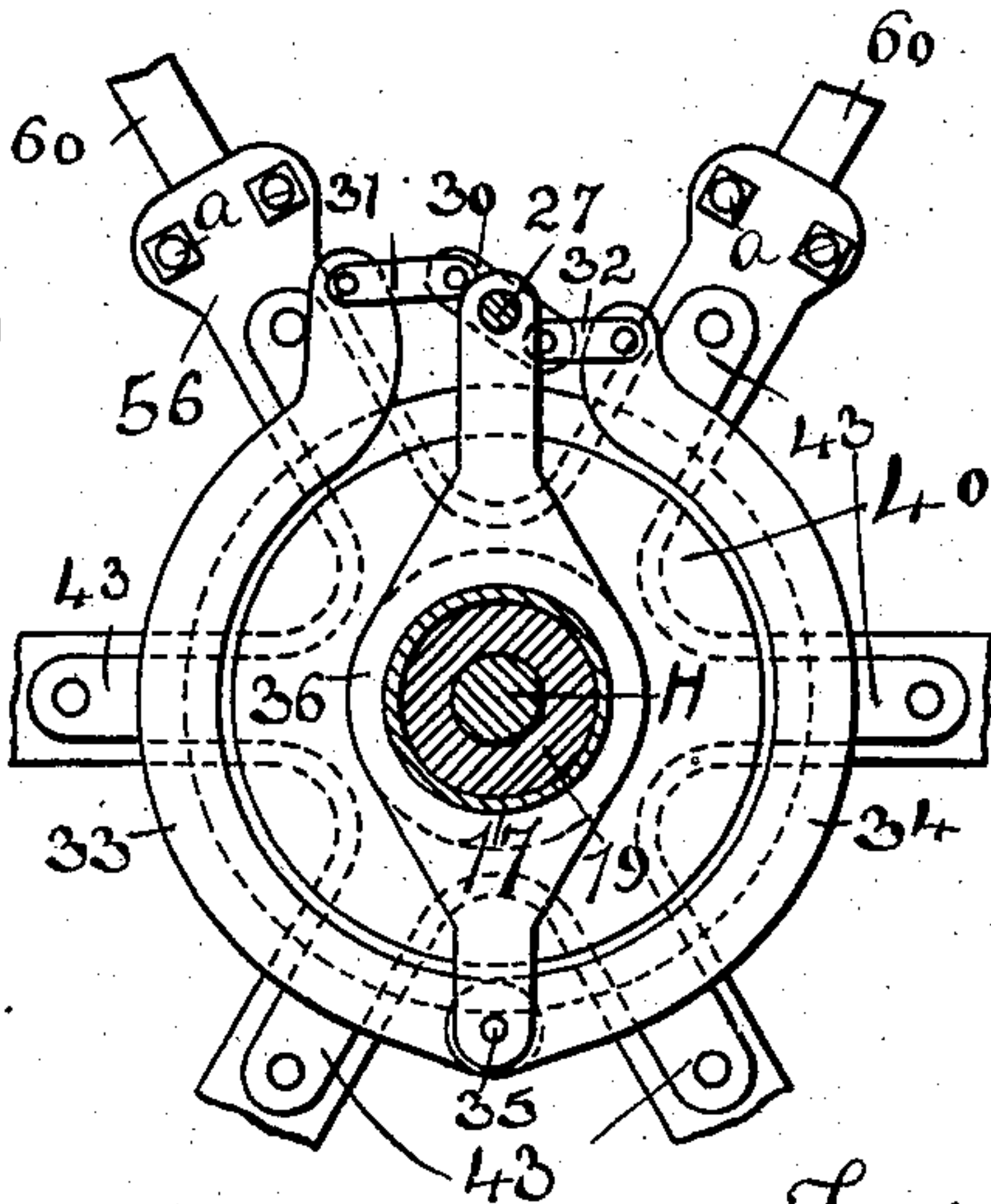
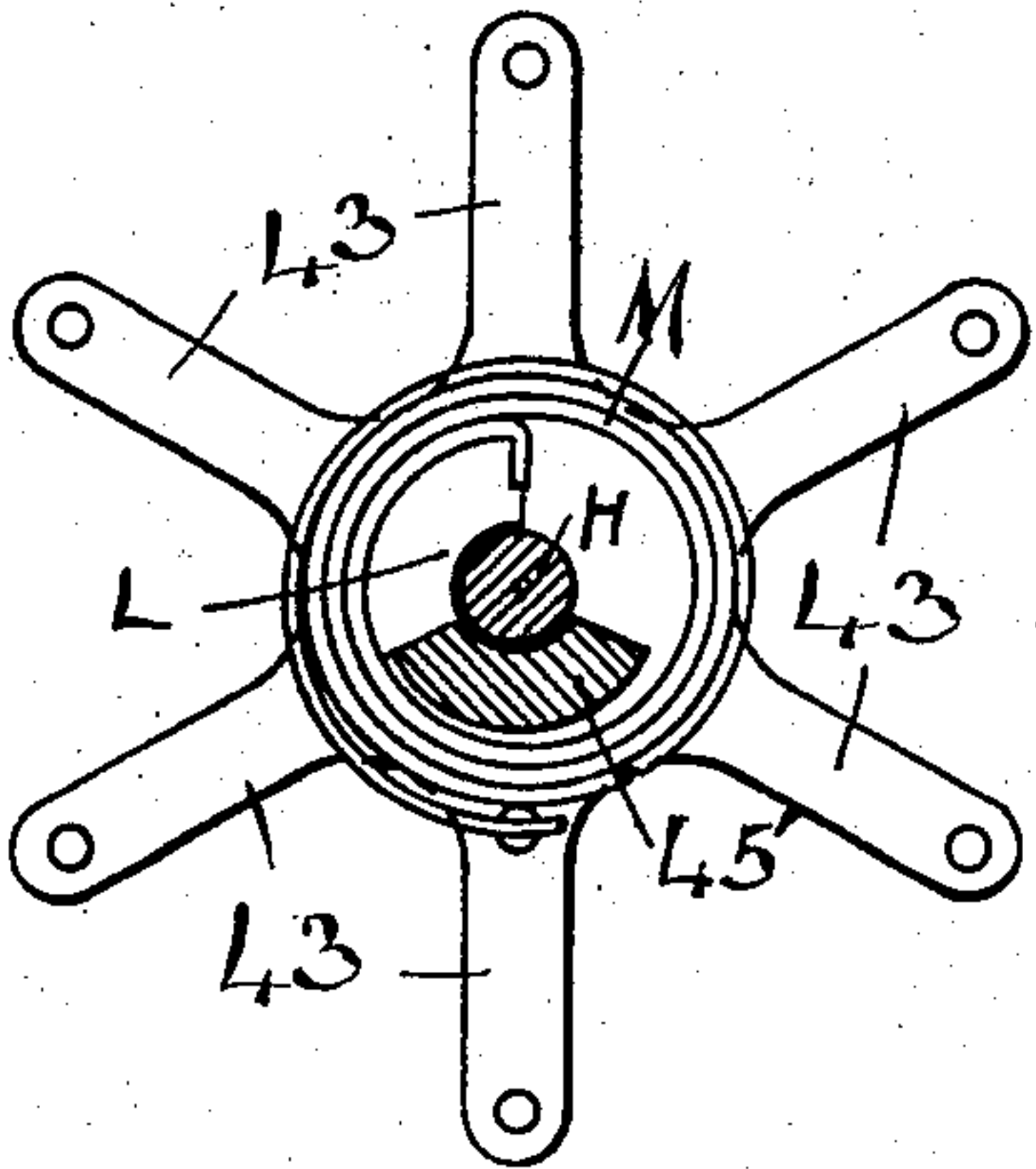
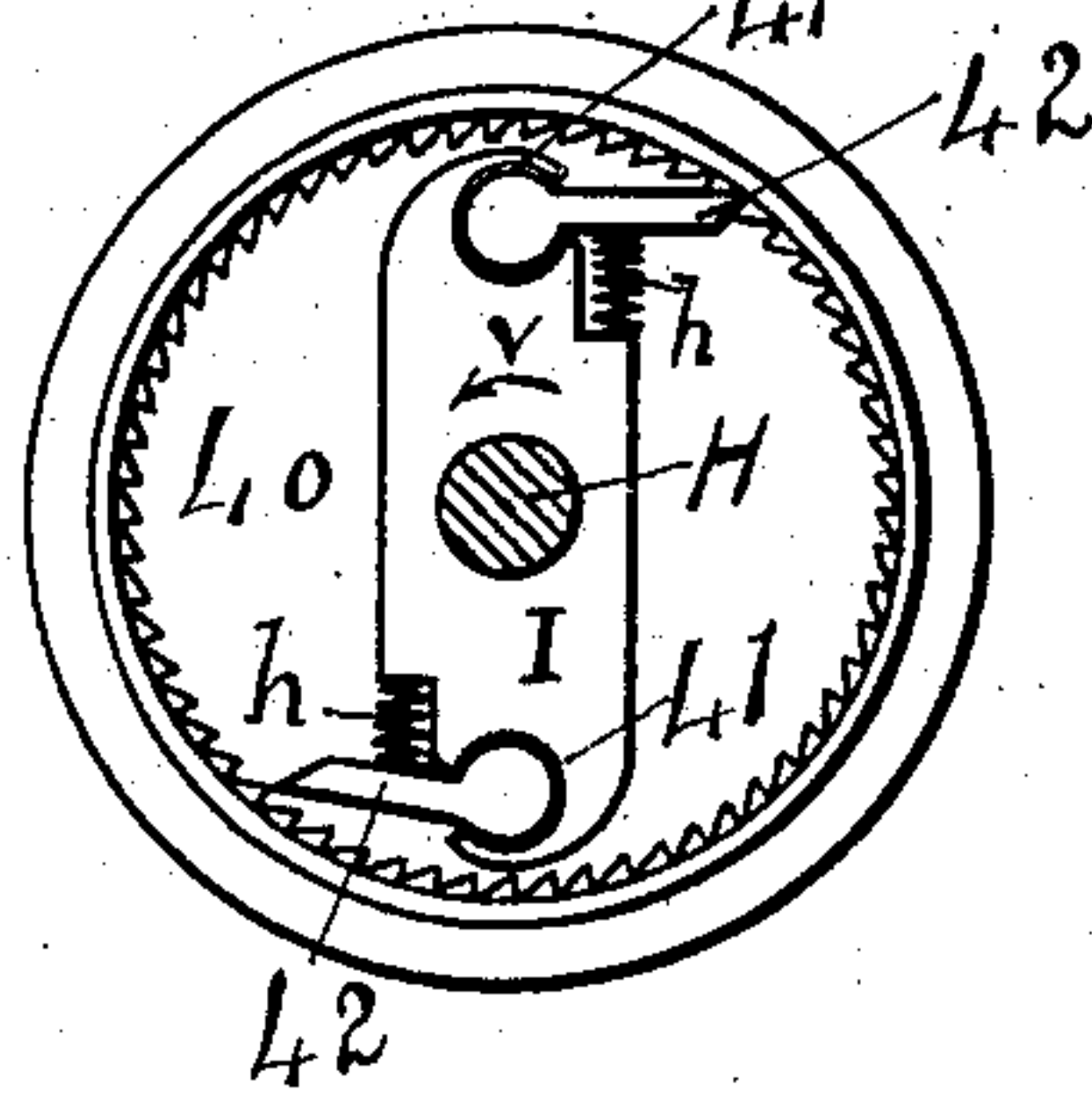
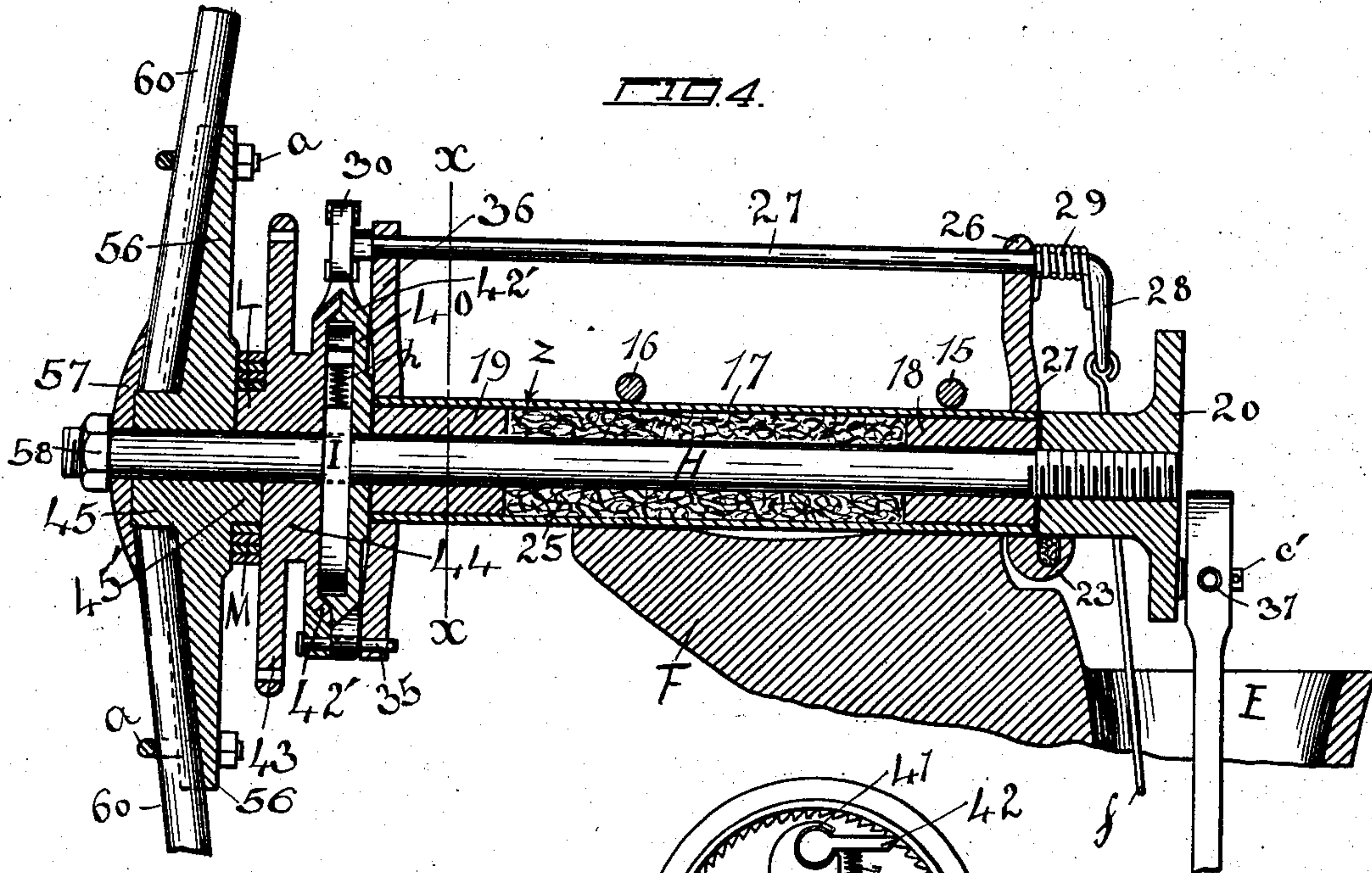
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3 SHEETS--SHEET 3.



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INVENTOR:

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BY

UNITED STATES PATENT OFFICE.

LOUIS C. HAMEL, OF STEVENS POINT, WISCONSIN.

WINDMILL.

SPECIFICATION forming part of Letters Patent No. 741,660, dated October 20, 1903.

Application filed January 27, 1903. Serial No. 140,696. (No model.)

To all whom it may concern:

Be it known that I, LOUIS C. HAMEL, residing at Stevens Point, in the county of Portage and State of Wisconsin, have invented certain useful Improvements in Windmills; and I do hereby declare that the following is a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to new and useful improvements in windmills.

The primary object of my invention is to provide a durable and effective mechanism for holding the sections composing the wind-wheel in the wind and to provide simple means for swinging said sections out of operative position.

The secondary object is to provide means for automatically lubricating the wearing parts, so that oil may be automatically carried from bearing to bearing, so that all parts requiring oil shall be kept lubricated, and to provide a construction whereby complication, and consequently friction and excessive wear, of the working parts is prevented.

My invention relates more particularly to that class of windmills known as the "vaneless" mills, in which an open wheel is used.

In the accompanying drawings I have shown in Figure 1 a front elevation, with portions broken away, of a windmill embodying my invention. Fig. 2 shows a sectional view with portions removed. Fig. 3 shows an enlarged detached detail disclosing the arrangements of the automatic oiler. Fig. 4 shows a sectional view, with portions removed, of the main driving-shaft and the connected members. Fig. 5 discloses a front view of the governor-wheel, showing the coacting lugs of the wind-wheel and governor-wheel, also the spring as used in my device. Fig. 6 discloses a front view showing one of the friction-plates and connected pawl-wheel. Fig. 7 shows a broken enlarged detail disclosing the arrangement of the friction-disks and the connected shoe.

In the accompanying drawings I have shown in Figs. 1 and 2 the upper portions of a number of uprights or standards 1, as usually employed in windmill construction, which stand-

ards are provided with the cap A, to which by means of suitable bolts *a* are secured the standards 1. This head A is provided interiorly with a conical seating 3, as shown in Fig. 1, with the the upper outer circular collar 2, as disclosed in Fig. 2. Below the uprights or standards 1 are provided with a suitable step-casting B (shown in Fig. 1) and secured by the bolts *a'*. This step-casting B is provided with a circular opening 5 and upon one side with a projecting ear 4, (also shown in Fig. 2,) and held within this ear 4 by means of the burs 7 is a guide-rod 6. Held within the opening 5 of the step-casting B and revolvably working within the upper collar 2 of the cap A is the pivot-collar E of the casting, with the two downwardly-extending bars 13, which below are secured to a disk *b'*, (shown in Fig. 1,) from which extends a boss *b*, the disk and boss being perforated to form a lower bearing. This hub-bearing works snugly within the opening of the step-casting B. Slidably held within this lower hub-bearing *b* and within a removable bushing *c* is the upper end of the pump-plunger A', which above by means of the pin *c''* is secured to the pitman C, as shown in Figs. 1 and 2, and this pitman extends through the pivot-casting E and is secured to the pin *c'*, extending from the disk 20, forming part of the wind-wheel shaft H, as shown. This pitman C is hollow and above is provided with an extending nipple 37, so that anything entering the nipple 37 will gravitate to the bearing containing the pin *c'* within the upper end of the pitman C, and from this upper bearing the oil will gravitate down the hollow pitman to the lower bearing, receiving the pin *c''* within the lower end of the pitman, and from thence the oil will flow laterally outward and drip down the pump-plunger A' to lubricate the bushed bearing within the hub *b*, insuring free operation of this pump-plunger.

Loosely held upon the upper end of the pump-plunger A', below the step-casting B, is a grooved collar 11, and within this collar is the bifurcated end 10 of a bracket 8, having a sleeve 9 working upon the guide-rod 6, as clearly shown in Fig. 1. Depending from this bracket 8 is a wire 12, which extends downward a suitable distance, so that the

same may be grasped below and secured by any suitable means to draw the same downward to pull down the bracket 8. Extending upward from this loosely-held collar 11 is a
 5 rod *f*, which by means of the ear *e* is secured to said collar 11, this ear forming a portion of said collar, as shown in Fig. 2. The rod *f* passes through a suitable opening within the hub *b*, adjacent to the bushing *c*, as shown in
 10 Figs. 1 and 2.

Extending from the upper end of the pivot-casting E is an arm F, provided with an upwardly-extending web 14, and this arm F and web 14 form suitable bearings, upon which
 15 is held a tube 17, which is secured to said web and arm by means of the U-bolts 15 and 16, as clearly shown in Fig. 2. This tube 17 is interiorly provided, as is clearly shown in Fig. 4, at one end with the bearing 18 and
 20 at the other end with the bearing 19, so that between these bearings 18 and 19 is formed the chamber provided with suitable absorbing material, such as cotton-waste or lamp-wick, as is shown at 25 in the drawings. At
 25 a suitable point, as indicated by the arrow *z*, this tubing is perforated, so that the lubricating-oil may be fed into this tubular chamber, forming an oil-reservoir.

Surrounding the tube 17 at the end adjacent the bearing 18 is a collar 23, which is in the form of a drip-cup, as shown in Figs. 4 and 3, and extending upward from this drip-cup 23, as shown in Fig. 2, is the arm 26, perforated to provide a bearing for the rock-shaft 27. This rock-shaft is provided with the crank-arm 28 and is surrounded by the
 35 spring 29, so that this rock-shaft is normally held in one position under spring tension in such a manner as to hold the bracket 8 (shown in Fig. 1) in its uppermost position by means of the connected rod *f*.

The drip-cup 23 is provided with a laterally-extending tube 24, (shown in Fig. 3,) filled with a suitable wick 25, and the end of this
 45 tube 24 is so positioned that in operating the nipple 37 comes in contact with the wick 25, so that what oil has collected at the end of this tube 24 is directed into this nipple intermittently as the nipple is successively brought
 50 in front of this tube 24.

Held within the bearings 18 and 19 is the main wind-wheel shaft H, which at one end is provided with the crank-disk 20, as shown in Fig. 4, and at the remaining end has secured to it the hub 45, from which extends the hub-arms 56, as shown in Fig. 4.

Surrounding the tube 17 at the end adjacent to the bearing 19 is a yoke 36, (shown in front view in Fig. 7,) and this yoke above supports the rock-shaft 27, as shown. Below this yoke 36 supports a pin 35, to which are secured the two counterpart brake-shoes 33 and 34. From the upper end of the brake-shoe 33 extends a link 31, while extending from the brake-shoe 34 is a link 32, and these links
 65 are secured to the opposite ends of the bar

30, secured to the rock-shaft 27, as shown in Figs. 4 and 7. As this rock-shaft 27 is rocked the shoes 33 and 34 are carried toward or away from one another. By virtue of the spring
 70 29 these brake-shoes are normally held outward their fullest capacity.

The hub 45 is provided with a semicircular lug 45', (shown in Fig. 5,) and this lug 45' is normally resting against a lug L, forming
 75 part of the governor-wheel 44, provided with the spokes 43. An ordinary coil-spring M is secured to the lug L and at its remaining end is secured to the head 45, so that the lug 45' of the friction-head is normally against
 80 the lug L of the governor-wheel 44. This governor-wheel 44 is provided with a bevel edge 42, (shown in Fig. 4,) and this edge 42 extends at an angle, as shown, and adjacent this governor-wheel 44 and loosely working
 85 upon the wind-wheel shaft H is a ratchet-provided friction-disk 40, a face view of the same being shown in Fig. 6. This friction-disk 40 is also provided with an angular flange 42, (shown in Fig. 4,) so that the two
 90 flanges of the friction-disk 40 and governor-wheel 44 present a V-shaped peripheral surface, and each brake-shoe 33 and 34 is also provided with a V-shaped seating, so that when these brake-shoes are brought together
 95 they bind upon the disk 40 and governor-wheel 44.

Secured to the wind-wheel shaft H and held between the governor-wheel 44 and the friction-disk 40 is a holder I, provided at each
 100 end with a seating 41, adapted at each end to receive a pawl 42, forced outward into engagement with the ratchet-teeth of the friction-disk 40 by means of the springs *h*, as shown in Fig. 6.

Secured to the hub-arms 56 are a plurality of fork-ended arms 60, (shown in Fig. 1,) which are secured by the U-bolts *a*, and within the bifurcated ends 59 of these arms 60 are held the cross-bars 63, holding the
 110 blades K, each holder being provided with an outwardly-projecting ear 62. The blades K are further secured by means of the holder 64, as shown in Fig. 1.

In Fig. 1 it will be noticed that I have
 115 shown six such bifurcated arms 60. Secured to each set of cross-bars 63 and 64 are held a set of blades K. Projecting from each ear 62 is a rod 63', secured to one of the spokes 43 of the governor-wheel 44, as shown
 120 in Fig. 1. The holders 63 are secured by means of suitable rods 61, as disclosed.

Extending from the upper end of the pivot-casting E is an outwardly-extending weight-arm 50, to which is secured a suitable counterweight to counterpoise the weight of the
 125 wind-wheel. Extending upward from this weight-arm 50 is a truss-bar 52, over which extends a truss-rod 57, secured to the outer end of the arm F, as shown in Fig. 2, this
 130 truss-rod passing above over the bolt 56. Below, passing through the truss-bar 52, is a

screw 53, holding a carrier 54, supporting a sheave 55, adapted to revolve upon the outer portion of the collar 2. This sheave takes up the strain that would be great enough to slightly tilt the pivot-casting in heavy wind.

When all the working effects have been properly arranged, the operation of my governing mechanism is as follows: The lugs of the hub and the governor-wheel, it will be remembered, are in spring contact by virtue of the interposed spring M. Now should the wind velocity increase sufficiently to throw the sails outward it would result in the shipper-rods 63 drawing backward against the tension of the spring M of the governor-wheel 45, so that the lugs L and 45' would travel away from one another. As the wind velocity increased the governor-wheel 45 would travel backward more and more. So, also, as the wind velocity decreased the governor-wheel would travel forward again, permitting the sails to come more and more into their normal position, in which they lie practically in one plane. By this means I provide a governing mechanism so constructed that the wind-wheel will practically revolve at the same speed irrespective of the force or the velocity of the wind. Now should it be desired to cut the wheel out of the wind the operator would actuate the rock-shaft 27 to apply the brake-shoes 33 and 34. This would result in stopping the movement of the governor-wheel, though the wind-wheel itself is revolving, which results in all of the shipper-rods being actuated to tilt the sails outward. The wind-wheel, however, will have continued to rotate the shaft H and the connected pawls 42, working over the ratchet within the friction-disk 40, so that after being thrown out of the wind the sails cannot tilt back, being held by virtue of the pawls 42 in engagement with the friction-disk 40, clutched by means of the brake-shoes 33 and 34. This sudden throw-out of the wind-wheel will not carry with it a shock or strain upon the working effects, for the reason that if the driving power of the wind-wheel is greater than the frictional contact between the friction-disk 40 and the shoes 33 and 34 this disk 40 and the bevel edge 42 will revolve within their shoes 33 and 34 until the momentum of the wind-wheel is lost.

Having thus described my said invention, what I claim as new, and desire to secure by United States Letters Patent, is—

1. The combination with a suitable support, of a pivot-casting, a wheel-shaft held by said pivot-casting, a hub secured to said wheel-shaft, a lug projecting from said hub, arms extending from said hub, sails pivotally secured to said arms, shipper-rods extending from said sails, a spring secured at one end to said hub, a governor-wheel loosely mounted on said shaft adjacent to said hub, said spring at its remaining end being secured to said governor-wheel, a lug projecting from

said governor-wheel, said spring normally forcing said lugs into contact under spring tension, said governor-wheel being provided with a projecting hub, a friction-disk loosely mounted upon said wheel-shaft, a pawl fixed to said wheel-shaft adapted to engage said friction-disk, a brake adapted to engage said friction-disk and said governor-wheel hub, said shipper-rods being connected to said governor-wheel, and means to operate said brake.

2. The combination with a suitable support, of a tube held by said support, bearings at each end within said tube, said tube being provided with an oil-feed opening, a crank-shaft working within said bearings, said tube being held in an inclined position, a drip-cup surrounding said tube at its lower end, a pipe projecting from said drip-cup, a hollow pitman working upon the crank of said shaft said pitman being provided with a nipple adapted to pass in close proximity to said pipe, and a suitable supported pump-plunger secured to the lower end of said pitman.

3. In a windmill the combination of the following instrumentalities to wit, a suitable support, a cap secured to said support, a pivot-casting working within said support, a step-casting secured to said support and revolvably holding the lower end of said pivot-casting, a guide-rod extending from said step-casting, a bracket slidably held upon said guide-rod, an operating-bar extending from said bracket, a pump-plunger working within the lower end of said pivot-casting, a tube secured in an inclined position to the upper end of said pivot-casting, bearings within each end of said tube, said tube forming an oil-reservoir, a wheel-shaft provided with a crank and supported by said bearings, a pitman provided with an oil-channel secured to aforesaid pump-plunger and to said crank-shaft, a drip-cup provided with an upper projection and having a tube extension adapted to come in the path of the oil-channel within said pitman, a yoke secured to said tube, a rock-shaft secured to said yoke and working within aforesaid upward yoke projection, brake-shoes pivotally secured to said yoke and to said rock-shaft, a spring to normally hold said rock-shaft in one position, a hub secured to the rear end of said wheel-shaft, arms extending from said hub, sails pivotally secured to said arms, shipper-rods extending from said sails, a lug projecting from aforesaid hub, a spring secured to said hub, a governor-wheel, aforesaid shipper-rods being secured to said governor-wheel, said governor-wheel being provided with a lug, aforesaid spring at its remaining end being secured to said governor-wheel to normally force aforesaid lugs into spring engagement, a hub projecting from said governor-wheel, a friction-disk adjacent said hub and loosely mounted upon aforesaid wheel-shaft, a pawl secured to said wheel-shaft and adapted to engage said friction-disk, a brake-shoe pivotally

secured to aforesaid yoke and to said rock-shaft and adapted to ride upon said friction-disk and the hub of said governor-wheel, and a rod extending from aforesaid rock-shaft and
5 being secured to aforesaid bracket, all arranged substantially as and for the purpose set forth..

In testimony whereof I affix my signature in presence of two witnesses.

LOUIS C. HAMEL.

Witnesses:

GEORGE W. SUES,

ELLA M. RUTHERFORD.