

No. 607,430.

Patented July 19, 1898.

H. A. FRENCH.
WINDMILL.

(Application filed Mar. 1, 1897.)

(No Model.)

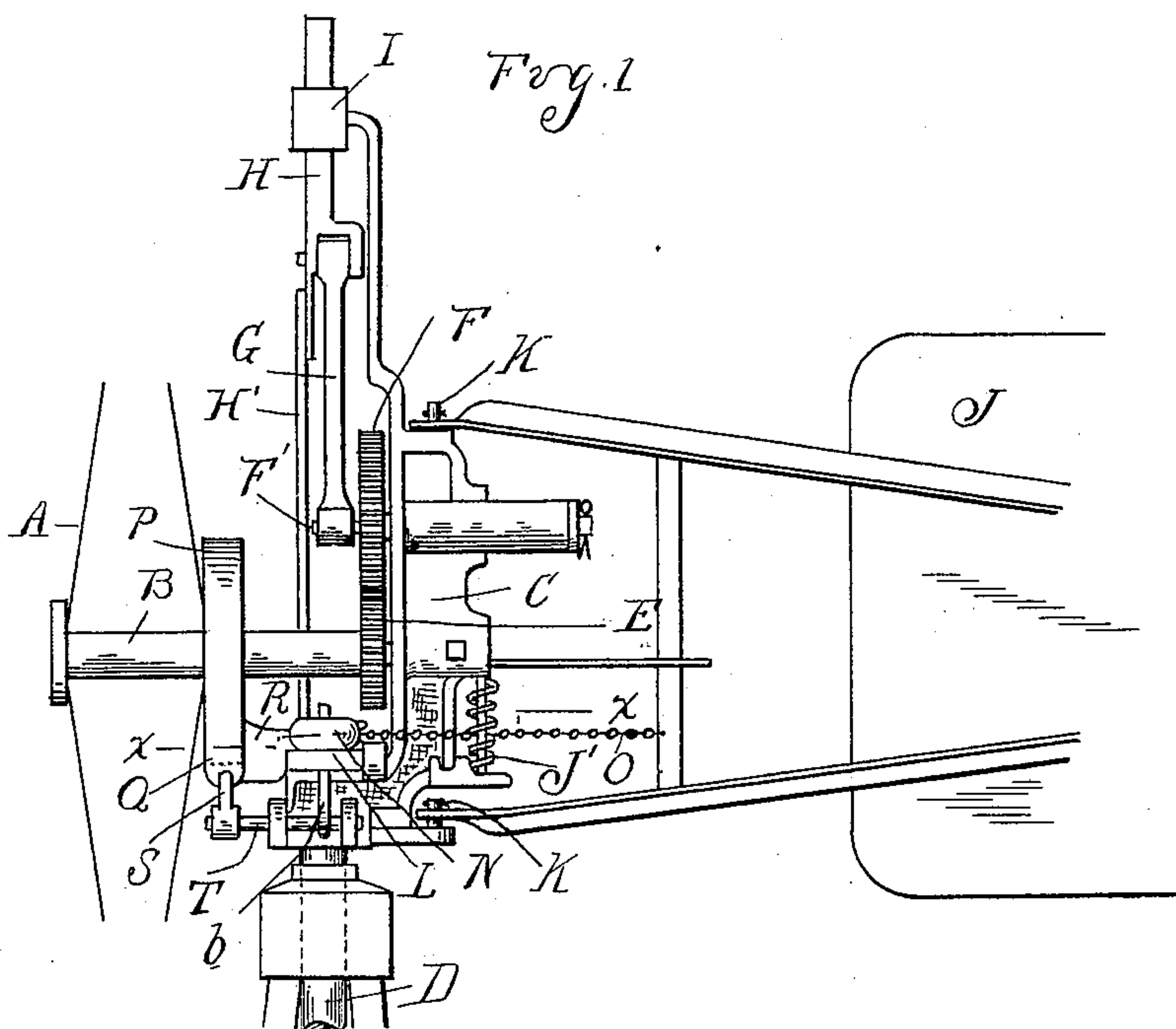


Fig. 2.

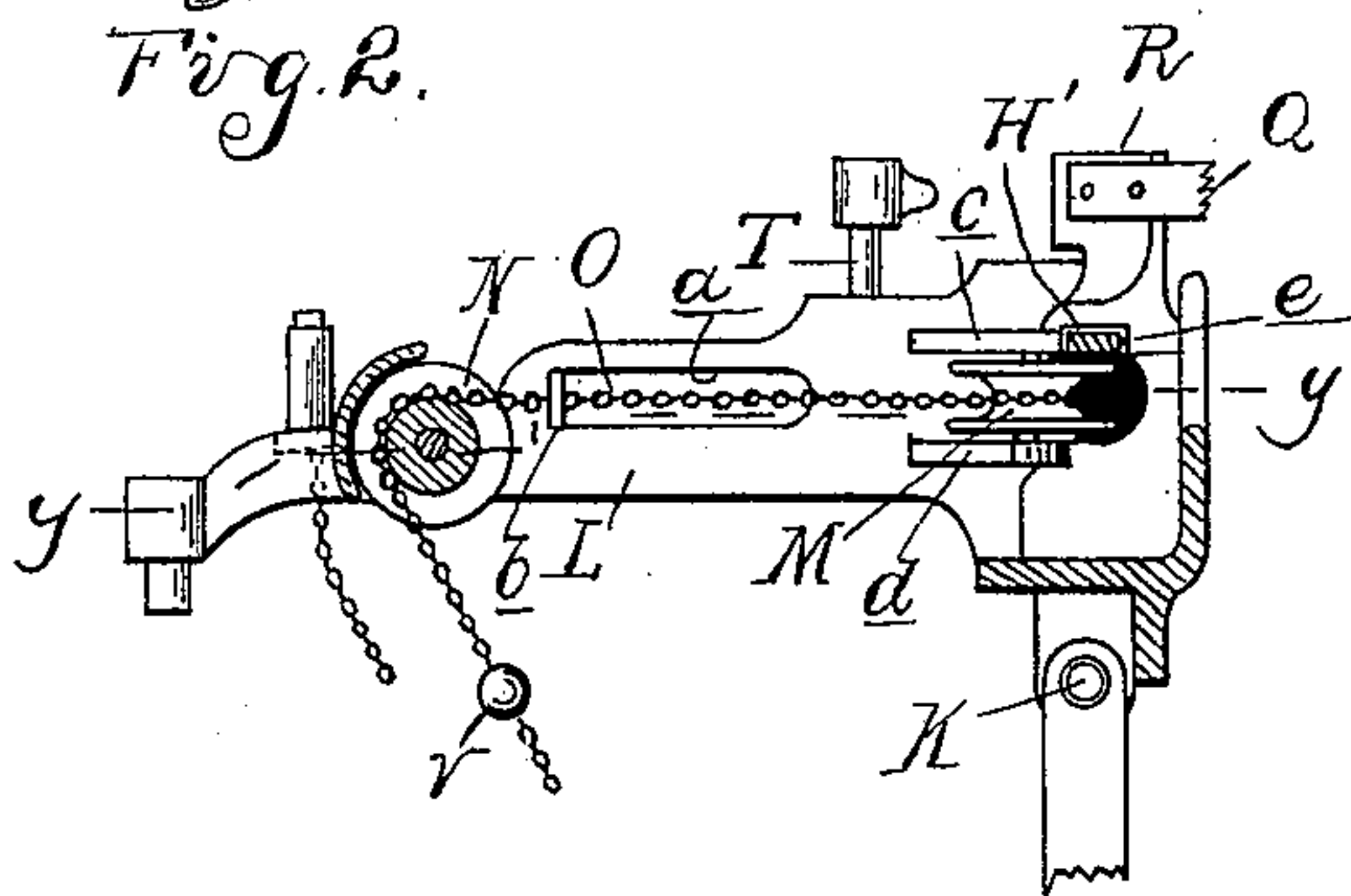


Fig. 3.

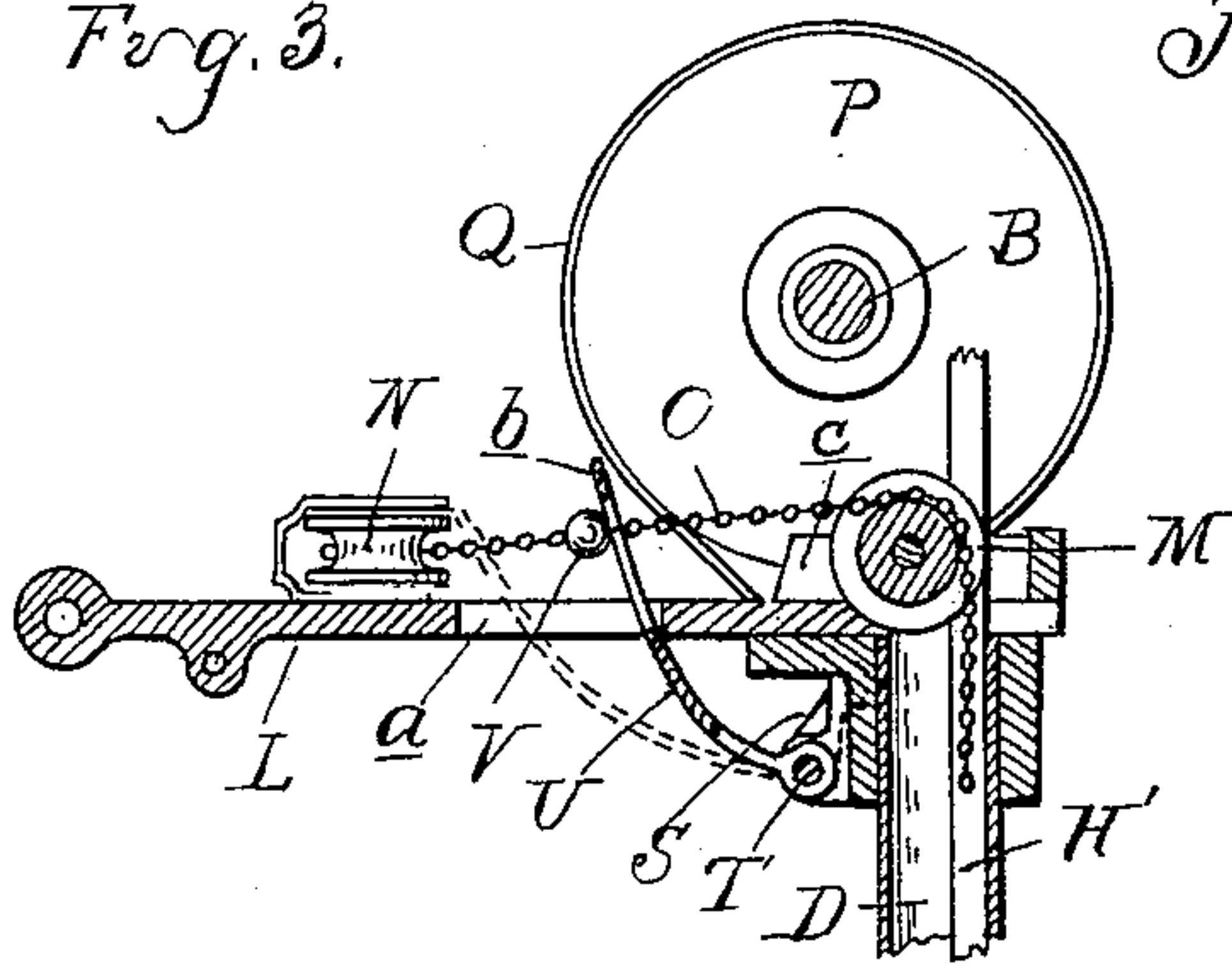
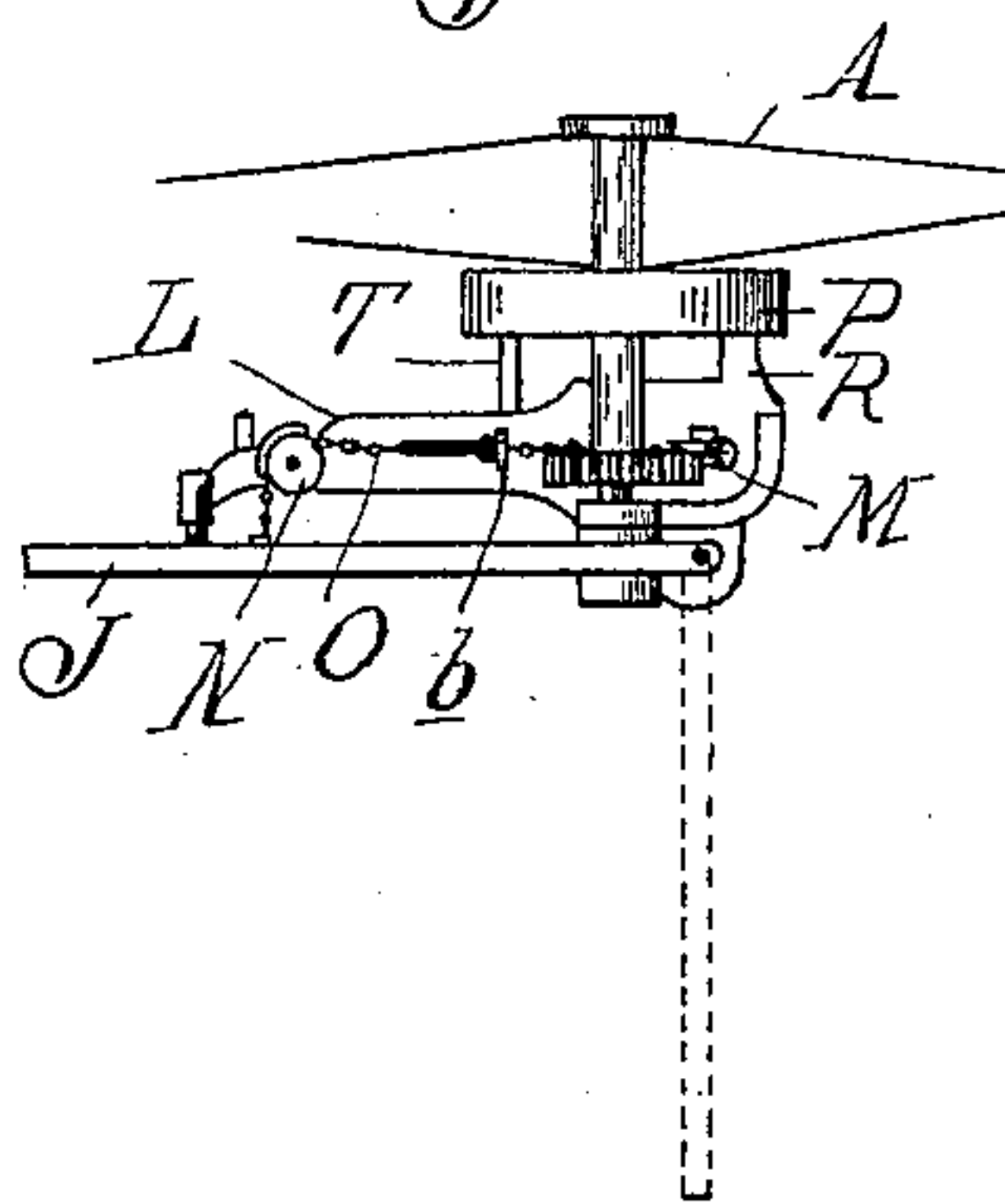


Fig. 4.



Witnesses

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WINDMILL.

SPECIFICATION forming part of Letters Patent No. 607,430, dated July 19, 1898.

Application filed March 1, 1897. Serial No. 625,602. (No model.)

To all whom it may concern:

Be it known that I, HENRY A. FRENCH, a citizen of the United States, residing at Lansing, in the county of Ingham and State of Michigan, have invented certain new and useful Improvements in Windmills, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to windmills of that class in which the mill is provided with mechanism for throwing it in and out of the wind both automatically when the pressure of the wind is too great and by hand when it is desired to stop the mill from working. Heretofore mills of this kind have been provided with brakes for stopping the wheel when the mill is not working; but it has been the practice to so arrange these brakes that they will be applied whenever the wheel is thrown out of the wind. This is objectionable, inasmuch as the only object of the brake is to prevent the wheel from turning when it is desired to stop the working of the mill, while with the above-described construction whenever the wind is strong or puffy the brake is constantly applied by the automatic movement of the wheel out of the wind. The effect of this is to quickly wear out the brake and unnecessarily retard the movement of the mill while it is working. My invention is designed to overcome these objections; and to this end it consists in the peculiar means employed for braking the wheel, whereby the brake is applied only when it is desired to stop the mill from working, all as more fully described and claimed.

In the drawings, Figure 1 is a side elevation of a windmill to which my invention is applied. Fig. 2 is a horizontal section on line *xx* of Fig. 1. Fig. 3 is a vertical section on line *yy* of Fig. 1. Fig. 4 is a plan of the mill out of the wind.

A is a wind-wheel mounted on a shaft B, journaled in suitable bearings on the head C, provided with a downwardly-extending hollow shank D, resting upon a turn-table in the tower. (Not shown.)

E is a pinion on the shaft B. F is a gear-wheel meshing therewith, having a crank-pin F', connected by a pitman G to the reciprocating head H, slidingly secured in the bearing I upon the head C.

H' is a rod connected to the head H and ex-

tending downwardly through the hollow shank D, which rod is connected at its lower end with the pump or other device for which the mill furnishes the power.

J is a tail-vane pivotally secured by the pins K to the head C, the parts thus far described being all of old and well-known construction.

L is an arm bolted or otherwise secured to the head C and extending laterally therefrom, preferably at right angles to the shaft B. M and N are grooved rolls journaled in bearings on this arm, the former above the opening into the hollow shank D and the latter near the outer end of the arm.

O is a chain or flexible connection attached at one end to the vane J, and passing around the rolls M and N it extends down through the hollow shank D, forming the means of turning the wheel out of the wind when it is desired to stop the mill from working.

The mill is also provided with suitable means for throwing it out of the wind automatically whenever the pressure of the wind becomes too great. To accomplish this, I preferably journal the wheel a little to one side of the center of the head C and hold it normally in the wind by the tension of a spring J', which when the pressure becomes too strong will permit the wheel to turn out of the wind.

P is a wheel or drum secured upon the shaft B. Q is a flexible band passing around this wheel, one end of which is secured to the stationary lug R on the arm L or head C, and the other end is connected to the rock-arm S, mounted on the rock-shaft T, journaled in bearings on the head C below the arm L.

U is a rock-arm secured to the shaft T, which passes up through the slot *a* in the arm L and is provided at its upper end with a loop *b*, through which the chain O passes.

V is a dog on the chain O, adapted to strike against the arm U to rock the latter in the movement of the chain.

The parts being thus constructed and arranged, their operation is as follows: When the wheel is in the wind, the rock-arm S is in a position where the tension on the strap Q is released, allowing the wheel P to revolve freely without friction. When the operator desires to stop the mill, he pulls upon the chain O, which draws the vane J into paral-

lelism with the wind-wheel, carrying the latter out of the wind. At the same time the movement of the chain O will cause the dog V to strike against the lever U and rock the shaft

5 T. This will turn the arm S into a position where the strap Q is drawn into frictional contact with the periphery of the wheel P, thereby stopping the motion of the wheel. Upon releasing the chain O the vane will
10 again be thrown into a position at right angles to the wheel by the spring J', and as the dog V is drawn away from the lever U the latter will fall by its own gravity, releasing the tension on the strap Q.

15 When the mill is working, the wheel may be automatically thrown out of the wind by the increased pressure thereof without applying the brake Q, as the latter, by reason of the lost-motion connection formed by the
20 chain, is independent of the movement of the vane, and thus the motion of the wheel is not checked.

As shown in Fig. 2 of the drawings, the grooved roll M, over which the chain O
25 passes, is journaled between two flanges c and d on the arm L, the former being provided with a bearing e, through which the rod H' passes, and the face of the roll M forming a guide, which holds the rod H' in said
30 bearing.

I preferably provide bumpers at the end of the arm L, against which the vane J strikes when the latter is drawn in parallelism with the wheel.

35 What I claim as my invention is—

1. The combination with a wind-wheel, and mechanism for automatically throwing it in or out of the wind, of a connection for throwing the wheel out by hand, a normally-released
40 brake for said wheel, means connecting the hand connection and the throwing-out mechanism adapted to apply said brake when the wheel is thrown out by the hand connection and permit its complete automatic movement
45 without applying the brake.

2. The combination with a wind-wheel, and mechanism for automatically throwing it out of the wind, of a normally-released brake for said wind-wheel, a hand connection for throw-
50 ing the wind-wheel out of the wind and for applying said brake, and a connection of flexi-

ble material between the brake and the automatic throwing-out mechanism, whereby the automatic operation of the latter will not apply the brake.

3. The combination with the wind-wheel and mechanism for automatically throwing it in or out of the wind, of a normally-released brake for said wheel, a lever for applying said brake, a flexible connection for actuat-
60 ing said throwing-out mechanism by hand, and a dog on said connection adapted to engage with and operate said brake-lever only when the wheel is thrown out by hand.

4. The combination with the wind-wheel, 65 the swiveled hollow head therefor, and automatic mechanism for throwing it in or out of the wind, of a brake-wheel on the shaft of said wind-wheel, a brake-strap therefor, a tightening-lever for said strap, an arm pro-
70 jecting laterally from said head, a connection of flexible material secured at one end to the vane and passing over a bearing on the end of said arm and down through said hollow head, and a dog on said connection adapted
75 to engage with said tightening-lever, for the purpose specified.

5. The combination with the wind-wheel, the swiveled hollow head, a reciprocating connecting-rod passing down through said head, 80 and mechanism for throwing said wheel in or out of the wind, of a chain or flexible connection for operating said throwing-out mechanism by hand passing down through said hollow head, and a pulley over which said
85 flexible connection passes forming a guide for said reciprocating rod.

6. The combination with the wind-wheel, and mechanism for automatically throwing it out of the wind, of a flexible connection for
90 throwing it out by hand, a brake mechanism, a lever for operating the same with which said flexible connection has a loose engagement, and a means carried by said flexible connection for engaging said lever to operate the
95 same.

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

HENRY A. FRENCH.

Witnesses:

GURDON B. SMITH,
CHAS. S. SMITH.