

(No Model.)

2 Sheets—Sheet 1.

S. HICKS.
MECHANICAL MOTOR.

No. 480,724.

Patented Aug. 16, 1892.

Fig. 1

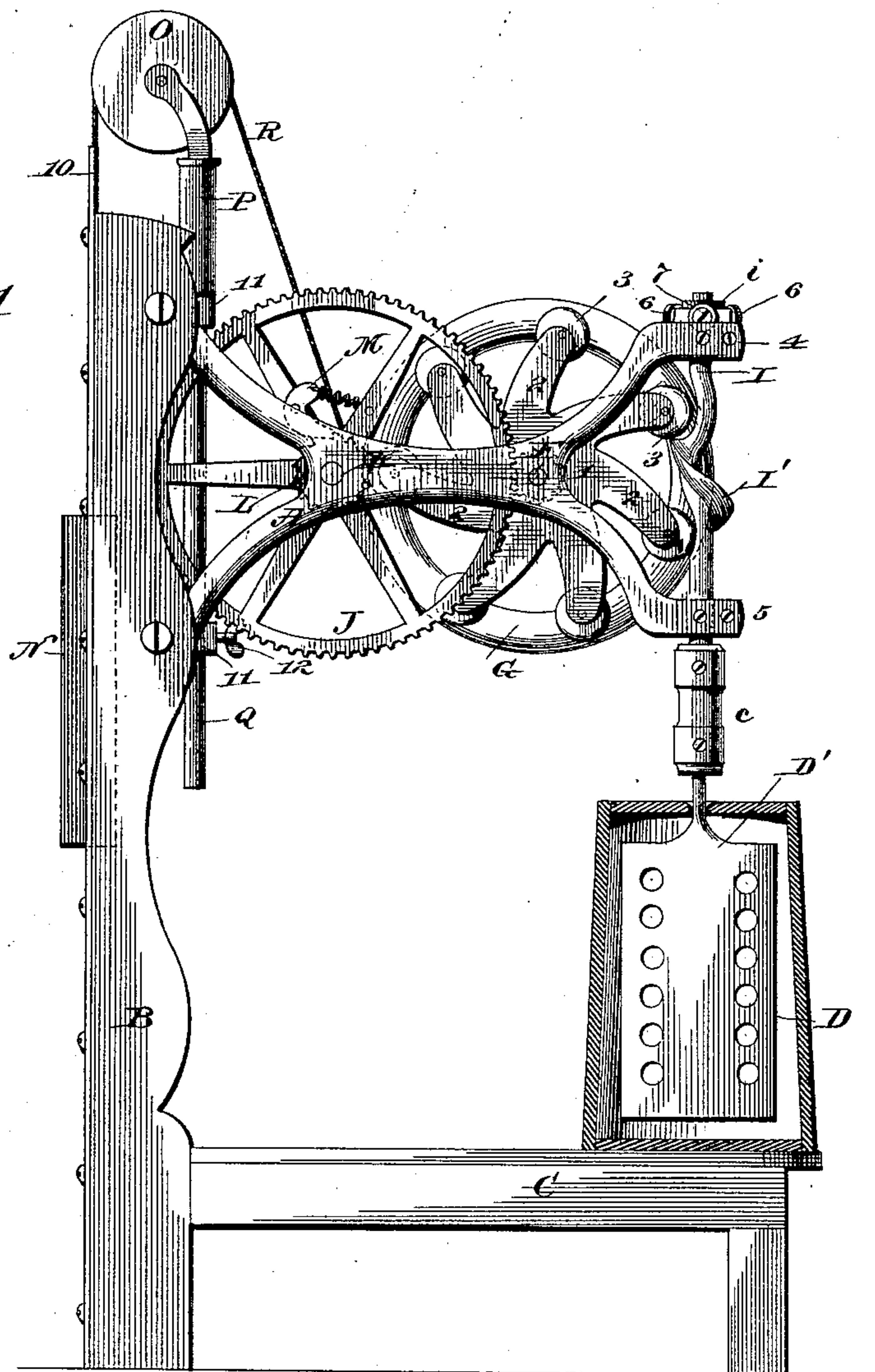
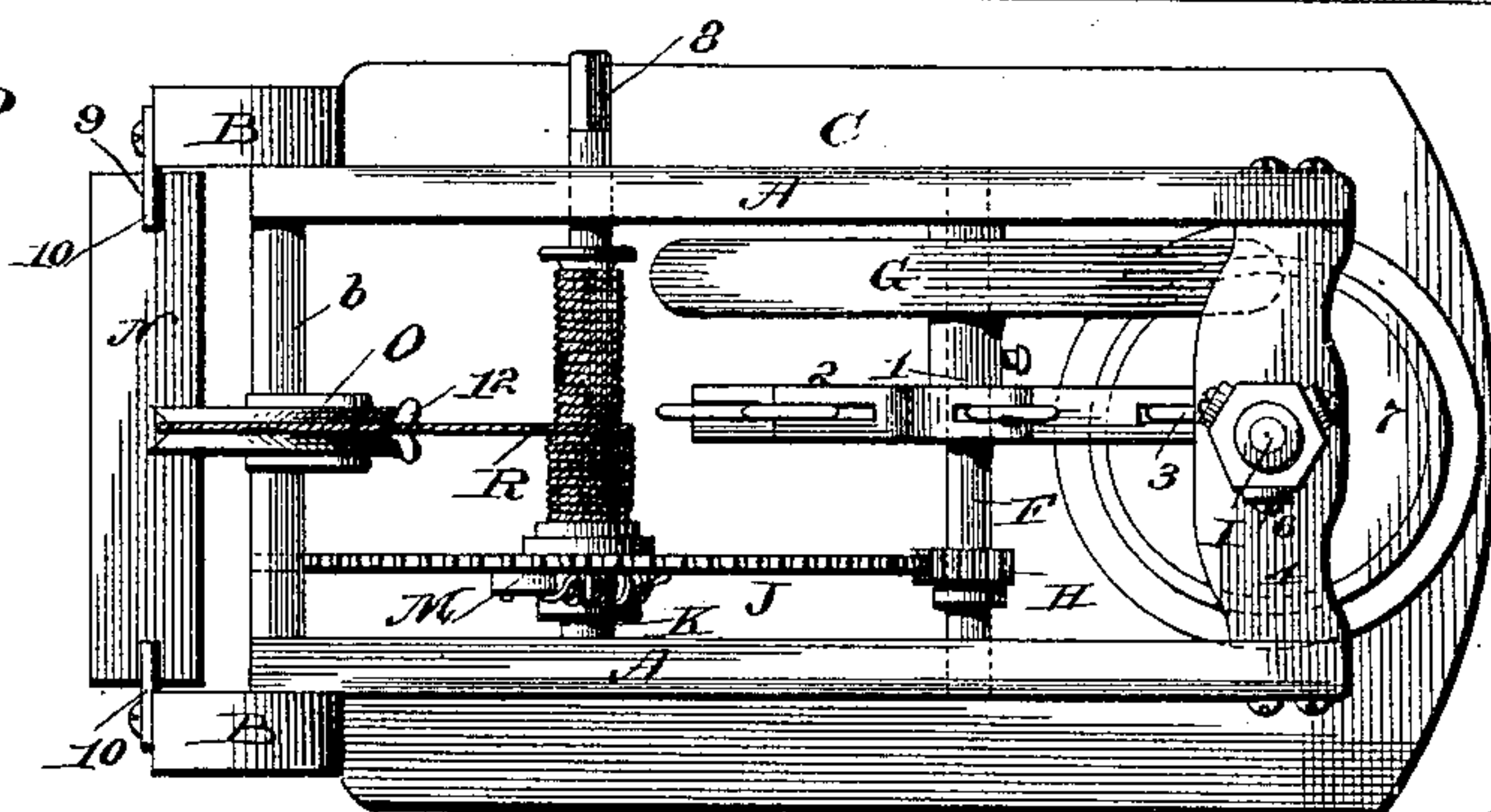


Fig. 2



Witnesses.

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M. C. Massie

Inventor,

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By Wm. Hunter Myers,
Att'y

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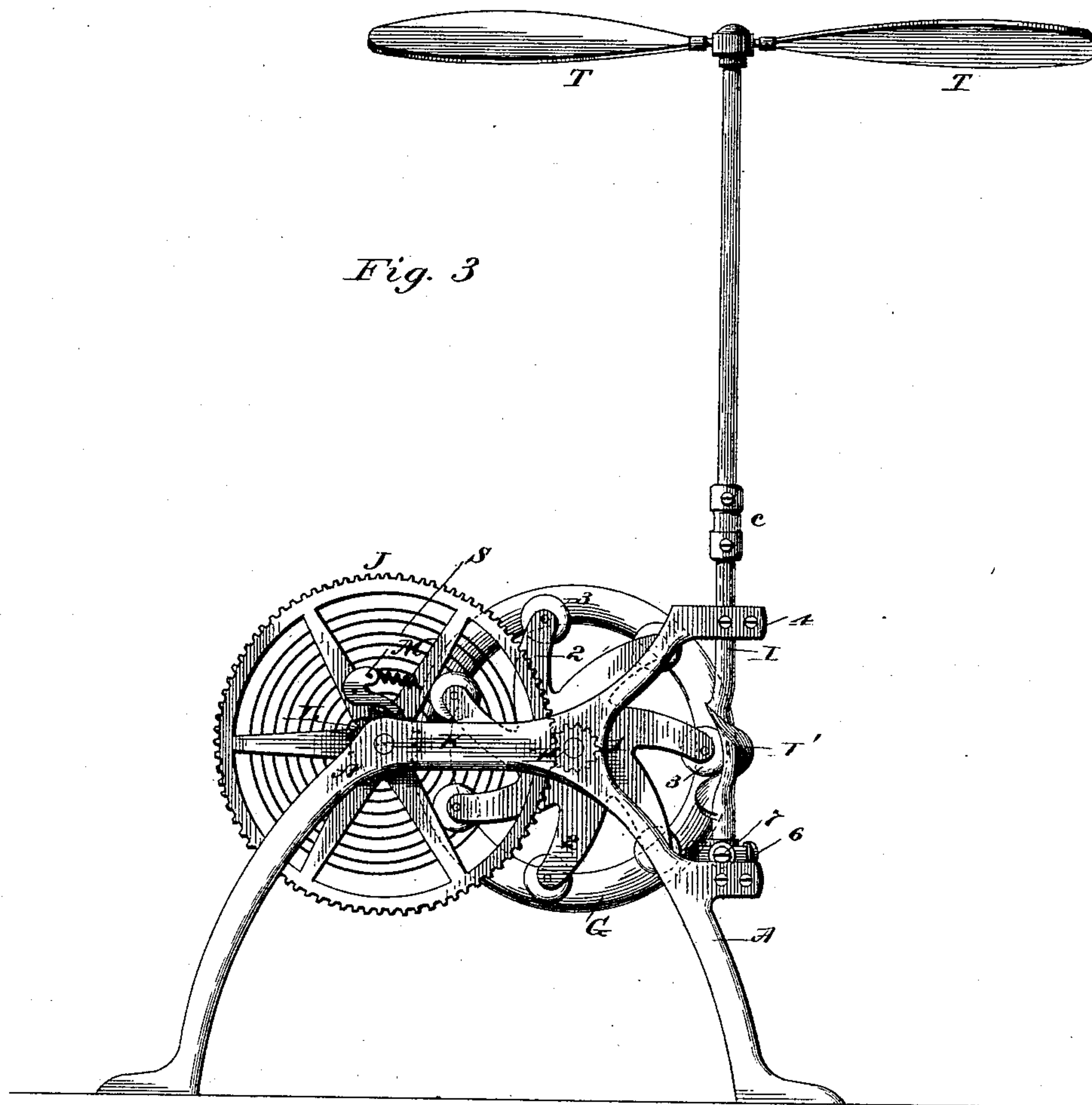
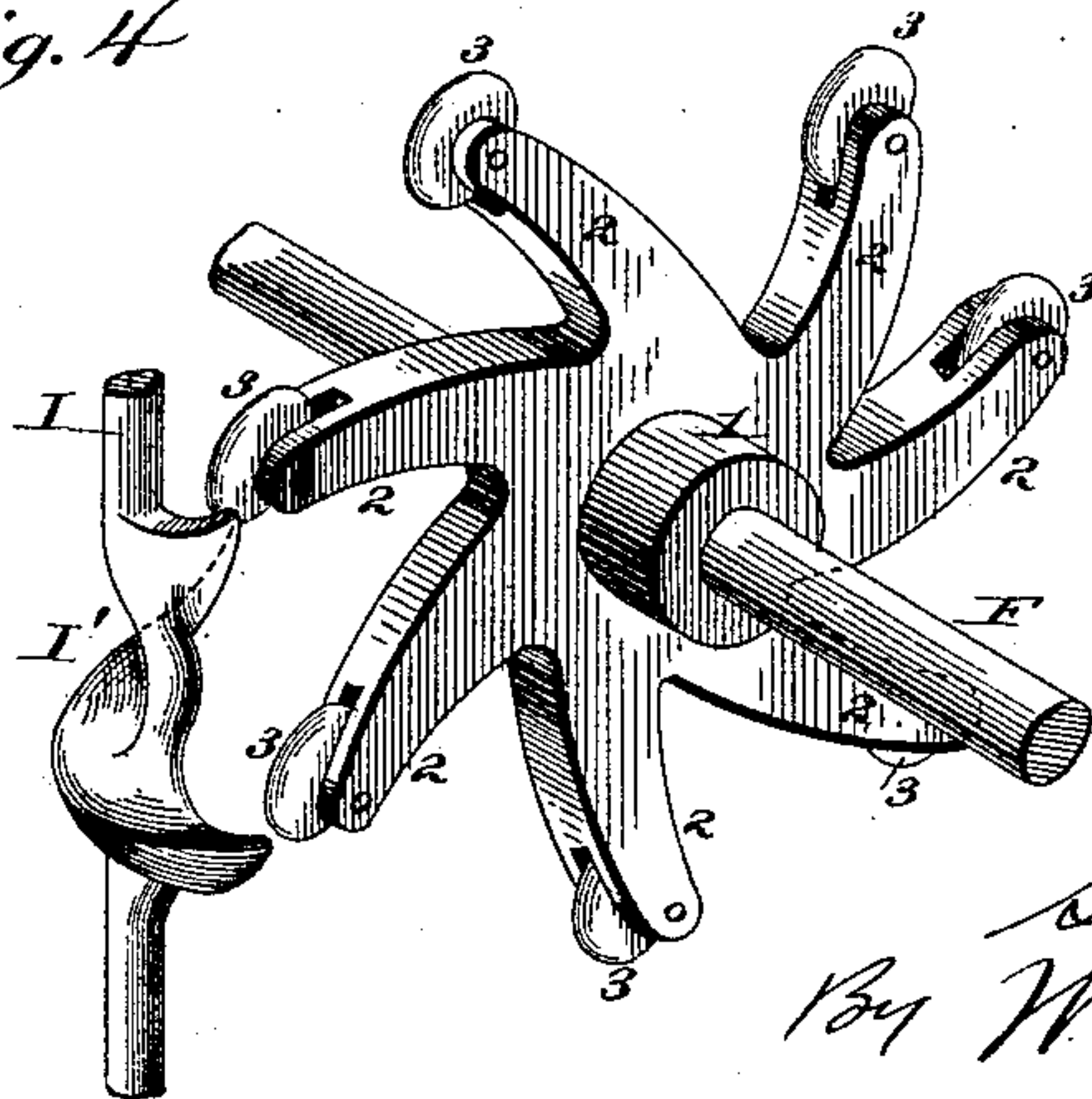


Fig. 4



Witnesses

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UNITED STATES PATENT OFFICE.

SHELBY HICKS, OF PROVIDENCE, KENTUCKY, ASSIGNOR OF ONE-HALF TO
JOHN W. GIVENS, OF SAME PLACE.

MECHANICAL MOTOR.

SPECIFICATION forming part of Letters Patent No. 480,724, dated August 16, 1892.

Application filed April 28, 1892. Serial No. 431,007. (No model.)

To all whom it may concern:

Be it known that I, SHELBY HICKS, a citizen of the United States of America, residing at Providence, in the county of Webster and State of Kentucky, have invented certain new and useful Improvements in Mechanical Motors, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to a mechanical motor well adapted for operating a churn-dasher, a fly-fan, and many other mechanisms.

The invention will first be described in connection with the accompanying drawings, and then pointed out in the claims.

Figure 1 of the drawings is a side elevation of one form of my invention applied as a churn-motor. Fig. 2 is a plan view of the same. Fig. 3 is a side elevation of a modified form of my invention applied as a fly-fan motor. Fig. 4 is a perspective detail view of the star-wheel on the star-wheel shaft in engagement with the spiral flange on the operating-shaft.

Similar letters and figures of reference indicate corresponding parts in all the views.

Referring to Figs. 1 and 2 of the drawings, A represents the framework of the motor, secured at its rear end to two uprights B, rising from a bench C, on which the churn D is to be placed.

E is a star-wheel, comprising a hub 1 and a series of arms 2, fixed on a horizontal shaft F, journaled in the sides of the frame A. In the outer bifurcated end of each arm 2 is journaled an anti-friction roller 3, whose tread-surface is preferably on an imaginary direct line through the longitudinal center of the arm. By thus locating the anti-friction rollers the torsional strain incidentally produced when they are located at one side of the center of the arms is avoided. Shaft F also carries a balance-wheel G and a pinion H.

I is a vertical operating-shaft loosely mounted in extensions 4 and 5 of the frame A and supported therein by a collar i, fixed on its upper end, carrying anti-friction rollers 6, which bear on the extension 4, said rollers being mounted on pintles 7, fixed in the periphery of the collar. On the lower end of this shaft is a coupling c, in which is secured

the stem of the churn-dasher D'. For the purpose of gearing this operating-shaft with the star-wheel it is provided with a spiral flange I', whose vertical length is about equal to the distance between two of the anti-friction rollers carried by said wheel, so that as one of the rollers is about leaving the flange another one will be brought into engagement with it, as seen in Figs. 1 and 4, whereby the force exerted by one of these rollers is not counteracted by the other, and consequently a steady rotation is imparted to the shaft. Furthermore, that portion of the shaft which bears the flange is curved to correspond with the inclination of the flange, as shown, whereby while the arms of the star-wheel move in the arc of a circle the rollers carried thereby will, during the time of their contact with the flange, be always at the same distance from the center of the shaft, thus having leverage and exerting power in turning the shaft throughout their travel over the flange.

The star-wheel shaft F is operated by a large gear-wheel J in mesh with the pinion H, said gear-wheel being loosely mounted on a horizontal driving-shaft K, journaled in frame A, and carrying, also, a fixed ratchet-wheel L, adjacent to wheel J, one end of said shaft being extended through and beyond the frame and squared, as at 8, for the reception of a wrench. A spring-actuated pawl M, pivoted to wheel J and in engagement with the ratchet-wheel L, serves to lock the gear-wheel to its shaft during the backward revolution of the latter.

N represents a weight having a longitudinal groove 9 in each side, and 10 represents an inwardly-extending plate secured to the rear side of each of the uprights B and entering the grooves in the weight to serve as ways on which the weight may slide.

O is a pulley mounted in the bifurcated upper end of a swivel P, the latter being supported on the upper end of a rod Q, passing through keepers 11, secured to cross-pieces b, uniting the uprights B, said rod being adjustably held by a thumb-screw 12, passed through one of the keepers.

R is a cord passed over the pulley O, and secured at one end to the driving-shaft K and at its other end to the weight.

Any suitable governor may be used—as, for

instance, an adjustable friction-brake bearing on the driving-shaft.

Instead of using the weight and cord to drive shaft K, I may dispense with them and substitute a coiled spring S, secured at one end to the shaft and at the other to the frame A, as seen in Fig. 3.

In Fig. 3 I have shown the motor arranged to drive a fly-fan T. In such a use as this the frame A is so constructed as to rest on any suitable base and the operating-shaft is extended upward, the anti-friction rollers 6, carried by the collar *i*, resting on the lower extension 5 of frame A.

The operation of my motor is so obvious as to render description unnecessary.

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

1. In a mechanical motor, the combination, with the frame, of a star-wheel bearing an anti-friction roller on each arm, a shaft revolvably mounted in the frame and carrying the star-wheel, an operating-shaft at a right angle to the star-wheel shaft, said operating-shaft having a spiral flange with which the anti-friction rollers engage and a curvature corresponding with the inclination of the flange, and means for driving the star-wheel shaft.

2. In a mechanical motor, the combination, with the frame, of a star-wheel each arm of which carries at its outer end an anti-friction roller in line with its longitudinal center, a shaft revolvably mounted in the frame and carrying the star-wheel, an operating-shaft mounted in the frame at right angles to the star-wheel shaft, said operating-shaft having a spiral flange with which the anti-friction

rollers successively engage and a curvature corresponding with the inclination of said flange, and mechanism for driving the star-wheel shaft.

3. In a mechanical motor, the combination, with the frame, of a star-wheel each arm of which carries at its outer end an anti-friction roller in line with its longitudinal center, a shaft revolvably mounted in the frame and carrying the star-wheel, an operating-shaft mounted in the frame at a right angle to the star-wheel shaft, said operating-shaft having a spiral flange with which the anti-friction rollers successively engage, and a curvature corresponding with the inclination of said flange, a collar fixed on the operating-shaft and carrying anti-friction rollers which bear on the frame, and mechanism for driving the star-wheel shaft.

4. A mechanical motor comprising frame A, driving-shaft K, ratchet-wheel L, fixed on said shaft, gear-wheel J, loose on said shaft and carrying spring-actuated pawl M, means for actuating said shaft, star-wheel shaft F, star-wheel E, carried by said shaft F, pinion H, and balance-wheel G, said star-wheel being provided with anti-friction rollers 3, operating-shaft I, having spiral flange I' and a curve corresponding to the inclination of the flanges, and collar *i*, fixed on shaft I and carrying anti-friction rollers 6, all constructed and arranged substantially as described.

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

SHELBY HICKS.

Witnesses:

B. D. BAILEY,
CARL DORRIS.