

No. 639,803.

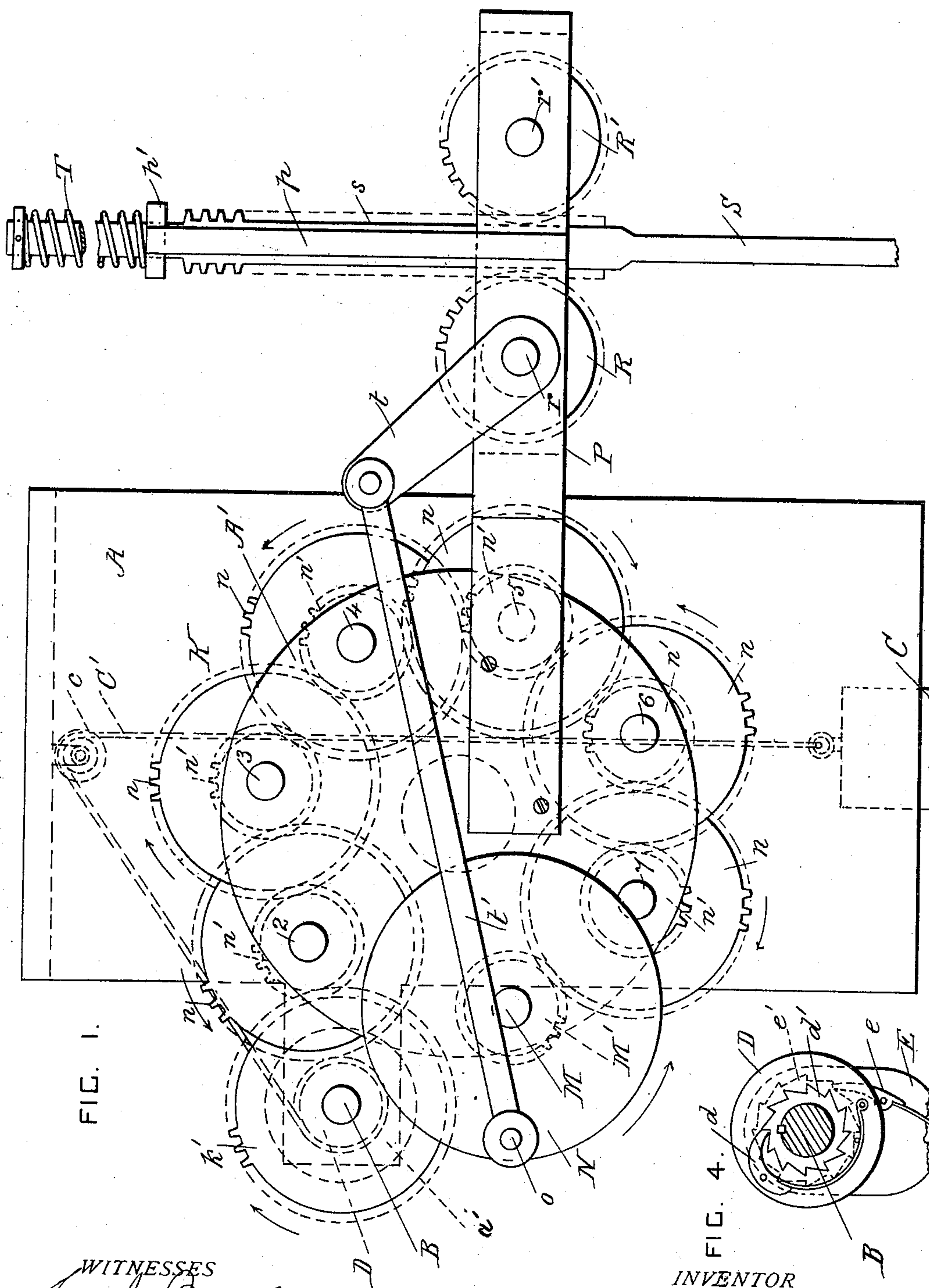
Patented Dec. 26, 1899.

J. A. WORKMAN.
GRAVITY MOTOR.

(Application filed Apr. 18, 1899.)

(No Model.)

2 Sheets—Sheet 1.

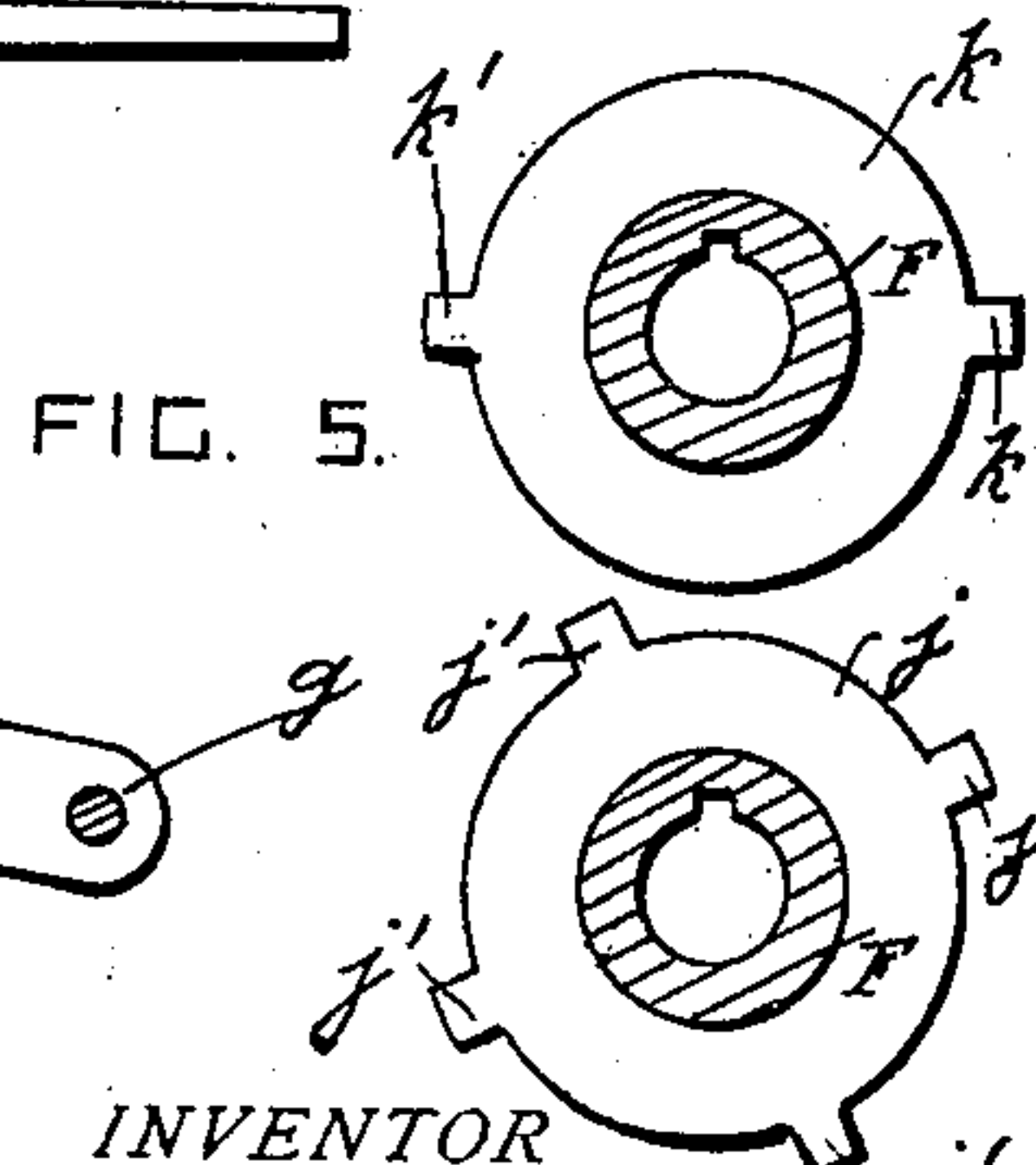
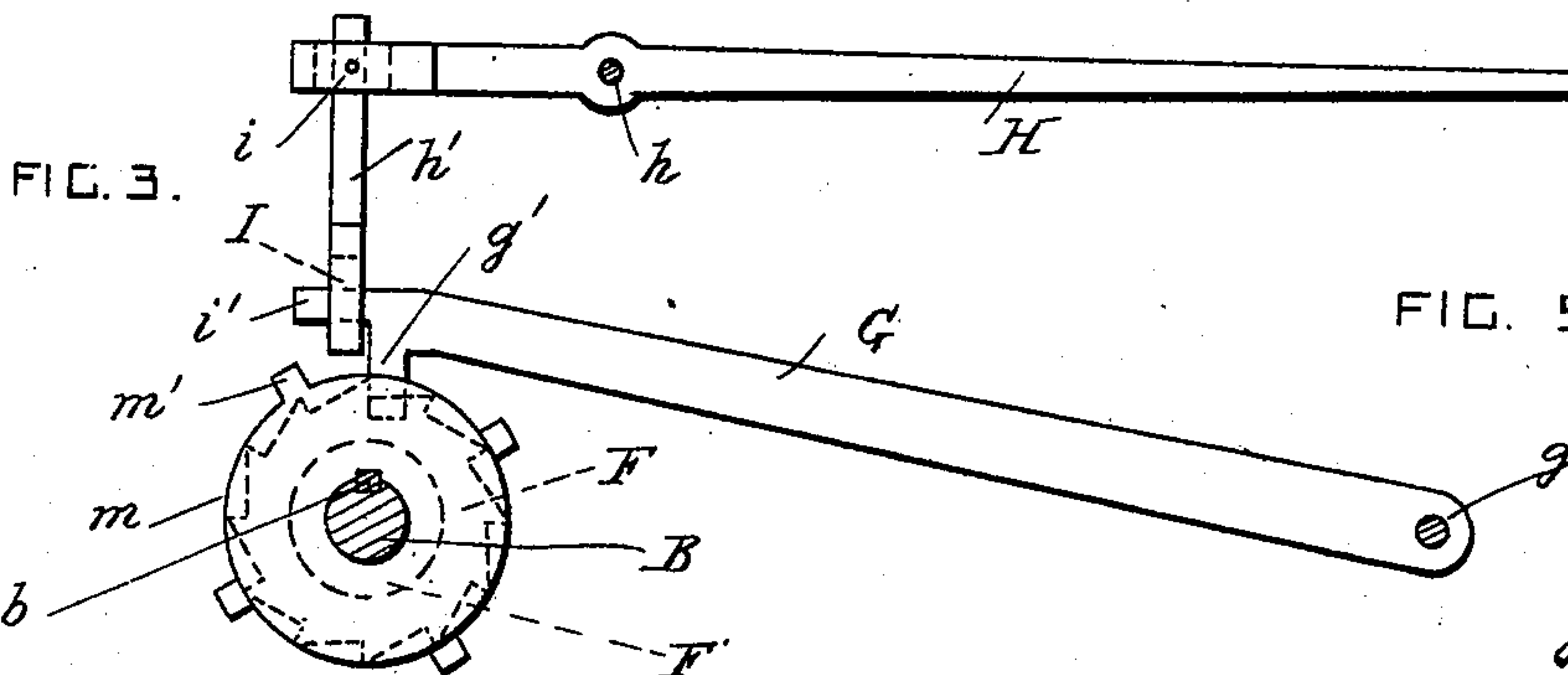
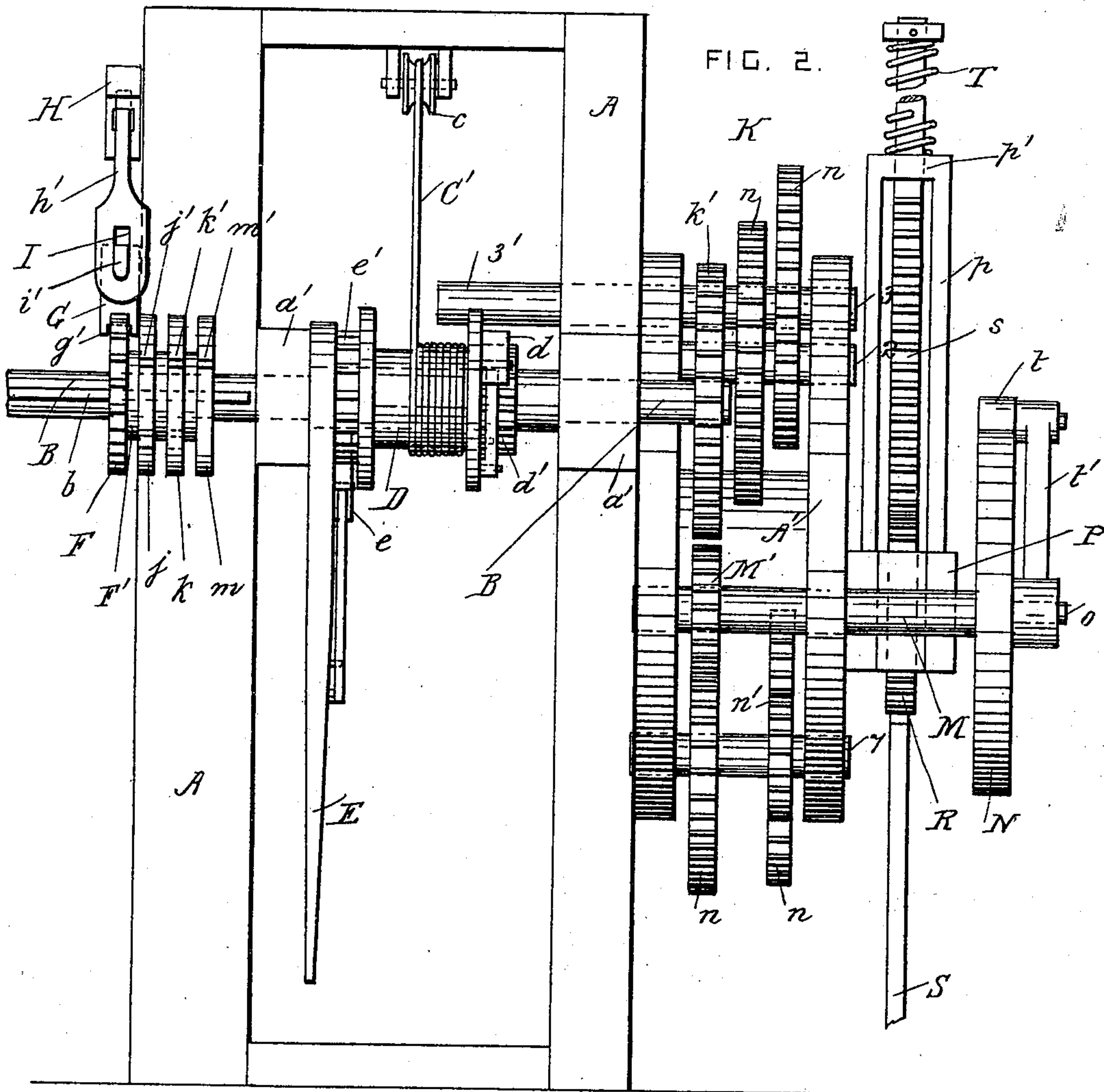


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GRAVITY MOTOR.

(Application filed Apr. 18, 1899.)

(No Model.)

2 Sheets—Sheet 2.



WITNESSES

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UNITED STATES PATENT OFFICE.

JAMES A. WORKMAN, OF NEW MADRID, MISSOURI.

GRAVITY-MOTOR.

SPECIFICATION forming part of Letters Patent No. 639,803, dated December 26, 1899.

Application filed April 18, 1899. Serial No. 713,492. (No model.)

To all whom it may concern:

Be it known that I, JAMES A. WORKMAN, a citizen of the United States, residing at New Madrid, in the county of New Madrid and State of Missouri, have invented certain new and useful Improvements in Gravity-Motors; and I do hereby declare the following to be 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.

This invention relates to gravity-motors; and it consists in the novel construction and combination of the parts hereinafter fully described and claimed.

In the drawings, Figure 1 is a front view of the motor. Fig. 2 is a side view of the motor. Fig. 3 is a detail view of the stop mechanism. Fig. 4 is a detail view of the winding-barrel. Fig. 5 shows detail views of the disks *j* and *k*.

A is a frame of any approved form and construction.

B is a main shaft journaled in bearings *a'* on the frame A.

C is a heavy weight which drives the motor, and when the frame A rests on the ground the weight slides in a pit or well formed in the ground.

C' is the cord or chain, which is attached to the weight and wound on the barrel D, and *c* is a guide-sheave, supported by the frame, for the cord C' to pass over.

The barrel D is journaled on the shaft B and is provided with a pivoted spring-pressed pawl *d*, which engages with a ratchet-toothed wheel *d'*, secured on the shaft B, so that the weight revolves the shaft B by turning the barrel and wheel *d'* as it descends by gravity.

E is the winding-lever, which is journaled on the shaft B. This lever is provided with a pivoted spring-pressed pawl *e*, which engages with a ratchet-toothed wheel *e'* on one end of the barrel D.

F is a ratchet-toothed wheel formed on a drum F', which is splined to the shaft B by a spline *b*.

G is the stop, which is pivoted at one end on a pin *g*, projecting from the frame. This stop is provided at its free end with a forked jaw *g'*, which straddles the wheel F and engages with its teeth. This stop normally pre-

vents the shaft B from revolving and enables the cord to be wound upon the barrel on oscillating the winding-lever, thereby raising the weight.

H is the stop-lever, which is pivoted on a pin *h*, projecting from the frame, and *h'* is a link pivoted to the short end of the lever H by a pin *i* and provided with an elongated hole I, which engages with a projection *i'* on the free end portion of the stop G. The stop is raised out of engagement with the ratchet-toothed wheel by depressing the stop-lever, and the elongated hole I permits the ratchet-teeth to raise and lower the stop when the motor is being wound up, so that the said teeth pass under the stop.

Three disks *j*, *k*, and *m* are formed on the drum F' parallel with the ratchet-toothed wheel F and are provided with projections *j'*, *k'*, and *m'*, respectively. The disk *j* has four projections, the disk *k* has two projections, and the disk *m* has one projection; but different numbers of projections may be used. After the motor has been started by raising the stop clear of the ratchet-toothed wheel the drum F' is slid on the shaft, so that the forked jaw *g'* engages with one or the other of the disks. The motor continues to operate until the next projection on the disk selected comes against the stop and arrests the motion of the motor. The time during which the motor will operate is determined by the disk selected and placed in engagement with the forked jaw of the stop. When the motor stops, it can be started for another similar period by raising the stop by means of the stop-lever and permitting it to reengage with the same disk when the said disk has revolved to a slight extent.

K is a train of toothed wheels and pinions driven by a toothed wheel *k'*, secured on the shaft B. The train K is supported by an auxiliary frame A', secured to the frame A.

2, 3, 4, 5, 6, and 7 are the shafts of the train of wheels, which shafts are journaled in the frame A'. Each shaft has a toothed wheel *n* and a toothed pinion *n'* secured on it. The pinion *n'* on shaft 2 gears into the wheel *k'* on the shaft B. Each remaining pinion *n'* gears into the wheel *n* next before it in the train.

M is a shaft journaled in the frame A' and

provided with a toothed pinion M' , which gears into the wheel n on the shaft 7. More or less wheels and pinions than those shown may be used to form the train of gearing.

5 The wheels and pinions are preferably arranged equidistant from and around a central point, and the auxiliary frame A' is preferably circular.

10 The shaft 3 has a projecting end portion $3'$, and the stop-drum F' may be carried by this end portion instead of by the shaft B, if desired. In a similar manner the stop-drum may be carried by any other shaft, according to the time it is desired to set the motor to
15 run.

N is a crank or crank-disk secured on the shaft M and provided with a crank-pin o .

P is a horizontal frame secured to the frame A' and provided with a vertical extension p ,
20 carrying a guide p' .

R R' are two toothed wheels carried by shafts r r' and arranged in the frame P.

S is a pump-rod provided with a double-toothed rack s , which engages with the teeth
25 of the wheels R R'. The pump-rod slides in the guide p' .

T is a spring which is secured to the projecting upper end of the pump-rod and which bears against the guide p' . This spring as-
30 sists in raising the pump-rod.

A crank or arm t is secured on the shaft r , and t' is a connecting-rod which couples the crank t to the crank-pin o . The throw of the crank or arm t is arranged so that the continu-
35 ous circular motion of the crank or crank-disk N is transformed into reciprocatory motion, and the pump-rod is moved up and down vertically. The arm t is oscillated back and forth by the connecting-rod and is not revolved.

40 This motor is used principally for working

a pump; but it may be used for any other purpose to which it can be applied.

What I claim is—

1. In a motor, the combination with a driving-shaft, and means for revolving it; of a
45 slidable drum revolving with the said shaft and provided with disks having projections on their peripheries, and a stop for engaging with either of the said disks, substantially as set forth. 50

2. In a gravity-motor, the combination, with a driving-shaft, a barrel operatively connected with the driving-shaft, and a weight operating to revolve the said shaft and barrel; of a ratchet-toothed wheel revolving with
55 the driving-shaft, a pivoted stop engaging with the said wheel, a pivoted stop-lever, and a link pivoted to the stop-lever and provided with an elongated hole which engages with a projection on the said stop and permits it to
60 move vertically without moving the said stop-lever during the winding-up operation, substantially as set forth.

3. In a gravity-motor, the combination, with a driving-shaft, a barrel operatively con-
65 nected with the driving-shaft, and a weight operating to revolve the said shaft and barrel; of a slidable drum splined to the said shaft and provided with disks having projections on their peripheries, a pivoted stop pro-
70 vided with a forked jaw for engaging with either of the said disks, and means for raising the said stop, substantially as set forth.

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

JAMES A. WORKMAN.

Witnesses:

HARRELL JOHNSON,
DAVID HUNTER.