

(No Model.)

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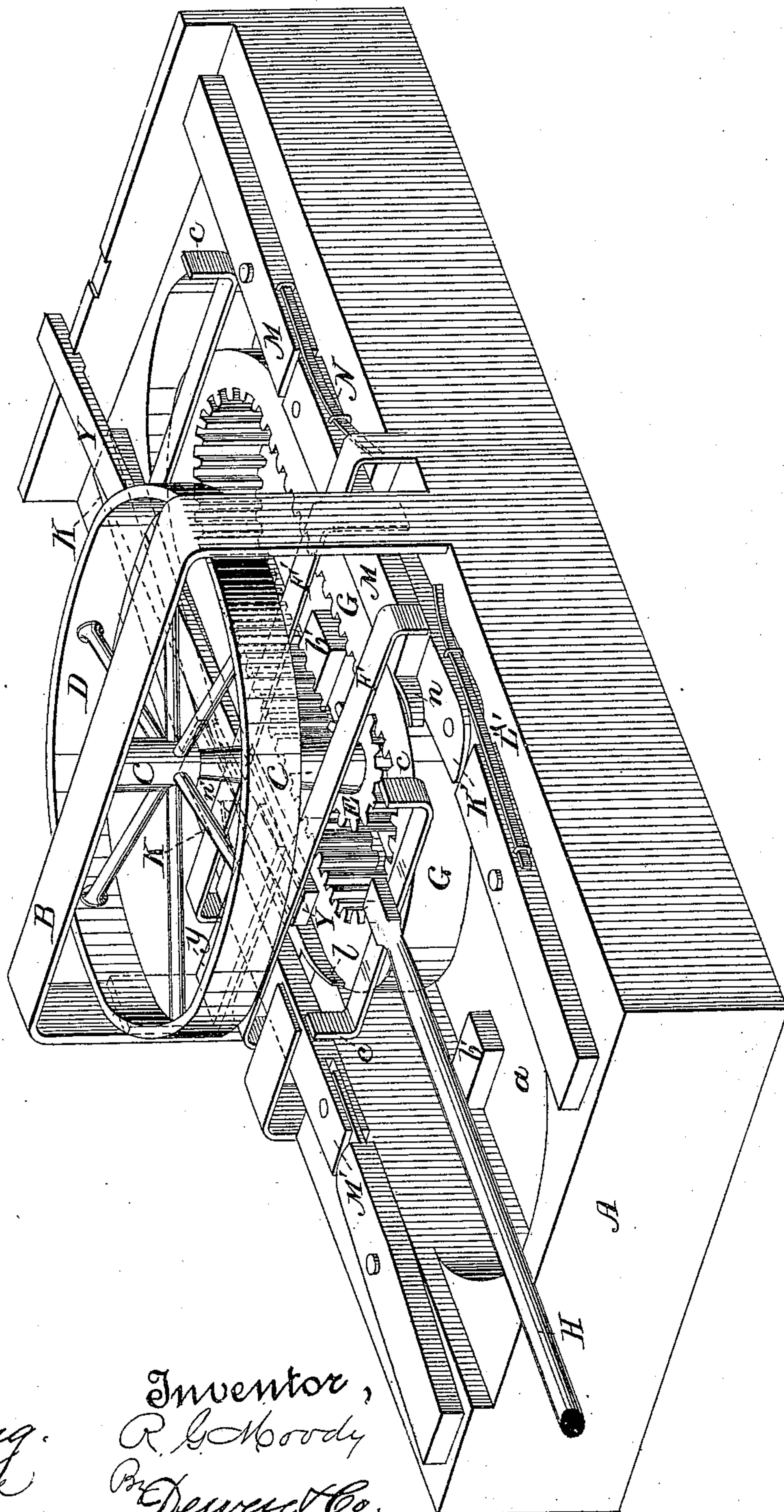
R. G. MOODY.

DEVICE FOR CONVERTING MOTION.

No. 287,307.

Patented Oct. 23, 1883.

Fig. 7.



Witnesses,
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J. H. House

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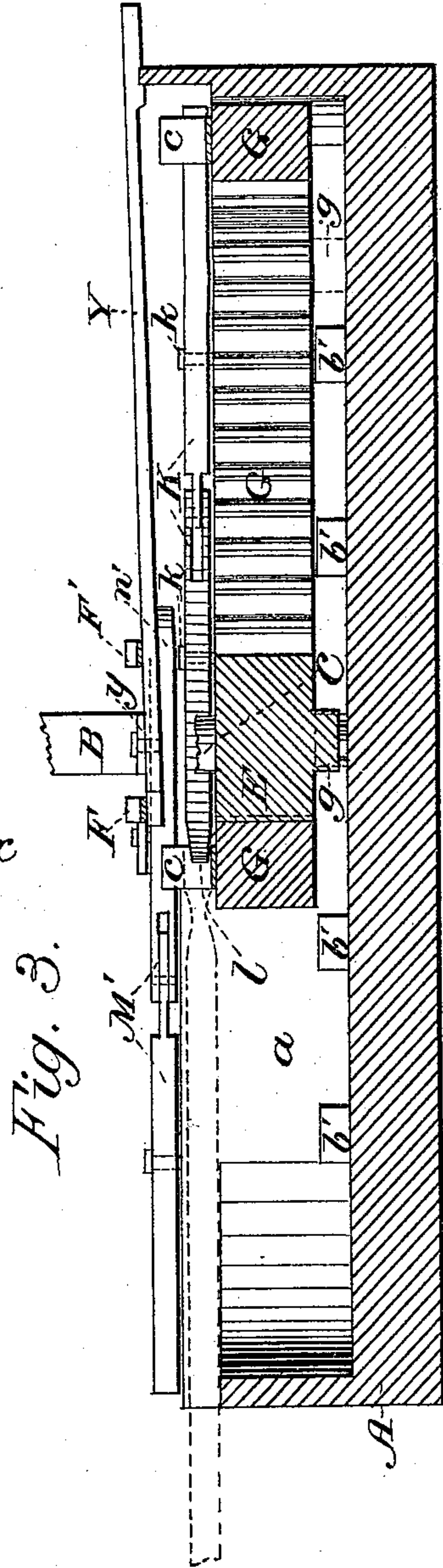
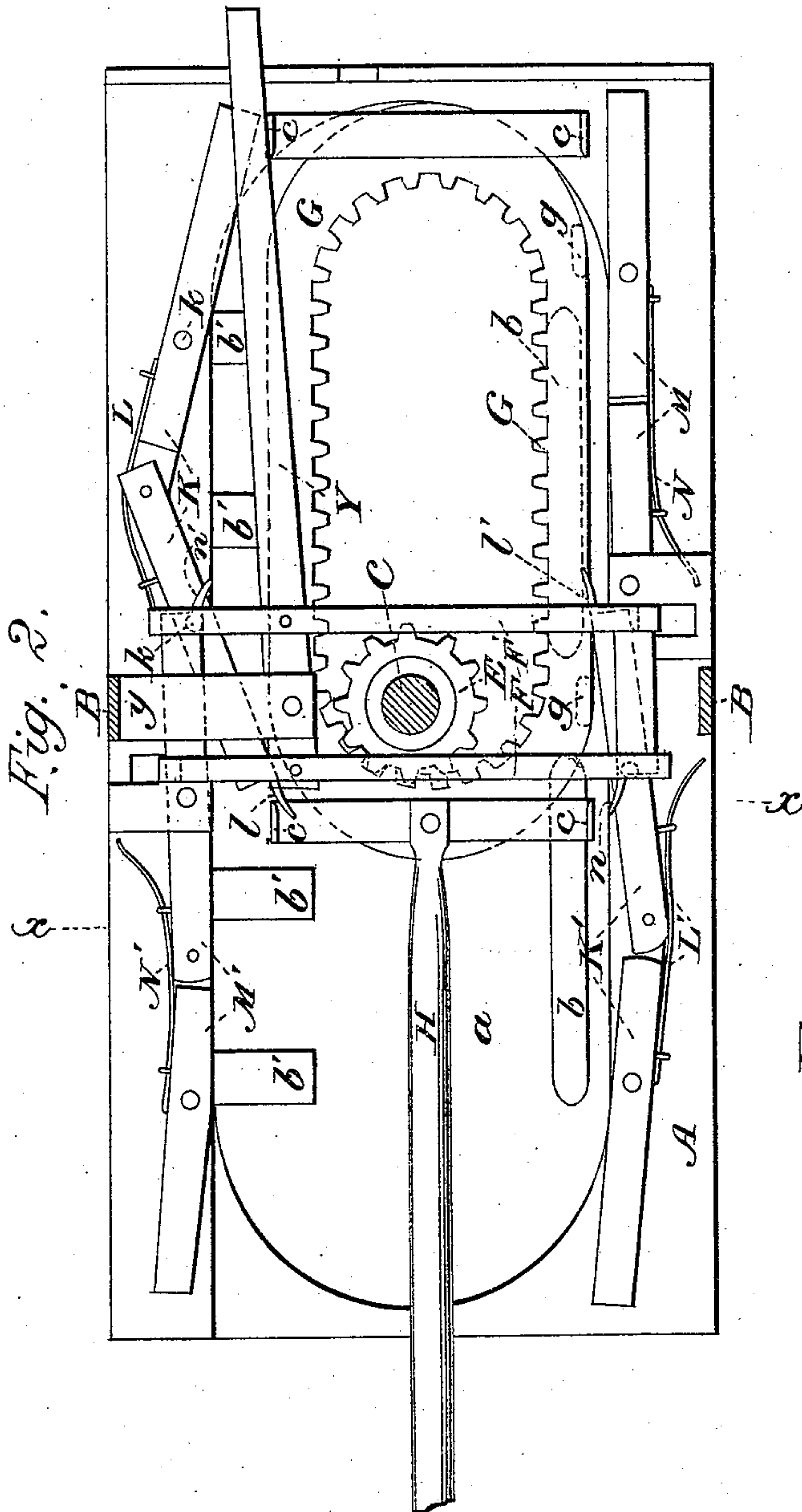
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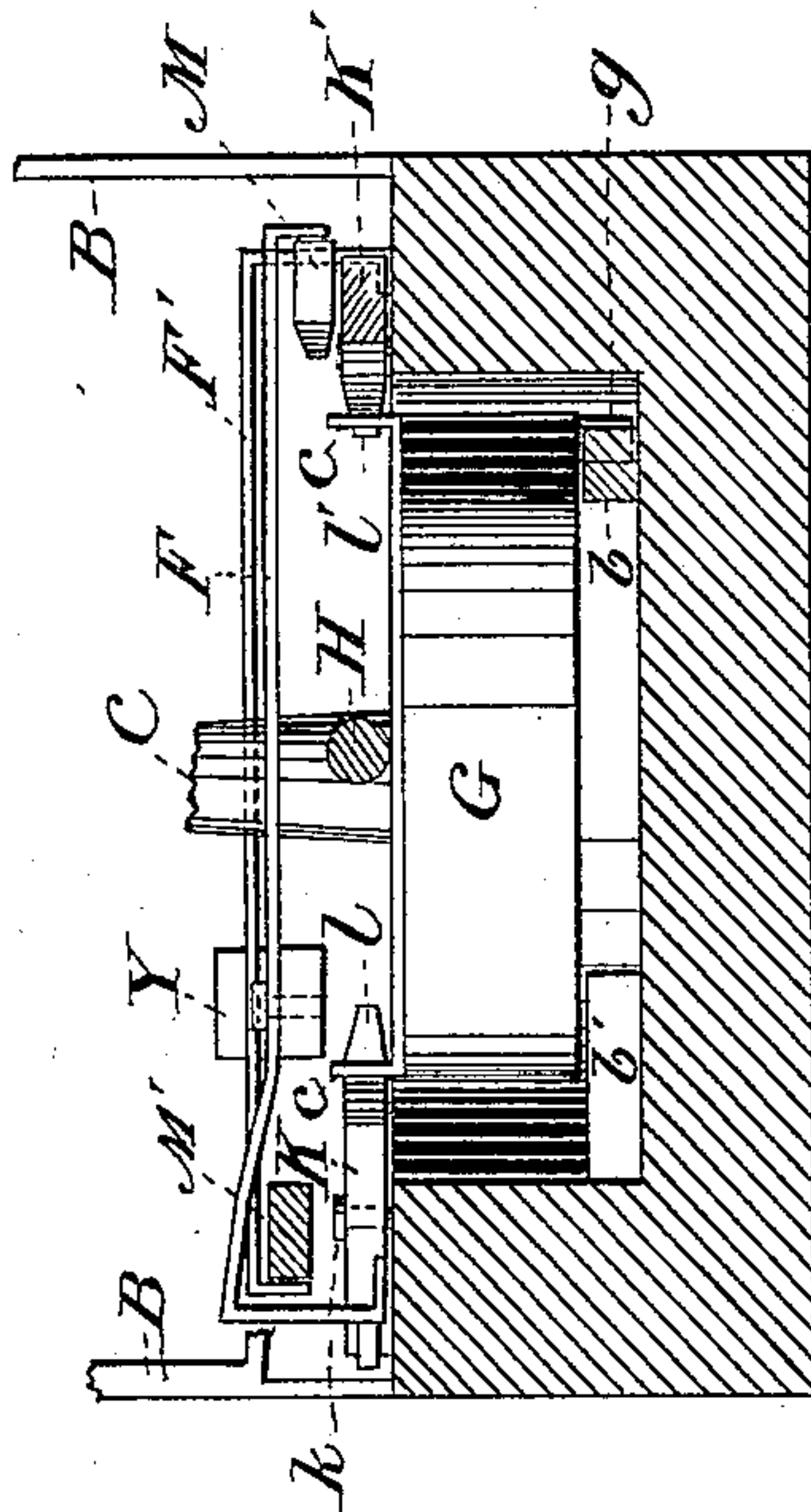
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Fig. A.



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UNITED STATES PATENT OFFICE.

RANSOM G. MOODY, OF SAN JOSÉ, CALIFORNIA.

DEVICE FOR CONVERTING MOTION.

SPECIFICATION forming part of Letters Patent No. 287,307, dated October 23, 1883.

Application filed August 22, 1883. (No model.)

To all whom it may concern:

Be it known that I, RANSOM G. MOODY, of San José, county of Santa Clara, and State of California, have invented an Improvement in Mechanical Movements; and I hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to a new and useful mechanical movement, the object of which is to convert a reciprocating rectilinear motion into a rotary motion; and it consists in a shaft having a pinion, an oval or elliptical internally-gearied rack meshing with said pinion, means for throwing said rack from one side to the other at the limits of its stroke, and suitable devices to guide its movement, together with certain details of construction, all of which I shall hereinafter fully explain.

The object of my invention is to transmit the motion indicated in the best manner, avoiding the employment of a crank, and enjoying the advantage for the greater part of the time of the crank's best point.

Referring to the accompanying drawings, Figure 1 is a perspective view of my device, showing the rack near the limit of its forward stroke and about to engage with one of the throw-levers to carry it over to the other side for its return-stroke. Fig. 2 is a plan, the fly-wheel being left off, and showing the rack at the limit of its forward stroke, just after it has engaged with one of the throw-levers and by it has been partially forced over. Fig. 3 is a vertical longitudinal section of my device. Fig. 4 is a transverse section on line *xx*, Fig. 2.

A is the foundation or bed-plate, in which is formed a chamber or recess, *a*.

B is a frame, in which is mounted or journaled the upper end of a vertical shaft, C, the lower end of which is journaled in a step in the center of the recess *a*.

D is a fly-wheel upon shaft C. E is a pinion on the lower end of said shaft.

G is an elliptical or oval internally-gearied rack, lying within the recess *a*, and meshing with the pinion E. Pivoted to this rack is the pitman H, whereby it is operated. The rack has less length and breadth than the recess which it occupies, and its own central socket has greater width and length than the pinion with which it engages. I have here shown the rack as provided on one side, at each end, with

short rounded leg-guides *g*, which travel about short tracks *b*, secured in bottom of recess *a*, Fig. 2. The leg-guides *g* are to be made in practice as wide as the tracks *b* are long. Its other side is supported on small pieces *b'*, so that it may lie level. The tracks *b* occupy such position with relation to the edge or wall of recess *a* that the legs of the rack may pass between them and the wall when the rack is thrown over in that direction, and when it is thrown over in the other direction to its limit against the opposite wall of the recess its legs move along the outer edges of the tracks. By these means the rack is guided in its movements and held to its engagement with the pinion, Fig. 2. The four corners of the rack are provided with upright arms or posts *c*. These posts may be secured directly to the rack, or, as here shown, may be formed by the upturned ends of a piece secured across the ends of the rack.

K is a compound lever, jointed at its center, and pivoted at *k k* to the bed-plate near the edge of the recess. A spring, L, holds said lever straight. Its rear end is provided with a hook or stop, *l*, with which the rear post or arm *c* of the rack is adapted to engage when thrown to that side and moving forward, Fig. 1. Upon the other side of the bed-plate, more toward the rear, is a similar compound lever, K', having a hook, *l'*, on its forward end, with which the forward arm *c* on that side is adapted to engage when the rack is coming back, Fig. 2. It is influenced by a spring, L'.

The operation of the device is as follows: When the rack is in the position shown in Fig. 1, it is over to the side of the throw-lever K, its legs being outside of their tracks and its teeth of one side engaging with the pinion. When the rack is moved forward, one of its rear arms *c* comes in contact with the hook or stop *l* of the throw-lever K just at the time when the rack has reached its forward limit, its legs being free of the tracks. The tendency of the rack would be to stop, as the force would then be in line with the pinion; but the engagement of the arm *c* with the hook *l* throws the center of the throw-lever K outwardly, forcing both its ends inwardly against both of the arms of the rack on that side, which movement throws the rack over to the other side, Fig. 2. The return-stroke of the

pitman then draws it back, its legs being inside of the tracks, until its forward arm of that side engages with the hook l' of throw-lever K' , when the rack is again thrown over, making its movement continuous, and transmitting its motion continuously and in the same direction to the upright shaft. The springs of the throw-levers return them to position. In order to provide for a reverse motion, I have similar throw-levers $M M'$, having springs $N N'$ and hooks $n n'$, so placed that the other arms c of the rack shall engage with them when the pitman is reversed; but this requires a mechanism to throw said reverse levers in position and the first set out.

Attached to frame B is an arm, y , to which is pivoted the lever Y , extending rearwardly. Pivoted to this lever on each side of its fulcrum-point are rods $F F'$, an opposite end of each of which embraces the hook ends of the reverse throw-levers $M M'$, while their other opposite ends are bent far down and back and impinge against the hook ends of the throw-levers $K K'$, Fig. 4. By moving the lever Y in one direction, the first set of hooks are drawn in, while the other set, their levers being relieved from the impingement of the other ends of the rods, are allowed to move out of the way under the influence of their springs. By moving the lever in the opposite direction, the hooks are reversed. By means of this device I do away with the crank, and still am enabled to retain the crank's best point or power the greater portion of the time.

It is obvious that this device may be set at an inclination, or upright, or in any position necessary to transmit its power to any shaft.

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

1. The means for converting a reciprocating rectilinear motion into a rotary one, consisting of the shaft C , having a pinion, E , in combination with the oval or elliptical internally-gear rack G , having the corner posts or arms c , the compound centrally-jointed and pivoted throw-levers $K K'$, having hooks $l l'$, and springs $L L'$, and means for guiding said rack in its engagement, substantially as herein described.

2. The recessed or chambered bed-plate A

and the vertical shaft C , having pinion E , in combination with the oval or elliptical internally-gear rack G , having corner arms or posts c , and the means for throwing said rack from side to side at the limits of its stroke, consisting of the centrally-jointed and pivoted throw-levers $K K'$, having hooks $l l'$, and springs $L L'$, substantially as herein described.

3. The recessed or chambered bed-plate A , having the short track guide-tracks b in its recess, and the vertical shaft C , having pinion E , in combination with the oval or elliptical internally-gear rack G , having leg-guides g , guided by said tracks, and corner posts or arms c , and the centrally-jointed and pivoted throw-levers $K K'$, having hooks $l l'$ and springs $L L'$, substantially as herein described.

4. The recessed or chambered bed-plate A and the vertical shaft C , having pinion E , in combination with the oval or elliptical internally-gear rack G , having corner arms or posts c , and the means for throwing said rack from side to side at the limits of its stroke, consisting of the centrally-jointed and pivoted throw-levers $K K' M M'$, having hooks $l l' n n'$, and springs $L L' N N'$, and means for alternately throwing one or the other set of throw-levers into or out of position, whereby the operation is effected on the reverse as well as on the right movement of the rack, substantially as herein described.

5. The recessed or chambered bed-plate A and the vertical shaft C , having pinion E , in combination with the oval or elliptical internally-gear rack G , having corner arms c , the double set of centrally-jointed and pivoted spring throw-levers $K K' M M'$, having hooks $l l' n n'$, and the means for alternately throwing one or the other set of throw-levers into or out of position to engage with the rack, whereby a reverse and a right movement may be obtained, consisting of the lever Y and the rods $F F'$, connected therewith and with the ends of the throw-levers, substantially as herein described.

In witness whereof I have hereunto set my hand.

RANSOM G. MOODY.

Witnesses:

C. D. COLE,

J. H. BLOOD.