

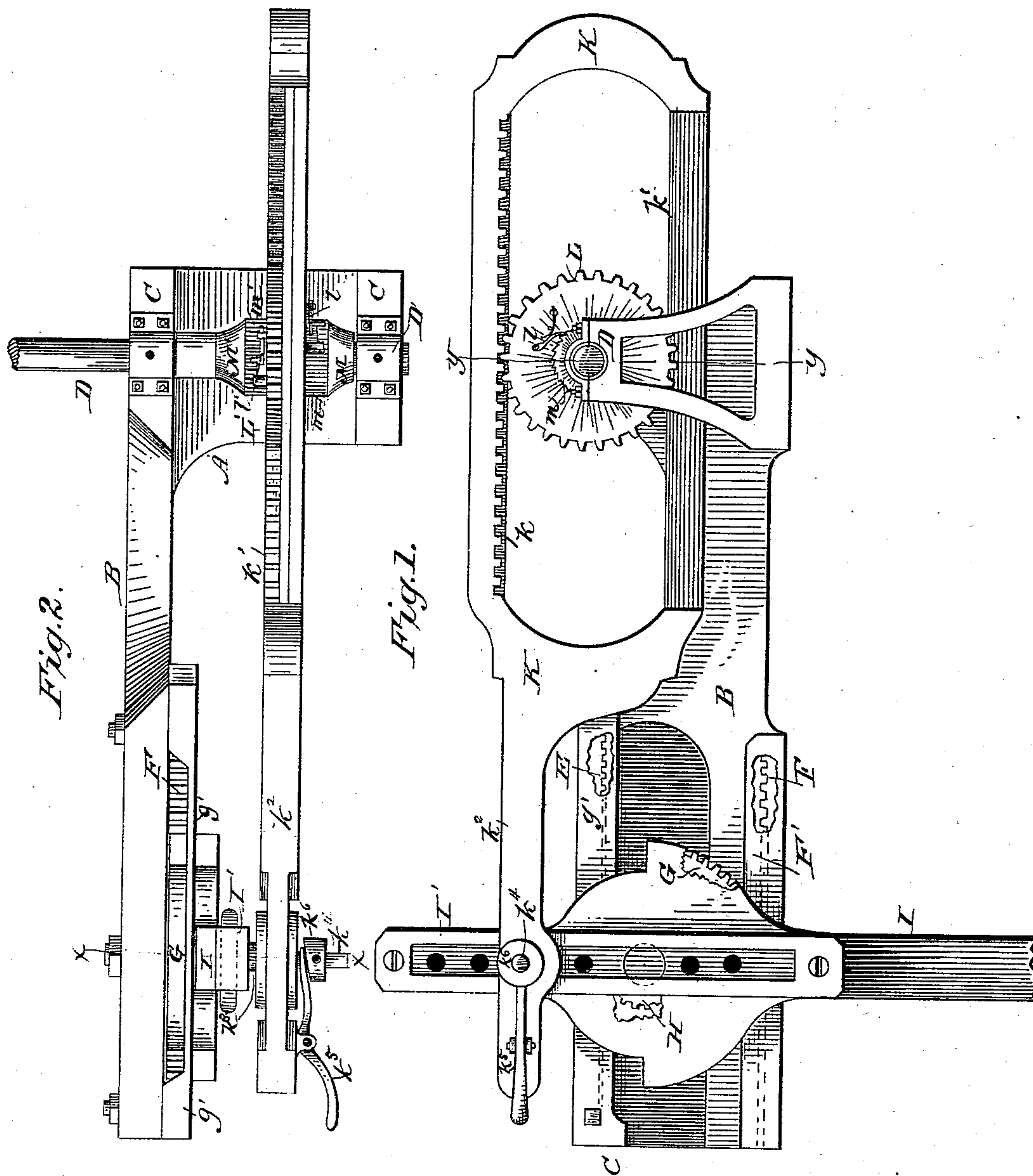
(No Model.)

2 Sheets—Sheet 1.

B. F. ANDREWS.
MECHANICAL MOVEMENT.

No. 379,499.

Patented Mar. 13, 1888.



WITNESSES:
Fred Z. Dieterich
John P. Kemmon

INVENTOR:
B. F. Andrews.
BY *Mum & Co.*

ATTORNEYS.

UNITED STATES PATENT OFFICE.

BENJAMIN FRANKLIN ANDREWS, OF MYERS, MISSOURI.

MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 379,499, dated March 13, 1888.

Application filed September 28, 1887. Serial No. 250,955. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN FRANKLIN ANDREWS, of Myers, in the county of Howard and State of Missouri, have invented a new and useful Improvement in Mechanical Movements, of which the following is a specification.

My invention relates to a mechanical movement for converting an oscillating movement into a rotary movement.

The object of my invention is to provide an improved device which will operate effectively within a limited space to produce a high rate of speed in a rotary shaft from a slowly-moving oscillating lever of greater power than that of the shaft, and the device may be applied to means for propelling vessels or vehicles, to various machines employed in the useful arts, and to engines for driving various kinds of machinery.

The invention consists in certain constructions and combinations of parts, hereinafter described, and particularly designated in the claims.

In the accompanying drawings, Figure 1 is a front elevation of my invention. Fig. 2 is a top plan view of the same. Fig. 3 is an end view. Fig. 4 is a vertical cross-section on line *x x*, Fig. 2. Fig. 5 is a detail face view of a pinion and segment-gear. Fig. 6 is a vertical cross-section on line *y y*, Fig. 1. Fig. 7 shows a modification.

The bed-plate A supports a frame, B, to one end of which is connected the housing C, which supports a rotary driving-shaft, D, in journal-boxes, and upon the other end of which are cast rack-bars E F, located, respectively, to project from the upper and lower edges of said housing in parallel planes, between which the toothed segment G and the loose wheel H of an oscillating hand-lever, I, are caused to roll by engagement with the teeth of the rack-bars when the lever I is oscillated. A guide-flange, F', is cast upon the outer face of the rack-bar F to fit a groove, *g*, Fig. 3, between the lever I and the toothed segment G, and a removable guide-flange, *g'*, bolted to the face of the rack-bar E, fits the groove *g*, above described, upon the upper side of the segment G, by which means the pivotal center of the lever I will reciprocate upon the frame B when the said lever is oscillated.

As the means for connecting the lever I with the shaft D, and thereby converting the oscillation of the former into a continuous rotary motion of the other, I employ a pitman, K, having an arm, *k*², which is jointed to lever I, while its body or enlarged main portion has an elongated slot whose two parallel sides are formed of internally-toothed rack-bars *k k'*. These racks engage with the gears L L', journaled loose on shaft D—that is to say, the upper rack, *k*, meshes with gear L and rack *k'* with gear L'. The gear L has a spring-pawl, *l*, pivoted to its outer side, and the same engages with a ratchet-hub, M, fixed on the shaft D, while a similar pawl, *l'*, forms like connection between gear L' and a similar hub, M'. The teeth *m m'* of these ratchet hubs or wheels M M' are pitched in same direction. It results from this arrangement and connection of parts that when the pitman K is reciprocated gears L L' rotate alternately in opposite directions, but impart motion to the shaft D when rotating forward, so that the latter rotates continuously in one direction. The gears L L' may be made, as shown in Fig. 7, with a recessed face, *l*², having teeth *l*³, and a hub, M², projects within said recessed face and carries a double-acting pawl, *m*², which may be thrown in either direction by a pin, *m*³, to engage with the teeth *l*³ and revolve the shaft to which the hub M² is secured in either direction. By substituting the wheels L², hubs M², and pawls *m*² for the wheels L L' and their connections with the shaft the rotation of said shaft may be reversed when desired.

The upper end of the lever I is connected adjustably with the end *k*² of the pitman K by means of a pin, *k*⁴, which is adapted to enter any one of a series of holes in said lever. The means for securing this pin and adjusting it are as follows: A longitudinally-slotted plate, I', is attached to lever I, from which its slotted portion is set off, as shown in Figs. 3 and 4. The pin *k*⁴ passes through a device, *k*³, (see Fig. 4,) which I shall for convenience term a "button." The same consists of a cylindrical body and an enlarged head or radial flange. The body fits in the slot of the aforesaid plate I', and the flange occupies the space between the plate I' and lever I, so that the device *k*³ is free to move up or down in the slot, but cannot be disengaged from it. The pin *k*⁴ is held

normally in any hole of lever I in which it may be placed by means of a spiral spring (see Fig. 4) arranged in a recess of device k^3 . To disengage pin k^4 from a hole of lever I, a thumb-lever, k^5 , is pivoted to arm k^2 of pitman K and engages a collar, k^6 , fixed on the pin, as shown in Figs. 1 and 2.

By adjusting the arm k^2 of pitman K upon the lever I at different distances from the pivotal center of said lever the pitman will be moved a greater or less distance at each oscillation of the lever, and as the pivotal center of said lever is reciprocated upon the frame when the lever is oscillated the throw or movement of the pitman may be greatly increased. A lever of considerable length may thus be operated with a short stroke to give a rapid rotation to the driving-shaft, and by adjusting the pitman upon the lever the speed of the rotary shaft may be regulated.

I do not in this application seek to cover mechanism whereby the motion of the shaft may be reversed, nor yet the particular mechanism for such purpose shown in Fig. 7 of the drawings, for the reason that such subject-matter are included in another application for patent filed by me February 8, 1888, Serial No. 263,399.

I claim as my invention and desire to secure by Letters Patent—

1. The combination, with the frame, of a shaft continually rotating in one direction, a slotted pitman having opposite racks, as specified, and an oscillating lever connected with said pitman and supported upon the frame to

move at its axial center upon said frame as it is oscillated, substantially as described.

2. The combination, with a driving-shaft, of the ratchet-wheels M M' and gears L L', alternately acting, the pitman having racks k k' , and a lever supported to oscillate upon the frame at its axial center, substantially as described.

3. The combination, with the frame, of the drive-shaft, the pitman having arm k^2 and connected therewith, an oscillating lever, a rack-gear upon the frame, and a toothed segment, G, upon the lever to engage with the rack of the frame for reciprocating the pitman, substantially as described.

4. The combination, with the frame, of the drive-shaft, the pitman connected therewith, the hand-lever having a rolling-gear, a rack upon the frame to engage with said gear, a guide-plate upon the frame, and a rolling wheel upon the lever supported upon a track parallel with the rack, substantially as described.

5. The combination, with the frame, of the drive shaft, the pitman having arm k^2 , the gears L L', driven, while operating the shaft, in the same direction by said pitman, the oscillating lever supported upon the frame to move at its axial center, and an adjustable connection between the operative end of said lever and the pitman, substantially as described.

BENJAMIN FRANKLIN ANDREWS.

Witnesses:

J. B. ANDREWS,
G. W. RENNOLDS.