(No Model.) 2 Sheets—Sheet 1.

E. C. McFARLAND.

CLUTCHING AND RELEASING MECHANISM.

No. 454,141. Patented June 16, 1891.

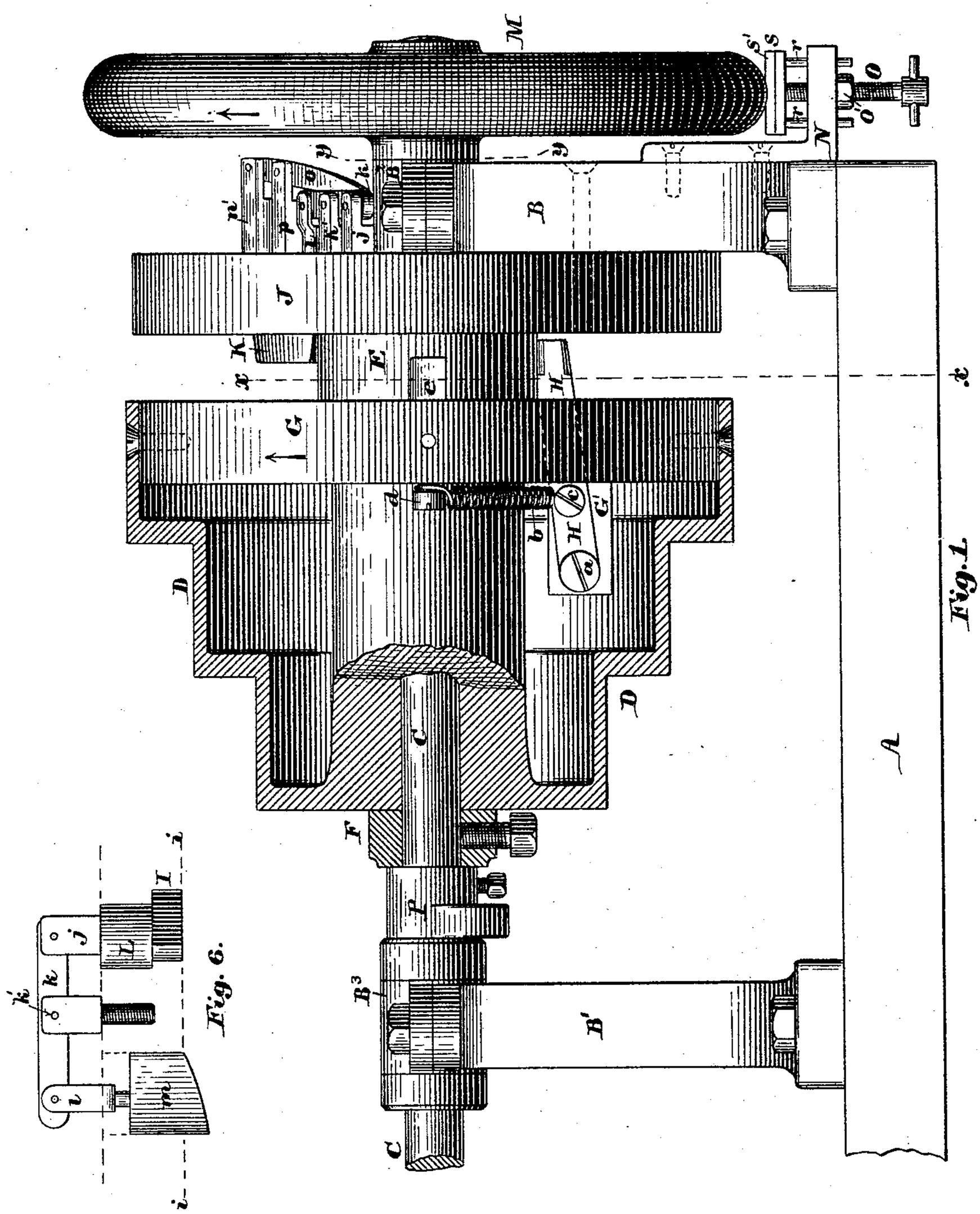

Fig. 6.

Witnesses:
Walter E. Lombard.
J. H. D. Farrell

Inventor;
Edwin C. McFarland,
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(No Model.) 2 Sheets—Sheet 2.

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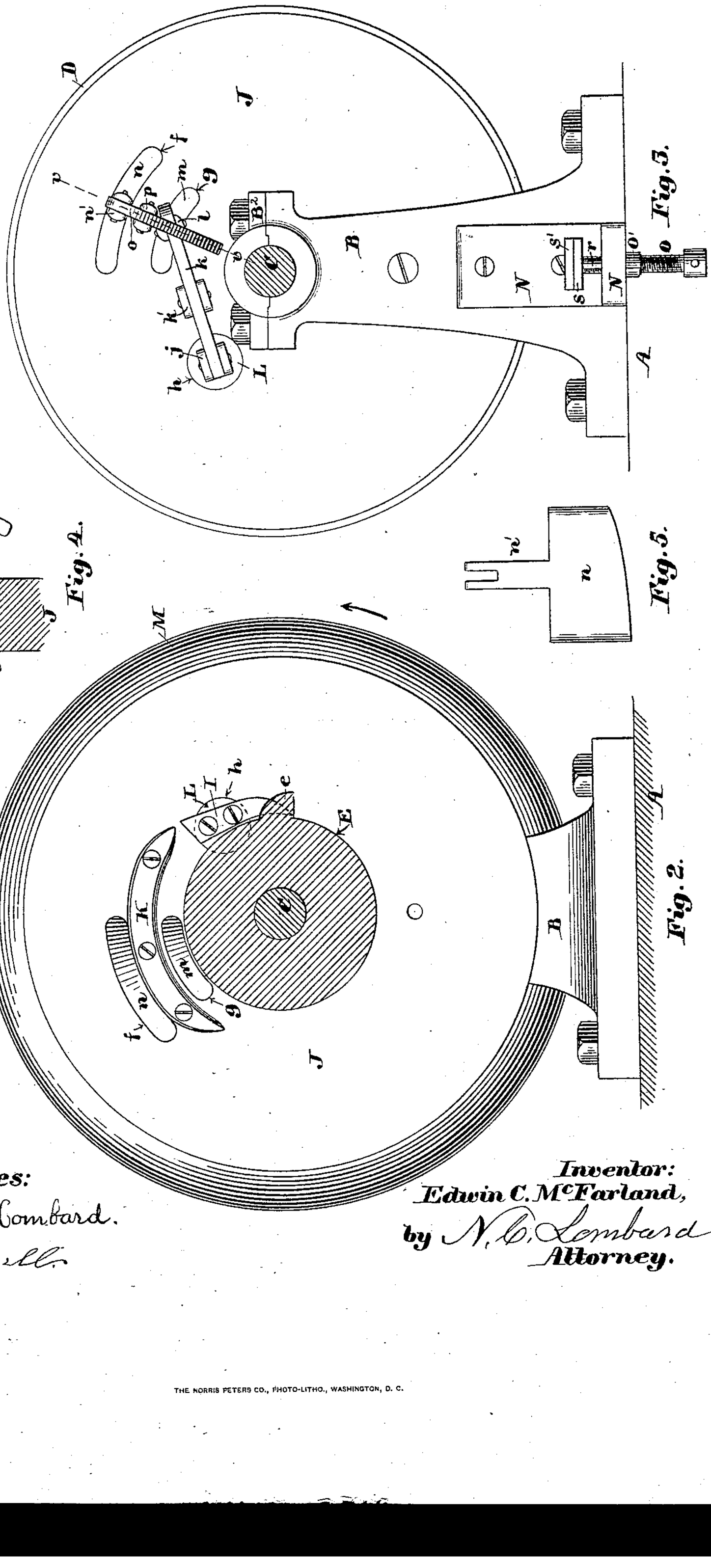

Fig. 1.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 2.

Witnesses:
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Inventor:
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UNITED STATES PATENT OFFICE.

EDWIN C. McFARLAND, OF EVERETT, ASSIGNOR TO THE BOSTON TYPE FOUNDRY, OF BOSTON, MASSACHUSETTS.

CLUTCHING AND RELEASING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 454,141, dated June 16, 1891.

Application filed March 28, 1891. Serial No. 386,831. (No model.)

To all whom it may concern:

Be it known that I, EDWIN C. MCFARLAND, of Everett, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Self-Acting Clutching and Releasing Mechanisms, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to automatically-operated clutches for alternately making and breaking connection between a constantly-revolving pulley or wheel and any piece of mechanism that it is desired to have operated intermittently; and it consists in certain novel features of construction, arrangement, and combination of parts, which will be readily understood by reference to the description of the drawings and to the claims hereinafter given, and in which my invention is clearly pointed out.

Figure 1 of the drawings is a sectional elevation of my improved automatic clutch mechanism applied to a cone-pulley and its shaft. Fig. 2 is a vertical transverse section on line *x x* on Fig. 1, and showing the fixed disk, the clutch-lever-operating switch, and the switch-operating cams in elevation, looking toward the right of Fig. 1. Fig. 3 is a section through the shaft on line *y y* on Fig. 1, and showing the fixed disk, the stands B and N, the friction brake-shoe, and the cam and switch-operating mechanism in elevation, looking toward the left of Fig. 1. Fig. 4 is a partial section of the fixed disk and the switch-operating cams on line *v v* on Fig. 3, looking obliquely toward the right of said figure. Fig. 5 is a plan of the outer sliding cam; and Fig. 6 is a plan of the inner sliding cam, the switch, and their connecting-lever.

In the drawings, A is the bed of a machine, having secured thereto the stands B and B′, having bearings B^2 and B^3, respectively, at their upper ends, in which is mounted the shaft C, to which is to be imparted an intermittent rotary motion about its axis.

D is a cone-pulley mounted loosely upon said shaft C, so as to be freely revoluble thereon between the collars E and F, firmly secured to said shaft. The cone-pulley D has fitted within its larger end the disk G, having formed upon or secured to its inner face the inwardly-projecting arm or lug G′, to which is pivoted at *a* the clutch-engaging lever H, the opposite end of which projects through a slot in said disk and extends nearly across the clutch-collar E, as shown in Fig. 1. A spring *b* is connected by one end to said clutch-lever at *c* and by its other end to the screw or stud *d*, set in the inner face of the disk G, the tension of which spring tends to hold the outer or movable end of said lever in contact with the periphery of the clutch-collar E, as shown in Fig. 1.

The clutch-collar E is provided with the projecting lug or tooth *e*, with which the side of the projecting portion of the lever H comes in contact, and thus causes the shaft C to be revolved whenever the switch I is retracted or drawn out of the normal path of said lever.

J is a fixed disk or plate fitted loosely on the shaft C and firmly attached to the stand B, so that it cannot be revolved with said shaft. This plate has formed therein the two segmental slots *f* and *g* and the circular hole *h*, as shown in Figs. 2 and 3, and has secured to its inner face between the two segmental slots *f* and *g* the segmental guide-rib K, having its two ends tapered or curved to points, as shown in Fig. 2. The hole *h* has fitted thereto, so as to be movable in the direction of the thickness of said plate J, the piston or plug L, to the inner end of which is secured the switch I, having an outline substantially like that shown in Fig. 2, said plate J having formed in its inner face two recesses of suitable shape and depth to receive those portions of the switch I which project beyond the periphery of the piston L, so that said switch may be retracted within said recesses till its inner edge does not project beyond the inner face of the plate J, as shown in Fig. 6, where the dotted line *i i* indicates the inner face of said plate.

The piston L is provided with the outwardly-projecting stem *j*, which is pivoted to one end of the lever *k*, fulcrumed at *k′*, and pivoted at its other end to the stem *l* of the curved cam-plate *m*, which is fitted to and movable

endwise in the segmental slot *g*, as shown in Figs. 3 and 6. The segmental slot *f* in the plate J has fitted thereto, so as to be movable endwise therein, the curved cam-plate *n*, having the outwardly-projecting stem *n'*, to the end of which is pivoted one end of the lever *o*, which in turn is pivoted to the end of the stud *p*, set in the outer face of the plate J, the free end of said lever *o* extending obliquely across the lever *k* opposite its pivotal connection to the stem *l* of the cam-plate *m*, as shown in Figs. 1, 3, and 4.

M is a hand or brake wheel firmly secured upon the end of the shaft C. N is an angular stand secured to the outer or right-hand face of the stand B, and has mounted in suitable bearings therein the vertical guide-rods *r r*, having attached to their upper ends the brake-shoe *s*, which has secured to its upper surface the piece of leather or other suitable frictional material *s'*, which is pressed hard against the periphery of the wheel M by the set-screw O, which is provided with the check-nut O', as shown in Figs. 1 and 3.

The shaft C may be extended to the left of Fig. 1 and be provided with cams, as at P, with gears or other means of communicating motion to the operative parts of any machine.

This invention has been successfully applied to type-casting machines, but is equally applicable to any machine that it is desired to have operated intermittently.

The operation of my invention is as follows: The parts being in the positions shown in the drawings and power being applied to the cone-pulley D by means of a belt leading therefrom to a suitable counter-shaft (not shown) to impart to said pulley a constant and uninterrupted rotary motion in the direction indicated by the arrows in Figs. 1 and 2, the lever H engages with the tooth *e* of the clutch-collar E and carries said collar and the shaft C around with said lever till said shaft has made a complete revolution. The movable end of said lever passing beneath the segmental rib K and coming in contact with the inner curved or inclined end of the cam-plate *m* forces said cam-plate outward or toward the right of Fig. 1, and by so doing causes the cam-plate *n* and the switch I to be moved toward the left of said figure and made to project beyond the inner or left-hand face of the plate J. When the pulley has made a complete revolution after the engagement of the lever H with the tooth *e*, the lever H comes in contact with the switch I and is raised or moved outward until it is released from engagement with the tooth *e*, when the friction of the brake-shoe upon the wheel M stops the motion of the shaft C and the clutch-collar E, the lever H passes over the tooth *e* and above the rib K, and its end comes in contact with the curved or inclined inner end of the cam-plate *n* and forces it outward or toward the right of Fig. 1, thereby moving the switch I in the same direction and the cam *m* in the reverse direction, so that on the third revolution of the pulley D the lever H will again come in contact with the tooth *e*, and thus impart another revolution to the shaft C, when the switch I is again projected into the path of the lever H and said lever is again raised thereby above the tooth *e* and the rib K, so that the pulley D makes its fourth revolution without moving the shaft C, and so continuing as long as the pulley D continues to revolve, the shaft C moving in unison with said pulley during every alternate revolution thereof and remaining in a state of rest during the intermediate revolutions of said pulley, the clutching and disengaging being entirely automatic.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The combination of an operating-shaft mounted in suitable fixed bearings and provided with a clutch-collar and tooth firmly secured thereon, a constantly-revoluble pulley or wheel mounted loosely on said shaft, a pivoted clutch-lever carried by said pulley or wheel, a spring for pressing the free end of said lever toward said shaft, a fixed disk or plate provided with a segmental guide-rib projecting therefrom over said clutch-collar and tooth, a switch for raising the free end of said clutch-lever to release it from engagement with the clutch-tooth, and two cam-plates to be acted upon by the end of said clutch-lever to move said switch into and out of the path of the free end of said lever.

2. The combination of an operating-shaft mounted in suitable bearings and freely revoluble therein and provided with a clutch-collar and lug or tooth firmly secured thereon, a pulley or wheel mounted loosely thereon, a pivoted clutch-lever carried by said pulley or wheel, a spring for pressing the free end of said lever toward said shaft, a fixed disk or plate provided with a segmental guide-rib projecting therefrom over said clutch-collar and tooth, a switch for moving the free end of said clutch-lever outward to release it from engagement with the clutch-tooth, two cam-plates fitted to bearings in said fixed disk or plate, one just inside and the other just outside of the segmental rib, in positions to be alternately struck and moved by the free end of said clutch-lever, and thus move said switch into and out of the path of said free end of the clutch-lever, and a friction-brake for checking the motion of said shaft when the clutch-lever and tooth are disengaged.

3. The combination of the shaft C, the pulley D, mounted loosely on said shaft, the clutch-collar E, provided with the lug or shoulder *e* and firmly secured upon said shaft, the stationary plate J, provided with the segmental rib K, the switch I, and cam-plates *m* and *n*, fitted to bearings in said plate J, the pivoted lever *k*, connected at one end to the stem of the cam-plate *m* and at its other end to the stem of the switch-carrying piston, and

the lever *o*, pivoted at one end to the stem of the cam-plate *n* and near its middle to the stud *p* and extending across the lever *k*, so as to be moved in one direction thereby, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 25th day of March, A. D. 1891.

EDWIN C. McFARLAND.

Witnesses:
N. C. LOMBARD,
FRANK J. BROWN.