

(No Model.)

R. E. WATERHOUSE.  
LET-OFF MECHANISM FOR LOOMS.

No. 334,063.

Patented Jan. 12, 1886.

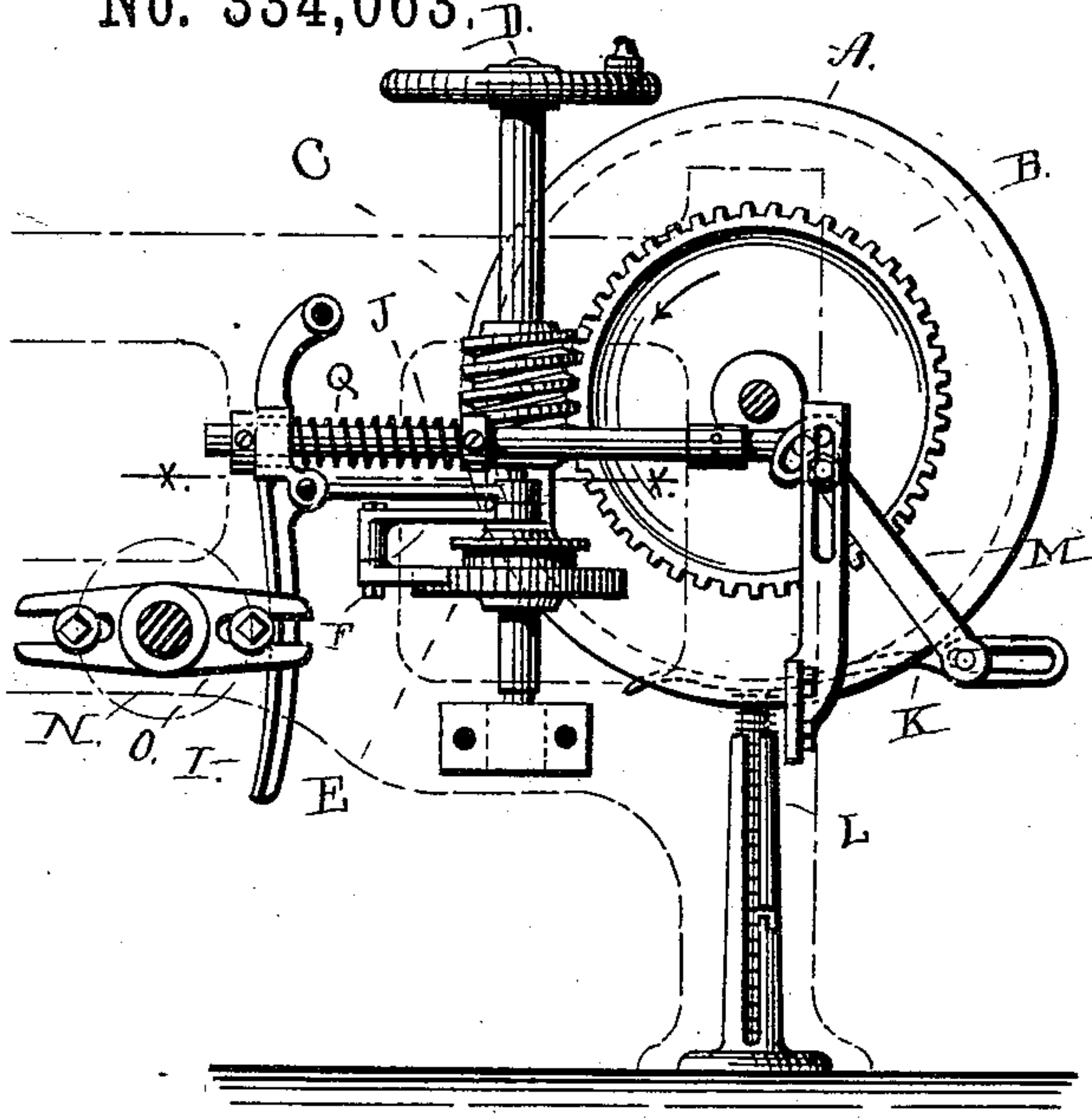


FIG. 1.

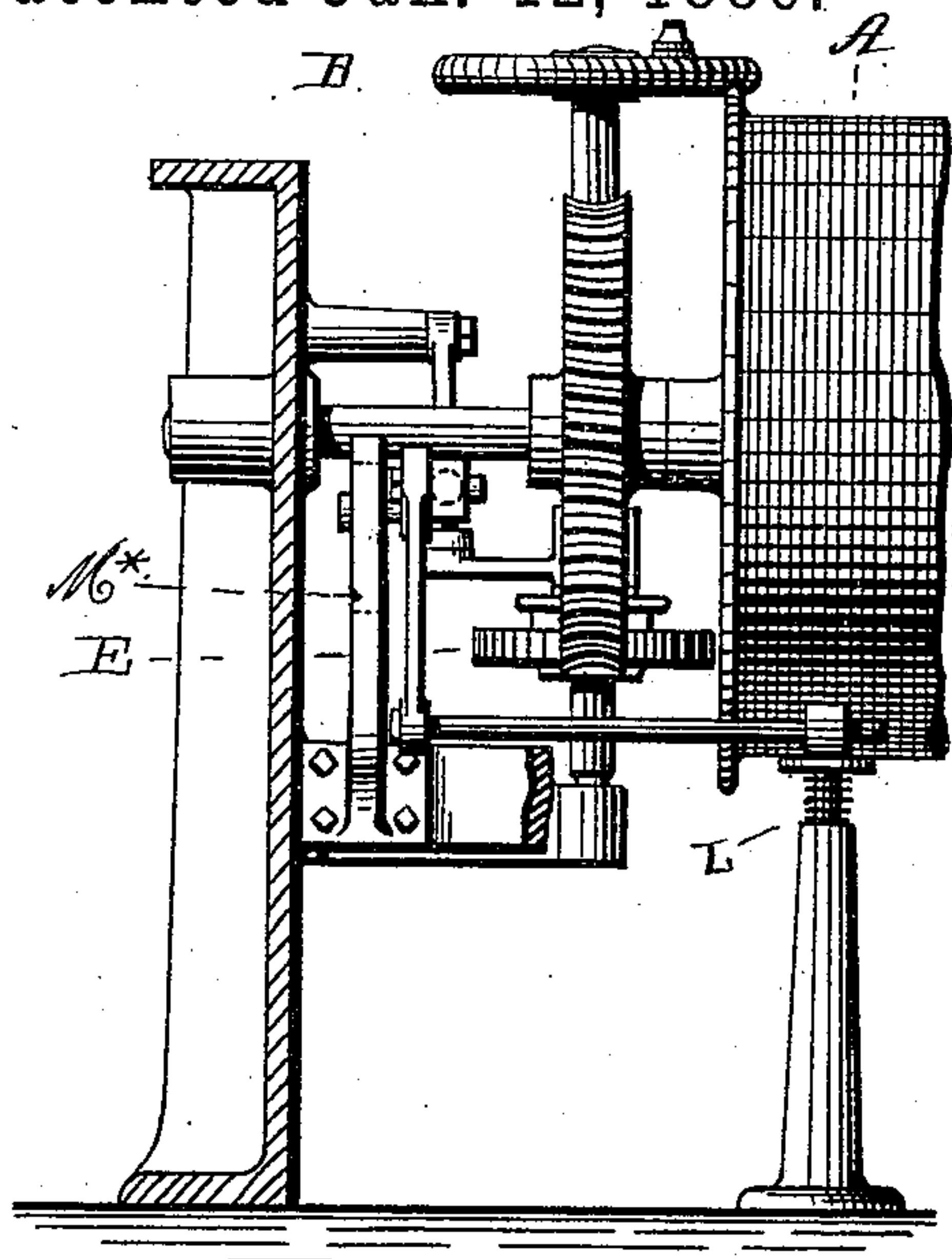


FIG. 2.

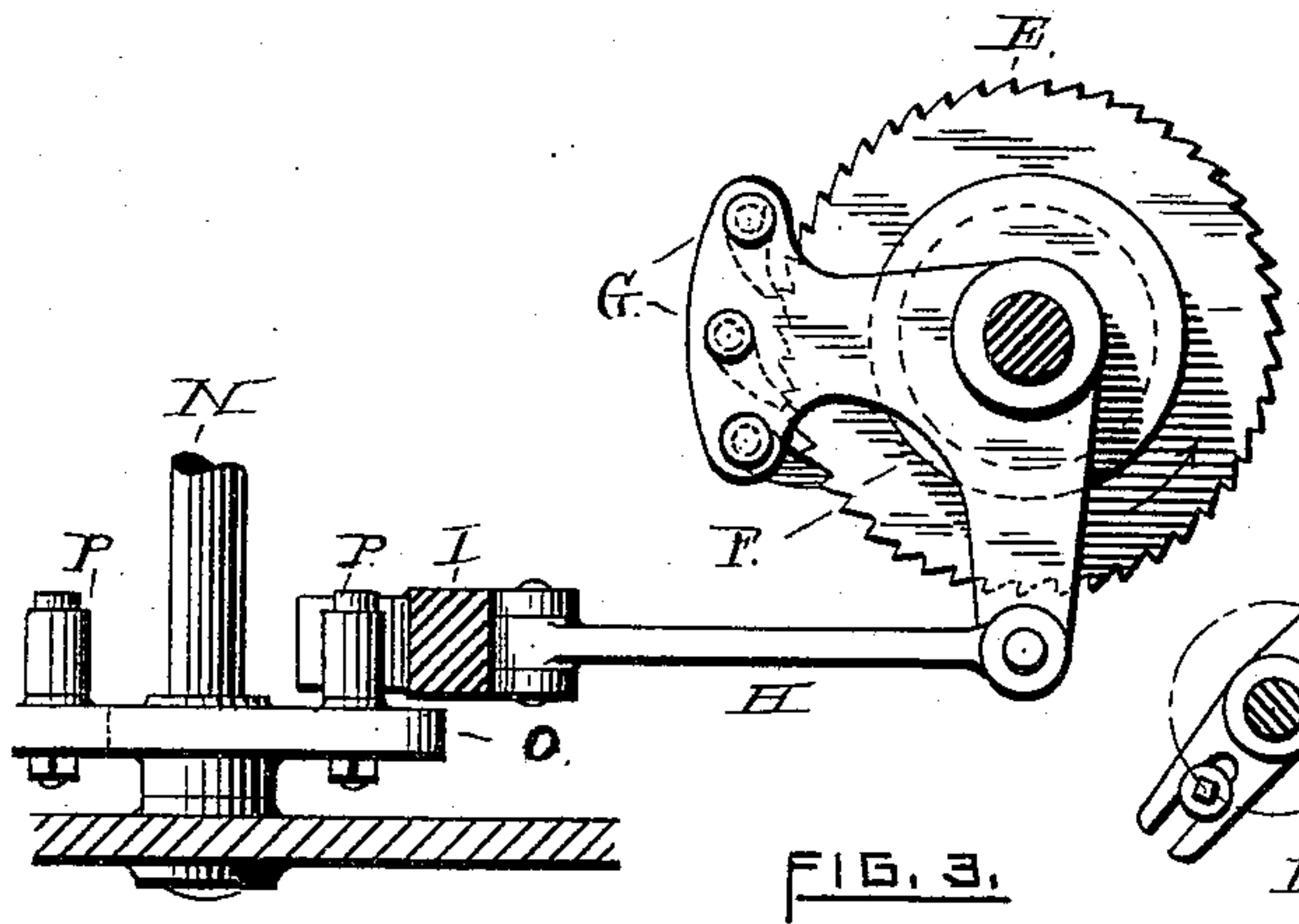


FIG. 3.

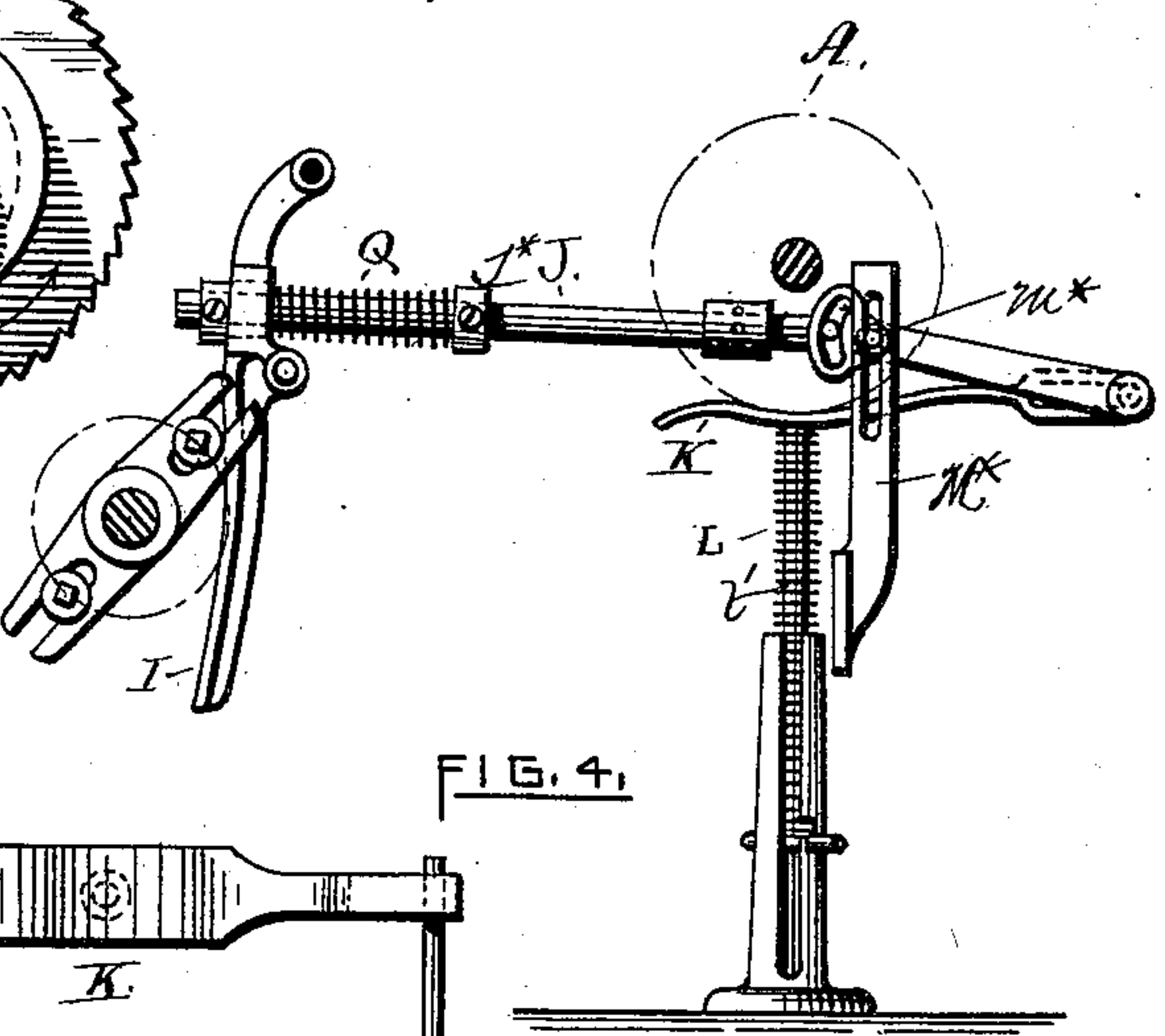


FIG. 4.

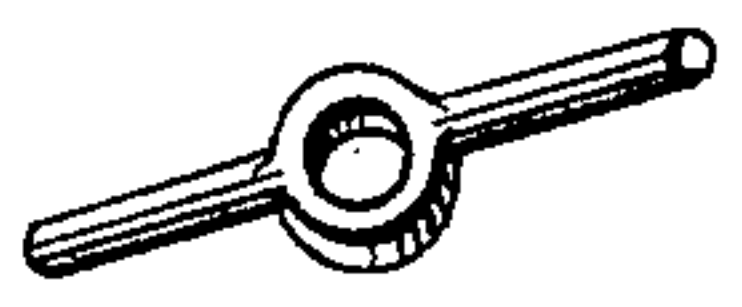


FIG. 7.

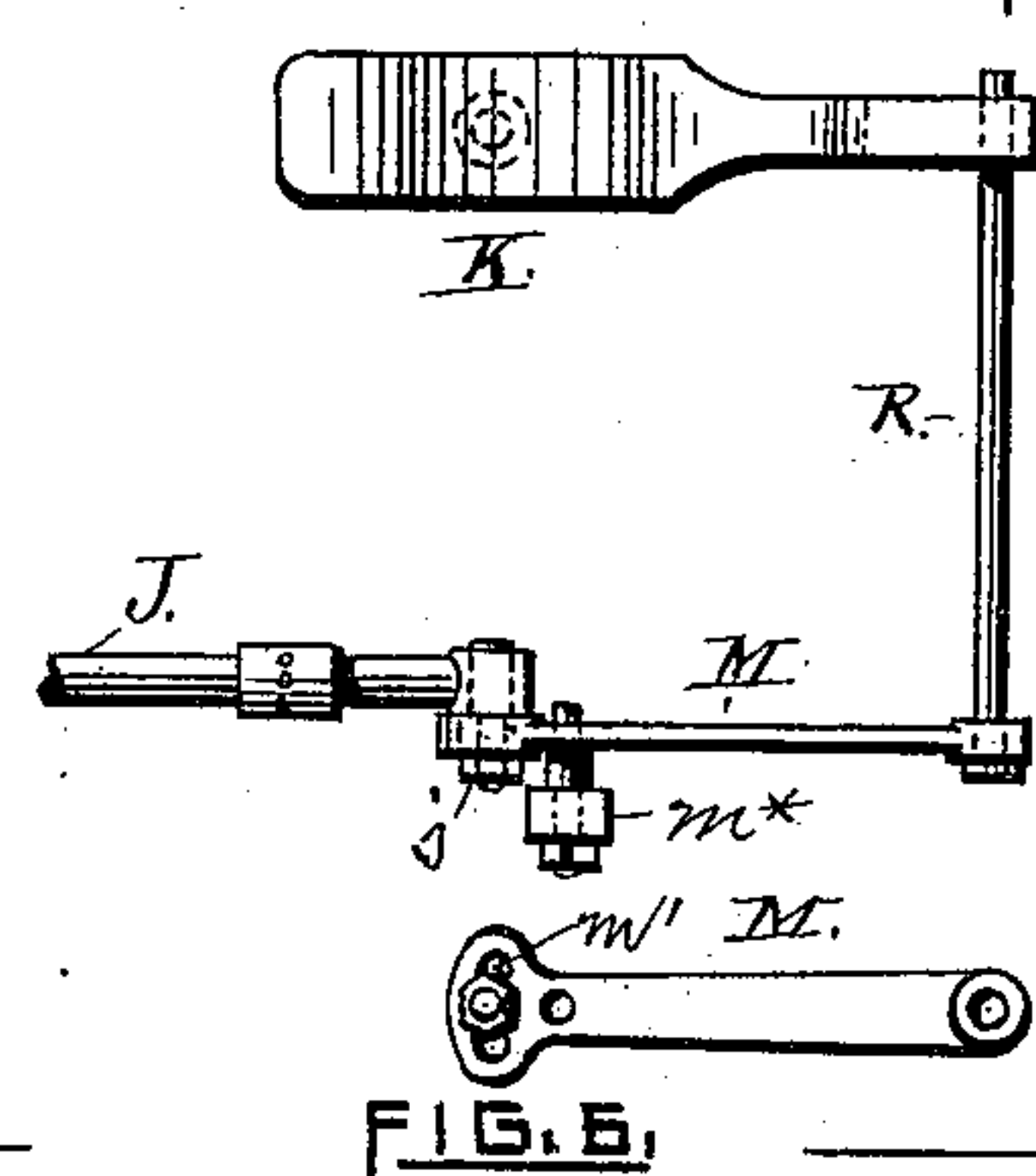


FIG. 5.

FIG. 6.

WITNESSES.

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# UNITED STATES PATENT OFFICE.

RICHARD E. WATERHOUSE, OF WARWICK, RHODE ISLAND.

## LET-OFF MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 334,063, dated January 12, 1886.

Application filed April 15, 1885. Serial No. 162,269. (No model.)

*To all whom it may concern:*

Be it known that I, RICHARD E. WATERHOUSE, of Warwick, in the State of Rhode Island, have made certain new and useful Improvements in Let-Off Mechanism for Looms; and I do hereby declare that the following specification, taken in connection with the drawings making a part of the same, is a full, clear, and exact description thereof.

Figure 1 is an end elevation, partly in section, of the improved mechanism, with part of a loom-frame indicated by dotted lines. Fig. 2 is a rear view of the improved mechanism, representing one end of a yarn-beam, and showing a portion of a loom-frame in section. Fig. 3 is a cross-section on line *xx* of Fig. 1. Fig. 4 is a view of portion of the mechanism, showing the position of the several parts with the yarn-beam empty. Fig. 5 shows the following-plate and connections. Figs. 6 and 7 show detached parts.

The object of my invention is to secure a positive intermittent movement of the yarn-beam by which the required quantity of yarn may be paid off, as and when required, without the aid of the tension upon the yarn heretofore necessary to secure the surface motion of the yarn-beam; and it consists in the devices for operating the yarn-beam, hereinafter described.

In the operation of the let-off mechanisms now and heretofore in use the motion of the yarn-beam in paying off the yarn has in some instances been produced by a tension or draft upon the yarn itself exerted by the take-up roller, which causes the yarn-beam to rotate at intervals as such strain is exerted. This strain or tension, especially with light or tender yarns, has a tendency to weaken and break them, and thus to deteriorate the quality, increase the labor of producing, and consequently enhance the cost of the goods. This method of operating the yarn-beam does not result in a uniform number of picks to the inch, for the reason that yarn will slip or be paid off too fast at one time and too slow at another, thus making thin and thick places in the goods.

In my invention, which I will now proceed to describe, I overcome these difficulties, and compel the yarn-beam to move at regular in-

tervals a sufficient distance to pay off a uniform length of yarn, the distance of such rotary movement of the yarn-beam varying and increasing with the decrease in its diameter.

In the drawings, A is the yarn-beam, provided at its end with a gear-wheel, B, into which works a screw, C, which is attached to a perpendicular shaft, D. Below the screw C, and also attached to the shaft D, is a ratchet, E. Pivoted upon the shaft D is an elbow-lever, F, upon one end or arm of which are pawls G, which engage the ratchet E, the remaining arm being connected by a rod, H, to a perpendicular lever, I. The lever I is pivoted to the frame at its upper end and encircles the rod J, upon which it has a horizontal movement.

K is a following plate, the surface of which is retained in contact with the yarn upon the yarn-beam as the latter decreases in diameter through the action of a supporting-spring, L, and stem *l'*. The plate K and the rod J are connected by a rod, R, passing through the slotted rear end of plate K and lever M, adjustably, in the manner shown in Figs 5 and 6, by means of a transverse curved slot, *m'*, in lever M, and a bolt and clamp-nut, *j*. The lever M is supported adjustably in the slotted bracket M\*, attached to some fixed portion of the framing, as shown in Fig. 2, the said lever M being held at the proper height by a bolt and clamp-nut, *m\**.

N is the cam-shaft of the loom, upon which, and extending both ways at right angles thereto, is a bar, O, upon the ends of which are rollers P, which operate upon the perpendicular lever I as the shaft N rotates.

Commencing with the parts in the position shown in Figs. 1 and 2, the operation of my invention is as follows, the several parts being capable of adjustment, as already explained: With each half-rotation of the main shaft N one of the rollers P, attached to the bar O, comes in contact with and presses rearward the lower end of the perpendicular lever I, overcoming the resistance of the spring Q, surrounding rod J, and held thereon by collar *j\**. This movement of the lever I, through the rod H, communicates a rotating movement to the elbow-lever F, and by means of the pawls G engaging with the ratchet E turns



the perpendicular shaft D, and produces a surface movement of the yarn-beam A, through the action of the screw C working in the gear-wheel B. As soon as the lever I has become released from the action of the roller of bar O, said lever I and the pawls G will resume their former position through the action of the spring Q, all of which will be readily understood. As the yarn is paid off, and the diameter of the yarn-beam decreases, the following plate K is carried upward perpendicularly by the spring L, which, through the lever M, forces back the horizontal rod J, which slides in its bearings, and with it the lever I until the yarn-beam is empty, and the several parts reach the position shown in Fig. 4. This movement of rod J is brought about by the moving of bar M, which, turning on the center at  $m^*$ , affects the rod J by its connection therewith at  $m'$ . During this movement the lever I is continually being pressed rearward a greater distance by each contact of a roller, P, therewith as it approaches the main shaft, and comes more within the stroke of the bar O, which increases the rotary movement of the ratchet-wheel E and the surface movement of the yarn-beam through the action of the intervening parts, as will be readily seen, such increase of movement being in proportion to and following the decrease in the diameter of the yarn-beam.

The mechanism herein described is also equally useful and effective for taking up, and may be easily applied to the cloth-roll.

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

1. The combination of the yarn-beam A, means, substantially as described, for operating it, following plate K, having slotted end, spring L, for causing plate K to rest against the circumference of the beam, lever M, having a connecting rod or stud working in the slot in plate K, a support for the lever M, rod J, connected to lever M, and connections, substantially as described, from rod J to the mechanism for operating the yarn-beam, all substantially as and for the purpose set forth.

2. The combination of the horizontal rod J, spring Q, and lever I, and means for operating said lever with rod H, lever F, pawls G, ratchet E, shaft D, worm C, wheel B, lever M, connected to rod J, stud or rod R, plate K, spring L, and yarn-beam A, all substantially as set forth.

3. The combination of shaft N, bar O, rollers P, lever I, and devices, as described, intermediate of lever I and the yarn-beam, whereby the latter is operated by the former, with spring Q, rod J, lever M, rod R, plate K, spring L, and the yarn-beam A, substantially as and for the purpose set forth.

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Witnesses:

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