

(No Model.)

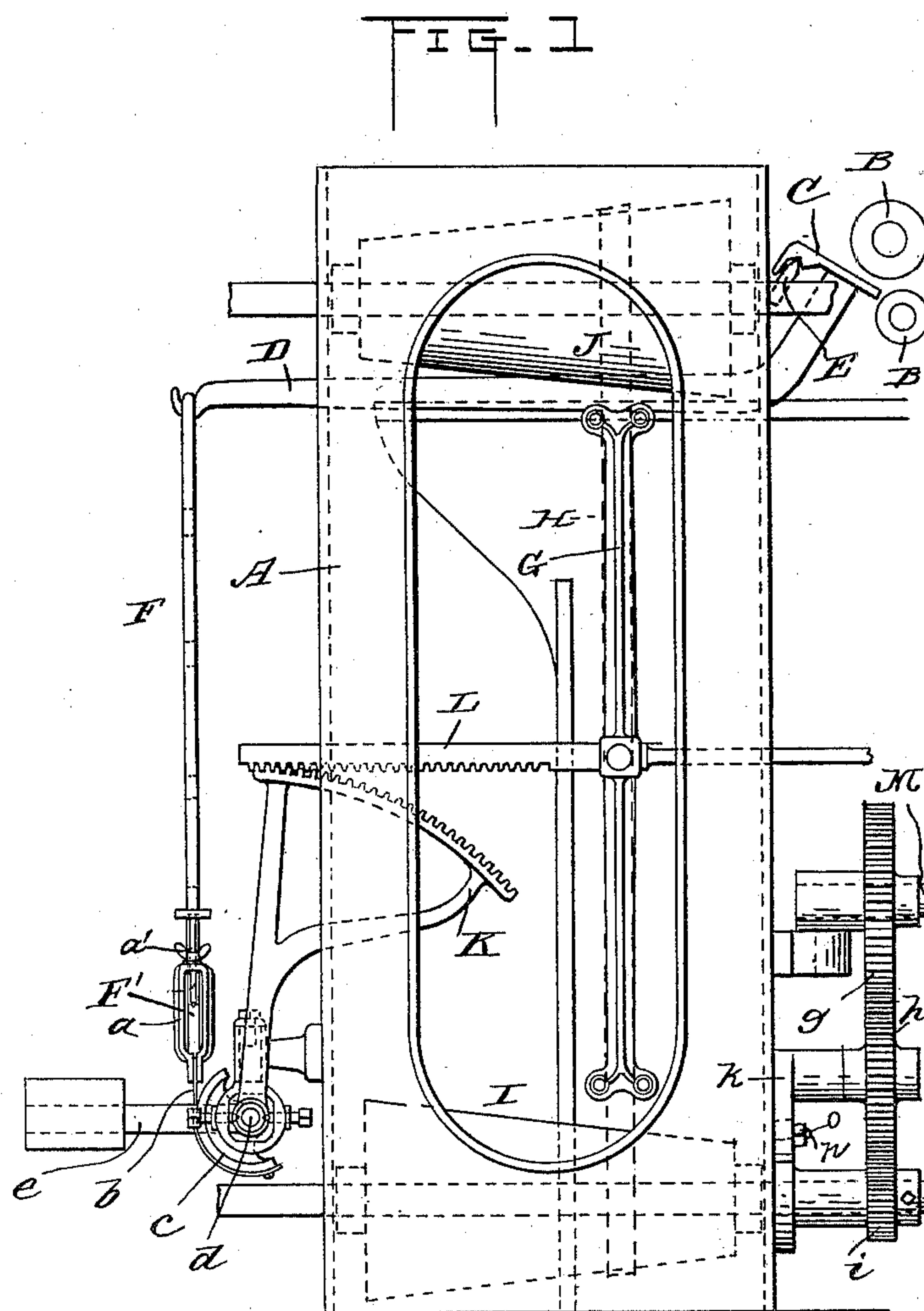
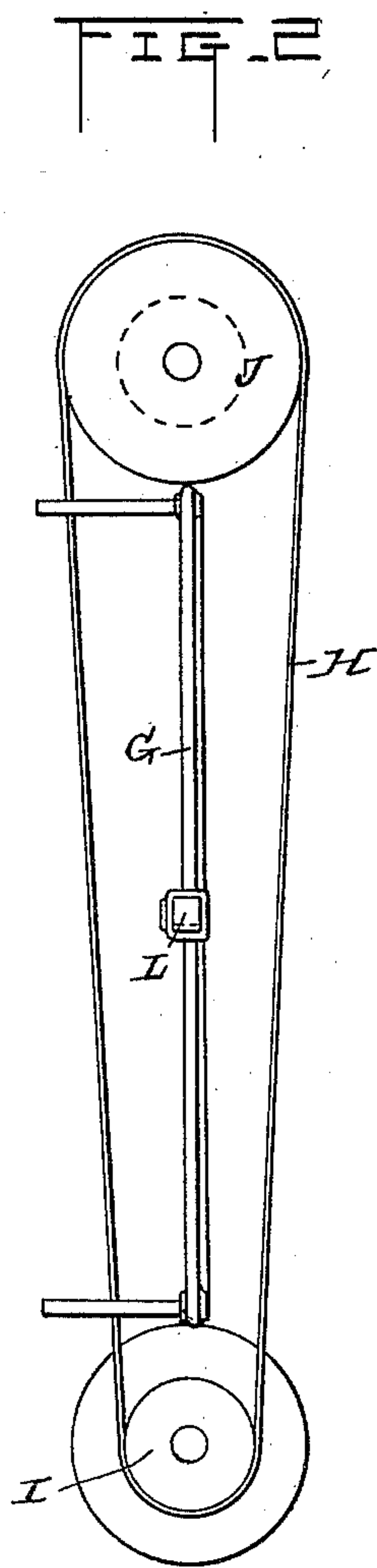
2 Sheets—Sheet 1.

J. C. POTTER.

# EVENING MECHANISM FOR COTTON OPENERS, &c.

No. 411,350.

Patented Sept. 17, 1889.



Witnesses

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his Attorney

(No Model.)

2 Sheets—Sheet 2.

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FIG. 3.

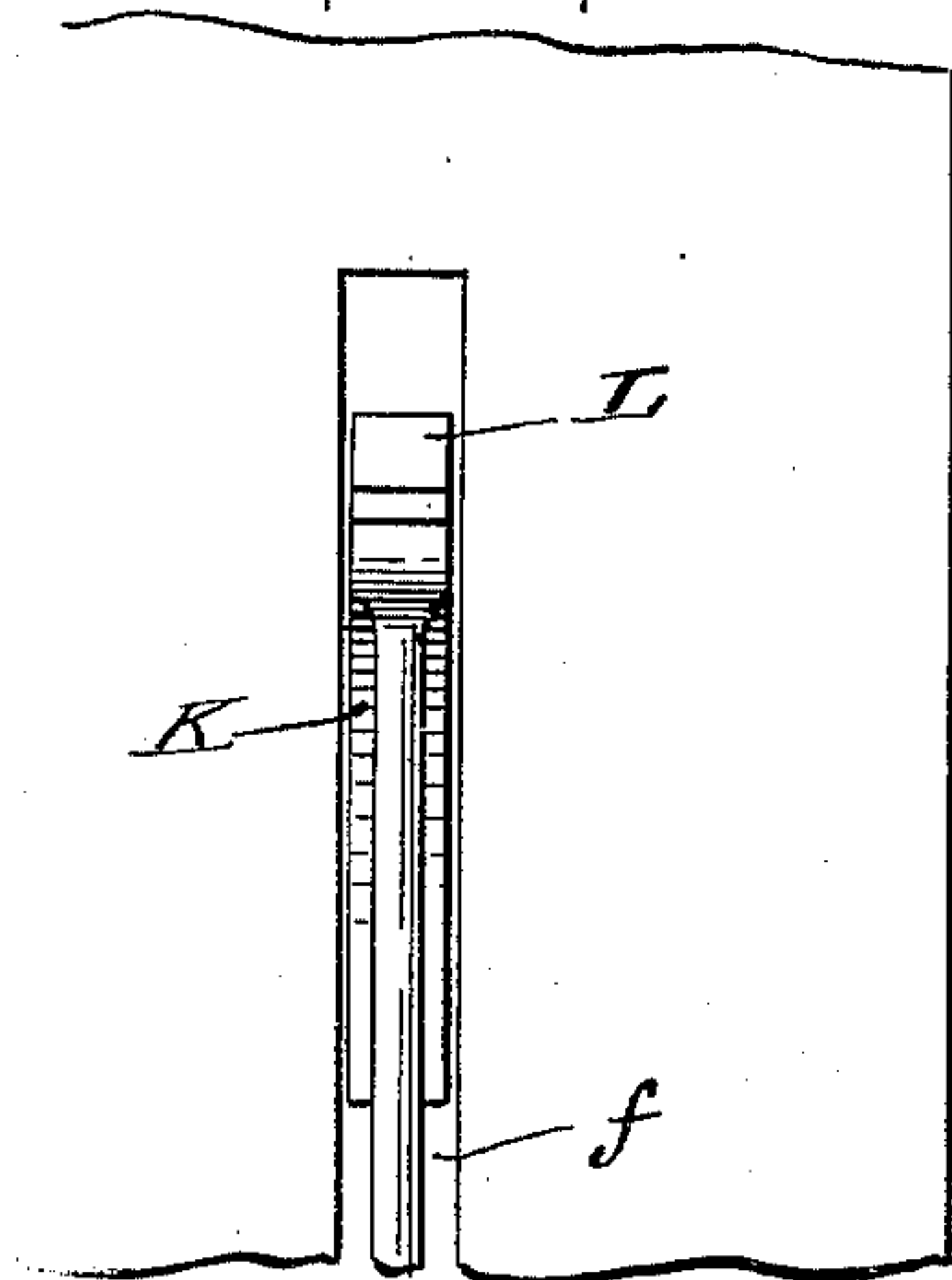


FIG. 4.

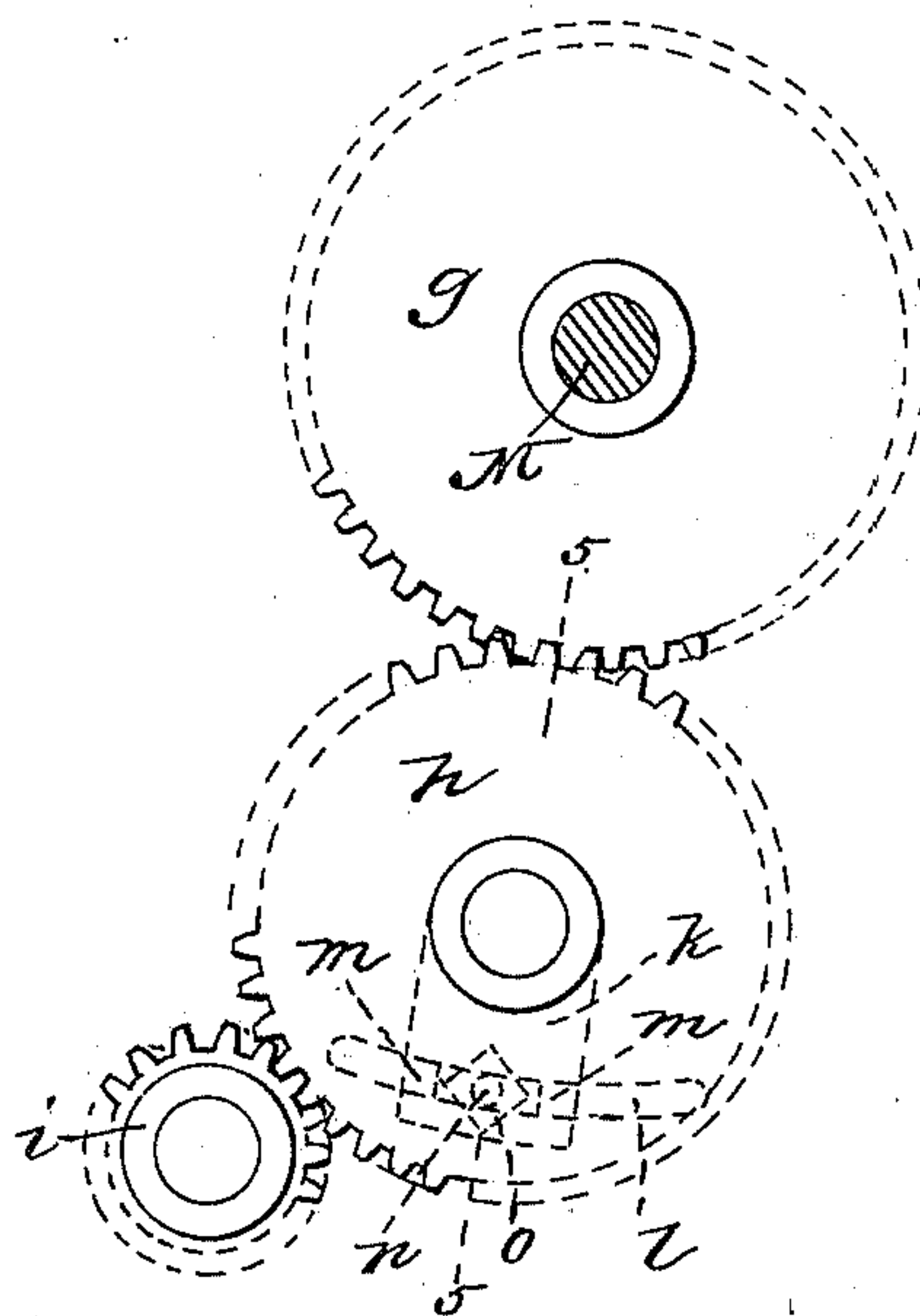
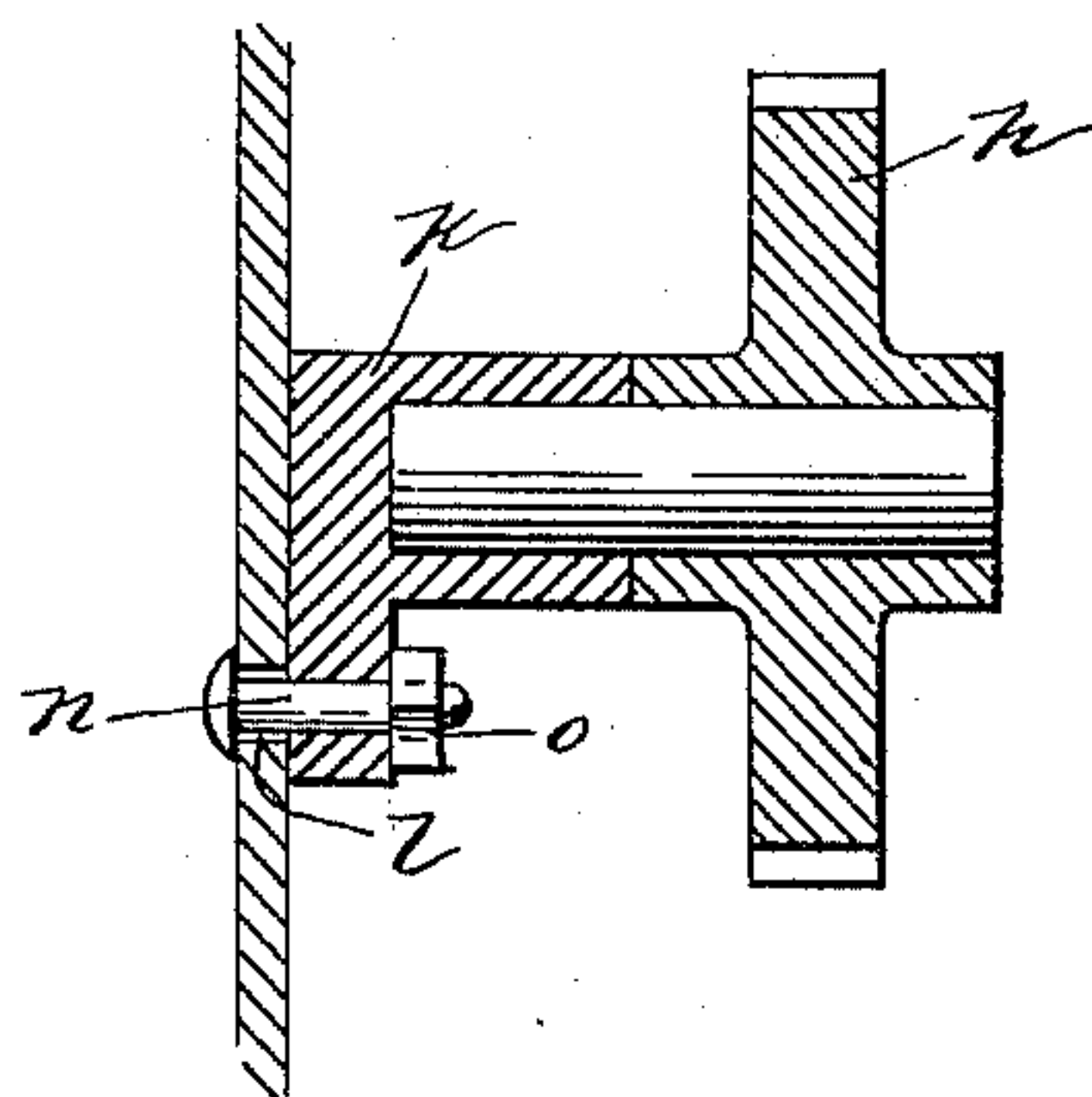


FIG. 5.



Witnesses

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# UNITED STATES PATENT OFFICE.

JAMES C. POTTER, OF PAWTUCKET, RHODE ISLAND.

## EVENING MECHANISM FOR COTTON-OPENERS, &c.

SPECIFICATION forming part of Letters Patent No. 411,350, dated September 17, 1889.

Application filed January 25, 1889. Serial No. 297,561. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES C. POTTER, of Pawtucket, in the State of Rhode Island, have invented a certain new and useful Improvement in Evening Mechanism for Cotton-Openers, &c., of which the following is a specification.

My invention relates to the evening mechanism of machines for opening or working cotton and other fibrous materials, and it has particular reference to the devices for imparting movement to the cone-drums and for regulating this movement. In this kind of machine one cone-drum is driven from the other through the intermediary of a belt, the position of which upon the drums is determined by a belt-shipper or shipping-fork connected with and actuated from the scale-lever system. For this purpose I employ a sliding rack-bar attached to the belt-shipper and gearing with a quadrant actuated by the scale-lever system. Such a combination, however, broadly considered, is not new. It is shown, for example, in my Letters Patent, No. 375,301, of December 20, 1887.

It is my object to arrange these parts so that there shall be as little friction as possible and so that they shall be extremely sensitive and quick to respond. To this end the rack-bar has its teeth upon the under side and at the toothed end rests upon and is supported by the toothed quadrant, with which it meshes, its bearing at this end being furnished entirely by the quadrant, save that the frame of the machine, or rather of the cone-drum box, through which it passes, furnishes guides to prevent it from lateral wobbling. The opposite or untoothed end of the bar is made cylindrical (in which respect it is unlike the toothed end, which has a rectangular cross-section) and slides in a hole cut for it in the wall of the cone-drum box. It is necessary to vary or change the normal speed of the driven cone-drum—that is to say, the cone-drum which receives motion from the other. Such change is needed in order to produce laps of different weight, and is also needed when, for example, four laps are being fed to the machine and one of the laps gives out, thus leaving only three. In the latter event the rate of feed must be increased sufficiently to com-

pensate for the missing lap at the feed end of the machine in order to maintain uniform weight in the finished lap at the calendar end of the machine. This change is usually effected in machinery of the kind in question by shifting the belt nearer to one end or the other of the cone-drums, as the case may be, this shifting being accomplished by means of an adjusting-screw—such, for example, as the adjusting-screw G in my Letters Patent No. 375,301.

It is advantageous to maintain the belt normally about midway between the ends of the drums, because thereby it is afforded the greatest range of movement in both directions. When it is shifted so as to stand normally nearer to one end of the drum, its range of movement in that direction is necessarily reduced. In some instances it is necessary to thus shift it to such an extent that it stands so near to one end of the drum as to have practically little or no range of movement in that direction, which is, of course, very objectionable.

To maintain the belt normally about midway of the drums, and yet to vary or change the normal speed of the driven drum, I combine with the driving-shaft and pinion or spur wheel thereon for imparting motion to the driving-drum, a change-gear on the driving-drum, and an intermediate gear adjustable in the arc of a circle, of which the axis of the driving spur-wheel is the center. The gear on the driving-drum can be changed at will for one having a greater or less number of teeth, and the intermediate gear can be adjusted to accommodate itself to this change. Thus instead of varying the normal speed of the driven drum by shifting the belt I accomplish the same result by varying the normal speed of the driving-drum.

In the accompanying drawings, Figure 1 is a side elevation of so much of a cotton-opening machine as is needed to illustrate my invention. Fig. 2 is an end elevation of the cone-drums, showing, also, the belt and the belt-shipper. Fig. 3 is an elevation of that portion of the cone-drum box through which the quadrant and the toothed end of the rack-bar pass, showing the bar and the upper portion of the quadrant. Fig. 4 is an elevation



of that portion of the wall of the cone-drum box, on which appear the change-gear, adjustable intermediate gear, and driving spur-wheel hereinbefore referred to. Fig. 5 is a section through the intermediate gear, its supporting-bracket, and the adjoining wall of the cone-drum box on line 5 5, Fig. 4.

A is the frame of the machine.

B B are the feed-rolls.

10 C is one of the evener-plates.

D is the evener-arm attached to the plate, and E is the knife-edge bar on which the evener-plates are supported. These last-named parts are represented in large measure diagrammatically and only to such an extent as to indicate their relation to the other portions of the system.

The particular arrangement of these parts, which is illustrated in the drawings, is one which I have made the subject-matter, in part, of a separate application for Letters Patent, filed July 9, 1888, Serial No. 279,395.

The scale-lever system is represented at F. It is one in which the scale-levers are combined with connecting-links, whereby the levers below are suspended from those next above, and the topmost levers are suspended from the evener-arms, all as fully described, and illustrated in my aforesaid application, Serial No. 279,395.

From the lowermost or main scale-lever, which I distinguish by the reference-letter F', motion is communicated to the shipper G, which controls the belt H of the cone-drums I J. This motion is transmitted in the present instance through the instrumentality of a link *a*, which straddles the central portion of the main scale-lever, and is connected by a strap *b* to a sector *c* on rock-shaft *d*, which shaft, by the weighted lever *e*, is normally turned in a direction to keep the scale-lever system taut and to hold the evener-plates with yielding pressure up against the top feed-roll B, which serves as an evener-roll as well.

Upon the rock-shaft *d* is fixed the toothed quadrant K, which plays through a slot *f* in the front wall of the cone-drum box. Through this slot also passes the toothed portion or end of the horizontal rack-bar L, which is fixed to the vertical belt-shipper. The toothed portion of the rack-bar has a rectangular cross-section, and the width of the slot *f*, through which it passes, is such that the sides of the slot form guides to prevent lateral wobbling of the rack-bar. That portion of the rack-bar which is on the other side of the shipper is cylindrical and passes through a round hole in the rear wall of the cone-drum box, which furnishes a bearing or guide in which this end of the rack-bar can easily slide. The rack-bar has its teeth upon its underside, and it depends for its support upon the toothed quadrant, on which it rests and with which it meshes. By reason of this arrangement the friction of the rack-bar is very greatly reduced and the mechanism is

rendered more sensitive and quick to respond.

The cone-drum I is the one from which movement is imparted to the other or driven drum J. Drum I is actuated from a rotary shaft M, which by suitable gearing is driven from the beater-shaft or other suitable portion of the machine through the intermediary of suitable gearing, as will be understood without further explanation. Motion is communicated from this shaft to the lower or driving drum I by a spur-wheel *g*, fixed on the shaft, which meshes with an intermediate gear *h*, which latter in turn meshes with a change-gear *i* on the hub of the cone-drum I. This change-gear is held upon the hub or axle of the cone-drum by a set-screw, so that whenever it is desired to change the speed of the driving-drum it may be readily removed and replaced by another gear having a greater or less number of teeth, according as the speed of the drum is to be reduced or increased.

Inasmuch as the various change-gears used from time to time on the cone-drum axle will vary in diameter, it becomes necessary to make the intermediate gear *h* adjustable, so that it may conform to the change, and to this end it is mounted upon a support or bracket *k*, which is movable in the arc of a circle having as its center the axis of the spur-wheel *g*, so that the intermediate gear, whatever may be its change of position, will always be at the same distance from the spur-wheel *g*. A convenient way of obtaining this adjustment is indicated in the drawings. In the wall of the cone-box is formed a slot *l*, the curve of which is struck upon a circle having as its center the axis of the spur-wheel *g*. The foot of the bracket *k* upon its inner face is provided with guide-lugs *m*, which enter and fit in the slot *l* to prevent any tilting of the bracket. A bolt *n* passes through the slot and through a hole in the foot of the bracket, and has screwed upon its outer end a nut *o*, by means of which the bracket, after having been adjusted, can be tightly and securely held in its adjusted position. By the means just described the normal speed of the driven drum J can be varied without using the cone-drum belt for the purpose. At the same time, however, in order to provide for extremeness of adjustment, I may, and in practice do, furnish the link *a* with an adjusting-screw *a'*, the point of which rests in a socket formed for it in the upper edge of the main scale lever. By turning this screw in one direction or the other the link *a* can be raised or lowered, and thus moving will act through the intermediary of the rock-shaft *d* and quadrant K to move the rack-bar in one direction or the other, as the case may be, and thus to correspondingly adjust the belt upon the cone-drums. Such an adjustment, however, will be very slight, and need not materially carry the belt to one side or the other of the median line.



Having described my improvements, what I claim, and desire to secure by Letters Patent, is—

1. The combination, with the cone-drums 5 and cone-drum belt, of the belt-shipper, the oscillatory toothed quadrant, and the sliding rack-bar attached to the belt-shipper and at its toothed end resting upon, supported by, and engaging the toothed quadrant, substantially as and for the purposes hereinbefore 10 set forth.

2. The combination, with the cone-drums and cone-drum belt, the belt-shipper, and evening mechanism for operating the same,

of the actuating-shaft M, its spur-wheel *g*, the 15 change-gear *i* on the hub or axle of one of the cone-drums, and the intermediate gear *h* and its supporting-bracket, adjustable in the arc of a circle struck from the axis of spur-wheel *g* as a center, substantially as and for 20 the purposes hereinbefore set forth.

In testimony whereof I have hereunto set my hand this 18th day of January, 1889.

JAMES C. POTTER.

Witnesses:

EWELL A. DICK,

WILL E. AUGHINBAUGH.