(No Model.)

2 Sheets—Sheet 1.

J. C. POTTER.

COTTON OPENER AND LAPPER.

No. 335,089. Patented Jan. 26, 1886.

Fig. 2.

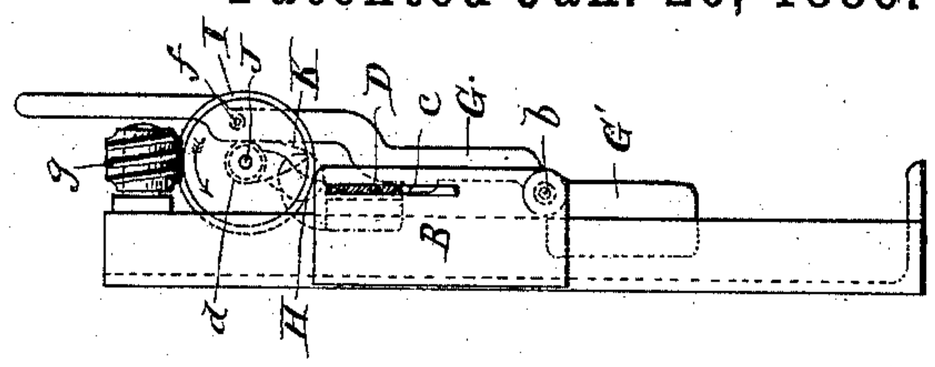
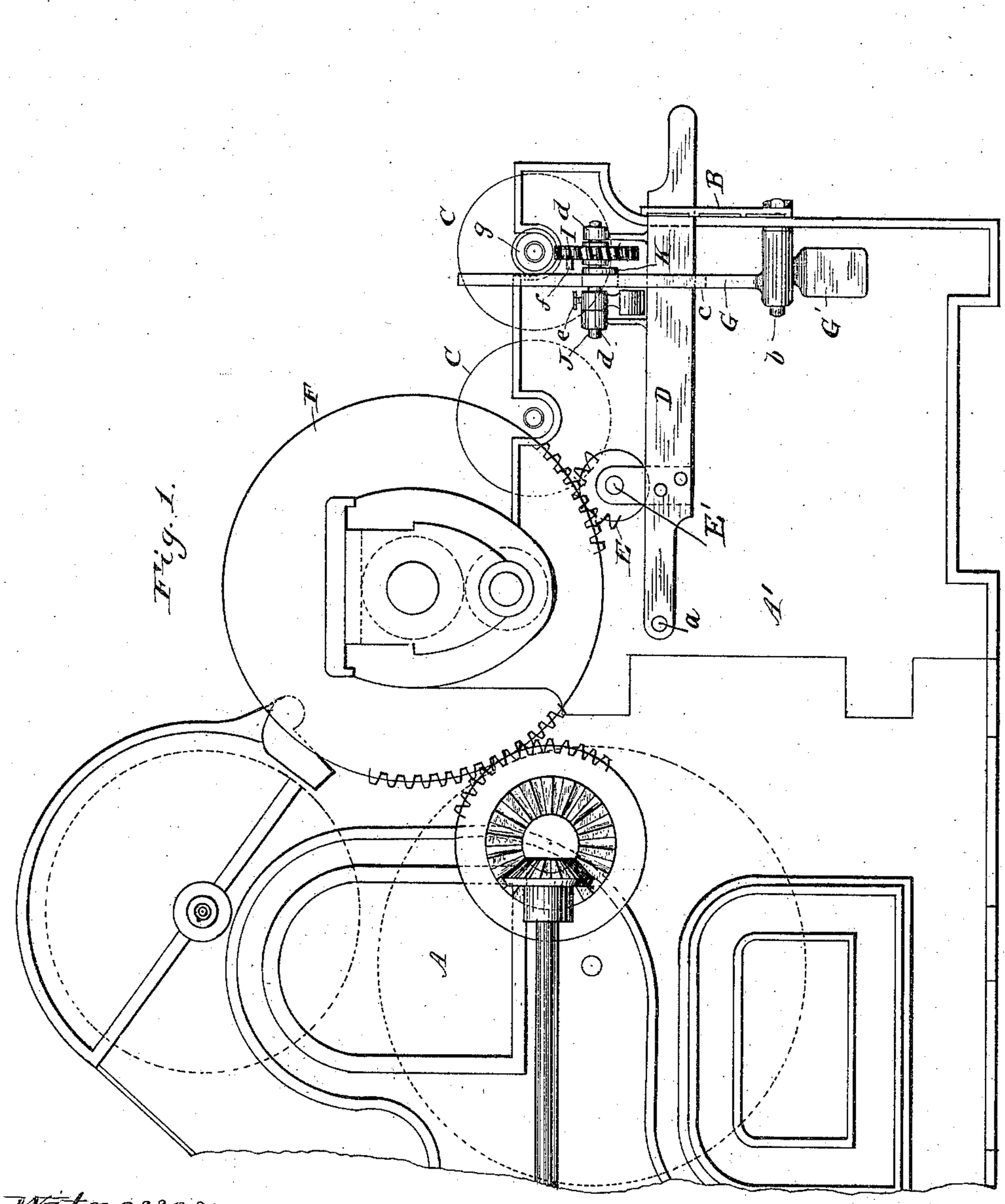


Fig. 1.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 4.

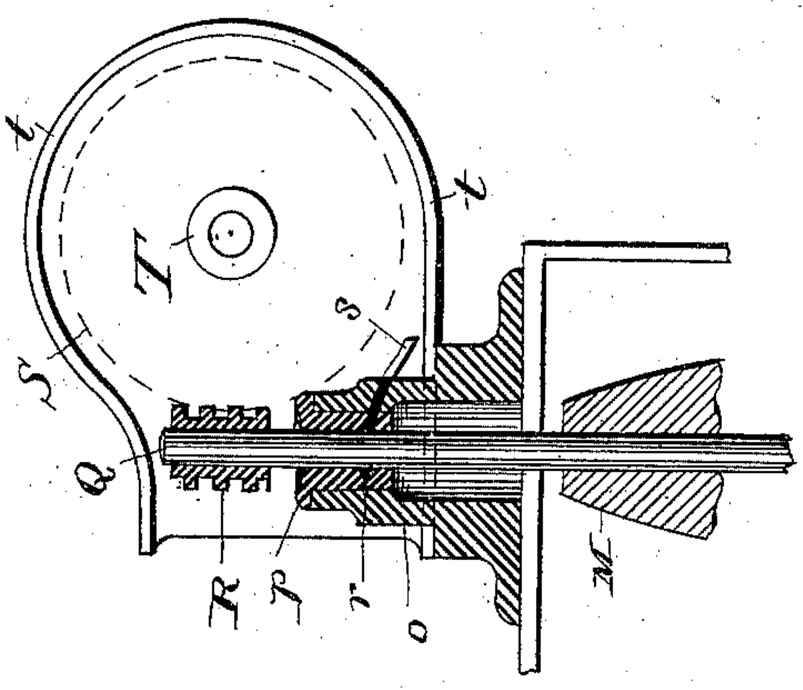
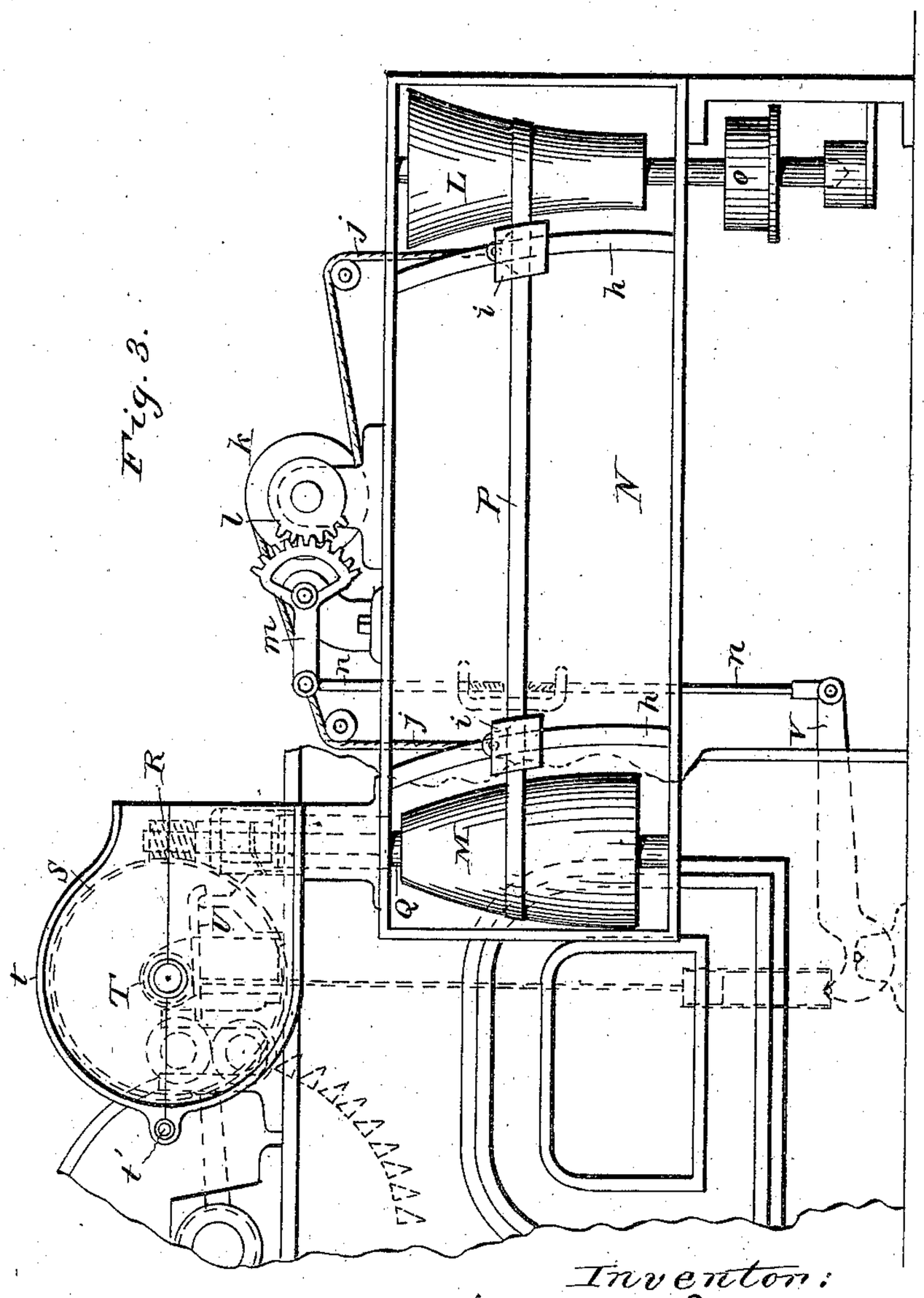


Fig. 3.



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UNITED STATES PATENT OFFICE.

JAMES C. POTTER, OF LOWELL, MASSACHUSETTS, ASSIGNOR TO THE ATHERTON MACHINE COMPANY, OF SAME PLACE.

COTTON OPENER AND LAPPER.

SPECIFICATION forming part of Letters Patent No. 335,039, dated January 26, 1886.

Application filed September 8, 1885. Serial No. 176,506. (No model.)

To all whom it may concern:

Be it known that I, JAMES C. POTTER, of Lowell, in the State of Massachusetts, have invented certain new and useful Improvements in Cotton Openers and Lappers, of which the following is a specification.

My improvements in cotton openers and lappers relate, first, to the "knocking-off" mechanism, and more particularly to that portion of said mechanism by which the drop-lever is released and allowed to fall at predetermined times; secondly, to the "evening" mechanism, more particularly to that portion of said mechanism by which the belt is shifted upon the cone-drums, and also to the means for oiling the shaft or upper journal of the driven cone-drum.

These improvements result, as a whole, in an improved lapper. At the same time, however, they are susceptible of separate application to cotton opening and lapping machines.

My improvements, which will be described in the order above named, can best be explained and understood by reference to the accompanying drawings, in which—

Figure 1 is a side elevation of so much of the back cage or calender-section of a lapping-machine as needed for the purpose of explanation. Fig. 2 is a rear elevation of the knocking-off devices and their supporting-stand, shown in Fig. 1 with the drop-lever in section and with the rear bearing of the shaft J removed. Fig 3 is a side elevation (on the opposite side of the machine from that shown in Fig. 1) of the front or apron-section of the machine, the front portion of the section being broken away so as not to disguise the parts in which my invention is more particularly comprised. Fig. 4 is a side view, (on the side opposite from that illustrated in Fig. 3,) partly in section and partly in elevation, of the upper portion of the shaft of the driven cone-drum, the stand for the same, the worm mounted on said shaft and the box or case to contain the worm-gear, which is driven by said worm.

A is the back cage-section of an ordinary lapper, to the rear of which is attached, as usual, the frame A′, carrying the calender-rolls C and the other rolls and appurtenances, such as usual in the calenders of cotton-lappers.

D is the drop-lever, pivoted at *a* and working in a vertical guide-slot in the arm B, as customary, carrying also the customary pinion-gear, E, which, when the drop-lever is lifted into normal position, engages with and drives the large gear F.

It may be here remarked that the large gear F in this class of machines drives, through suitable intermediate gearing, all of the feed-rolls of the machine, so that the feed takes place or ceases according as the gear F is engaged with or disengaged from the pinion E. Pinion E itself is power-driven through the instrumentality of the shaft E′ on which it is fixed. One end of said shaft is carried in a bearing on the drop-lever D, as shown. The shaft thence extends across to the opposite side of the machine, where it is supported in a proper bearing, and is continuously driven by pulleys and belting or shafting and gearing from the beater-shaft or other suitable moving part of the machine. Its bearings are so arranged that it can have the limited movement requisite to move the pinion E into and out of engagement with the gear F. This arrangement of parts is common and too well-known to those skilled in the art to require illustration or further description.

G is the catch-lever, pivoted at *b* to the frame, and having a weighted end, G′, which tends to hold the lever in such position that the catch or lug *c* on its inner face will come beneath and uphold the drop-lever when the latter is lifted, as indicated in Fig. 2.

Thus far there is nothing essentially novel in the construction, arrangement, or mode of operation of the parts. They are such as are usually found in machines of this class, and being well-known to those skilled in the art require no further explanation.

Mounted upon and carried by the drop-lever, are the devices by which, at a predetermined time, the drop-lever is released from the control of the catch-lever, so as to be permitted to descend far enough to carry the pinion E out of engagement with the gear F. These devices consist of the shaft J, the pendent

weight H, the worm wheel I, and the dog K. The shaft J is hung on centers in bracket-bearings *d*, attached to the drop-lever, on which shaft are mounted the pendent weight and the worm-wheel, both of which are fixed to the shaft—the pendent weight being adjustably fastened to said shaft by a set-screw, *e*, for a purpose which will be hereinafter referred to. The dog K is also mounted on the shaft J, but is loose thereon. This dog is so placed that it comes opposite to the shank of the catch-lever. Normally it hangs down vertically in the position indicated by dotted lines in Fig. 2, and in this position it of course does not affect the catch-lever. When, however, it is pressed or moved outwardly, it bears against the catch-lever and pushes it back far enough to disengage it from the drop-lever. The device for thus operating the dog consists of a pin, *f*, carried by and projecting laterally from the worm-wheel I in such position that it will meet the dog when the wheel I revolves far enough, the revolution of the wheel being effected by a worm, *g*, on the end of one of the calenders C.

Supposing the parts thus far described to be in the position indicated in Fig. 2, and the worm-wheel I to be revolving in the direction of the arrow in that figure, the mode of operation is as follows: The rotary movement of the wheel causes a corresponding movement of the shaft J and of the pendent weight H, which is fixed to it. The dog K, however, being loose on the shaft, remains in the position indicated in Fig. 2 until the pin *f* reaches it. By the continued revolution of the wheel the dog is then forced outwardly against the catch lever, pushing it gradually back until it is entirely disengaged from the drop-lever. The moment this takes place the drop-lever falls, carrying both the pinion-gear E out of engagement with the gear F and the worm-wheel I out of engagement with the worm. Then the pendent weight H at once returns the shaft J and consequently the wheel I to normal position—that is to say, to the position from which the wheel started—thus automatically returning the devices to the position which they are required to assume when the machine is restarted. The dog K also, being freed from the control of the pin *f*, at the same time resumes its vertical position on shaft J. By adjusting or changing the position of the pendent weight H on the shaft J the position of the pin-wheel I can be shifted, so that it shall be caused to complete a full revolution or any portion of a revolution before its pin *f* causes the dog to operate the catch-lever. In this way I am enabled to "knock-off" earlier or later, as desired, in order to produce any length of lap desired.

Aside from the advantage just stated, which is due to the adjustability of the pendent weight, my improved knocking-off mechanism possesses this marked advantage over such knocking-off devices now in use as are known to me—to wit, that when my knocking-off mechanism is adjusted to any length of lap, the knocking-off devices, as soon as the drop-lever falls, at once automatically return to that adjusted position, so that when the machine is restarted the prescribed length of lap will be made before the machine again knocks off; whereas in other knocking-off devices of which I have knowledge, if, after any portion of the prescribed length of lap is made the machine should become clogged, as is often the case, necessitating the stopping of the machine and the removal of the portion of the lap already made, the knocking-off devices do not return to their original position; but the machine when restarted knocks off as soon as the remaining portion of the prescribed length of lap is produced, instead of making a full lap, as, for instance, if the lap to be made is forty-five yards in length and fifteen yards of that length are completed when the machine is stopped, the machine when restarted will produce only a lap of thirty yards before it again knocks off, the result being that laps of different sizes are frequently produced, which is not the case when my mechanism is made use of.

I now proceed to the description of that portion of my improvements relating to the evening mechanism, illustrated in Figs. 3 and 4.

L M are the usual cone-drums of the evening mechanism contained, as customary, in what is termed the "cone-box" N. L is the driving-cone operated by means of a pulley, O, on its axle, around which passes a belt from some suitable moving part of the machine—such as the beater-shaft, as shown, for example, in Letters Patent No. 110,318, of December 20, 1870—and the cone-drum M is driven from cone L by belt P. The axle or shaft Q of the driven cone-drum N projects up through the cone-drum box and carries on its upper end a worm, R, which gears with and drives the worm-gear S on the axle of the roll T, beneath which are the evener-plates U, connected by upright rods and scale-levers with the evener-lever V, the movement of which latter, due to variations in thicknesses of material passing between the evener plates and the roll above the same, causes other suitable intermediate mechanism to affect the shifting of the cone-drum belt with a view to making uniform the supply of material fed to the machine.

Thus far there is nothing essentially novel in the construction, arrangement, or mode of operation of the parts.

My improvements reside in the belt-shifting devices proper, and will now be described, the object being to provide more efficient means for shifting the belt, whereby the same tension may be exerted upon the belt, no matter upon what portion of the cones it may happen to be.

The cone-drum box has two slots, *h*, extending from top to bottom of the box and curved each to conform to the internal slant or curve of the drum which it adjoins, in which slots are guided and moved the belt-shifters *i* for

the cone-drum belt P. These shifters are supported and operated each by means of a rope or chain, *j*, attached at one end to the shifter and at the other end to the periphery of the drum *k*, supported in suitable bearings on top of the cone-drum box, and having on its axle at one end a toothed quadrant-wheel, *l*, which gears with and is operated by the toothed quadrant-lever *m*, hung on a horizontal pivot in a bracket on top of the cone-box and connected to the evener-lever V by a rod or link, *n*, preferably made in two parts, having its contiguous screw-threaded ends screwing into a connecting-yoke, so that it may be adjusted in length. When the evener-lever vibrates, it will, through the intermediary of the connecting-rod *n*, cause a corresponding movement of the quadrant-lever, which will have the effect of partially rotating the drum *k* in one direction or the other, thus moving the shifters up or down, as the case may be, and correspondingly shifting the position of the belt upon cone-drums according to the requirements of the work.

The oiling device which I use in connection with the shaft of the driven cone-drum is intended to furnish a more efficient means for preventing the oil from running down upon the shaft and getting upon the cone and thus injuring the belt and interfering with its successful operation, and it is illustrated clearly in Figs. 3 and 4.

On top of the cone-drum box, at the point where the driven cone M passes through it, is secured the tubular stand *o*, through which the shaft passes loosely, the worm R, hereinbefore referred to, being mounted on the end of the shaft that projects above the stand. Into the top of the stand is tightly fitted a bushing, *p*, which affords a top support or bearing for the cone-drum shaft. In the inner face of this bearing is an annular groove, *r*, and through both the stand and the bushing is bored in a slanting direction a passage to receive a tube or pipe, *s*.

The worm-gear S, hereinbefore referred to, is contained in a two-part case, *t*, the lower portion of which forms a box and the upper portion a cover for the box, hinged thereto on a horizontal hinge at *t'*. This box rests upon a shoulder on the stand *o*, and fits closely and tightly thereon. The slanting pipe *s* extends from the groove *r* out through the stand *o* in a downward direction, and terminates nearly at the bottom of the box *t*. The oil or lubricating material for the parts is contained in the box, and is, when the parts in the box are in movement, carried up on the worm-wheel S, from which it is transferred to the worm R, whence it passes in limited but sufficient quantity down between the shaft and its surrounding bushing until it reaches the groove in the bushing. On reaching this point, however, instead of passing farther down the shaft, it returns through the slanting pipe into the box, and is thus prevented from passing down to the cone box and cones below.

Having described my improvements in cotton openers and lappers, and the best way now known to me of carrying the same into effect, I remark, in conclusion, that I do not restrict myself to the special details hereinbefore described, and shown in the accompanying drawings in illustration of the same; but

What I believe to be new and of my own invention is—

1. The combination, with the drop-lever and the catch lever or device by which the same is upheld, of knocking-off devices for disengaging said catch from the drop-lever at predetermined times, mounted on and carried by said drop-lever, substantially as and for the purposes hereinbefore set forth.

2. The combination of the drop-lever, the catch device or lever, the rotary shaft carried by said drop-lever, the counterbalance or pendent weight, and pin and wheel fixed to said shaft, and the loosely-pivoted dog, these parts being combined and arranged for joint operation, substantially as and for the purposes hereinbefore set forth.

3. The combination of the drop-lever, the catch device or lever, and knocking-off devices for disengaging at predetermined times the catch from the drop-lever, arranged and operating, substantially as described, to automatically resume or return to their normal adjusted position when the drop-lever falls, substantially as and for the purposes hereinbefore set forth.

4. The combination, with the catch and drop levers, of the rotary shaft carried by said drop-lever, the wheel and pin fixed to said shaft, the pendent or counterbalance weight adjustably connected to said shaft and the loosely-pivoted dog, substantially as and for the purposes hereinbefore set forth.

5. The combination, with the cone-drum box, the cone-drums and their connecting-belt, of the evener-lever and evener mechanism, whereby said lever is actuated, the shifters *i*, guided and moving in slots *h* in the cone-drum box, the rope or ropes *j*, the drum *k* and its toothed quadrant-wheel *l*, and the toothed quadrant-lever *m*, connected to and operated by the evener-lever, as and for the purposes hereinbefore set forth.

6. The combination, with the cone-drum box, the driven cone-drum and its shaft, of the worm-gear box *t*, the stand *o*, the bushing *p*, provided with internal annular groove, *r*, and the downwardly-slanting pipe *s*, leading from said groove out through the bushing and stand, as and for the purposes herein set forth.

In testimony whereof I have hereunto set my hand this 3d day of September, 1885.

JAMES C. POTTER.

Witnesses:
A. T. ATHERTON,
C. T. ATHERTON.