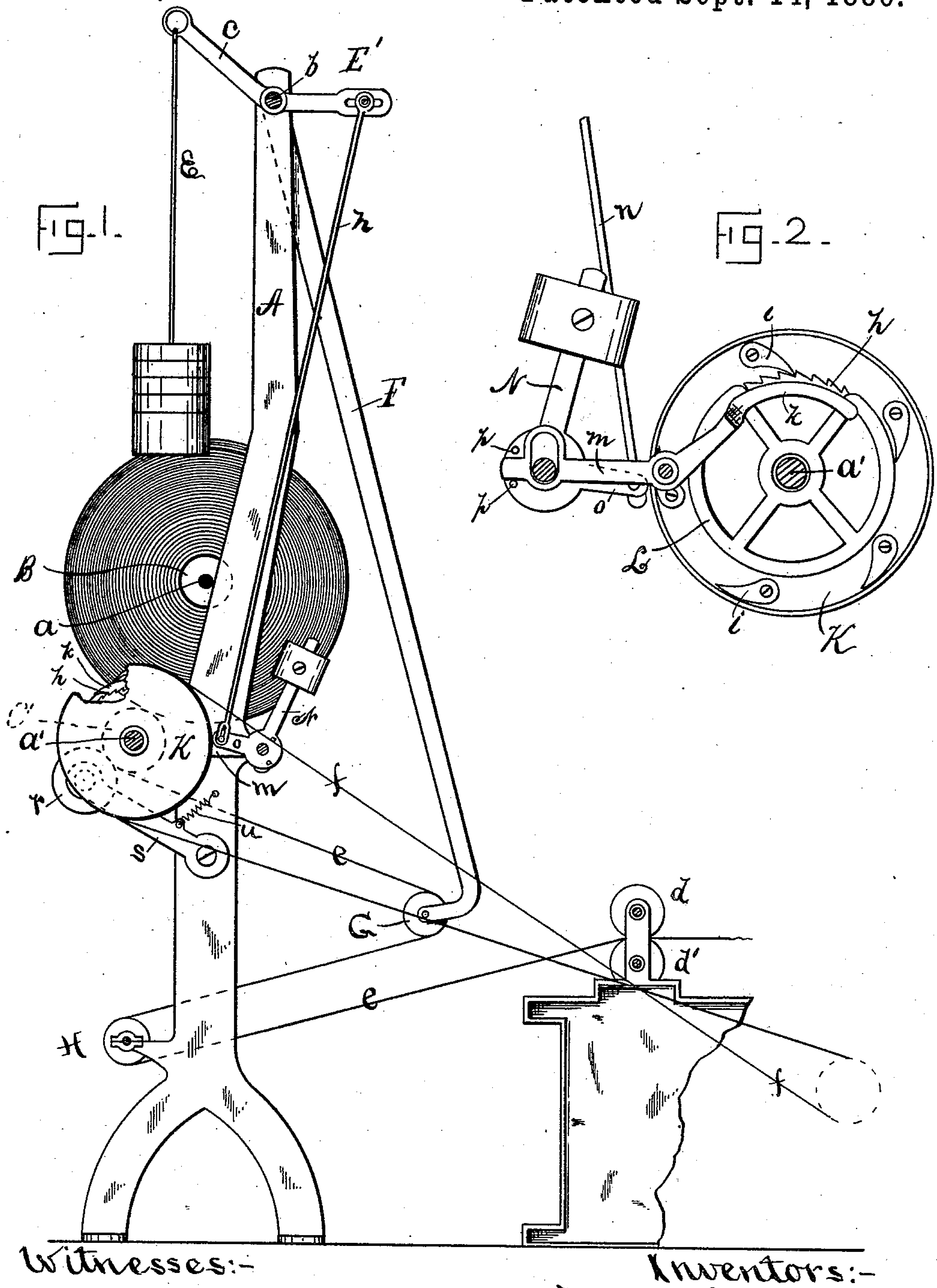
(No Model.)

2 Sheets—Sheet 1.

# M. BARBER & S. P. WEEKS.

## LAP FEEDING MECHANISM FOR CARDING MACHINES.

No. 349,201. Patented Sept. 14, 1886.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

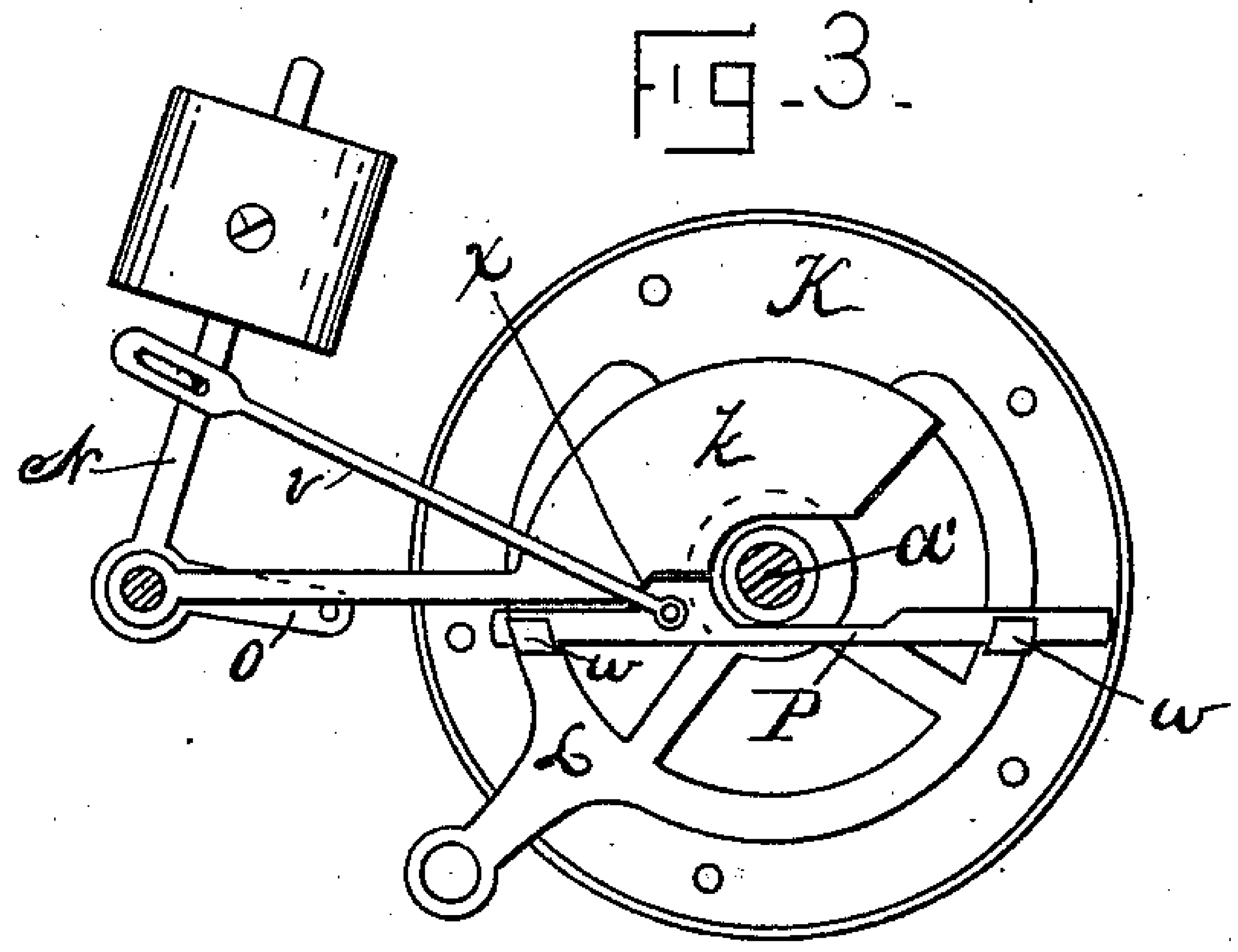


Fig. 5.

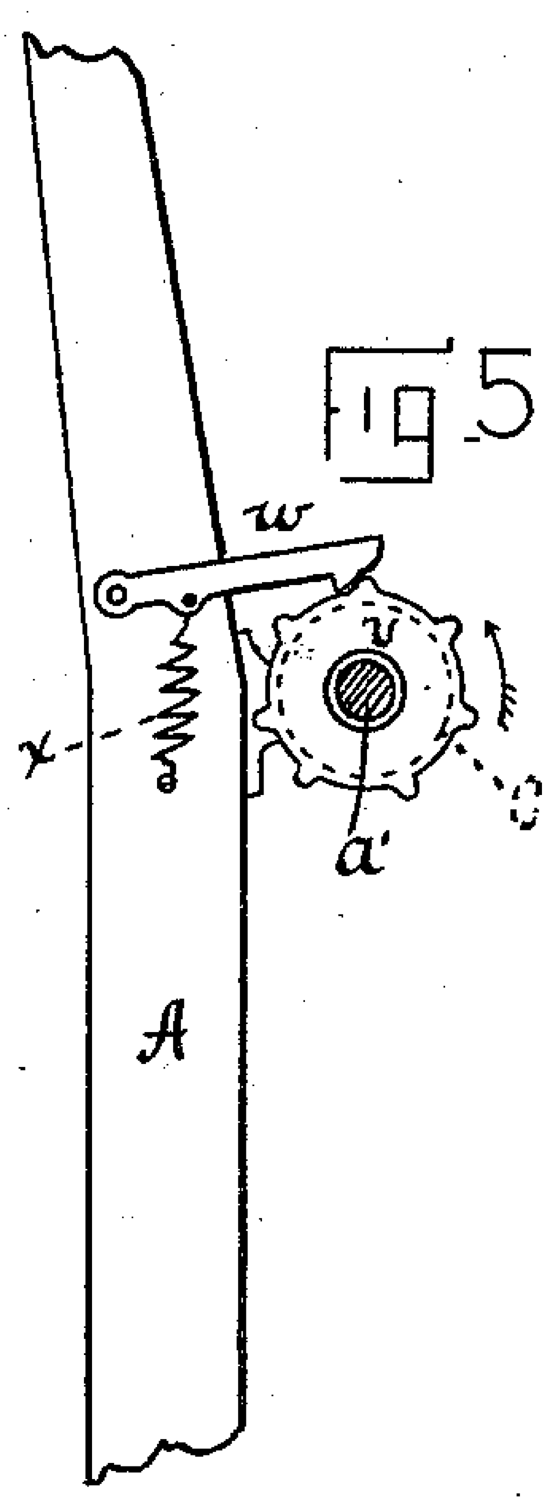
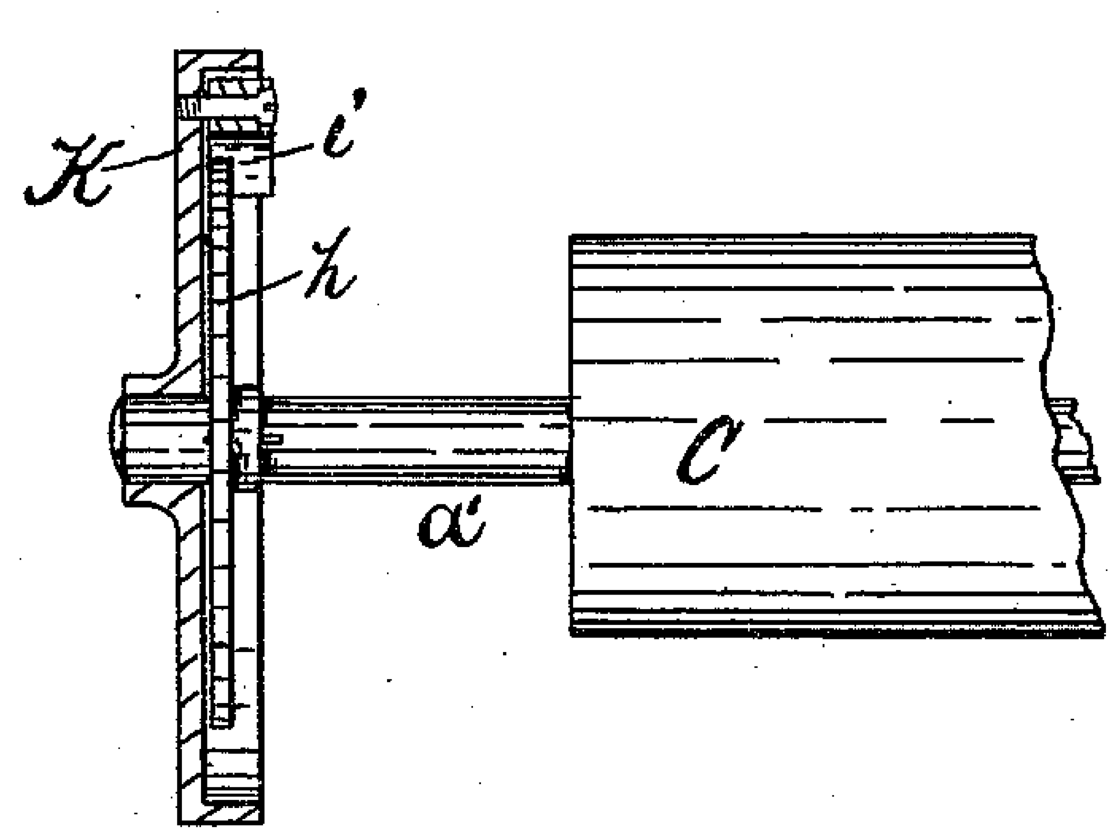


Fig. 4.



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# UNITED STATES PATENT OFFICE.

MOSES BARBER AND STEPHEN P. WEEKS, OF SOUTH COVENTRY, CONN.

## LAP-FEEDING MECHANISM FOR CARDING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 349,201, dated September 14, 1886.

Application filed May 20, 1886. Serial No. 202,726. (No model.)

*To all whom it may concern:*

Be it known that we, MOSES BARBER and STEPHEN P. WEEKS, of South Coventry, Windham county, Connecticut, have made certain new and useful Improvements in Lap-Feeding Mechanisms for Carding-Machines, which improvements are fully set forth and described in the following specification, reference being had to the accompanying two sheets of drawings.

Our invention relates, principally, to the mechanism in carding-machines by which the lap or so-called "sliver" is delivered from the full beam to the carding and condensing mechanism, our immediate object being to provide a simple device which shall automatically control and deliver said lap or sliver as fast as needed, and which shall also maintain a uniform degree of tension on said lap, acting equally well with either a full or nearly empty beam. Inasmuch as an imperfect yarn must of necessity produce imperfect cloth, it is desirable, if not absolutely necessary, in drawing down the lap that a uniform size and weight be maintained, and especially so in the so-called "second breaker and finisher."

In the accompanying drawings, Figure 1 is a side elevation of the beam-supporting frame, located in the usual place at the rear of the carding-machine proper, a portion of said machine-frame, with its feed-rollers *d d'*, being also shown in said figure. Fig. 2 is an enlarged detached view of our new regulating device, looking from the inner side. Fig. 3 is a modification of said device, showing a slightly different means for operating the movable shield, described in detail hereinafter; and Fig. 4 is a detached side view, partly in section, showing the relative positions of the rotating disk K, the ratchet-wheel *h*, roller C, and their common shaft, *a'*. Fig. 5 shows the end of shaft *a'* opposite to that shown in Fig. 1 provided with a friction-disk and pawl to check the movement of roll C.

The letter A represents one of the beam-supporting frames, the opposite frame being of the same general shape.

B represents the beam, and C (in dotted line, Fig. 1) the roll on which said beam rests. The middle portion of the frame A is inclined, as shown, and the bearings *a* of the beam rest against said inclined rear side, the lap resting on the roll C. As the lap is taken from the beam and the roll is reduced in diameter, the bearings *a* gradually ride downward on the inclined frame.

Pivoted in the upper end of the supporting-frame is a rock-shaft, *b*, having attached to it and extending rearward an arm, *c*, from the outer end of which is suspended a weighted rod, E, and also extending in the opposite direction is an arm, E'.

Attached to shaft *b* at each end are arms F, which, reaching well downward between the frame A and the carding-machine proper, support in their free ends a pivoted roll, G, around which the lap *e* passes after leaving roll C. Said lap is then passed around roll H, and from thence is led direct to the feed-rollers *d d'*.

The counterbalanced roll G is provided to maintain a given degree of tension on the lap, and in order to hold said roll G in approximately the same position at all times we have arranged a let-off mechanism, which we will proceed to describe, by which the beam is rotated to give off the necessary amount or length of lap as often as required by the feed-rolls of the carding-machine, said let-off mechanism being caused to act by the forward or backward movement of said roll G. The tension of the lap remains the same at all times, and roll G simply swings with said lap for the purpose, as above stated, of operating said let-off mechanism.

On the outer end of the shaft *a'*, which carries roll C, is a loosely-fitting disk, K, kept in continuous rotary motion by a belt, *f*, leading from and connected with the driving mechanism of the carding-machine. Adjacent to disk K, on its inner side, is a ratchet-wheel, *h*, secured rigidly to shaft *a'*. The disk K carries a series of pawls, *i*, which, under certain conditions, hereinafter explained, engage the ratchet-wheel to rotate roller C and let off the lap as needed. The pawls *i* are kept from engagement with the greater portion of ratchet-wheel *h* by a fixed shield, L, which is bolted or otherwise secured to the frame A. This shield L is cut away at its upper side to expose several ratchet-teeth, and is so located that the pawls, as they travel with disk K, ride on said shield until they reach the exposed ratchet-teeth, when they drop into said teeth and move roll C. When the shield is again reached, the pawls ride upward onto the periphery of said shield and out of engagement with the ratchet-wheel, which then stops.

It will be obvious to one familiar with carding machinery that if the pawls were left free to act continuously on the ratchet-wheel the lap would be let off much faster than the carding mechanism could take care of it; so, to check the movement of the lap and to regulate the feeding mechanism, we have provided a second shield, *k*, pivoted to shield L, and formed as an arc of the same circle as said shield L, said section *k* being so connected to the other mechanism that it is raised at the proper instant to throw the pawls out of the ratchet-teeth, and thus cause roll C to stop. Shield *k* is operated by a weighted arm, N, whose right-angular extension *o* is connected with lever-arm E′ by a rod, *n*.

In Figs. 1 and 2 the auxiliary movable shield *k* has an arm, *m*, extending outward past the pivotal point of the weighted lever N, and so slotted that it is limited in its upward or downward movement by said pivot, as plainly shown in Fig. 2. Secured in arm N, on each side of arm *m*, is a pin or lug, *p*, which as arm N is rocked to the right hand (see Fig. 2) engages the arm *m* to elevate it, and, in consequence, to depress shield *k*, so that the pawls may reach and move the ratchet-wheel. When the weighted lever N is moved toward the left hand, pin *p* depresses arm *m* and raises shield *k* to throw the pawls out of engagement with the ratchet-teeth.

Referring again to the rock-shaft *b*, it should be understood that the arms *c* E′ F are practically a single piece, and that they all center in or on said rock-shaft. As the feed-rolls *d d′* draw the roving into the carding-machine the roll G is moved slowly toward frame A, which movement causes rod *n* to rock lever N. Said lever travels very slowly until its weight passes the center of gravity, when it drops forcibly forward, and by engagement of pin *p* with the shield-arm *m* throws the shield *k* downward, thus allowing the pawls to move roll C and the beam to deliver the required amount of lap or sliver. As said lap is allowed to unwind the counterbalanced roll G travels away from frame A, preserving a uniform tension on said lap. When roll G has traveled the required distance, rod *n* again brings arm N back past the center of gravity, and the shield *k* is knocked up into position to protect the ratchet from the pawls and stop the rotary movement of the beam. The movements described are repeated automatically as more of the lap is required, the counterbalanced roll G preserving at all times the same degree of tension on said lap.

In Fig. 3 we have shown the movable shield as pivoted on the same stud which supports the arm N, and said arm is connected by rod *v* with a sliding piece, P, arranged to move longitudinally in guides *w*, formed on the fixed shield L. The confronting edges of pieces *k* and P are cut diagonally, as at *x*, and it will be understood by referring to said Fig. 3 that a sliding movement of piece P will elevate the free end of shield *k*, and thus throw the pawls out of engagement with the ratchet-wheel. The reverse movement of piece P allows the shield to drop, when the pawls again act to rotate or partially rotate the beam.

In place of the weight which we use as a counter-balance for roll G, a spring could be used; but we prefer the system shown, as it gives a more uniform counterbalance. The pawls on disk K are held in proper position without the use of springs by a flange cast integral with said disk, as shown.

In order to change a nearly empty beam for a full one without stopping the machine, we have provided a roll, *r*, which is hung in arms *s*, secured to the frames A. (See Fig. 1.) This roll *r* is held in engagement with roll C by a spring, *u*. When a beam is nearly empty, the remaining ends of the lap are allowed to hang from the rear side of said roll *r*, and a full beam is placed in proper position. The several ends of the old lap are now pieced or connected to the new, being accomplished without stopping or even delaying the work for an instant. It will be evident that the supporting-arms *s* could, if preferred, be pivoted to frame A above roll C, instead of below, as herein shown.

In Fig. 5 we have shown a disk, *v*, secured to the end of shaft *a′* opposite to that carrying the pawl-and-ratchet device described above. This disk is formed with a series of projections on its periphery, which as roll C revolves engage and lift a pawl, *w*, pivoted to the main frame A, said pawl being held in contact with disk *v* by a spring, *x*; or, if preferred, it (the pawl) may be made heavy enough to accomplish the desired effect. The devices thus described are provided to overcome any inclination on the part of roll C to continue its rotary movement after the pawls *i* are thrown out of engagement with the ratchet-wheel *h*. While the friction-stops thus provided act to check the momentum of roll C the instant the pawls *i* are thrown out of ratchet-disk *h*, they do not offer resistance enough to interfere with the free working of said pawls and disk.

Having thus described our invention, we claim—

In combination with a beam-supporting frame having a central diagonal section adapted to receive and support the bearings of the beam, a rock-shaft pivoted in said frame, having depending arms carrying in their free ends a roller, and being provided, also, with the weighted arm *c* and arm E′, as described, a roller located below and adapted to support the beam, carrying a ratchet-wheel, as described, a flanged disk loosely fitted on the shaft which carries said ratchet-wheel adjacent to said ratchet-wheel, and provided with a series of pawls, as described, a fixed shield adjacent to said ratchet-wheel, having its upper portion cut away, as described, an auxiliary shield, *k*, located and pivoted substantially as described, and mechanism for operating said auxiliary shield, consisting of the weighted arm N and a connecting-rod extending from said arm to the arm E', all of said elements being formed and connected in substantially the manner and for the object specified.

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