No. 667,708. Patented Feb. 12, 1901.

H. KEMP.

FEEDING MECHANISM FOR CARDING MACHINES.

(Application filed Feb. 25, 1899.)

(No Model.) 2 Sheets—Sheet 1.

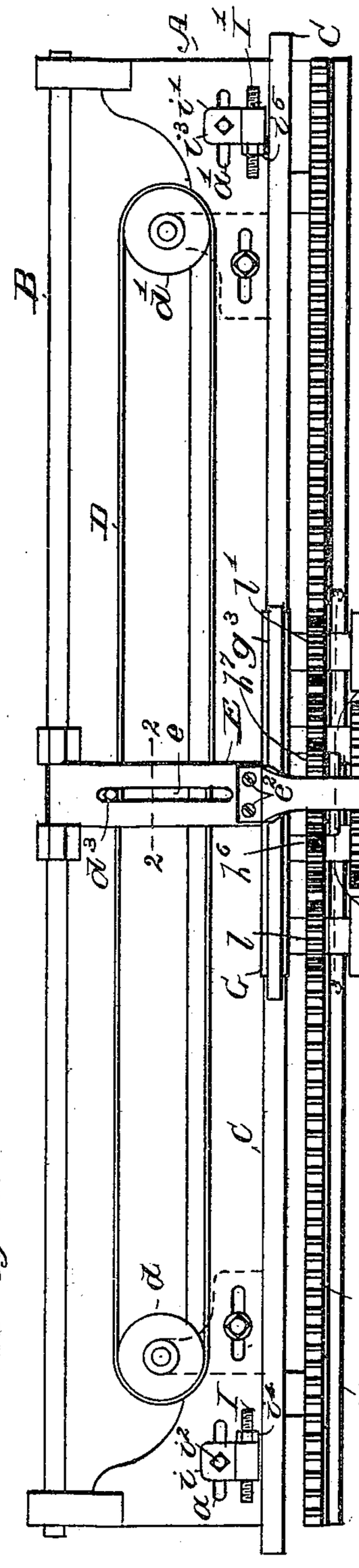

Fig. 1.

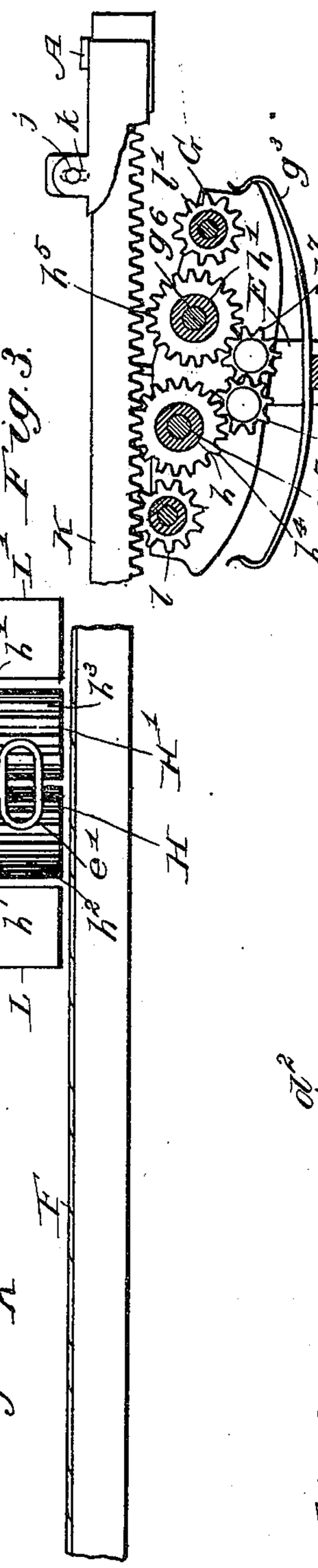

Fig. 3.

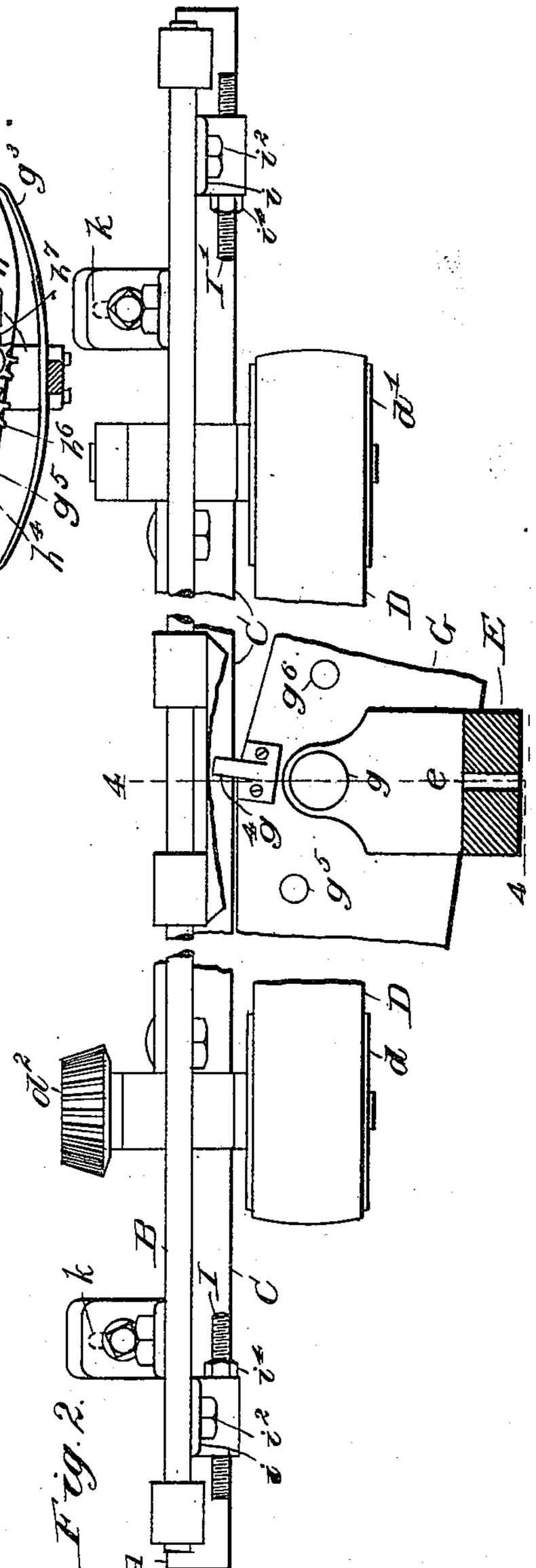

Fig. 2.

Witnesses.
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Fig. 4.

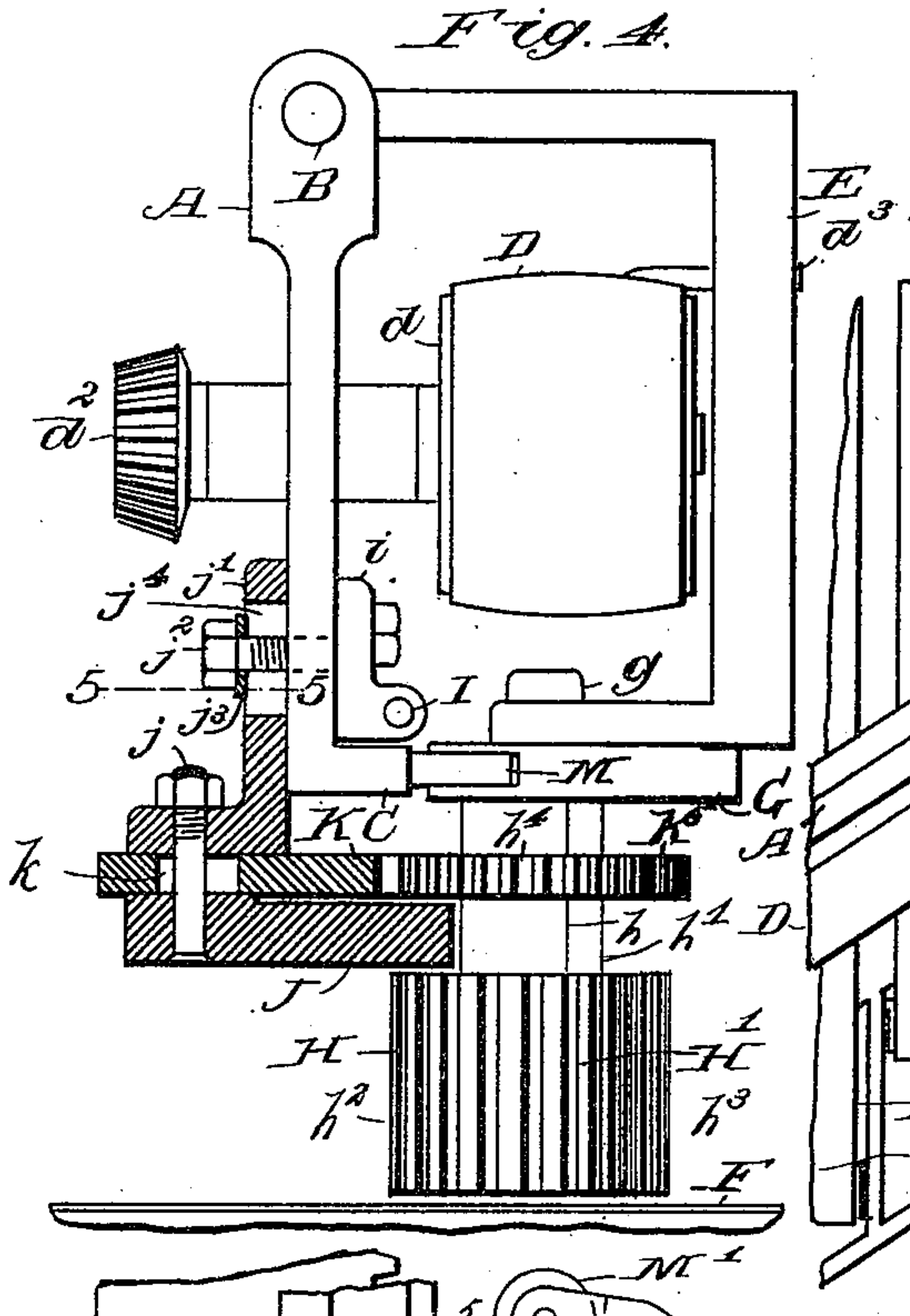


Fig. 6.

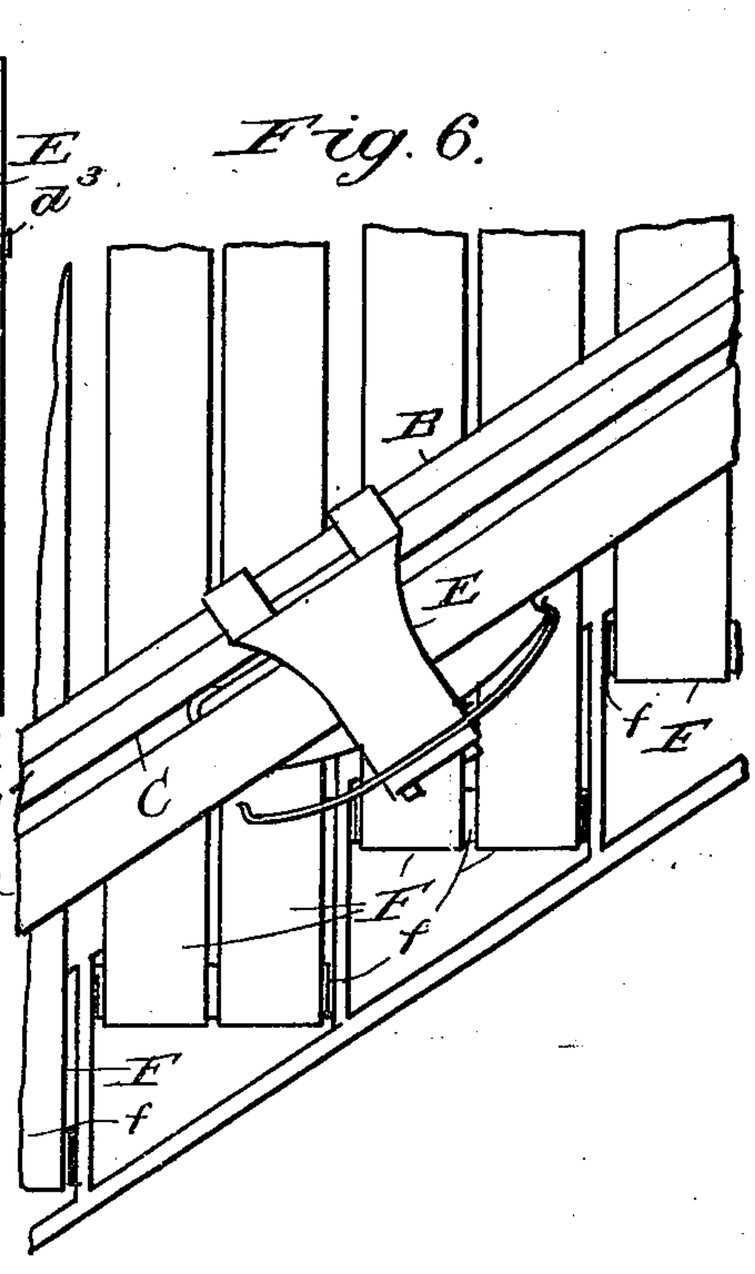
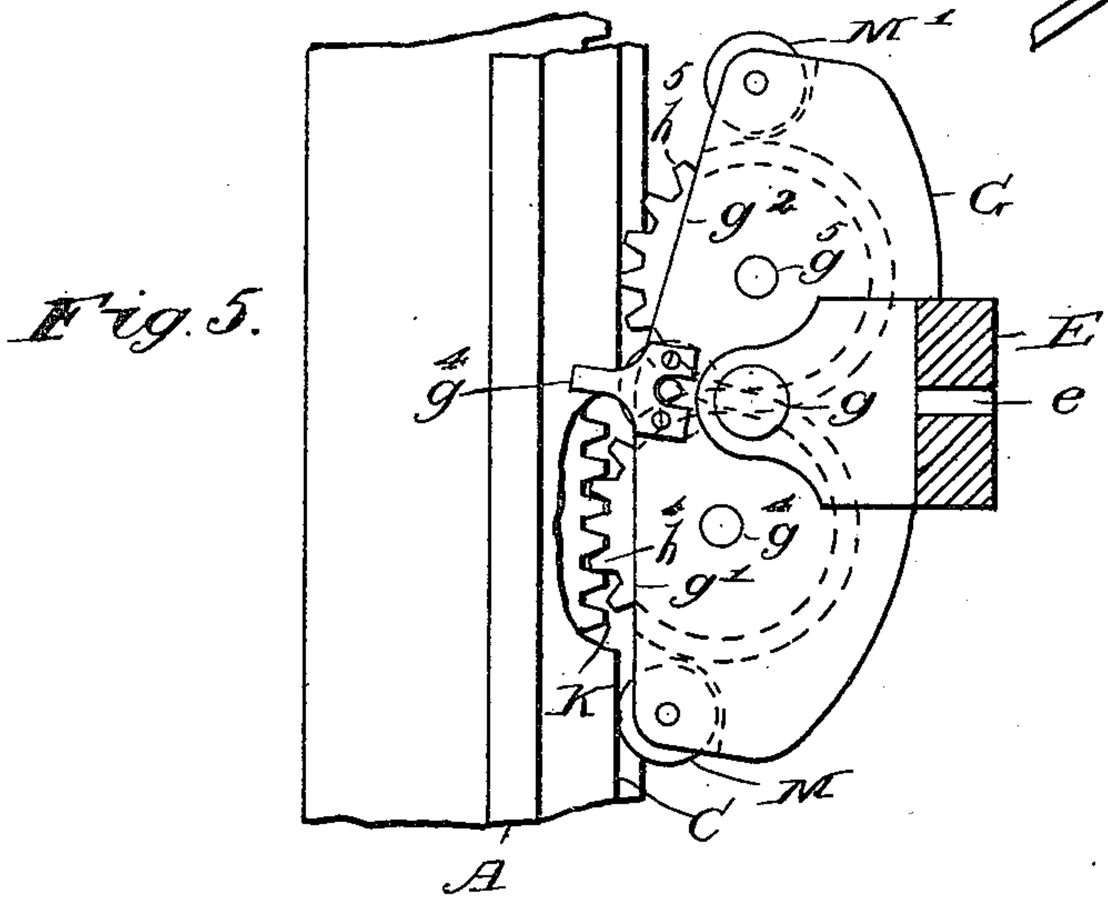


Fig. 5.



WITNESSES.

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FEEDING MECHANISM FOR CARDING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 667,708, dated February 12, 1901.

Application filed February 25, 1899. Serial No. 706,827. (No model.)

To all whom it may concern:

Be it known that I, HARRY KEMP, a subject of Victoria, Queen of the United Kingdom of Great Britain and Ireland, and a resident of Collinsville, in the town of Dracut, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Feeding Mechanism for Carding-Machines, of which the following is a specification.

My invention relates to feeding mechanism for carding-machines; and it consists of the devices and combinations hereinafter described and claimed.

The objects of my improved feeding apparatus are to feed the slivers or roping positively, to hold the sliver in place after being fed, and to dispense with the latches commonly used in the so-called "Apperly feed," (substantially shown in United States Patent No. 18,888, granted December 22, 1857, to Apperly and Clissold for carding-machines,) upon which feed this invention is an improvement.

My apparatus also prevents any strain or tension upon the sliver when laid upon the feed-aprons, or, in other words, after the sliver leaves the delivery-rolls or feed-rolls, and thereby causes the slivers delivered by the first breaker or carding-machine to the second breaker and from the second breaker to the finisher to be more uniform in size and weight and causes the "ends" delivered from the finisher to be of uniform weight and size from side to side of the finisher, except the side ends or waste ends, which may be lighter than heretofore and therefore require less recarding, because these side ends or waste ends, being of ununiform thickness and weight, are unfit for spooling and spinning and must be recarded, and every recarding breaks up the stock. The strain of tension upon the sliver between the feed-rolls and the apron is prevented by giving to the feed-rolls a surface speed greater than the travel of the carrier, so that the feed-rolls deliver a greater length of sliver than the distance traversed by the carriage. This prevents the doubled ends of the sliver from being drawn away from the sides of the feed-aprons or feeding-surface toward the center of said feeding-surface. It will be understood that if the tension of the sliver is too great between the delivery-rolls and the machine next preceding in operation the relative speed of said machine must be increased or the speed of said feed-rolls must be diminished.

It is true that the slivers have heretofore been positively fed to the carding-machine; but the attempt has been made to keep the slivers in place on the apron by holding them only where they are doubled at the sides of the apron, whereas I hold each course in place as it is fed throughout the whole length of the course, binding the sliver as fast as said sliver is delivered by delivering said sliver under the presser-bar and between said bar and apron.

Positively-driven delivery-rolls which do not pinch the sliver, but merely reduce or prevent friction, are well known in the class of machines to which this invention belongs. In the only instance, however, known to me (United States Patent No. 534,418, granted to Bates February 19, 1895) where positively-driven vertical feed-rolls positively pinch or engage and deliver the sliver the presser-plate is not used, but the courses are attempted to be held in place by the usual side belts, which run above the apron parallel therewith. I place each course under the presser-plate in such a manner that the position of said course relatively to the next preceding course cannot change. Of course delivery-rolls which positively engage the sliver must turn in opposite directions—that is, their adjacent surfaces must move in the same direction with each other and their rear surfaces or surfaces next the stock on the apron must move in opposite directions—so that if the axes of these rolls lie in the same plane parallel with the line in which the carrier which supports said rolls travels the roll in advance will rub against and disturb the last previously-delivered course of sliver. The axes of the rolls should therefore stand in a plane which is at such an angle to the path of travel of the carrier that the leading roll shall be out of contact with the previously-delivered stock and that the following roll shall lay the course being delivered in proper position under the presser-plate. It is therefore necessary that this angle between the line of travel and the plane of the

axes of the rolls shall be reversed at each end of each course. I provide means for changing said angle and for determining the exact place of changing said angle. When the leading roll is thus held out of contact with the previously-laid stock, a much softer or less-twisted sliver may be used, and the slivers will thus unite to form a more continuous and better web, because if the leading roll comes in contact with the previously-laid sliver the sliver must be twisted to prevent the fibers from catching and winding on said roll.

In the accompanying drawings, on two sheets, Figure 1 is an elevation of the front of a feed mechanism at right angles to said front; Fig. 2, a plan of the same, the carrier being in horizontal section on the line 2 2 in Fig. 1; Fig. 3, a plan of the bottom of the rack and swing-plate, showing the gears and pinions, the carrier and rolls being in horizontal section on line 3 3 in Fig. 1. Figs. 4 and 5 show a modification, Fig. 4 being a side elevation of the carrier and apron and carrier-driving belt and pulley, the rack and presser-plate and their supporting-bracket being in vertical section on the line 4 4 in Fig. 2; Fig. 5, a plan of parts of the rail, the rack, and the carrier, the carrier being in horizontal section on the line 5 5 in Fig. 4; Fig. 6, a plan of some of the aprons, their front rolls, parts of the frame, and my improvement.

The frame A, horizontal guide-rod B, supported in said frame, the rail or horizontal projection C on the front of said frame, the driving-band D and its rolls d d', one of said rolls d being positively driven by gearing which engages the bevel-pinion d^2, Figs. 2 and 4, the driving-pin d^3, secured to the belt at right angles thereto and projecting into or through a vertical slot e in the carrier or feeder E, the feed-aprons F, and apron-rolls f, these parts are or may be all of the usual construction and operation and as shown in said Apperly and Clissold patent, except the carrier or feeder.

The carrier E is supported on the guide-rod B and is caused to traverse diagonally back and forth across the feed-aprons by the constant movement of the belt in one direction in the usual manner to lay the slivers diagonally on said aprons.

The carrier E is provided with a plate G, pivoted thereto at g, a part of the rear edge of which bears against the rail C, and said rear edge is so inclined from back to front from the middle to the ends thereof at g' g^2 that either of said inclines may be brought in contact with said rail by turning said plate G on its pivot. The plate G is held in either of these positions, as by a spring, represented as a leaf-spring g^3, clamped between the front of the carrier E and the sliver-guide e', which is of ordinary construction and is secured by bolts e^2 to said carrier, Figs. 1 and 3. The spring g^3 is curved, as shown in Fig. 3, and its ends are adapted to hook backward over the sides of said plate G and prevent the same from being accidentally turned on its pivot, while allowing said plate to be turned by the application of sufficient force.

Adjustable stop-bolts I I′ are arranged to turn in brackets i i', which are themselves laterally adjustable on the frame A, said brackets being secured as by means of bolts i^2 i^3, which pass through slots a a' in said frame in an obvious manner. The bolts I I′ when adjusted are prevented from turning by check-nuts i^4 i^5, which turn on said bolts against said brackets i i'.

Just before the carrier reaches the end of its traverse and while the driving-pin d^3 is passing onto the outer side of the corresponding roll d or d' a projection g^4 on the plate G, Fig. 2, strikes a bolt I I′, and said plate is thereby caused to turn on its pivot, so that when the movement of the carrier is reversed the incline g' or g^2 in advance is out of contact with the rail C. Feed-rolls H H′, arranged below said plate on opposite sides of the pivot g, are provided with parallel vertical hubs h h' and turn on studs g^5 g^6, secured in said plate G and projecting vertically downward therefrom, said feed-rolls being so connected that their adjacent surfaces move in the same backward direction and said feed-rolls reach under the presser-plate J instead of bearing against the front edge thereof, as shown in said Apperly and Clissold patent, where what I have called the "rail" C serves as a presser-plate; but in the Apperly feed as now commonly used the presser-plate J is supported below the rail C by means of bolts j, secured in said plate J and running up through brackets j', which are adjustably held on the back of the frame A by bolts j^2 and washers j^3, said bolts j^2 passing through vertical slots j^4 in said brackets to enable the presser-plate to be adjusted vertically, substantially as shown in Fig. 4.

The curved or working faces of the feed-rolls H H′ fill the space between the presser-plate J and the feed-apron and may be smooth; but I prefer to provide them with longitudinal flutes h^2 h^3, as shown in Figs. 1 and 4. To the hubs h h' of the feed-rolls I secure gears h^4 h^5, which may engage each other directly, as shown in Fig. 5; but I prefer to connect them by a pair of intermediate gears h^6 h^7, as shown in Figs. 1 and 3, because I am enabled thereby to make the feed-rolls of slightly-larger diameter than the gears h^4 h^5, and thus to give a slightly-greater surface speed than that of said last-named gears (which is equal to the speed of the traverse of the carriage) to prevent any strain or tension upon the sliver after the sliver leaves the feed-rolls.

Upon the presser-plate J, I support a rack K, which engages, one at a time, the gears h^4 h^5, the bolts j passing through slots k in said rack to allow of the rack being properly adjusted to said gears h^4 h^5. The traverse of

the carrier and the engagement of the rack and gears rotates the feed-rolls in the desired direction above indicated, it being understood that the gear of the following feed-roll only is in engagement with the rack and that turning the plate G on its pivot at the end of the traverse of the carrier causes one of said gears to be thrown out of engagement and the other of said gears into engagement with said rack.

It will be seen that both of the feed-rolls H H′ always turn in the same direction when the machine is in operation, no matter in which direction the carrier is moving.

I prefer to use additional rolls L L′ to compact the slivers under the presser-plate. These rolls L L′ are substantially like the feed-rolls H H′, except that their curved surfaces are smooth and that they have preferably a slightly-greater surface speed than that of said feed-rolls, the gear *l l′* of the rolls L L′ being smaller than the gears h^4 h^5 of said feed-rolls proportionately to the bodies of said rolls, respectively. The following one of the gears *l l′* engages the rack K and is rotated thereby; but the leading one of said gears is thrown out of engagement with said rack with the leading feed-roll, the axes of all the feed-rolls H H′ and compacting-rolls L L′ being arranged in substantially the same vertical plane.

The construction shown in Figs. 4 and 5 differs only in the omission of the rolls L L′, the use of antifriction-rolls M M′, journaled in the plate G and running against the rail C, and the direct engagement of the gears h^4 h^5, the intermediate gears shown in Figs. 1 and 3 being omitted.

I claim as my invention—

1. The combination of the frame, the rack, the presser-plate, the carrier, having feed-rolls, arranged to extend under said presser-plate, and having gears to engage said rack, said gears being smaller in diameter than said feed-rolls, and means for causing said carrier to traverse.

2. The combination of the frame, the rack, the presser-plate, the carrier-body, a plate, pivoted thereon, feed-rolls, supported on said pivoted plate on opposite sides of the pivot thereof and connected to revolve with their adjacent faces in the same direction and each provided with a gear, said gears being arranged to engage said rack one at a time, means for causing said carrier to traverse on said frame, means for turning said pivoted plate at the end of each traverse to bring the leading gear of the next traverse out of engagement with said rack and compacting-rolls, also supported on said plate on opposite sides of said feed-rolls, means for rotating each compacting-roll at the same time with and in the same direction with the nearest feed-roll.

3. The combination of the frame, the rack, the presser-plate, the carrier-body, a plate, pivoted thereon, feed-rolls, supported on said pivoted plate on opposite sides of the pivot thereof and connected to revolve with their adjacent faces in the same direction and each provided with a gear, said gears being arranged to engage said rack one at a time, means for causing said carrier to traverse on said frame, means for turning said pivoted plate at the end of each traverse to bring the leading gear of the next traverse out of engagement with said rack, and compacting-rolls, also supported on said plate on opposite sides of said feed-rolls, and each provided with a gear, arranged to engage said rack at the same time with the gear of the nearest feed-roll.

In testimony whereof I have affixed my signature in presence of two witnesses.

HARRY KEMP.

Witnesses:

ALBERT M. MOORE,

FRED TEAL.