

E. V. BATES.  
CARD FEEDING MECHANISM.  
APPLICATION FILED DEC. 30, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

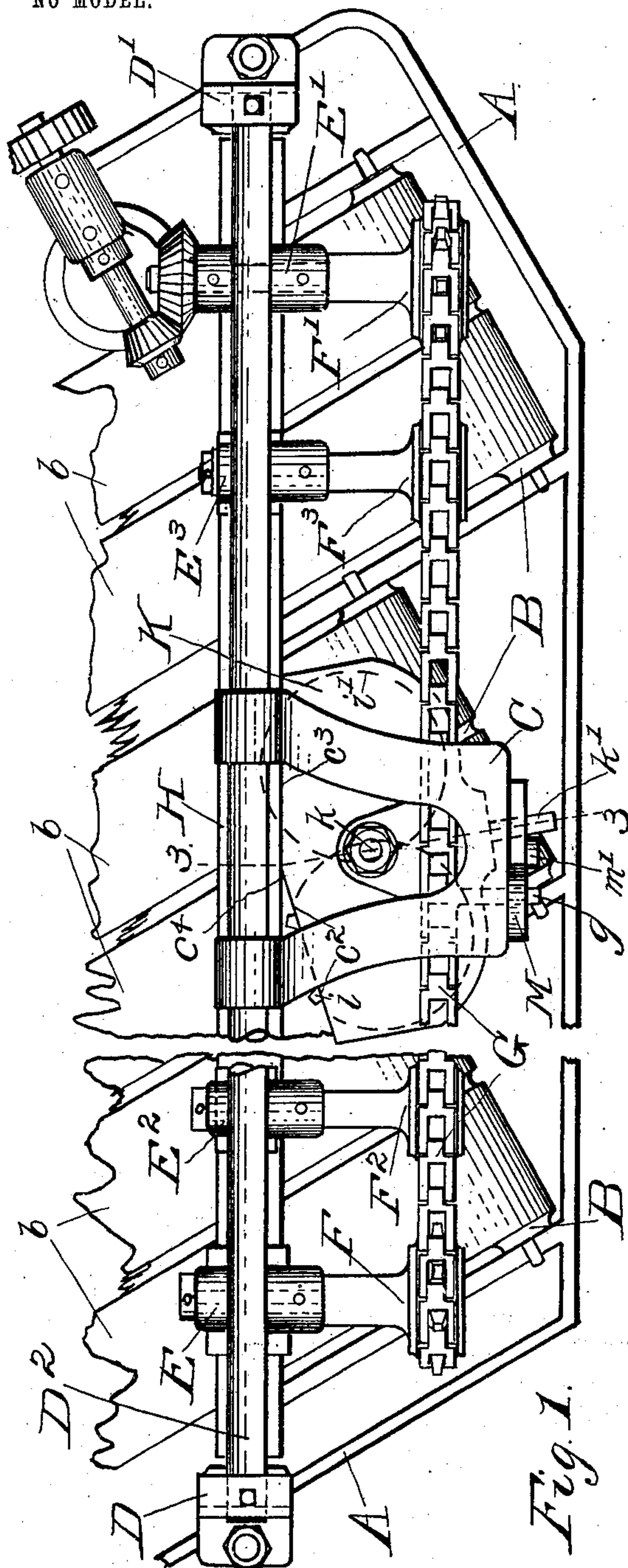


Fig. 1.

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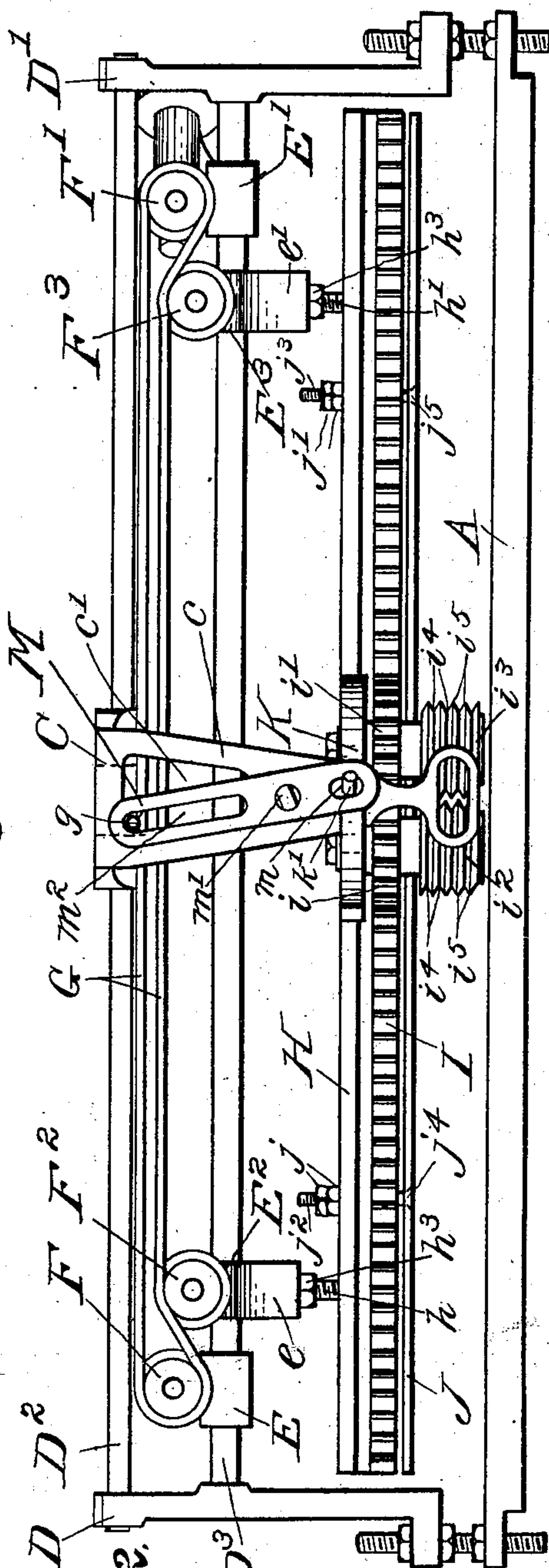


Fig. 2.

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No. 754,189.

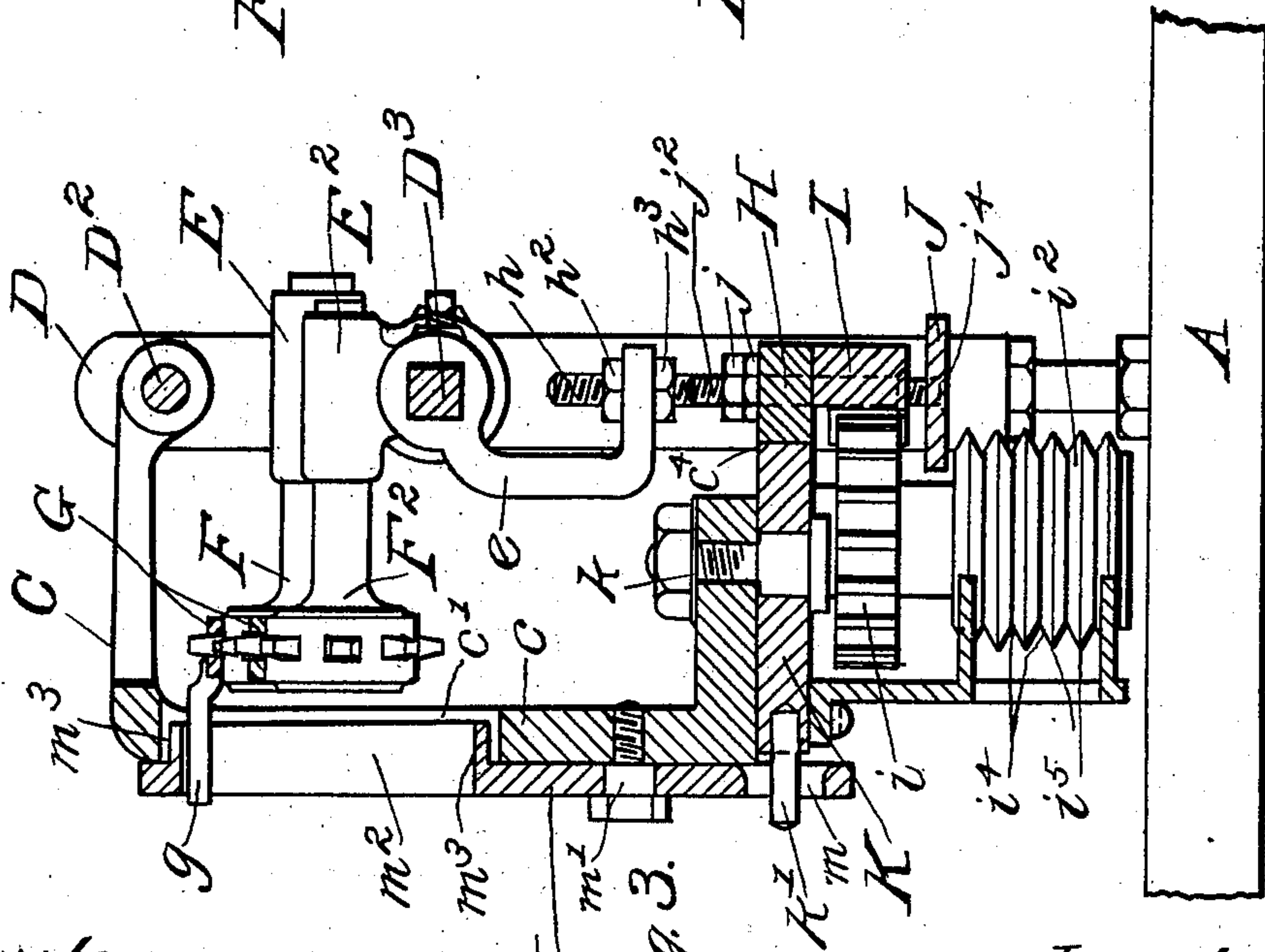
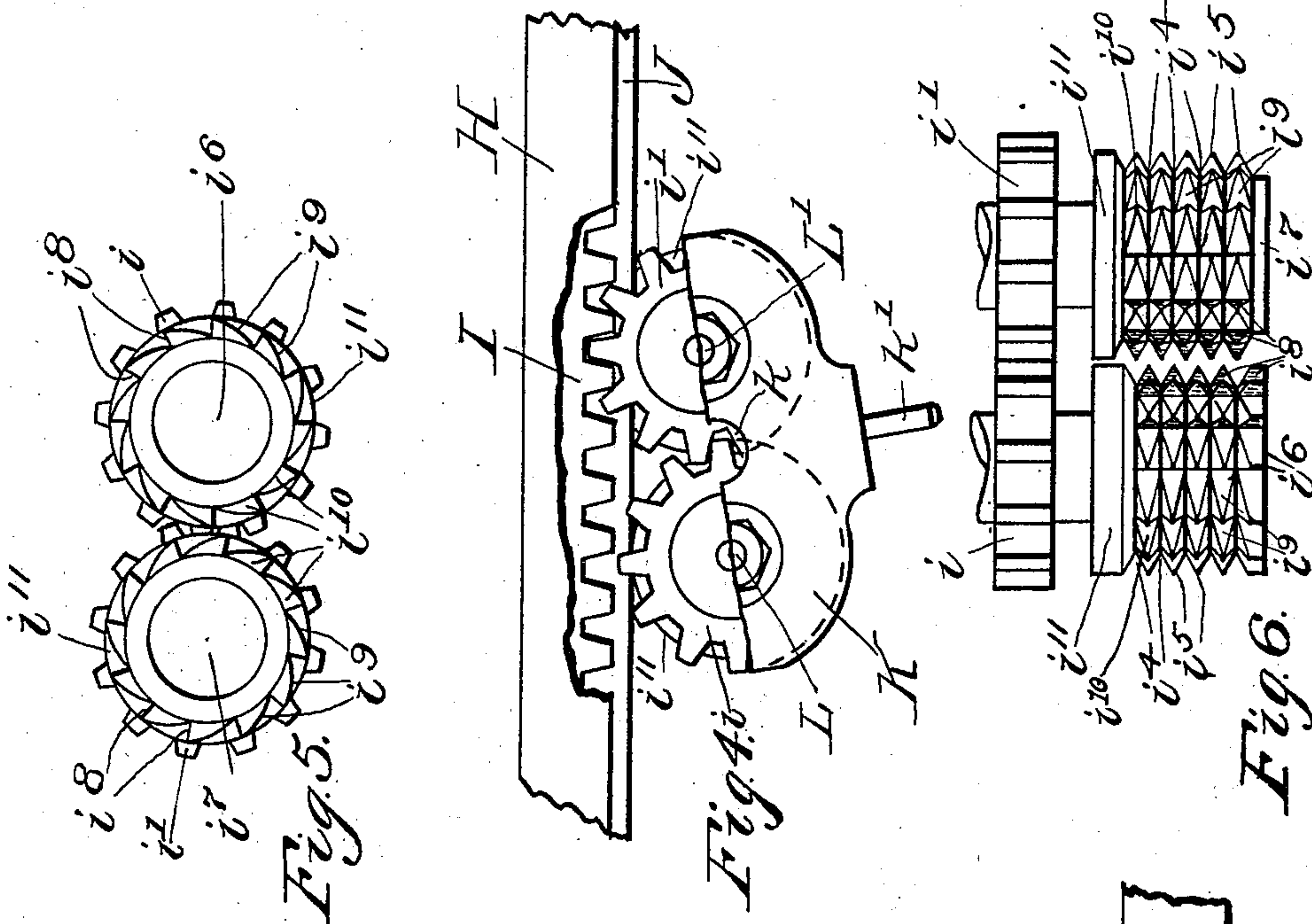
PATENTED MAR. 8, 1904.

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2 SHEETS—SHEET 2.



Witnesses.  
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## UNITED STATES PATENT OFFICE.

EDDO V. BATES, OF LOWELL, MASSACHUSETTS.

## CARD-FEEDING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 754,189, dated March 8, 1904.

Application filed December 30, 1903. Serial No. 187,095. (No model.)

*To all whom it may concern:*

Be it known that I, EDDO V. BATES, a citizen of the United States, residing in Lowell, in the county of Middlesex and Commonwealth of Massachusetts, have invented a certain new and useful Improvement in Card-Feeding Mechanisms, of which the following is a specification.

This invention relates especially to card-feeding mechanisms of that variety in which a traveler or carrier is caused to traverse above aprons or an apron arranged diagonally to the path of the traveler and in which said traveler carries a pair of feed-rolls, each provided with a gear, said gears being in engagement with each other and adapted one at a time to engage a stationary rack and to be rotated by such engagement and by the movement of said traveler in such a manner that the adjacent sides of the feed-roll move in the same direction to feed a sliver pinched between them. In this variety of feed mechanisms means are provided by which the following gear is always in engagement with the rack, so that each feed-roll always turns in the same direction, whether the traveler be moving in one direction or in the opposite direction. It is customary to support the feed-rolls and their gears upon a swiveling plate and to provide at each end of the traverse a knock-off against which a projection on said plate strikes at or near the end of the traverse of the traveler, causing the plate to turn and to move one gear out of engagement with the rack and the other gear into such engagement. These knock-offs have to be adjusted with considerable care wherever the length of the traverse is varied and are liable to get loose and to be moved out of place by the shock of the projection striking against them, in which case the swiveling plate will not be properly turned. The noise caused by the projection on the plate striking against the knock-offs is also objectionable. I dispense with these knock-offs. It is also customary to hold the swiveling plate in either of its two positions by an arc-shaped spring secured by the middle to the back of the body of the traveler, the ends of said spring engaging notches in the ends of the swiveling plate one at a time to hold the proper gear in en-

gagement with the rack. These springs are quite expensive, as they must be carefully made to exert sufficient pressure upon the plate to hold it after it is turned to the proper position and yet not sufficient to prevent the plate from being turned readily. The springs wear out the notches on the plate and allow the plate to slip out of place and render the knock-offs more likely to be displaced by the resistance which they offer to the swiveling of the plate, and they are also easily broken. I also dispense with these springs. When for any reason the machine is stopped too near a knock-off and again started toward said knock-off, the traveler does not move with sufficient rapidity and force to swivel the plate far enough to bring one gear entirely out of engagement with the rack and the other gear into such engagement and far enough to cause the end of the spring to engage the leading end of said plate. The result is the rapid traversing movement of the traveler causes the gears to bump against the rack, and the delivered sliver is drawn out of place on the apron and is frequently broken, requiring the machine to be stopped and the sliver to be pieced. Unless the sliver is carefully pieced the enlargement made by the piecing will not readily pass through the hole and the sliver is liable to be for a second time displaced or broken. Sometimes the stopping of the rolls by an enlargement of the sliver causes the driving-belt of the feed mechanism to be thrown off the pulley. It is usual to cause the traveler to traverse by means of an endless chain or belt running on wheels or rolls continuously in the same direction, said chain or belt being provided with a horizontal pin which enters a vertical slot in the shank of the traveler, the direction of movement of the traveler depending on which member of the chain or belt the pin happens to be. I use such a chain or belt and pin, but engage the pin not with said shank, but with a lever supported on the traveler, said pin entering a longitudinal slot in the upper arm of the lever, the lower arm of said lever being connected to the plate which carries the feed-rolls and gears in such a manner that the first effect of the change of direction of the pin is to swivel



said plate to its extreme position with the following gear in engagement with the rack, and it is only after such engagement is completed and the lever can be turned no farther that the pull of the chain on the lever will start the carriage. The pull on the lever continues from one end of the traverse to the other and holds said plate and the following gear in proper position, rendering the spring unnecessary, and when the direction of movement of the driving-pin is reversed the lever will be drawn in the other direction, reversing the position of the plate and gear before the movement of the carriage is reversed, thus rendering the stop unnecessary. I have also improved the feed-roll surfaces to adapt them to feed slivers of varying thicknesses.

Said invention consists in the devices and combinations hereinafter described and claimed.

In the accompanying drawings, on two sheets, Figure 1 is a plan of a feeding mechanism embodying my invention; Fig. 2, a front elevation of the same; Fig. 3, a vertical section on the line 3 3 in Fig. 1; Fig. 4, a plan of parts of the rack, supporting-bar, the presser-plate, and swiveling plate, the feed-rolls and their gears. Fig. 5 is a reversed plan of the preferred form of feed-rolls. Fig. 6 is a front or rear elevation of the same.

The frame A, the apron-rolls B, supported thereon, and the aprons *b* are or may be of any usual construction, and the aprons are arranged to travel at an angle other than a right angle with the path of the traveler or carriage C, hereinafter described, in the usual manner in order that said carriage may lay parallel courses of sliver diagonally upon said aprons, as shown in Patent No. 543,418, granted February 19, 1895, to me.

A supplementary frame consists of two uprights D D' and two horizontal rails D<sup>2</sup> D<sup>3</sup>, secured to said uprights in any convenient manner at an angle with the aprons. The upper rail D<sup>2</sup> is round and supports the traveler C in the usual manner, said traveler being caused to traverse diagonally above the feed-aprons *b* (sometimes called collectively the "feed-apron") by means described below. The lower rail D<sup>3</sup> supports brackets E E', on which turn sprocket-wheels F F', the shape of said rail and of the holes in the brackets through which it passes being such as to prevent said brackets from turning on said rail, which is represented as square in cross-section. The sprocket-wheels F F' are supported in the brackets E E', and a chain G, having the usual driving-pin *g*, connects said wheels, the wheel F' being positively driven by the usual means. I use additional sprocket-wheels F<sup>2</sup> F<sup>3</sup>, supported in a similar manner by brackets E<sup>2</sup> E<sup>3</sup> between the wheels F F' and arranged to press the lower member of the chain G as near as possible without interference to the upper

member thereof to keep the driving-pin as near as practicable at the same level at all times. The brackets E<sup>2</sup> E<sup>3</sup> are each provided with a hanger *e e'*, which extends down under the lower rail D<sup>3</sup>. From the hangers *e e'* is supported below said rail D<sup>3</sup> the supporting-bar H by means of adjusting-screws *h h'*, rigidly secured at their lower ends to said supporting-bar and extending loosely up through the lower horizontal parts of said hangers, said screws being retained in said hangers by nuts *h<sup>2</sup> h<sup>3</sup>* above and below said supporting-bar. By varying the position of said nuts on said screws the bar H may be raised or lowered to adjust the height of the rack-bar I (which is riveted or otherwise rigidly secured to said bar H) to the height of the feed-roll gears *i i'*. The height of the presser-plate J is regulated by nuts *j j'* turning on the upper ends of bolts *j<sup>2</sup> j<sup>3</sup>* (which pass up through the rack-bar I and supporting-bar H) against the top of the supporting-bar, the lower ends of said bolts being headed or enlarged at *j<sup>4</sup> j<sup>5</sup>*, Figs. 2 and 3. The supporting-bar, rack-bar, and presser-plate are not connected in the usual manner to the uprights D D', but may be adjusted in height relatively to the traveler C and to each other.

The swiveling plate K is pivoted at *k* on the traveler C and carries the studs L L', on which the gears *i i'* and the feed-rolls *i<sup>2</sup> i<sup>3</sup>* turn freely, the gears being arranged above the presser-plate J and engaging each other and engaging one at a time the rack-bar I and the feed-rolls being arranged below said presser-plate and extending under the same, all in a well-known manner except as hereinafter stated.

The swiveling plate K is provided with a stud *k'*, which enters the slot *m* in the lower arm of a lever M, pivoted at *m'* to the front of the shank of the traveler C, the upper arm of said lever being preferably longer than the lower arm thereof and being provided with a longitudinal slot *m<sup>2</sup>*, through which the driving-pin *g* projects from the chain G. The slot *m<sup>2</sup>* is surrounded by a ledge *m<sup>3</sup>*, which extends through an opening *c'* in the shank *c* of the traveler to afford a longer bearing for the pin *g* and lever M on each other and to bring said lever nearer to the chain G, and thus to lessen the tendency of the resistance of said lever to deflect said pin and the adjacent part of the chain and to draw said pin out of engagement with said lever. The opening *c'* in the shank of the traveler is large enough to allow the lever to be moved until stopped by the proper bearing-surface *c<sup>2</sup> or c<sup>3</sup>*, Fig. 1, of the swiveling plate striking the front of the supporting-bar. It will be understood that the bearing-surfaces *c<sup>2</sup> c<sup>3</sup>* are represented as the usual vertical longitudinal plane surfaces, which meet at an angle at *c<sup>4</sup>* at the back of the swiveling



plate and rest one at a time against the straight front of a guiding-bar, which is here represented as the supporting-bar H, and that the following gear or gear nearest that bearing-surface which for the time being is in contact with said bar H is in engagement with the rack. The upper arm of the lever M should be sufficiently longer than the lower arm of the same to overcome the inertia and friction of the plate K and the resistance which the angle formed by the surfaces  $c^3 c^3$  opposes to the swiveling of said plate and to insure the swiveling of said plate before the reversal of the movement of the traveler.

The arrangement of the parts is such that the swiveling plate is an essential part of the connection between the chain and the traveler.

The feed-rolls  $i^2 i^3$  are represented in Figs. 2 and 3 as circumferentially grooved at  $i^4$ , the grooves on one roll being opposite the ridges  $i^5$  between the grooves on the other roll and the rolls being slightly separated from each other; but the preferred form of the feed-rolls is shown on a larger scale in Figs. 5 and 6 at  $i^6 i^7$ , where said rolls are represented as not only grooved circumferentially, but also longitudinally, one side of each longitudinal groove  $i^8$  being radial and the other side,  $i^9$ , being at such an angle therewith as to form a series of ratchet-shaped teeth  $i^{10}$ . The rolls are right-handed and left-handed with respect to each other, the teeth pointing in the opposite direction from the direction in which the rolls turn and the rolls being set at a slight distance from each other and so arranged that the teeth of each roll are opposite spaces of the other rolls, both vertically and horizontally. The teeth of each roll therefore crowd the sliver into the depressions of the other roll, but do not hold onto the sliver or hook into the same. This construction of the feed-rolls enables them to grasp a sliver of any usual diameter without requiring any variation of the distance of the rolls from each other.

Lands  $i^{11}$  or ungrooved parts of the feed-rolls at the upper ends of the same prevent the stock from working over the tops of said rolls.

I claim as my invention—

1. The combination of a traveler-body suitable guiding means therefor, a traveling belt or chain and connecting means, including a plate swiveled on said body, between said body and said belt or chain, a pair of gears carried by said plate and engaging each other, a pair of feed-rolls each rotating with one of said gears, and a rack normally engaging the following one of said gears.

2. The combination of a traveler-body a lever pivoted thereon, a traveling belt or chain engaging said lever, a plate pivoted on said body and connected to said lever, a pair of gears carried by said plate and engaging each other, a pair of feed-rolls each rotary with

one of said gears, and a rack adapted to engage the following one of said gears.

3. In a feeding mechanism for carding-machines, the combination of main sprocket-wheels, an endless chain supported thereby, other sprocket-wheels arranged between said main sprocket-wheels to hold the lower member of said chain in close proximity to the upper member of the same, the traveler-body, suitable guides therefor, a lever fulcrumed on said traveler-body and having a longitudinal slot, a driving-pin carried by said chain and entering said slot in said lever, a plate pivoted on said traveler-body and swiveled by the movement of said lever, gears carried by said plate and engaging each other, feed-rolls, each carried by one of said gears and a rack-bar, adapted to engage said gears one at a time.

4. In a card-feeding mechanism, the combination of the traveler, feed-rolls carried thereby and having circumferential grooves and arranged with the grooves of one roll opposite the ridges between the grooves of the other roll, means for causing said traveler to traverse and means for rotating said feed-rolls by the traversing movement of said traveler.

5. In a card-feeding mechanism, the combination of the traveler and feed-rolls carried thereby, each feed-roll having circumferential and longitudinal grooves and above said grooves having a land or continuous cylindrical surface at the full or largest diameter of said roll.

6. In a card-feeding mechanism, the combination of the traveler, feed-rolls carried thereby each having ratchet-like teeth, means for causing said carriage to traverse and means for rotating each feed-roll in the opposite direction to that in which its teeth point.

7. In a card-feeding mechanism, the combination of a traveler, feed-rolls carried thereby, each having ratchet-like teeth, the teeth of one roll pointing in the opposite direction from the teeth of the other roll, means for causing said carriage to traverse and means for rotating each feed-roll in the opposite direction from that in which its teeth point.

8. In a card-feeding mechanism, the combination of a traveler, feed-rolls carried thereby, each having ratchet-like teeth, the teeth of one roll pointing in the opposite direction from the teeth of the other roll, means for causing said carriage to traverse and means for rotating each feed-roll in the opposite direction from that in which its teeth point, each roll having above said teeth, a land or continuous cylindrical surface at the full diameter of said roll.

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

EDDO V. BATES.

Witnesses:

ALBERT M. MOORE,  
GRACE CROWLEY.