

(No Model.)

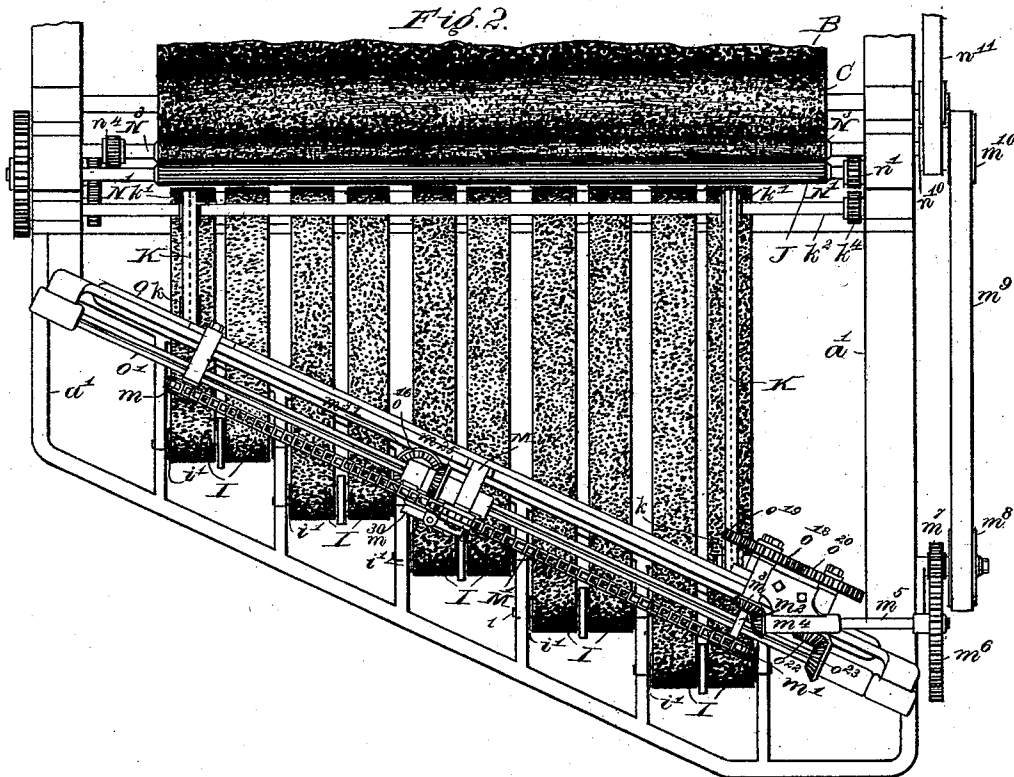
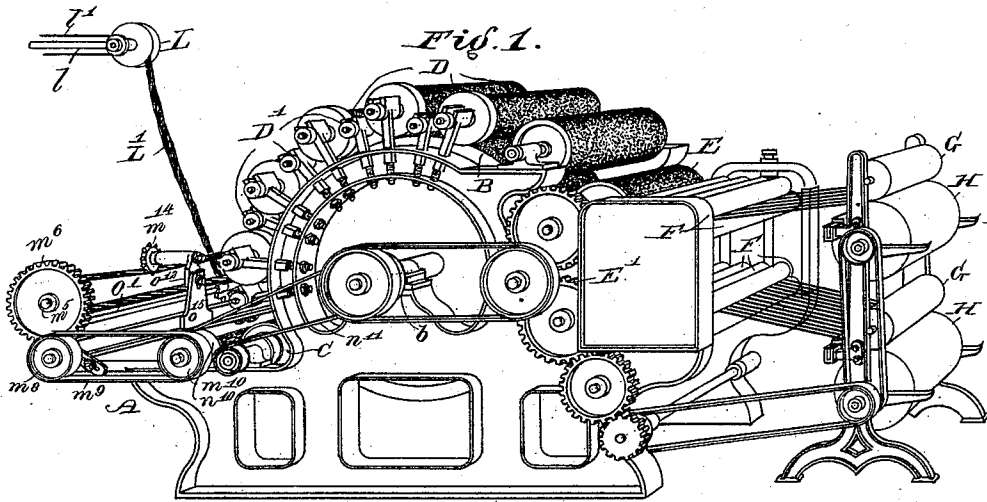
5 Sheets—Sheet 1.

E. V. BATES.

FEEDING MECHANISM FOR CARDING MACHINES.

No. 534,418.

Patented Feb. 19, 1895.



WITNESSES.

Kinkley Lodge
 Nellie C. Clifford

INVENTOR

Eddo V. Bates,

By *Albert M. Moore,*
his ATTORNEY.

(No Model.)

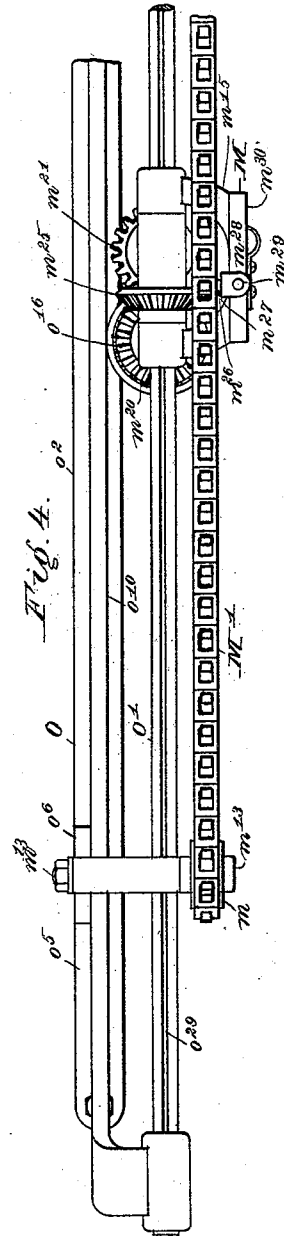
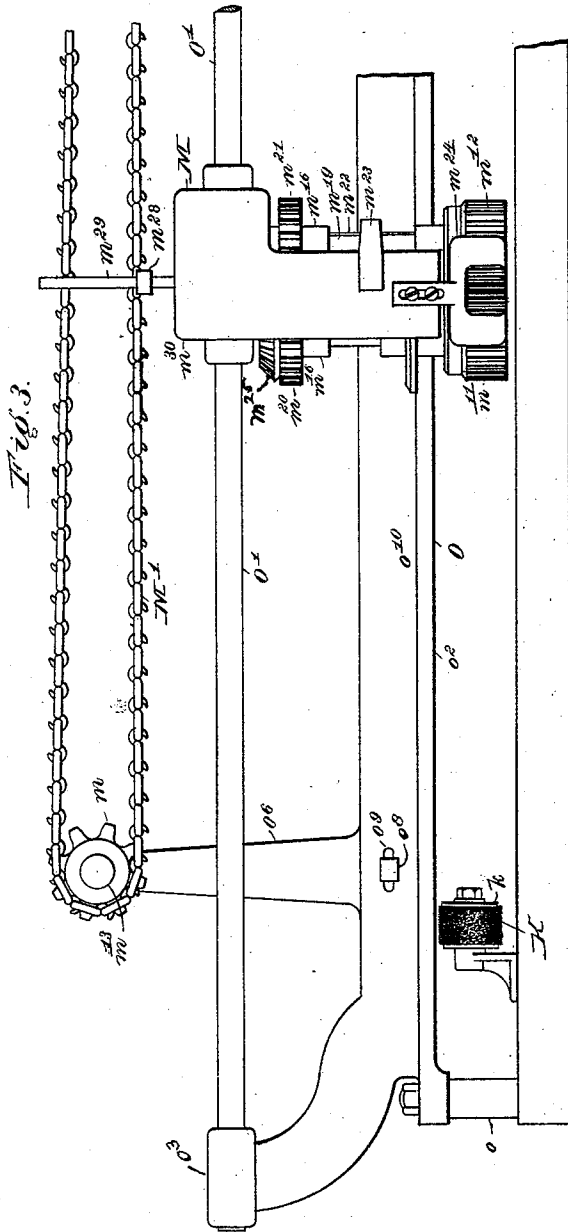
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WITNESSES.

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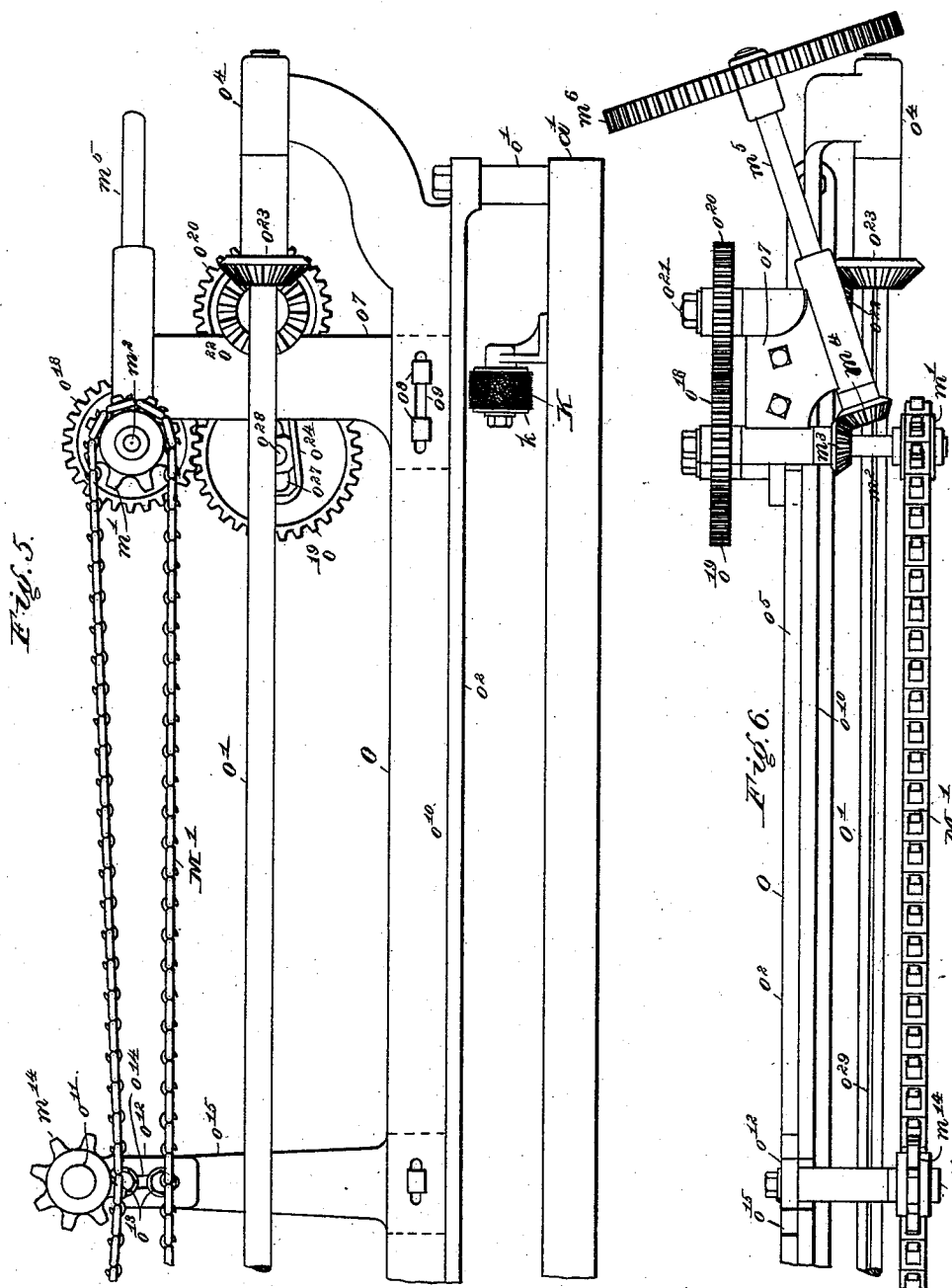
(No Model.)

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WITNESSES.

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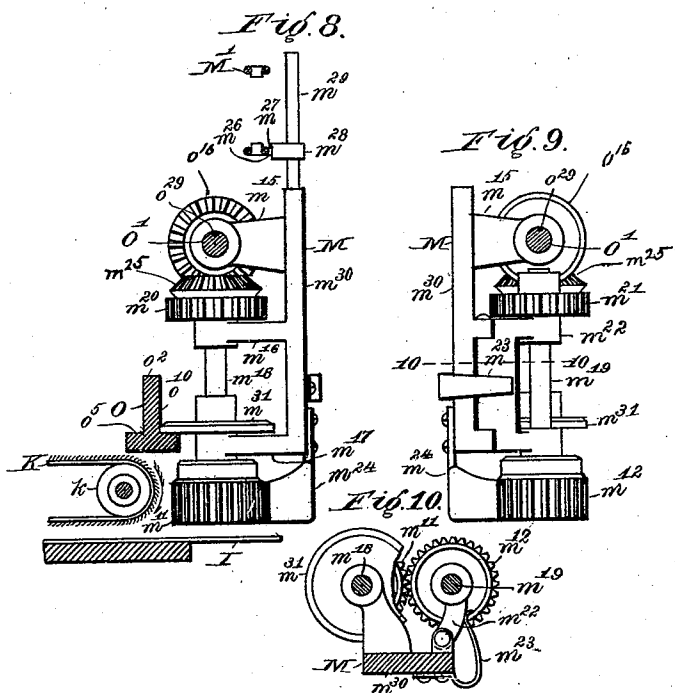
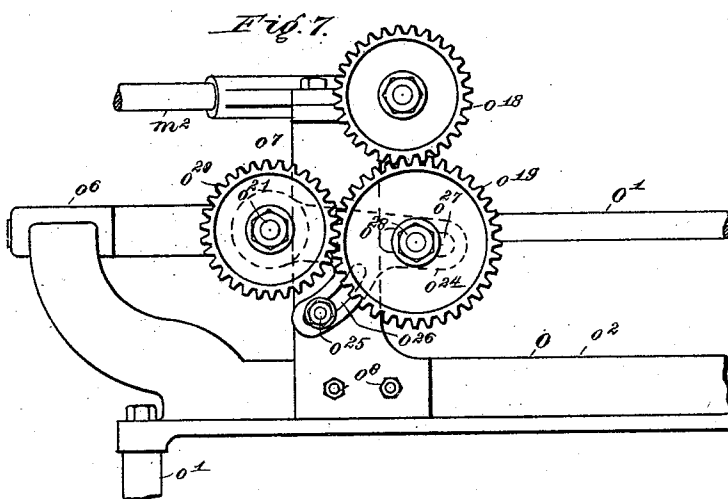
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E. V. BATES.

FEEDING MECHANISM FOR CARDING MACHINES.

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WITNESSES.

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(No Model.)

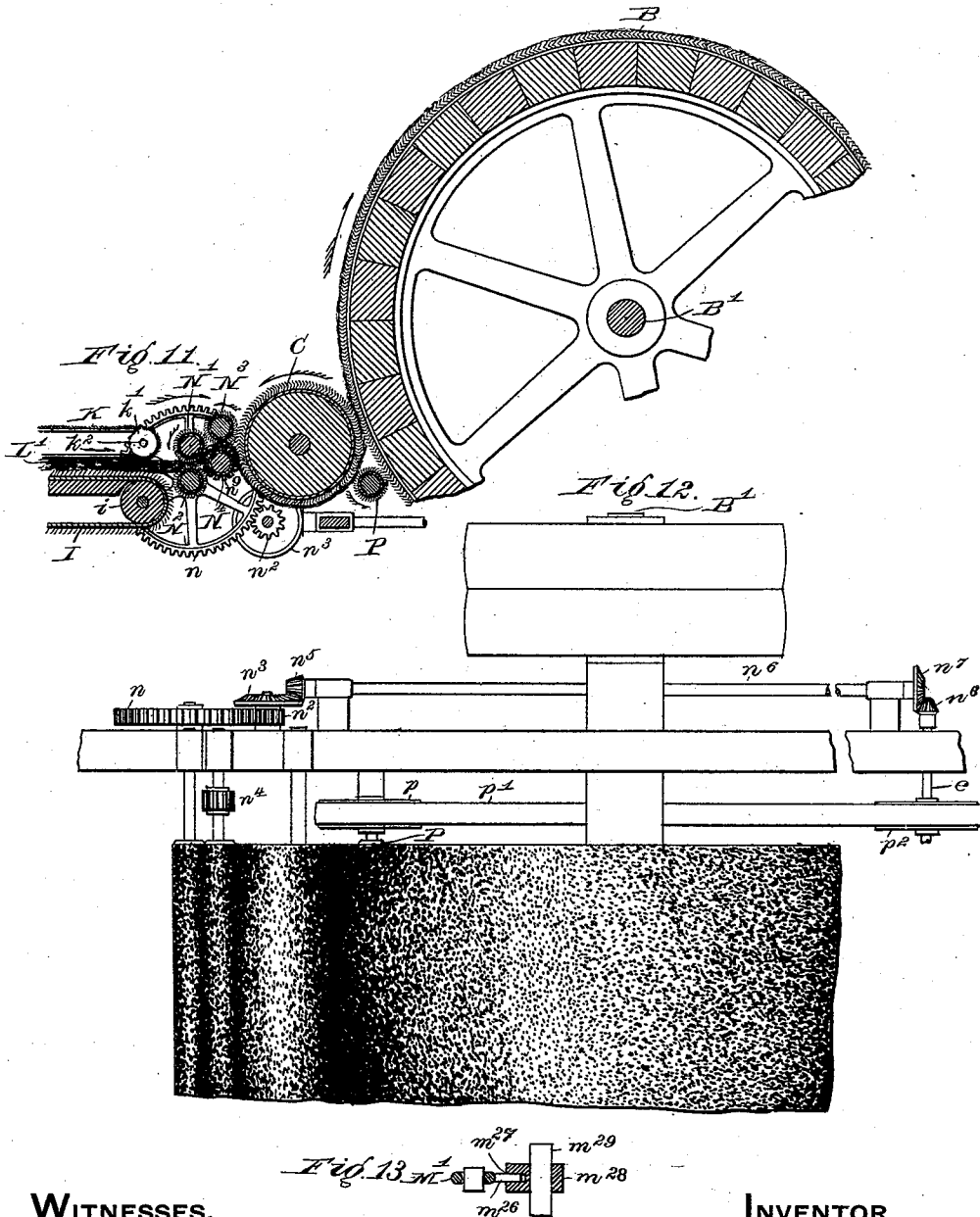
5 Sheets—Sheet 5.

E. V. BATES.

FEEDING MECHANISM FOR CARDING MACHINES.

No. 534,418.

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WITNESSES.

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UNITED STATES PATENT OFFICE.

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FEEDING MECHANISM FOR CARDING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 534,418, dated February 19, 1895.

Application filed February 11, 1893. Serial No. 461,898. (No model.)

To all whom it may concern:

Be it known that I, EDDO V. BATES, a citizen of the United States, residing at Dracut, in the county of Middlesex and Commonwealth of Massachusetts, have invented a certain new and useful Improvement in Feeding Mechanism for Carding-Machines, of which the following is a specification.

My invention relates to carding machinery and consists of devices and combinations hereinafter described and claimed, and includes an improved feeding apparatus for feeding slivers positively.

In the accompanying drawings on five sheets, Figure 1 is a perspective view of a carding engine provided with my improvements. Fig. 2, is a plan of the feed aprons, feed-rolls, tumbler, feeding-head or distributing carriage and actuating mechanism with parts of the frame; Fig. 3, a front elevation of the distributing carriage, a part of the frame on which it travels, a sprocket-chain which causes said carriage to traverse, and one of the side-belts; Fig. 4, a plan of what is shown in Fig. 3; Fig. 5, a front elevation of a part of the frame on which the distributing carriage travels at the right of the machine, showing the gearing which drives the sprocket-chain and rotates the shaft by which the distributing rolls of the carriage are operated, showing also in front elevation one of the side-belts; Fig. 6, a plan of the parts shown in Fig. 5, omitting the side-belt; Fig. 7, a rear view of the spur gears shown in Fig. 5, a part of the frame shown in Fig. 5, and the rotary shaft supported therein; Fig. 8, a left-side elevation of the distributing carriage, its actuating gear and one of the feed aprons, showing in section the carriage supporting-rail and the feed-table and the carriage operating shaft and sprocket-chain; Fig. 9, a right-side elevation of the carriage, omitting the stud on which the chain-engaging pin slides and a cross-section of the carriage-actuating shaft; Fig. 10, a horizontal section on the line 10 10 in Fig. 9. Fig. 11 is a central vertical section of the main cylinder, the tumbler, the lumper-roll, feed-rolls, feed-table, one of the feeding-aprons, showing also in elevation a part of the side-shaft through which motion is communicated from the lower do-

fer-roll and the gears which connect said side-shaft and the feed-rolls; Fig. 12, a plan of a part of the frame, a part of the main cylinder and its shaft, the fast pulley and loose pulley on said shaft and a plan of the mechanism which drives the feed-rolls and the lumper-roll from the shaft of the lower doffer; also a part of said last-named shaft; Fig. 13, a side elevation of the link of the sprocket-chain which carries a pin to engage the slide on the carriage and a vertical section of said slide in the plane of the axis of said pin.

In Figs. 1, 2, 11 and 12, A denotes the frame of a breaker-card; B, the main cylinder; C, the tumbler; D, the workers; D', the strip-pers; E, the upper and E' the lower doffer; F, the rubbers or rub-rolls, between which the rovings pass from the doffers to the spools G, the latter being rotated by a frictional contact of said spoolers or of the rovings wound around them, with the drums H, these parts being all of the usual construction and operation as used in wool-carding engines.

The sliver-feeding devices hereinafter described are an improvement on the so-called Apperly feed, said Apperly feed being shown and described in United States Letters Patent No. 18,888, granted December 22, 1857, to James Apperly and William Clissold.

The frame *a'*, represented in Fig. 2, supporting apron-rolls *i i'* (Figs. 2 and 11), on which run narrow feed-aprons I of card-cloth-ing, the feed-rolls N' N², and the side-belts K, are of the usual construction and operation as commonly used in the so-called Apperly feed and are substantially as shown in said patent, except as hereinafter stated. Instead of the floor-delivery shown in said patent, an overhead delivery is now commonly used, as represented in Fig. 1, consisting of a grooved pulley L, journaled in a laterally swinging arm *l*, and having a positive and uniform motion from a belt *l'*. The distributing carriage is represented in said patent as caused to traverse by an endless belt, a horizontal pin, rigidly secured to said belt, engaging a vertical slot in said carriage. In practice, the belt is found to slip on its pulleys, and to vary its speed, making unequal intervals between the courses of the drawing on the feed-aprons, and making the rovings of varying diameter

and weight. I drive the carriage M by an endless chain M', running on the sprocket-wheels $m m'$, the wheel m' being fast on the same shaft m^2 with the bevel-pinion m^3 , said pinion m^3 being engaged by another bevel-pinion m^4 , fast on the same shaft m^5 with the spur-gear m^6 , said gear m^6 being driven by a pinion m^7 , concentric with and turning with the band-pulley m^8 , and said pulley m^8 being connected by a belt m^9 , with a band-pulley m^{10} , fast on the shaft of the upper rear feed-roll N³, hereinafter described (see Figs. 2 to 6), one link of the chain M' having a pin m^{26} which enters a hole m^{27} in a slide m^{28} , capable of moving vertically on a stud m^{29} , fixed in the top of said carriage. (See Fig. 13.) The shaft m^5 is by the means above described rotated at a uniform speed.

The guide-frame O is supported by vertical posts $o o'$ on the frame a' and consists of a bottom-rail o^2 (Figs. 2 to 8), shaped in cross-section like an inverted T and having at its ends stands $o^3 o^4$, in which is journaled a shaft O' which guides and supports said carriage M and also drives distributing-rolls $m^{11} m^{12}$ hereinafter described.

The shelf o^5 or rear part of the base of the rail o^2 supports standards $o^6 o^7$, in which the shafts $m^{13} m^2$ of the sprocket-wheels $m m'$ are journaled, and which are secured to said rail o^2 by bolts o^8 which pass through said standards and through slots o^9 in the vertical web o^{10} of said rail, said slots permitting the lateral adjustment of the standards when necessary to tighten the chain M' or to adjust the position of the gears on the shaft m^2 to the gears by which they are engaged. The tension of said chain M' may also be varied by raising or lowering the idle sprocket-wheel m^{14} which turns loosely on a horizontal stud o^{11} rigidly secured to a plate o^{12} which, by means of bolts o^{13} passing through a vertical slot o^{14} in said plate into a standard o^6 (substantially like the standard o^6 and supported in like manner therewith), may be held at any desired height.

The carriage M (Figs. 3, 4, 8, 9, 10 and 13) consists of a vertical plate m^{30} having three backwardly-extending brackets $m^{15} m^{16} m^{17}$ rigidly secured thereto, the uppermost bracket m^{15} surrounding the guide-shaft O' and having a sliding fit thereon. In the two lower brackets $m^{16} m^{17}$ is journaled a vertical shaft m^{18} , having fast thereon a spur-gear m^{20} , and in a swinging frame m^{22} , pivoted between the brackets $m^{16} m^{17}$, is journaled another vertical shaft m^{19} , having fast thereon a spur-gear m^{21} , caused to engage the gear m^{20} by a spring m^{23} , secured to the plate m^{30} and pressing against said swinging frame (Figs. 8, 9 and 10). On the lower ends of the shafts $m^{18} m^{19}$ are fast the fluted distributing-rolls $m^{11} m^{12}$ which mesh into each other and pull the drawing L' through a trumpet m^{24} of the usual construction, and deposit said drawing on the feed-aprons I when said shafts $m^{18} m^{19}$ are rotated as hereinafter described.

The carriage M is prevented from swinging forward by a guide-wheel m^{31} which is fast on the shaft m^{18} and presses against the front side of the vertical part o^{10} of the rail o^2 . The shaft m^{18} , has fast thereon at its upper end, a bevel-gear m^{25} , which engages a bevel-gear o^{16} which turns with the shaft o' and also has a longitudinal movement on said shaft with the carriage M, said shaft having a key-seat o^{29} extending from end to end thereof, engaged by a spline secured in the hub of said beveled gear o^{16} .

The shaft O' (Figs. 3 and 6) is rotated through a train of gears, as follows: The gear o^{18} , fast on the shaft m^2 of the sprocket-wheel m' , and engaging the intermediate gear o^{19} , the latter engaging the gear o^{20} , fast on the shaft o^{21} , and a bevel-gear o^{22} on said shaft o^{21} engaging a bevel-gear o^{23} , fast on said guide-shaft O'.

The shaft m^2 is rotated through connecting mechanism above described from the shaft of the lower rear feed-roll N⁴.

An arm o^{24} (Figs. 5 and 7), capable of swinging on the shaft o^{21} , is held in the desired position by a bolt o^{25} which passes through a slot o^{26} , curved concentrically with said shaft o^{21} , said arm having also a straight slot o^{27} radial to said shaft o^{21} , in which slot the stud o^{28} , on which said intermediate gear o^{19} turns, is adjustable in a well-known manner, so that either of the gears $o^{18} o^{20}$ may be changed for a gear of a greater or less number of teeth to vary the speed of the distributing-rolls, and the amount of drawing deposited thereby on the feed-aprons, the speed of the distributing-rolls being regulated according to the speed of the delivery of the drawing L'.

In said Patent No. 18,888 are represented two levers, sometimes called latches, around the free end of which alternately is laid the bight of the drawing L', at the end of the traverse, to prevent the last delivered course of the drawing being pulled out of place by the tension of the drawing, each lever or latch being raised out of such engagement just before a new bight is formed. The rolls which in said Apperly feed, as heretofore used, most nearly correspond in position to my distributing-rolls are not distributing-rolls or feed-rolls, being placed too far apart to exert any holding pressure upon the drawing and serving merely as guide-rolls or idle-rolls. The unequal contraction of the different courses or parallel lines of the drawing on the feed-aprons causes the edges of the lap formed by said lines of drawing to be uneven and the outer slivers formed from said lap to vary so greatly in weight and size in different parts that these outer slivers, one at each side of the machine, are called waste slivers and are commonly returned to the first breaker after passing between the rub-rolls, the rovings formed from the waste slivers being too uneven to be spun. These latches I am enabled to dispense with, partly because I use the positively driven distributing-rolls $m^{11} m^{12}$ which deliver the drawing uniformly at all

times when the carriage M is traversing in either direction, and partly because I lengthen the side-belts K, causing them to extend forward under the guide-frame O, as near as possible without interference, to the plane in which the rear faces of the distributing-rolls lie, so that the last-laid course of drawing will be caught between said side-belts and the feed-aprons before a new course is laid. It will be understood that these side-belts K are parallel endless belts of card-clothing running on idle pulleys k and on other pulleys k' fast on the shaft k^2 , the latter being provided with a fast gear k^4 which engages a fast gear (not shown) on the shaft of the rear roll i' of the feed-aprons I, in the usual manner.

Heretofore it has been customary to use a single pair of card-clothed feed-rolls $N' N^2$ to take the lap of drawing from the feed-aprons I and side-belts K (see Figs. 2 and 11), and deliver the same to leaders-in (not shown) or directly to the tumbler C, which in turn delivers the fibers to the main cylinder B. I arrange a second pair of feed-rolls $N^3 N^4$, between said first pair and the tumbler, the center of the roll N^4 or lower roll of the second pair being at equal distances from the centers of the roll $N' N^2$ said second pair being precisely like the first pair, but run at a higher rate of speed in order to draw the fibers and present them to the tumbler at right angles to the axis thereof, instead of parallel therewith, in order that the fibers may be placed straight on the cylinder B and to prevent the outer slivers from a variation in weight and size due to the irregular bending of the drawing L' at the sides of the lap. The upper front feed-roll N' has a gear n' which engages a precisely similar gear (not shown) on the shaft of the lower front feed-roll N^2 , in the usual manner, so that said front feed-rolls are driven at the same surface speed.

The shaft of the lower front feed-roll N^2 is provided with a spur gear n which engages a spur-pinion n^2 , secured to a bevel gear n^3 concentrically therewith, said bevel-gear n^3 engaging a bevel pinion n^5 , fast on the front end of the side shaft n^6 , said side shaft having on its rear end another bevel gear n^7 which engages a bevel-pinion n^8 , fast on the shaft e of the lower doffer-roll E' , said lower doffer-roll being driven through a belt and gearing from the shaft B' of the main cylinder B.

The shaft of the upper rear feed-roll N^3 is provided with a spur-gear n^4 which engages a precisely similar gear n^9 on the shaft of the lower rear feed-roll, so that both rear feed-rolls have the same rate of speed (see Figs. 2, 11 and 12) and the shaft of the lower rear feed-roll is provided with a band-pulley n^{10} (Fig. 1) connected by a belt n^{11} with a pulley b fast on the shaft of the main cylinder. The roll N^4 takes the fiber from the rolls $N' N^2$ and carries it up to the roll N^3 which also cleans the fiber from the roll N' .

The fibers are presented by the rear feed-

rolls to the tumbler C which runs at a greater rate of speed than said rear feed roll which delivers the fibers to the main cylinder B, as above stated, in the usual manner. In the angle below and between said tumbler and main cylinder I arrange a lumper-roll P, the same being covered with a card clothing and rotating in the direction shown by the adjacent arrow in Fig. 11, being driven by a belt p' which connects the band-pulley p fast on the shaft of said lumper-roll with another band-pulley p^2 , fast on the shaft e of the lower doffer-roll E' .

The lumper-roll does not entirely strip the tumbler C but evens the stock on said tumbler, catching the bunches and surplus stock on said tumbler and pulling the bunches apart, the adjacent surfaces of said tumbler and lumper revolving in opposite directions. The lumper-roll is stripped by the cylinder B.

I claim as my invention—

1. The combination of the carriage-body, a frame, movable thereon, the horizontal supporting-shaft, a bevel-gear supported on said shaft and rotary therewith and movable longitudinally thereon with said carriage-body, two parallel shafts one of which is journaled in said carriage-body and the other of which is journaled in said frame, each of said parallel shafts being provided with a fluted distributing-roll, said rolls engaging each other, and a spring, arranged to force said frame toward said carriage-body, to keep said distributing rolls in engagement with each other, the parallel shaft journaled in said carriage-body having a bevel-gear fast on said last named shaft and engaging said first named bevel-gear, as and for the purpose specified.

2. The combination of the carriage-body, a swinging frame pivoted thereto, the horizontal supporting-shaft, a bevel gear supported on said shaft and rotary therewith, and movable longitudinally thereon with said carriage-body, two parallel shafts, one of which is journaled in said carriage-body and the other of which is journaled in said swinging-frame, each of said parallel shafts being provided with a fluted distributing-roll,—said rolls engaging each other—and a spring secured to said carriage-body and operating upon said swinging-frame to keep said distributing-rolls in engagement with each other, the parallel shaft journaled in said carriage-body having a bevel-gear, fast on said shaft and engaging the bevel-gear first above-named, as and for the purpose specified.

3. The combination of carriage-body, a swinging-frame pivoted thereto, the horizontal supporting-shaft, a bevel gear supported on said shaft and rotary therewith and movable longitudinally thereon with said carriage-body, two parallel shafts, one of which is journaled in said carriage-body and the other of which is journaled in said swinging-frame, each of said parallel shafts being provided with a fluted distributing-roll and with

a spur-gear which engages the spur-gear of
the other parallel shaft, and a spring to keep
said spur-gears in engagement with each
other, the parallel shaft journaled in said
5 carriage-body, having a bevel-gear fast
thereon and engaging said first named gear,
as and for the purpose specified.

In witness whereof I have signed this speci-
fication, in the presence of two attesting wit-
nesses, this 7th day of February, A. D. 1892.
EDDO V. BATES.

Witnesses:

ALBERT M. MOORE,
JOSEPH W. PIPER.