(No Model.) 4 Sheets—Sheet 1.

W. C. BRAMWELL.

FEEDING MECHANISM FOR CARDING ENGINES.

No. 311,948. Patented Feb. 10, 1885.

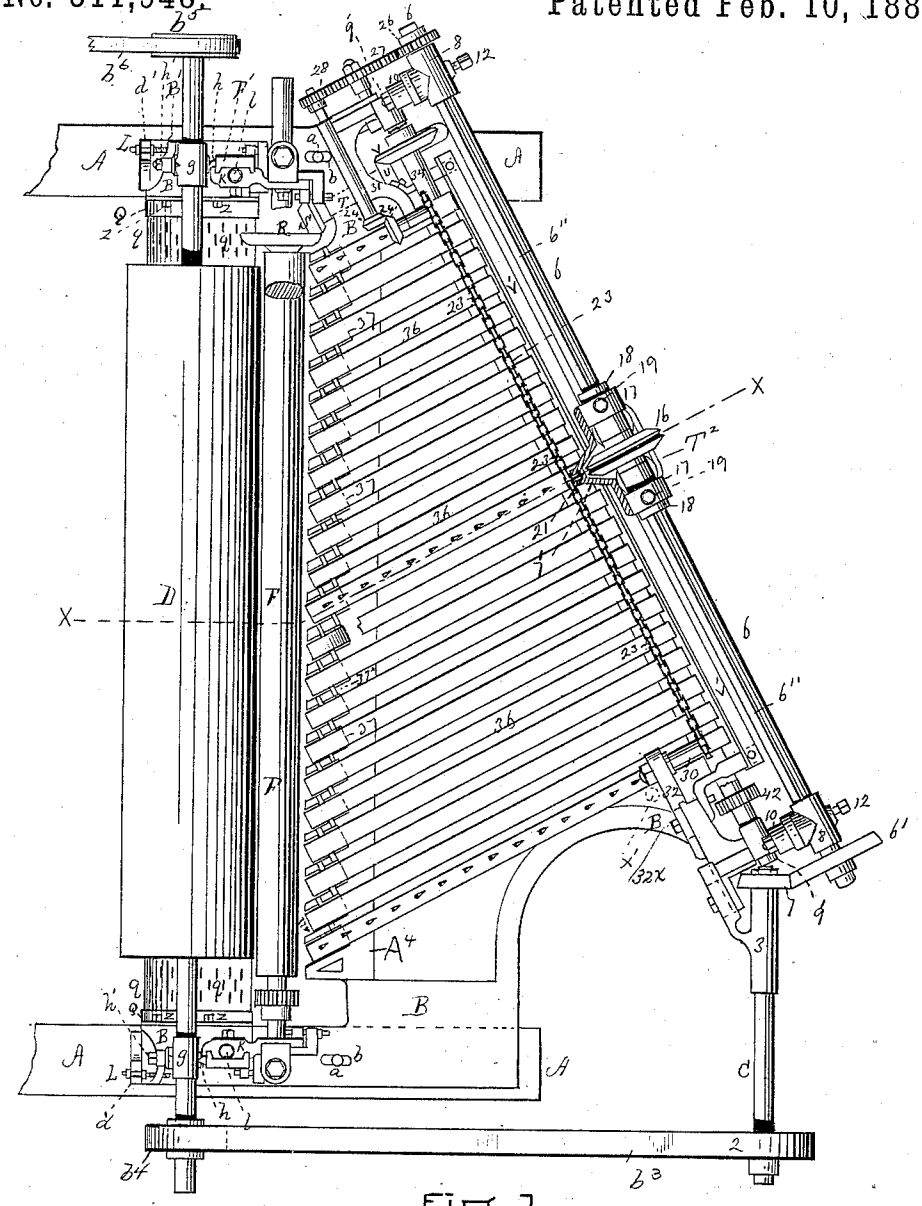


Fig. 1.

WITNESSES

Joseph Ashbaugh.

B. W. Williams.

INVENTOR

William C. Bramwell

By his Atty.

Henry W. Williams

N. PETERS, Photo-Lithographer, Washington, D. C.

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W. C. BRAMWELL.

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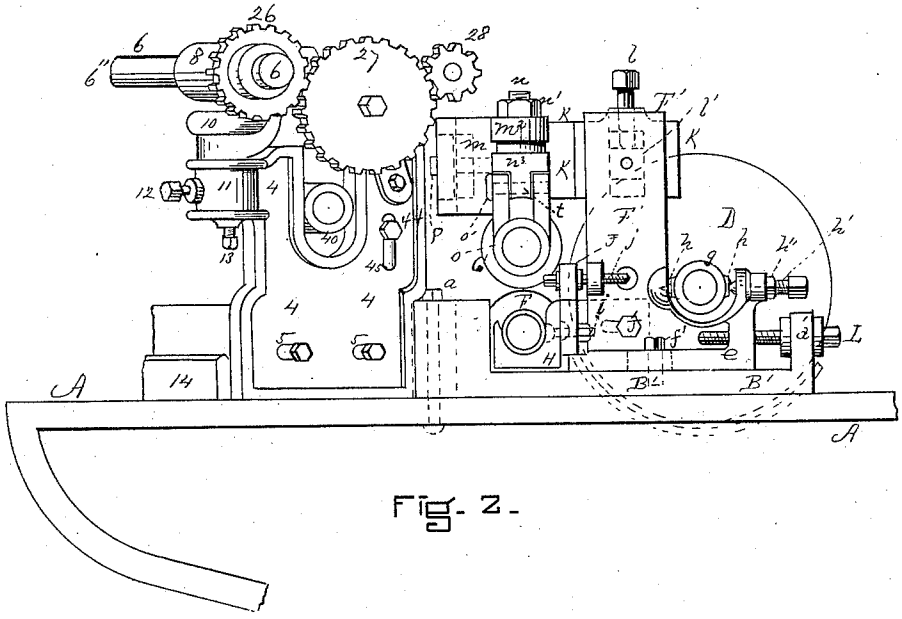


Fig. 2.

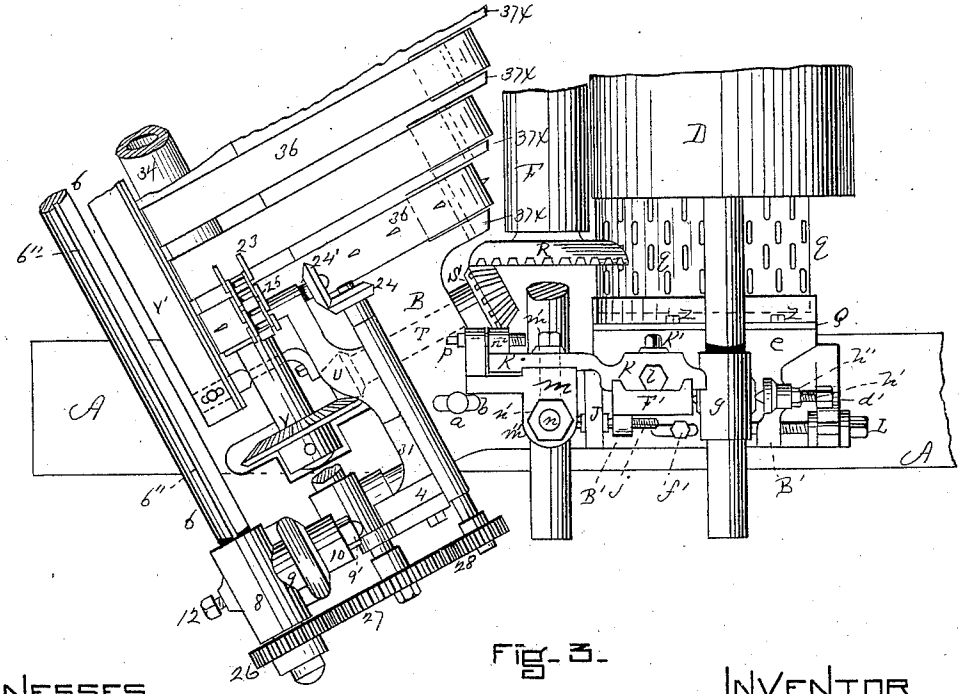


Fig. 3.

WITNESSES

Joseph Ashbaugh.

D. W. Williams

INVENTOR

William C. Bramwell

By his Atty.

Henry W. Williams

N. PETERS. Photo-Lithographer. Washington, D. C.

(No Model.) 4 Sheets—Sheet 3.

W. C. BRAMWELL.

FEEDING MECHANISM FOR CARDING ENGINES.

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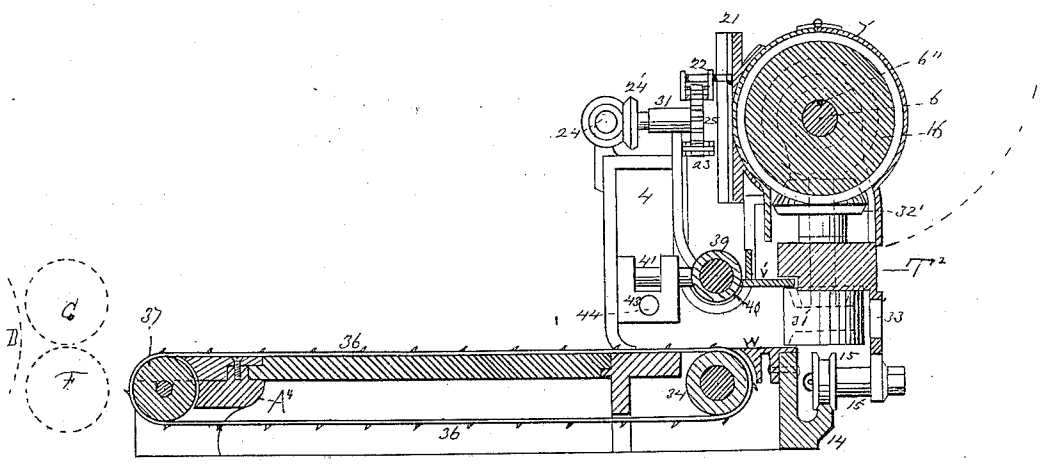


Fig. 4.

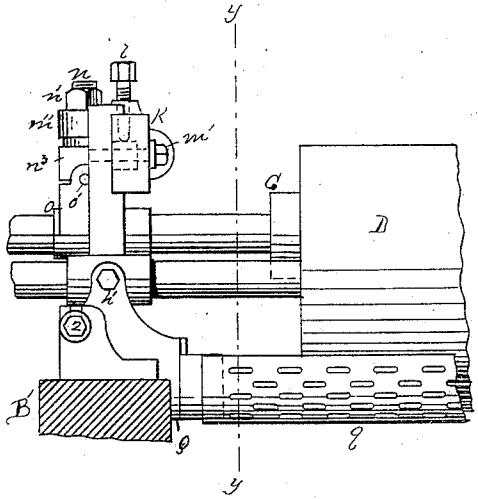


Fig. 5.

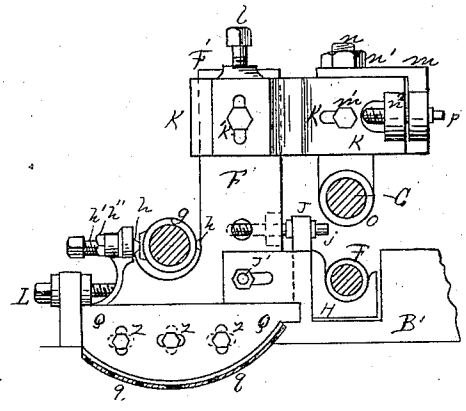


Fig. 6.

WITNESSES

Joseph Sehbaugh.

B. W. Williams

INVENTOR

William C. Bramwell

By his Atty.

Henry W. Williams

N. PETERS. Photo-Lithographer, Washington, D. C.

(No Model.) 4 Sheets—Sheet 4.

W. C. BRAMWELL.

FEEDING MECHANISM FOR CARDING ENGINES.

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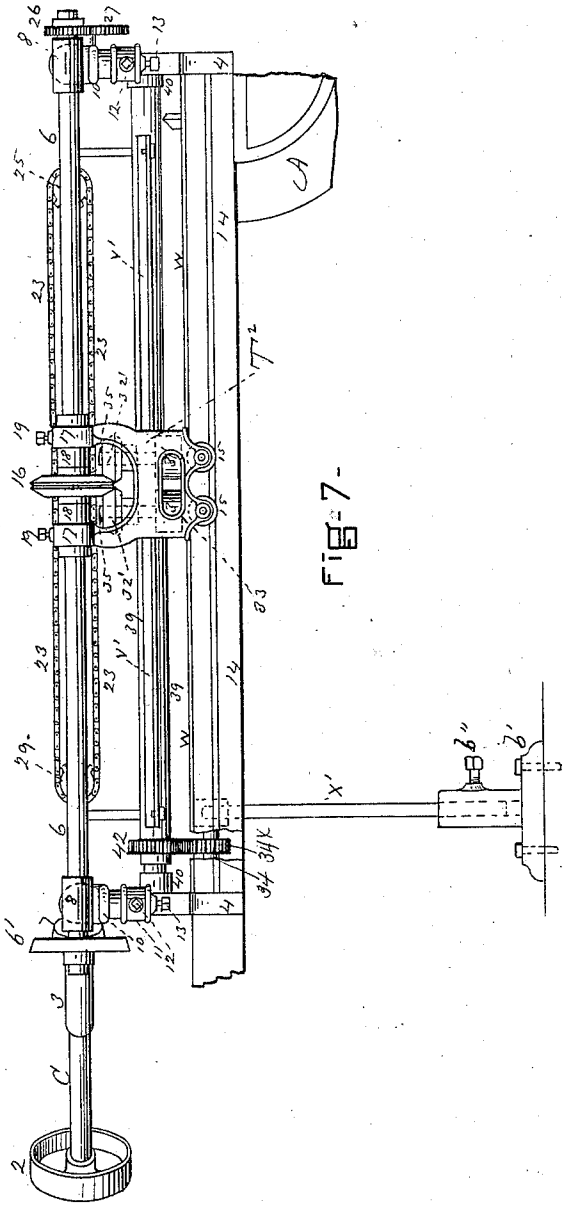


Fig. 7.

WITNESSES

Joseph Ishbaugh.

B. W. Williams

INVENTOR

William C. Bramwell.

By his Atty.

Henry W. Williams

N. PETERS. Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

ILLIAM CALVERT BRAMWELL, OF HYDE PARK, MASSACHUSETTS.

FEEDING MECHANISM FOR CARDING-ENGINES.

SPECIFICATION forming part of Letters Patent No. 311,948, dated February 10, 1885.

Application filed May 7, 1883. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM C. BRAMWELL, of Hyde Park, in the county of Norfolk and State of Massachusetts, have invented new and useful Improvements in Feeding Mechanism for Carding-Engines, of which the following is a specification.

In that class of carding-machines in which the card is fed by means of a continuous roving or sliver laid diagonally upon belts placed and held so as to move in a path at right angles to the feed-rollers and axis of the card-cylinder the accumulated sliver or roving on the shorter of the narrow belts constituting the feeding-table is taken therefrom by the feed-rollers more readily than at that part of the table where the belts are the longest, which results in an unequal supply of wool to the card. In such class of feeding mechanism the sliver or roving is laid across the narrow belts diagonally, and the mass of sliver or roving on the series of belts has a tendency to "crawl," as I denominate it, toward the belts of least length. It is a great desideratum to present as many ends as possible to the feed-rollers, and to be able to present the mass of sliver or roving in a uniformly-compact condition; but when the rollers of the traveler are driven frictionally instead of positively the sliver or roving cannot be compacted or laid snugly each layer side by side to the necessary degree. In my experiments I have found that the sliver or roving can be laid on the belts much more closely if flattened by the rolls of the traveler, and if one edge of the sliver so flattened is delivered upon the belts of the table; and one object of my invention is the production of a mechanism, substantially as will be described, for flattening the sliver and presenting its edge to the belts. I have also found that the delivery of the wool to the feed-rolls and card may be more uniform, and that all crawling of the sliver across the belts may be effectually avoided by placing the belts in diagonal position with relation to the feed-rolls, so that the sliver may be laid on the belts at right angles thereto, instead of diagonally, as heretofore done. Laying the slivers on the belts at right angles to the length of the latter enables said slivers to be carried uniformly forward at each end, and the belts do not have any tendency to draw the slivers across the table.

It will be understood by those skilled in the art to which my invention appertains that by flattening the sliver and laying it up edgewise in a throat, and then compressing the same before it is laid on the belts, a much larger quantity of material or length of sliver can be got upon the table than is possible when the sliver is fed in its round form, or without compression, and therefore a proportionately larger number of ends of said slivers will be presented to the carding-cylinders at one time, and, consequently, that the inequalities of the individual slivers will be compensated for and equalized in proportion to the increased number of slivers which may be presented simultaneously to the feed-rollers.

In this my invention I have placed in front of the roller which drives the feeding-belts, and between it and the rear side of the traveler, two plates, which constitute a throat, through which the sliver, laid in parallel rows by the traveler, is forced into position to pass upon the belts, and above the roller which drives the said belts, and at the rear side of the said throat, and parallel with the said roller, I have arranged a retarding-roller, and have placed its periphery at such a distance from the belts as to leave a narrower space between the retarding-roller and the belts than between the upper and lower plates constituting the throat, so that the sliver laid into the throat may be uniformly compacted therein to the desired extent between the front side of the throat and the retarding-roll and belts, thus permitting the sliver to be laid together row after row in the throat, and to be condensed to the desired extent preparatory to being delivered upon the belts, condensed sliver passed over the throat being delivered upon the feed-plates with their thin edges uppermost, each sliver standing on edge close to and between slivers at each side. From six to eight movements of the traveler fills the throat with sliver, ready to be delivered upon the belts, and compresses the said sliver sufficiently to be taken without further compression by the feed-rollers of the card as the belts bring the sliver to the said feed-rollers. This throat and retarding-roller arranged in front of the belts are of

especial advantage in that by them it is possible to condense or compact the sliver to the proper or any desired degree preparatory to delivering the same on the belts, and by being able to compress the sliver before it is delivered upon the belts it is possible to save very considerable sliver heretofore wasted, especially when starting to feed the card with a new lot of wool.

In the old plans prior to my invention the sliver was condensed to a limited extent between the traveler and feed-rollers for the card, whereas in my plan it is condensed before it is fed upon the table, and in the old plan, if the condensing of the sliver was attempted to any considerable extent, the mass of sliver on the table was liable to bunch or curl up to such degree as to render the operation of the machine impracticable. The retarding-roller being parallel with the path of the sliver, it is clear that the density of the wool passing it is equal and uniform, and that, too, irrespective of the amount of wool on the table at the rear of the said roller. By adopting positive motion for the various parts, and combining them together by gearing, instead of depending upon belts, there is insured a simultaneous movement of the sliver onto the feed-belts in its progress toward the card.

In carding-machines heretofore used, and fed by a continuous sliver, as herein referred to, the taker-in has been run at a comparatively slow speed to avoid waste resulting from throwing the fiber on the floor. To enable the taker-in to be run at a high speed, and to avoid such waste, I have provided a perforated shell, which I have placed under the taker-in, and have supported the said shell from the bearing of the shaft of the taker-in, so that the said shell follows the taker-in in all the adjustments of the latter, which would not be the case if the shell were connected with the frame-work of the carding-machine, as heretofore. I have enlarged or extended the frame of the feeding apparatus to properly sustain not only the feed-rolls, but the taker-in and the shell.

Figure 1 is a plan view of my feeding apparatus, the retarding-roll and the upper feed-roll being broken out, and also part of the hood which covers the gear 16. Fig. 2 is an elevation of that end of the apparatus where the belts are the shortest. Fig. 3 is an enlarged plan of that end of the apparatus where the belts are the shortest; Fig. 4, a cross-section through line $x\,x$, Fig. 1. Fig. 5 is an enlarged detail in elevation of the taker-in, the shell, and other parts to be described. Fig. 6 is a cross-section through line $y\,y$, Fig. 5. Fig. 7 is a front elevation of the feeding apparatus, the hood covering the gear 16 being omitted, part of the frame-work being broken out to show the shaft 34 and its gear.

Similar letters of reference indicate like parts.

A is the frame of the carding-machine, on which my improved feeding mechanism or apparatus rests, it being fixed thereto by the bolts a, which pass through the slots b.

B is the frame-work of the feeding apparatus, which is shown as cast in one piece, inclusive of the projecting bases B′, which receive the bearings for the feed-rolls and taker-in cylinder, and aid in supporting the perforated shell. The outwardly-projecting end of the frame-work B is supported by an adjustable leg, x', (see Fig. 7,) fitting in a socketed plate or base, b', fixed to the floor and held therein by the set-screw b''. The driving-shaft C receives its motion from any convenient source—as, for instance, by a belt, b^3, extended from the pulley 2 to the pulley b^4 on the shaft of the taker-in, the latter at its other end having a pulley, b^5, which will be driven by a belt, b^6, extended about a pulley on the main shaft of the carding-cylinder. The shaft C is supported by the bracket 3, fixed to a lug projecting from the supporting end plate, 4, which is suitably bolted to the frame-work. There is one of these supporting end plates at each end of the apparatus, and they support the longitudinally-slotted shaft 6, which receives its motion from the shaft C through a pair of bevel-gears, 6′ 7. Shaft 6 is rotated in the boxes 8, each provided with a shank which is passed through a right-angled bracket, 10, the boxes being held therein by a nut, 9′. Each bracket has a downwardly-projecting foot, which is fitted into the base 11, cast upon the plate 4, the foot being held therein by the set-screw 12, the bracket 10 being raised and lowered by the screw 13. This arrangement allows the boxes 8 to be adjusted to place the shaft 6 in proper position.

Beneath the slotted shaft 6, and parallel with it, is a track or guide, 14, fixed to the frame-work of the feeding apparatus, which track serves not only to support the traveler or carrier T^2, (shown in Figs. 1, 4, and 7,) but also acts as a guide to hold the lower part of the traveler up to the throat, to be described. The lower part of this traveler has studs 15′, which support a pair of grooved wheels, 15, (see Figs. 4 and 7,) the said wheels running upon the track 14. The shaft 6, slotted at 6″, Figs. 3 and 4, and passed through the hubs 17 of the traveler, carries a double-bevel gear, 16, having a key or feather within its boss, which enters and slides in the slot in the said shaft. The double-bevel gear 16 is kept equidistant between the hubs 17 of the traveler by a pair of sleeves, 18, which fit the shaft 6, and are fixed within the hubs of the traveler by set-screws 19. These sleeves have their inner ends countersunk. The traveler has fixed to it a hood, 7′, which covers the gears 16, and also serves as a support for the vertical slotted plate 21, that receives a pin, 22, fixed to the endless chain 23, driven by the bevel-gears 24 and 24′ and sprocket-gear 25, the whole receiving motion by gears 26 27 28 from the shaft 6, as shown in Fig. 2. The other end of the chain is supported and carried by the

sprocket-gear 29, running loose upon the stud 30. When, in the movement of the chain, the pin 22 passes about a sprocket-wheel, it slides down or up, as the case may be, within the slotted plate 21, thus reversing the movement of the traveler in a well-known manner, compelling it to move from one to the other side of the apparatus. The pin 22 has a head or small wheel fixed to its outer end, which slides in a recess of the plate 21, so that the pin may not part company with the said plate, and thereby leave the traveler stationary. The arms 31 and 32, (see Figs. 1, 3, and 4,) supporting the operative parts of the chain, are suitably attached to the end pieces, 4. The arm 32 is shown in Fig. 1 as connected by a bolt, $32^{\times}$, extended through a slot, (shown in dotted lines,) so that the arm 32 may be adjusted toward or from the arm 31, according to the length of the chain. The traveler also carries a pair of vertical rolls, 31′, having upright spindles 35, which pass through holes cast in the horizontal web or partition uniting the two hubs of the traveler, and to the upper ends of said spindles bevel gears 32′ are fixed, each of which is engaged by the double-bevel gear 16, which is placed between them, and from which they receive their motion. The front of the traveler is provided with an oblong slot, 33, through which and between the rolls 31′ the sliver to be fed is passed. The rolls 31′ are in practice quite close together—say from one-eighth to three-eighths of an inch apart—so that as the sliver passes between them it is flattened or compressed from a round into a flat shape. When the slotted shaft 6 is turned upon its axis, motion will be simultaneously imparted to the vertical rolls 31′ and the chain 23, and thus a certain length of sliver will be uniformly drawn and flattened and have its edge laid on the plate W, located at the rear of the traveler, the said plate, together with the plate V′ above it, constituting a throat in advance of the retarding-roll 39, to be described. The sliver so compressed is laid upon its edge on the said plate W without stretching the same, and without injury to its continuity. The roller 34 (see Fig. 4) carries the endless feed-belts 36, whose other ends are carried by separate small pulleys 37, each having its journals supported by lugs $37^{\times}$, (see Figs. 1 and 3,) extended upward from a plate or cross-piece, A^4, the said lugs being so shaped as to leave between them spaces within which the said pulleys revolve. The belts 36 are driven by the roll 34, and part or all of them may have teeth projecting from their outer sides, according to the wool to be fed. These belts constitute a feed-table, and are arranged at right angles with relation to the path of the traveler and the axis of the shafts, and diagonally with relation to the feed-rolls F G, and the sliver is laid on the said belts at right angles to the length of the latter, so that the said belts carry the sliver uniformly forward and without tendency to move it laterally thereon, as in machines where the feed-belts are at right angles to the feed-rolls.

Above the apron-roll 34 is fixed a retarding-roll, 39, which may be provided with teeth, or left smooth, as the case may require. It is journaled at each end in the boxes 40, which have short spindles 41 cast upon them, and which extend loosely into the forked projections of a plate, 43, (shown in Fig. 4,) which permits the boxes to adjust themselves to the journals of the said roll. The plate 43 is fixed by a bolt, 44, passing through a slot, 45, (see Fig. 2,) in the end supporting-plate, 4, so as to allow of its adjustment with relation to the lower or belt roll, 34, and belts 36. The retarding-roll 39 receives its motion from the shaft of the roll 34 by gears $34^{\times}$ and 42. (See Fig. 7.) The belt-roll 34 receives its motion from the lower feed-roll, F, by the face-gear R, Fig. 3, driving the bevel-gear S, fixed to the outer end of a short shaft, T, whose inner end has a bevel-gear, U, gearing with a larger bevel-gear, V, attached to the shaft of the feed-belt roll 34, as shown in Fig. 3. Thus the belts or bands have positive movements imparted to them from the feed-rolls. The rolls 31′ pass beneath the smooth plate V′, and the flattened sliver is condensed in the throat or space between this plate and the plate W, Figs. 4 and 7, the latter plate being fixed so as to be level with the top of the feeding-belts. The rolls 34 and 39 take the condensed wool away from the said throat, the speed of the said rolls thus determining the extent to which the sliver is condensed in the said throat in advance of the retarding-roll. Leaving the rolls 34 and 39, the feed-belts continue the progress of the wool toward the feed-rolls G and F, by which the wool is transferred to the taker-in D, while the latter presents the wool to the cylinder of the carding-machine.

The frame-work of the feeding apparatus at each side or end is extended in the form of an arm to rest on the card-frame and form a base, B′, Fig. 2, upon which a sliding bearing-plate, *e*, having an upright standard, F′, is fixed by the bolt *f*′, which passes through a slot in the plate or foot of the standard and screws into the base B′. The base B′ is turned upward at its outer end, *d*′, and slotted to receive a shouldered bolt, L, which screws into the bearing-plate *e*, and as the two feed-rolls G F and taker-in D are supported by the slide *e*, the screw-bolt L, on being turned, serves to move them all together toward or away from the cylinder of the carding-machine. The taker-in D is supported in a box-bearing, *g*, having a pivot, *h*, cast upon it and entering a recess in the standard F′. A conical pivoted screw, *h*′, also enters a recess in the box, and is there held by the check-nut *h*″. The lower feed-roll, F, is supported in an open-top swivel-bearing, H, held by the bolt *i* in the slotted plate J, which is fixed to the standard F′ by a bolt, J′, as shown. The plate J has a slotted

lug, which receives a shouldered bolt, *j*, which screws into the standard F′, and when said bolt is turned the lower feed-roll is moved toward or away from the taker-in D. The arm K is secured to the upper part of the standard F′ by a bolt, K′, (see Fig. 6,) extended through a slot in the arm, and the latter is raised or lowered by the bolt *l*, the lower end of which rests loosely upon a square block, *l′*, fixed upon the standard F′, projecting from it at the back and entering a recess made for it in the said arm K. This recess is enough longer from the top to the bottom than the block *l′* to effect the raising and permit the lowering of said arm (see broken lines in Fig. 2) by turning the bolt *l*, tapped into the ear of arm K, turning the bolt down raising the said arm, while the opposite movement of the bolt shortens its end below the ear and permits the arm K to descend by reason of its own weight. The bolt K′ passes through the block *l′* and standard F′. On the arm K a sliding block, *m*, is fixed by a bolt, *m′*, at the back, which latter passes through a slot in said arm and screws into the sliding piece *m*, which is provided near its top part with a projecting lug, *m″*, bored to receive the spindle *n*, having an enlarged end, n^3, a nut, *n′*, holding it thereto. The box *o* of the upper feed-roll has two upwardly-projecting lugs, (see Fig. 2,) which receive between them the pendent lug *t*, forming part of the enlarged end n^3 of the spindle *n*, above referred to, the said lugs receiving a pin, *o′*, thus forming a joint, so that the box *o* is free to turn to adjust itself to the requirements of the journal of the feed-roll. The shouldered bolt *p* (see Figs. 2, 3, and 6) rests in the slot of a lug projecting from sliding piece *m*, and screws into an ear, n^2, of the arm K, so that when turned it will move the sliding piece *m* along the arm K, and with it the upper feed-roll, toward or from the taker-in D. It will be seen that the taker-in and rolls F G may be moved in any direction independently of each other by the bolts *l j p*, or the whole may be moved simultaneously toward or from the carding-machine by the bolt L. The sliding bearing-plate *e* has a curved projecting lip, Q, cast as part of it, and projecting inward and downward at each end or side of the feeding apparatus, and to this curved lip is fixed by screws *z z z* a perforated shell, *q*. (See Fig. 6.) The shell *q* is extended beneath the taker-in D across its whole length, and, being set quite close to the teeth of the taker-in, the said shell may be moved in unison with the taker-in as the latter is adjusted. The shell keeps the wool from falling away from the taker-in, but permits the dirt in the wool to escape through the perforations of the shell.

I claim—

1. The feed-rolls F G and the series of endless belts placed diagonally with relation to the axes of rotation of the said feed-rolls, combined with means to rotate the said belts, to operate substantially as described.

2. The feed-rolls F G, a series of endless belts placed diagonally with relation to the axes of rotation of the said rolls, and a traveler to lay a sliver on the said belts at right angles to their length, combined with means to operate the said belts, rolls, and traveler, as and for the purposes set forth.

3. The series of endless belts, means to move them, the track 14 at right angles to the said belts, and the traveler and its rolls, combined with means, substantially as described, to positively reciprocate the said traveler and rotate the rolls therein, substantially as set forth.

4. The series of endless belts, means to move them, the traveler, means to reciprocate the same, the rollers mounted in the said traveler, and means to rotate them positively to flatten the sliver and deliver it edgewise into the throat, combined with the plates W and V′, constituting a throat, and with the retarding-roll located at the rear side of the said throat, to operate substantially as set forth.

5. The feed-rolls F G, the series of endless belts placed diagonally with relation to the axes of rotation of the said feed-rolls, and means to move the said rolls and belts, the retarding-roll, and the plates W and V′, constituting the throat, combined with the traveler, its track or guide, and with means to operate the said traveler and retarding-roll, for the purposes specified.

6. The traveler, its track or guide, means to move the traveler on the said track or guide, the throat composed of the plates W and V′, the retarding-roller at the rear of the said throat, the shaft 6, the rolls 31′, carried by the traveler, the shafts upon which the said rolls are mounted, and their gear 32′, combined with gears to move the gear 32′, and with means to rotate the shaft 6, the rolls 31′ being located near each other to flatten the sliver delivered from between them, substantially as described.

7. The frame-work of the feeding apparatus, the taker-in, the feed-rolls F G, and the endless belts and traveler mounted on the said frame-work, and means to operate the said taker-in, rolls, belts, and traveler, combined with a perforated shell connected with and made adjustable, in unison with the said feeding apparatus, toward and from the card-cylinder, as set forth.

8. The combination of the shaft T, bevel-gears R S U V, feed-rolls F G, shaft or roll 34, and feed-bands 36, substantially as and for the purpose set forth.

WILLIAM CALVERT BRAMWELL.

Witnesses:
HENRY W. WILLIAMS,
JOSEPH ISHBAUGH.