P. SHARP.

STOP MOTION FOR TEXTILE MACHINERY.

APPLICATION FILED NOV. 23, 1908.

972,265. **Patented Oct. 11, 1910.**

2 SHEETS—SHEET 1.

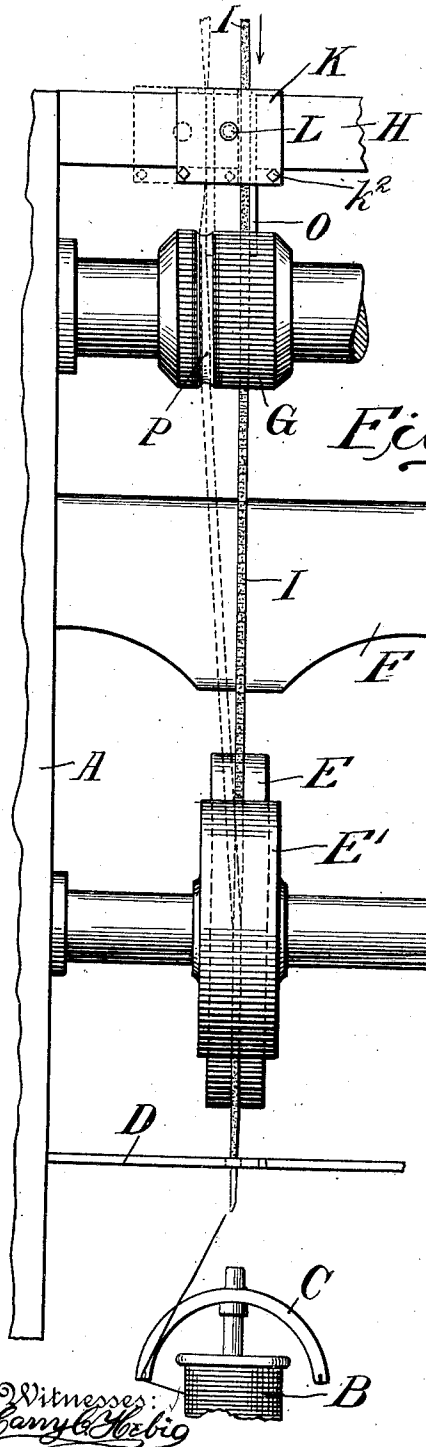

Fig. 1.

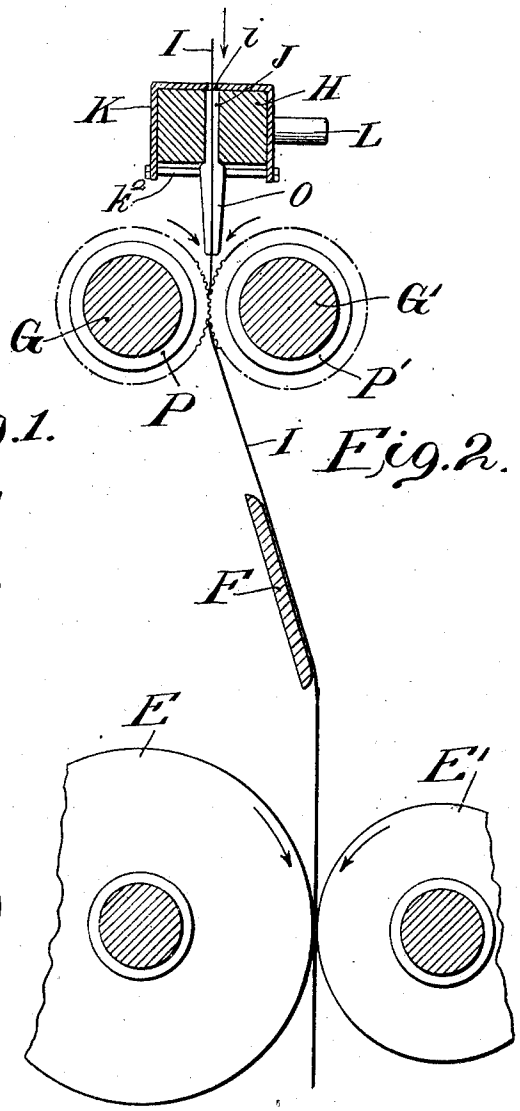

Fig. 2.

Witnesses:
Harry B. Hebig
V. E. Mattemann

Inventor
Peter Sharp
By his Attorneys
Griffin & Bernhard

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2 SHEETS—SHEET 2.

Fig. 3.

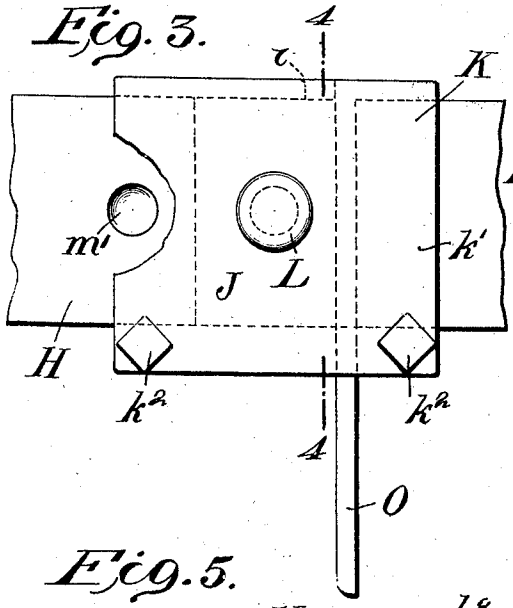


Fig. 4.

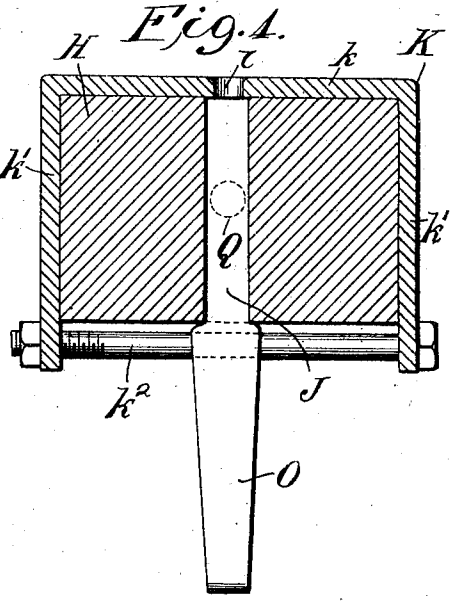


Fig. 5.

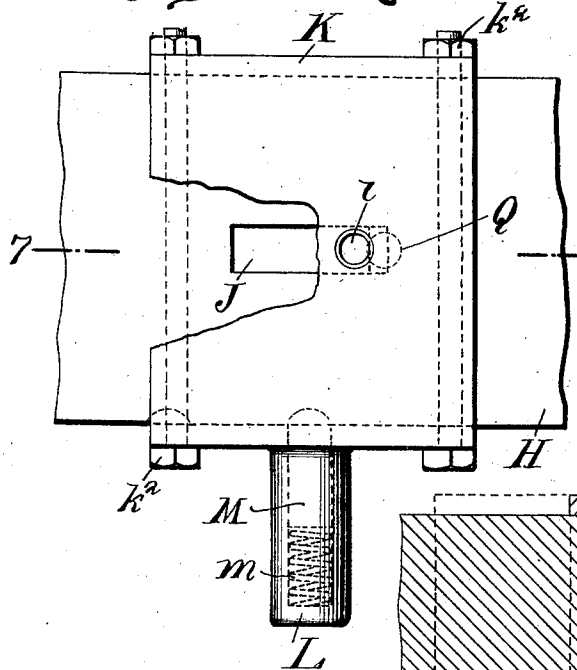


Fig. 6.

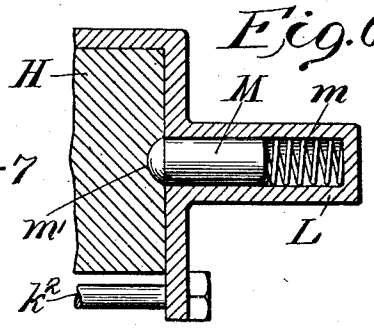
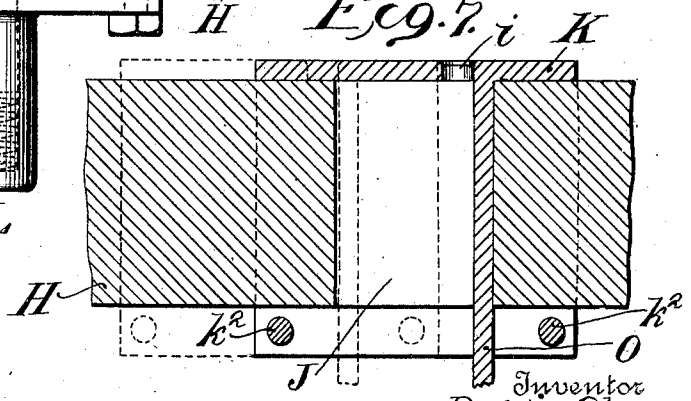


Fig. 7.



Witnesses:
Harry C. Hazbig
V. E. Martmann

Inventor
Peter Sharp
By his Attorneys
Griffin & Bernhard

UNITED STATES PATENT OFFICE.

PETER SHARP, OF NEW YORK, N. Y., ASSIGNOR TO AUTOMATIC ROVE-STOP COMPANY, A CORPORATION OF NEW YORK.

STOP-MOTION FOR TEXTILE MACHINERY.

972,265. Specification of Letters Patent. **Patented Oct. 11, 1910.**

Application filed November 23, 1908. Serial No. 464,167.

To all whom it may concern:

Be it known that I, PETER SHARP, a subject of the King of Great Britain, residing in the city of New York, borough of Manhattan, county and State of New York, have invented a certain new and useful Stop-Motion for Textile Machinery, of which the following is a specification.

This invention is a stop motion for textile machinery, the same being particularly adapted for use in connection with all kinds of spinning machinery for operation on flax, jute, hemp, cotton, woolen, and other fibers, as well as upon thread machinery, twisting machines, and various other textile machines.

One serious objection incident to the spinning machinery now in use, is that the rove not infrequently breaks between the flier and the drawing rolls. This results in the broken rove becoming seriously entangled in various parts of the mechanism, as well as with adjacent roves, and the operation of piecing the broken rove requires the skill and deterity of an expert spinner. This occasions the loss of considerable time and waste of rove, and, besides, diminishes the output of the machine.

The method now followed for piecing a broken rove is for the operator to catch the thread at the point of the break and throw it up out of place over the guide rail, leaving the piecing operation to be performed at some opportune time; but in the meantime, the spindle is out of service. What occasions particular difficulty in piecing threads on machines now employed is the fact that the rove continues to be fed not only after the break, but, also, during the piecing operation.

The present invention overcomes the foregoing and other objections inherent in the old mechanisms of the types under consideration, and provides means whereby the operation of piecing a broken thread may be expeditiously and effectively accomplished without necessitating the employment of skilled labor.

In one respect, the invention may be said to consist of means whereby a rove may be positively locked against movement in such manner as to preclude it from being acted upon by the feed rolls. The preferred manner of accomplishing this result is to shift the rove into a groove between the feed rolls but separate from the pass of said rolls. This locking operation, or the shifting and locking operation, may be accomplished manually, and held in said locked position until the operator desires to piece the threads.

When my mechanism is employed, the operation of piecing the broken thread is a comparatively simple one because of the fact that the rove does not become entangled, as in prior mechanisms, and, moreover, because during the piecing operation, the rove is precluded from being acted upon or fed by the feeding rolls.

In the accompanying drawings I have illustrated one practical embodiment of the invention, but the construction shown therein is to be understood as illustrative, only, and not as defining the limits of the invention.

Figure 1 is a side elevation showing a portion of an ordinary spinning machine to which my improvements are applied. Fig. 2 is a view at right angles to Fig. 1, certain parts being shown in section. Fig. 3 is a front view illustrating a part of the invention on an enlarged scale, and applied to the guide rail of a spinning machine. Fig. 4 is a cross section of the line 4—4 of Fig. 3. Fig. 5 is a top plan view of the devices shown in Figs. 3 and 4. Fig. 6 is a detail horizontal section taken transversely through Fig. 5 illustrating one form of locking device for the slide of my invention. Fig. 7 is a cross section on the line 7—7 of Fig. 5.

For the purposes of illustration, the present invention is shown in connection with an ordinary spinning machine wherein A designates a part of the machine frame, B a part of the spindle, C a part of the flier, D the thread plate, E, E′ the drawing rolls, F the breast plate, G, G′ the feed rolls, and H the guide rail.

As is obvious, these parts may be of the usual or any preferred construction, but in a preferred embodiment of the invention it has been thought advisable to modify the struc-

ture of rolls, G, G′, and guide rail, H, in certain particulars which will be explained presently. Before passing to a description of the novel devices, it is desired to state that drawing rolls, E, E′, are composed, respectively, of wood or metal; that said rolls are driven positively at greater peripheral speed than feed rolls, G, G′, for the purpose of attenuating the rove, and that feed rolls, G, G′, are provided with plain or roughened working surfaces for the purpose of securing a firm grip on the rove, the latter being indicated at I.

One change in the construction of the ordinary mechanism consists of a short slot, J, in guide rail, H, in lieu of the usual rove perforation. Said slot is shown clearly in Figs. 5 and 7 of the drawings, and it extends lengthwise of rail, H. Rove, I, passes through the slot, J, but instead of being restricted to a feed movement only through the slot, as is the case when the rove passes through the ordinary perforation, said rove is capable of being shifted laterally in slot, J, by a suitable device intended to be operated by hand.

The device just referred to, in one embodiment of the invention, is a slide, K, shown in the drawings as a box or clip adapted to embrace rail, H, and capable of movement lengthwise thereon. Said slide consists of a top plate, k, and side plates, k', the latter extending below the lower face of rail, H, and supporting one or more bolts, k^2, the latter passing through said plates, k', so as to retain slide, K, on rail, H. Top member, k, of slide, K, is provided with an eye or opening, l, which is normally in register with slot J, whereby rove, I, is adapted to pass through the eye of slide, K, and slot, J, of rail H.

Various forms of constructions may be provided for facilitating the operation of slide, K, and for locking said slide in adjusted positions, but in the drawings I have elected to show said slide as having a forwardly extending knob, L. Said knob is hollow or chambered in order to accommodate a locking dog, M, and a spring, m, for actuating said dog. Rail, H, is provided with a plurality of pockets or depressions, m', two or more in number, and these pockets are spaced at suitable intervals for the purpose of receiving locking dog, M, when slide, K, is adjusted to its normal position, wherein the rove passes freely through said slide and slotted rail, H, and, also, for locking the slide in its operative position, wherein said slide locks or confines rove, I, from feeding movement through eye, l, and slot, J.

When the operator desires to preclude the rove from passing through rail, H, the knob, L, is grasped and by exerting comparatively slight pressure thereon, dog, M, is unseated from one depression or pocket, m', in rail, H, the slide moving freely along rail, H, until the dog, M, snaps into the next pocket. This operation shifts the rove sidewise in slot, J, and causes the eye, l, to assume such relation to an end wall of slot, J, that the rove will be caught or pinched between the edges of eye, l, and slot, J, so as to retain said rove in a locked position, thus precluding the rove from being drawn through the rail and slide by rolls, G, G′. The slide and rove are retained in their abnormal adjusted positions until the operator shall have an opportunity of piecing the thread, and when it is desired to set the machine into operation again at or before the time the piecing operation is completed, the operator returns the slide back to normal position, as shown in full lines in the drawings, locking dog, M, moving freely out of one pocket when pressure is applied to knob, L.

For the purpose of securing or shifting the rove I, with slide, K, it is preferred to employ a finger, O, which is movable with slide, K, and is adapted to operate between feed rolls, G, G′, above the faces of said rolls which grip the rove. Said finger, O, is shown as a metal strip or plate which is attached or connected to the top, k, of slide, K, said plate extending downwardly through slot, J, in rail, H, and passing through the open lower side of said slide. Finger, O, depends from the slide into a part of the space between rolls, G, G′, as shown in Figs. 1 and 2, and when the slide is moved along rail, H, said finger, O, engages with rove, I, for the purpose of imparting the lateral movement to said rove, whereby the rove is adapted to assume the position shown in dotted lines in Fig. 1.

The second alteration in the construction of the ordinary spinning mechanism consists in providing complemental grooves, P, P′, in feed rolls, G, G′, respectively. Said grooves are formed in the plain or toothed surfaces of the feed rolls, and they are provided in said rolls near one end thereof. The grooves occupy coincident positions in the rolls so that they register with each other, as shown in Fig. 2, and when the rove is shifted sidewise by slide, K, and finger, O, said rove is caused to enter grooves, P, P′, thus precluding the feed roll from gripping and feeding said rove.

The operation and advantages of the invention will be readily apparent to those skilled in the art from the preceding description, but it may be stated, briefly, as follows: It frequently happens that the thread breaks at a point between flier, C, and thread plate, D. When this condition obtains the operator, immediately upon observing such breakage of the rove, operates slide, K, by

moving it along rail, H, to the dotted lined position of Figs. 1 and 7, whereby at one operation the rove is moved laterally into the space between grooves, P, P′, of rolls, G, G′, and said rove is positively locked in position by gripping it between the edges of eye, *i*, and slot, J. The rove is thus moved to a position where the feed rolls cannot feed and grip it, and it is locked against endwise movement by drawing rolls, E, E′. It is not necessary for the operator to throw the rove over rail, H, or allow it to continue running, for the reason that the rove remains in a stationary position in the grooves of the rolls, G, G′, said rove extending down to the nip of the drawing rolls, until the operator shall have an opportunity of piecing the thread. It will be seen that the rove remains at rest, that is, it is not fed endwise, thus overcoming one of the serious objections of ordinary spinning frames, wherein the rove continues to be fed notwithstanding the fact that it may be thrown over the rail, H. When the operator is ready to perform the piecing operation, the thread from the spindle is drawn up and held in one hand, and with the other hand the slide is shoved back to normal position, thus again commencing the operation of feeding and drawing the rove, so that said rove may be pieced in the usual way. When the operator is ready to perform the piecing operation, slide, K, is moved back to normal position with one hand, and the spindle is allowed to go into operation by removing the other hand from the spindle, thus restoring the parts into operation easily and quickly.

The operation is as follows:—The rove passes through opening, *i*, in locking slide, K, and opening, J, in guide rail, H, the rove being at one side of member, O, on said slide. When the slide is in a non-locking position, the rove passes between the "nip" of feed rolls, G, G′, that is, between the corrugated surfaces thereof, and thence said rove passes across breast plate, F, between drawing rolls, E, E′, through an opening in thread plate, D, and thence to flier, C, and spindle, B. Under normal conditions of operation, the rove is fed downward at the required speed by feed rolls, G, G′, and as the rove passes over the thread plate it is flattened somewhat by frictional contact therewith, the rove being placed under light tension by the action of drawing rolls, E, E′. Said drawing rolls perform the function in spinning machinery of drawing out, lengthening or extending the rove, and to accomplish this end to better advantage said drawing rolls coöperate with breast plate, F, and feed rolls, G, G′. It is well known that the rove treated in spinning machinery is a comparatively heavy or thick strand of fiber, the same being practically untwisted, but of course the thickness of the rove differs according to the character of the material of which it is composed.

In treating a rove of the character specified in my machine, it is not only fed in a positive manner, but it is drawn out, lengthened or extended, then twisted into a thread, and finally wound on the spindle.

The operation of feeding the rove is performed by rolls, G, G′. Rolls, E, E′, rotate at higher speed than rolls, G, G′, and the first named rolls (E, E′) thus act on the rove to draw it out, extend or lengthen it, the fibers of the rove partially separating readily in a lengthwise direction without, however, breaking the rove, whereby the thickness of the rove is reduced to a material extent, and when the attenuated material is twisted, there results a relatively thin thread or yarn which is wound on the spindle.

The operation of drawing out the rove is performed, mainly, by rolls, E, E′, but breast plate, F, contributes somewhat to this result, for the reason that the rove passes over said plate, and in frictional contact therewith, and the rove is flattened somewhat by contact with the plate and the light pull or tension exerted on the rove by rolls, E, E′.

Now, when the thread breaks, the break taking place usually between flier, C, and thread plate, D, the operator shoves locking slide, K, to the left in Fig. 1, by pressing on handle, L. This movement of the slide secures two operations; first, the slide and member, O, thereof shoves the rove sidewise, to the dotted line position of Fig. 1, and thereby the rove is moved out of the nip of the feed rolls and into the groove or grooves, P, P′, of said rolls, so that the rolls cannot continue to feed the rove downward, and, second, the rove is gripped between the edge of opeing, *i*, in slide, K, and an edge of opening, J, in guide rail, H, thus positively locking in a positive manner the rove from feeding or lengthwise movement. The feed rolls and the drawing rolls continue in operation while the rove is occupying the grooves in the feed rolls, and although the feed rolls cannot act to move the rove downward, still the drawing rolls continue to pull on the rove. It is evident that were the rove not locked or gripped by slide, K, that is, were the rove free to pass through the slide, the guide rail, and the grooves of the feed rolls, said rove would be drawn down by the drawing rolls, and such downward feed of the rove would take place at increased speed over the rate of feed given to the rove by the feed rolls, because of the higher peripheral speed of the drawing rolls, in consequence of which the rove would be wound around the drawing rolls and become entangled with other roves and

adjacent parts of the machine, thus resulting in great waste and loss of the material. Such disadvantageous results cannot take place, however, for the reason that the rove is not only removed from the nip of the feed rolls, but it is locked or gripped in a positive manner by the slide, K, to preclude said rove from being fed downward by the drawing rolls. While the rove is thus shifted out of the nip of the feed rolls and locked or gripped by the coöperation of rail, H, and slide, K, the drawing rolls continue to draw on the rove and to thin it out until such time as the slivers or fibres become so thin that no further drawing can take place, and thus a substantial part of the rove, while shifted and locked as described, hangs downward from the rail and the grooved portions of the feed rolls. At an opportune time, the operator picks up the thread from the spindle and pieces it with the depending part of the gripped rove, and at the same time the operator shoves the slide back to its non-locking position, and replaces the pieced rove in the drawing rolls. Now as the slide is returned to position to release the rove, the latter is caught by the nip of the feed rolls, and the operations of feeding and drawing the rove are resumed.

Instead of providing the slide with plane surfaces against which the rove travels, I may provide a ball as indicated in dotted lines by the reference character, Q, in Fig. 4. The function of this ball is to exert a braking action on the rove when slide, K, is moved to its abnormal position, the ball rotating with some friction. Should the rove not pass quickly from the corrugated to the grooved parts of the feed rolls, the ball allows the rove to continue running, but at the same time, it will act sufficiently on the rove to jam it against the slotted part of the rail.

Having thus fully described the invention, what I claim as new, and desire to secure by Letters Patent is:

1. In a machine of the class described, rove feeding mechanism, rove-drawing mechanism operating to draw out or lengthen a rove, and laterally-movable means coöperating with said feeding and drawing mechanism for moving the rove transversely to its feed and for positively locking the rove and preventing its feeding.

2. In a machine of the class described, rove feeding mechanism, rove-drawing mechanism operating to draw out or lengthen a rove, and unitary means for removing the rove from the rove feeding mechanism and for positively locking the rove against the action of said drawing mechanism.

3. In a machine of the class described, rove feeding mechanism, rove drawing mechanism, and laterally-movable means operating to shift the rove out of the field of action of said rove feeding mechanism, and, also, to positively lock said rove in its shifted position against the action of said rove drawing mechanism.

4. In a machine of the class described, coöperating rove-feeding rolls provided with means for precluding the rove from being acted upon by said rolls, drawing mechanism, and unitary means for moving the rove transversely to its feed and for positively locking the rove against the feeding and drawing actions of the rove-feeding rolls and the drawing mechanism.

5. In a machine of the class described, coöperating rove-feeding rolls provided with complementary grooves for precluding the rolls from feeding the rove, rove drawing mechanism, and means acting substantially simultaneously to shift the rove into the grooves of the feed rolls and to positively lock said rove against the action of the drawing mechanism.

6. In a machine of the class described, coöperating rove-feeding rolls provided with means for positively locking the rove against the feeding action of said rolls, coöperating drawing rolls, and a single device operating to move the rove into coöperative relation to said locking means of the rove-feeding rolls and to, also, lock the rove against the action of the drawing rolls.

7. In a machine of the class described, coöperating rove-feeding rolls provided with complementary grooves adapted to permit a rove to rest idly therein, rove drawing rolls, and a device for shifting the rove into said complementary grooves and operating, also, to positively lock the rove against the action of said drawing rolls.

8. In a spinning machine, a rail having a rove-feeding slot, a rove retaining member movable on said rail and coöperating therewith in gripping a rove against movement in said slot, and means adjacent to said rail for moving a rove through said slot when the rove retaining member occupies a non-locking position.

9. In a spinning machine, a rail having an opening through which a rove is adapted to pass, a rove retaining member slidable relative to the rove opening in said rail, said rove-retaining member coöperating with said rail in gripping a rove against feed movement through said opening, and rove-feeding rolls adjacent to the rail for moving a rove through said opening when the rove-retaining member occupies a non-locking position.

10. In a spinning machine, a rail having a slot for the passage of a rove, a rove-retaining member movable on said rail and coöperating therewith in gripping a rove against lengthwise movement, means for moving the

rove in a lengthwise direction and through said slot when said rove-retaining member occupies a non-locking position, and locking devices coöperating with said rove-retaining member for precluding it from movement when in a position to grip said rove.

11. In a spinning machine, a rail having a slot through which a rove is adapted to pass, feed rolls for moving the rove in the direction of its length and through said slot, a rove-retaining member slidable on the rail and having an opening for the passage of the rove, said rove-retaining member coöperating with said rail in gripping the rove when said member occupies a locking position, and means carried by said rove-retaining member and positioned adjacent to said feed rolls for shifting the rove out of said rolls when said rove-retaining member is moved to a position for gripping the rove.

12. In a spinning machine, a rail having a rove-receiving slot, feed rolls below said rail, one of said rolls having a groove, drawing rolls coöperating with the feed rolls, a slide mounted on the rail, said slide having a rove-opening, and a rove shifting member depending from the slide and positioned adjacent to the feed rolls for moving the rove into said groove of the rolls, said slide coöperating with the rail in gripping a rove to preclude the latter from movement by the drawing rolls.

13. In a machine of the class described, complementary rove-feeding rolls having coincident grooves, rove drawing rolls coöperating with the rove feeding rolls, and a member operating to shift the rove into said grooves of the feeding rolls and, also, to positively lock the rove against the action of the drawing rolls.

14. In a machine of the class described, complementary rove-feeding rolls having coincident grooves, rove drawing rolls, a guide rail, a slide on said rail, and a member extending from the rail for shifting a rove into said grooves and acting, also, to grip and positively lock a rove against the rail to preclude it from feeding movement under the action of the drawing rolls.

15. In a machine of the class described, a rail having a slot, rove-feeding rolls provided with coincident grooves, a rove-locking member having an eye in register with the slot of said rail, and a rove-shifting member extending from said locking member into coöperative relation with said rolls.

16. In a spinning machine, rolls for feeding a rove, drawing rolls coöperating therewith to draw out or lengthen the rove, and unitary means coöperating with said feed rolls and the drawing rolls for simultaneously moving the rove out of the action of the feed rolls and gripping and positively locking said rove to preclude it from continued feed movement by the action of the drawing rolls.

17. In a spinning machine, a rail having a slot for the passage of a rove, rove feeding rolls coöperating with said rove feeding rolls in drawing out or lengthening the rove, a breast plate intermediate the feeding rolls and the drawing rolls, and means operating to move the rove sidewise and out of the feed rolls and, also, to positively grip or lock said rove for precluding it from continued feed movement under the drawing action of said drawing rolls.

18. In a spinning machine, feed rolls, drawing rolls coöperating therewith in drawing out or lengthening a rove, a spindle having a flier in coöperative relation to the drawing rolls, a rail adjacent to the feed rolls, said rail having a slot for the passage of a rove, and means coöperating with the rail for simultaneously moving a rove sidewise in the slot and for gripping and positively locking the rove, whereby said rove is removed from the feed rolls and is positively locked from continued feed movement under the drawing action of said drawing rolls.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

PETER SHARP.

Witnesses:
JAS. H. GRIFFIN,
V. E. MARKMANN.