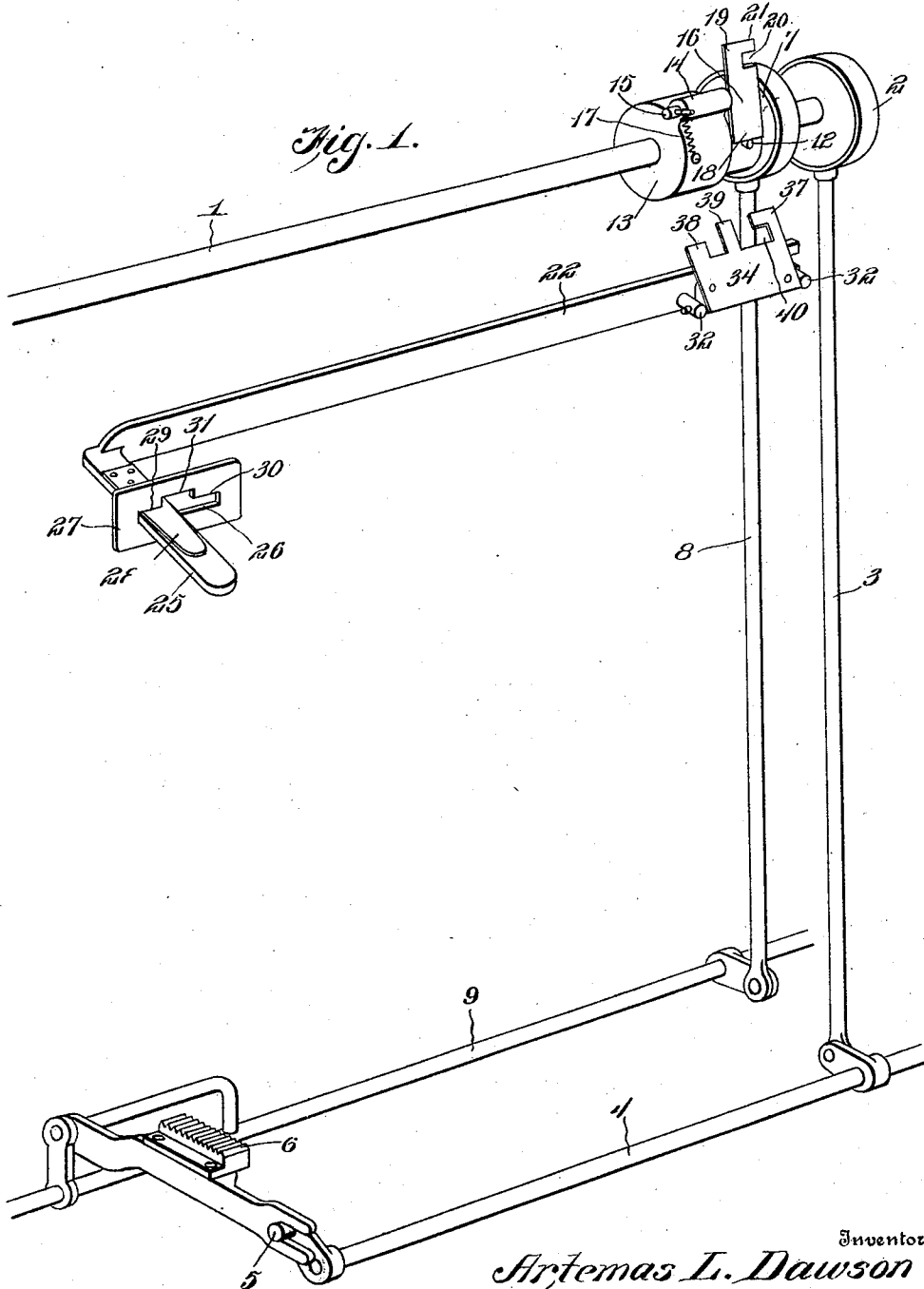


A. L. DAWSON.
 FEED MECHANISM FOR SEWING MACHINES.
 APPLICATION FILED JULY 2, 1909.

968,329.

Patented Aug. 23, 1910.

2 SHEETS—SHEET 1.



Witnesses

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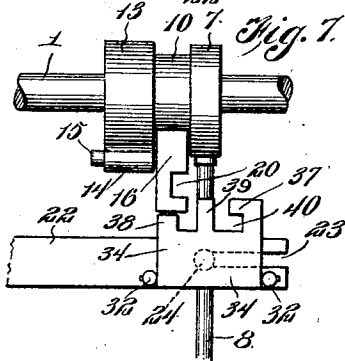
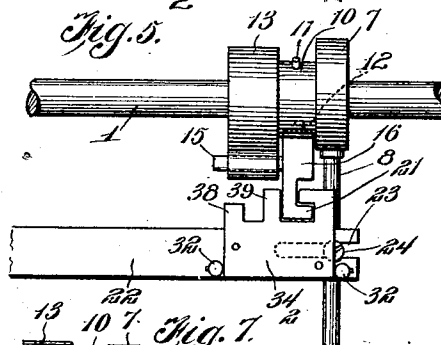
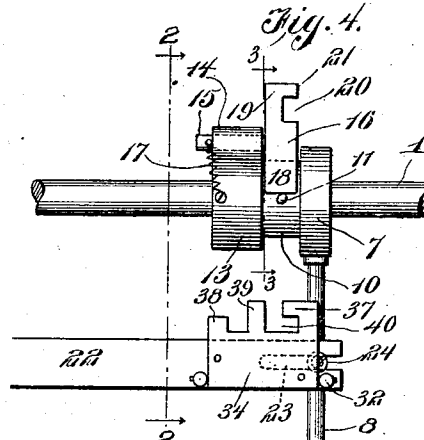
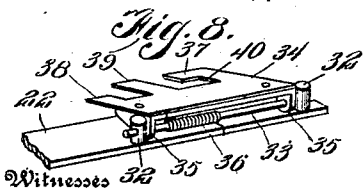
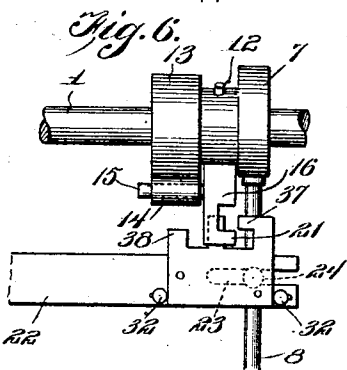
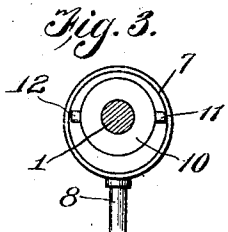
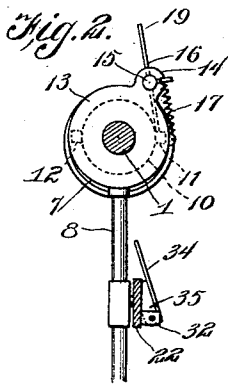
By *Victor J. Evans*
 Attorney

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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

ARTEMAS L. DAWSON, OF DEVAL BLUFF, ARKANSAS, ASSIGNOR OF ONE-HALF TO
JOEL M. McCLINTOCK, OF DEVAL BLUFF, ARKANSAS.

FEED MECHANISM FOR SEWING-MACHINES.

968,329.

Specification of Letters Patent. Patented Aug. 23, 1910.

Application filed July 2, 1909. Serial No. 505,620.

To all whom it may concern:

Be it known that I, ARTEMAS L. DAWSON, a citizen of the United States, residing at Devall Bluff, in the county of Prairie and State of Arkansas, have invented new and useful Improvements in Feed Mechanism for Sewing-Machines, (Case B,) of which the following is a specification.

This invention relates generally to feed mechanism for sewing machines, and particularly to a means for controlling the action of the fabric feeding device.

In a prior application for Letters Patent, filed May 25, 1909, Serial No. 498,286, I have shown, described and claimed a feed mechanism by which the direction of feed motion of the feed plate or device may be reversed for stitching backward and to secure the ends of a seam against loosening or raveling, or sew a zigzag or irregular seam without turning the fabric, or whereby the feed plate or device may be reciprocated back and forth to sew any one stitch over and over at one point and make what I term a "shuffle" stitch to tie or lock the thread against raveling.

The object of the present invention is to provide a different construction of means for effecting the same results, as well as to provide a mechanism which is more compact and therefore better adapted for use upon some makes of machines without varying the general construction and arrangement of the usual parts.

The invention consists of the features of construction, combination and arrangement of parts hereinafter fully described and claimed, reference being had to the accompanying drawings, in which:—

Figure 1 is a view showing one of the many applications of the invention to essential parts of the feed mechanism of a sewing machine. Fig. 2 is a vertical section on line 2—2 of Fig. 4. Fig. 3 is a similar section on line 3—3 of Fig. 4, omitting the feed or clutch pawl. Fig. 4 is a front elevation showing the feed pawl set for a forward feed motion of the fabric, and the controller arranged to trip the pawl for a backward feed motion of the fabric. Fig. 5 is a similar view illustrating the movement of the pawl past the controller in such action. Fig. 6 is a view similar to Fig. 5 showing

the parts arranged for a "shuffle" stitch action. Fig. 7 is a like view showing the parts arranged for a continuous forward feed of the fabric. Fig. 8 is a perspective view of the controller.

Referring to the drawing, the numeral 1 designates a shaft of the machine on which is a cam or eccentric 2 which, through the medium of a rod or pitman 3, communicates motion to a rocking arm or lever 4 for actuating the rocker member 5 which imparts a vertical oscillatory motion to the feed bar or plate 6. The shaft 1, which ordinarily extends through and is journaled in the hollow arm of the machine, also communicates motion in the ordinary manner through any suitable known type of connecting means to the needle bar of the machine. Also mounted on the shaft 1 is a cam or eccentric 7 which communicates motion through a rod or pitman 8 to a rock shaft 9 which reciprocates the feed bar or plate 6 back and forth. These parts operate in timed accord with the aforesaid parts for imparting vertical reciprocatory motion to the feed bar or plate, and are controlled in action by my improved feed controlling means for the purposes described.

The cam or eccentric 7 has an integral laterally extending hub or collar 10 which is loosely mounted therewith on the shaft 1 and which collar is provided with a pair of peripheral clutch pins or projections 11 and 12, arranged at an angle of about 180° apart and on opposite sides of the circumferential center of said collar. This collar forms one member of a clutch, the other or complementary member of which comprises a collar 13 fixed to the shaft and arranged on the side of said loose collar 10 opposite the eccentric 7. Said collar 13 is provided with a transverse bearing 14 for an oscillatory stem 15 which projects beyond the opposite sides thereof and carries at its relatively inner end a feed dog or pawl 16, the opposite end of said stem being connected with the collar by a spring 17 which tends to maintain it in a prescribed position in its oscillatory movement and controls such movement.

The feed pawl or dog 16 is preferably in the form of an oblong rectangular plate intermediately mounted upon the stem to provide an arm 18 to engage the pins 11 and

12 and an arm 19 adapted to cooperate with the fingers or elements of a controlling device, as hereinafter described. The pawl is normally maintained by the action of the spring 17 with the edge of its arm 18 in pin-engaging position, the spring, however, permitting the pawl to yield so that its engaging arm 18 will ride over the clutch pins when the shaft is rearwardly rotated for any purpose, as in effecting an adjustment of the needle bar, and also so that the pawl may be tilted by the controlling device to throw it out of engagement with either clutch pin in adjusting the feed mechanism for the different actions previously described. The arm 19 of the pawl is provided at one side with a notch 20, thereby forming a finger 21. While I have shown and described a particular relative construction and arrangement of the clutch pins and pawl, any equivalent construction and arrangement of these parts or any equivalent construction of means for performing the same function may be employed.

In some types of machines the main shaft 1 rotates in the upper horizontal arm of the machine, which is made hollow for this purpose, and mounted on said shaft within the arm is the cam or eccentric (not shown) which actuates the shuttle mechanism and also, as shown, the cam, or eccentric which imparts the back and forth or horizontal reciprocatory motion to the feed bar or plate. A supporting bar or strip 22 is mounted in practice in said hollow arm of the machine below and in advance of the shaft 1 or in any other suitable position to avoid interference with the rotating parts, and is connected at one end with the rod 8 for vertical reciprocatory motion therewith. In the present instance I have shown such end of the bar formed with a longitudinal slot 23 through which passes a screw 24 entering the rod and slidably and detachably securing the bar thereto, the slidable connection permitting the controller to be properly arranged for operation with respect to the feed pawl. The other end of the bar 22 is connected with an adjusting lever or handle 25 which is designed in practice to extend outwardly through a slot in the hollow arm of the machine. This lever or handle is shown in the present instance as extending through a longitudinal slot 26 in a latch plate 27 and provided with a spring locking dog or member 28 normally movable away from said lever to engage the end portions 29 and 30 of the upper wall of the slot or to engage an intermediate notch or recess 31 therein for the purpose of locking the bar in different positions.

A pair of posts 32 projects from the face of the slotted end of the bar 22 and supports a fixed pivot pin 33 carrying a permutation controlling device 34 in the form of a sub-

stantially rectangular controlling plate having at its normally lower edge rearwardly bent ears 35 pivotally engaging said pin. This controlling plate is arranged immediately below and in advance of the clutch members 10 and 13 and the feed pawl 16 and inclines upwardly and rearwardly toward the same, its upper edge being arranged to normally rest upon the upper edge of the bar 22 to support it in such inclined position. A spring 36 surrounds the pin 33 and serves to normally maintain the plate in the operative position described, while permitting it to tilt outwardly or forwardly under certain conditions, as hereinafter stated.

The upper edge of the controller plate 34 has extending therefrom terminal fingers 37 and 38 and an intermediate finger 39. The fingers 38 and 39 are straight and extend in parallel relation, while the finger 37 is L-shaped and produces between it and the finger 39 a notch 40. The fingers 37 and 39 are coextensive in length or project the same distance from the plate, while the finger 38 is relatively shorter. In the operation of the machine the bar 22 and controller plate 34 vibrate vertically with the rod 8 as the latter is reciprocated up and down by the action of the eccentric 7. The fingers 37, 38 and 39 are arranged to be brought by a longitudinal shifting movement of the bar 22 independently in the path of movement of the arm 19 of the pawl to control the action of the latter. The purpose of the finger 39 is to trip the pawl on each half revolution of the shaft 1 for alternate engagement with the pins 11 and 12 and correspondingly varying the movement of the rod 8 to alternately shift the feed plate 6 backward and forward. The fingers 37 and 38 are designed to trip and reset the pawl for a continuous backward or forward feed of the fabric, to properly dispose the pawl for one of these purposes after the mechanism has been operated for a different action.

The arrangement of the eccentric 7 is such with relation to the pins 11 and 12 that the pawl 16 when engaged with the pin 11 is adapted to couple the eccentric to the shaft 1 to transmit a continuous forward feed to the fabric in the usual way, and when the pawl is engaged with the pin 12 a reverse feed motion is set up to continuously feed the fabric backward. When the parts are adjusted for the "shuffle" stitch the pawl is controlled in action to alternately engage the pins 11 and 12 and thus effect an alternate back and forth movement of the feed plate and fabric within the limits of a single stitch. Assuming that the parts have been previously arranged for either a forward feed or a shuffle stitch action, Fig. 4 shows the controller adjusted to correct and control the pawl for a backward feed action,

the pawl being in engagement with the forward feed clutch pin 11 and the eccentric arranged for the downward stroke of the rod 8. The machine being set into operation, the pawl will transmit motion to the eccentric and its finger 21 will engage the finger 37 of the controller, whereby the arm 18 of the pawl will be thrown by the tripping of the pawl out of engagement with the pin 11 and the finger 21 will slide upon and past the finger 37. The pawl will then resume its normal position through the action of the spring 17 and will move around with the shaft 1 while the eccentric is at rest for a half revolution until it engages the pin 12, by which operation it will be corrected or set for the backward feed action. During the interval of downward movement of the pawl and until it is tripped by the finger 37, the downward movement of the rod is completed, so that as soon as the pawl engages the pin 12 the eccentric begins its upward stroke which is completed and the rod and controller plate move to their highest limit of movement at the time the arm 19 of the pawl in its orbit of movement comes into close proximity to the controller. As a result the parts are so disposed as to permit the reduced portion of the arm 19 and finger 21 of the pawl to pass through the notch 40 in the controller plate and the finger 37 of the latter to pass through the notch 20 in said arm, whereby the pawl on each revolution is adapted to pass through the controller without interference, so that the feed mechanism will now be operated for a continuous backward feed motion of the fabric. Fig. 5 shows the relative arrangement of the parts of the controller and the trip arm of the pawl when the controller is adjusted for this operation and at that point in the orbit of the movement of the pawl where it passes through the notch in the controller.

When it is desired to set the parts of the feed mechanism to effect a forward feed of the fabric, the bar 22 is shifted by means of the handle 25 until the finger 38 of the controller is brought to a position opposite the path of movement of the pawl. The pawl being in engagement with the backward feed pin 12, it will be apparent that on the first revolution of the eccentric under these conditions the rod 8 and controller plate will be at the limit of their upward movement at the time the arm 19 approaches said plate, so that said arm will strike the finger 38 which will trip the pawl to move it out of engagement with the pin 12. The pawl will thereupon ride over and past the finger 38 and continue its motion for a half revolution while the eccentric is at rest until it engages the pin 11, when the downward movement of the rod 8 and controller will begin, which movement will be sufficient at the time the arm 19 approaches the plate to throw the finger 39 below and out of the path of movement of the pawl. The pawl may thus continue to rotate and transmit motion to the eccentric through the pin 11 without interference from the controller to impart a forward fabric feed motion to the feed plate 6. The operator on reaching the end of a seam sewed in the fabric during such forward feed motion by the adjustment of the controller to the position first described and shown in Figs. 4 and 5, may reverse the feeding action so that the fabric may be fed backward and a reverse seam sewed therein for any distance from the end of the seam, to either double the strength of the seam, or to tie or lock the end of the thread, which latter may be then severed to free the fabric. A shifting of the adjusting handle to its opposite position from this reverse feed motion will restore the parts to the operative position for normal or forward feed motion, as will be readily understood.

It is desirable under some conditions to tie or lock the thread in a different manner from that described in order that the thread may be tied within the length of a single stitch, which is accomplished by adjusting the feed mechanism to reciprocate the feed plate back and forth to stitch over and over through the fabric at one point and make what I term a "shuffle" stitch. It will be apparent from the foregoing description that in the adjustment of the parts for the forward and backward feeding operations, the parts are locked in these respective positions by the engagement of the spring locking dog 28 with the surfaces 29 and 30 of the latch plate 27. In adjusting the feed mechanism for the shuffle stitch action, the lever 25 is moved to a central position in which it is held by the snapping of the spring dog into the notch 31 of the latch plate. By this adjustment the controller plate 34 will be moved to bring the finger 39 into the path of movement of the arm 19 of the feed pawl, so that said pawl will be tripped on each half revolution thereof. Assuming that the pawl is in engagement with the pin 12, it will be understood that the parts will be set for a backward motion of the fabric the length of a single stitch, at which time the arm 19 will engage the finger 39, by which the pawl will be tilted and released from engagement with said pin 12. The eccentric 7 will, therefore, remain at rest for a half revolution during the time of the stitch, or until the pawl engages the pin 11, whereby the feed plate will be reciprocated in a forward or opposite direction, at the end of which motion the pawl will again be retracted by the trip device. In this manner the pawl will alternately engage the two pins to effect the reciprocation of the feed plate to move the fabric back

and forth the length of a single stitch at proper intervals to stitch over and over through the fabric at a single point, thus locking the end of the thread in an effective manner. After the thread is severed for the release of the fabric, the mechanism may be shifted for a forward feed motion in the manner previously described. By adjusting the mechanism the thread may be tied or locked at the beginning or end of the seam in either of the ways described, as will be readily understood.

In making a garment or other article consisting of several or many parts, two or more of the parts, after having been sewed together, may have to be handled many times before all these parts are united to form the complete garment. In this repeated handling of the unfinished parts, the ends of the seams are subjected to more or less strain, which loosens the stitches at the ends of the seams, and if the threads of the seams have been cut off close to the fabric, one or more of the stitches may ravel out. To avoid this, careful operators leave a sufficient length of loose or free thread at each end of a seam and then tie the loose ends to form a knot, to prevent raveling. This loss of thread and time is avoided by my invention, since, having either shuffle or backward-stitched the end of the seam, the thread is effectually locked against raveling and the threads may be cut off close up to the fabric. Further, when it is desired to sew a zigzag seam across a piece of fabric, to either strengthen or stiffen it, my mechanism renders the operation easy and rapid, by avoiding the repeated reversals of the fabric that are necessary in sewing machines as ordinarily constructed.

In practice the latch plate 27 may be suitably secured to the hollow arm of the machine, in which event the slot 26 and notch 31 will register with a corresponding slot and notch in the arm. If desired, however, a lock plate as such may be dispensed with and the lever extended through a slot having locking portions of the character described formed directly in the arm. It will be understood that the pivotal mounting of the controller plate 34 adapts it to tilt back when struck by the pawl, to prevent injury thereto or to the pawl, when the shaft 1 is turned backwardly for any purpose, such as, for instance, in the operation of elevating the needle bar to permit the needle to be threaded.

I claim:—

1. In a feed mechanism for sewing machines, the combination of a drive shaft, a feed bar, eccentrics, one fixed to and the other loosely mounted on the shaft, means actuated by the fixed eccentric for vertically oscillating the feed bar, means actuated by the loose eccentric for horizontally oscillat-

ing the feed bar, a clutch connection between the shaft and loose eccentric controllable to set said eccentric to transmit either a forward or a backward feed motion to the feed bar, said clutch connection embodying a member having spaced contacts and a second member movable to engage either contact, and an adjustable controlling device having contact portions to engage said second member for adjusting it into engagement with either contact or alternately throwing it into and out of engagement with said contacts.

2. In a feed mechanism for sewing machines, the combination of a drive shaft, a feed bar, eccentrics, one fixed to and the other loosely mounted on the shaft, means actuated by the fixed eccentric for vertically oscillating the feed bar, means actuated by the loose eccentric for horizontally oscillating the feed bar, a clutch connection between the shaft and loose eccentric controllable to set said eccentric to transmit a forward or backward feed motion to the feed bar or a reciprocatory feed motion to said bar, and means for controlling said clutch connection for the purposes described.

3. In a feed mechanism for sewing machines, the combination of a drive shaft, a feed bar, an eccentric loosely mounted on the shaft, connecting means between the eccentric and feed bar for oscillating the latter, a clutch connection between the shaft and eccentric for reversing the direction of feed motion of the bar, said clutch connection embodying a member having spaced contacts and a member movable to engage either contact, and an adjustable controlling device having contact portions to engage said second member for shifting it into and out of engagement with the contacts.

4. In a feed mechanism for sewing machines, the combination of a drive shaft, a feed bar, an eccentric loosely mounted on said shaft, connecting means between the eccentric and feed bar for oscillating the latter, a clutch connection between the shaft and eccentric for controlling the operation of the latter to secure a feed motion of the feed bar in either direction or to alternately reciprocate said bar for a corresponding backward and forward feed motion, and means for controlling said clutch mechanism for the purposes set forth.

5. In a feed mechanism for sewing machines, the combination of a drive shaft, a feed bar, means for oscillating said bar including an eccentric loose on the shaft and connections between the same and the bar, circumferentially spaced contacts carried by the eccentric, a spring-actuated pawl mounted on the shaft and tripable to engage the respective contacts for transmitting motion to the eccentric to move the feed bar either backward or forward on its feed motion, and

a controller having fingers to engage the pawl adjustable to set said fingers to trip the pawl for either operation.

6. In a feed mechanism for sewing machines, the combination of a drive shaft, a feed bar, an eccentric loose on the shaft, means operated thereby for oscillating the feed bar, a clutch member connected with the eccentric and having circumferentially spaced contacts, a clutch member carried by the shaft operative to engage one or the other of said contacts for actuating the eccentric to transmit a forward or backward feed motion to the feed bar or to alternately engage the contacts for imparting a reciprocatory back and forth feed motion to the feed bar, and a device operative to control said clutch member for effecting said operation.

7. In a feed mechanism for sewing machines, the combination of a drive shaft, a feed bar, an eccentric loosely mounted on the shaft, circumferentially spaced contacts carried by the eccentric, a spring actuated pawl carried by the shaft to engage one or the other of said contacts for setting said eccentric to impart a backward or forward motion to the feed bar or to alternately engage said contacts to effect an alternate back and forth feed motion of the feed bar, and adjustable controlling means for regulating the action of the pawl for the purposes described.

8. In a feed mechanism for sewing machines, the combination of a drive shaft, a feed bar, an eccentric loose on the shaft and provided with circumferentially spaced contacts, a pawl fixed to the shaft to engage said contacts, and controlling means operative to effect the engagement of the pawl with either contact or its alternate movement into and out of engagement with said contacts.

9. In a feed mechanism for sewing machines, the combination of a drive shaft, a feed bar, an eccentric loose on the shaft and provided with circumferentially spaced contacts, a resilient pawl carried by the shaft to engage said contacts, and an adjustable controller having portions to engage and trip the pawl to set it for engagement with either contact or to adapt it to alternately engage said contacts.

10. In a feed mechanism for sewing machines, the combination of a drive shaft, a feed bar, an eccentric loose on the shaft and provided with circumferentially spaced contacts, a resilient pawl carried by the shaft to engage said contacts, and an adjustable controller having projecting fingers to engage and trip the pawl to set it for engagement with either contact or to alternately shift it into engagement with said contacts.

11. In a feed mechanism for sewing machines, the combination of a drive shaft, a feed bar, an eccentric loose on the shaft and

provided with circumferentially spaced contacts, means including a rod actuated by the eccentric for oscillating the feed bar, a pawl carried by the shaft and movable to engage either contact or to be alternately thrown into and out of engagement with said contacts, a controller adjustably mounted on and movable with the rod and having portions for engaging and tripping the pawl for the purposes described, and means for adjusting said controller.

12. In a feed mechanism for sewing machines, the combination of a drive shaft, a feed bar, an eccentric loose on the shaft and provided with spaced contacts, means including a rod actuated by the eccentric for oscillating the feed bar, a pawl carried by the shaft and operative to engage either contact, and a controller mounted on and movable with the rod and having portions for engaging and tripping the pawl.

13. In a feed mechanism for sewing machines, the combination of a feed bar, means for oscillating the same, a clutch device forming part of said means for varying the feed motion to move the bar either forward or backward on such motion or to impart an alternate back and forth feed motion thereto, and means independent of said clutch device for controlling the action thereof for the purposes set forth.

14. In a feed mechanism for sewing machines, the combination of a feed bar, mechanism for oscillating the same, a clutch device forming part of said mechanism for varying the feed motion of the bar, said clutch device embodying a clutch member having spaced contacts and a cooperating clutch member to engage the respective contacts for transmitting motion to respectively move the feed bar backward and forward on its feed motion, and an adjustable controller having elements to set said clutch member to engage either contact or alternately engage it with and release it from said contacts to reciprocate the feed bar alternately backward and forward.

15. In a feed mechanism for sewing machines, the combination of a drive shaft, a feed bar, an eccentric loose on the shaft and provided with spaced contacts, means including a rod actuated by the eccentric for oscillating the feed bar, a pawl carried by the shaft and movable to engage either contact, a controller mounted on and movable with the rod and provided with fingers to engage and set the pawl, and means for adjusting said controller to bring said fingers into pawl engaging position.

16. In a feed mechanism for sewing machines, the combination of a drive shaft, a feed bar, an eccentric loose on the shaft and provided with circumferentially spaced engaging members, means actuated by the eccentric for oscillating the feed bar, a clutch

member carried by the shaft and operative to engage either engaging member, and a permutation controlling device having fingers for engaging and adjusting said clutch member.

17. In a feed mechanism for sewing machines, the combination of a drive shaft, a feed bar, an eccentric loose on the shaft and provided with spaced clutch members, a trippable clutch member adapted to engage one or the other of the first named clutch members to oscillate the feed bar in one direction or the other, and a permutation controlling device having fingers for tripping and setting said clutch member.

18. In a feed mechanism for sewing machines, the combination of a drive shaft, a feed bar, an eccentric loose on the shaft and provided with spaced clutch members, a co-acting spring actuated clutch member on the shaft movable to engage either of said spaced clutch members or to be alternately thrown into and out of engagement therewith, and a controlling device provided with portions to engage said movable clutch member for the purpose described and adjustable to move said portions into and out of operative position.

19. In a feed mechanism for sewing machines, the combination of a feed bar, means for oscillating the same, a clutch device forming part of said means for varying the direction of feed motion of the feed bar, said device embodying coöperating clutch members, and an adjustable controlling de-

vice having spaced portions to respectively engage and set one of said clutch members for oscillating the bar in one direction or the other.

20. In a feed mechanism for sewing machines, a driving shaft, an oscillatory feed bar, eccentrically operated means for oscillating said bar from said shaft, a clutch device forming part of said means and embodying coöperating elements adjustable to vary the motion of the driving connections to oscillate the feed bar in one direction or the other, an adjustable permutation controlling element having spaced contact portions for setting said clutch for the purposes described, and means for adjusting said element.

21. In a feed mechanism for sewing machines, a driving shaft, an oscillatory feed bar, an operating connection between the shaft and bar including a clutch formed of coöperating members, one having spaced contacts and the other a pawl adjustable to engage either contact or to alternately engage the same, a controller having spaced fingers to engage and trip the pawl, and means for adjusting said controller to set the fingers into operative position.

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

ARTEMAS L. DAWSON.

Witnesses:

C. C. HINES,

E. A. WAKEFIELD.