

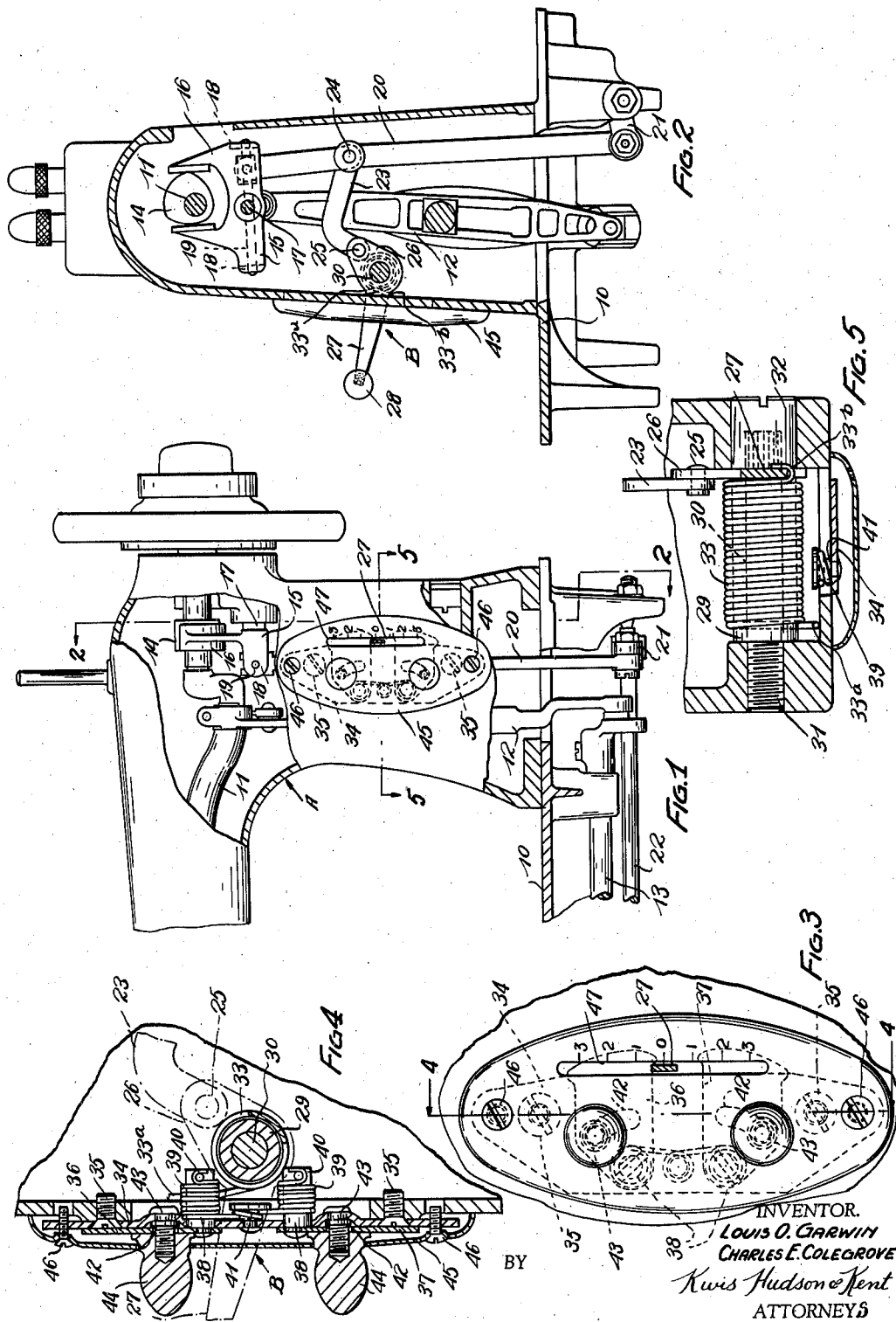
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STITCH REGULATING MECHANISM FOR SEWING MACHINES

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STITCH REGULATING MECHANISM FOR
SEWING MACHINES

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This invention relates to a sewing machine and more particularly to means for regulating and indicating the length of stitch thereof.

In operating sewing machines it is often necessary to vary the length of stitch, and accordingly it is customary to provide in sewing machines mechanism to change the amplitude of the feeding movement and consequently the length of stitch. This mechanism should be controllable with facility by the machine operator, and ordinarily the control member for this purpose has a portion located exteriorly of the sewing machine head where it can be readily grasped by the operator to move the member to regulate said mechanism and vary the length of stitch. In order that the operator will know definitely the position to which said member should be moved to obtain a certain length stitch, indicating means may be operatively associated with the control member.

An object of the invention is to provide in operative association with the control member of the regulatable feed actuating mechanism that determines the length of stitch of a sewing machine, improved and novel adjustable means for limiting the movement of said member at predetermined points correlated to stitch lengths and for indicating the length of stitch to be obtained when said member is located at said points.

Another object is to provide means such as specified in the first object and which is simple in construction, can be readily adjusted, and is accurate and positive in operation.

Sewing machines may be provided with feed actuating mechanisms which can have their operation reversed so that the machine may stitch in either the forward or reverse direction, as desired.

A further object is, therefore, to provide in operative association with the control member of a sewing machine regulatable feed actuating mechanism of the reversible feed type, improved and novel adjustable means for limiting the movement of said member at predetermined points correlated to stitch lengths in either the forward or reverse direction and for indicating the length of stitch to be obtained in either direction when said member is located at said points.

A still further object is to provide means, such as set forth in the last object, and which is so constructed that the length of stitch in the forward or reverse direction may be independently regulated.

Inasmuch as the normal operation of a sewing machine is in the forward stitching direc-

tion, another object is to provide in a sewing machine regulatable feed actuating mechanism of the reversible feed type, improved means for indicating and controlling the length of stitch in either the forward or reverse direction and including a manually movable member for controlling said mechanism and the length and direction of stitch, together with means for normally maintaining said member in, or for returning it to, a position wherein the stitching movement will be in a forward direction.

Further and additional objects not hereinbefore noted will become apparent hereinafter during the following detailed description of an embodiment of the invention that is illustrated in the accompanying drawing, wherein

Fig. 1 is a fragmentary front view of a sewing machine head, partly in elevation and partly in section, and shows stitch regulating and indicating means thereon embodying the invention.

Fig. 2 is a transverse vertical sectional view through the sewing machine head shown in Fig. 1 and is taken substantially on line 2—2 of Fig. 1 looking in the direction of the arrows.

Fig. 3 is a fragmentary front elevational view of that portion of the sewing machine head upon which the stitch regulating and indicating means is mounted and is on a larger scale than Fig. 1.

Fig. 4 is a vertical sectional view taken substantially on line 4—4 of Fig. 3 looking in the direction of the arrows, certain parts which would not actually appear in the section being indicated by dash lines to illustrate their relationship to the other parts, and

Fig. 5 is a fragmentary horizontal sectional view on an enlarged scale through line 5—5 of Fig. 1 looking in the direction of the arrows.

The invention will be described herein by way of illustration as applied to a sewing machine of the reversible feed type, inasmuch as it has particular utility in connection with this type of machine, but it should be understood that the invention, in certain of its aspects, also could be usefully applied to a sewing machine of the non-reversible feed type.

The feed actuating mechanism is shown herein as located in the upper part of the gooseneck of the sewing machine head, but it will be appreciated that the invention may be applied equally as well to a sewing machine wherein said mechanism is located beneath the bed plate of the head.

The sewing machine head shown in the drawing comprises the usual bed plate 10 having the hollow gooseneck A, as will be well understood. The main shaft 11 that actuates the needle bar

and take-up mechanism (not shown) of the machine is located in the horizontal arm of the gooseneck and is provided with a crank portion operatively connected to a main connecting assembly indicated generally at 12 and located in the vertical arm of the gooseneck. The main connecting assembly 12 extends below the bed plate 10 and is operatively connected to a shaft 13 that actuates the hook or shuttle mechanism (not shown as the arrangement is well known).

The main shaft 11 has fixed thereto a cam 14 for operating the feed actuating mechanism which comprises a rocker plate 15 having an upwardly extending forked portion 16 that embraces and contacts the cam 14. The rocker plate 15 is rockably connected to the interior of the gooseneck intermediate the ends of the plate as indicated at 17. The left hand side of the rocker plate, as viewed in the drawing, is provided at its opposite ends with laterally extending lugs 18 which support a pin 19 on which is slidably mounted a block. This block is located between the forked upper end of a feed actuating pitman 20 and the block is connected to said end by a pin extending through it transversely to the pin 19, as will be well understood. The lower end of the pitman 20 is pivotally connected to one end of a link 21, the opposite end of which link is operatively connected to the rock shaft 22 that extends beneath the bed plate 10 and, in turn, is operatively connected to the feed bar (not shown).

The construction heretofore described is well known in the art and consequently need not be set forth in greater detail. It is also well understood that when the point of connection between the rocker plate 15 and the upper end of the pitman 20 is shifted along the pin 19 on one side of the axis of the rocking movement of the plate the length of feeding movement or the length of stitch in one direction will be varied, while when the movement occurs along the pin on the opposite side of said axis the feeding movement or stitch length in the opposite or reverse direction is varied. In Fig. 2 the connection between the plate and pitman is on that side of the axis that results in normal or forward feeding or stitching movement.

The shifting of the location of the point of connection between the pitman 20 and the rocker plate 15 to vary the length and direction of stitch will now be explained.

An angularly shaped link 23 has one of its ends pivotally connected to the pitman 20 intermediate the ends of the latter as indicated at 24 in Fig. 2. The opposite end of the link 23 is pivotally connected, as indicated at 25 in Figs. 2, 4 and 5, to the free end of one arm 26 of an angular lever designated in its entirety by the letter B and constituting the control member for regulating the feed actuating mechanism. The other arm 27 of the control member or lever B extends outwardly through an elongated vertical opening in the vertical arm of the gooseneck A to the front side of the sewing machine head where it is readily accessible to the operator; the outer end of said arm of the lever being provided with a knob 28 or similar element for the convenience of the operator in moving the lever.

The control member or lever B is pivoted at the junction of its arms 26 and 27 upon a sleeve 29 extending between two spaced internal bosses in the gooseneck and carried by a supporting bolt 30 having a threaded end portion 31 screwed into

a tapped opening in one of the bosses and a head 32 located in an opening in the other boss and accessible from the exterior of the gooseneck to facilitate assembly and disassembly.

It will be seen that pivotal movement of the control member or lever B upon movement of the arm 27 thereof by the operator acts, through the link 23, to move the pitman 20 and shift its point of pivotal connection to the rocker plate 15 along the pin 19, thus changing the amplitude of the oscillating movement imparted to the pitman by the rocker plate, with a resultant change in the length of movement of the feeding mechanism and the length of stitch. Of course when the control member or lever B is pivotally moved by a downward movement of the arm 27 thereof past a given point, the connection between the upper end of the pitman 20 and rocker plate 15 is shifted to that side of the axis of the plate where reverse operation of the feed actuating mechanism takes place.

Although it is often desirable to stitch in the reverse direction, the normal or usual operation of the machine is in the forward direction and, therefore, it is decidedly advantageous that the feed actuating mechanism normally is arranged for forward stitching. In order to attain this end means is provided that serves to constantly urge the arm 27 of the control member or lever B in an upward direction, wherefore when the operator releases the arm 27 after stitching in the reverse direction it is immediately moved upwardly to bring the point of connection between the pitman and rocker plate to that side of the axis of the latter wherein forward stitching movement occurs. The means just referred to comprises a coil spring 33 surrounding the sleeve 29 and having one end portion 33a in engagement with the wall of the gooseneck A and the other end portion 33b hooked beneath the arm 27 of the control member or lever B. It will be seen that downward movement of the arm 27 tensions the spring 33 and that when downward pressure is removed from the arm the end portion 33b of the spring 33 will move the arm upwardly and thus normally maintain the parts in position for forward stitching movement.

As previously stated, the arm 27 of the control member or lever B extends through an elongated vertical opening in the vertical arm of the gooseneck A and there is arranged on the front side of this vertical arm means operatively associated with the lever arm 27 of the control member for limiting movement of said member in opposite directions and at predetermined points and for indicating the length of stitch in either the forward or reverse direction. This means will now be described.

A vertically elongated mounting plate 34 extends over the elongated opening in the vertical arm of the gooseneck A and is connected to said vertical arm by screws 35, it being noted that a portion of said opening is not covered by the plate and thus is provided a vertically elongated slot through which extends the arm 27 of the control member B. Stop members for limiting the movement of the arm 27 in opposite directions, and hence the length of stitch in the forward or reverse direction, are mounted on the outer side of the plate 34. These stop members are in the form of sector-like plates 36 and 37 having their small ends fixed to rotatable pins 38 mounted in the plate 34 and extending into the interior of the gooseneck (see Fig. 4).

A spring 39 has its opposite end portions wound

around the pins 38 and hooked about abutment elements 40 carried by the pins, while the middle portion of the spring 39 is wound about a fixed pin 41 carried by the plate 34 on the inner side thereof. It will be seen that the spring 39 acts to normally rotate the upper pin 38 and its attached sector plate 36 in a clockwise direction and to normally rotate the lower pin 38 and its attached sector plate 37 in an anti-clockwise direction. This results in the sector plates having a normal tendency to move toward each other with their arcuate ends extending across the slot and lying in the path of movement of the arm 27. It will be seen that if the sector plates are locked against movement at predetermined points they will act as limiting stops for the arm 27 and thus can arrest movement of said arm at various points correlated to stitch lengths in either the forward or reverse direction.

The sector plates 36 and 37 are provided with arcuate slots 42 formed about the pins 38 as centers and threaded studs 43 carried by the plate 34 extend through these slots. Locking knobs 44 are mounted on the studs 43 and it will be seen that when said knobs are screwed down tightly against the sector plates 36 and 37 said sector plates will be clamped between the knobs and the plate 34 against movement in either direction. The arcuate slots 42 are of predetermined length to limit the amplitude of movement of the sector plates in opposite directions in a manner such that said plates can be used as limiting stops for the arm 27 of the control member B at any point between minimum and maximum stitch length in either the forward or reverse direction.

A cover and indicating plate 45 is mounted over the plate 34 and is attached thereto by screws 46. This plate 45 is provided with openings through which the knobs 44 extend and with a vertically elongated slot 47 through which extends the arm 27 of the control member or lever B. The plate 45 adjacent to the slot 47 is provided with suitable graduations and numerals to guide the operator in positioning the arm 27 and correlated to stitch lengths in either the forward or reverse direction.

Assuming that the operator desires to employ a stitch length in the forward direction corresponding to the numeral 2 on the cover plate 45 he loosens the upper knob 44 to unclamp the stop plate 36 and then either moves the arm 27 of the control member or allows the same to move under the action of the spring 33 upwardly until the lower edge of the stop plate 36 is in line with the arrow at the numeral 2, whereupon he again screws the knob 44 downwardly until the stop plate 36 is firmly clamped in this position. In the same way the operator can obtain various desired stitch lengths in the forward direction merely by unlocking the plate 36 and then positioning the lower edge of the plate by movement of the particular point corresponding to the stitch length desired. Likewise, the operator can obtain various stitch lengths in the reverse direction by unclamping the stop plate 37 and moving the same by the arm 27 to the desired location, and then clamping said stop plate in position. As already explained, the spring 33 normally urges the arm 27 in an upward direction, i. e., into forward stitching position and against the upper stop plate 36. When reverse stitching is taking place it will be necessary for the operator to hold the arm 27 in engagement with the lower stop plate 37 until the reverse stitching is

finished, after which, upon release of the downward pressure on the arm 27, the latter will move again into forward stitching position and against the lower edge of the stop plate.

Although a preferred embodiment of the invention has been illustrated and described herein, it will be understood that the invention is susceptible of various modifications and adaptations within the scope of the appended claims.

Having thus described our invention we claim:

1. In a sewing machine having a regulatable feed actuating mechanism, a movable control member operatively associated with said mechanism for regulating the same and thus varying the length of stitch produced by the machine, a rockable stop means having a portion located in the path of movement of said member, means operatively associated with and normally rocking said stop means in a direction to engage said portion with said member, and means for locking said stop means against rocking movement to arrest movement of said control member at predetermined points correlated to different stitch lengths.

2. In a sewing machine having a regulatable feed actuating mechanism, a movable control member operatively associated with said mechanism for regulating the same and thus varying the length of stitch produced by the machine, a pivoted stop means having a portion located in the path of movement of said member, means normally urging said stop means in one direction, and means for locking said stop means against movement in either direction to arrest movement of said control member at predetermined points correlated to different stitch lengths.

3. In a sewing machine having a regulatable feed actuating mechanism, a movable control member operatively associated with said mechanism for regulating the same and thus varying the length of stitch produced by the machine, a rockable stop means having a portion located in the path of movement of said member, means operatively associated with and normally rocking said stop means in a direction to engage said portion with said member, means limiting the rocking movement of said stop means in opposite directions and within predetermined limits, and means for locking said stop means against movement in either direction to arrest movement of said control member at predetermined points correlated to different stitch lengths.

4. In a sewing machine having a regulatable feed actuating mechanism, a movable control member operatively associated with said mechanism for regulating the same and thus varying the length of stitch produced by the machine, a pivoted stop means having a portion located in the path of movement of said member, means normally urging said stop means in one direction, means limiting the movement of said stop means in opposite directions and within predetermined limits, and means for locking said stop means against movement in either direction to arrest movement of said control member at predetermined points correlated to different stitch lengths.

5. In a sewing machine having a regulatable feed actuating mechanism, a movable control member operatively associated with said mechanism for regulating the same and thus varying the length of stitch produced by the machine, a pivoted plate having a portion located in the path of movement of said member, a spring operatively associated with said plate to urge piv-

otal movement of the same in one direction, said plate having an arcuate slot of predetermined length, a threaded stud extending through said slot, and means screwed on said stud for clamping said plate against movement in either direction to arrest movement of said control member at predetermined points correlated to different stitch lengths.

6. In a sewing machine having a regulatable feed actuating mechanism, a movable control member operatively associated with said mechanism for regulating the same and thus varying the length of stitch produced by the machine, a rockable stop means having a portion located in the path of movement of said member, means operatively associated with said member and normally maintaining the same in engagement with said portion of said stop means, means operatively associated with said stop means and normally rocking the same toward said member, and means for locking said stop means against rocking movement to arrest movement of said control member at predetermined points correlated to different stitch lengths.

7. In a sewing machine having a regulatable feed actuating mechanism, a movable control member operatively associated with said mechanism for regulating the same and thus varying the length of stitch produced by the machine, a pivoted stop means having a portion located in the path of movement of said member, means operatively associated with said member and normally maintaining the same in engagement with said portion of said stop means, means operatively associated with said stop means and normally urging the same toward said member, means limiting the movement of said stop means in opposite directions and within predetermined limits, and means for locking said stop means against movement in either direction to arrest movement of said control member at predetermined points correlated to different stitch lengths.

8. In a sewing machine having a regulatable feed actuating mechanism, a movable control member operatively associated with said mechanism for regulating the same and thus varying the length of stitch produced by the machine, a rockable stop means having a portion located in the path of movement of said member, means operatively associated with and normally rocking said stop means in a direction to engage said portion with said member, means cooperating with said control member and provided with indicia representing different stitch lengths, and means for locking said stop means against rocking movement to arrest movement of said control member at different points correlated to different stitch lengths as indicated by said indicia.

9. In a sewing machine having a regulatable feed actuating mechanism, a movable control member operatively associated with said mechanism for regulating the same and thus varying the length of stitch produced by the machine, a rockable stop means having a portion located in the path of movement of said member, means operatively associated with said control member and normally maintaining the same in engagement with said portion of said stop means, means operatively associated with and normally rocking said stop means toward said member, means cooperating with said control member and provided with indicia representing different stitch lengths, and means for locking said stop means against rocking movement to arrest movement

of said control member at different points correlated to stitch lengths as indicated by said indicia.

10. In a sewing machine having a reversible and regulatable feed actuating mechanism, a movable control member operatively associated with said mechanism for controlling the same and thus regulating the length and direction of stitch produced by the machine, a pair of rockable stop means having portions located in the path of movement of said member on opposite sides thereof and rockable independently of each other, means operatively associated with said control member and normally maintaining the same in engagement with the said portion of one of said stop means, and means for locking said stop means against rocking movement to arrest movement of said control member at different points correlated to stitch lengths in either the forward or the reverse direction.

11. In a sewing machine having a reversible and regulatable feed actuating mechanism, a movable control member operatively associated with said mechanism for controlling the same and for thus regulating the length and direction of switch produced by the machine, a pair of rockable stop means having portions located in the path of movement of said member on opposite sides thereof and rockable independently of each other, one of said stop means being adapted to arrest movement of said member to regulate the length of stitch in the forward direction and the other of said stop means being adapted to arrest movement of said member to regulate the length of stitch in the reverse direction, means operatively associated with said control member and normally maintaining the same in engagement with said portion of said first named stop means, and means for locking said stop means against rocking movement to arrest movement of said control member at predetermined points correlated to stitch lengths in either the forward or the reverse direction.

12. In a sewing machine having a reversible and regulatable feed actuating mechanism, a movable control member operatively associated with said mechanism for controlling the same and for thus regulating the length of stitch produced by the machine in either the forward or the reverse direction, a pair of pivoted stop means having portions located in the path of movement of said member on opposite sides thereof and movable independently of each other, and means for locking said stop means against movement to arrest movement of said control member at predetermined points correlated to stitch lengths in either the forward or the reverse directions.

13. In a sewing machine having a reversible and regulatable feed actuating mechanism, a movable control member operatively associated with said mechanism for controlling the same and for thus regulating the length of stitch produced by the machine in either the forward or reverse direction, a pair of pivoted stop means having portions located in the path of movement of said member on opposite sides thereof, one of said stop means arresting movement of said member to control the length of stitch in the forward direction and the other of said stop means arresting movement of said member to control the length of stitch in the reverse direction, means operatively associated with said control member and normally maintaining the same in engagement with said portion of said first named

stop means, and means for locking both of said stop means against movement to arrest movement of said control member at predetermined points correlated to stitch lengths in either the forward or the reverse direction.

14. In a sewing machine having a reversible and regulatable feed actuating mechanism, a movable control member operatively associated with said mechanism for controlling the same and for thus regulating the length of stitch produced by the machine in either the forward or reverse direction, a pair of pivoted stop means having portions located in the path of movement of said member on opposite sides thereof and movable independently of each other, means operatively associated with said stop means and normally urging the same toward said member and each other, means for locking said stop means against movement to arrest movement of said member at predetermined points, and means cooperating with said member and provided with indicia correlated to stitch lengths in either the forward or the reverse direction.

15. In a sewing machine having a reversible and regulatable feed actuating mechanism, a movable control member operatively associated with said mechanism for controlling the same and for thus regulating the length of stitch produced by the machine in either the forward or the reverse direction, a pair of pivoted stop plates having portions located in the path of movement of said member on opposite sides thereof, means operatively associated with said stop plates and acting to normally urge the same toward said member and each other, said stop plates being provided with arcuate slots of predetermined length correlated to maximum and minimum stitch lengths in opposite directions, threaded studs extending through said slots, a cover mounted over said stop plates and provided with a slot through which said control member extends and with openings through which said studs are accessible, indicia carried by said cover adjacent said slot and representative of different stitch lengths in either the forward or reverse direction, and knobs screwed on said studs and extending to the exterior of said cover and acting to clamp said stop plates against movement to arrest movement of said member at different predetermined points correlated to stitch lengths in opposite directions.

16. In a sewing machine having a regulatable feed actuating mechanism, a rockable control member operatively associated with said mechanism for controlling the same and for thus regulating the length of stitch produced by the machine, and a rockable stop means movable about an axis transverse to the axis of movement of said member and having a portion located in the path of movement of said member.

17. In a sewing machine having a regulatable feed actuating mechanism, a rockable control member operatively associated with said mechanism for controlling the same and for thus regulating the length of stitch produced by the machine, a rockable stop means movable about an axis transverse to the axis of movement of said member and having a portion located in the path of movement of said member, and means normally maintaining said member in engagement with said portion.

18. In a sewing machine having a reversible and regulatable feed actuating mechanism, a rockable control member operatively associated

with said mechanism for controlling the same and for thus regulating the length of stitch produced by the machine in either the forward or reverse direction, and a pair of rockable stop means independently movable about axes transverse to the axis of movement of said member and each having a portion located in the path of movement of said member.

19. In a sewing machine having a regulatable feed actuating mechanism, a rockable control member operatively associated with said mechanism for controlling the same and for thus regulating the length of stitch produced by the machine in either the forward or reverse direction, a pair of rockable stop means independently movable about axes transverse to the axis of movement of said member and each having a portion located in the path of movement of said member, said portion of one of said stop means being located in the zone of movement of said member for regulating the forward stitch length and said portion of the other of said stop means being located in the zone of movement of said member for regulating the reverse stitch length, and means normally maintaining said member in engagement with said first mentioned portion.

20. In a sewing machine having a reversible and regulatable feed actuating mechanism, a rockable control member operatively associated with said mechanism for controlling the same and for thus regulating the length of stitch produced by the machine in either the forward or reverse direction, a pair of rockable stops independently movable about axes located above and below the axis of said member and each having a portion located in the path of movement of said member, and means associated with said member for maintaining the same in engagement with the said portion of one of said stop means and which is located in the zone of movement of said member controlling the length of stitch in the forward direction.

21. In a sewing machine having a regulatable feed actuating mechanism, a rockable control member operatively associated with said mechanism for controlling the same and for thus regulating the length of stitch produced by the machine, a rockable stop means having a portion located in the path of movement of said member, and means normally maintaining said member in engagement with said portion of said stop means.

22. In a sewing machine having a reversible and regulatable feed actuating mechanism, a movable control member operatively associated with said mechanism for controlling the same and for thus regulating the length of stitch produced by the machine in either the forward or reverse direction, a pair of rockable stop means having portions located in the path of movement of said member on opposite sides thereof and movable independently of each other, means operatively associated with and normally rocking said stop means to move said portions toward said member and each other, and means for locking said stop means against rocking movement to arrest movement of said control member at predetermined points correlated to stitch lengths in either the forward or the reverse direction.

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