July 26, 1955 R. E. JOHNSON ET AL 2,713,838

NEEDLE-VIBRATION CONTROLLING MECHANISMS FOR ZIGZAG STITCH SEWING MACHINES

Filed May 25, 1953 5 Sheets-Sheet 1

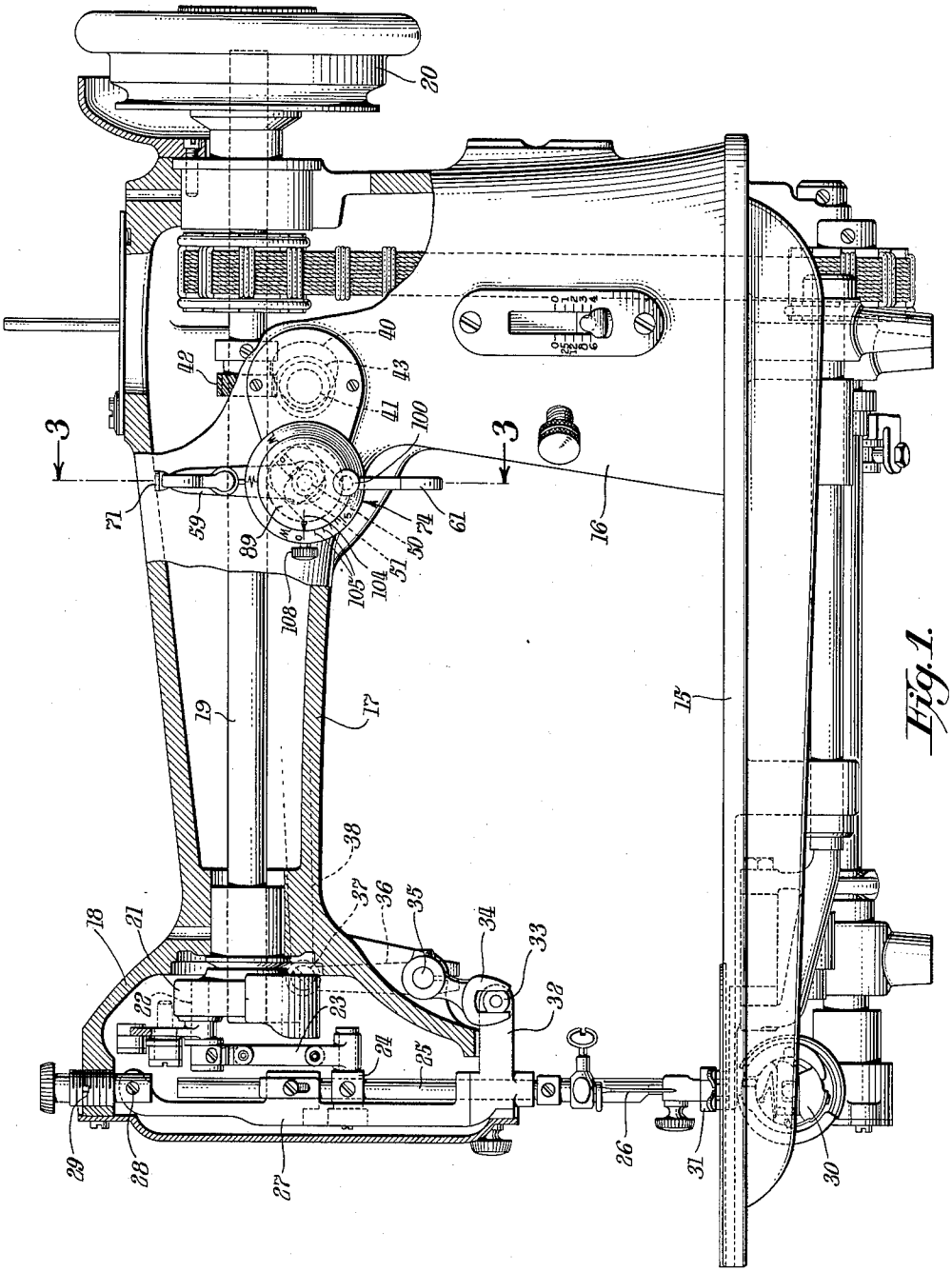


Fig. 1.

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WITNESS

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NEEDLE-VIBRATION CONTROLLING MECHANISMS
FOR ZIGZAG STITCH SEWING MACHINES

Filed May 25, 1953 5 Sheets-Sheet 2

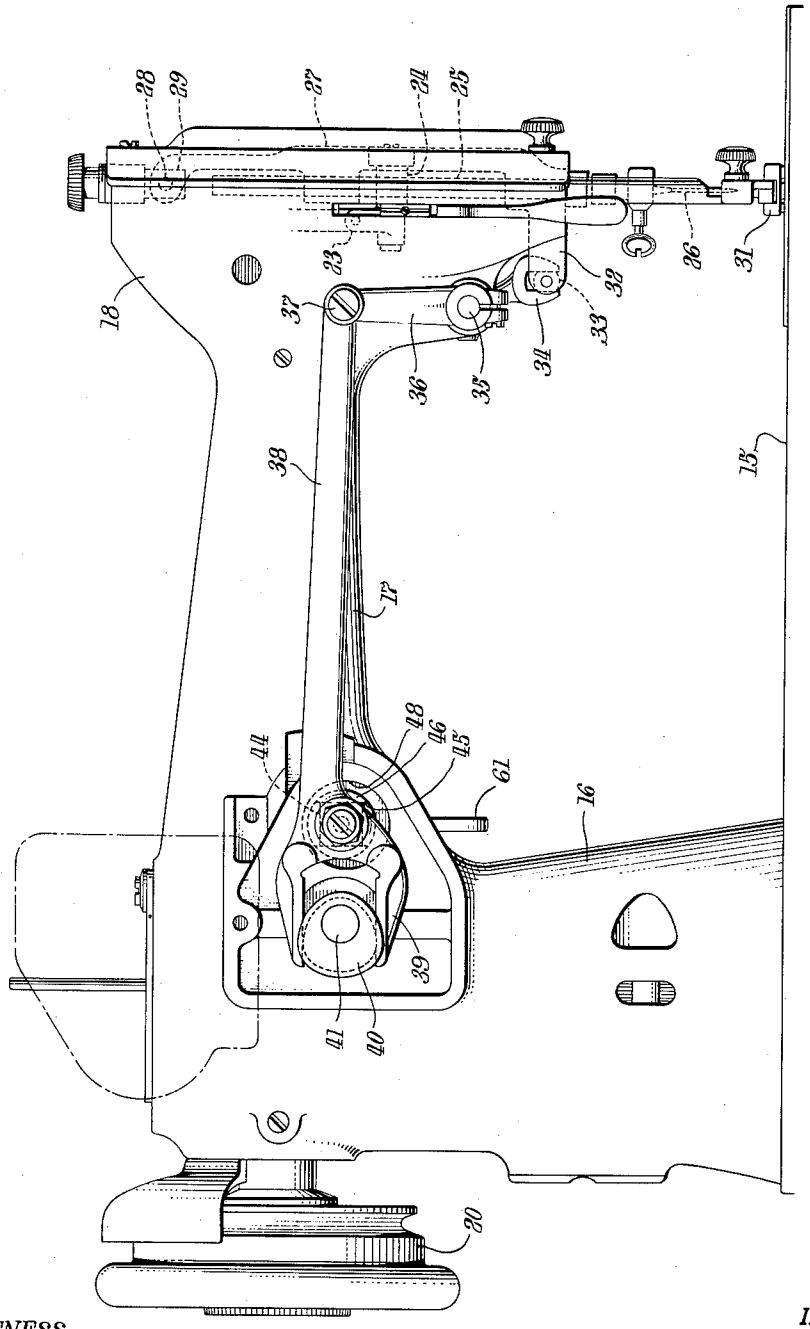


Fig. 2.

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NEEDLE-VIBRATION CONTROLLING MECHANISMS FOR ZIGZAG STITCH SEWING MACHINES

Filed May 25, 1953 5 Sheets-Sheet 3

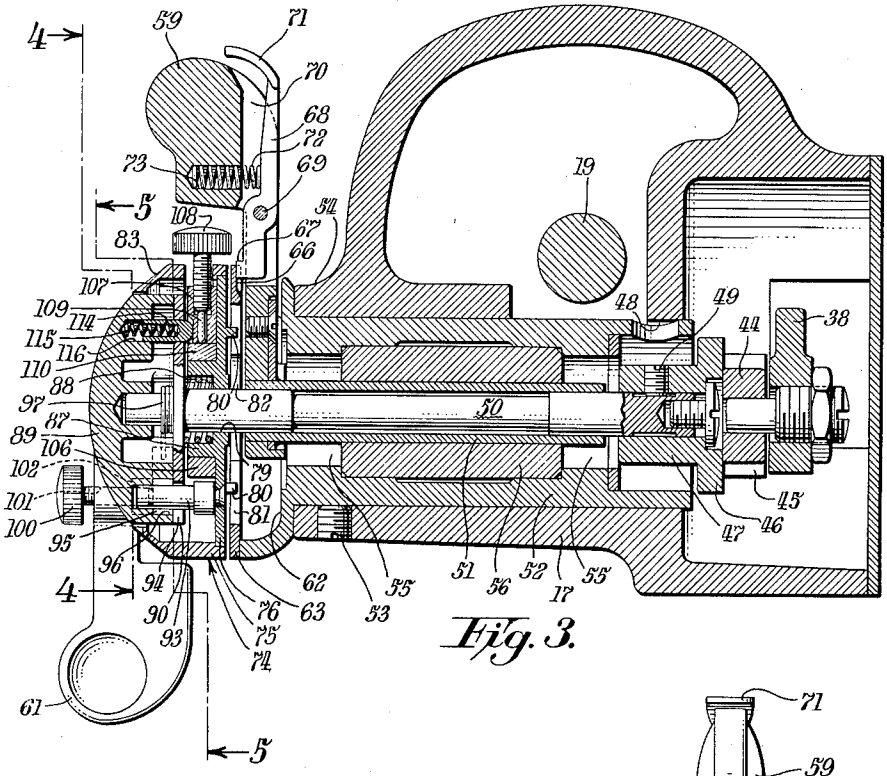


Fig. 3.

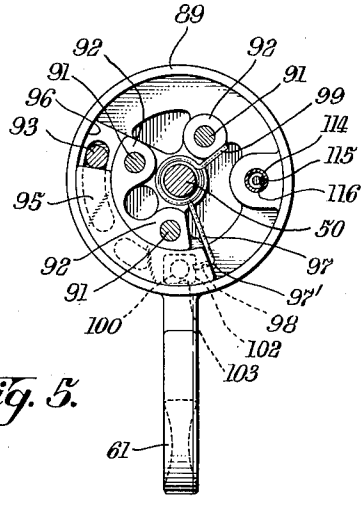


Fig. 5.

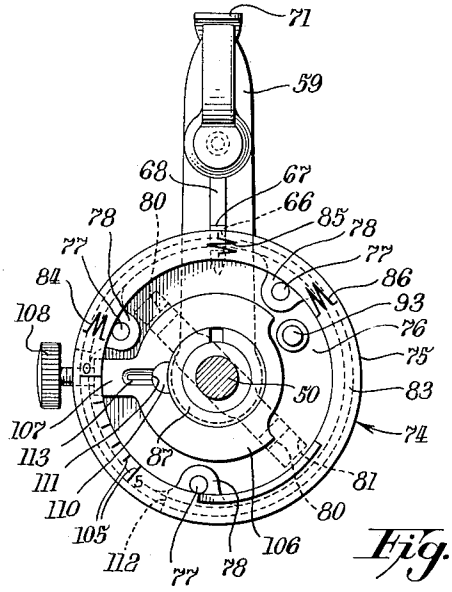


Fig. 4.

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NEEDLE-VIBRATION CONTROLLING MECHANISMS FOR ZIGZAG STITCH SEWING MACHINES

Filed May 25, 1953 5 Sheets-Sheet 4

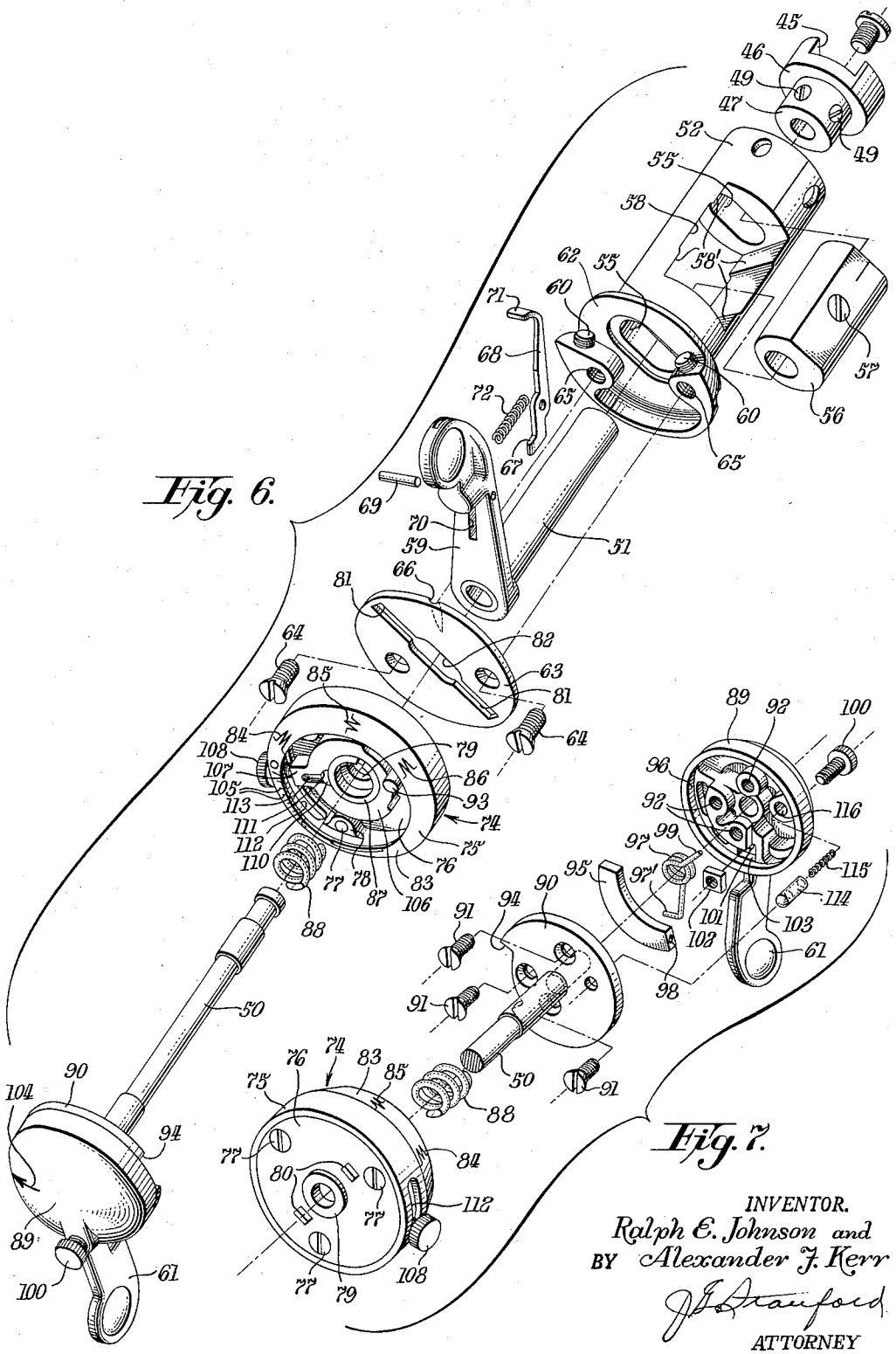


Fig. 6.

Fig. 7.

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NEEDLE-VIBRATION CONTROLLING MECHANISMS FOR ZIGZAG STITCH SEWING MACHINES

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Fig. 11.

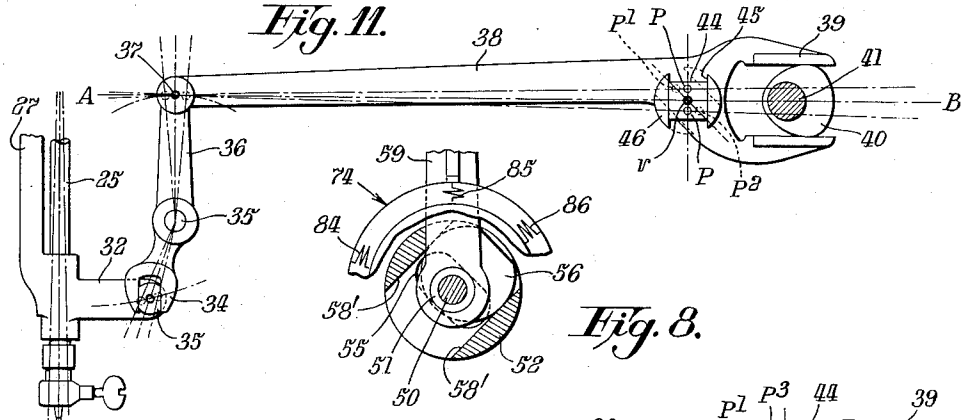


Fig. 8.

Fig. 12.

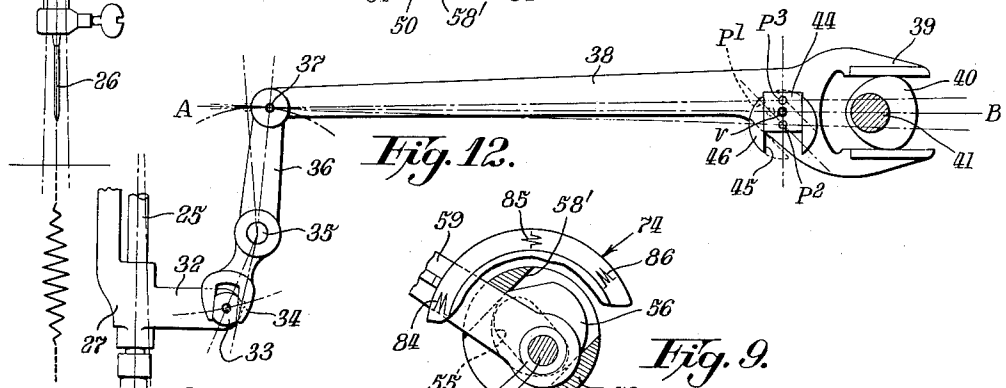


Fig. 9.

Fig. 13.

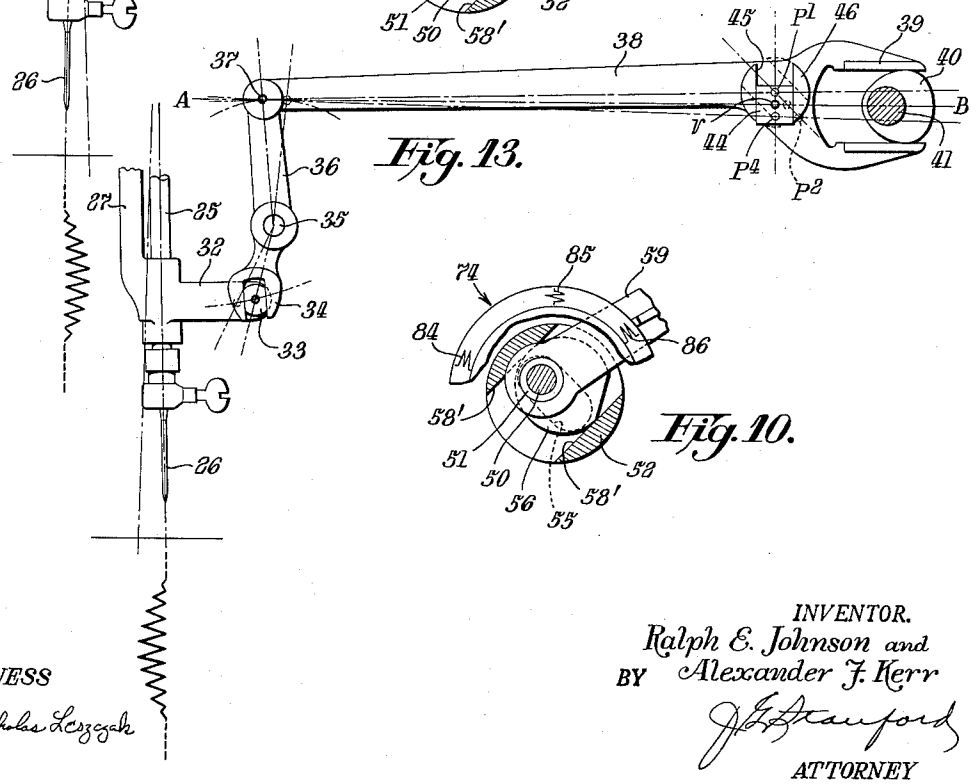


Fig. 10.

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United States Patent Office 2,713,838 Patented July 26, 1955

2,713,838

NEEDLE-VIBRATION CONTROLLING MECHANISMS FOR ZIGZAG STITCH SEWING MACHINES

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Application May 25, 1953, Serial No. 356,928

12 Claims. (Cl. 112—158)

This invention relates to improvements in zigzag stitch sewing machines of the laterally vibratory needle type, and has for an object to provide conveniently controllable means for determining a neutral position of non-vibration of the needle at either the center or at either side of the field of lateral throw of the needle, whereby the needle may be caused to vibrate laterally from zero to maximum either across the center line through the field or entirely from one or the other side of the field of vibration of the needle.

Another object of the invention is to provide neutral position controlling means for a laterally vibratory needle constructed and arranged to maintain a fixed field of maximum vibration of the needle irrespective of the selected neutral position of the needle.

A further object of the invention is to provide simple means for indicating the amplitude of needle vibration in different positions of the mechanism controlling neutral positions of the needle.

Yet another object of the invention is to provide a unitary mechanism which may be applied to a sewing machine, which mechanism is adapted to control the lateral vibratory movements of the needle.

With the above and other objects in view, the invention comprises the devices, combinations and arrangements of parts hereinafter described in connection with the accompanying drawings which illustrate a preferred embodiment of the invention, from which the several features of the invention and the advantages attained thereby will be readily understood by those skilled in the art.

In the drawings:

Fig. 1 represents a side elevation, partly in section, of a sewing machine containing the present improvements.

Fig. 2 represents a rear side elevation of the bracket-arm of the machine.

Fig. 3 represents a sectional view taken substantially along the line 3—3 of Fig. 1.

Fig. 4 represents a sectional view taken substantially along the line 4—4 of Fig. 3.

Fig. 5 represents a sectional view taken substantially along the line 5—5 of Fig. 3.

Fig. 6 represents a disassembled perspective view of the regulating mechanism for controlling the amplitude of needle vibration and different neutral positions of the needle.

Fig. 7 represents a disasembled perspective view of portions of the mechanism disclosed in Fig. 6.

Figs. 8, 9 and 10 represent detailed views illustrating cross-sections of the adjusting shaft in its supporting bushing with the neutral position controlling lever at different limits of movement in respective illustrations.

Figs. 11, 12 and 13 represent detail views of the needle gate vibrating pitman and diagrammatically illustrating the effect of the pitman controlling mechanism in causing the needle to vibrate across and from either side of the neutral position of non-vibration of the needle.

The present improvements are illustrated in the drawings and herein described as embodied in the zigzag stitch

sewing machine disclosed in the United States patent of George M. Eames, No. 2,005,673, dated June 18, 1935.

Referring to the drawings, the sewing machine illustrated has a bed-plate 15, affording a work-support, from one end of which bed-plate rises the hollow standard 16 of a bracket-arm 17, overhanging the bed-plate and terminating at its free end in a head 18.

Rotatably journaled in suitable bearings provided in said bracket-arm 17 is a horizontally disposed main shaft 19, extending lengthwise of the bracket-arm and carrying at one end a driving pulley 20. At its opposite end, the main shaft 19 carries a counterbalanced crank-arm 21 provided with a crank-pin 22 connected by a jointed link 23 to a collar 24 suitably secured upon a vertically disposed needle-bar 25.

The needle-bar 25 carries at its lower end a needle 26 and is journaled for endwise reciprocation in suitable bearings provided in a vibratory gate 27. The gate 27 is pivotally hung upon a screw stud 28 carried by a supporting member 29 adjustably threaded into the upper wall of the bracket-arm head 18 to provide for swinging movements of the gate 27 about a pivotal axis substantially transverse to the axis of rotation of the main shaft 19.

Cooperating with the needle 26, below the cloth-plate and in the formation of lock-stitches, is a loop-taker 30 supported for rotation in a vertical plane parallel to and rearwardly of the plane of needle vibration. The loop-taker is rotated twice for each complete needle reciprocation by suitable driving connections with the main shaft 19. Suitable feeding mechanism of the lower four-motion type is provided for advancing work past the needle in a direction transverse to the plane of needle vibration, any usual or suitable presser-foot 31 being opposed to the work-engaging portion of the feeding mechanism.

Extending horizontally from the lower end of the gate 27 is an arm 32 of which the free end extends externally of the bracket-arm head and carries a pivot-block 33. Embracing the pivot-block 33 is a forked end of a rock-arm 34 depending from the front end of a short rock-shaft 35 disposed horizontally transverse to the main shaft 19 and suitably journaled at the under side of the bracket-arm head 18. Extending upwardly from the rock-shaft 35 at the rearward side of the head 18 is a rock-arm 36 of which the free end is connected by a pivot screw 37 to one end of a pitman 38 disposed horizontally and externally at the rearward side of the bracket-arm 17. The other end of the pitman 38 has a fork or yoke 39 embracing a cam 40 suitably secured upon the rearward end of a cam shaft 41 journaled in the front and rear walls of the bracket-arm 17, said cam shaft 41 being disposed below and horizontally transverse to the main shaft 19. A spiral gear 42 carried by the main shaft 19 drives a spiral gear 43 secured upon the cam shaft 41, whereby the latter is rotated at one-half the speed of rotation of the main shaft.

From the foregoing, it will be understood that, during the operation of the machine, the cam 40 vibrates the pitman 38 laterally about the pivot screw 37 and that the needle 26 performs one complete reciprocation for each lateral throw of the pitman.

In order to translate the laterally vibratory movements of the pitman 38 into effective endwise reciprocatory movements, thereby to impart swinging movements to the needle-bar gate 27, a guide-block 44 (see Figs. 2 and 3) is suitably secured upon the pitman 38 adjacent the yoke 39 and at the side of the pitman adjacent to the bracket-arm 17. The guide-block 44 is shiftably disposed in a guideway 45 constituted by a rearwardly open slot formed in the outer or rearwardly exposed face of an accurately and bodily adjustable guidehead 46. The guideway 45 and the block 44 preferably have straight sides but, if desired, both the guideway and the block

may be arcuate with the center of curvature thereof in one position of the guide-head **46** lying in the pivotal axis of the pitman **38** afforded by its pivotal connection **37** with the rock-arm **36**.

The guide-head **46** has a hub **47** extending freely through an opening **48** in the rear wall of the bracket-arm **17**, whereby the portion of the guide-head containing the guideway **45** is disposed externally of the bracket-arm at the rear side thereof. The guide-head hub **47** is secured by set screws **49** upon an adjusting shaft **50** disposed parallel to the cam shaft **41** and having its longitudinal axis in substantially the horizontal plane containing the axis of rotation of the cam shaft.

The adjusting shaft **50** of the guide-head is rotatably journaled in a bearing sleeve **51** in the form of a hollow shaft telescopically arranged in a coaxial relation with the adjusting shaft and supported for turning and bodily lateral movements thereof by a supporting member in the form of a fixed bushing **52** secured by one or more screws **53** in a suitably apertured bearing boss **54** provided in the front wall of the bracket-arm **17**. The opposite ends of the bearing sleeve **51** are fitted to slide in parallel guide slots **55** provided in the opposite ends of the bushing **52**, such guide slots being elongated in a direction corresponding to the general direction of the center line of the guideway **45** at its limit of angular movement in which the needle **26** has its maximum lateral throw. The guide slots **55** therefore confine the bearing sleeve **51** and the adjusting shaft **50** journaled in said bearing sleeve through lateral movements in a path corresponding to the path of movement of the block **44** in the guideway **45** at the limit of angular movement of the guide-head **46** influencing maximum vibration of the needle. As lateral movements of the adjusting shaft **50** determine the different neutral positions of non-vibration of the needle, it will be understood that the maximum field of vibration of the needle remains fixed on changing from one to another neutral position of non-vibration of the needle. This arrangement has the advantage of maintaining cooperative relationship between the needle and the loop-taker within predetermined limits of lateral throw of the needle so that within set limits no provision need be made for imparting compensating movements to the loop-taker regardless of the neutral position adjustment of the controlling mechanism.

In order manually to effect bodily shifting movement of the adjusting shaft **50** and therefore the axis of angular adjustment of the guide-head **46**, an eccentric **56** is secured, by set screw **57**, upon the bearing sleeve **51** within the ends of the latter. The eccentric **56** is disposed within a recess **58** provided in the bushing **52** between the ends of the bushing containing the guide slots **55**, the opposed and parallel walls **58'** which define the recess **58** being substantially transverse to the length of the guide slots **55** diametrically of the bushing. The front end of the bearing sleeve **51** extends beyond the front end of the bushing **52** and carries, rigidly therewith, an operating arm **59** disposed externally of the front wall of the bracket-arm **17**.

By turning the operating arm or handle **59** from one limit of movement shown in Fig. 9 of the drawings, to the other limit of movement shown in Fig. 10, a combination turning and sliding movement is imparted to the eccentric **56** within the confining walls **58'** of the bushing **52** due to the fact that the bearing sleeve **51** which carries the eccentric is confined by the guide slots **55**. The described movement of the eccentric **56** carries the bearing sleeve **51** from one end to the other of the guide slots **55** and thereby effects a bodily lateral shifting movement of the angular adjustment axis of the guide-head **46** between fixed limits. Obviously, the operating arm **59** may be turned a less distance than its full throw, if desired, while opposed adjusting screws **60** threaded into the forward face of the bushing **52** (see Fig. 6) may be employed to limit the lateral movement of the bearing sleeve **51** in the guide slots **55**.

The front end of the adjusting shaft **50** extends forwardly beyond the front end of the bearing sleeve **51** and secured thereto by means hereinafter described, is a hand lever **61** operable to turn angularly the guide-head **46** and thereby change the amplitude of needle vibration.

Referring particularly to Figs. 3 and 6, it is to be noted that the fixed bushing **52** has its forward face portion provided with a cutout **62** in which the handle **59** operates. Positioned forwardly of the handle **59** is a fixed plate or disc **63** which is secured to the forward end of the fixed bushing **52** by means of screws **64** which are threaded directly into apertures **65** provided in the forward face of the fixed bushing **52**. As may be best observed from Figs. 3 and 6 the rear face of the plate **63** is provided with a notch **66** which cooperates with the extended portion **67** of a finger **68** which is pivotally mounted by means of a cross-pin **69** upon the handle **59**. More specifically, the finger **68** is disposed within a notch **70** provided in the handle **59**, and the upper portion **71** of the finger extends over the handle **59** so as to afford a finger-piece by means of which the member **68** may be moved forwardly against the biasing action of a coil-spring **72** which is provided within an aperture **73** formed within the handle member **59**. It may be observed from Fig. 3 that the spring **72** functions to bias the projecting lug **67** into coincidence with the notch **66** formed in the plate **63** thereby to provide a tactual signal within the handle **59** whenever the operator shifts the handle back and forth past the location in which the notch **66** is formed. The notch **66** is curved so that the finger **67** of the member **68** will not arrest the movement of the handle **59** but will merely provide a tactual signal which will notify the operator when the handle **59** is in its mid-position. In other words, the notch **66** is positioned substantially midway between the arc defined by the two limit screws **60** positioned in the forward face of the fixed bushing **52**. However, if in performing certain operations, the user of the machine does not wish to have the tactual signal produced within the handle **59** he may merely depress the finger-piece **71** against the action of the spring **72** to the end that no tactual signal will be produced as the handle passes by the mid-position as defined by the notch **66**.

Positioned forwardly of the stationary disc **63** is an indicia member in the form of a cup-shaped disc generally designated by the numeral **74**. This indicia member is made up essentially of two elements of which the first is a hollow cup-shaped annular disc **75** having its rear face closed by means of a plate **76**.

Referring particularly to Figs. 4 and 7, the plate **76** is adapted to be rigidly secured to its associated member **75** by means of screws **77** which are threaded into lugs **78** provided in the inner portion of the member **75**. The center portion of the plate **76** is provided with an aperture **79** for receiving the forward end portion of the adjusting shaft **50**, and the entire member **74** is prevented from rotating with the adjusting shaft **50** by means of a pair of lugs **80** which are struck up from the rear face of the plate **76** and which are adapted to be received within the opposite end portions of a slot **81** formed within the stationary disc **63**. The slot **81** is positioned in alignment with the slots **55** formed in the stationary bushing **52** so as to permit the entire unit **74** to move laterally with the adjusting shaft **50** whenever the bearing sleeve **51** is moved, to the end that the eccentric **56** functions to shift both the bearing sleeve **51** and the adjusting shaft in a lateral direction as hereinabove described. The central portion of the stationary disc slot **81** is enlarged as at **82** to permit the sleeve **51** to shift lengthwise of the slot in response to movements of the handle **59**.

The forward face of the indicia member **74** is beveled as at **83**, and as may be best seen from Fig. 4, the upper portion of this face is provided with three indicia figures

84, 85 and 86 of which the figure 85 indicates the central or null position of the needle illustrated in Fig. 11, while the figure 84 indicates an extreme left-hand adjustment of the needle as illustrated in Fig. 12. The figure 86 illustrates an extreme right-hand position of the needle as illustrated in Fig. 13.

Referring particularly to Figs. 3, 6 and 7, the disc member 76 of the indicia member 74 is provided with a hollow hub 87 which is adapted to receive a beehive spring 88, of which one end is biased against the forward handle unit 61 rigidly secured to the shaft 50 so as to provide a frictional drag between the indicia unit 74 and the stationary plate 63.

The above noted forward handle member 61 which functions to turn the adjusting shaft 50 about its longitudinal axis is made up of a hollow cap element 89 to which is secured a disc element 90 by means of three screws 91 which are received within threaded hubs 92 formed within the cap body. The disc 90 is rigidly secured to the adjusting shaft 50 and, thus, as the handle member 61 is shifted in an arcuate direction, the adjusting shaft 50 and, consequently, the guide hub 46 with its guideway 45 is angularly adjusted.

Referring particularly to Figs. 3, 4, 6 and 7, the disc 76 of the indicia member 74 has projecting forwardly therefrom a stop pin 93 which is adapted to project into the cap 89 by way of a slot 94 formed in the periphery of the cap disc 90. It is manifest that the stop pin 93 and the side walls of the slot 94 function together to limit the maximum amplitude of turning movement of the forward handle member 61 in view of the fact that the indicia member 74 is prevented from rotating about the axis of the adjusting shaft 50.

Referring to Figs. 5 and 7, the adjusting shaft handle member 61 is provided with means for limiting its angular movement through amplitudes less than the range provided by the slot 94 of the disc 90. More specifically, the cap portion 89 of the forward handle member 61 is provided with an arcuately-shaped shoe 95 which rides within a slot 96 formed within the cap 89, and the upper end portion of the shoe 95 engages the stop pin 93 due to the fact that a wire spring 97 has its lower end portion 97' received within an aperture 98 formed within the shoe 95 so as to bias the shoe toward the pin at all times. The spring 97 has its mid-portion bent around the adjusting shaft 50 and its other end portion 99 abuts against a boss 92 so as to lock the spring in a predetermined position. A manually adjustable thumb screw 100 passes through an aperture 101 formed within the cap 89 so that the screw may be threaded into a nut 102 positioned within a square aperture 103 formed within the inner portion of the cap. It is to be understood that with the screw 100 backed away from the shoe 95 the latter will be free to shift relative to the cap 89 as the latter is shifted relative to the stop pin 93. However, it is manifest that whenever the screw 100 is advanced toward the shoe 95, the latter will be locked against the disc 90 so as to prevent the shoe from moving relative to the cap 89. Thus, the shoe 95 may be locked in a selective one of a plurality of positions so as to prevent the shifting movement of the handle 61 relative to the indicia member 74 or to restrict the movement of the handle member 61 to various degrees of amplitude of arcuate movement within the maximum range as determined by the size slot 94 of the disc 90. In this latter connection, it may be particularly observed from Figs. 1 and 6 that the forward face of the cap member 89 is provided with an indicia mark in the form of an arrow 104 which cooperates with the indicia markings 105 formed along the beveled surface 83 of the dial member 74 (see Fig. 4). These indicia markings 104 and 105, therefore, will show the operator the amount of movement of the handle 61 relative to the indicia member 74. In other words, these markings function to show the operator the amount of lateral amplitude of the needle 26 for any particular setting of the null position of the needle.

Journaled upon the hub portion of the disc element 76 of the indicia member 74 is a tactual member 106 in the form of an annular member having a lug 107 projecting radially thereof.

As is best disclosed in Fig. 3, the lug member 107 of the member 106 has threaded radially therein the threaded portion of a manually operable screw 108 of which the distal end portion is formed as a non-threaded finger 109 which is adapted to impinge against a shoe 110 positioned within a slot 111 of the member 106 so that the shoe may engage the hub portion 87 of the disc 76. Thus, as the screw 108 is backed out of the member 106, the latter may be freely shifted about the hub 87 within the confines of a slot 112 formed in the peripheral wall of the indicia member 74. However, whenever the screw 108 is advanced inwardly toward the adjusting shaft 50, it will function to bias the shoe 110 against the hub 87 of the disc 76 thereby to lock the tactual member 106 fast to the disc 76.

The forward face of the lug 107 is provided with a slot 113 which is adapted to receive a finger 114 which is spring biased toward the member 106 by means of a beehive spring 115 positioned within an aperture 116 formed in the cap 89. From this, it will be appreciated that as the forward handle member 61 is shifted in an arcuate direction, the spring finger 114 will be biased into the notch 113 whenever the handle 61 is shifted past predetermined locations of the tactual member 106 thus setting up a tactual signal within the handle 61. In this connection, it is to be understood that the tactual member 106 has a maximum range of movement which is equal to or greater than that of the handle 61 so that member 106, by means of the manually operable screw 108, may be shifted into any desired position throughout the range of movement of the handle 61 and may be locked in such position by means of the screw 108. Therefore, a tactual signal may be set up within the handle 61 to advise the operator whenever the handle 61 is being shifted past a selective position of adjustment of the tactual member 106 to the end that the operator can, for example, move from a position of zero needle amplitude to a predetermined position of greater amplitude depending upon the sewing requirements. Thus, within a particular range of movement of the handle 61, as determined by the setting of the brake shoe 95 and the thumb screw 100, the operator may shift the handle 61 back and forth, and by properly positioning the indicia member 106 he may then receive a tactual signal through the handle 61 to indicate the mid-position of the range selected.

From the above, it will be appreciated that the bushing 52 and the pitman controlling mechanism supported thereby constitute an assembly which may be mounted in or detached as a unit from the bracket-arm 17.

In the mid-swing position of the operating arm 59, illustrated in Fig. 8 of the drawings, the fulcrum axis of the adjusting shaft 50 is disposed at its mid-position of its movement within the inclined slots 55 of the bushing 52, and the non-vibration path of the needle is located centrally of its field of vibration as illustrated in Fig. 11 of the drawings. Referring particularly to Fig. 8, it will be observed that the handle 59 is disposed in alignment with the indicia figure 85 thus indicating that the needle is in its central position. In this position of the lever 59, and when the hand lever 61 employed to control the vibration amplitude of the needle is disposed in its lowest position, as indicated in Fig. 1, the index arrow 104 points to the zero marking on the indicia member 74 and this is indicative of the fact that upon operation of the machine the needle will be reciprocated in a fixed path which, as above indicated, is located centrally of its field of vibration. This is due to the position of the guideway 45 which, as shown in full lines in Fig. 11, is now disposed

in a neutral position wherein the guide block 44 idly traverses said guideway in a path P, P which has the pivot screw 37 at its center, whereby no appreciable endwise movement is imparted to the pitman 38.

If the hand lever 61 is now turned in a counterclockwise direction, as viewed in Fig. 1, the guideway 45 will be correspondingly turned angularly into a position of maximum influence upon the pitman 38, the center of the guide-block 44 now traversing a path P^1, P^2 which extends equal distances to opposite sides of and intersects the angular adjustment axis *r* of the guideway 45. Consequently, the component of said movement of the guide-block 44 projected upon the line AB represents the extent of endwise movement imparted to the pitman 38 to vibrate the needle laterally; the throw of the needle to opposite sides of its neutral path of reciprocation being obviously equal. In the described position of the operating arm 59, any positions of the hand lever 61 from zero to maximum throw of the needle will be visibly indicated by the index figures 104 and 105 of the member 74 and the cap portion of the arm 61.

When the operating arm 59 is turned into its left-hand limit of its movement (see Fig. 9) while the hand lever 61 remains at its position as illustrated in Fig. 1, the fulcrum axis of the adjusting shaft 50 will be laterally displaced in a direction corresponding substantially to the length of the guideway, that is in substantially the path P^1, P^2 illustrated in Fig. 11. As heretofore explained, this is due to the fact that the guide slots 55 are elongated in a direction substantially corresponding to the path P^1, P^2.

Referring now more particularly to Fig. 12, it will be observed that the lateral shifting of the adjusting shaft 50 from the position illustrated in Fig. 11 has displaced the fulcrum axis *r* of the guideway 45 into coincidence with the lower limit P^2 of movement of the center of the guide-block 44. Consequently, operation of the hand lever 61 now effects angular adjustment of the guideway 45 about said point P^2 and the guide-block 44 has a path of travel bearing from its neutral path P^2, P^3 to its path P^1, P^2 of maximum influence upon the pitman 38, the neutral path of reciprocation of the needle being entirely at the left-hand side of its field of vibration as shown in Fig. 12.

Referring now to Fig. 10, it will be seen that the handle 59 has been moved to its extreme right-hand position opposite to the indicia device 86 so that the needle will be shifted to its extreme right-hand position as illustrated in Fig. 13. When the operating arm 59 is turned to this right-hand position while the hand lever 61 remains at its position as disclosed in Fig. 1, the fulcrum axis of the adjusting shaft 50 will be laterally displaced again in a direction corresponding substantially to the length of the guideway or substantially in the path P^1, P^2 illustrated in Fig. 13. As heretofore explained, this is due to the fact that the guide slots 55 are elongated in a direction corresponding substantially to the path P^1, P^2. This lateral shifting of the adjusting shaft 50 from the position illustrated in Fig. 9 displaces the fulcrum axis *r* of the guideway 45 into coincidence with the upper limit P^1 of movement of the center of the guide-block 44. Consequently, operation of the hand lever 61 now effects angular adjustment of the guideway 45 about the point P^1 and the guide roller 44 has a path of travel varying from the neutral path P^1, P^4 to its path P^1, P^2 of maximum influence upon the pitman 38, the neutral path of reciprocation of the needle being entirely at the right-hand side of its field of vibration as shown in Fig. 13. For descriptive purposes, the direction of lateral adjustment of the fulcrum axis of the guideway 45 has been hereinafter described as corresponding substantially to the length of the guideway at one extreme position of angular adjustment thereof. It is to be understood, however, the said lateral adjustment of the guideway axis may be effected at any time, regardless of the angular position of the guideway 45.

Having thus set forth the nature of the invention, what we claim herein is:

1. A needle vibration control for zigzag stitch sewing machines comprising, an angularly adjustable guideway for controlling the lateral throw of the needle, a hollow supporting member, an adjusting shaft carrying said guideway and journaled in said supporting member for rotary and bodily lateral adjustment therein, means for laterally displacing said adjusting shaft in said supporting member, a manually operable handle connected with said adjusting shaft for turning the latter to effect angular adjustment of said guideway, tactual means carried by said supporting member for producing a tactual signal within said handle whenever the latter is angularly shifted past a selective location along its path of angular adjustment, and means for adjusting said tactual means so that the tactual signal within said handle may be produced in response to the movement of said handle past various selective positions of its path of angular movement.

2. A needle vibration control for zigzag stitch sewing machines comprising, an angularly adjustable guideway for controlling the lateral throw of the needle, a supporting member, an adjusting shaft carrying said guideway and journaled in said supporting member for rotary and bodily lateral adjustment therein, means including an eccentric for laterally displacing said adjusting shaft in said supporting member, a manually operable handle connected with said adjusting shaft for turning the latter to effect angular adjustment of said guideway, a tactual member carried by said supporting member for angular adjustment about the axis of said adjusting shaft, means for locking said tactual member in selective positions of angular adjustment, and means connecting said handle and said tactual member for producing a tactual signal within said handle whenever the latter is angularly shifted past a selective location of angular adjustment as determined by the angular position of said tactual member.

3. A needle vibration control for zigzag stitch sewing machines comprising an angularly adjustable guideway for controlling the lateral throw of the needle, a supporting member, an adjusting shaft carrying said guideway and journaled in said supporting member for rotary and bodily lateral adjustment therein, means including an eccentric for laterally displacing said adjusting shaft in said supporting member, a manually operable handle connected with said adjusting shaft for turning the latter to effect angular adjustment of said guideway, a tactual member carried by said supporting member for angular adjustment about the axis of said adjusting shaft, means for locking said tactual member in selective positions of angular adjustment, and means including a spring-biased detent and a detent-receiving seat carried by said handle and said tactual member for producing a tactual signal within said handle whenever the latter is angularly shifted past a selective location of angular adjustment as determined by the angular position of said tactual member.

4. A needle vibration control for zigzag stitch sewing machines comprising an angularly adjustable guideway for controlling the lateral throw of the needle, a supporting member, an adjusting shaft carrying said guideway and journaled in said supporting member for rotary and bodily lateral adjustment therein, means including an eccentric for laterally displacing said adjusting shaft in said supporting member, a manually operable handle connected with said adjustment shaft for turning the latter to effect angular adjustment of said guideway, means for limiting the maximum amplitude of adjustment of said handle to an arc of predetermined length, a tactual member carried by said supporting member for angular adjustment about the axis of said adjusting shaft and through an arc equal to or greater than the first mentioned arc, means for locking said tactual member in selective positions of angular adjustment, and means connecting said handle and said tactual member for producing a tactual signal within said handle whenever the

latter is angularly shifted past a selective location of angular adjustment as determined by the angular position of said tactual member.

5. A needle vibration control for zigzag stitch sewing machines comprising, an angularly adjustable guideway for controlling the lateral throw of the needle, a supporting member, an adjusting shaft carrying said guideway and journaled in said supporting member for rotary and bodily lateral adjustment therein, means including an eccentric for laterally displacing said adjusting shaft in said supporting member, a manually operable handle connected with said adjusting shaft for turning the latter to effect angular adjustment of said guideway, means for limiting the maximum amplitude of adjustment of said handle to an arc of predetermined length, manually operable means for arresting the angular adjustment of said handle thereby to produce selective ranges of handle movement within the predetermined arc, a tactual member carried by said supporting member for angular adjustment about the axis of said adjusting shaft and through an arc equal to or greater than the first mentioned arc, means for locking said tactual member in selective positions of angular adjustment, and means connecting said handle and said tactual member for producing a tactual signal within said handle whenever the latter is angularly shifted past a selective location of angular adjustment as determined by the angular position of said tactual member.

6. A needle vibration control for zigzag stitch sewing machines comprising, an angularly adjustable guideway for controlling the lateral throw of the needle, a supporting member, an adjusting shaft carrying said guideway and journaled in said supporting member for rotary and bodily lateral adjustment therein, means including an eccentric for laterally displacing said adjusting shaft in said supporting member, a first manually operable handle connected with said eccentric for turning the latter, first tactual means carried by said supporting member for producing a tactual signal within said first handle whenever the latter is angularly shifted past a predetermined location along its path of movement, a second manually operable handle connected with said adjusting shaft for turning the latter to effect angular adjustment of said guideway, and second tactual means carried by said supporting member for producing a tactual signal within said second handle whenever the latter is angularly shifted past a selective location along its path of angular adjustment.

7. A needle vibration control for zigzag stitch sewing machines comprising, a hollow supporting member, a pair of coaxially aligned and telescopically arranged shafts mounted for turning movements about their longitudinal axis within said supporting member, a first handle member carried by and extending radially from the outside shaft at a location adjacent said supporting member for turning such shaft about its axis, a second handle member carried by the distal end of and extending radially from the inside shaft for turning such shaft about its axis, a non-rotatable hollow indicia cap disposed about the distal end of said inner shaft entirely between said first and second handles, means to secure said indicia cap to said supporting member to prevent said cap from turning with said handles, indicia means carried by said cap and said handles for indicating the degree of turning movements of said handles relative to said cap, tactual means disposed between said cap and said second handle for producing a tactual signal within said second handle whenever the latter is angularly shifted past a selective location along its path of angular adjustment and means for adjusting said tactual means so that the tactual signal within said second handle may be produced in response to the movement of such handle past various selective positions of its path of angular movement.

8. A needle vibration control for zigzag stitch sewing machines comprising, a hollow supporting member, a pair of coaxially aligned and telescopically arranged shafts mounted for turning movements about their longitudinal axis within said supporting member, a first handle member carried by and extending radially from the outside shaft at a location adjacent said supporting member for turning such shaft about its axis, a second handle member carried by the distal end of and extending radially from the inside shaft for turning such shaft about its axis, a non-rotatable hollow indicia cap disposed about the distal end of said inner shaft entirely between said first and second handles, means to secure said indicia cap to said supporting member to prevent said cap from turning with said handles, indicia means carried by said cap and said handles for indicating the degree of turning movements of said handles relative to said cap, a tactual member disposed within said cap for angular adjustment about said inner shaft, means for locking said tactual member in selective positions of angular adjustment, and means connecting said second handle and said tactual member for producing a tactual signal within such handle whenever the latter is angularly shifted past a selective location of angular adjustment as determined by the angular position of said tactual member.

9. A needle vibration control for zigzag stitch sewing machines comprising, a hollow supporting member, a pair of coaxially aligned and telescopically arranged shafts mounted for turning movements about their longitudinal axis within said supporting member, a first handle member carried by and extending radially from the outside shaft at a location adjacent said supporting member for turning such shaft about its axis, a second handle member carried by the distal end of and extending radially from the inside shaft for turning such shaft about its axis, such second handle including a central circular hub disposed concentrically of said shafts, a non-rotatable hollow cup-shaped indicia cap disposed about the distal end of said inner shaft entirely between said first and second handles so that the hub portion of said second handle covers the cup opening of said cap, means to secure said indicia cap to said supporting member to prevent said cap from turning with said handles, and indicia means disposed about the adjacent relatively movable surfaces of said cap and said hub for indicating the degree of turning movement of said second handle.

10. A needle vibration control for zigzag stitch sewing machines comprising, a hollow supporting member, an adjusting shaft journaled in said supporting member for rotary and bodily lateral adjustment therein, a second shaft in the form of a sleeve laterally movable in said supporting member and providing a journal for said adjusting shaft, an eccentric carried by said sleeve for engaging said supporting member, a first handle member carried by and extending radially from said sleeve for turning said eccentric thereby to shift said sleeve and said first shaft laterally of said supporting member, a second handle member carried by the distal end of and extending radially from said adjusting shaft for turning such shaft about it axis within said sleeve, a non-rotatable indicia cap carried upon the distal end of said adjusting shaft entirely between said first and second handles, means connecting said cap and supporting member for preventing said cap from rotating about the axis of said adjusting shaft and for guiding said cap in movements back and forth laterally of such shaft, and indicia means carried by the adjacently disposed and relatively movable surfaces of said cap and said second handle.

11. A needle vibration control for zigzag stitch sewing machines comprising, a hollow supporting member, an adjusting shaft journaled in said supporting member for rotary and bodily lateral adjustment therein, a second shaft in the form of a sleeve laterally movable in said supporting member and providing a journal for said adjusting shaft, an eccentric carried by said sleeve for engaging said supporting member, a first handle member car-

ried by and extending radially from said sleeve for turning said eccentric thereby to shift said sleeve and said first shaft laterally of said supporting member, a second handle member carried by the distal end of and extending radially from said adjusting shaft for turning such shaft about its axis within said sleeve, a non-rotatable indicia cap carried upon the distal end of said adjusting shaft entirely between said first and second handles, means connecting said cap and supporting member for preventing said cap from rotating about the axis of said adjusting shaft and for guiding said cap in movements back and forth laterally of such shaft, indicia means carried upon the peripheral surface of said cap adjacent said two handles for indicating the degree of relative angular adjustment between each handle and said cap, and tactual means for producing a tactual signal within each of said handles whenever it is angularly shifted past a selective location along its path of angular adjustment relative to said cap.

12. A needle vibration control for zigzag stitch sewing machines comprising, a hollow supporting member, an adjusting shaft journaled in said supporting member for rotary and bodily lateral adjustment therein, a second shaft in the form of a sleeve laterally movable in said supporting member and providing a journal for said adjusting shaft, an eccentric carried by said sleeve for engaging said supporting member, a first handle member carried by and extending radially from said sleeve for turning said eccentric thereby to shift said sleeve and said first shaft laterally of said supporting member, a second handle member carried by the distal end of and extending radially from said adjusting shaft for turning such shaft about its axis within said sleeve, a non-rotatable indicia cap carried upon the distal end of said adjusting shaft entirely between said first and second handles, means connecting said cap and supporting member for preventing said cap from rotating about the axis of said adjusting shaft and for guiding said cap in movements back and forth laterally of such shaft, indicia means carried by the adjacently disposed and relatively movable surfaces of said cap and said second handle, tactual means connecting said second handle and said cap for producing a tactual signal within such handle whenever the latter is angularly shifted past a selective location along its path of angular adjustment relative to said cap, and manually operable means disposed between said second handle and said cap for selectively limiting the amplitude of angular adjustment of said second handle relative to said cap.

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