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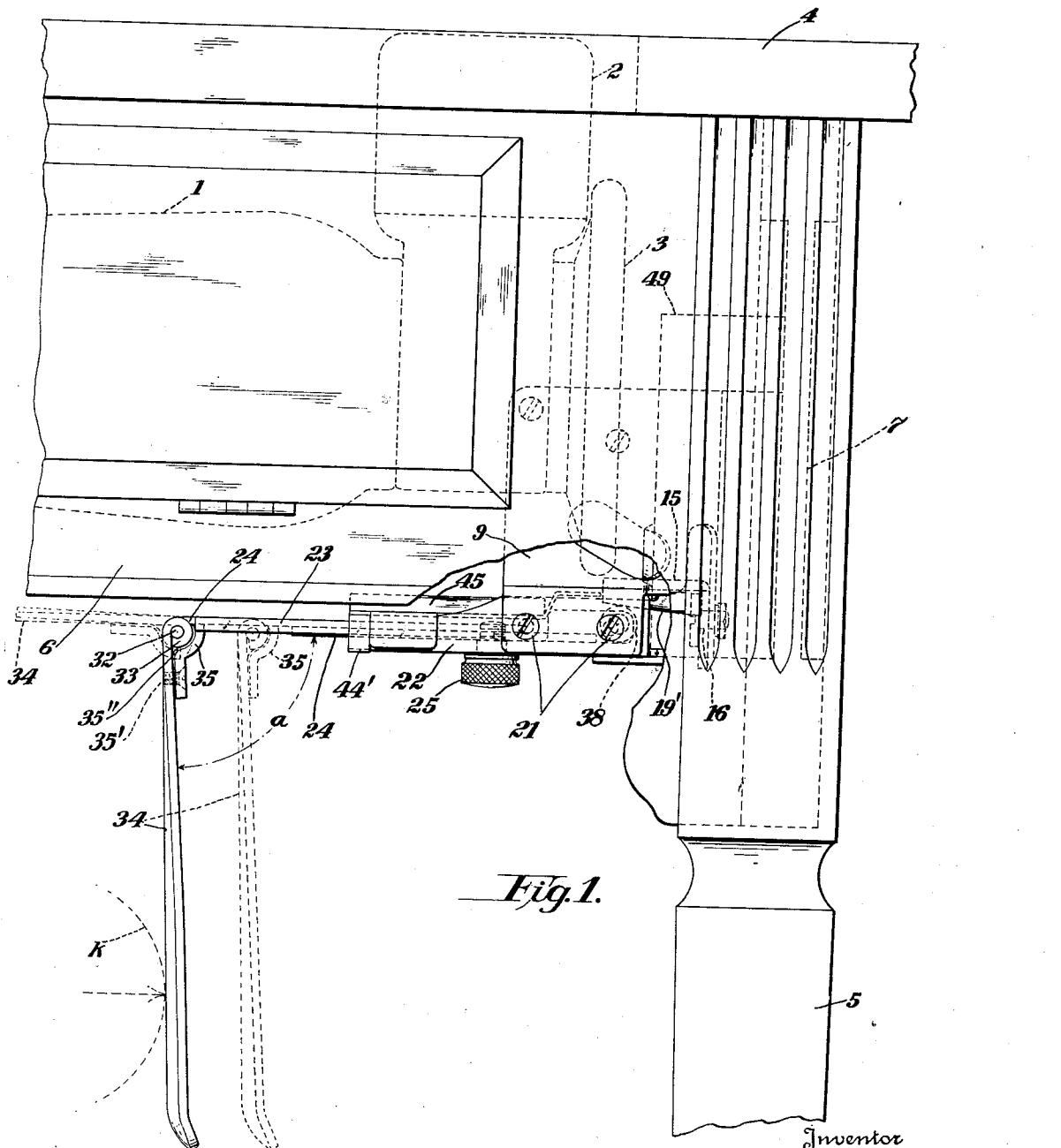
D. H. CHASON

1,947,827

KNEE CONTROL MECHANISM FOR ELECTRIC SEWING MACHINES

Filed June 25, 1932

3 Sheets-Sheet 1



Witness:

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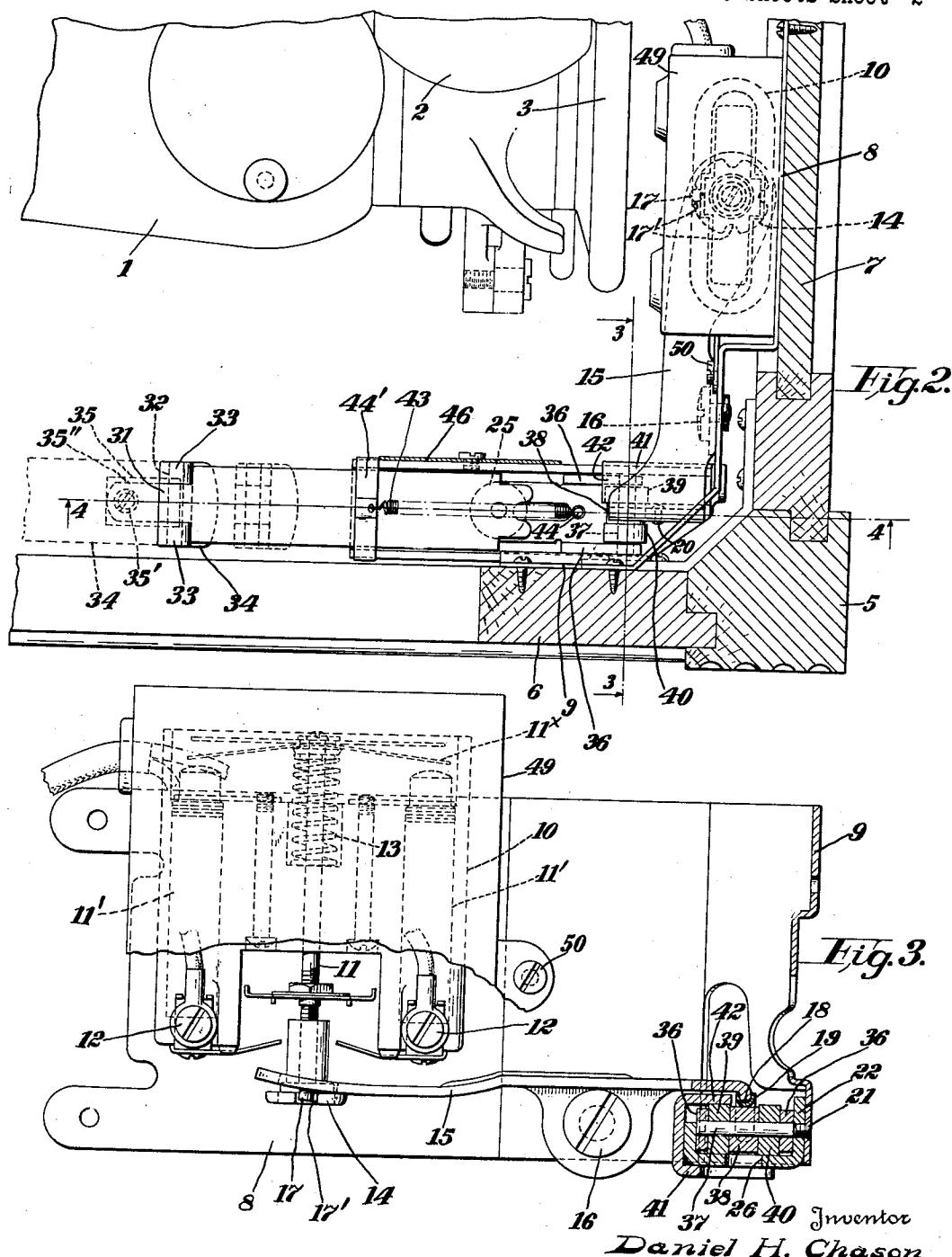
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3 Sheets-Sheet 2



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3 Sheets-Sheet 3

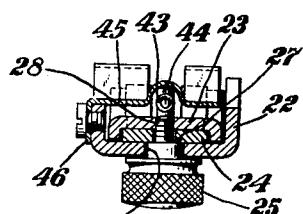


Fig. 5

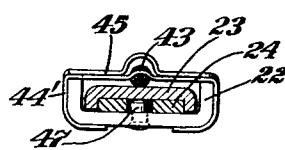


Fig. 6

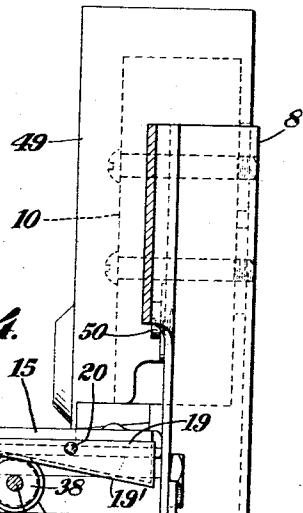
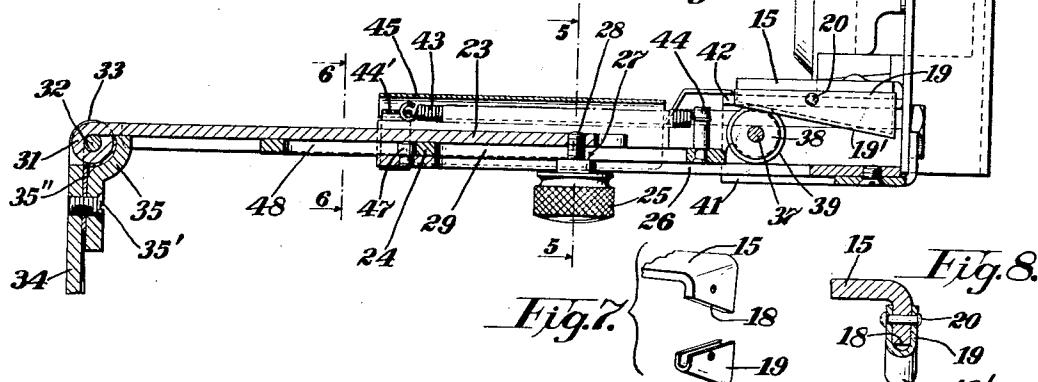


Fig. 4



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UNITED STATES PATENT OFFICE

1,947,827

KNEE-CONTROL MECHANISM FOR ELECTRIC SEWING MACHINES

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Application June 25, 1932. Serial No. 619,203

8 Claims. (Cl. 45—27)

This invention relates to electric sewing machines of the table or cabinet type adapted to rest upon the floor and has for an object to provide such a machine with an improved knee-control mechanism for regulating the speed of the sewing machine while in use. A further object of the invention is to provide a knee-control mechanism for an electric sewing machine, the knee-engaged element of which is shiftable to an inconspicuous or concealed inoperative position and which, when in working position, follows the movements of the operator's knee with a parallel motion, without rubbing upon or sliding relative to the knee.

With the above and other objects in view, as will hereinafter appear, the invention comprises the devices, combinations and arrangements of parts hereinafter set forth and illustrated in the accompanying drawings of 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 accompanying drawings, Fig. 1 is a fragmentary front side elevation of a sewing machine table embodying the invention. Fig. 2 is a horizontal section through one corner of the table, showing the knee-control mechanism in top plan. Fig. 3 is a section on the line 3—3, Fig. 2, with the woodwork omitted. Fig. 4 is a section substantially on the line 4—4, Fig. 2. Fig. 5 is a section on the line 5—5, Fig. 4. Fig. 6 is a section on the line 6—6, Fig. 4. Fig. 7 is a disassembled perspective view of one end of the controller-lever and its reinforcing means. Fig. 8 is a section substantially on the line 4—4, Fig. 2. Fig. 9 is a disassembled perspective view of the operating slide-bar and guide elements of the mechanism.

1 represents an electric sewing machine head including the motor 2 and hand-wheel 3 which is installed as usual in a drop-head sewing machine table or cabinet having a table-top 4, corner legs one of which is shown at 5, a front wall 6, and end walls one of which is shown at 7. The designation "sewing machine table" as used herein, has a broad significance and is intended to include a sewing machine support of any known cabinet, stand or table type adapted when in use to rest upon the floor.

Screwed to the end wall 7 of the table is one leg 8 of an angular supporting plate the other leg 9 of which is screwed to the front wall 6 of the table. Mounted on the leg 8 of the angle-plate 8, 9 is a motor-controller-unit or rheostat 10 of the well known carbon-compression type

disclosed, for example, in the patent to Chason, No. 1,792,818, of Feb. 17, 1931. Such a controller-unit includes an operating pull-rod or draw-bar 11 carrying the bow-spring bridging contact-member 11' which, when pulled downwardly, contacts with and gradually decreases the electrical resistance of the stacks of carbon disks 11' between the terminal screws 12 connected in series with the sewing machine motor, thus increasing the speed of the motor. The recovery spring 13 raises the draw-bar 11 to its "off" position when the down-pull on such draw-bar is relieved. The lower screw-threaded end of the draw-bar 11 carries the adjustable flanged nut 14 which is engaged by the apertured rearward end of a lever 15 fulcrumed on the screw 16 threaded into the supporting-plate-leg 8. A lug 17 on the lever 15 enters a notch 17' in the flange of the nut 14 to prevent accidental turning of the nut 14 when the device is operated. The lever 15 is formed at its forward end with a downturned tip terminating in an inclined lower edge 18 which is reinforced and covered by a U-shaped wear-strip 19 of hardened steel having a rounded bottom edge 19' and held in place by means of the rivet 20.

Mounted on the angle-plate-leg 9 by screws 21 is the trough-shaped guide 22 which slidably receives a slide-bar comprising two sections 23, 24 held clamped together by a thumb-screw 25 which passes freely through a clearance slot 26 in the bottom wall of the guide 22. The thumb-screw 25 has a clamping shoulder 27 at the base of the reduced and threaded shank 28. The shank 28 passes through a slot 29 in the slide-bar section 24 and is screwed into the tapped hole 30 in the slide-bar section 23 which latter is in the form of an inverted trough receiving and embracing the section 24. By loosening the shouldered thumb-screw 25 the section 23 may be adjusted endwise of and relative to the section 24 to vary the effective total length of the slide-bar.

The slide-bar section 23 is formed at its free end with a hinge-loop 31 for the hinge-pin 32 connecting the hinge-loops 33 at the upper end of the knee-extension arm 34 which depends from the slide-bar 23, 24 to a position within reach of the operator's knee indicated at k. There is secured to the knee-extension arm 34 by means of a screw 35' a stop 35 which limits the swinging movement of the arm 34 relative to the slide-bar 23, 24 in one direction and determines the operative angular relation between such arm and slide-bar; the arm 34 making a slightly acute angle α with the slide-bar 23, 24 when in its op-

erative position, as shown in full lines in Fig. 1. In other words the arm 34 is inclined away from a position normal to the slide-bar 23, 24 in the direction in which the slide-bar is moved by the operator. Pressure of the operator's knee exerted laterally in the direction of the arrow, Fig. 1, therefore causes a slight lifting or upward camming of the arm 34 which tends to balance any cramping or binding tendency of the slide-bar 23, 24 in the guide 22 due to the application of the lateral knee-pressure to the arm 34 at a point below the level of the slide-bar.

The slide-bar section 24 is formed at its end remote from the arm 34 with upstanding ears 36 which support the bearing pin 37 for the three anti-friction rollers 38, 39 and 40. The intermediate roller 38 is somewhat smaller in diameter than the outer rollers 39, 40 and operatively engages the inclined lower edge 19' of the wear-strip 19, as shown in Figs. 3 and 4. The outer rollers 39 and 40 track upon the bottom wall of the guide 22 and an end-piece 41 having a flange 42 overhanging the roller 39, as shown in Fig. 3, is secured to the guide 22 to resist upward movement of the roller 39 under any twisting tendency of the slide-bar 23, 24 in the guide 22.

The slide-bar 23, 24 is biased in opposition to the force of the operator's knee by means of the spring 43 which is anchored at one end to the pin 44 on the slide-bar section 24 and at its opposite end to the clip 44' embracing the left-hand end of the guide 22.

A cover-plate 45 protects the spring 43 and has a depending side wall 46 which is screwed to one side wall of the guide 22, as shown in Fig. 5.

Projecting upwardly from the bottom wall of the guide 22 is a stop-pin 47 which enters the slot 48 in the slide-bar section 24 and limits the endwise movement of the slide-bar in opposite directions. A suitable cover 49 encloses and protects the controller-unit 10. This cover is secured to the angle-plate-leg 8 by the screw 50.

It will be observed that the slide-bar 23, 24 and its knee-extension 34 move bodily to the right, Fig. 1, from the full line "off" position to the dotted line extreme "on" or full speed position, with a parallel motion, and without sliding relative to or rubbing against the operator's knee. This is an important advantage not heretofore attained in a knee-controller shiftable to an inconspicuous inoperative position; it being obvious that the arm 34 may be swung about the hinge pin 32 to a horizontal concealed position, preferably in line with the slide-bar 23, 24, where it is practically hidden beneath the lower edge of the front wall 6 of the table. Any suitable means may be provided to produce enough friction in the hinge-joint between the bar 24 and arm 34 to retain the arm 34 in any position to which it may be shifted relative to the bar 24. To this end there may be clamped between the stop 35 and the arm 34 a leaf-spring 35'', Fig. 4, which is curved at one end to frictionally engage or press upon the hinge-loop 31.

The invention is not to be understood as limited to the specific embodiment of the invention shown and described as various modified forms of the invention will be apparent to those skilled in the art from the teachings of the present disclosure.

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

1. The combination with a drop-head sewing machine table adapted in use to rest upon the

floor, said table having a table-top and side-wall members defining a cavity into which the sewing machine may be dropped when not in use, of an electric sewing machine motor-controller mounted in a fixed position within the cavity of said table and including a movable control element, a guide mounted on said table separately from and independently of said controller at a level above the normal position of the operator's knee, said guide having a guideway disposed substantially parallel to the front wall of the table, a slide mounted in said guide and connected to the movable control element of said controller, and a knee-extension depending from said slide to a position alongside the operator's knee.

2. The combination with a sewing machine table adapted in use to rest upon the floor and including a table-top, of an endwise slidable rod mounted below said table-top substantially horizontally at a level above the normal position of the operator's knee, a knee-extension depending from said slide-rod to a position alongside the operator's knee, and an electric motor-controller connected to be operated by said slide-rod, said knee-extension being operatively related at an acute angle to said slide-rod and inclined downwardly away from the operator's knee.

3. The combination with a drop-head sewing machine table adapted in use to rest upon the floor, said table having a table-top and side-wall members defining a cavity into which the sewing machine may be dropped when not in use, of an electric sewing machine motor-controller mounted in a fixed position within the cavity of said table and including a movable control element, a guide mounted on said table separately from and independently of said controller at a level above the normal position of the operator's knee, said guide having a guideway disposed substantially parallel to the front wall of the table, a slide mounted in said guide and connected to the movable control element of said controller, and a knee-extension depending from said slide to a position alongside the operator's knee, said knee-extension being hinged to said slide to swing upwardly to an inoperative position in a direction opposite the knee-influenced movement thereof.

4. The combination with a sewing machine table having front and end walls and a straight guideway parallel to said front wall, of a draw-bar-operated sewing machine motor-controller unit mounted adjacent the inner side of said end-wall, a pivoted lever member connected to the draw-bar of the controller-unit, and a knee-operated slide member bodily movable in said guideway and disposed horizontally at an angle to and terminating adjacent said lever member, one of said members having an inclined portion in operative engagement with the other member.

5. The combination with a supporting angle-plate, of a sewing machine motor-controller unit mounted on one leg of said plate, a lever fulcrumed on said leg of said plate and connected to operate said controller, a knee-operated rod slidably carried by the other leg of said plate, and means for converting endwise sliding movement of said rod into a rocking movement of said lever.

6. A knee-controller for electric sewing machines comprising a supporting plate adapted for attachment to a sewing machine table, a trough-shaped member carried by said supporting plate and constituting a guideway, a slide-bar mounted in said guideway, a knee-extension hinged to said slide-bar, and an electric motor-controller unit connected to be operated by said slide-bar.

7. A knee-controller for electric sewing machines comprising a supporting plate adapted for attachment to a sewing machine table, a trough-shaped member carried by said supporting plate and constituting a guideway, a slide-bar mounted in said guideway, a knee-extension hinged to said slide-bar, an electric motor-controller unit mounted on said supporting plate, and a controller operating lever having a portion inclined to the path of movement of said slide-bar and 10 operatively engaged by the latter.

8. An electric sewing machine motor-controller comprising a guideway, a slide-bar received in said guideway and having at one end three coaxial rollers the outer two of which track upon said guideway, a knee-shift depending from said slide-bar, a variable resistance unit, and a movable member for operating said unit having an inclined edge engaging the intermediate one of said rollers. 80

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