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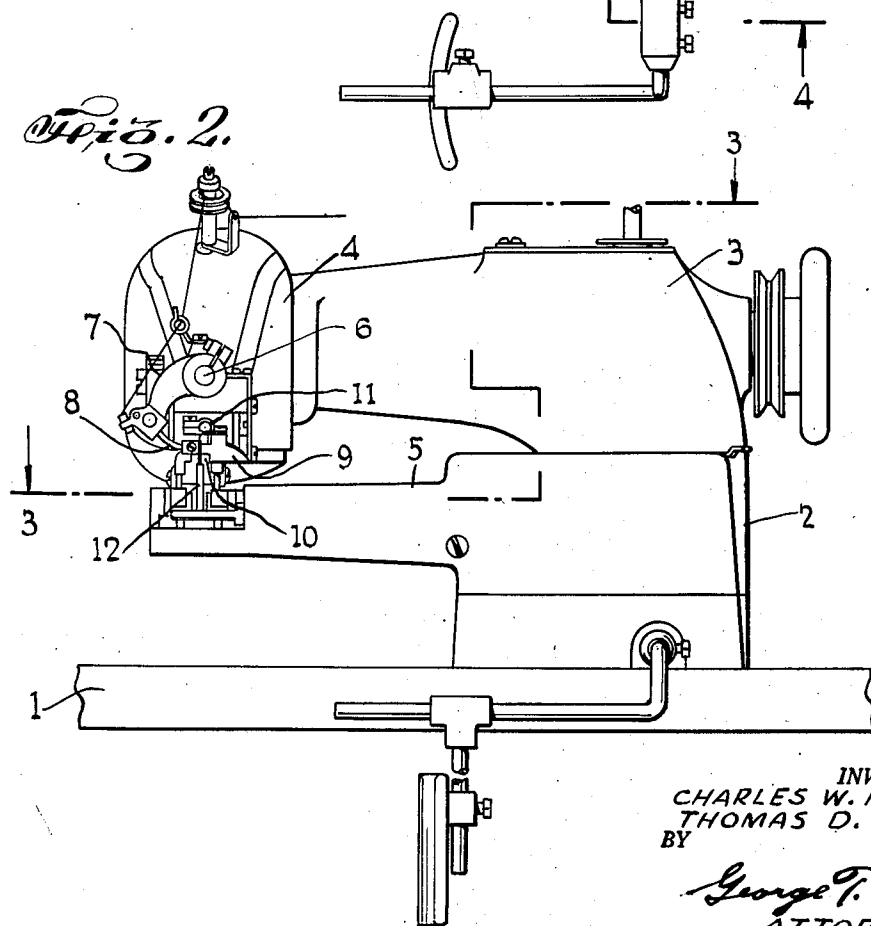
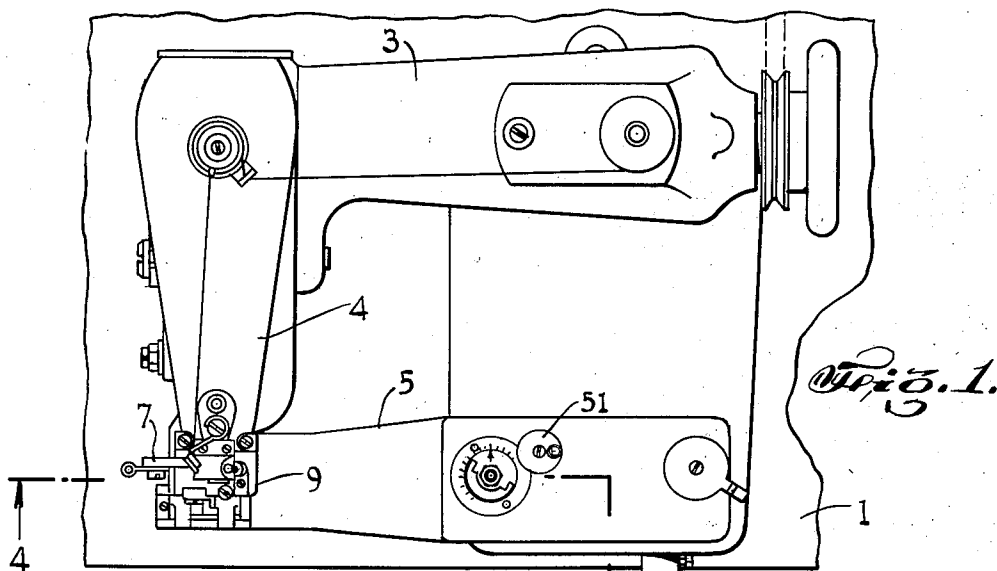
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NODE FORMER ADJUSTING MEANS FOR BLIND STITCH SEWING MACHINES

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3 Sheets-Sheet 1



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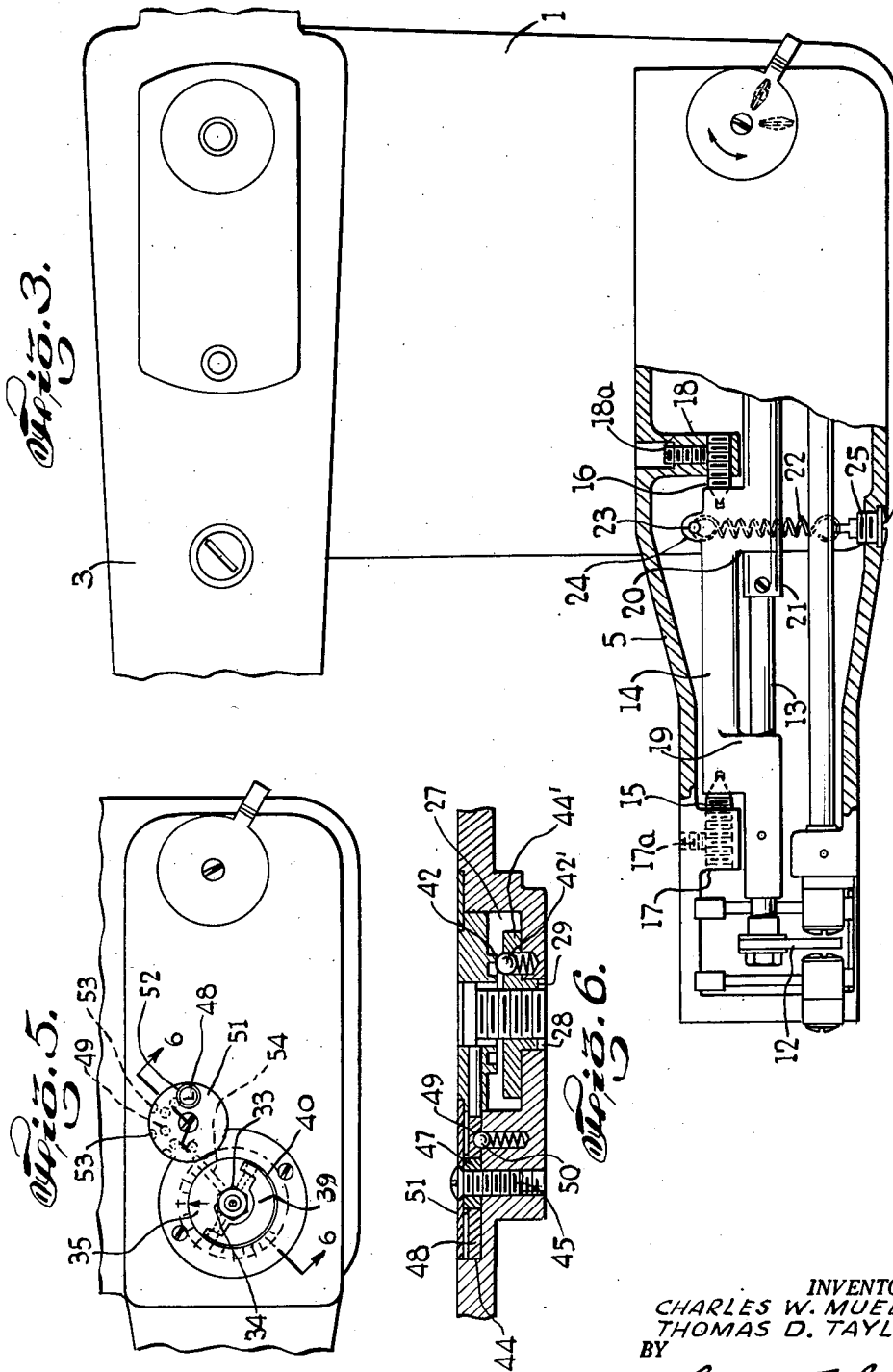
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3 Sheets-Sheet 2



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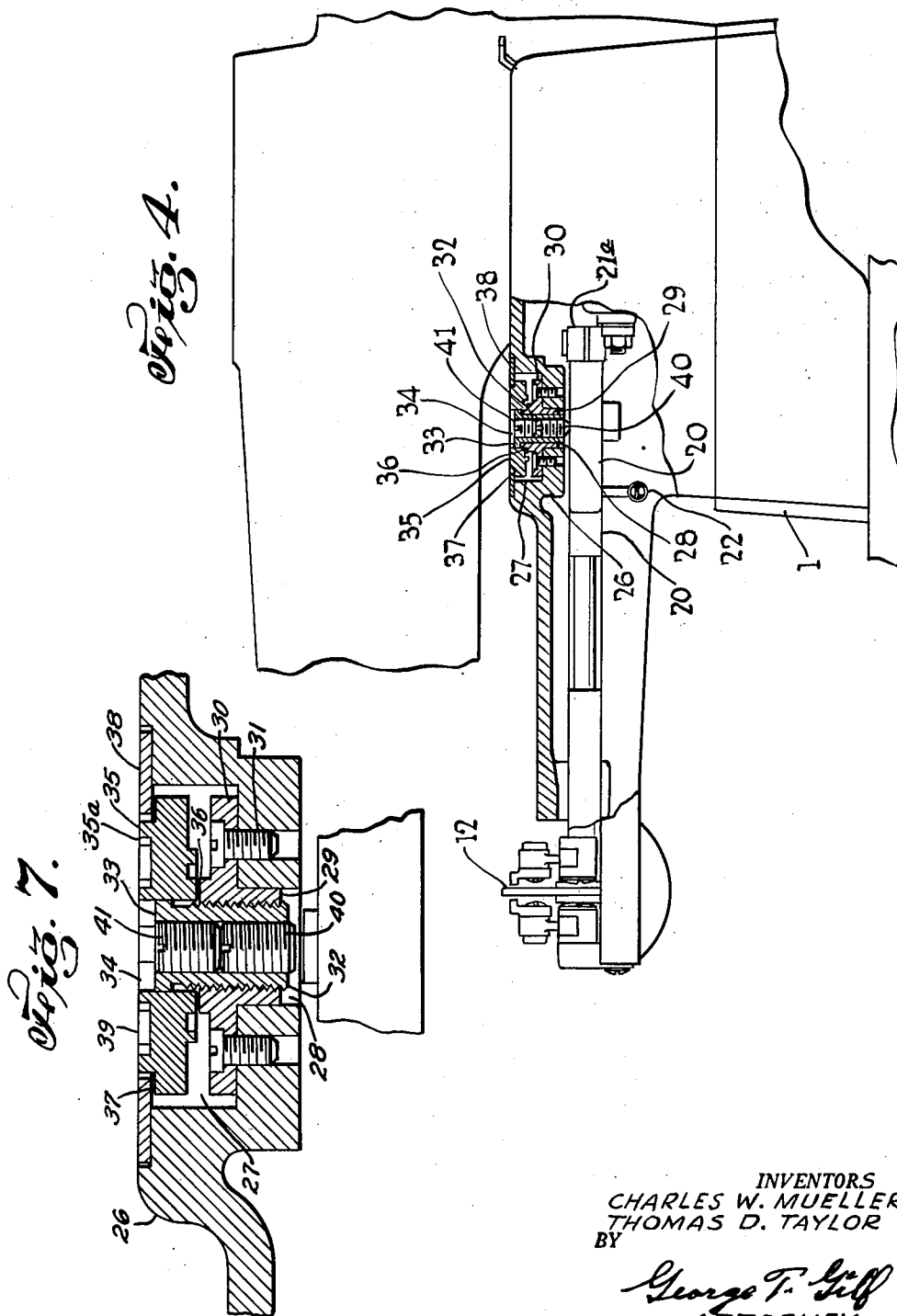
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UNITED STATES PATENT OFFICE

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NODE FORMER ADJUSTING MEANS FOR
BLIND STITCH SEWING MACHINES

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The invention herein disclosed relates to blind-stitch sewing machines of the kind in which a node of the material being sewn is formed in the path of the needle by a node-former. More particularly, the invention relates to an arrangement for adjusting the position of the node-former with respect to the presser foot or the path of the needle.

In sewing machines of the kind mentioned it is necessary to adjust the position or relation of the node-former with respect to the path of the needle for materials of different thickness and for the extent of penetration of the material by the needle. The principal object of this invention is to provide a simple and effective arrangement for adjusting the node-former in such sewing machines. Another object of the invention is to provide an arrangement of the kind mentioned that gives a clear, vernier indication of the relation of the node-former with respect to the presser foot.

The foregoing objects and certain advantages that will hereinafter appear are realized in the embodiment of the invention illustrated in the accompanying drawings, as one practical application of the invention, and described in detail below.

The drawings include:

Fig. 1 which is a plan view of a blind-stitch sewing machine embodying the invention;

Fig. 2 which is a front elevation of the same;

Fig. 3 which is a plan view, partly in section, the section being taken along the line 3—3 of Fig. 2;

Fig. 4 which is an elevation, partly in section, the section being taken along the line 4—4 of Fig. 1;

Fig. 5 which is an enlarged plan of the work table;

Fig. 6 which is a fragmentary sectional elevation taken on the line 6—6 of Fig. 5;

Fig. 7 which is a fragmentary section, on enlarged scale, of the adjusting mechanism.

The machine illustrated in the drawing, except for the improvements hereinafter described, represents a high-speed, chain-stitch, blind-stitch, sewing machine. Such a machine, includes a frame that comprises a base 1; and a hollow upright or standard 2, which extends from the rear of the base; a hollow, transversely-extending arm 3 formed integral with the standard 2; and a hollow, forwardly extending arm 4 that is secured to the end of the arm 3. In addition, there is a transversely extending, work table 5 which is secured at the front of the base 1.

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A needle actuating shaft 6 is journaled in the arm 4 and extends through the forward end thereof. On the extended end of the needle shaft 6, there is secured a needle bar 7 that carries a curved needle 8. A presser foot 9 is secured to the end of the arm 4 and extends over the work table 5. In a manner well known in the art, the needle actuating shaft 6 is oscillated to cause the needle 8 to move to and fro across the presser foot. The presser foot has an opening 10 there-through, through which nodes of material are projected into the path of the needle. A looper 11 cooperates with the needle in the formation of the stitches.

The material being sewn is formed into nodes and projected through the opening in the presser foot by a node-former 12. The particular node-former illustrated is in the form of a sector of a disc and it is oscillated to form a succession of nodes in the material being sewn as the material is fed through the machine. The relation of the node-former to the presser foot must be adjusted for different thicknesses of material, as, for example, heavy, medium and light materials. In addition, for a given thickness of material, the relation of the node-former to the presser foot will determine the depth of penetration of the needle. This invention is particularly directed to an arrangement for effecting the adjustment of the relation of the node-former with respect to the presser foot.

The node-former 12 is secured on the end of the node-former shaft 13 that is journaled in a movable bearing bracket 14. The movable bearing bracket 14 is in the form of a cradle that is pivotally mounted upon spaced centering pins 15 and 16. These centering pins are threaded in openings in brackets 17 and 18 extending inwardly from the side wall of the work table, and they are fixed in position by set screws 17a and 18a respectively. The cradle 14 includes spaced, radially extending bearing arms 19 and 20 in which the node-former shaft 13 is journaled. A collar 21, fixed on the node-former shaft and abutting the bearing arm 20, and a clamp 21a also fixed on the node-former shaft and abutting the opposite end of the bearing arm 20 position the node-former shaft axially. The cradle 14 is resiliently urged or biased, to move about the axis of the centering pins 15 and 16, in a direction to move the node-former towards the presser foot.

A spring 22 acts on the cradle to bias the cradle in a direction to move the node-former towards the presser foot. One end of the spring 22 is secured to a pin 23 that is secured in and extends

from an offset lug 24 on the cradle. The other end of the spring 22, is secured to an adjusting screw 25 that is threaded in the side of the work table. Through the adjusting screw, the resilient force exerted by the spring may be varied, to a limited extent. For adjusting the position of the node-former with respect to the presser foot, an adjustable stop is provided that acts directly on the cradle, particularly the bearing arm 20.

The adjustable stop is mounted in a housing 26 that is formed in the upper wall of the work table. This housing provides an enlarged recess 27 extending inwardly from the work supporting surface of the work table and an opening 28 through to the interior of the work table. Within the opening 28 and extending into the recess 27, there is a boss 29. The boss is internally threaded and it is provided with an external, annular flange 30 that is secured to the base of the housing 26 by machine screws 31. Within the boss 29, and in threaded engagement therewith, there is an internally and externally threaded tubular member or element 32. This tubular member is provided, at its upper end, with an outwardly extending flange 33, the perimeter of which flange is hexagonal. The hexagonal flange 33 is received in a complementary opening 34 through a disc 35. The disc 35 is of substantial thickness. A shoulder 36, formed on the boss 29, supports the disc 35. Adjacent the upper surface thereof, the disc 35 is reduced in diameter forming a shoulder 37. An annular disc 38, recessed in the work-supporting surface of the work table, overhangs the shoulder 37. The surface of the disc 38 is provided with graduations and the surface of the disc 35 is provided with an indicating mark for indicating the position of the disc 35 with respect to the graduations on the annulus 38. A pivoted finger piece 39 is secured to the disc 35. The disc 35 is provided with a recess 35a which receives the finger piece when it is not in use. Through the finger piece 39, the disc 35 may be rotated which, in turn, rotates the tubular member 32.

Within the tubular member 32 and in threaded engagement therewith, there are two screws; an adjusting screw 40 and a set screw 41. The screw 40 extends through the lower end of the tubular member and engages the bearing arm 20 of the cradle 14. The set screw 41 serves to lock the adjusting screw 40 in its adjusted position with respect to the tubular member, the set screw 41 acting in the nature of a check nut. With this arrangement, the node-former may be positioned, by adjusting the adjusting screw 40, to correspond with the indications on the annulus 38 and the indicator on the disc 35. When this adjustment is made, the adjusting screw 40 is locked in place by the set screw 41. The set screw 40 thus acts as a stop, resisting the action of the spring 22 in its effort to raise the node-former towards the presser foot.

Upon rotation of the disc 35, through the finger piece 39, the tubular member 32 is rotated. Through the threaded, locked connection of the adjusting and lock screws 40 and 41 with the member 32, the adjusting screw 40, acting upon the cradle, is raised or lowered. When the set screw 40 is thus lowered, it forces the cradle downwardly and moves the node-former away from the presser foot. When it is raised, it permits the spring 22 to elevate the cradle and thus raise the node-former towards the presser foot. The position of the adjusting screw 40, thus determines the operating position of the node-

former with respect to the presser foot. In the event that a greater thickness of material passes between the node-former and the presser foot, such for example as a seam, the spring 22 permits the node-former to yield for this greater thickness.

As will be seen in Fig. 6, the under surface of the disc 35 is provided with a series of teeth 42 which correspond to the graduations on the annular disc 38. A resilient detent in the form of a spring pressed ball 42', cooperates with the teeth 42. With this arrangement, the indicator mark on the disc 35 is always positioned opposite one of the graduations on the annular disc 38. The ball 43 extends up through a slot 44' formed in the flange 30 of the boss 29, to engage between the teeth 42.

Adjacent to and partially overlapping the recess 27, there is another circular recess 44 formed in the work-supporting surface of the work table 5. At the center of the recess 44, there is a threaded opening 45 extending through the work table. A machine screw 46 is threaded into the opening 45. Within the recess, a collar 47 surrounds the machine screw and an indicator disc 48 is rotatably mounted about the collar 47. On the under surface of the disc 48, there are a series of spaced depressions, such as the depression 49, which cooperates with a resilient detent, in the form of a spring pressed ball 50. Above the indicator disc 48, there is a disc 51 fixed between the head of the screw 46 and the collar 47. The disc 51 has an opening 52 there-through, through which indications on the surface of the indicator disc 48 become visible. The indications on the disc 48 indicate the nature or relative thickness of the goods for which the node-former is set. These indications are desirably in the form of letters such for example as "L" for light work "M" for medium work and "H" for heavy work.

The indicator disc 48, is actuated in accordance with the disc 35. For this purpose, the disc 48 is provided a series of spaced notches 53 in the edge thereof. A pin 54 carried by the disc 35 and extending therefrom cooperates with the notches 53 for actuating the disc 48 every time the pin 54 passes a particular point in its rotation. With this arrangement, a complete indication of the adjustment of the node-former with respect to the presser foot is provided. The indicator disc 48 indicates the nature or relative thickness of the work for which the node-former is set, and the position of the indicator mark on the disc 35 with respect to the graduations on the annulus 38 indicates the depth of penetration of the needle for the class of goods indicated by the indicator disc 48.

From the foregoing description of the embodiments of the invention illustrated in the drawings, it will be apparent to those skilled in the art that by this invention there is provided an arrangement for adjusting, and completely indicating the adjusted position, of the node-former with respect to the presser foot that is simple in construction and effective in operation, and that, though mounted in the work table, provides a flush surface for the passage of the material being sewn over the work supporting surface of the work table.

It will be obvious that various changes may be made by those skilled in the art in the details of the embodiment of the invention illustrated in the drawings and described above within the principle and scope of the invention as expressed in the appended claims.

We claim:

1. In a blind-stitch sewing machine, the combination comprising a work table, a presser foot, a bearing bracket movable with respect to the work table, a node-former shaft journaled in the movable bearing bracket, a node-former movable with the node-former shaft and positioned to cooperate with the presser foot, resilient means biasing the movable bearing bracket to move the node-former towards the presser foot, and means for adjusting the position of the node-former with respect to the presser foot including an adjustable stop mounted in the work table and positioned to engage the movable bearing bracket.

2. In a blind-stitch sewing machine, the combination comprising a work table, a presser foot, a bearing bracket movable with respect to the work table, a node-former shaft journaled in the movable bearing bracket, a node-former movable with the node-former shaft and positioned to cooperate with the presser foot, resilient means biasing the movable bearing bracket to move the node-former towards the presser foot, and means for adjusting the position of the node-former with respect to the presser foot including an adjustable stop mounted in the work table and positioned to engage the movable bearing bracket, an indicator for indicating the relation of the node-former with respect to the presser foot recessed in the surface of the work table, and a finger piece for adjusting the stop, normally recessed in the surface of the work table to present a smooth surface for the passage of the work thereover.

3. In a blind-stitch sewing machine, the combination comprising a work table, a presser foot, a bearing bracket movable with respect to the work table, a node-former shaft journaled in the movable bearing bracket, a node-former movable with the node-former shaft and positioned to cooperate with the presser foot, resilient means biasing the movable bearing bracket to move the node-former towards the presser foot, and means for adjusting the position of the node-former with respect to the presser foot including an adjustable stop mounted in the work table and positioned to engage the movable bearing bracket, and a vernier indicator associated with the stop for indicating the relation of the node-former to the presser foot.

4. In a blind-stitch sewing machine, the combination comprising a work table, a presser foot, a bearing bracket movable with respect to the work table, a node-former shaft journaled in the movable bearing bracket, a node-former movable with the node-former shaft and positioned to cooperate with the presser foot, resilient means biasing the movable bearing bracket to move the node-former towards the presser foot, and means for adjusting the position of the node-former with respect to the presser foot including an adjustable stop mounted in the work table and positioned to engage the movable bearing bracket, and a vernier indicator associated with the stop and actuated upon movement thereof for indicating the relation of the node-former to the presser foot comprising an indicator for indicating the class of work for which the stop is set and another indicator for indicating the relative thickness of the work within the class for which the stop is set.

5. In a blind-stitch sewing machine, the combination comprising a work table, a presser foot, a bearing bracket within the work table and tiltable with respect thereto, a node-former shaft journaled in the bearing bracket, a node-former mov-

able with the node-former shaft and positioned to cooperate with the presser foot, resilient means biasing the tiltable bearing bracket to move the node-former towards the presser foot, and means for adjusting the position of the node-former with respect to the presser foot including an adjustable stop mounted in the work table, and an indicator recessed in the work-carrying surface of the work table for indicating the relation of the node-former with respect to the presser foot.

6. In a blind-stitch sewing machine, the combination comprising a work table, a presser foot, a bearing bracket within the work table and tiltable with respect thereto, the work table having an opening therethrough from the work-carrying surface thereof and above the tiltable bearing bracket, a node-former shaft journaled in the tiltable bearing bracket, a node-former carried by the shaft and positioned to cooperate with the presser foot, resilient means biasing the tiltable bearing bracket in a direction to move the bearing bracket toward the work table and the node-former towards the presser foot, and means for adjusting the position of the node-former with respect to the presser foot including an externally and internally threaded tubular member, a set screw within the tubular member and projecting inwardly therefrom, means for locking the set screw relative to the tubular member, and means for rotating the tubular member to position the end of the set screw with respect to the tiltable bearing bracket.

7. In a blind-stitch sewing machine, the combination comprising a work table, a presser foot, a bearing bracket below the work-carrying surface of the work table and tiltable with respect thereto, the work table having an opening therethrough from the work-carrying surface and above the tiltable bearing bracket and an enlarged recess at the work-carrying surface of the work table, a node-former shaft journaled in the tiltable bearing bracket, a node-former carried by the shaft and positioned to cooperate with the presser foot, resilient means biasing the tiltable bearing bracket toward the work table and the node-former toward the presser foot, and means for adjusting the position of the node-former with respect to the presser foot including an internally threaded boss having a flange secured in the recess in the work table, a disc journaled on the boss within the recess and having a polygonal opening therethrough, a pivoted finger piece secured to the disc for manually rotating the disc, an externally and internally threaded tubular member threaded through the boss and having a polygonal flange on the end thereof within the polygonal recess in the disc, a set screw threaded in the tubular member and projecting inwardly therefrom to contact the tiltable bracket, and a locking screw securing the set screw in adjusted position with respect to the tubular member.

8. In a blind-stitch sewing machine, the combination comprising a work table, a presser foot, a bearing bracket below the work-carrying surface of the work table and tiltable with respect thereto, the work table having an opening therethrough from the work-carrying surface and above the tiltable bearing bracket and an enlarged recess at the work-carrying surface of the work table, a node-former shaft journaled in the tiltable bearing bracket, a node-former carried by the shaft and positioned to cooperate with the presser foot, resilient means biasing the tiltable bearing bracket toward the work table

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and the node-former toward the presser foot, and means for adjusting the position of the node-former with respect to the presser foot including an internally threaded boss having a flange secured in the recess in the work table, a disc journaled on the boss within the recess and having a polygonal opening therethrough, a pivoted finger piece secured to the disc for manually rotating the disc, an externally and internally threaded tubular member threaded through the boss and having a polygonal flange on the end thereof within the polygonal recess in the disc, a set screw threaded in the tubular member and projecting inwardly therefrom to contact the tiltable bracket, and a locking screw securing the set screw in adjusted position with respect to the tubular member, spaced indications on

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said disc, another disc spaced from said first mentioned disc and having indications thereon, and means for moving said second mentioned disc a partial revolution for each revolution of the first mentioned disc.

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