(Model.)

2 Sheets—Sheet 1.

W. Y. ALLEN.

SEWING MACHINE.

No. 262,720. Patented Aug. 15, 1882.

FIG. 1.

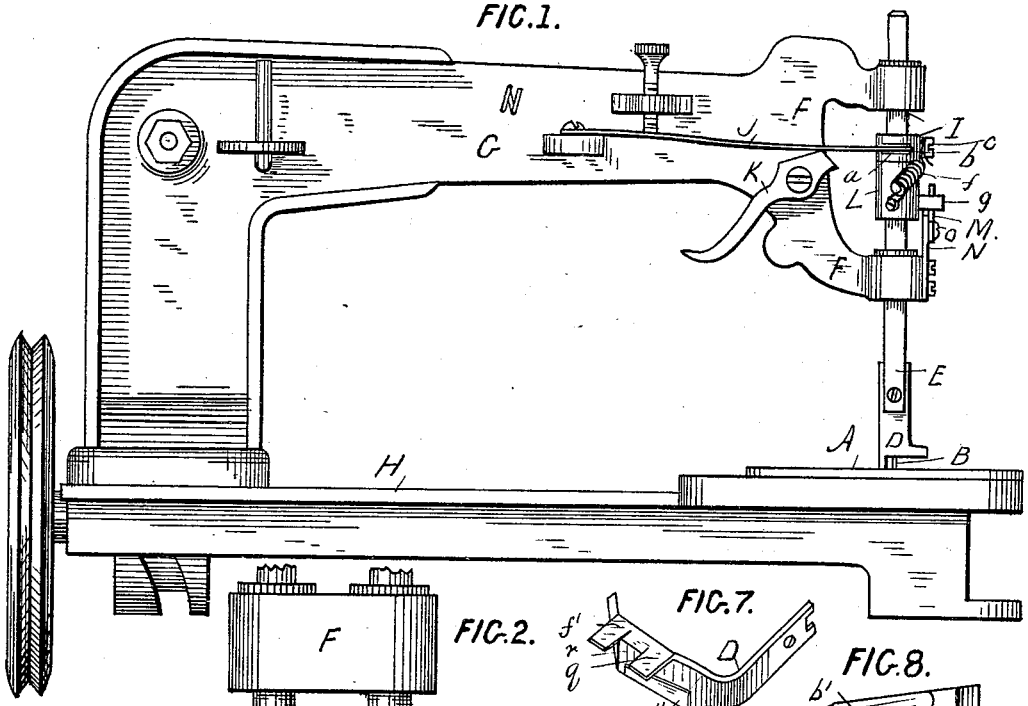


FIG. 2.

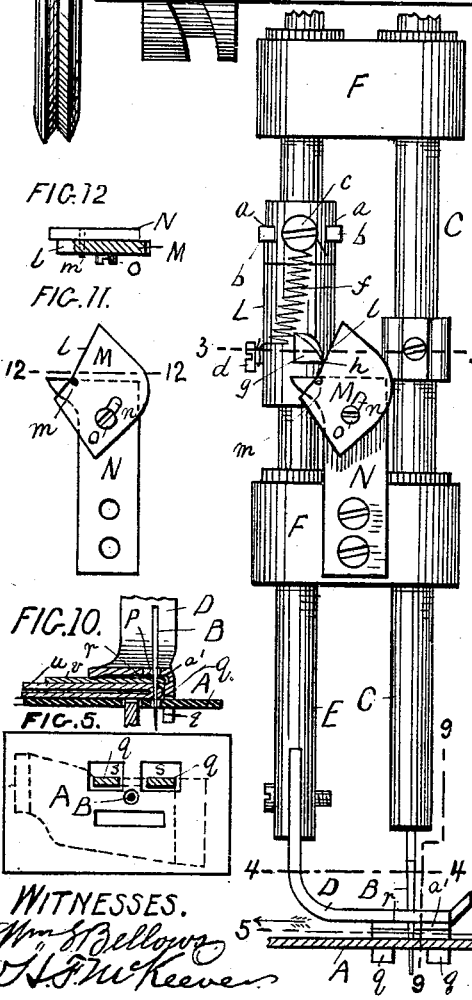


FIG. 7.

FIG. 8.

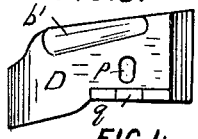


FIG. 3.

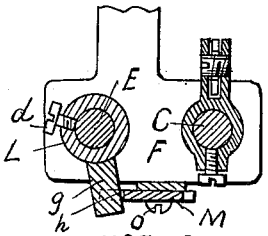


FIG. 4.

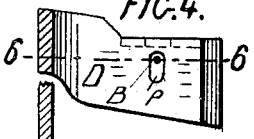


FIG. 12

FIG. 11.

FIG. 14.

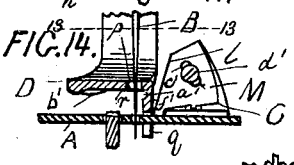


FIG. 6.

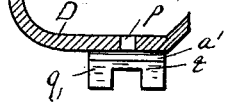


FIG. 10.

FIG. 5.

FIG. 9.

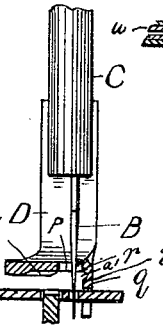


FIG. 15.

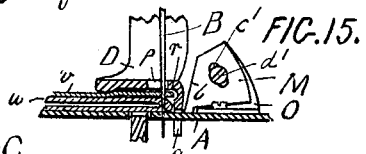
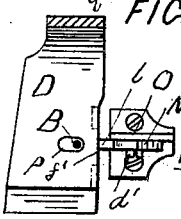


FIG. 13.



WITNESSES.

Wm. H. Bellows

H. F. McKeever

Wm Y. ALLEN,
INVENTOR
Brown Bros.
Attorneys

(Model.) 2 Sheets—Sheet 2.

W. Y. ALLEN.

SEWING MACHINE.

No. 262,720. Patented Aug. 15, 1882.

FIG. 16.

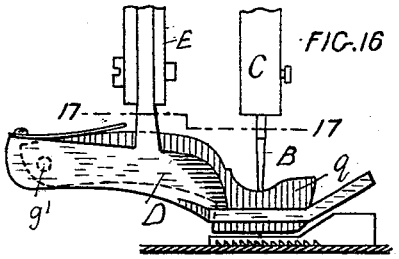


FIG. 18.

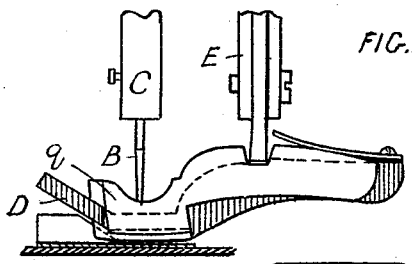


FIG. 17.

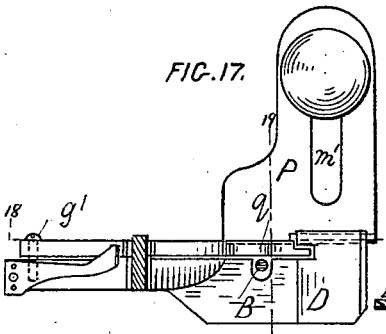


FIG. 19.

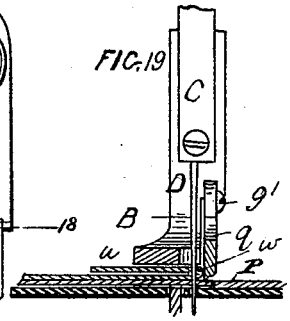


FIG. 20.

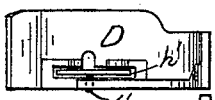


FIG. 21.

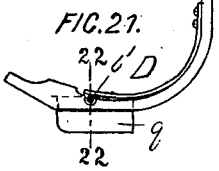


FIG. 22.

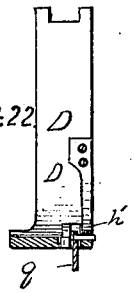


FIG. 23.

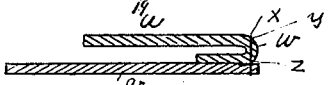


FIG. 24.

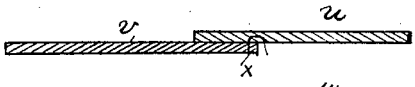


FIG. 25.

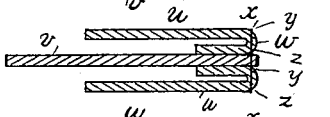


FIG. 26.

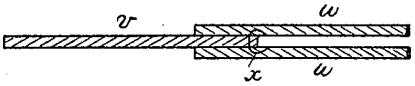


FIG. 27.

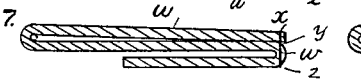


FIG. 28.

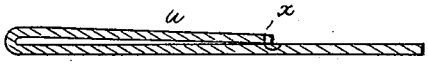


FIG. 29.

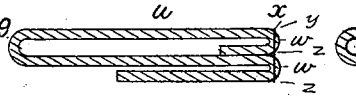


FIG. 30.

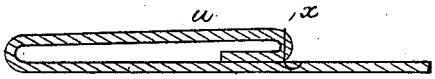


FIG. 31.

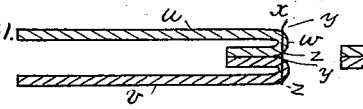


FIG. 32.

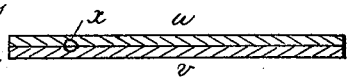


FIG. 33.

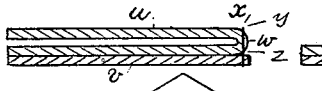


FIG. 34.

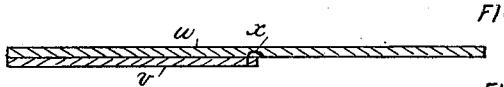


FIG. 35.

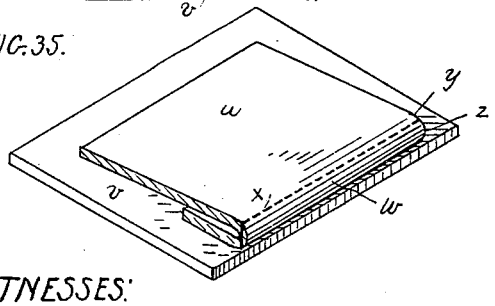
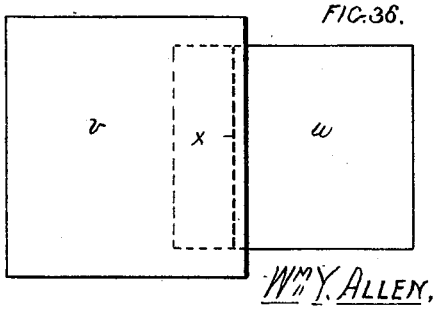


FIG. 36.



WITNESSES:
Wm. B. Bellows
H. F. McKeever

Wm. Y. ALLEN,
INVENTOR;
PER Brown Bros.
ATTORNEYS

UNITED STATES PATENT OFFICE.

WILLIAM Y. ALLEN, OF EAST ABINGTON, MASSACHUSETTS.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 262,720, dated August 15, 1882.

Application filed September 3, 1881. (Model.)

To all whom it may concern:

Be it known that I, WILLIAM Y. ALLEN, of East Abington, in the county of Plymouth and State of Massachusetts, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a full, clear, and exact description.

This invention relates to the adaptation of a sewing-machine for stitching together layers of flexible material—such as leather, cloth, felt, &c.—either one or more of which layers are folded by stitches that enter or pass into the thickness of the fold or folds of either one or more of the several layers in a manner to be wholly concealed from sight as to at least one face of the material at such fold or folds, thereby producing a "blind stitch," as it may be termed.

The object of this invention, in substance, is to provide in a sewing-machine of the ordinary or of any otherwise suitable construction to feed and stitch the so-folded material, means for guiding the material to be stitched as aforesaid, and for an automatic adjustment of such means to varying thicknesses of material, and for otherwise operating thereon, as will hereinafter appear; and to that end it consists, first, of a presser-foot adapted to be raised and lowered, provided with a downwardly-projecting guide or gage for the goods to be sewed, in combination with a suitably-constructed recess or slot in the throat or cloth-plate of the machine, into which the guide or gage can project, all as will hereinafter fully appear; second, of a presser-foot adapted to be raised or lowered, provided with a downwardly-projecting guide or gage for the goods to be sewed, and arranged to be adjusted in a lateral or horizontal direction across the line of travel of the goods under the presser-foot, and all in a manner to insure the making of the stitch by the needle in the material being sewed at and along the line of the fold or folds, as will hereinafter fully appear; third, of a presser-foot adapted to be raised and lowered, provided with a downwardly-projecting guide or gage for the goods to be sewed, and arranged to have a lateral and horizontal movement across the line of travel of the goods under the presser-foot, in combination with a suitably-constructed abutment secured to the machine in proper position for the presser-foot to be moved by it as it is raised or lowered from the thickness of goods passing under it in a lateral or horizontal direction in a manner to insure the making of the stitch by the needle in the material being sewed at and along the line of fold or folds, as will hereinafter fully appear; fourth, of a presser-foot which is adapted to be raised and lowered, and which is provided with a gage or guide for the goods traveling under it to be sewed, that is constructed with a groove or channel in and along its guiding-face and running in the direction of the travel of the goods under the presser-foot, all substantially as hereinafter described.

In the accompanying plates of drawings the present invention is illustrated as applied to a Wheeler & Wilson sewing-machine.

Plate 1, Figure 1, is a side elevation with the presser-foot raised slightly from its bearing on the cloth-plate. Fig. 2 is an elevation of Fig. 1 at the front end of the head-stock, showing by an arrow located at the left of the presser-foot the direction of the feed. Figs. 3, 4, and 5 are horizontal sections respectively on lines 3 3, 4 4, and 5 5 of Fig. 2. Fig. 6 is a vertical section of presser-foot on line 6 6, Fig. 4. Fig. 7 is perspective view of the presser-foot detached. Fig. 8 is a plan view of the bearing or working face of the presser-foot. Figs. 9 and 10 are transverse vertical sections of the presser-foot, with the needle either in part or in whole in elevation, and showing in Fig. 10 the goods being sewed in cross-section. Figs. 11 and 12 are views in detail, the latter being a longitudinal section on line 12 12, Fig. 11. Figs. 13, 14, and 15 are views showing a modification, to be hereinafter explained, Fig. 13 being a horizontal section of the presser-foot, as on line 4 4 Fig. 2, but showing the modification, and Figs. 14 and 15 vertical sections across the presser-foot, with the goods being sewed in cross-section and under the presser-foot in Fig. 15 and the needle in part in elevation. In Plate 2, Fig. 16 is an elevation at the front side of a presser-foot, showing the guide thereof arranged to have a movement vertically, as will hereinafter be fully explained. Fig. 17 is a horizontal section on line 17 17, Fig. 16, showing a guide for the goods being sewed as attached to the cloth-plate. Fig. 18 is a vertical section on line 18 18, Fig. 17. Fig. 19 is a vertical cross-section on line 19 19, Fig. 17. Fig. 20 is a plan view of a presser-foot, showing a guide as arranged to move vertically

thereon, and in modification of the arrangement of the guide for a similar movement shown in Figs. 16, 17, 18, and 19. Fig. 21 is a side elevation of the presser-foot and its guide shown in Fig. 20; and Fig. 22 is a cross vertical section on line 22 22, Fig. 20. Figs. 23, 25, 27, 29, 31, and 33 are severally cross-sections showing goods having one or more of its pieces folded or doubled and stitched through the bend of the fold or folds and otherwise, as shown and described. Figs. 24, 26, 28, 30, 32, and 34 are severally cross-sections, the same respectively as Figs. 23, 25, 27, 29, 31, and 33, but with the united layers, or rather such as can be spread or laid flat. Fig. 35 is a perspective view of the united layers as shown in Fig. 23, and Fig. 36 is a face view of the under side of the layers as they are shown in Fig. 24.

In the drawings, A is the cloth-plate.

B is the needle, and C its bar.

D is the presser-foot, and E its bar.

F is the head-stock of goose-neck G of base-plate H.

I is a collar surrounding presser-bar, and *a* is a groove in opposite sides of collar I, in which lie the tines *b b* of the free end of a spring-lever, J, fulcrumed at its other end upon the goose-neck G; and K is a cam-lever of a construction and arrangement, when properly turned, for its cam to work against the under side of the spring-lever J in a direction to force such arm to lift the collar I and all connected with or fastened to said collar I, and to hold the same so lifted and to leave said spring-lever free to exert its pressure in a downward direction upon said collar.

All of the several parts above recited are common to "Wheeler & Wilson" sewing-machines, so known; but for some of the purposes of this invention, as will hereinafter appear, the collar I, instead of being fixed to the presser-bar, as heretofore, is left loose, so that the presser-bar is free to turn therein and the collar can move lengthwise on the bar; and, again, it has a set-screw, *c*, so that it can be fastened to the bar.

L is a collar, and *d* a set-screw fastening it to the presser-bar below the collar I.

f is a coiled spring, hung at each end to the set-screws *c d* of the collars I L of presser-bar. With the spring *f* at a tension from end to end and the ordinary lifting and upper collar, I, loose upon the presser-bar E, and the lower and fixed collar, L, of the presser-bar placed with the end connection of the spring thereto at the left of its end connection to the loose collar, and with the loose collar held from turning upon the presser-bar by the tines *b* of the lifting spring-arm J, it is plain that the tension of the spring *f* will rotate the fixed collar L and the presser-bar in a direction from left to right, and in the reverse direction—that is, from right to left—if the lower end connection of the spring be placed at the right of its upper end connection, and that this rotation will cease when said lower end connection of the spring comes into a vertical line with said upper end connection. Again, it is evident that the presser-bar is free to be rotated against the tension of the spring *f*—that is, from the right to the left, or vice versa, as the case may be—that this tension of the spring *f* acts also and always vertically upon the two collars, whereby either the two collars will be drawn toward each other or either one toward the other, and thus, if the lower collar be so drawn toward the upper, then a corresponding lift of the presser-foot will take place, and that this tendency, whatever it may be, of the spring *f* to lift the presser-foot can be overcome by having the fixed collar adjusted so that the loose collar I, from the downward pressure of its lifting spring-arm J, can come to a rest upon the upper end of the fixed collar, and by having the downward pressure of said lifting spring-arm J, greater than the upward pull of the spring *f* upon said fixed collar. Under this invention these two springs *f* J are arranged for the relative action above stated, and in addition the lifting spring-arm J is given sufficient power to secure the desired pressure of presser-foot upon the goods being sewed, however thick or thin they may be.

The fixed collar L has a horizontal arm or abutment, *g*, which at its edge *h* rests against the inclined edge *l* of a plate, M, pivoted at *m* to a post, N, that is secured by screws to the front end of the head-stock F. This plate M has a curved slot, *n*, concentric with its pivot *m*, and *o* is a headed screw which passes loosely through said slot into the post N, all so that the plate M can be adjusted and set upon the post to present its inclined edge *l* at a greater or lesser degree of inclination to the vertical line of movement of the presser-bar E through its bearings of the head-stock F and through the collar I, if such collar be left loose upon the presser-bar.

p is the needle-throat through the presser-foot, and *q* is a lip or flange on the presser-foot, back of its needle-throat, and projecting downward from its bearing or working surface *r* through a slot, *s*, in the cloth-plate A. The front vertical face, *t*, of the lip *q* is for a guide to the edge of the goods placed under the presser-foot to be sewed. As shown, (see Figs. 2, 6, and 7,) the guide-lip is in two parts or prongs, and the slot *s* for its projection through the cloth-plate is similarly in two parts; but, as is plain, the lip and slot may be each made continuous from end to end. The needle-throat *p* is elongated in a direction at right angles to the feed of the machine, and the slot *s* in each of its parts is elongated in a similar direction, and both the throat and said slots are lengthened or widened in the line of the feed, all so as to allow of the lateral movement or swing of the presser-foot across the direction of the feed with and against the action of the spring *f*, which connects the presser-bar E to the collar I, loosely surrounding it,

as has been described, and as will more fully appear hereinafter.

In the use of a sewing-machine having a presser-foot provided with a guide-lip, *q*, and the presser-bar provided with loose and fixed collars I L, connected by a spring, *f*, at a tension, and such spring arranged with its tension to rotate the presser-bar from left to right and against its tension to permit the presser-bar to be rotated from right to left, and the inclined edge *l* adjusted at an angle of inclination to the vertical line of movement of the presser-bar to permit of such rotations of the presser-bar as the presser-bar is raised and lowered, it is plain that with the goods to be sewed placed under the presser-foot, as usual, but with the edge thereof against and so kept against the vertical face *t* of the guide-lip as they are fed and sewed, such goods will then be guided by such lip, and thus their stitching be secured in a parallel line therewith and at a distance from their edge in contact with the guide equal to the distance of such guide from the needle, and that this distance of the line of stitches in the goods from their edge in contact with the guide will be varied in accordance with the varying thicknesses of the goods, for the reason that the lift or drop of the presser-foot, as the case may be, allows on the lift the rotation of the presser-bar with the tension of its spring *f* and on the drop the rotation of the presser-bar against the tension of its spring *f*, in both instances moving the presser-foot laterally to the needle, and in the first instance increasing proportionately and in the second instance proportionately decreasing the distance of the guide *q* of the presser-foot from the needle, and, as a consequence, in the first instance increasing and in the second instance decreasing the distance between the line of stitches and that edge of the goods which in sewing was in contact with the guide.

A presser-foot arranged and operating as described is particularly advantageous when goods which are folded or doubled are to be sewed in a line through and between the inner or outer edges of the bend of the fold, for the reason that being properly adjusted to sew with a given thickness of goods under the presser-foot the guide *q* then insures the making of the stitch along the line desired, and also a similar making of the stitch in goods so folded and doubled, but which have a greater or lesser thickness compared with that of the goods to which the presser-foot has been particularly adjusted.

Illustrations of goods sewed through the bend of a fold or double in them and between the inner and outer edges of such bend are shown in Figs. 23 to 36, inclusive, of the drawings; but such sewing of itself constitutes no part of this invention, and therefore suffice it to say, as the features therein show, that *u* and *v* are two separate pieces of goods, *w* folds or bends in the piece *u*, and *x* the stitch through the bend of a fold or folds, *w*, between the inner and outer edges, *y z*, thereof, and through the thickness of the piece *v* from side to side thereof.

If a folded or doubled piece of goods is to be sewed with the stitch through the bend of the fold and between the inner and outer edges of said bend to another piece and at and along an edge thereof, it is desirable, in order to secure a better hold of the stitch in such piece, to have its edge project slightly beyond the outer edge of the bend in the fold. In these cases, for the folded edge of the goods to bear against the vertical face of the presser-foot guide, (which, for obvious reasons, it is preferable in all cases it should do,) a groove, *a'*, is made along the length of the face of guide to receive said projecting edge. (See Figs. 6, 9, and 10 of the drawings.) Again, for sewing goods so disposed it is preferable to have the groove *a'* in the guide *q* at the bearing-face *t* of the presser-foot D, for in such position it is capable of receiving said projecting edge of the goods whatever may be the thickness of the goods as placed under the presser-foot.

b' is a raised rib, rounding in cross-section, and running diagonally on and in the direction of the length of the bearing-surface *r* of the presser-foot, and its greatest distance from the guide *q* of the presser-foot is at the end of the foot at which the goods enter under the foot to be fed to the needle to be sewed, and all in a manner to act to force the edge of the goods being sewed toward, and thus insure its bearing against, the guide *q* as the goods are fed along to be sewed.

The combination of a guide on presser-foot and of a slot in cloth-plate A, as described, secures a bearing of the goods against the guide *q* for their full thickness, whatever that thickness may be, which obviously is important and advantageous.

The elongation of the needle-throat *p* in presser-foot, as described, enables a presser-foot having a guide for the purpose specified to be adjusted laterally to place the working-face of the guide at a greater or lesser distance from the needle.

As particularly explained, the lateral adjustment of the presser-foot in sewing goods of varying thickness is automatic in operation; but it is plain that the parts for securing such automatic adjustment from time to time are capable of being fixed so as to rigidly hold the presser-foot guide to one given distance from the needle—as, for instance, by placing the edge *l* so that as the presser-foot is raised or lowered said presser-foot can move neither to the right nor to the left from the action of the spring *f*, connected to the collars I L of the presser-bar and of the edge *l* against such spring.

In Fig. 14, which is a vertical section through and across the presser-foot at right angles to the line of feed, and in Fig. 13, which is a horizontal section and plan view on line 13 13, Fig. 14, the plate M, having working-edge *l*, herein-

before described as attached to a post, N, of the head-stock, is shown as secured by slot *c'* and set-screw *d'* to a standard, O, of the cloth-plate in a position to present its working-edge *l* to the rear edge, *f'*, of the presser-foot. Obviously a plate so located, together with the spring-connection between the collar I of presser-bar E, differs in no material respect, either as to the operation of the working-edge of the plate upon the presser-foot or as to the operation of the spring upon the presser-bar, from the operation of the same parts with such plate located as has been before fully explained.

With the loose collar I, secured to the presser-bar by the set-screw *c* and the plate M, placed out of bearing upon the presser-bar E or foot D, as the case may be, obviously the presser-bar is then adapted for its ordinary operation, as also for that of an ordinary presser-foot, if one be then attached to the bar.

In Figs. 16 to 22, inclusive, the guide on the presser-foot is shown as arranged to have a perpendicular movement relative to the bearing-surface of the presser-foot upon the goods being sewed, and in such movement to lift against a spring arranged to press it downward.

In Figs. 16 to 19, inclusive, this arrangement of the presser-foot guide *q* consists in suspending it from a fulcrum-pin, *g'*, and locating it along the length and at one side of the presser-foot, and in Figs. 20 to 23 it consists in locating it within a longitudinal slot, *h'*, of the presser-foot at one side of the needle-throat and shouldering it by a cross-pin, *l'*, to prevent its dropping through said slot.

A presser-foot guide, *q*, arranged in either of the ways allows a layer or layers of the goods being sewed to pass under it, while at the same time another layer or layers are given a rest and bearing against the front vertical face, *t*, of the guide. (See Fig. 19.) Again, if the presser-foot guide *q* be arranged to be raised and lowered for a projection of one part of the goods being sewed under and across it, obviously, if so desired, a guide may be used for the edge of the so-projecting goods, and in Figs. 16, 17, and 18 such a guide is shown. This guide P has a slot, *m'*, running at right angles to it, through which passes a thumb-screw, which enters into the cloth-plate, all so as to fasten the guide to said plate and to allow the guide to be adjusted in its distance from the guide of the presser-foot, according, as may be desired, to accommodate the projection of goods under the guide of the presser-foot.

As illustrated and described, the guide on the presser-foot is between the needle and the goose-neck; but obviously it may be on the opposite side of the needle, and if so, to then secure the automatic adjustment of the presser-foot guide herein described, the spring *f*, connecting the loose and fixed collars of the presser-bar, must be arranged for its tension to rotate the presser from right to left, instead of from left to right, as described and shown, and the plate, with its edge *l*, must be arranged to work upon the presser-foot in a direction against such action of the spring *f*, all as is plain without further explanation.

Although the contrivances herein described are particularly designed for use in sewing goods through a fold or double in the line and between the outer and inner edges of such fold or double, it is evident they are suitable for use in sewing goods not so folded—as, for instance, when it is desirable to have the line of stitches at a given uniform distance from an edge of the goods.

A presser-foot having a guide, *q*, arranged for a vertical movement upon it can be arranged for a horizontal lateral movement, the same as has been particularly described for the presser-foot, having its guide *q* not adapted for such a vertical movement. Again, the grooving or channeling of the guide *q* is adapted to all the forms and arrangements of the guide herein described.

Figs. 23 to 26, inclusive, relate to an invention for which an application for Letters Patent is made by me of even date herewith, and are only introduced in this application to illustrate how the goods are sewed by the sewing-machine described in this application.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a sewing-machine, the combination, with the presser-foot having a downwardly-projecting guide, *q*, for the goods, of the cloth-plate provided with a recess or slot, *s*, into which said guide is adapted to project, substantially as described.

2. A presser-foot for sewing-machines, having a guide, *q*, for guiding the goods to be sewed, in combination with mechanism constructed and arranged to move said presser-foot horizontally and laterally relative to the line of sewing as it is raised and lowered, all substantially as and for the purposes described.

3. A presser-foot for sewing-machines, having a guide, *q*, for guiding the goods to be sewed, a stationary plate, M, with its edge or abutment *l*, loose and fixed collars I L, spring *f*, connecting said collars I L, in combination with the presser-bar E, and a pressure-spring J therefor, all substantially as and for the purpose described.

4. The combination, with a presser-foot for sewing-machines, having a guide, *q*, for guiding the goods to be sewed, of the groove or channel *a'* in and along said guide *q*, all substantially as and for the purpose described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

WM. Y. ALLEN.

Witnesses:
EDWIN W. BROWN,
WILLIAM S. BELLOWS.