

(No Model.)

3 Sheets—Sheet 1.

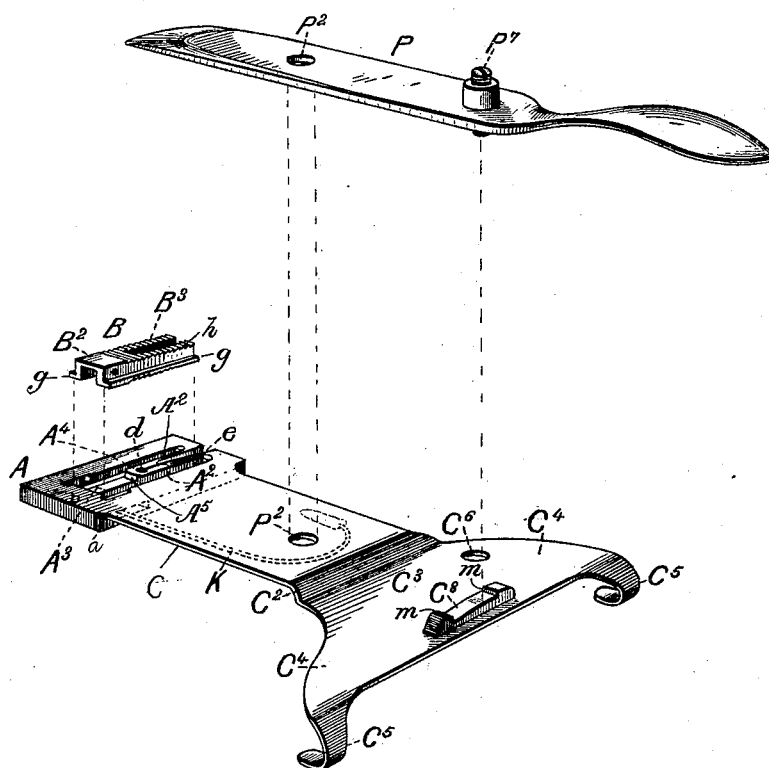
M. E. HALL.

HEMSTITCHING ATTACHMENT FOR SEWING MACHINES.

No. 493,496.

Patented Mar. 14, 1893.

Fig. 1.



Witnesses.

*Robert Emmett*

*Geo. H. Rear*

Inventor.

*Mary E. Hall.*

By

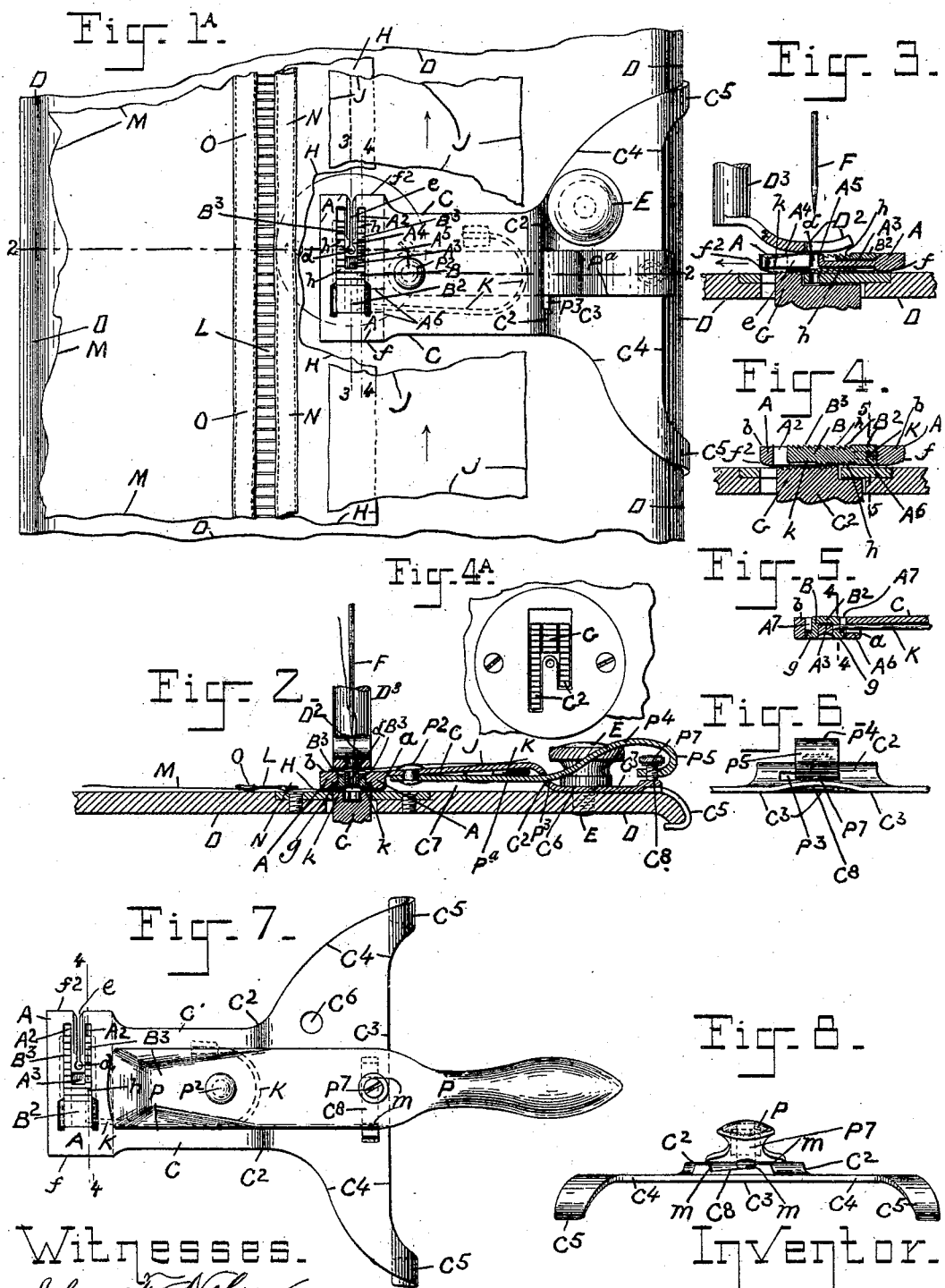
*Brown Bros Attys*

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John F. Nelson

Marion C. Brown

Inventor.

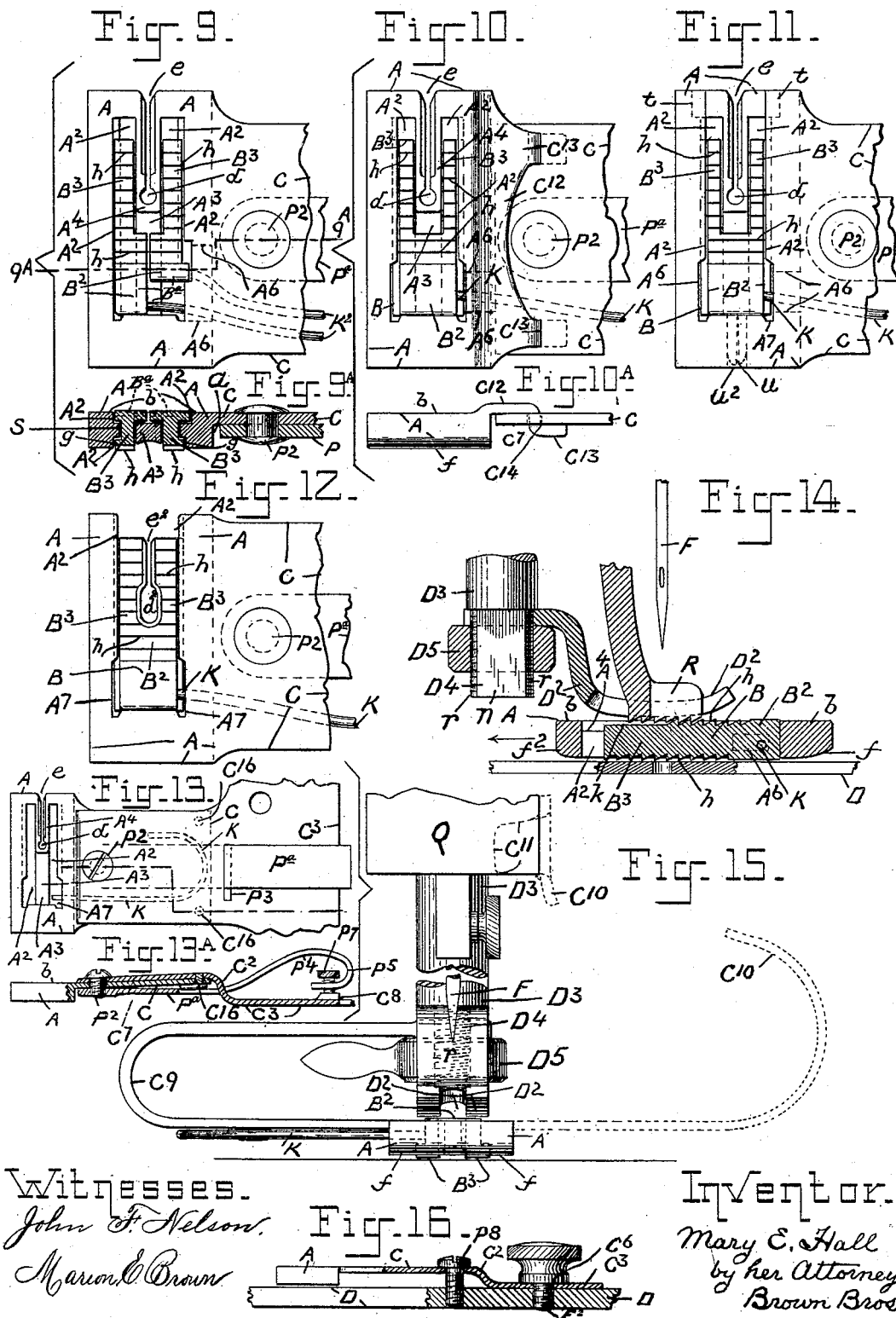
Mary E. Hall  
by her Attorneys  
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 Mary E. Hall  
 by her Attorneys  
 Brown Bros.

# UNITED STATES PATENT OFFICE.

MARY E. HALL, OF BOSTON, MASSACHUSETTS.

## HEMSTITCHING ATTACHMENT FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 493,496, dated March 14, 1893.

Application filed September 15, 1892. Serial No. 445,995. (No model.)

*To all whom it may concern:*

Be it known that I, MARY E. HALL, a citizen of the United States of America, and a resident of the city of Boston, in the county of Suffolk and State of Massachusetts, have invented a certain new and useful Improved Hemstitching Attachment for Sewing-Machines, of which the following is a full, clear, and exact description.

10 The object of this invention is to adapt a sewing machine for hemstitching fabrics, leather, &c., that is, for securing, in the making by the machine, of each ordinary stitch,—additional and loose length of the needle  
15 thread, whereby on opening or laying out the so stitched goods, all of said additional lengths of needle thread with the ordinary stitches accompanying them, are hemstitches, that is, they are, in effect and appearance,  
20 the same as if a woven fabric had had a certain number of the contiguous lengths of its threads running in one direction withdrawn and then had had the lengths of its threads running in the other direction and exposed  
25 by said withdrawal of threads, caught together in, and open spaces left between the groups, all in accordance with the common and established definition of hemstitches.

To the end stated this invention consists, in  
30 substance, of an attachment for a sewing machine, composed of a head or block, which is suitable to be located between the presser-foot and cloth-plate or table of the machine and is adapted, so located, to be held and to  
35 permit the goods which are to be hemstitched, to be disposed in layers under and above and in that position to be fed forward, and hemstitched as above stated, and of a feed-dog, suitable for feeding goods in a sewing machine,  
40 and it and said block relatively adapted for said feed-dog to be moved to and fro on said block, in one direction,—(to feed the goods)—by the action thereon of the feed-dog of the sewing machine, and in the other direction,—  
45 (to place it in position to again feed the goods,)—by the reaction of a spring, or other resilient device suitably applied therefor, and all otherwise substantially as hereinafter described, and whereby the goods are hem-  
50 stitched, and the upper and under layers of goods are conjointly fed to the stitching

mechanism of the machine and allowed to pass from said head or block.

In addition to the above, the invention consists of means adapted to detachably attach  
55 said head or block to the cloth-plate or other suitable stationary part of the sewing machine; again of means adapted to hold, with an elastic or resilient pressure, said head or block in position in the machine as afore-  
60 said; again of constructions and arrangements, in detail, of said head or block and of its said feed-dog and of other appurtenances and appliances, all substantially as hereinafter described.

In the drawings, forming part of this specification, Figure 1 is a perspective view of the attachment of this invention in a most preferable form, and showing its several parts  
70 opened out or separated from each other. Fig. 1<sup>A</sup> is a plan view, as will hereinafter fully appear, of some of the parts of the attachment, as shown in Fig. 1, placed together and in a working condition and of modifications  
75 in construction and arrangement of the other parts of the attachment from those shown in Fig. 1. In this figure the attachment as a whole is shown as on the cloth-plate—(illustrated only in part)—of a sewing machine and again two rows of hemstitches are shown, one  
80 opened or spread out and the other not opened or spread out. Figs. 2 and 3 are vertical sections, line 2—2, and line 3—3, respectively, Fig. 1<sup>A</sup>. Fig. 4 is a vertical section, line 4—4, Figs. 5 and 7. Fig. 4<sup>A</sup> is a plan of an underfeed-  
85 dog of a sewing machine. Fig. 5 is a vertical section, line 5—5, Fig. 4. Fig. 6 is an end view, in part, of Fig. 2, as hereinafter appears. Fig. 7 is a plan view of the attachment as shown  
90 in Fig. 1, with its several parts placed together and in a working condition. Fig. 8 is an end view of Fig. 7, as hereinafter appears. Figs. 9, 9<sup>A</sup>, 11 and 12 are views of the head or block and feed-dog of the attachment illustrating modifications in their construction and  
95 arrangement together. Figs. 10, 10<sup>A</sup>, 13 and 13<sup>A</sup> are views illustrating a connection of the head or block with the means to fasten the block in position in the machine, and whereby the block can be attached to and detached  
100 from said fastening means. Fig. 14 is a vertical section, illustrating an adaptation of the

attachment for being used with an upper feed-dog, in lieu of with an under feed-dog of a sewing machine as shown in the figures preceding. Fig. 15 is an elevation illustrating, by full lines, the securing of the attachment to the vertical bar of the presser-foot, and by dotted lines, the securing of the attachment to the head of the goose-neck of a sewing machine. Fig. 16 is a view, in detail, as hereinafter appears.

Referring to the drawings, more especially Figs. 1, to 8, both inclusive, A is the head or block and B is the feed-dog or device, together constituting the attachment of this invention for securing, in co-operation with the ordinary and usual stitch forming and feed devices of a sewing machine, the hemstitching of goods as hereinbefore stated.

The head or block A is flat and of rectangular outline and of a thickness, preferably, substantially equal to the length of the hemstitch desired to be produced in goods being sewed in a sewing machine to which said block is applied as hereinafter appears.

The block A has a flat arm-extension C, preferably of spring sheet metal, by which to secure it in position in a sewing machine as hereinafter stated. This arm C leads off from the edge *a* and its upper face is flush with the upper face *b* of the block A and, intermediately of its length, it has a downward bend or offset C<sup>2</sup>, slightly greater in height than the thickness of said block, and it thence continues in a flat portion C<sup>3</sup>, with side wings C<sup>4</sup>, each having a leg C<sup>5</sup> of hook shape, and suitable to engage the corresponding edge of a cloth-plate D of a sewing machine, for instance, the well known Willecox & Gibbs, and so engaged to have the flat portion C<sup>3</sup> of the arm-extension C, in contact with the upper surface of said cloth-plate, and the block A under and lengthwise of the presser-foot D<sup>2</sup> and between it and said cloth-plate, and the whole in position to be rigidly secured to said cloth-plate, as for illustration, Figs. 1<sup>A</sup> and 2, by means of a thumb-screw E, that passes by its screw-threaded shank loosely through a hole C<sup>6</sup> of said flat-portion C<sup>3</sup> and screws into a screw-threaded hole of said cloth-plate, preferably, the hole usually found therein, for securing other and well known attachments for sewing machines.

The block A has a rectangular opening A<sup>2</sup> through its thickness. A<sup>3</sup>, A<sup>4</sup> is a fixed bridge or bar centrally and lengthwise of said opening A<sup>2</sup>. The end-portion A<sup>3</sup> of this bridge,—the portion in front of the sewing machine needle F, (shown only in part) when the block is in the position described, has its upper face below and the end-portion A<sup>4</sup> then back of and about the pathway of the needle has its upper face flush with the upper face of the block, and at the juncture of these end-portions is a vertical abutment or stop face A<sup>5</sup>. The under face of the bridge, preferably, is above the plane of the under face of the block. *d*, is a vertical hole through the flush por-

tion A<sup>4</sup> of the bridge A<sup>3</sup>, A<sup>4</sup> of the block, and it is in position for the passage of the needle F therethrough, when the block is in the position stated and *e* is a way or throat through said flush portion and in communication with the needle-hole *d* and open to the outside of the end of the block back of the needle. This throat is in the line of travel of the stitches as they are made by the stitch forming devices of the sewing machine. The block A, at both ends, front and back, of the needle hole *d*, is rounded off at its under corners or edges *f*, *f*<sup>2</sup> respectively.

The feed-dog or device B is of rectangular shape in outline, and shorter in length than the length of the rectangular opening A<sup>2</sup> in the block A and it is adapted, by its portion B<sup>2</sup> in front of the needle-hole *d*, to loosely straddle the front portion A<sup>3</sup> of the bridge A<sup>3</sup>, A<sup>4</sup> of said block and to comparatively loosely fill its opening at its said portion A<sup>3</sup> and, by its tine or leg-portions B<sup>3</sup>, to comparatively loosely fill the opening of the block at each side of the flush portion A<sup>4</sup> of its bridge, and otherwise located in said opening as described and in its normal position to have its end-portion B<sup>2</sup> in front of the needle, against the corresponding end of the opening and off from the stop or abutment face A<sup>5</sup> of the bridge of the block and also to have the ends of its tines or legs off from the end of said opening rear of the needle, to a distance at least equal to the full length of the to and fro movement which it is desired the feed-dog shall have on the block, and as will hereinafter appear.

The feed-dog B is of a thickness, preferably, substantially the same as that of, but it may be either thinner or thicker than the block A, and at its under face it has a lateral flange *g*, along its opposite side edges, overlapping the under face of the block at each side of its said opening A<sup>2</sup>, see Figs. 2 and 9<sup>A</sup> more particularly.

Both the under and upper sides or faces of the feed-dog B are exposed at the corresponding sides of the block A and each exposed face, preferably, is roughened or indented, as for illustration by parallel transverse serrations *h*, in the form of ratchet teeth, with their inclined faces, at the under and upper sides of the feed-dog presented in opposite directions. These serrations of the feed-dog, Figs. 1, 1<sup>A</sup>, 3, 4, 9, 10, 11 and 12 embrace the full length of the upper side of each tine B<sup>3</sup> of the dog, and also a portion of the length of the dog just in front of the needle-hole *d* of the block A, shown, Fig. 12, as in the feed-dog and not in the block A as has been before explained. Again the serrations of the feed-dog B, Figs. 1, 3 and 4, embrace only the length of the under side of the feed-dog, beginning at or near the needle hole *d* and ending at or near the end of the portion of the feed-dog which is front of the needle, and the balance *k* of the under side of the feed-dog is smooth. In the normal position of the feed-dog B of the attachment, that is, with its end-portion

front of the needle at rest against the corresponding end of the opening  $A^2$  in the block A, and in the normal position of the under feed-dog G,  $G^2$ ,—(shown only in part, Figs. 3 and 4)—of the machine, said smooth portion  $k$  of the feed-dog B is over the cross serrations of the portion G of said under feed-dog at the rear of the needle and said cross serrations of the under side of said feed-dog B are then over the cross serrations of the portion  $G^2$  of said under feed-dog at the front of the needle. This under feed-dog G,  $G^2$  is shown in full, Fig. 4<sup>A</sup>, and it and its arrangement and mechanism for operating it are all as well known, for illustration, as in the sewing machine, known as the Willcox & Gibbs, and as they constitute no part of this invention, it is not deemed necessary to particularly show or describe them. The serrations of the under feed-dog G,  $G^2$ , are presented in proper direction, to secure, by the forward movement, or in other words, the movement of the dog toward the needle as well known, the feed of a layer of goods H, Figs. 1<sup>A</sup> and 2, located on the cloth-plate or table C of the machine, and under the block A of the attachment of this invention. In addition to and simultaneously with this feed of the under goods H, a layer of goods J on the upper side of the block A and under the presser-foot  $D^2$  is also fed, and this feed, of said upper goods, is because of the movement of the feed-dog B of the attachment, produced by the action of the under feed-dog G,  $G^2$  of the machine, both on the under goods at their portion lying between the smooth under side of said feed-dog B, and at their portion lying between the serrations of the under side of said feed-dog B and the serrations of said under feed-dog G,  $G^2$ . In the feed of the upper and under layers of the goods as just described, the serrations of both of said dogs are as before explained in the directions most proper and suitable therefor. On the completion of said feed of the goods H, J, the under feed-dog G,  $G^2$  moves down and out of contact with the under layer of the goods and it and the feed-dog B of the attachment then return to position for again feeding the goods as before and so on. The return of the feed-dog B is secured by the reaction of a bow-shape spring K that, at its free end, is engaged with said feed-dog B, and at its other end is made fast at the under side of the arm-extension C of the block A and for its movement passes loosely through a suitable slot  $A^6$  of said block A.

With the feed of upper and lower goods H, J, all as stated, obviously on the making of and at each stitch, there is loose needle thread extending between the two layers of goods which in length is substantially equal to the extent of separation of the layers produced by the thickness of the attachment described, that is, either of its block A or its feed-dog B, according as one or the other is the thicker. Each stitch and its loose thread as the stitch is made, passes from the needle hole  $d$  into

and through the throat  $e$  of the attachment and out at the outer open end of said throat.

On removal of stitched goods as aforesaid from the machine and on spreading or opening them out in opposite directions, hemstitching, such as hereinbefore referred to as the object of this invention to secure using a sewing machine, then will appear in a row L, Figs. 1<sup>A</sup> and 2, and connecting two layers M and N of goods together, and which goods, when sewed in the machine to produce said row of hemstitches, had the layer M under the block A of the attachment and on the cloth-plate of the machine the same as the layer H is now shown, Figs. 1<sup>A</sup> and 2, but which layer H, when making the hemstitches of row L, was on the block A of the attachment and under the presser-foot, where now is placed the layer J to be stitched to the layer H as said layer H was stitched to said layer M and a row of hemstitches produced, all as before explained. Both layers H and J of goods are shown, Fig. 1<sup>A</sup>, as broken out to expose the attachment and again stitched hems N and O as well known are shown, one at each side of the row L of hemstitches.

The extension arm C of the attachment and its downward offset or bend  $C^2$  as explained, furnish an unobstructed open space  $C^7$  to receive a length of the under layer of the goods to be stitched to the extent of the distance of said offset from the pathway of the needle of the machine and the attachment otherwise presents no practical obstruction to the presentation and disposition of either the under or upper layers H, J of goods all as is obvious without further explanation.

As before stated, the arm-extension C of the block A of the attachment, is preferably made of spring metal as thereby while said block can be firmly secured to the machine, it has more or less elasticity or spring in a vertical direction, and so it possesses an automatic adjustability to the upward and downward pressure thereon of the presser-foot and feed-dog of the machine. This adaptability of the arm-extension C however can be dispensed with and the arm be rigid or firm.

If the arm-extension C of the block A of the attachment is elastic or springy as stated, then it is well to adapt it to be positively actuated in a manner to regulate or control or wholly offset its elasticity. This may be accomplished in various ways and three are illustrated, to be now described.

P, Figs. 1, 7 and 8, is an arm, extending over and lying on the upper side of the arm-extension C of the attachment and at its end toward and near the block A of the attachment it is secured and is fulcrumed, by a riveted pin  $P^2$ , on said arm-extension. The arm P has a pin  $P^7$  for its bearing on a raised cam-flange  $C^8$  of the flat portion  $C^3$  of the arm extension C. This pin  $P^7$ , preferably, is screw-threaded and is applied to be screwed in and out, all so that by swinging the arm P, on its fulcrum-pin, in one direction and by the then co-operative ac-

tion of its pin  $P^7$  and of the cam  $C^8$  of the plate  $C^3$ , the block A, according to the direction in which said arm is swung, will be placed either in close and more or less rigid bearing on, or allowed to rise from the cloth-plate or table D of the machine, and in either case, be elastic or springy, but varying in degree and controlled or regulated to a greater or less extent as to whether the arm P is resilient as stated, or is rigid or inflexible, and again according as to how said pin  $P^7$  is adjusted as to its bearing on said cam-edge  $C^8$ .

$m, m$  are vertical faces one at each end of the cam  $C^8$  and in co-operation with the bearing-pin  $P^7$  of the arm P, they control or limit the swing of said arm in its opposite directions.

In Figs. 1<sup>A</sup>, 2 and 13, the arm  $P^a$  which is the equivalent of the arm P of Figs. 1, 7 and 8 is shown as passing through a horizontal slot  $P^3$  of the offset  $C^2$  of the arm-extension C of the attachment and thence continued with an upward bend  $P^4$ , in turn continued with a downward and under bend  $P^5$  ending over the cam-flange  $C^8$ , before referred to, of the flat portion  $C^3$  of said arm-extension C, and carrying a screw-pin the same as the screw-pin  $P^7$ , Figs. 1, 7 and 8 and so lettered, for bearing on said cam edge. The use and work of the arm  $P^a$  and arm-extension C, cam  $C^8$ , and screw-pin  $P^7$ , all constructed and arranged as just above explained, are substantially the same as the corresponding parts, Figs. 1, 7 and 8.

In Fig. 16, the regulation of the pressure of the block A of the attachment, heretofore explained, is secured, by means of the pressure which is brought to bear on the arm-extension C of the block, from the turning of a headed screw-pin  $P^8$ , that passes loose through a hole of and by its head has a rest on said extension and screws into the cloth-plate or table D. This view, Fig. 16, shows the securing of the attachment in its desired and stated position, by means of two screws, one, the screw-pin  $P^8$ , just above referred to, and the other, a thumb-screw,  $E^2$  entered into the cloth-plate or table in a line with and to the right of said screw-pin  $P^8$ .

In lieu of securing this attachment to the cloth-plate, or table, D of a sewing-machine, as has hereinbefore been described, it may be secured to the vertical bar or rod  $D^3$ , Figs. 2, 3, 14 and 15, which carries the presser-foot  $D^2$ , and is otherwise arranged, combined and operated, in sewing-machines, as well known, or it may be secured to the head Q, shown only in part, Fig. 15, of the goose-neck (not shown), as well known in sewing-machines.

The securing of the attachment to the presser-foot rod  $D^3$  may be, Fig. 15, made by means of a bow or U-shaped arm  $C^9$ , in full lines, and preferably of spring metal and which, preferably, is at one end extended from either the right or left side of and held on the block A, (shown as from the left) and to a distance sufficient to afford ample space for the disposal of the upper layer of the goods within

its bow shape, and at the other end, suitably adapted therefor, it is set over, Figs. 14 and 15, the opposite flat sides  $n$ , and opposite screw-threaded edges  $r$  of the downward projected stud  $D^4$  of the presser-foot rod  $D^3$ , on which is set said bow arm  $C^9$  and the presser-foot and both held by means of a screw-threaded nut  $D^5$ , that is screwed thereon and against the under side of the bow-arm  $C^9$ , located below the presser-foot.

The securing of this attachment to the head Q of the goose-neck, Fig. 16, may be by means of a bow, or U-shaped, arm  $C^{10}$ , in dotted lines and broken out, and in all respects similarly to the arm  $C^9$ , except in securing to the head, which is by means of a square sided lug  $C^{11}$  entered into and suitably engaged with the head, and if desired, fastened by a screw or screws (not shown) or other suitable means.

So far as the attachment of this invention has been now explained, it has been in connection with the under feed-dog G,  $G^2$  of a sewing-machine. Plainly however, it, in every respect so far as described, and also as will hereinafter appear as to modifications in it and other instrumentalities of it, may be used as well in connection with the upper feed-dog R, Fig. 14, of a sewing-machine, and simply by having the under and upper sides of the feed-dog B respectively at the upper and under sides of the block A.

The upper feed-dog R of the machine is of course adapted to act, in substance, in conjunction with the feed-dog B of the attachment, the same as the under feed-dog G,  $G^2$  of the machine acted therewith and so adapted, the upper feed-dog, as has been before explained for the lower feed-dog, is to be otherwise constructed, arranged and operated, for its action to feed goods as ordinary, or otherwise and as well known and in no respect do such features constitute any part of this invention.

The feed-dog B may be in one whole piece, Figs. 1, 1<sup>A</sup> to 5 inclusive, 7, 10, 11, 12 and 14, or it may be in separate parts,  $B^a$  Figs. 9, and 9<sup>A</sup>, each adapted by means of a separate spring  $K^2$  to independently move to and fro on the block A, as has been herein before explained for the feed-dog B, when in one whole piece. Again the feed-dog  $B^a$  and opening  $A^2$  of the block A may be relatively provided with tongue and groove S, Figs. 9 and 9<sup>A</sup>, for supporting and guiding the feed-dog  $B^a$  on the block A, and this construction, if the feed-dog is in one whole piece, would be sufficient and so the bridge  $A^3$ ,  $A^4$  of the block A, in so far as it acts as a guide or support for the feed-dog, may be dispensed with, but hardly so, if the feed-dog is in parts, Figs. 9 and 9<sup>A</sup>, unless said parts are joined by tongue and groove so as to be supported from and to move on each other.

The relative adaptation, just above explained, of the feed-dog B and block A for supporting and guiding the feed-dog on the

block, however is particularly applicable to said parts, Fig. 12, with the bridge  $A^3$ ,  $A^4$  of the block A dispensed with and the end of the block A back of the sewing-needle left open and the hole  $d^2$ , for the passage of the needle and the throat or passage  $e^2$  leading from said hole  $d^2$  in the feed-dog.

In the arrangement of the feed-dog B and block A, Figs. 1, 1<sup>a</sup> to 5, both inclusive, by withdrawing and thus disconnecting the bow-spring K from the feed-dog B, the feed-dog can be then removed from the block, by drawing its end portion front of the needle through the opposite side enlargements  $A^7$  of the opening  $A^2$  of the block and each of which enlargements extends for the full thickness of the block. The same is true of the feed-dog B, Fig. 11, assuming that the feed-dog and the block A to be the same in every respect as in Figs. 1 to 5, inclusive, but by this figure the feed-dog and the block are represented as being relatively adapted with tongue and groove connection, the same as shown, Figs. 9 and 9<sup>a</sup>, but there as applied to a feed-dog, in separate parts, in lieu of to a feed-dog in one whole, Fig. 11. Again, Fig. 11 shows the bridge  $A^3$ ,  $A^4$  of the block, as attachable to, and detachable from the block, by the combination with, the attachable and detachable end-portion of the block A, that is at the rear of the needle, and which and the bridge, in place on the block, engages by its flat side wings  $t$ , on its opposite vertical sides, corresponding shaped grooves or recesses in the opposite sides of the opening  $A^2$ , of a spring split tongue or pin  $u$  in continuation of the bridge  $A^3$ ,  $A^4$  and which, in placing the bridge in the block as stated, is entered into a socket  $u^2$  of the end-portion of the block front of the needle, and which is suitable to receive and confine it.

The relative construction of the bridge and block as just explained, is of itself, if the holding parts explained are properly adapted to each other, sufficient to hold the bridge in place on the block, but plainly this hold, if desired, may be made positive and certain, by using fastening screws (not shown) for the engaging portions of the bridge with the block at either one, or the other, or at both of its ends.

The construction and arrangement of the bridge and block, Fig. 11, allow the bridge  $A^3$ ,  $A^4$  and the feed-dog B to be readily removed from and replaced in the block, and thus the same block can be used with different feed dogs.

All of the constructions and arrangements of the block A and feed-dog B which have been described, applied to and used in a sewing-machine, and whether the feed of the machine is an under or an upper feed, operate substantially in the same manner, and which has heretofore been, in its main features, fully explained but will now, in its details, be explained.

By rounding off the under edges  $f$ ,  $f^2$  at the

front and rear of the block A, as has been described, the under layer of goods to be and as they are being sewed can the better pass under and out from under the block A.

The throat or passage  $e$  or  $e^2$  leading from the hole  $d$  or  $d^2$  of the attachment for the passage of the needle in its work to sew together the upper and under layers of goods, allows the stitches as they are formed and with the additional length of needle-thread at each stitch, to pass along and out from the attachment.

As before stated, it is preferable to have a smooth extreme end-portion  $k$  of the feed-dog B at the rear of the needle and for the reason, that in the return movement of said feed-dog and the feed-dog of the machine all liability of a return action of the feed-dog B, on the goods being sewed, is practically prevented.

Preferably the feed-dog B is allowed a more or less up and down movement on the block A, for the reason, that, when the feed-dog B is not under the action of the feed-dog of the machine, it can practically so free itself from the goods as on its return movement to obviate all liability of its carrying the goods, with it.

The block A and the means to hold it in position on the machine, so far as they have at present been described, are continuous with each other, referring more particularly to the part thereof directly in extension or otherwise of the block. It is sometimes preferable to have said block and said means separable for the reason, that then either the means to hold the block on the machine, may be used with blocks of different thicknesses and the same blocks may be used with different means to hold them in position on the machine, according as said means may of necessity be different for the adaptation of the attachment to the different types of sewing-machines now well known or which may be hereafter known. Two modes of adapting said block, and said means to hold the block on the machine, for the separation of the two from, and the attachment of the two to each other, are shown, Figs. 10 and 10<sup>a</sup>, and Figs 13 and 13<sup>a</sup>.

In Figs. 10 and 10<sup>a</sup>, the arm-extension C of the block A, which as before explained was attached to said block is therein shown as unattached to the block, and the block, at its side edge, of which said arm C was in extension, has an extension  $C^{12}$ , having at each of its opposite end-portions, a similar bent ear-piece  $C^{13}$ , and said arm C has two transverse slots  $C^{14}$  of a width and length corresponding to said ear-pieces and suitably located to receive and have them inserted therein and therethrough, and so inserted then brought to a bearing against the under side, and the extension  $C^{12}$  of the block to a bearing on the top of said arm C. The parts C,  $C^{12}$  joined together as has been explained are plainly separable from and also attachable to each other, and while attached as stated obviously they may be rigidly held together by enter-



ing fastening screws (not shown) through their overlapping parts. However as to holding them together, it is plain, that the bow shaped spring K hereinbefore described, will, to a great extent, afford practical security against their accidental displacement, when the attachment is in use.

In Figs. 13 and 13<sup>A</sup>, the arm extension C and its offset C<sup>2</sup> and plate C<sup>3</sup> are in parts, which are lapped upon and secured to each other by the fulcrum pin P<sup>2</sup> of the lever arm P<sup>a</sup>, and which pin passes through them, and by screw-pins C<sup>16</sup> screwed into them, between the fulcrum and the handle end of the lever.

Having thus described the invention, what is claimed, and desired to be secured by Letters Patent, is—

1. In combination, a slotted block, means to fasten said block in position under the presser-foot of a sewing machine; a feed-dog located, and free to move to and fro in said slotted block, and having its upper and under sides exposed, and it and said block relatively adapted for the needle to move therethrough, and the stitches to pass therefrom, and means to automatically move said feed-dog in one direction on said block, substantially as described, for the purposes specified.

2. In combination, a slotted block, a spring arm in extension and at one side of said block and adapted to be secured to the cloth or bed plate of a sewing machine, and fasten said block in position under the presser foot, a feed dog located, and free to move to and fro in said slotted block, and having its upper and under sides exposed, and said block relatively adapted for the needle to move therethrough, and the stitches to pass therefrom, and means to automatically move said feed-dog in one direction on said block, substantially as described, for the purposes specified.

3. In combination, a slotted block, a spring arm in extension and at one side of said block and adapted to be secured to the cloth or bed

plate of a sewing machine, and fasten said block in position under the presser foot, means held on said spring-arm extension and consisting of a swinging lever at one end bearing on said extension and a fixed cam edge, in position as said lever is swung to work on the under side of it, a feed dog located, and free to move to and fro in said slotted block, and having its upper and under sides exposed, and it and said block relatively adapted for the needle to move therethrough, and the stitches to pass therefrom, and means to automatically move said feed-dog in one direction on said block, substantially as described, for the purposes specified.

4. A slotted block A, having a bridge A<sup>3</sup>, A<sup>4</sup>, lengthwise thereof and its portion A<sup>4</sup> above its portion A<sup>3</sup> and said portion A<sup>4</sup> provided with a needle hole *d* and a throat *e* leading therefrom, means to fasten said block in position under the presser foot of a sewing machine, a feed-dog, located and free to move to and fro in and to straddle the lower portion A<sup>3</sup> of said bridge of said slotted block, and to have its upper and under sides exposed, and means to automatically move said feed-dog in one direction on said block, substantially as described, for the purpose specified.

5. In combination, a slotted block A and a feed-dog B which is located and is free to move to and fro in said slotted block and has its upper and under sides exposed and provided with parallel transverse ratchet serrations, the incline faces of which on the one side are in an opposite direction to those of the other side, substantially as described, for the purposes specified.

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

MARY E. HALL.

Witnesses:

ALBERT W. BROWN,  
MARY W. STORER.