

G. J. STEVENS.

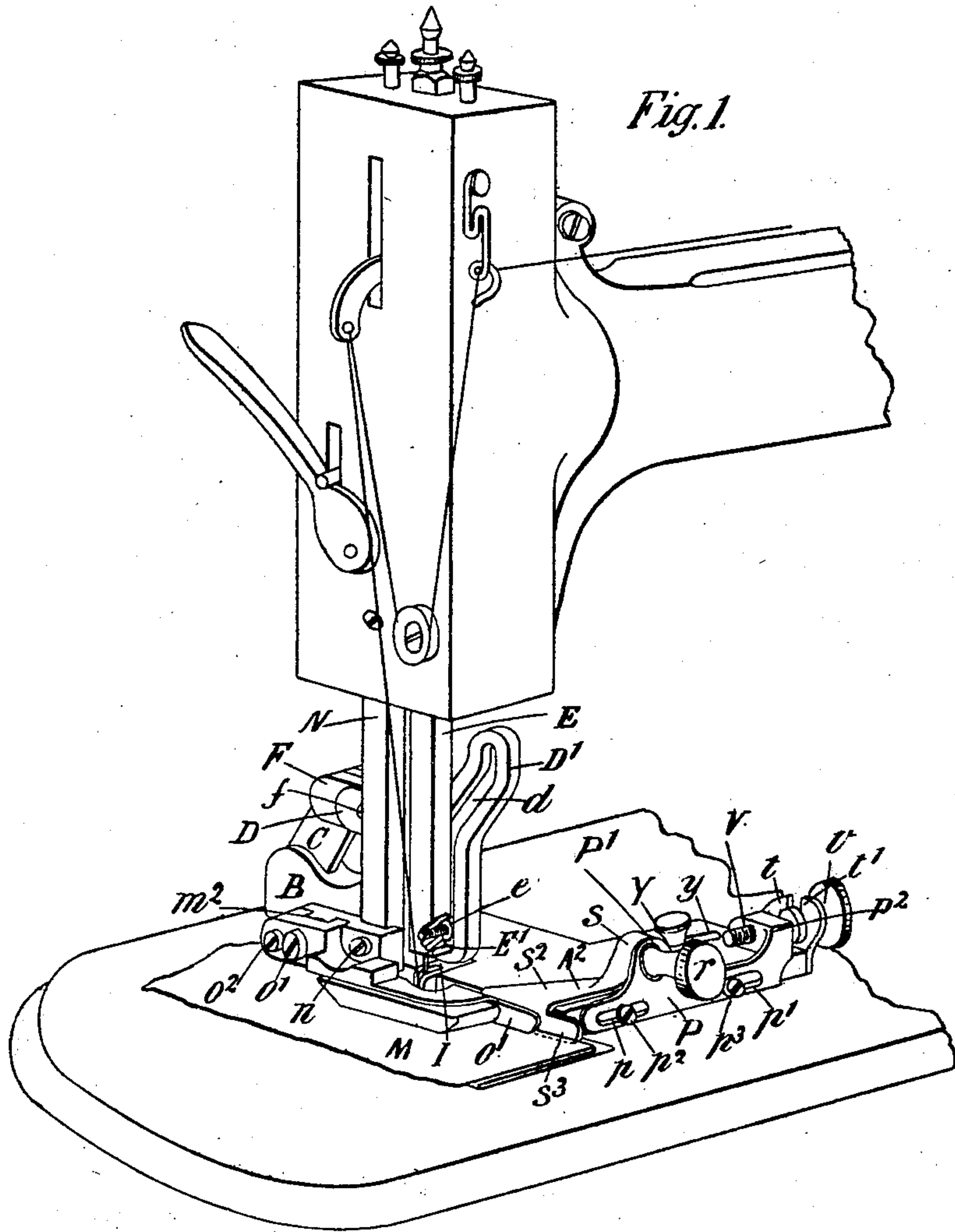
SEWING MACHINE ATTACHMENT FOR OVERSEAMING AND THE LIKE.

APPLICATION FILED SEPT. 30, 1901.

968,997.

Patented Aug. 30, 1910.

3 SHEETS—SHEET 1.



WITNESSES:

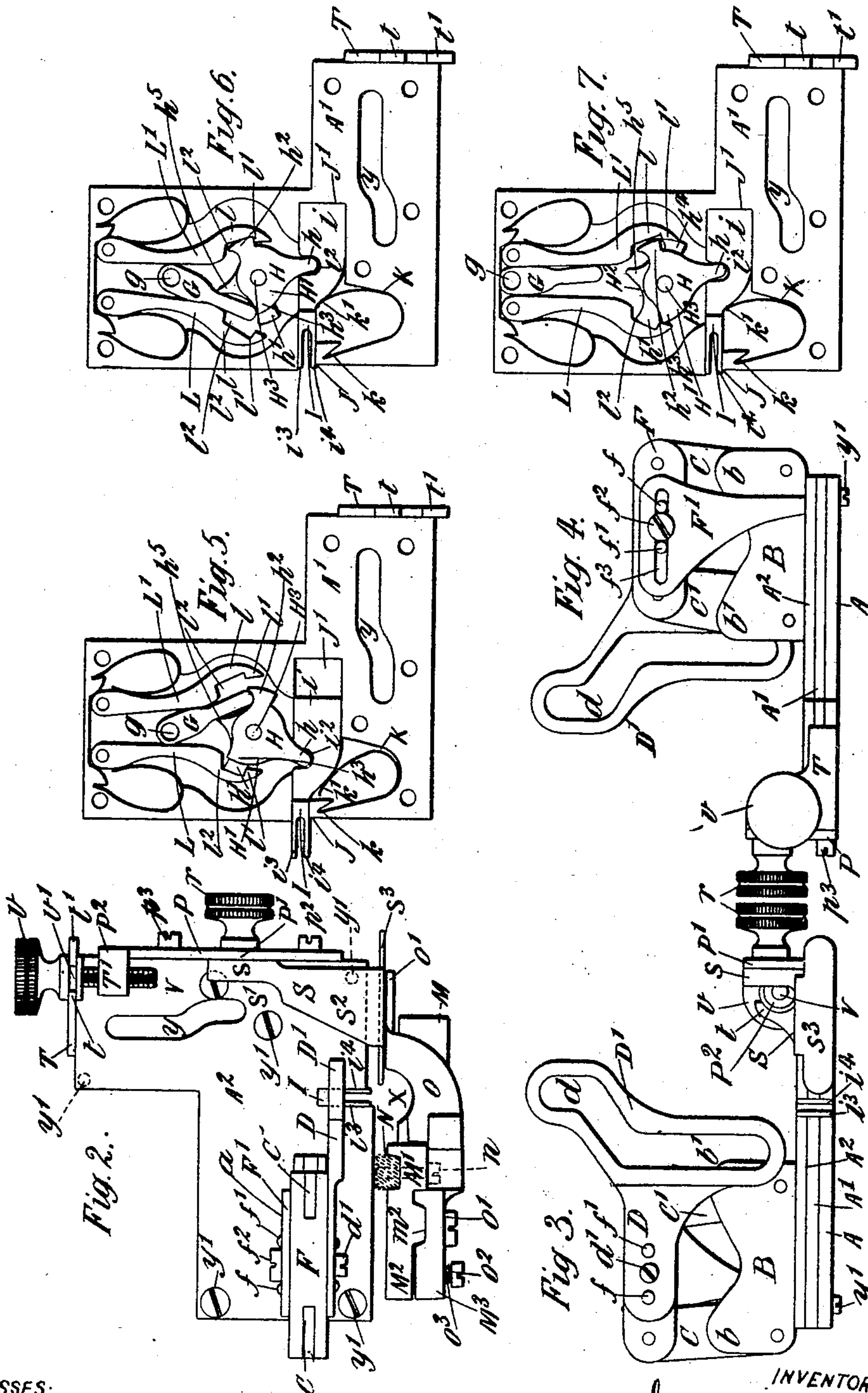
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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

Fig. 8.

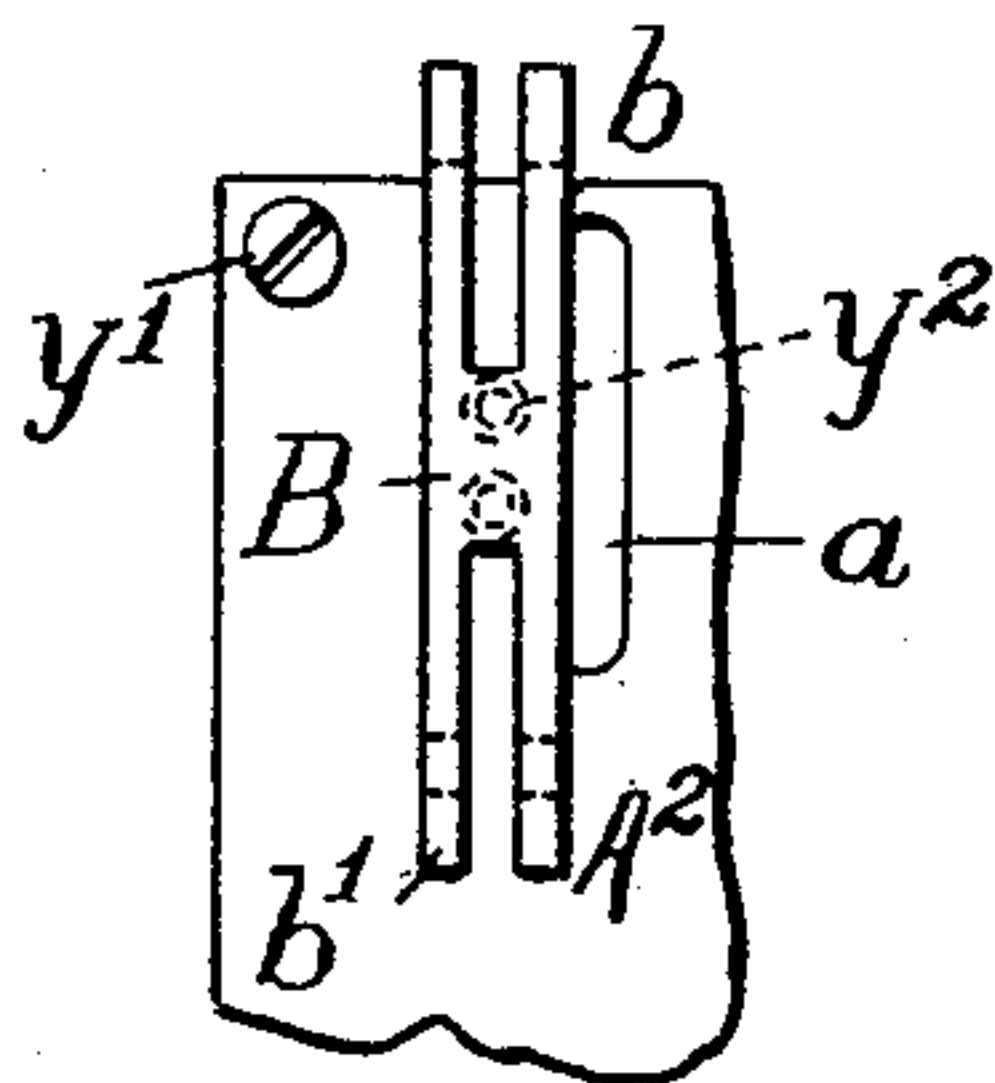


Fig. 9.

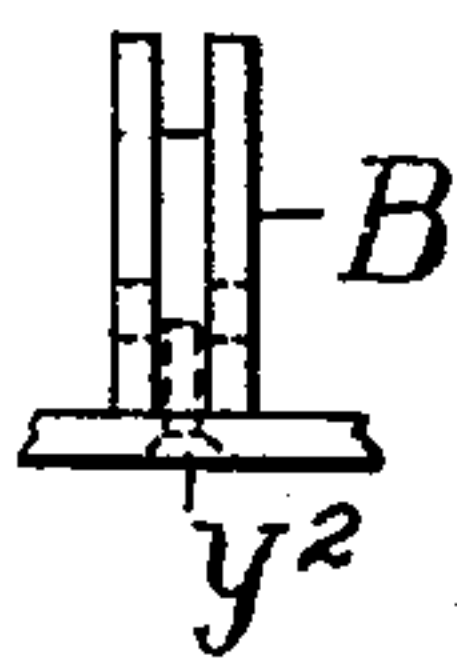


Fig. 10.

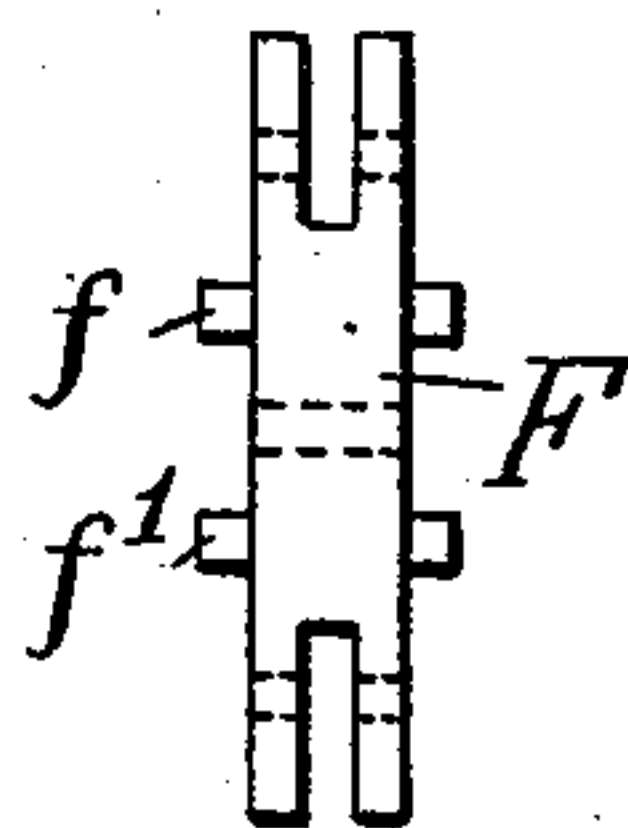


Fig. 11.

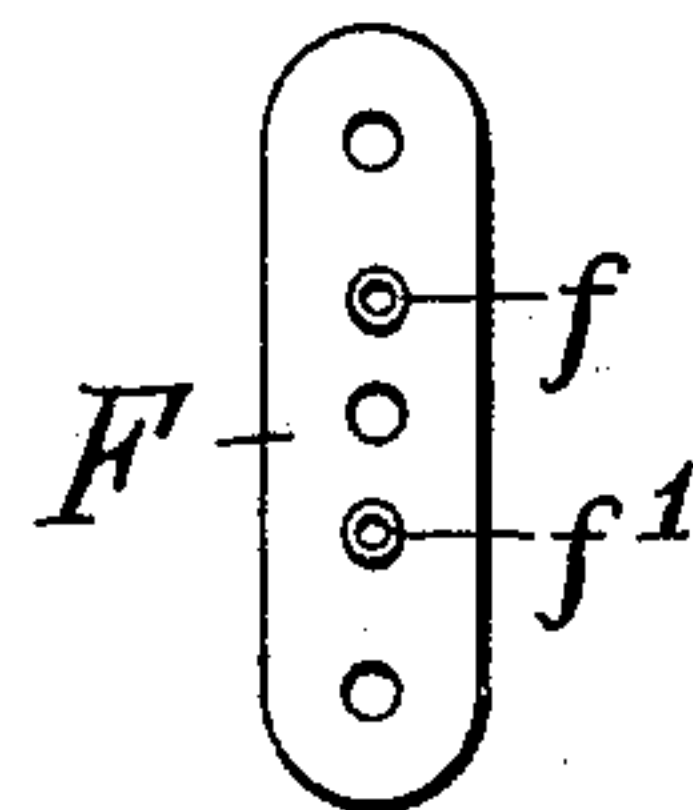


Fig. 12.

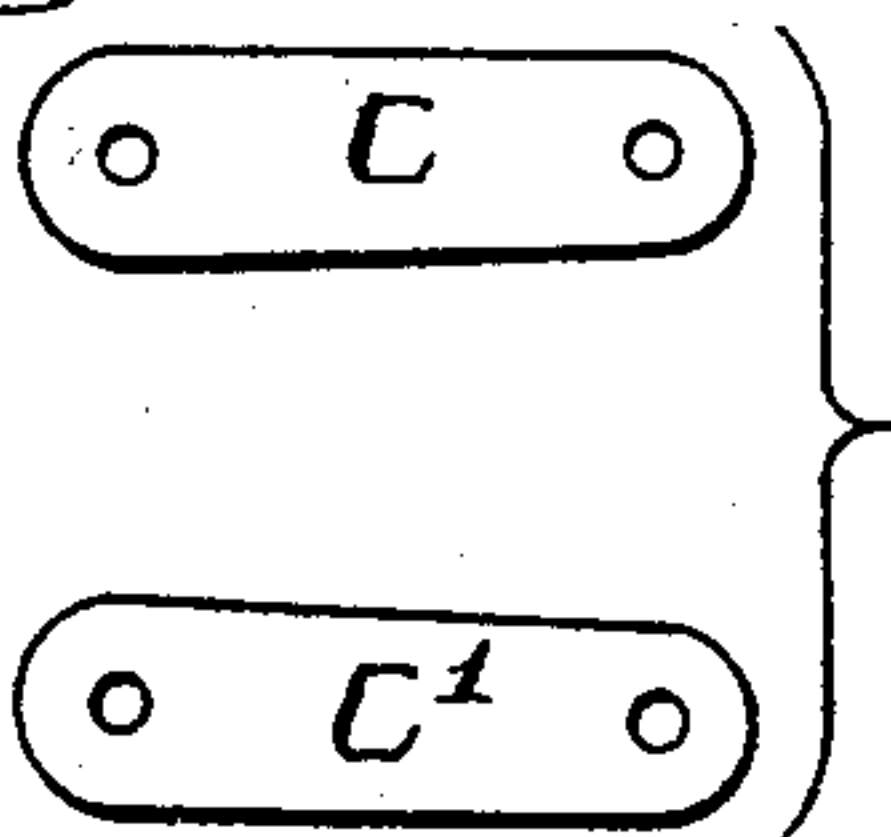


Fig. 13.

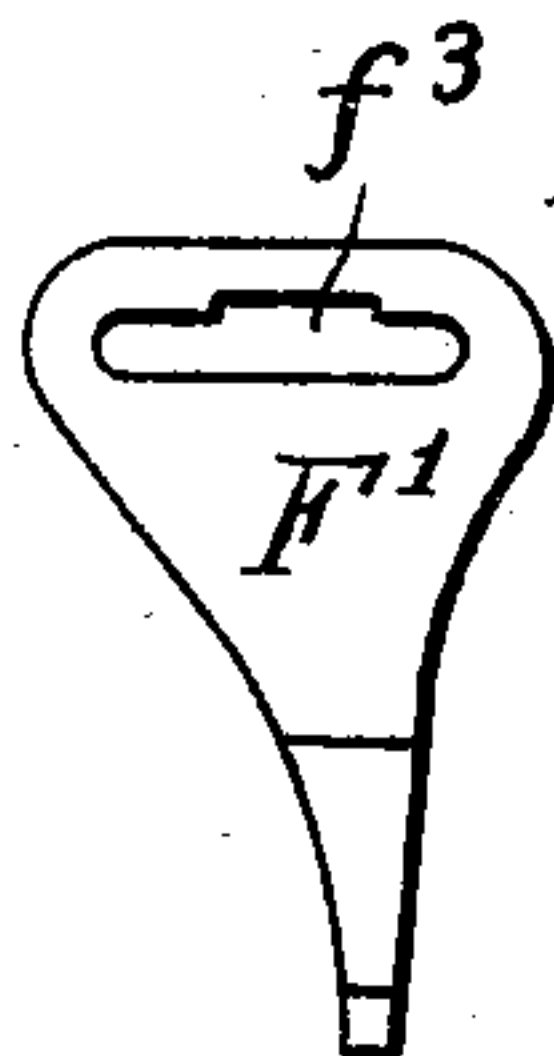


Fig. 14.

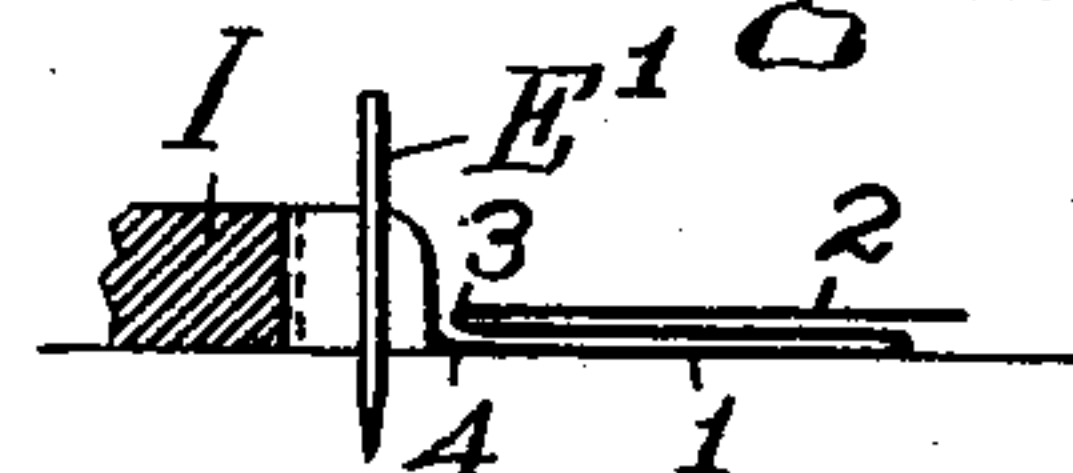


Fig. 15.

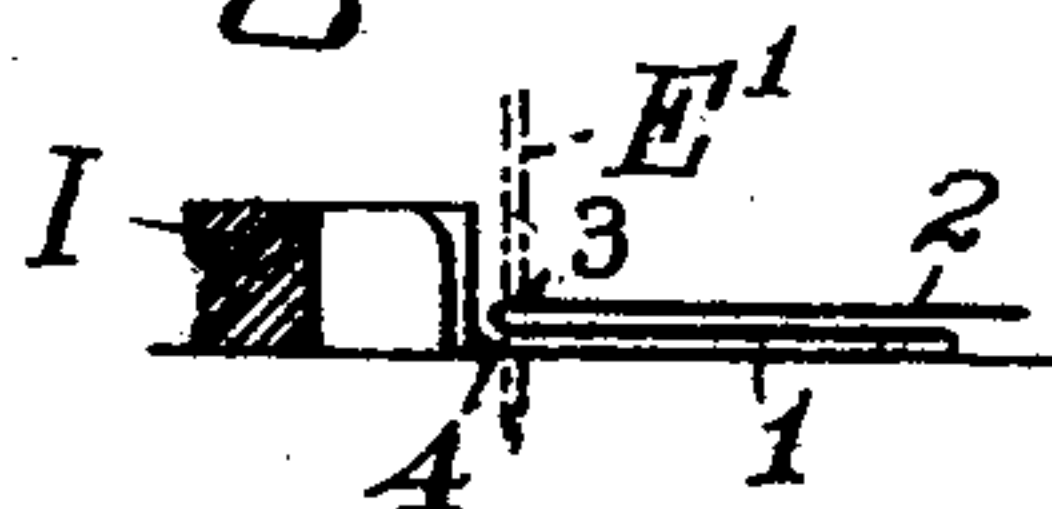


Fig. 16.

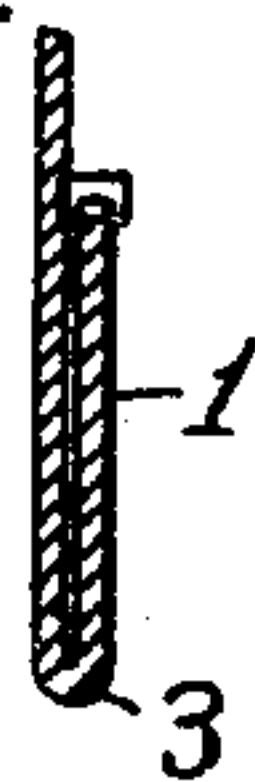
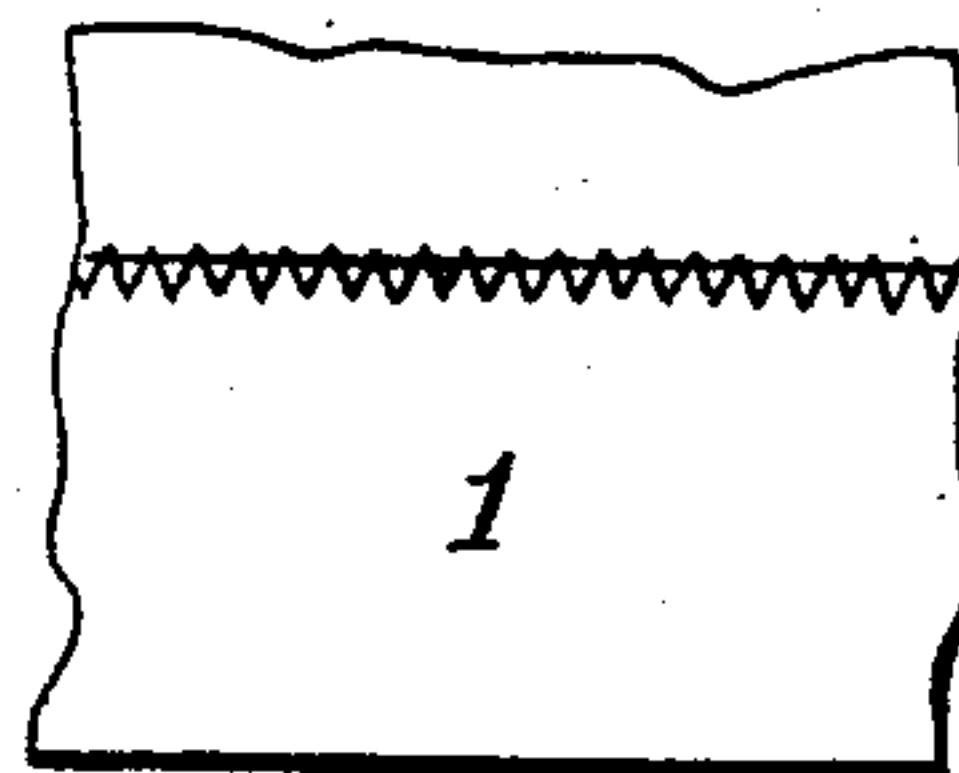


Fig. 17.



Witnesses

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UNITED STATES PATENT OFFICE.

GEORGE JOHN STEVENS, OF LONDON, ENGLAND, ASSIGNOR, BY MESNE ASSIGNMENTS,
TO AMERICAN ATTACHMENT COMPANY, OF PORTLAND, MAINE, A CORPORATION
OF MAINE.

SEWING-MACHINE ATTACHMENT FOR OVERSEAMING AND THE LIKE.

968,997.

Specification of Letters Patent. Patented Aug. 30, 1910.

Application filed September 30, 1901. Serial No. 77,088.

To all whom it may concern:

Be it known that I, GEORGE JOHN STEVENS, a subject of the King of Great Britain and Ireland, formerly of South View, Pearson Lane, Bradford, Yorkshire, England, but now residing at 25 East Lake road, Loughborough Junction, London, England, have invented a certain new and useful Improvement in Sewing-Machine Attachments for Overseaming and the Like; and I do hereby declare the following to be a full, clear, and exact specification of the same.

My invention relates to improvements in attachments for sewing machines for felling, (or blind-stitching) serging, (or over-casting) stoating, (or over-seaming) and fancy or ornamental stitching and the like, in which the construction is simplified, the action rendered more positive, more certain and more efficient, and the operation accomplished by both the up and the down movement of the needle bar of the sewing machine, and it consists in the construction and arrangement of parts as hereinafter described and pointed out in the annexed claims.

In the accompanying drawings, Figure 1 is a perspective view of my improved attachment in position upon the base plate of a sewing machine. Fig. 2 is a plan view of the attachment. Fig. 3 is a side elevation of the attachment looking away from the needle bar. Fig. 4 is a side elevation looking toward the needle bar. Figs. 5, 6 and 7 are plan views of the operating parts of the attachment with the top plate removed, showing the plunger and duplex lever in different positions. Fig. 8 is a plan view of the post supporting the links and cam plate. Fig. 9 is an end view of the same. Fig. 10 is a plan view of the cross plate connecting the upper ends of the links. Fig. 11 is an end view of the same. Fig. 12 is a detail view of the links. Fig. 13 is a detail view of the downwardly depending lever. Figs. 14 and 15 are detail views showing the manner of folding the cloth for blind-stitching; Fig. 14 showing the pusher extended and Fig. 15 the pusher withdrawn. Fig. 16 is a sectional view of a piece of cloth with a blind-stitched hem, and Fig. 17 shows a plan view of the same.

Similar reference characters refer to similar parts in the different figures.

In the drawings the attachment consists of a base plate A, upon which are superposed two additional plates A¹, A², the center of the middle plate A¹ being cut away as shown in the drawings, the three plates together forming a closed box or case which contains most of the operating parts. The plates A, A¹ and A² are secured together by screws y¹, or in any other desired manner. At the back side of the attachment (that is the side opposite to the operator when sitting at the machine, and next to the back of the machine) I secure to the top plate A² of the attachment, by the screws y² (see Figs. 8 and 9) or in any other desired manner, a bifurcated post or standard B, having jaws b, b¹ between which I pivot the lower ends of two upright links or levers C, C¹, to the top ends of which is pivoted a cross piece F which carries a cam plate D. The two ends of the cross piece F are slotted to receive the upper ends of the links C, C¹ which are pivoted therein, and the said cross piece is provided with two pins f, f¹ which extend entirely through the cross plate and to a short distance beyond either side of the same, forming bearing pins for the cam plate D and the lever F¹ which are secured to the cross piece F respectively by set screws d¹ and f², the lever F¹ having an elongated slot f³ in its upper end to permit the adjustment of the lever F¹ on the cross piece F, as hereinafter more fully explained. The cam plate D is provided in its fore end D¹ (the end toward the operator) with a cam way d, adapted to receive the set screw e that fastens the needle E¹ in the needle bar E, these parts being so arranged that, as the needle bar E moves up and down, the set screw e acting in the cam way d imparts a lateral reciprocating movement to the cam plate D, cross piece F and to the two links or upright levers C, C¹ pivoted thereto and to the post or standard B. To the upper ends of these links or upright levers C, C¹, as before stated, I pivotally secure the cross piece F. To this cross piece F, upon the side opposite the cam plate D, is adjustably secured by means of the set screw f² and pins f, f¹ a downwardly projecting lever F¹, the lower end of which passes through a slot a (see Fig. 8) formed in the top plate A² of the attachment down into the box like interior of the attachment, and there engages

in an eye g found in one end of the horizontal reciprocating plunger G , the free end of which is arranged to strike one side or the other, alternately, of the four armed pivoted duplex lever or alternator H turning the same upon its pivot H^3 , thereby imparting a reciprocating movement to the pusher I as is hereinafter more fully explained.

In a slot J formed in the side of the attachment next to the needle E^1 , and in the line therewith, is a reciprocating U-shaped pusher I , the end i of which, opposite to the needle, passes into the interior of the attachment and engages with one arm h of the duplex lever H , a recess i^2 being formed in the end i of the pusher into which the arm h of the duplex lever H passes and works. A U-shaped spring K is arranged within the attachment, one end k of the spring K being secured to the attachment and the other end k^1 to the pusher I and constantly acts upon the pusher I to draw it away from the needle E^1 into the slot J in the side of the attachment. The end i of the pusher is elongated forming a tail piece which works in a slot J^1 formed in the plates A , A^1 and A^2 , this construction preventing any side or vertical displacement of the pusher while doing its work. The jaws i^3 , i^4 of the pusher I pass one on either side of the needle E^1 when the pusher is extended and the needle and needle bar of the sewing machine make their down stroke.

Two spring actuated catches L , L^1 are pivotally secured in the attachment to the base plate A thereof, at one of their ends at either side of the reciprocating plunger, their free ends l being provided with hooks l^1 and so arranged that they will alternately engage with the projecting arms h^1 , h^2 , h^4 , formed upon the sides of the duplex lever H , locking the lower part H^2 of the duplex lever H in the two positions it is caused to assume by the action of the reciprocating plunger G , and also locking the pusher I in its retracted position, as hereinafter more fully explained. The hooked ends l^1 of the catches L , L^1 are provided with recesses l^2 for receiving the projecting arms h^1 , h^2 , h^4 upon the sides of the duplex lever. The duplex lever H is formed in two parts H^1 , H^2 superposed one upon the other and both pivoted to the base plate A upon the same pivot pin H^3 . The lower part or half H^2 of the duplex lever H is provided with two projecting side arms h^1 , h^4 for engagement with the spring actuated catches L , L^1 , and which are acted upon by the reciprocating plunger G in its forward movements, and with a third arm h^5 that projects into the path of the reciprocating plunger G , as hereinafter described. The upper part or half H^1 of the duplex lever H is also provided with two projecting side arms h^2 , h^3 which are also acted upon by the

reciprocating plunger G in its forward movements, one of which h^2 is adapted to engage with one of the spring actuated catches L so as to retain the pusher I in a locked position within the attachment until the proper time when it is to be extended to do its work, the other side arm h^3 being cut away somewhat so that it will not be held by the spring actuated catch L upon the other side of the attachment, but may slip past the catch L as the pusher I is retracted by the U-shaped spring K after it (the pusher I) has done its work, and the horizontal reciprocating plunger G has completed its stroke and is being withdrawn.

The upper part or half H^1 of the duplex lever H is also provided with a third arm h as hereinbefore stated, which works in a recess i^2 formed in the end i of the pusher I , and which reciprocates the pusher I in and out of the slot J in the side of the attachment as the duplex lever H is turned from side to side on its pivot pin H^3 by the reciprocating plunger G .

The attachment is secured to the base plate of a sewing machine by the usual set screw Y which passes through a slot y formed in the attachment. In order that I may secure a more firm hold of the attachment on the machine and to allow for any inequalities in the base plate of the machine, I allow two of the screws y^1 , which secure the plates A , A^1 and A^2 of the attachment together, to project a short distance below the lower surface of the base plate A , the attachment resting on these two screws y^1 and the diagonally opposite arms of the attachment. I find that by this mode I can securely fasten the attachment on the machine, the spring of the metal in the attachment aiding me in so doing. The screws y^1 may be adjusted to any height by simply turning them in or out with any ordinary screw driver.

In operating my improved attachment it is secured in position on the base plate of the sewing machine by the set screw Y , the set screw e on the needle bar E being introduced into the cam way d in the cam plate D . As the needle bar E moves upward and downward, the said set screw e working in the cam way d imparts a reciprocating motion to the cam plate D , the links C , C^1 , the cross piece F and the downwardly projecting lever F^1 , which in turn imparts a reciprocating horizontal movement to the horizontal plunger G within the attachment, the free end of which operates the duplex lever H , which in turn imparts a reciprocating in and out motion to the pusher I .

When the pusher I is retracted in the slot J in the side of the attachment, it is held in that position by the U-shaped spring K hereinbefore referred to, the lower half H^2 of the duplex lever being locked in position

by the right hand catch L^1 . As the needle bar E comes down in its next stroke, the horizontal plunger G comes forward, being turned to the right hand side by the arm h^5 of the lower half H^2 of the duplex lever, striking the right hand catch L^1 and releasing the lower half H^2 of the duplex lever which is then free to move on its pivot pin H^3 . The plunger G then comes still farther forward, striking the right hand side of the duplex lever and both right hand side arms h^1 and h^2 of the upper and lower halves of the duplex lever H, causing the two parts H^1 and H^2 to be turned on their pivot pin H^3 toward the left hand side, when the left hand side arms h^3 and h^4 of the duplex lever H pass into the recess l^2 formed in the free end l of the left hand spring actuated catch L, the hook l^1 of which engages with the arms and locks the parts in that position. As the upper half H^1 of the duplex lever H is turned upon its pivot pin H^3 by the action of the plunger G, the arm h , working in the recess i^2 , causes the pusher I to be extended out of the slot J in the side of the attachment, the jaws i^3 , i^4 passing on either side of the needle E^1 . The reciprocating plunger G having completed its stroke is then drawn back during the upward motion of the needle bar E by the action of the set screw e working in the cam way d in the cam plate D.

As the plunger G is being withdrawn and as soon as it leaves the arms h^3 and h^4 , the spring K acts upon the pusher I and immediately withdraws or retracts it within the slot J in the side of the attachment, for the arm h^3 , being slightly cut away, is not held or locked by the hook l^1 of the catch L, but slips past the same as the spring K retracts the pusher. The lower half H^2 of the duplex lever is, however, locked by the catch L^1 and remains so until the next forward movement of the plunger G. At the next downward stroke of the needle bar E the reciprocating plunger G is again brought forward by the action of the cam plate D, its free end this time striking the left hand side of the arm h^5 of the lower duplex lever H^2 which extends rearwardly into its path and, as it passes forward, releases the left hand spring actuated catch L, releasing the lower half H^2 of the duplex lever and turning the said lower half to the right so as to be ready for the next forward action of the plunger. The right hand side arms h^2 and h^4 of the duplex lever H at the same time pass into the recess l^2 formed in the free end l of the right hand spring actuated catch L^1 , the side arms h^2 and h^4 of the duplex lever being locked in position thereby, in which position they will be retained by the catch L^1 until the next stroke of the plunger G. These movements are repeated alternately as the needle bar E moves up-

wardly and downwardly operating the cam plate D and the parts connected therewith.

It will be obvious that the position of the two parts of the duplex lever may be reversed if desired, that is to say what I have described as the upper part of the duplex lever may be used as the lower part of the duplex lever, and that the lower part of the duplex lever may be used as the upper part, without departing from the spirit of my invention.

In operating my attachment for blind-stitching, the cloth is folded as shown in Figs. 14 and 15, that is to say a hem 1 is folded up, and then the cloth 2 is folded back over the hem 1 and the material is fed to the needle with the fold 3 uppermost and the single layer 4 underneath. The single layer should project a little beyond the fold 3. If then, at the first down stroke of the needle bar E, the pusher I is retracted into the slot J, the needle in coming down will pass through the center of the cloth at the fold 3 and through the single layer 4 and pass down and form a stitch with the shuttle thread. As the needle bar E makes its next down stroke, the set screw e working in the cam way d will move the cam plate D, the cross piece F and the lever F^2 forward, which will throw the plunger G forward, releasing the duplex lever H from the right hand catch L^1 and turning the duplex lever H toward the left hand side, the arm h working in the recess i^2 extending the bifurcated end of the pusher I out of the slot J in the side of the attachment, as is shown in Figs. 5 and 14, in which position it is held by the left hand catch L. When the pusher is extended, the cloth is pushed by the pusher away from the needle as shown in Fig. 14, and, as the needle comes down in its down stroke, it misses the cloth and makes a stitch with the shuttle thread upon the outside. On the next up stroke of the needle bar E, the set screw e , working in the cam way d , brings the cam plate D, cross piece F and lever F^2 forward again, throwing the plunger G forward, which releases the left hand catch L, and turns the duplex lever H to the right hand side, the arm h retracting the pusher I into the slot J, as shown in Figs. 6 and 15, in which position they will be held by the right hand catch L^1 . This method of stitching produces a zig-zag line of stitches, as is clearly shown in Figs. 16 and 17, firmly uniting the single layer 4 to the fold 3 and overcasting the raw edge of the single layer 4, preventing raveling, while as the thread passes only part way through the thickness of the cloth in the fold 3, no stitches are visible upon the face of the cloth and a true blind-stitching is produced. When serging the cloth is fed flat, and a line of zig-zag stitches is produced along the edge of the cloth, thereby

overcasting it and preventing raveling. When stoating or overseaming, the two pieces of cloth are laid one above the other, the edges being brought in line with each other, and the cloth is fed flat, a line of zig-zag stitches along the edges being produced. When stitched the two pieces of cloth will be found securely sewn together and need only be straightened out and pressed to have the appearance of a single piece of cloth. The attachment will, too, by suitably regulating the tensions and length of stitches, do a large variety of fancy and ornamental stitchings suitable for blouses and waists, as well as cording, plaiting, etc. I have found, however, that by raising the pusher so that it will act upon the fold or upper layers of cloth only that I produce an entirely new stitch that will be very valuable for some purposes. In forming this stitch the needle passes first through the fold of the cloth and the lower layer, then the pusher comes forward pushing the fold or upper layers out of the way of the needle so that the next stitch is made in the lower layer of cloth only. Every other stitch appears on the face of the lower layer as a plain stitch, while a line of zig-zag stitches appears between the upper and lower layers, the upper fold being blind-stitched.

It will be obvious that the shape of the cam path may be such that the horizontal plunger may be actuated at the proper moment so that the pusher may be extended only when it is desired to do its work and immediately retracted when that work is done, and so that the feeding of the cloth will not be interfered with.

In order that my attachment may be adjusted upon and worked on the various kinds and patterns of machines, and in order to provide for the different lengths of the up and down strokes of the needle bars of these machines, it is necessary to construct several cam plates D, making the cam way d in each of a length and contour to accommodate the length of the stroke of the needle bar of the machine, and to give the right reciprocatory movements of the levers. I have found, however, in practice that I can so fashion the cam way d that one cam plate will fit most of the machines known as high-arm, and another cam plate most of the machines known as low-arm machines, and that special cam plates will only be required for machines where the stroke of the needle bar varies considerably from that of the standard machines. As hereinbefore stated, the cam plate D is secured to the cross piece F by the set screw d^1 , the pins f , f^1 aiding in retaining it in place thereon and preventing displacement and lost motion. Cam plates may, therefore, be changed at will by simply unscrewing the set screw d^1 and taking one cam plate off the pins f , f^1 and placing an-

other thereon, securing it in place with the set screw d^1 .

In order to adjust and regulate the stroke of the plunger G, and also to provide for any difference in the position of the set screw e on the needle bar E, as this set screw is not always at a true right angle to the needle bar, I have formed the downwardly depending lever F^1 with an elongated slot f^3 in its upper part. The lever F^1 is screwed to the cross piece F by a set screw f^2 , the bearing pins f , f^1 passing into the slot f^3 . The lever F^1 may, therefore, be adjusted on the cross piece F by loosening the set screw f^2 and moving the lever F^1 the one way or the other on the bearing pins f , f^1 , when it may be secured in the desired position by the tightening of the set screw f^2 . In this manner the lever F^1 may be adjusted so that it will give the plunger G, the duplex lever H and the pusher I just the proper motion to do the work properly.

In adjusting my attachment upon the bed plate of the machine, I place the attachment upon the bed plate in such a manner that the pusher when extended will push the material to be sewn clear of the needle and, in practice, I have found that it will be sufficient if the extreme outer edges of the jaws i^3 , i^4 are in line with the outermost point of the circumference of the needle and, in some cases, it is sufficient if the outer edges of the jaws i^3 , i^4 are in line with the eye of the needle. When the attachment has been placed in this position upon the machine, it may be secured therein by tightening the set screw Y which engages with the usual screw threaded hole formed in the bed plate of the machine.

It will be observed that in case the spring K should by any means become broken, that the attachment will continue to work nevertheless, as the plunger G will, in its forward movements, strike the arms h^1 , h^2 , h^3 and h^4 as it operates first on the one side and then the other of the duplex lever H, turning the duplex lever H upon its pivot pin H^3 and consequently extending and retracting the pusher.

Having now fully described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. In a sewing machine attachment, a pusher, a cam plate engaging with and operated by the needle bar of the machine, means for supporting the cam plate upon the attachment, means for transmitting a reciprocatory motion to the pusher from the cam plate, and catches adapted to control the movements of the pusher.

2. In a sewing machine attachment, a cam plate engaging with and operated by the needle bar of the machine, means for supporting the cam plate upon the attachment, a pusher, means for transmitting a recipro-

catory motion to the pusher from the cam plate, means for retracting the pusher as soon as it has completed its work, and catches adapted to control the movements of the pusher.

3. In a sewing machine attachment, a cam plate engaging with and operated by the needle bar of the machine, pivoted links and a cross piece carried by the attachment, and supporting the cam plate, and means for transmitting a reciprocatory motion to the pusher from the cam plate.

4. In a sewing machine attachment, a reciprocatory pusher, means for operating the pusher, comprising a lever system, a cam plate engaging with and operated by the needle bar of the machine for imparting motion to the said lever system, locking catches for the pusher and its operating lever and means for operating the same, and with said operating means arranged to extend the pusher only while it is doing its work and to retract it within the attachment while the feed of the machine is operating.

5. In a sewing machine attachment, a pusher, a plunger, a duplex lever having two members, one member of which engages with the pusher and imparts a reciprocatory movement thereto, the other member of which extends into the path of the plunger and deflects the same at each stroke of the needle bar alternately to one side or the other of the said duplex lever, means for communicating reciprocatory motion to the plunger from the needle bar of the machine, and means for retracting the pusher.

6. In a sewing machine attachment, a pusher, a duplex lever comprising two members, one of which engages with and imparts a reciprocatory motion to the pusher, as the needle bar makes its up and down stroke, a reciprocatory plunger acting alternately upon the two sides of the duplex lever and imparting motion thereto, means for actuating the plunger by the needle bar of the machine, and means for retracting the pusher.

7. In a sewing machine attachment, a pusher, a duplex pivoted lever comprising two members, one of which engages with and operates the pusher, a reciprocating plunger, means for causing the plunger to act alternately upon the two sides of the duplex lever, means for operating the plunger by the needle bar of the machine, and means for retracting the pusher as soon as it has completed its work.

8. In a sewing machine attachment, a pusher, a duplex pivoted lever comprising two members one of which engages with and operates the pusher, a reciprocating plunger, means for causing the plunger to act alternately upon the two sides of the duplex lever, means for operating the plunger by the needle bar of the machine, and catches

controlling the movements of the pusher and duplex lever.

9. In a sewing machine attachment, a pusher and means for imparting a reciprocatory movement to the pusher at each alternate down stroke of the needle bar, comprising a cam plate engaging with the needle bar, a cross piece, pivoted links, a depending lever carried by the cross piece, a plunger, and a lever actuated by the plunger and operating the pusher, substantially as shown and described.

10. In a sewing machine attachment, a pusher, a cam plate engaging with and operated by the needle bar of the machine, a cross piece attached to and reciprocated by said cam plate, pivoted links supporting said cross piece, a depending lever carried by said cross piece, means for transmitting reciprocatory motion to the pusher from the depending lever, and independent means for retracting the pusher as soon as it has done its work.

11. In a sewing machine attachment, a pusher, a cam plate engaging with and operated by the needle bar of the machine, a cross piece attached to and reciprocated by said cam plate, pivoted links supporting said cross piece, a depending lever carried by said cross piece, means for transmitting reciprocatory motion to the pusher from the depending lever, independent means for retracting the pusher as soon as it has completed its work, and spring actuated catches controlling the movements of the pusher.

12. In a sewing machine attachment, a pusher, a duplex lever imparting a reciprocatory movement to the pusher, means for operating the duplex lever from the needle bar of the machine, catches for controlling the duplex lever, the said duplex lever having one of its side arms cut away somewhat so as to permit one of its members to slip past the catch when the pusher has completed its work, and independent means for retracting the pusher.

13. In a sewing machine attachment, a pusher, a duplex pivoted lever comprising two members one of which engages with the pusher and imparts a reciprocatory movement thereto, a reciprocating plunger, means for causing the plunger to act alternately upon the two sides of the duplex lever, spring actuated catches controlling the movements of the pusher and duplex lever, means for retracting the pusher as soon as it has completed its work, and means for operating the plunger by the needle bar of the machine.

14. A sewing machine attachment comprising a pusher, a pivoted four armed duplex lever composed of two members, one engaging with and operating the pusher, a plunger engaging with the arms of the lever and operating the same, means for com-

municating motion to the plunger from the needle bar of the machine, and means for retracting the pusher.

15. In combination, the needle bar, a pusher, an alternator, engaging the pusher, a reciprocating plunger making direct contact with the alternator and operated from the needle bar, and a spring for retracting the pusher as the said plunger retracts from contact with the alternator.

16. In combination, a pusher, an alternator, formed in two parts, one part H^1 of which is connected with the pusher, a catch for engaging said part, the plunger G , means for operating the same, a spring for retracting the pusher, the second part H^2 of the alternator serving to direct the plunger first in one direction and then the other, and a second catch coöperating with that first

mentioned for controlling the part H^2 of the alternator, substantially as described.

17. In a sewing machine, a pusher, means to actuate the pusher to push the material being sewed out of the path of the needle, upon each alternate downstroke of the needle, means for retracting the pusher during the upstroke of the needle following each such alternate downstroke, and positive means for holding the pusher in its retracted position during each intervening down and up stroke of the needle.

In witness whereof I have hereunto set my hand in presence of two witnesses.

GEORGE JOHN STEVENS.

Witnesses:

FREDC. HARRIS,
G. F. WARREN.