

No. 896,948.

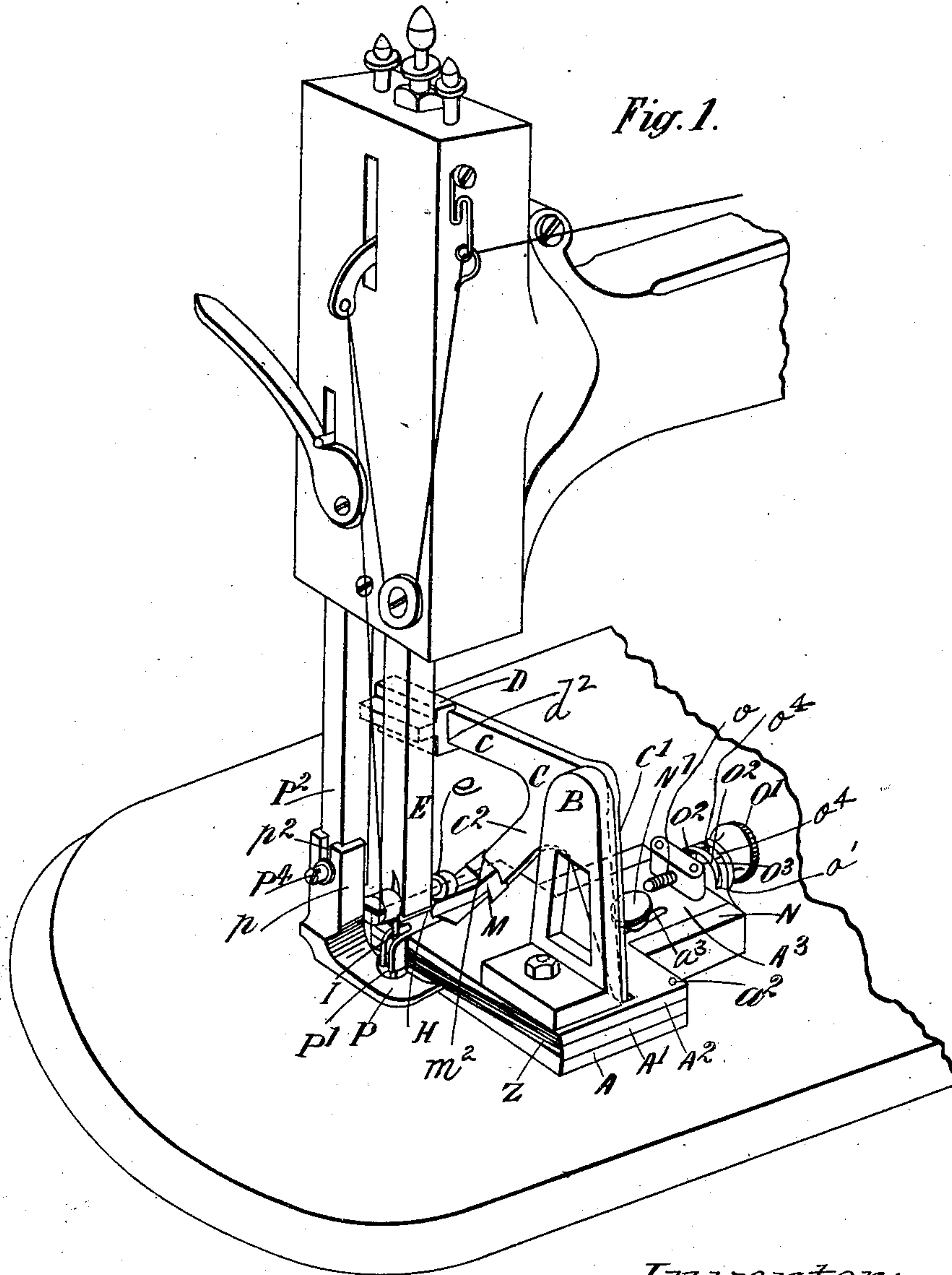
PATENTED AUG. 25, 1908.

G. J. STEVENS.

ATTACHMENT FOR SEWING MACHINES FOR FELLING.

APPLICATION FILED AUG. 28, 1901.

4 SHEETS—SHEET 1.



Witnesses:
E. B. Bolton
Isabella Waldron

Inventor:
George John Stevens
By *Richardson*
his Attorneys.

No. 896,948.

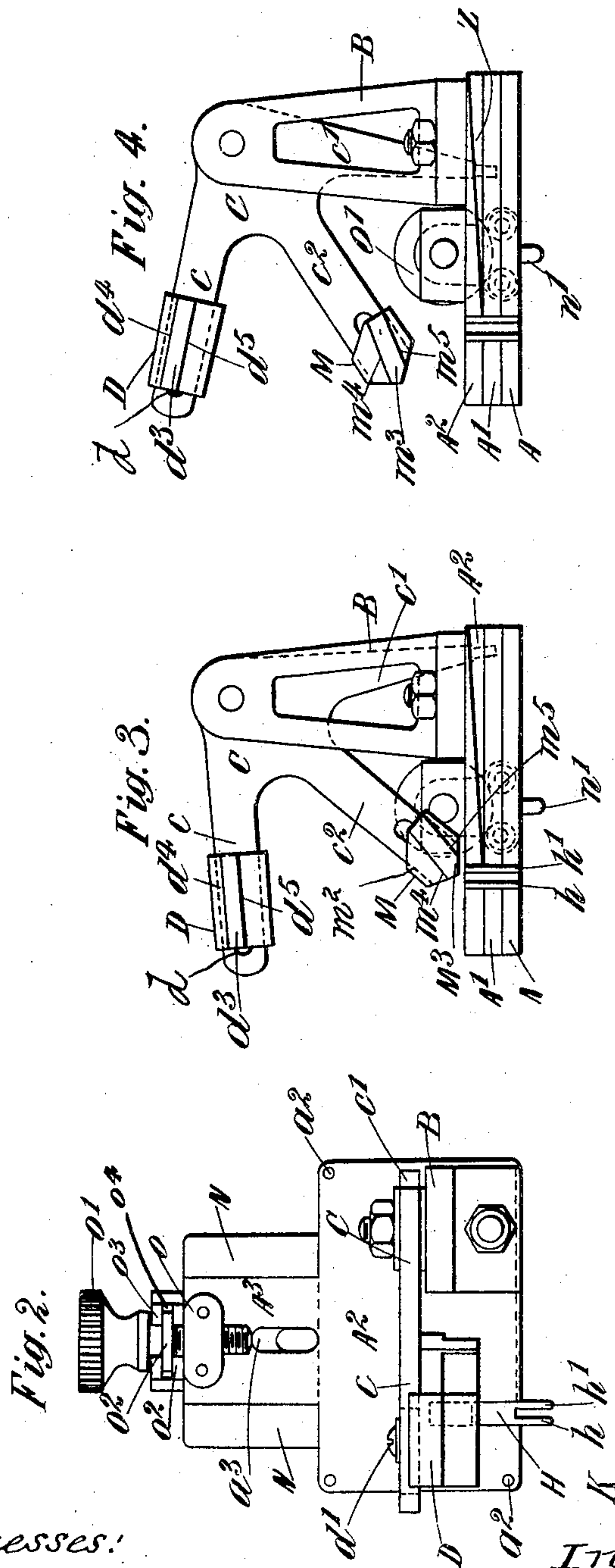
PATENTED AUG. 25, 1908.

G. J. STEVENS.

ATTACHMENT FOR SEWING MACHINES FOR FELLING.

APPLICATION FILED AUG. 28, 1901.

4 SHEETS—SHEET 2.



Witnesses:
E. H. Bolton
Deabella Waldron

Inventor:
George John Stevens
By *Richardson*
his Attorneys.

No. 896,948.

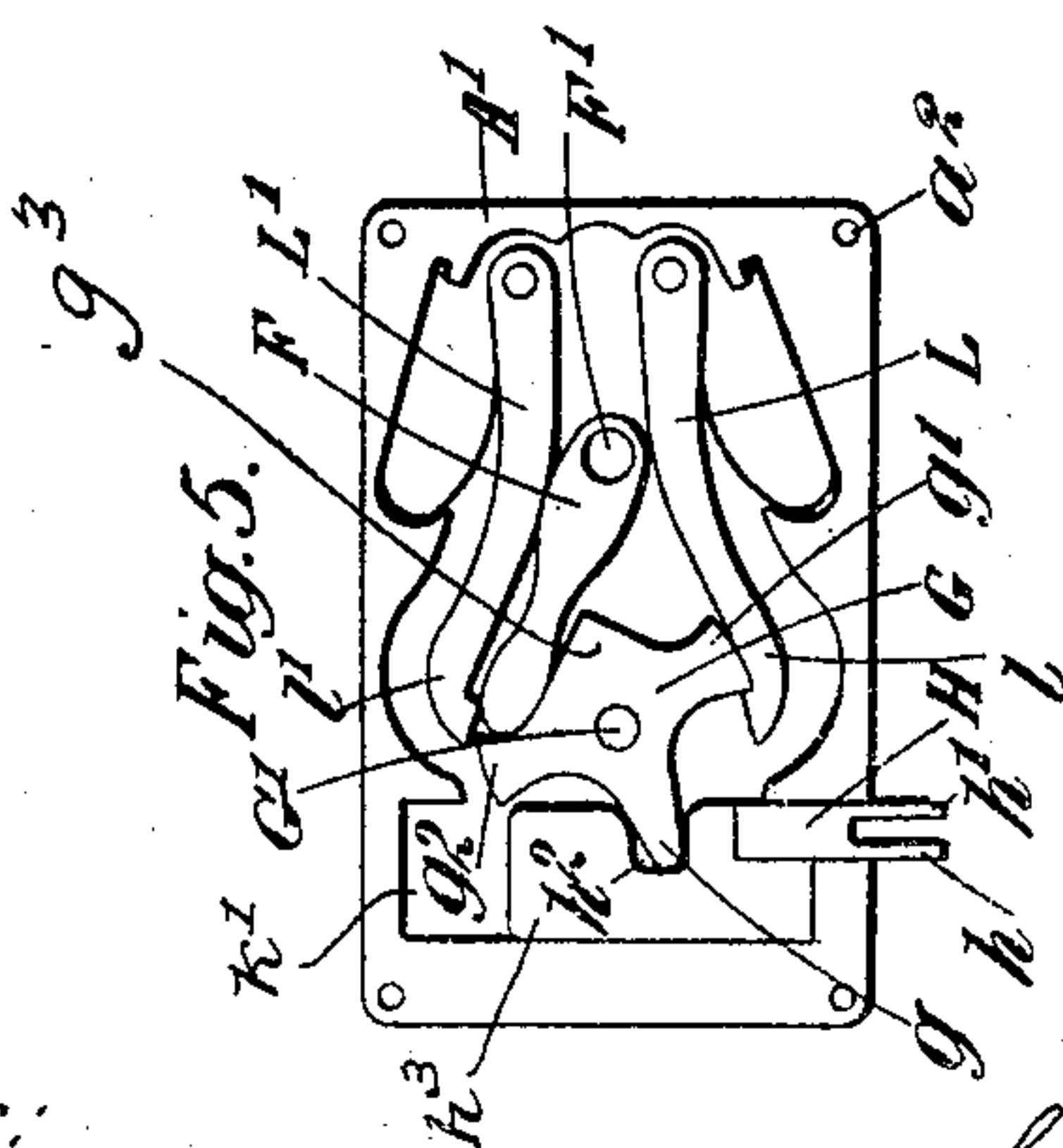
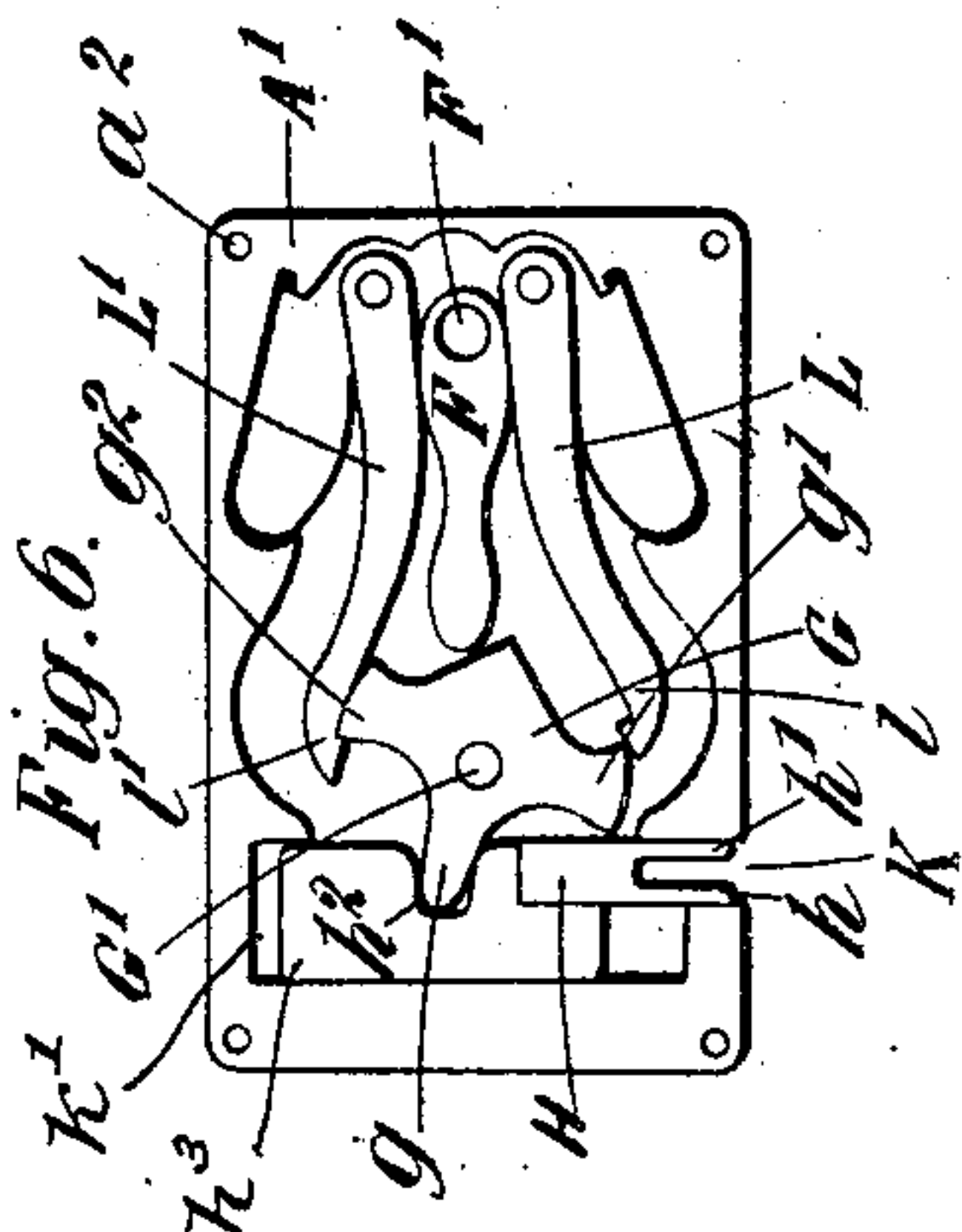
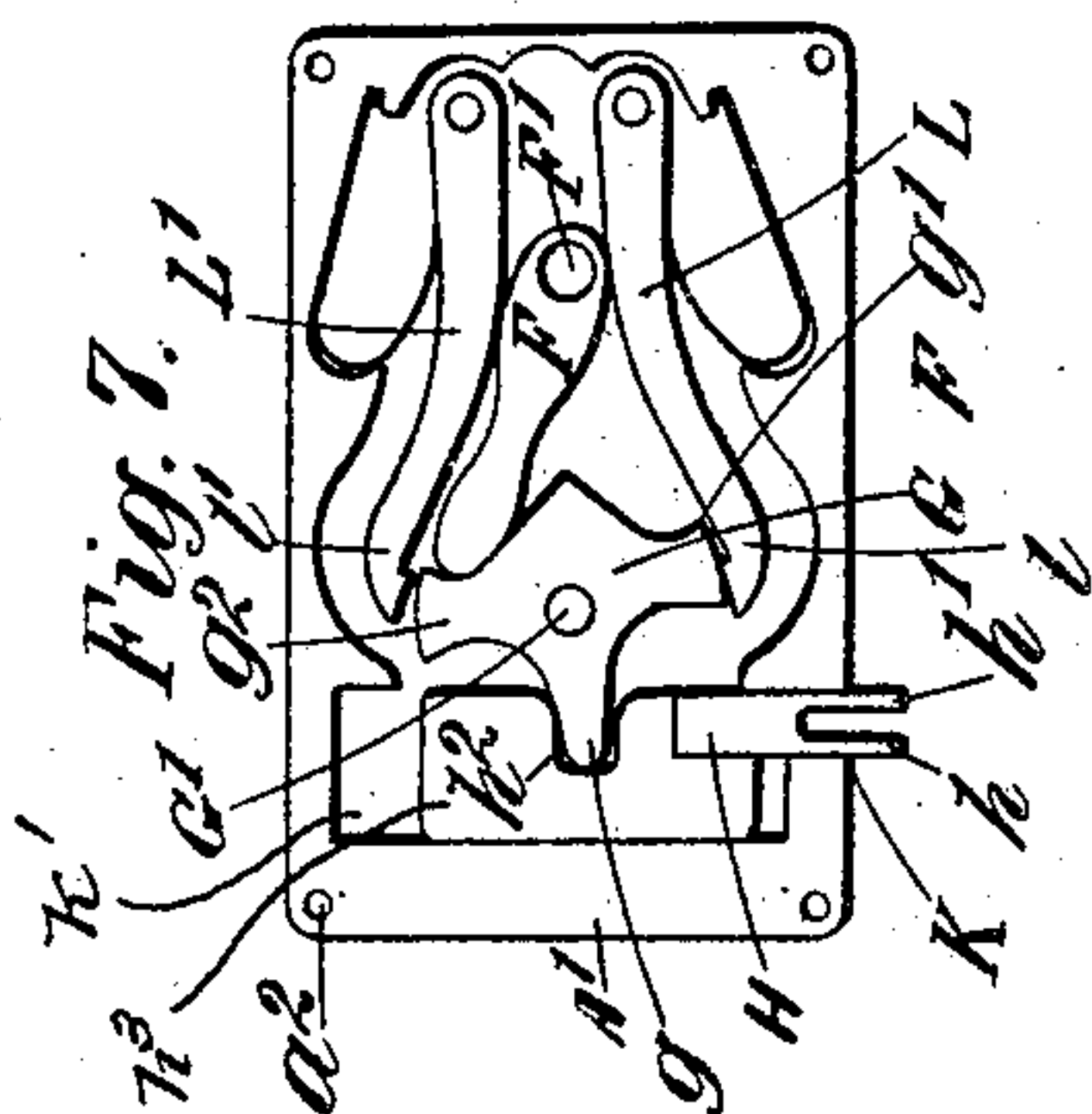
PATENTED AUG. 25, 1908.

G. J. STEVENS.

ATTACHMENT FOR SEWING MACHINES FOR FELLING.

APPLICATION FILED AUG. 28, 1901.

4 SHEETS—SHEET 3.



Witnesses:

E. B. Bolton
Isabella Waldron

Inventor:

George John Stevens

By Richard Leo

his Attorneys.

UNITED STATES PATENT OFFICE

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

ATTACHMENT FOR SEWING-MACHINES FOR FELLING.

No. 896,948.

Specification of Letters Patent.

Patented Aug. 25, 1908.

Application filed August 28, 1901. Serial No. 73,622.

To all whom it may concern:

Be it known that I, GEORGE JOHN STEVENS, a subject of the King of Great Britain and Ireland, residing at South View, Pearson Lane, Bradford, Yorkshire, England, have invented certain new and useful Improvements in Attachments for Sewing-Machines for Felling; and I do hereby declare the following to be a full, clear, and exact specification of the same.

This invention relates to an attachment for sewing machines, for felling, (or blind-stitching) serging, (or overcasting the raw edges of seams and the like to prevent raveling), stoating (or joining the edges of two pieces of cloth together by overseaming), and fancy and ornamental stitching and the like.

The object of this invention is to produce an attachment that may be fitted to and operated upon practically all existing sewing machines, and that will do felling, serging, stoating, and fancy and ornamental stitching; to make the construction and operation positive, avoiding the use of springs and the like as far as practicable; to provide means for operating the attachment by the needle-bar of the sewing machine or by parts connected therewith; and to provide means for efficiently adjusting the attachment so that either thick or thin material may be stitched, also to provide a special presser foot for use with the attachment.

In the accompanying drawings which illustrate the invention and in which similar letters of reference indicate the same parts wherever they occur: Figure 1 is a perspective view of the attachment showing it in position upon the base-plate of a sewing machine, the head of the needle being distorted somewhat in order to show the attachment more clearly. Fig. 2 is a plan view. Fig. 3 is a side elevation showing the operating lever at the lowest point of its down stroke. Fig. 4 is a side elevation showing the operating lever at the highest point of its up stroke. Figs. 5, 6 and 7 are plan views of the operating parts in the interior of the attachment, the top plate and operating lever being removed:—Fig. 5 showing the parts in the position they assume when the pusher is extended; Fig. 6 showing the parts in the position they assume when the pusher is retracted; Fig. 7 showing the position of the parts as the plunger comes forward releasing one of the spring actuated catches and about

to move the compound lever which I term the butterfly. Fig. 8 is a central longitudinal section of the adjustment block, and parts connected therewith. Fig. 9 is a cross-section of the adjustment block and connected parts. Fig. 10 is a view partly in section of the end of one of the arms of the operating lever and the tappet upon the same. Fig. 11 is a side elevation of the end of the horizontal arm of the operating lever showing the tappet mounted thereon. Fig. 12 is a plan and Fig. 13 a side elevation of the presser-foot. Fig. 14 is a sectional view and Fig. 15 a plan of a piece of cloth showing a blind-stitched or felled hem and the stitching of same. Figs. 16 and 17 are detail views showing the manner in which the cloth is folded for felling or blind-stitching and the way it is fed to the needle, Fig. 16 showing the pusher in its extended position and Fig. 17 showing the pusher in its retracted position. Fig. 18 is a plan and Fig. 19 a side elevation of the pusher separately.

In this invention the attachment consists of a base plate A upon which are superposed two additional plates A¹, A², (the central portion of the middle plate A¹ being cut away), the three plates together forming a covered box or case which contains most of the operating parts. At one side or end of this case and formed integral with or secured to the top plate A² by screws or rivets a², is an upright post or standard B, to the upper end of which is pivoted a three-armed bell-crank lever C, the upper or horizontal arm c of which carries an adjustable tappet D which is so arranged when the attachment is in position on the sewing machine as to be struck by the set screw e on the needle-bar E of the sewing machine at each upward stroke of the said needle-bar, while the vertical arm c¹ of the said lever C passes through a slot C¹ formed in the top plate A² and into an eye F¹ formed in one end of the reciprocating lever or plunger F, thereby causing the said plunger F to reciprocate forwards and backwards at each up and down stroke of the needle-bar, the plunger F in turn operating, at each upward stroke of the needle-bar, a peculiarly shaped four-armed lever G (which I term a "butterfly") which is pivoted on a pivot pin G¹ to the base plate A¹. One arm g of the butterfly G extends forward and engages in an approximately V shaped recess h² suitably formed in the side of the U shaped

pusher H which is arranged and works in the slot K formed in the side of the attachment for that purpose and operates the same so that at each alternate up stroke of the needle-bar E the end of the pusher H nearest the needle I will be extended outwardly a short distance beyond the edge of the base-plate A of the attachment, the two sides or arms h h^1 of the U shaped pusher H passing one on either side of the needle I, as the latter passes down through the bed-plate of the sewing machine on its way to form a stitch with the shuttle of the machine, while at each alternate up-stroke of the needle-bar E the pusher H is brought back or retracted into the slot K by the said arm g , as is hereinafter more fully explained. The pusher H is formed with a tail piece h^3 which works in a slot K^1 formed in the side wall of the attachment thereby causing the said pusher to reciprocate in a true line and preventing any side or vertical displacement of the same.

Two spring actuated arms or catches, L L^1 , are pivoted at one of their ends to the base plate A at either side of the reciprocating lever or plunger F, their free ends l l^1 being hooked and arranged so that they will alternately engage with the projecting arms g^1 g^2 formed upon the sides of the butterfly G, locking the butterfly G and consequently the pusher H in the two positions they are caused to assume, and until they are released at the next upstroke of the needle-bar E. The operation of these parts is as follows: When the pusher H is in its extended position, it is locked in that position by the left hand catch L engaging with the arm g^1 upon the left side of the butterfly G. The butterfly G is provided with an arm g^3 extending beyond the pivot-pin G^1 rearwardly into the path of the plunger F, and when the parts are in the above positions pointing toward the right side of the attachment. At the next upstroke of the needle-bar E the reciprocating lever or plunger F comes forward, its free-end being turned to the left hand side of the attachment by the arm g^3 of the butterfly G which extends rearwardly into the path of the plunger, and first striking the catch L that is locking the butterfly and pusher and releasing them, then strikes the left side of the butterfly G and causes it to turn to the right side of the attachment, the arm g of the butterfly G engaging with the pusher H and working in the recess h^3 causing the pusher H to be retracted within the slot K in the side of the attachment. As this is done the catch L^1 on the right side of the attachment engages with the arm g^2 upon the right side of the butterfly G and locks these parts in this position. At the next upstroke of the needle-bar E the reciprocating lever or plunger F comes forward again, this time being turned to the right hand side of the attachment by the arm g^3 and unlocks the right-

hand catch L^1 releasing the butterfly G, and pusher H, and then strikes the right side of the butterfly G and causes it to turn to the left side of the attachment, thereby extending the pusher H by means of the arm g^1 working in the recess h^2 , while the catch L upon the left side of the attachment engages with the arm g^1 upon the left side of the butterfly G again locking the parts in position. These motions are repeated alternately at each up stroke of the needle-bar E.

Instead of employing a spring for the purpose of bringing the bell-crank lever C back to its normal position, I form my bell-crank lever C with a third arm c^2 which preferably extends obliquely down from the elbow of the lever C to a point almost directly beneath the outer extremity of the horizontal arm c of the same. Upon the lower end of this third arm c^2 I adjustably mount, by means of a set screw m passing through a slot m^1 formed in the lower extremity of the arm c^2 , a tappet M which will be struck by the set-screw e upon the needle-bar E at each down stroke of the needle-bar E and bring the bell-crank lever C and the parts connected therewith into their normal positions.

The tappet M is provided with a longitudinal groove m^2 in its side next to the arm c^2 of the lever C for engagement therewith, the side walls of the groove embracing the sides of the arm c^2 and aiding in retaining the tappet M in proper position thereon. The tappet M is also provided with a rib m^3 on its side opposite to the said arm c^2 , this rib m^3 being arranged obliquely across the face of the tappet M, thus forming two striking surfaces m^4 , m^5 , of unequal heights for engagement with the set screw or projection e upon the needle-bar E. The tappet M may be adjusted upon the arm C^2 of the lever C by simply unloosening the set screw m which secures it to the arm c^2 and turning either the one striking surface m^4 or the other m^5 of the tappet M uppermost, or by moving the tappet M upwardly or downwardly upon the arm c^2 of the lever C, when it may be secured in the desired position by simply tightening the set screw m . The tappet D is also adjustable on the horizontal arm c of the bell crank lever in precisely the same manner, the arm c having a slot d near its outer extremity, and the tappet having a longitudinal groove d^2 for receiving the arm c , the tappet D being adjustably secured upon the arm c by a set screw d^1 . The tappet D also has a rib d^3 arranged a little to one side of its center to form the two striking surfaces d^4 , d^5 . The tappet D may therefore be adjusted upon the arm c by unloosening the set screw d and by moving the tappet outwardly or inwardly upon the arm C, and either of the two striking surfaces d^4 , d^5 , may be presented for engagement with the set screw or projection e as desired.

In order to adjust the attachment upon the sewing machine and to provide for the sewing of cloths of various thicknesses, I form the top plate A^2 of the attachment with an extension A^3 the edges a, a^1 , of which are beveled and adapted to engage with a grooved way n formed in the upper portion of a block N, the walls of the groove n also being correspondingly beveled so that the extension A^3 will fit in the groove n and be held securely therein. This said block N is provided upon its bottom with a peg or pin n^1 adapted to fit in one of the tapped screw holes usually formed in the bed plate of the sewing machine, and with a slot n^2 , which registers with a slot a^3 formed in the upper plate A^2 , to receive a set-screw N^1 , which engages with another tapped screw-hole in the bed-plate of the machine. The block N and therefore the entire attachment, is held firmly in place upon the bed-plate of the sewing machine by the said set-screw, N^1 and peg or pin n^1 , being prevented from any side displacement by the peg or pin n^1 .

The extension A^3 carries upon its outer extremity a block O which is provided with a central screw-threaded hole o , and the block N is provided upon its outer extremity with an upwardly extending lug o^1 which is bifurcated forming jaws o^2, o^3 and provided with a slot o^4 . A set screw O^1 provided with a collar O^2 passes between the jaws o^2, o^3 of the lug o^1 , the collar O^2 being adapted to fit into and work in the slot o^4 , and engages with the tapped hole o in the block O upon the extension A^3 . As the set-screw O^1 is turned the one way or the other, it is held by the collar O^2 in the slot o^4 of the lug o^1 , and its screw-thread end working in the tapped hole o in the block O carries the extension A^3 , and consequently the entire attachment nearer to or away from the needle-bar E, and consequently just the proper adjustment can be made to sew any desired material, however thick or thin the latter may be.

Instead of using the ordinary presser-foot, usually employed upon the machine, I construct my presser-foot P with a recess P^1 formed in the side of the presser-foot P next to the needle, to take the bulge of the cloth when the stitch is being made during felling or blind-stitching. Projecting upwardly from the rear-end of the presser-foot P is a stem p , having a central vertical groove p^1 , which receives the lower end of the presser-bar P^2 , the presser-foot P being attached to the presser-bar P^2 by a set-screw P^4 which passes through an opening p^2 in the stem p , and engages in a screw-threaded hole in the lower end of the presser-bar P^2 .

In operating my attachment for blind-stitching the cloth is folded as shown in Figs. 16 and 17, 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. Care should be taken to have the single layer project a little beyond the fold 3. If then at the first down-stroke of the needle bar E the pusher H is retracted into the slot K, the needle 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 up-stroke the set screw e strikes the tappet D actuating the bell crank lever C, which will throw the plunger F forward, releasing the butterfly G from the right hand catch L^1 , and turning the butterfly G towards the left hand side, the arm g working in the recess h^2 extending the bifurcated end of the pusher H out of the slot K in the side of the attachment as is shown in Figs. 5 and 16, 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. 16, and as the needle comes down in its next 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 strikes the tappet D actuating the bell crank lever C, throwing the plunger F forward, which releases the left hand catch L, and turns the butterfly G to the right hand side, the arm g retracting the pusher H into the slot K, as shown in Figs. 6 and 17, in which position they will be held by the right hand catch L^1 . At each down stroke of the needle-bar E the set screw e strikes the tappet M on the arm c^2 of the bell-crank lever C, bringing the latter and the plunger F back to their normal positions. This method of stitching produces a zig-zag line of stitches as is clearly shown in Figs. 14 and 15, firmly uniting the single layer 4 to the fold 3, and over-casting the raw edge of the single layer 4, preventing raveling, while as the thread passes only part way through 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 over-casting 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 sewed 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.

In order to facilitate the guiding of the cloth to the needle when the work is being fed to the machine, I slightly groove or hollow out that side Z of the attachment next to the needle, and in feeding the work the cloth is pressed up against this guide by the fingers of the operator.

The butterfly lever G it will be noticed has an oscillatory motion and it may be termed an alternator in that it moves first one way and then the other and moves the pusher alternately in and out. The catches hold the alternator or butterfly lever in each of its extreme positions. This is necessary in order to prevent the pusher from retracting under the pressure from the cloth and also to insure the pusher remaining in its innermost position for the prescribed period. The locking of the butterfly in both positions also insures the correct position thereof for engagement by the plunger F on its next stroke.

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

1. The combination with a pusher, of an alternator arranged to operate said pusher and an oscillating reciprocatory plunger, said alternator deflecting the plunger first on one side and then on the other as the plunger reciprocates, and means for reciprocating the plunger.

2. The combination with a pusher, of a plunger and an alternator arranged to operate said pusher, said alternator operated by said plunger, and means for operating said plunger from the needle bar of the machine.

3. In an attachment for sewing machines, the combination with a pusher, an oscillating lever arranged to reciprocate said pusher, means for operating said oscillating lever, and means for locking said oscillating lever in each of its extreme positions.

4. In an attachment for sewing machines, the combination with a reciprocating plunger operated by the needle bar, of an alternator and a pusher operated thereby, said plunger acting on alternate sides of the alternator.

5. In an attachment for sewing machines, the combination with a reciprocating plunger operated by the needle bar, of an alternator and a pusher operated thereby, said plunger acting on alternate sides of the alternator, and means for locking said pusher in each of its extreme positions.

6. The combination with a needle bar, of an alternator, means for operating said alternator positively in alternate directions by the movement of the needle bar, a pusher arranged to be operated by said alternator, and means for locking said alternator in its extreme positions.

7. The combination with a pusher, of an oscillating reciprocating plunger, and a pivoted connection between said pusher and said plunger, said connection arranged to de-

flect said reciprocating plunger, first on one side during one forward stroke of the plunger and then on the other side during the next forward stroke.

8. The combination with a pusher, of an oscillating reciprocatory plunger, in connection therewith, means for locking said pusher at each end of its movement, and means for operating said plunger to reciprocate said pusher, said plunger also releasing said pusher by positive action against said locking means.

9. The combination with a pusher, of an oscillating plunger, means for operating the same and an oscillating part connecting the plunger and the pusher, and means for locking said oscillating part, said means being controlled by the plunger.

10. In an attachment for a sewing machine, the combination with a pusher, of a lever for reciprocating said pusher and a reciprocatory oscillating plunger contacting directly with alternate sides of said lever, whereby it receives an oscillating movement and means for reciprocating said plunger.

11. The combination with a pusher, of an oscillating lever for operating said pusher, catches for locking said lever at each end of its oscillating movement, and means for oscillating said lever which means also engages said catches to release said lever.

12. The combination with a pusher, of an oscillating lever for operating said pusher, catches for locking said lever at each end of its oscillating movement, and an oscillating reciprocatory plunger for oscillating said lever, said plunger also engaging said catches to release said lever and means for operating said plunger.

13. The combination with a pusher, of an oscillating lever engaging with said pusher, a plunger for actuating said lever, and pivoted catches for locking said lever at each end of its oscillating movement.

14. The combination with a pusher, of an oscillating reciprocatory plunger for operating said pusher, means for locking said pusher at each end of its stroke, said locking means being controlled by contact of the plunger as it oscillates and means for operating said plunger.

15. In an attachment for sewing machines, the combination with a pusher, of a four armed pivoted lever, one arm of which engages said pusher, a reciprocating plunger alternately engaging the two other opposite arms of said lever to oscillate said lever, said plunger being deflected alternately to said opposite arms by said fourth arm of said lever as said lever oscillates, and means for reciprocating said plunger.

16. In an attachment for sewing machines, the combination with a pusher, of a four armed pivoted lever, one arm of which engages said pusher, a reciprocating plunger

alternately engaging the two other opposite arms of said lever to oscillate it, said plunger being deflected alternately to said opposite arms by said fourth arm of said lever as said lever oscillates, spring actuated pivoted catches for engaging and locking said opposite arms as the lever oscillates, said catches arranged to be released by the deflection of said plunger before said plunger engages said arms, and means for reciprocating said plunger.

17. In an attachment for a sewing machine, the combination with a horizontally disposed pusher, of a horizontally disposed

lever for reciprocating said pusher, a horizontally disposed plunger for operating said lever, horizontally disposed catches for locking said lever in its extreme positions, and means operated from the vertical operating needle bar for reciprocating said plunger horizontally.

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

GEORGE JOHN STEVENS.

Witnesses:

G. F. WARREN,

WALTER I. SKERTEN.