

No. 775,209.

PATENTED NOV. 15, 1904.

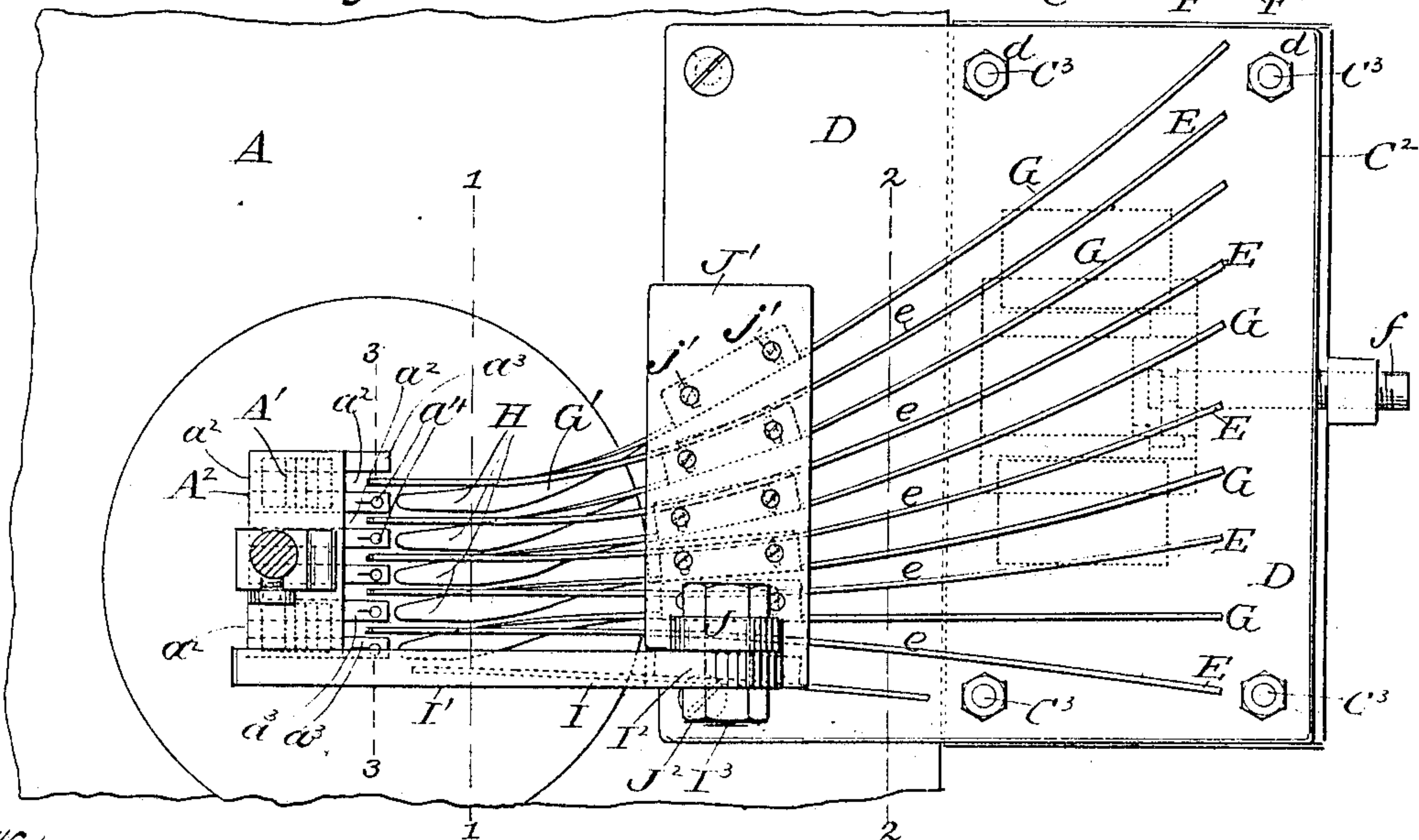
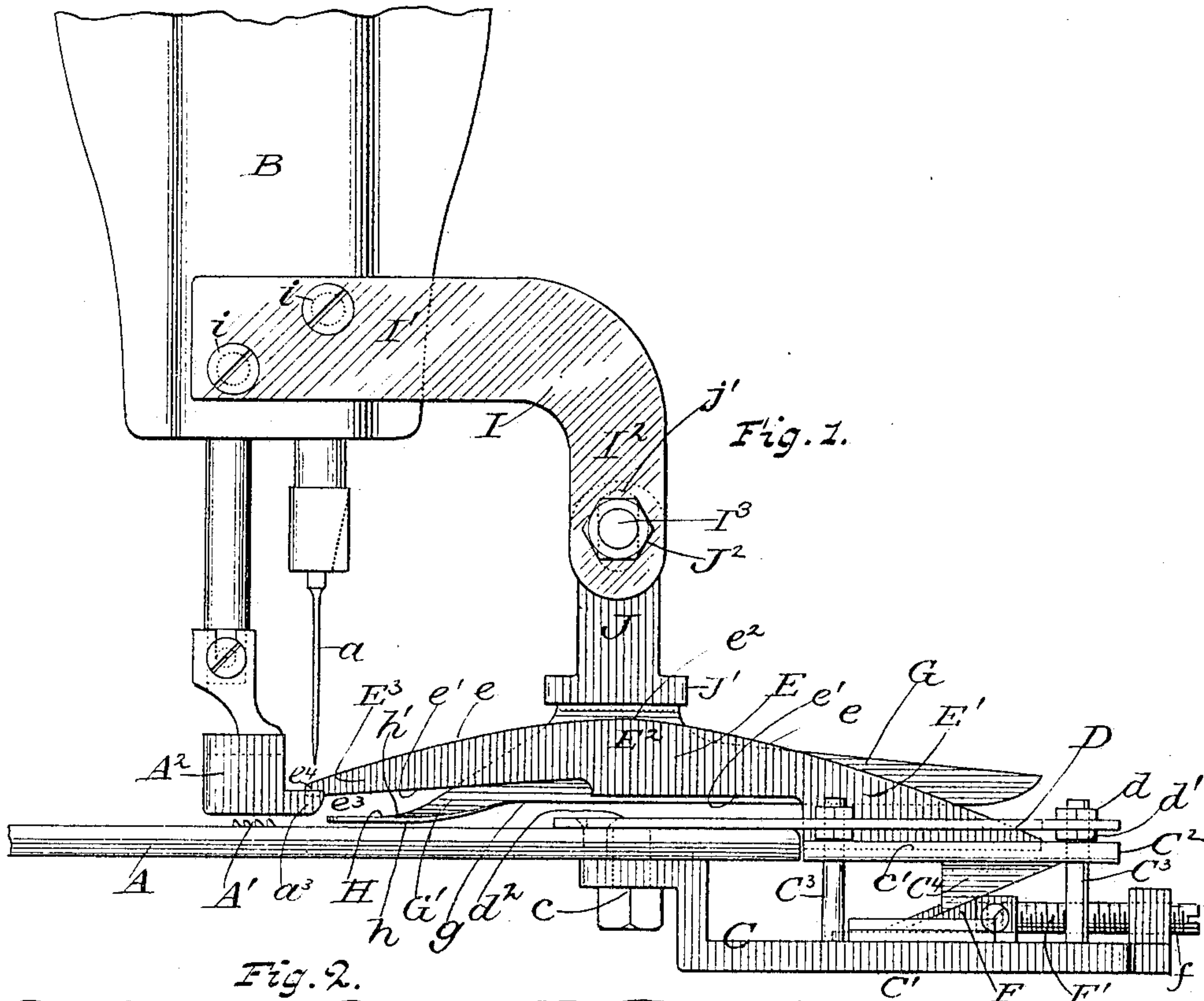
J. H. DE NIKE.

PLAIT FORMING ATTACHMENT FOR SEWING MACHINES.

APPLICATION FILED SEPT. 15, 1902.

NO MODEL.

4 SHEETS—SHEET 1



Witnesses.

Charles Leuker
A. Leuker

Joseph H. De Nike,
Inventor,

by Alex. Bellkirk
attorney

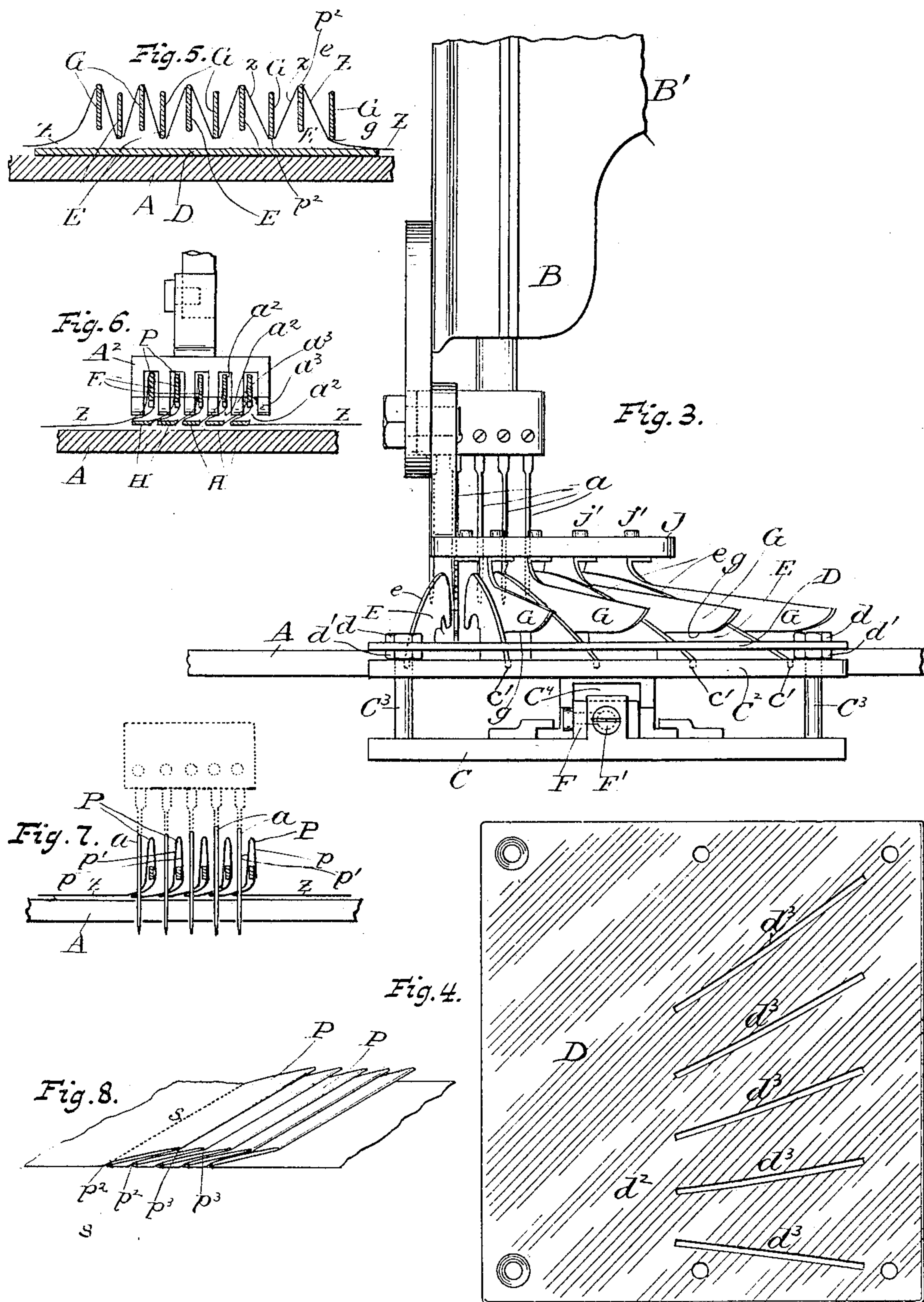
J. H. DE NIKE.

PLAIT FORMING ATTACHMENT FOR SEWING MACHINES.

APPLICATION FILED SEPT. 15, 1902.

NO MODEL.

4 SHEETS—SHEET 2.



Witnesses.

Charles L. Lusk
 A. Lusk & Co.

Joseph H. De Nike,
 Inventor.

by Alex. Lusk
 Attorney

No. 775,209.

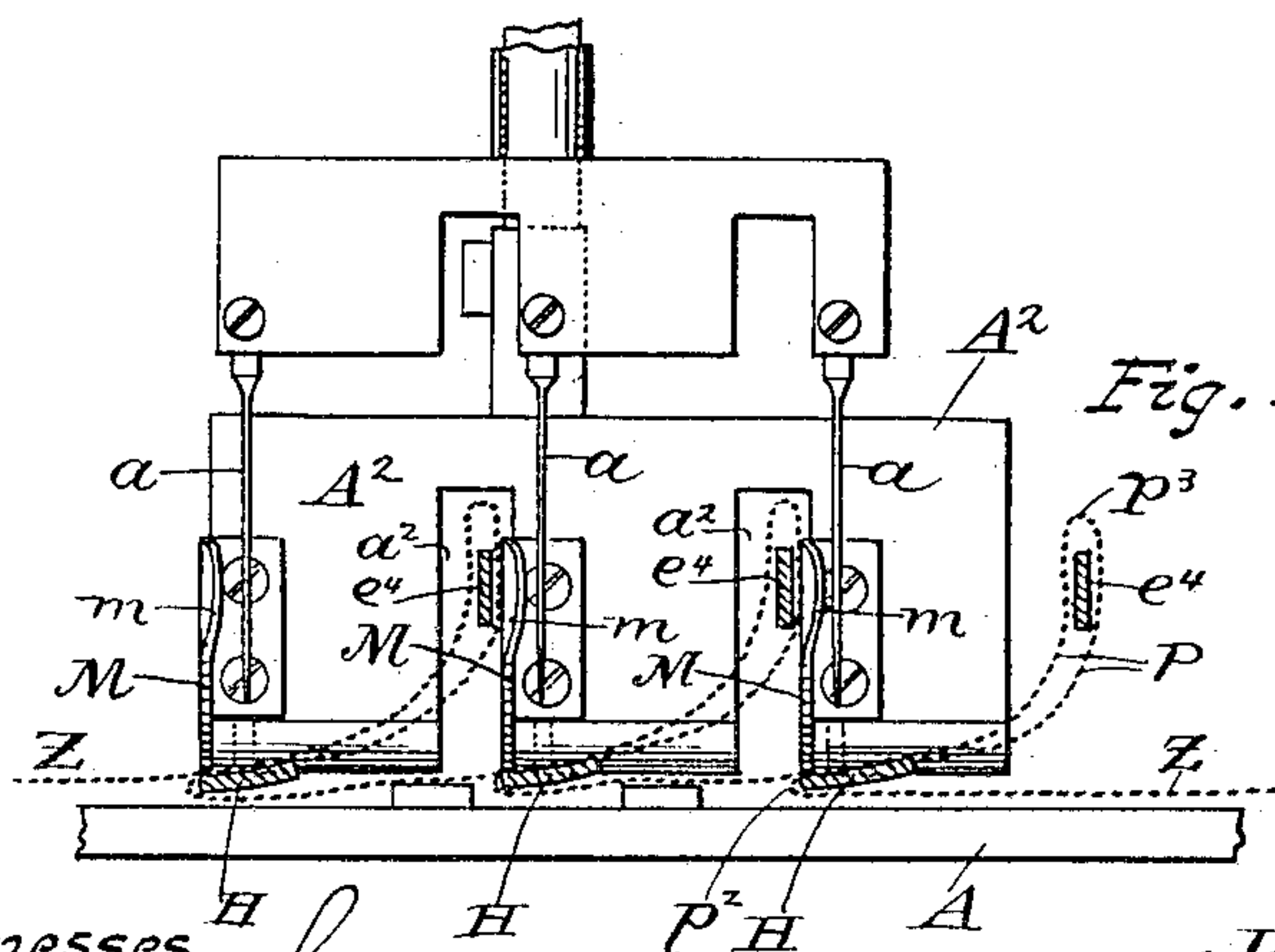
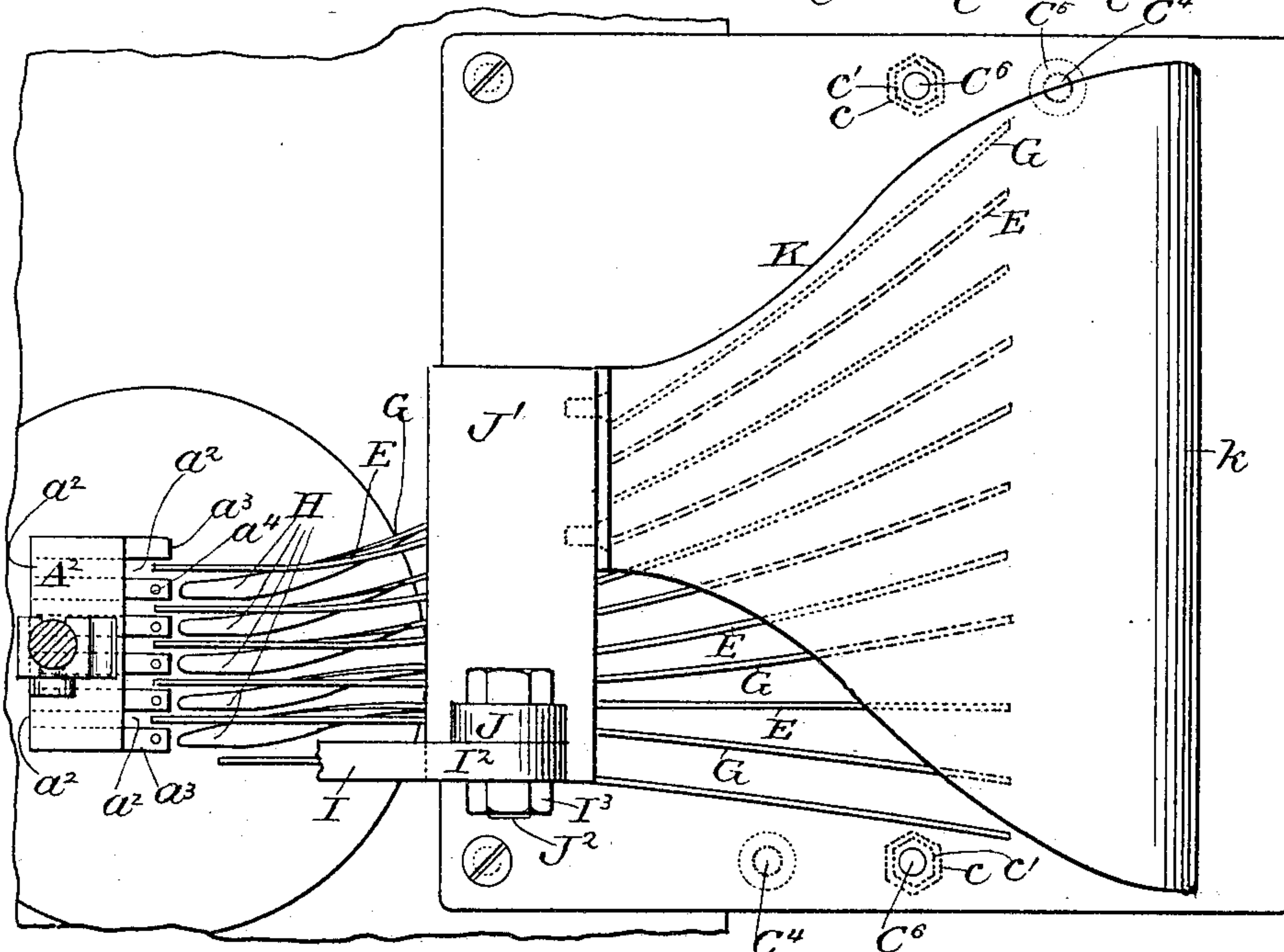
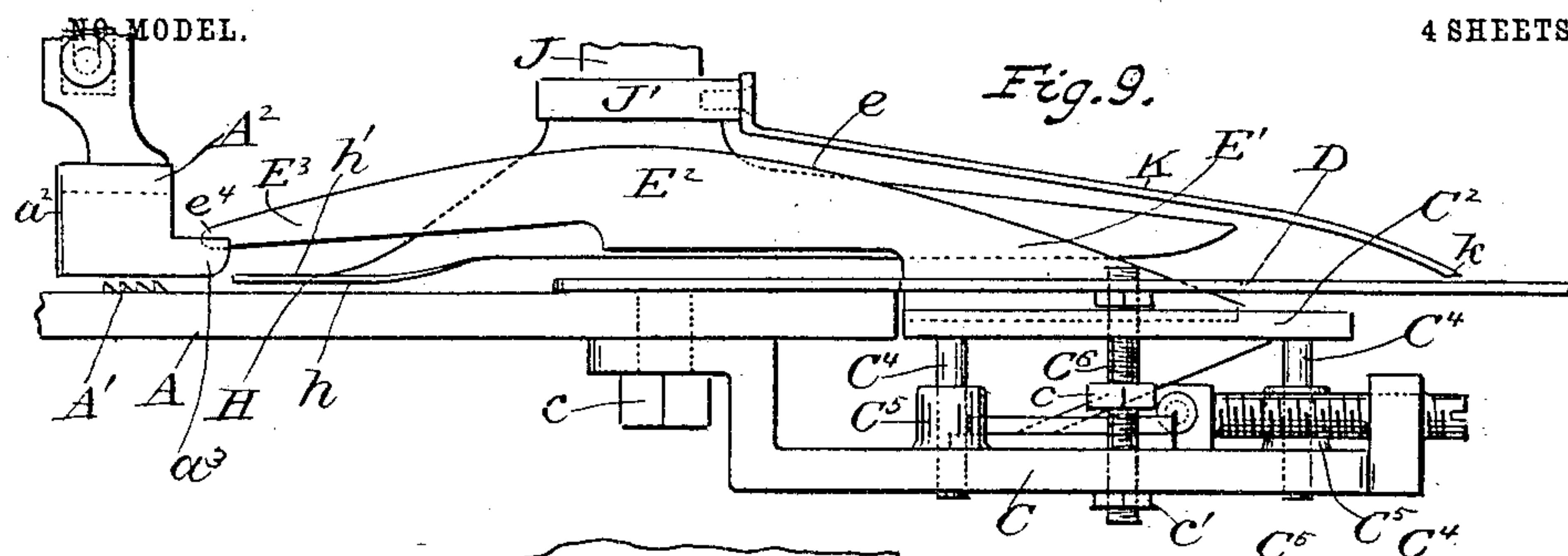
PATENTED NOV. 15, 1904.

J. H. DE NIKE.

PLAIT FORMING ATTACHMENT FOR SEWING MACHINES.

APPLICATION FILED SEPT. 15, 1902.

4 SHEETS—SHEET 3.



Witnesses

Charles E. Lusk
A. Lusk & Co.

Joseph H. De Nike,
Inventor.
by Alex. Selkirk

Attorney

No. 775,209.

PATENTED NOV. 15, 1904.

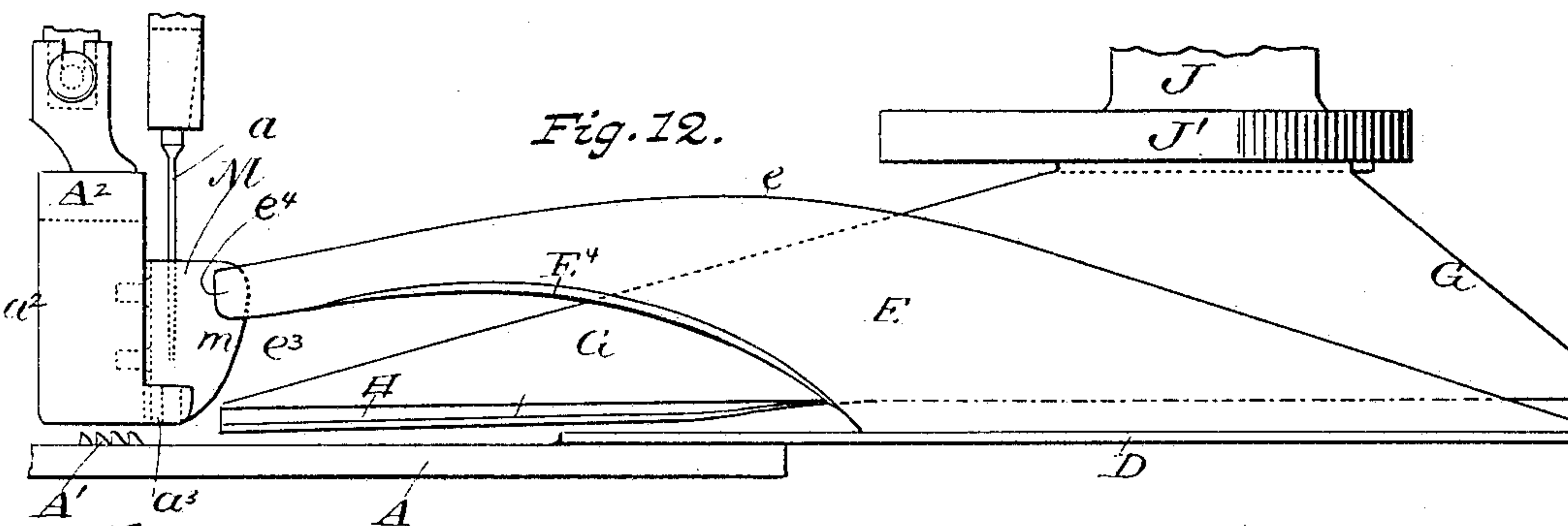
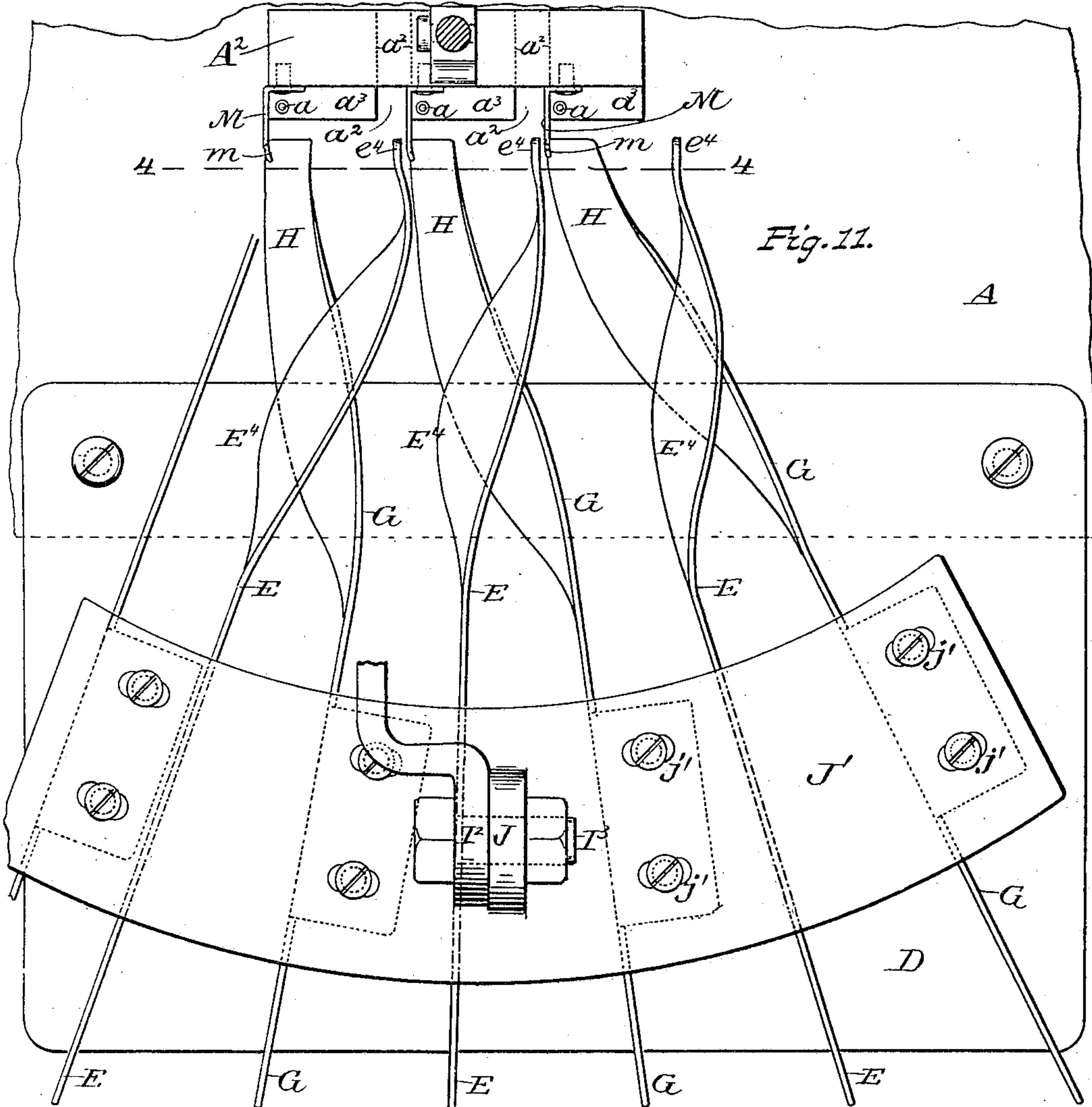
J. H. DE NIKE.

PLAIT FORMING ATTACHMENT FOR SEWING MACHINES.

APPLICATION FILED SEPT. 15, 1902.

NO MODEL.

4 SHEETS—SHEET 4.



Witnesses.
Charles S. Kirk
A. S. Kirk

Joseph H. DeNike,
Inventor.
by Alex. Selkirk
Attorney

UNITED STATES PATENT OFFICE.

JOSEPH H. DE NIKE, OF ALBANY, NEW YORK, ASSIGNOR OF ONE-HALF TO UNITED SHIRT & COLLAR COMPANY, OF TROY, NEW YORK, A CORPORATION OF NEW YORK.

PLAIT-FORMING ATTACHMENT FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 775,209, dated November 15, 1904.

Application filed September 15, 1902. Serial No. 123,453. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH H. DE NIKE, a citizen of the United States, and a resident of Albany, in the county of Albany and State of New York, have invented new and useful Improvements in Plait-Forming Attachments for Sewing-Machines, of which the following is a specification.

My invention relates to plaiting attachments for sewing-machines and adapted to form two or more parallel plaits or tucks in each plait in lines which are beneath an adjoining plait, so as to be covered by the same, and thereby either hide from view said stitches or expose the same, as may be preferred; and it consists of the novel devices and parts and novel features of construction and combinations and arrangements of the same, as hereinafter described, and set forth in the claims, reference being had to the accompanying drawings in four sheets, forming a part of this specification, in which—

Figure 1 is an elevation showing this invention applied to a suitable sewing-machine. Fig. 2 is a plan view of the same. Fig. 3 is a front view of the attachment when applied to the machine. Fig. 4 is a plan view showing the lower plate in this attachment adapted to receive and guide the series of lower side tuck-forming blades. Fig. 5 is a section taken at line 2 in Fig. 2. Fig. 6 is a section taken at line 1 in Fig. 2. Fig. 7 is a section of the fabric, at the needles, being stitched and immediately before passing under the presser-foot. Fig. 8 is a perspective view of the stitched plaits after passing under the presser-foot. Fig. 9 is a side elevation illustrating a modification of mechanisms which may be employed. Fig. 10 is a plan view of the same. Fig. 11 is a plan view illustrating other modifications which may be employed. Fig. 12 is a side elevation of the same; and Fig. 13 is a view, part in section, taken at line 4 in Fig. 11.

Similar letters of reference refer to similar parts throughout the several views.

In the drawings, A is the base-plate of the

sewing-machine. B is the head of the same connected with the arm B' of the machine.

a a are the needles.

A' is the feeding device, and A² the presser-foot.

C is the supporting-frame of the lower plaiting-plate and adjuncts to the same. This frame C comprises the bracket-plate C', vertical adjustable blade-supporting plate C², posts C³, suitably secured to the said bracket-plate and adapted to guide the said blade-supporting plate in its vertical movements. These posts C³ also serve as studs for supporting the blade-guiding plate D, which is rigidly held mounted on the upper ends of said posts by the lower and upper clamping-nuts d d' and also serves as a work-supporting plate. This frame C is secured to the base-plate A of the machine from its lower side by bolts c c and receives and supports the mechanism provided for adjusting the height of the projection of the lower series of tucking-blades from the blade-guiding plate D, serving also as the work-supporting plate.

E E are the lower side tuck-forming blades, which blades may be employed in any preferred number in connection with the blade-guiding plate D and a similar number of needles in the machine. Although these tucking-blades E may be made with any preferred suitable form of construction and outline of shape of upper and lower edges e e' and also to be made with any preferred elevation of their upper edges e above the plane of the upper surface d² of the plate D which supports the fabric being plaited, yet for general use for running plaits or tucking and stitching the same with rows of either hidden or exposed stitches I prefer to make the said blades with forms of portions thereof similar to those shown in Figs. 1 and 3, in which the outlines of their upper and lower edges produce a convex form of upper edge e in direction from front to rear, thereby causing the said edge of the forward portions of these blades to run on curved inclined lines from about the point e² of middle of length of said

blades to the forward ends of the same, while the rearward portions of the same are respectively made to run on a curved incline of upper edge from said point e^2 to the rear end terminals of said blades. These blades E E are so arranged in relation to each other as to converge as they run rearward toward the needles $a a$ and presser-foot A^2 . These lower tucking-blades E are of thin metal, preferably steel, and have in them, respectively, the downwardly-extended forward portion E' , seated in plate, the elevated middle portion E^2 , having its lower edge above plate D, and the more elevated rearward portion E^3 , having its lower edge e' elevated to near the upper side of the presser-foot, preferably as shown in Fig. 1, so as to produce between said lower edge e' and the upper surface of the bed-plate A the relatively larger opening e^3 in vertical direction, which will permit the said blade to be depressed to a suitable distance without closing the said opening.

In the plate D, operating to support the fabric while being crimped and also to guide the vertical movements of the blades E, are provided slots d^3 in number corresponding to that of said blades E employed in this attachment. These slots are made in width, form, and relative arrangement in correspondence with the thickness, form, and relative arrangement of the forward portions E' of said lower clamping-blade E, so as to adapt said slots in the series in plate D to nicely receive the respective portions E' which are to be guided in vertical adjustments of said blades. The lower margins of these blade portions E' , passing down through their respective guiding-slots d^3 , are shown in Fig. 3 to enter grooves c' in the upper side of the vertical adjustable plate C^2 , in which they are suitably secured, so as to adapt said adjustable plate to elevate or depress all of the said tuck-forming blades E to distances preferred. Any suitable mechanism may be employed for vertically adjusting said plate C^2 ; yet I at present prefer to employ the downwardly-projected inclined piece C^4 , depending from the lower side of said plate C^2 , and the horizontal-moving incline piece F, revolving screw-threaded shaft F' , having one end thereof provided with screw-threads f and working in a suitable screw-threaded piece which is suitably connected with bracket-plate C and adapted to move said incline piece F in proper direction against incline piece C^4 , so as to raise the plate C^2 or allow it to move downward, together with the crimping-blades secured thereto, as may be preferred or as the width of the plaits may require.

G G are a series of upper side tucking-blades in number and in form in horizontal direction corresponding with the lower tucking-blades E. These blades G are shown in Figs. 1, 2, 9, 11, and 12 to have integral with them, respectively, the flat horizontal lower

plait-edge supports H H, which are extended rearward to within a short distance from the front edge of the presser-foot A^2 , as shown in said figures. These upper side crimping-blades G and flat supports H are made preferably of thin steel with the former preferably arranged, respectively, at the right of the respective lower blades E, while the latter, the said flat supports, are arranged to the left of the forward ends of said blades E, as shown in Figs. 2, 10, and 11, and are carried to said location by the underturned portions G' of the metal blades which comprise the said upper side tucking-blades G and flat edge supports H when made integral. These turned portions G' respectively pass from the left side of the adjoining lower blades E to beneath the lower edge e' of the latter and hold located these flat lower plait-edge supports H fairly between each pair of adjoining forward end portions of lower blades E, as shown in Figs. 1 and 2. These several upper side tuck-forming blades G and the said plait-edge supports H are supported with their respective lower edges g and lower surfaces h out of touch with the upper surfaces of either the base-plate A or work-plate D, while the plane of the upper surfaces h' of the plait-edge supports H are respectively about on a line with lower side surface of the presser-foot A^2 .

By an inspection of Fig. 6 it will be observed that the upper edges e of the rearward portions E^3 of the lower tucking-blades will be at all times at a distance above the planes of the upper surfaces h' of the plait-edge supports H greater than the distance the said rearward portions E^3 are apart.

By an inspection of Fig. 2, in connection with Fig. 7, it will be understood that the opposite side portions $p p'$ of the plaits P produced between the crimping-blades E and G will be of greater width than the width the forward portions E^3 of said blades are apart and that the needles a operating to stitch the opposite sides of the respective plaits together will run their respective rows of stitching in each plait at lines which are relatively nearer to the lower edge p^2 of each plait than the upper edge p^3 , so that when the several plaits are formed and stitched and pressed down by the presser-foot each left-hand plait will when flat down on its adjoining right-hand plait cover the row of stitchings s run in the latter, as shown in Fig. 8. This series of upper side crimping-blades G G and flat horizontal plait-supports H may be supported in place free and clear of the base-plate of the machine and the work-supporting plate by means of any suitable mechanism adapted to support said blades suitably grouped and arranged, respectively, midway between each pair of adjoining lower tucking-blades E, as shown, and also adapted to be adjustable vertically in either direction in relation to said lower tucking-blades. My preferred mechanism for these purposes is

shown in Figs. 1, 2, and 3, taken in connection to consist of the angle-form bracket I, secured by its horizontal portion I' to the head B of the sewing-machine, preferably by screws i , and having in its vertical portion I² a suitable perforation for receiving a coupling-bolt I³ and the suspended bracket J, which is also of angular form, as shown in Fig. 3. These two brackets I and J may be secured between the head of the machine and the series of upper tucking-blades and their connected horizontal plait-supports by any suitable means, such as bolts or screws i , securing bracket I to the head, and screws j , securing the blades G to bracket J. These brackets are adjustable in vertical direction and are so made, preferably, by means of the slot-form perforation j , (indicated by dotted lines in Fig. 1,) made in the vertical portion of one of said brackets—say J—and bolt-hole of circular form in the vertical portion of the other bracket I and the clamping-bolt I³ and its nut J². By means of these brackets I and J coupled together, so that bracket J may be adjustable in vertical directions in relation to the head of the machine, the series of upper tucking-blades G may be readily raised or depressed in relation to the lower tucking-blades E and plait-supports H, which are also adjustable in vertical directions, so that this attachment may be so adjusted in these parts as to adapt them to operate with fabrics of different kinds and thicknesses for forming plaits and stitching the same by rows of stitches s , so as to be either hidden or exposed, as may be preferred.

The presser-foot A² is shown to be provided with a series of slot-form openings a^2 and forwardly-projected fingers a^3 , alternating, as shown in Figs. 2, 6, 10, 11, and 13, and respectively in numbers corresponding with the number of plait-supports H employed in the series. Suitably located in said fingers a^3 , provided with the presser-foot A², are needle-holes a^4 , through which the needles a work. The terminals h' of said plait-supports H are shown to be near the forward ends of said fingers a^3 , but not connected with the same. The sides of said slot-form openings a^2 are shown to be extended upward to a line above the plane of the upper sides of said supports H.

The manner in which the several parts of this crimping or plaiting device and stitching and feeding mechanism operate is as follows: The operator will adjust the parts of the said two tuck-forming devices above described, so as to adapt all portions operating with the fabric to the thickness of the latter which is to be plaited and stitched. The fabric will then be properly moved from the work-plate rearward and between the downwardly-inclined edge e of the forward portion of blades E and the upwardly inclined forward edge g of the upper tucking-blades G, when said fabric will be re-

ceived between the said blades and become plaited in form, as shown in the fabric z in Fig. 5, which fabric as it is moved rearward toward the series of plait-supports H will be made to have the angular lines z of their crimping on acute lines by the joint-action of the alternating converging portions of the lower and upper tucking-blades E and G. When the angularly-crimped fabric arrives at the series of plait-supports H, as at dotted line 1 in Fig. 2, the fabric will be supported by the lower crimped edges thereof resting on said supports H, while the main portions of the now looped portion P of the crimped fabric will be supported from the upper edges e of the lower tucking-blades E, as illustrated in Fig. 6, when the upper crimped edges p of the plaits will be fully formed and held relatively vertical between their respective adjoining needles and be held upright, or nearly so, as shown in Fig. 7, by the action of the side walls of the slot-form openings a^2 between the adjoining fingers a^3 , respectively, in the series between which the rear end terminals of the lower tuck-forming blades E are shown to be located, as shown in Fig. 2. The fingers a^3 of the presser-foot now coöperating with the feeding mechanism at the same time the needles are being operated holds the lower tucked edges of the fabric down, while the respective needles of the series are made to stitch the said tucked lower edge portions at the time the upper edge and body plaited portions of the fabric are in raised positions, as shown in Fig. 7.

Modifications of parts in this invention may be made without departing from the spirit of this invention. Thus all the blades in each series may be so arranged in reference to adjuncts thereto, respectively, as to remove from the upper and lower tuck-forming devices the feature, the vertical adjustability, which may be omitted when this invention is to be applied for use with machines for making plaits of only one given width, or some of the blades in each series may be made fixed, so as not to be relatively adjusted vertically, while other blades in said two series may be made to have the feature of vertical adjustability, so that the invention may be made to be adapted to form plaits of two different widths in each group of plaits run and stitched. The respective mechanism employed for vertically adjusting the two series of crimping-blades may be modified, and any suitable known equivalents or substitutes may be used in place of those shown, and the number of crimping-blades in both the lower and upper series and the plait-supports may be increased or lessened, as may be preferred or found to be convenient to be employed, as these changes or modifications will not change the essential features and operations in this invention.

In Fig. 9 are illustrated modifications of

mechanism for adjusting the platform or plate D in relation to plate C², which modifications comprise the vertical posts C⁴, suitably connected with plate C², so as to depend from the same and work nicely in the guiding-blocks C⁵, secured to bracket C, and the vertical adjusting screw-shafts C⁶, provided with right and left screw-threads and working through corresponding screw-threads in bracket C and plate C² and provided each with finger-piece c for convenience for revolving said screw-shaft in either direction required. Set-nuts c' also are provided at the lower ends of said shafts for holding the said shafts from moving in relation to brackets C. The upper ends of said screw-shafts are provided with adjusting-nuts arranged between plates C² and D and bearing against the lower side of the latter plate for supporting the said plate to the plane to be adjusted to, as may be required by the width of the tucks to be produced. The mechanism for elevating and depressing plate C² (shown in Fig. 1) is shown in Fig. 9 to be employed for the same purpose.

Figs. 9 and 10 show a fabric-smoothing plate K, arranged and suitably supported from the plate J, from which the upper tuck-forming blades G are supported and extended forward past the forward ends of blades E and G to a suitable distance, with its forward edge k at a short distance above the upper surface of plate D, so as to adapt said edge to hold the fabric from becoming bunched when passing to between the blades E and G.

Figs. 11 and 12 show a modification of form which may be given to the lower tuck-forming blades E and upper tuck-forming blades G, which preferably comprise the tuck-forming mechanism. In this modification rearward portions E³ of the lower tuck-forming blades E are shown to be bent by a partial twist E⁴ from vertical lines to horizontal, so that the lower portions of said forward portions E are approximately flat where they cross the plate-supports H, shown to be integral with upper tuck-forming blades G. This modification also shows the rear terminals e⁴ of blades E to end at a point relatively forward of the needles a instead of rearward of the same, as in Figs. 1 and 2, and also show upper tuck-edge supports M, secured to the presser-foot with their forward ends m passing the terminals, so as to adapt said supports M to receive the upper bow-form edges of the respective tucks as they pass from the rear ends of said lower tuck-forming blades E. With these modifications I prefer to provide with the presser-foot, Figs. 12 and 13, slots which alternate with the fingers and are extended upward above the upper side of the latter to such a plane above the plait-supports H as may be suitable for passage of wide tucks or plaits from front to rear of the said presser-foot. With this above-described modification of presser-foot I prefer to provide in

the cross-bar N, carrying the needles a, slots N', into which the upright portions of the tucks may enter and not become broken down when the said cross-bar descends for thrusting the needles through the lower edge margins of the tucks or plaits being stitched.

These above-described modifications of parts shown in Figs. 9, 10, 11, 12, and 13 may be made, as may others in other parts not shown, without departing from the spirit of this invention, so that tucks, plaits, &c., of narrow width or of great width or of medium widths may be formed and stitched as fashion or preference may require.

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

1. In combination with a frame and the stitching mechanism of a sewing-machine, of a plate vertically adjustable with relation to the frame, a tuck-forming member supported by said plate, a second tuck-forming member, and means for simultaneously adjusting all of said latter members.

2. The combination with the needles of a stitching mechanism of a sewing-machine and the feeding mechanism of the same, of a presser-foot having a series of forwardly-projected fingers each having a needle-hole for passage of a needle, and formed with slot-form openings which alternate with said fingers, tuck-forming members supported by the sewing-machine, and means to guide the formed tucks into said slot-form openings, said means being carried by the tuck-forming members.

3. The combination with the needles of a stitching mechanism of a sewing-machine and a fabric-feeding mechanism, of a presser-foot having a series of forwardly-projected fingers, provided each with a needle-hole, for passage of a needle, and formed with slot-form openings alternating with said fingers, tuck-forming members, and means integral with said members to guide the formed tucks into said slot-form openings.

4. The combination with one or more needles of a stitching mechanism, a feeding mechanism, a work-supporting plate and a presser-foot provided with fingers provided each with a needle-hole and alternating with slots, of a series of lower tuck-forming members and upper tuck-forming blades alternating with those of said lower members, and plait-supports arranged flat in front of the fingers of said presser-foot and adapted to support the lower edges of the plaits, tucks, &c., when entering into the said slots between the said fingers preparatory to being stitched.

5. In a crimping and plaiting device of a sewing-machine employing a series of needles, and a stitching mechanism of the same, the combination with a work-supporting plate, a series of lower-side tuck-forming blades projected upward from said plate and having their upper edges adapted to support the upper

edge portions of the plaits, and a series of upper side tuck-forming blades supported clear of the upper surface of the said work-supporting plate, and operated to tuck the lower line of fold of the plaits, of a series of flat horizontal supports, between the rear end portions of adjoining lower side tuck-forming blades, and below the same, and having their rear terminals extended rearward to near the frontside of the presser-foot and opposite the needles, the said supports being adapted to receive and support the lower line of folds of the plaits as they pass from beneath the lower edges of the said upper blades, the rear half portions of the lower crimping-blades being adapted to support the body portions of the several plates while passing to beneath the presser-foot, and while a line of stitchings is being run near to the lower edges of said plaits and distant from the upper edge folds of the same.

6. In a crimping and plaiting device of a sewing-machine employing a series of upper tucking-blades, the combination with a work-supporting plate fixedly supported below said tucking-blades in a horizontal plane, and having in it a series of slot-form openings which serve as guides, a series of lower tuck-forming blades, which have their forward portions seated respectively in said slots, in said plate, so as to be adapted to be guided in vertical movements, of a vertical moving horizontal plate having secured to it the lower edges of said forward portions of the said lower tucking-blades which work in the slots of said work-supporting plate, and mechanism to adjust said vertical moving horizontal plate and the series of tucking-blades which are secured thereto and guided by the slots in said work-supporting plate.

7. In a crimping and plaiting device of a sewing-machine, the combination with a vertical adjustable series of lower tuck-forming members and a fixed work-supporting plate, of a series of upper tuck-forming members alternating with the former and adapted to be adjusted in relation to the upper surface of the said fixed work-supporting plate, and mechanism adapted to hold the said upper series of tuck-forming members at elevations adjusted to.

8. In a crimping and plaiting device of a sewing-machine, having a series of needles, of a stitching mechanism, and a presser-foot, the combination with a series of lower tuck-forming blades having the upper edges of their respective forward portions inclined downward and forward, and their respective rear ends terminating approximately near the needles of the stitching mechanism of the machine, of a series of upper tuck-forming blades which alternate with the lower tucking-blades, and have the lower edges of their respective forward portions on inclines from the forward ends of said blades downwardly and rearwardly to the lower edges of said upper blades, and a series of low-down plaiting-supports integral with the blades of the upper series, and arranged between the rearward portions of the adjoining blades in said lower series and relatively between the lower edges of the rear portions of the blades of the same series with their respective rear end terminals near the forward end edge of the respective portions of the presser-foot, through which the respective needles, opposite the said supports, pass.

JOSEPH H. DE NIKE.

Witnesses:

CHARLES SELKIRK,
A. SELKIRK, Jr.