June 5, 1934. J. MANN 1,962,022

COMBINED SEAMING AND PINKING MACHINE

Filed April 10, 1933 8 Sheets-Sheet 1

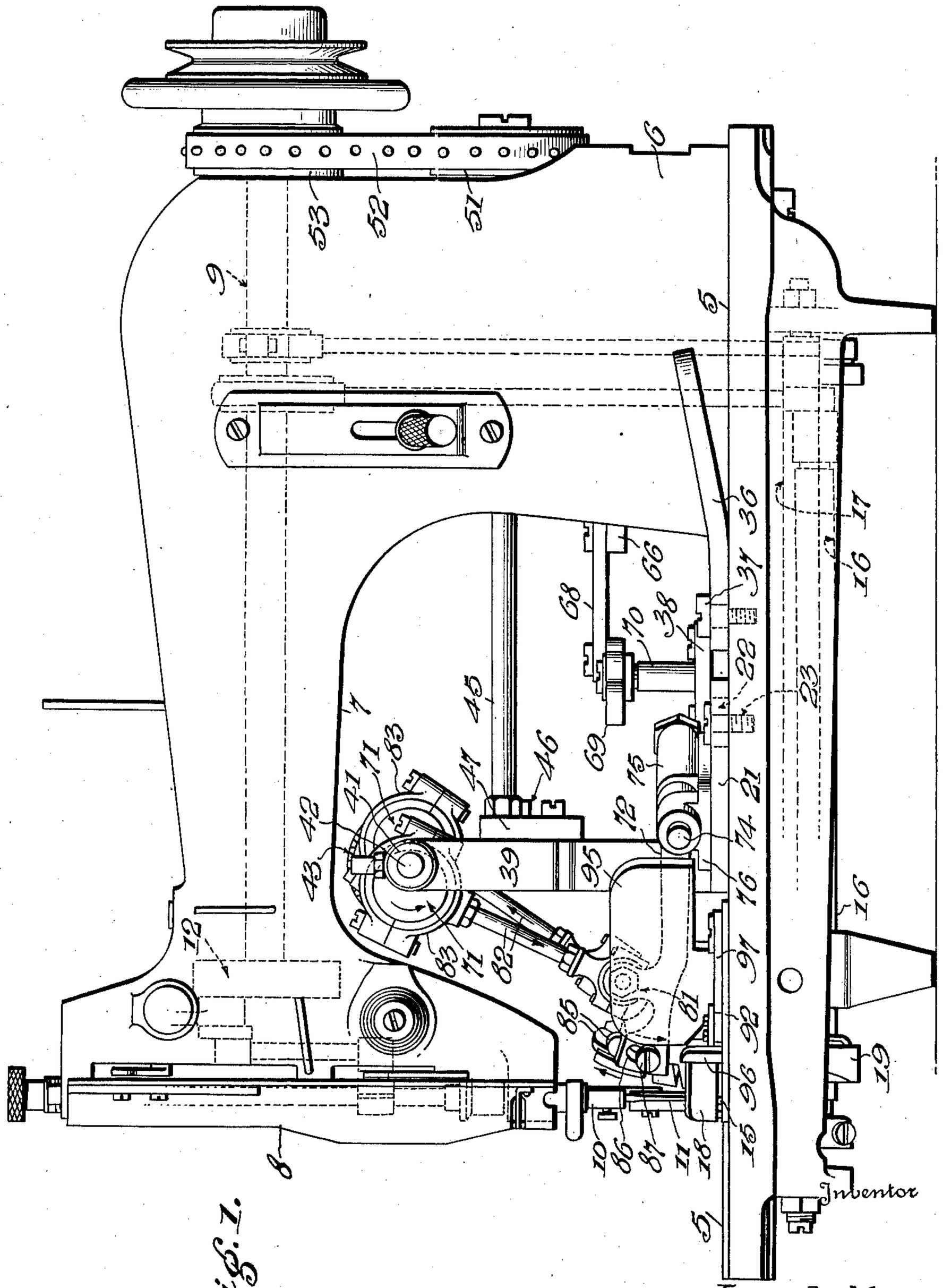


Fig. 1.

June 5, 1934. J. MANN 1,962,022

COMBINED SEAMING AND PINKING MACHINE

Filed April 10, 1933 8 Sheets-Sheet 2

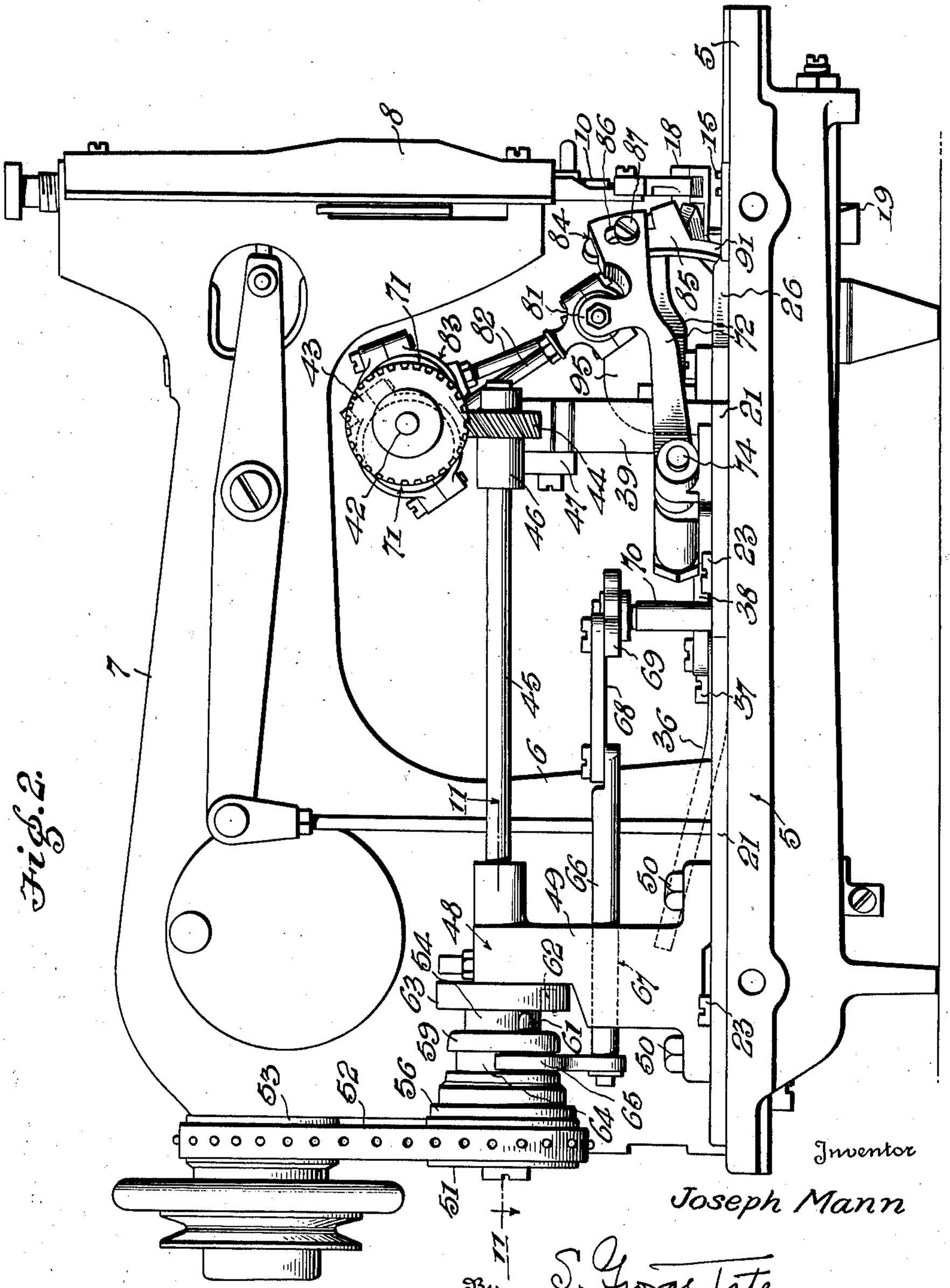


Fig. 2.

Inventor

Joseph Mann

By S. George Tate

Attorney

June 5, 1934. J. MANN 1,962,022

COMBINED SEAMING AND PINKING MACHINE

Filed April 10, 1933 8 Sheets-Sheet 3

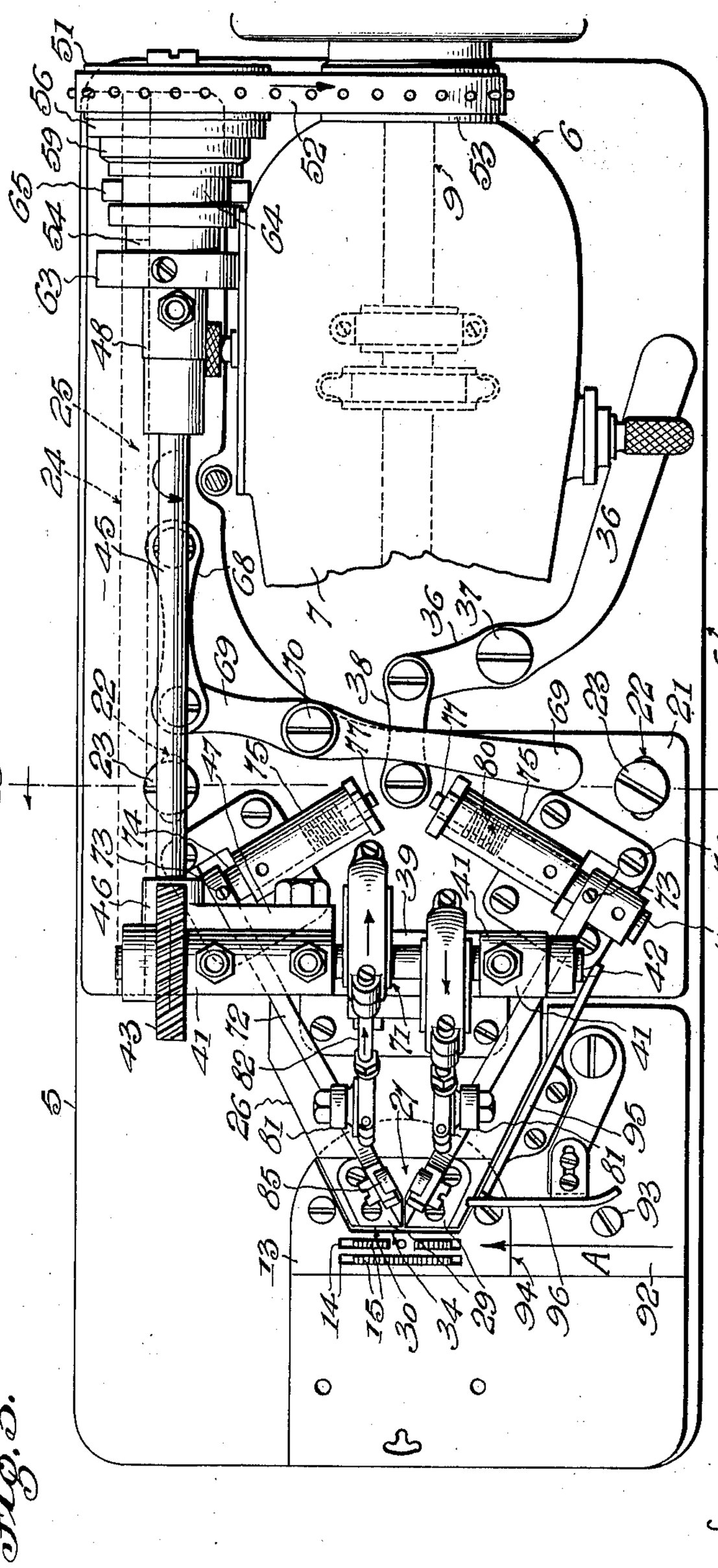


Fig. 3.

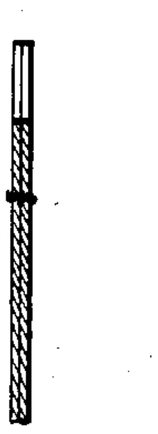


Fig. 24.

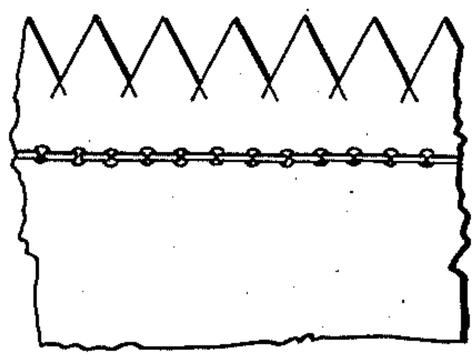


Fig. 23.

Inventor

Joseph Mann

By S. George Tate

Attorney

June 5, 1934. J. MANN 1,962,022

COMBINED SEAMING AND PINKING MACHINE

Filed April 10, 1933 8 Sheets-Sheet 4

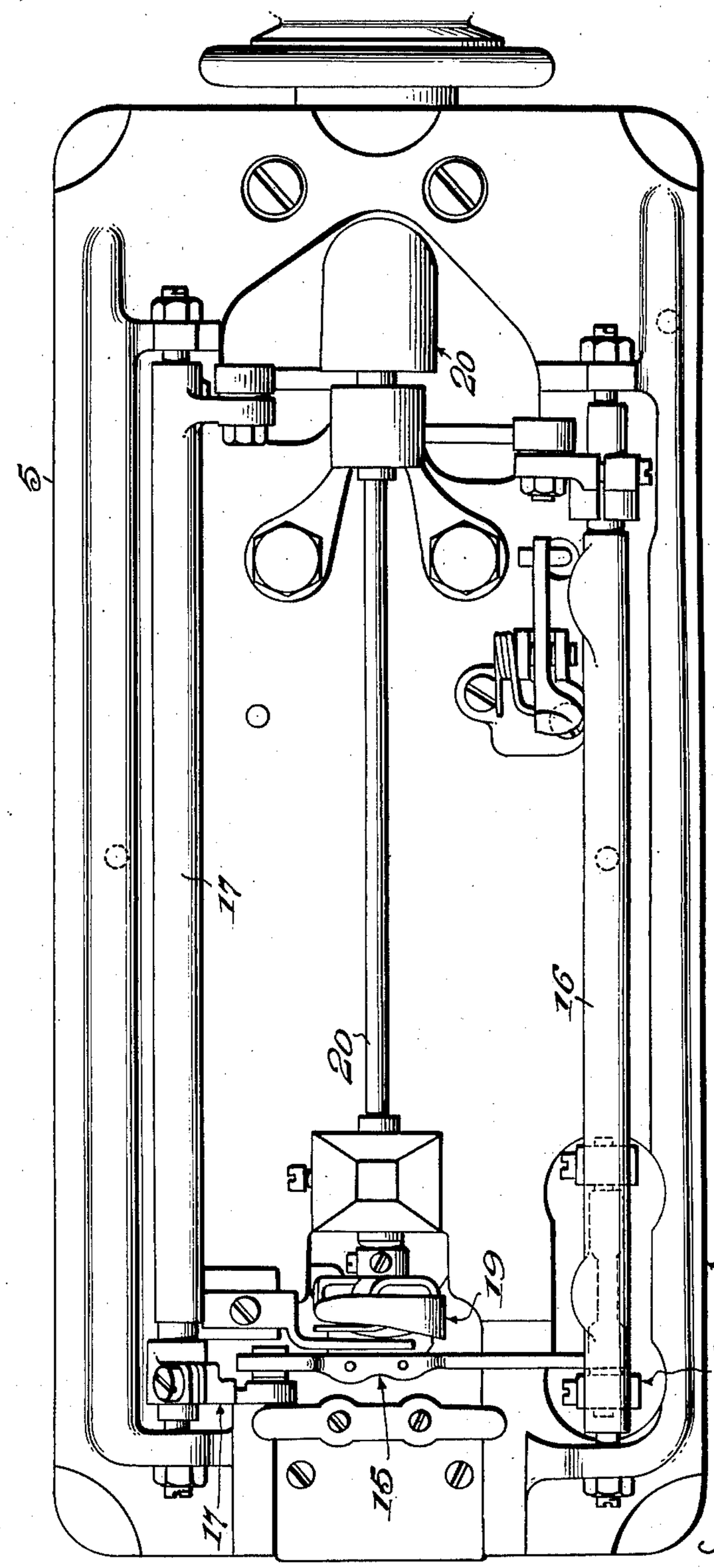
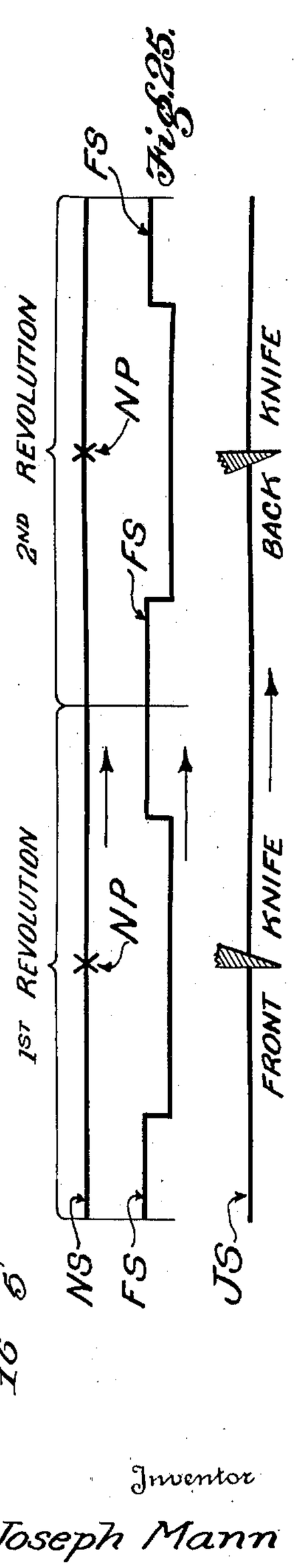


Fig. 4.



Inventor

Joseph Mann

By S. George Tate

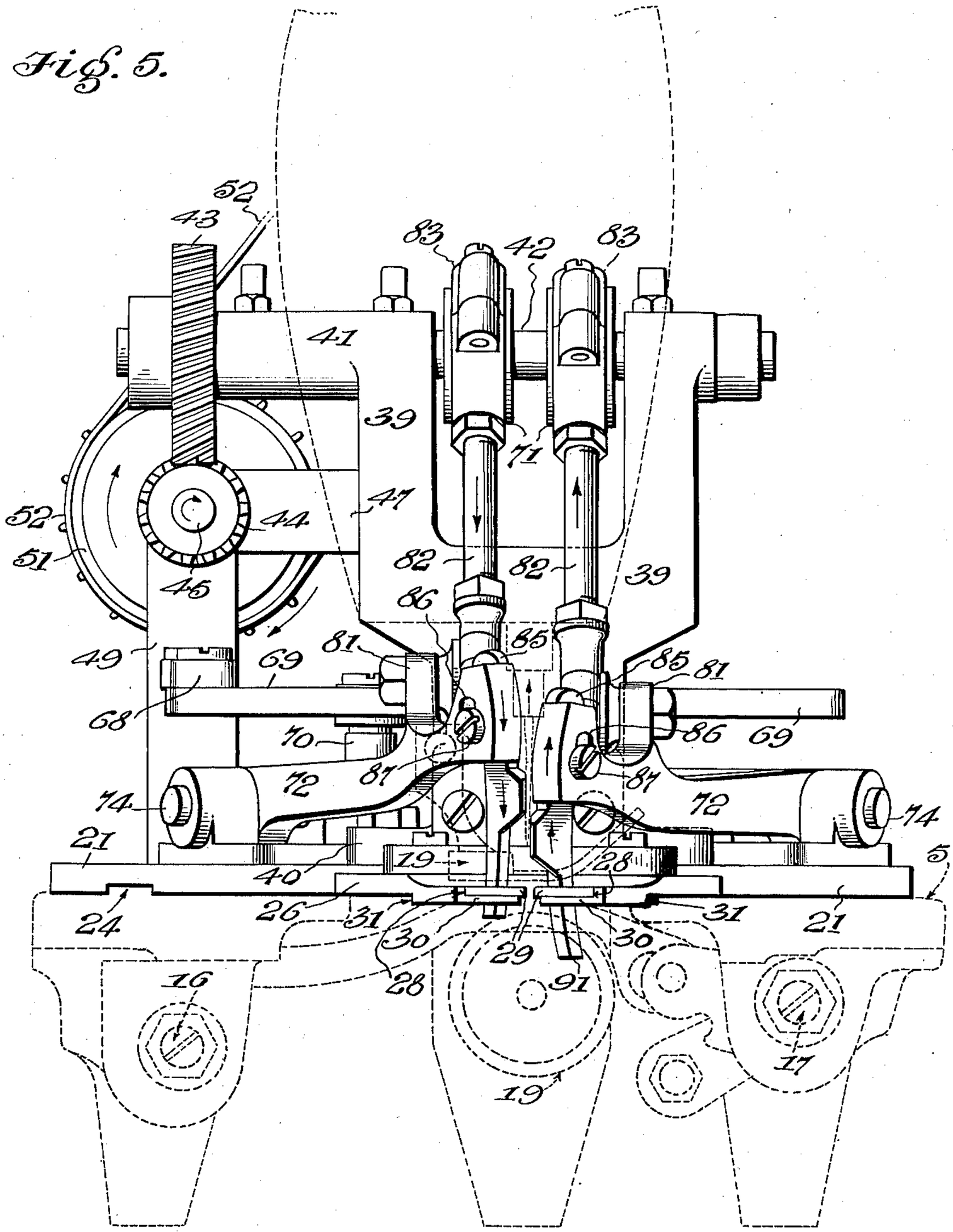
Attorney

June 5, 1934. J. MANN 1,962,022

COMBINED SEAMING AND PINKING MACHINE

Filed April 10, 1933 8 Sheets-Sheet 5

Fig. 5.



Inventor

Joseph Mann

By S. George Tate

Attorney

June 5, 1934. J. MANN 1,962,022

COMBINED SEAMING AND PINKING MACHINE

Filed April 10, 1933 8 Sheets-Sheet 6

Fig. 8.

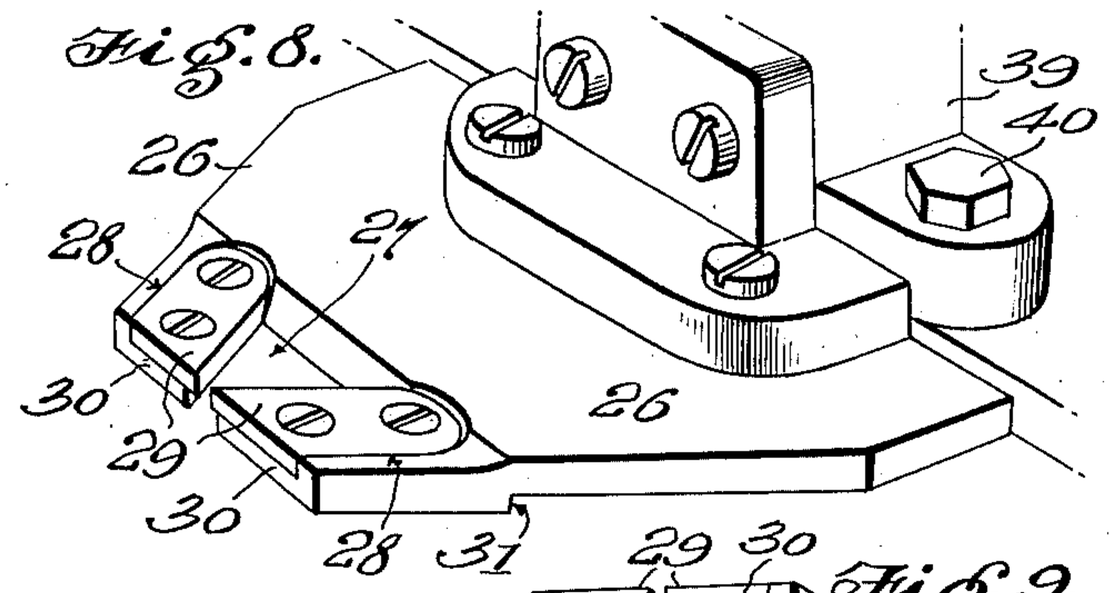


Fig. 6.

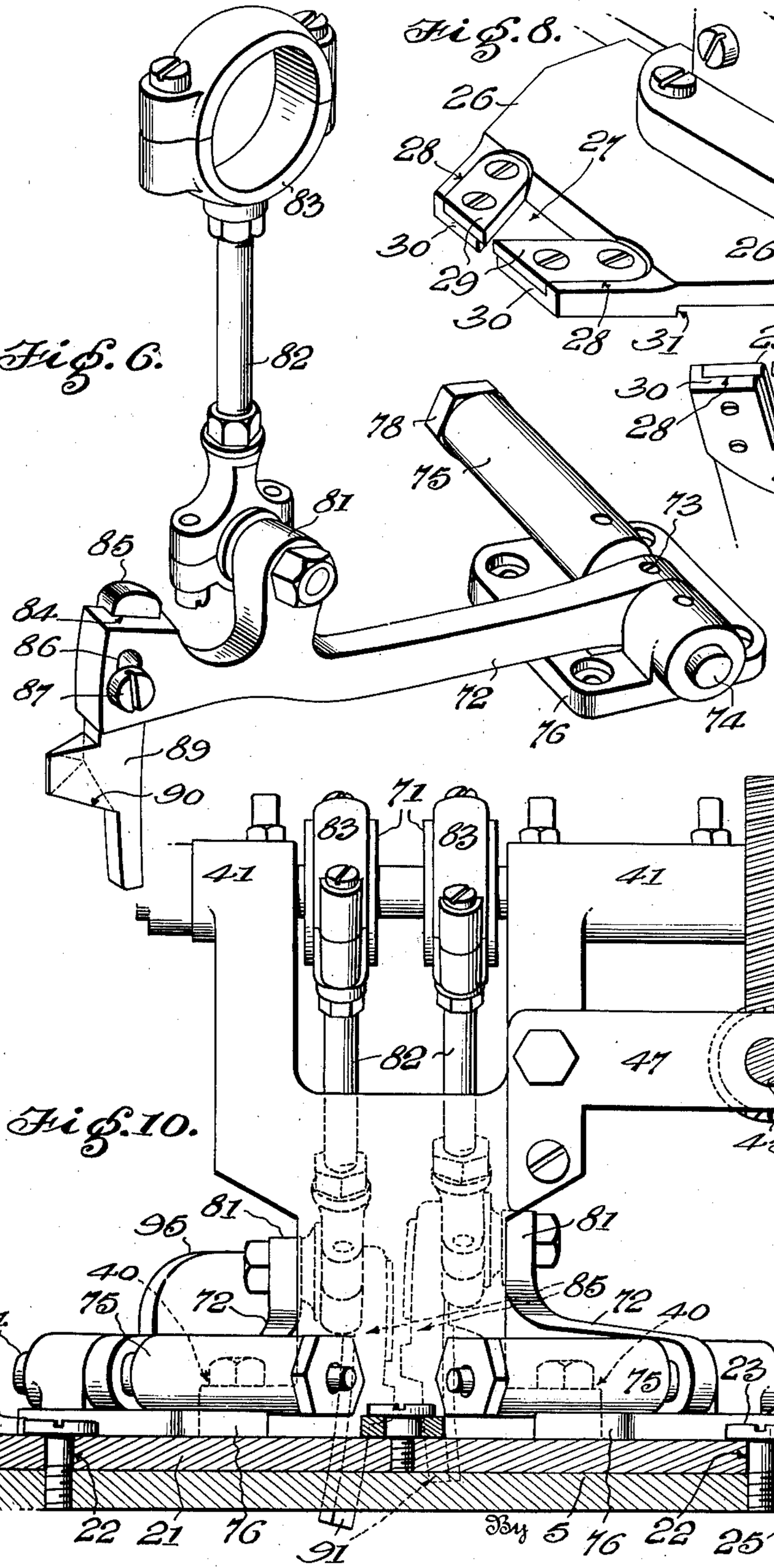


Fig. 9.

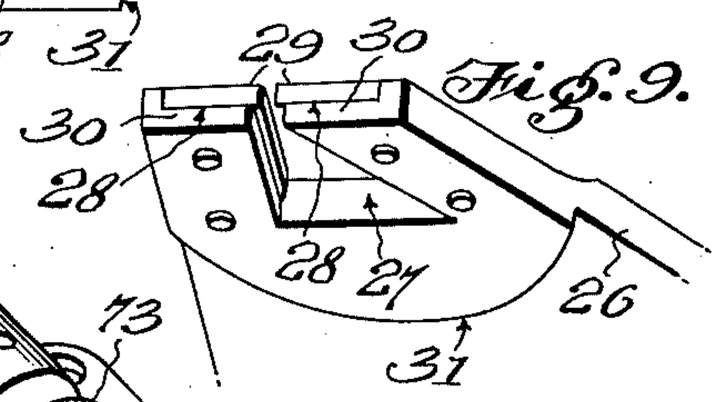


Fig. 7.

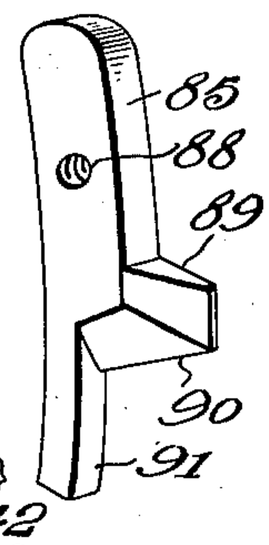


Fig. 10.

Inventor
Joseph Mann
By S. George Tate
Attorney

June 5, 1934. J. MANN 1,962,022

COMBINED SEAMING AND PINKING MACHINE

Filed April 10, 1933 8 Sheets-Sheet 7

Fig. 11.

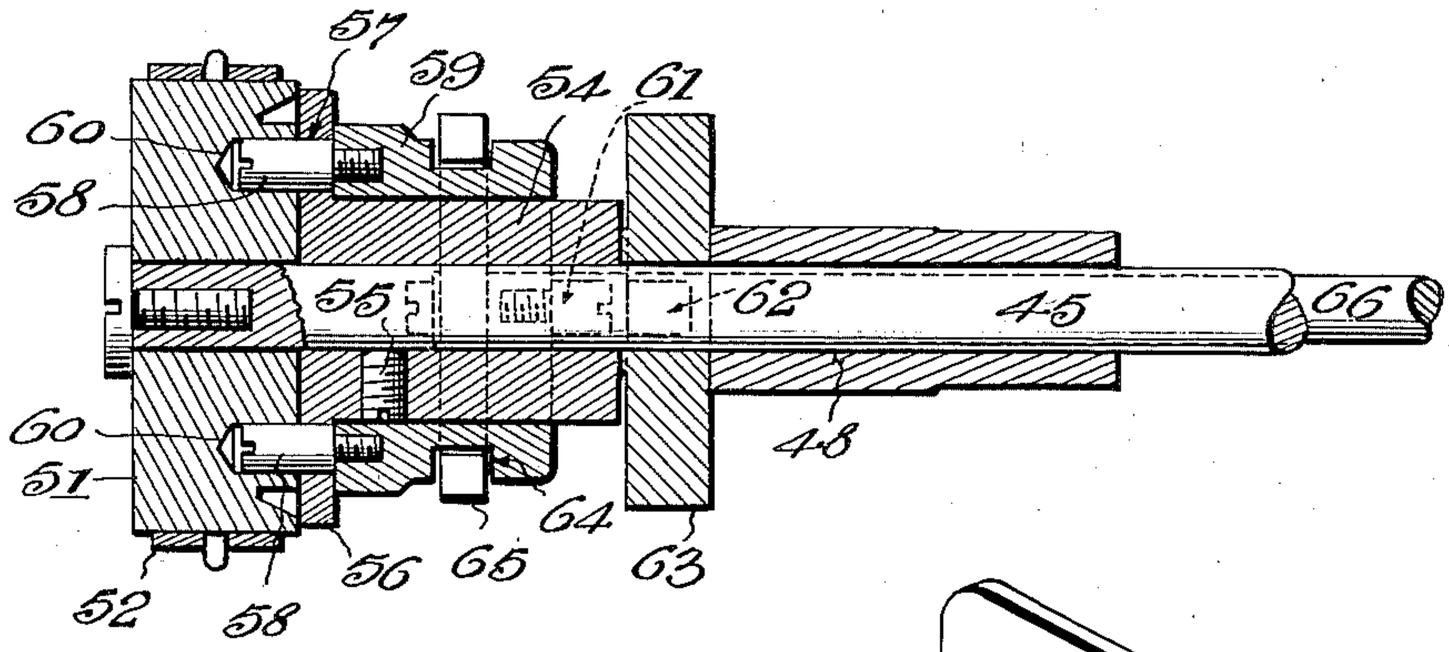


Fig. 12.

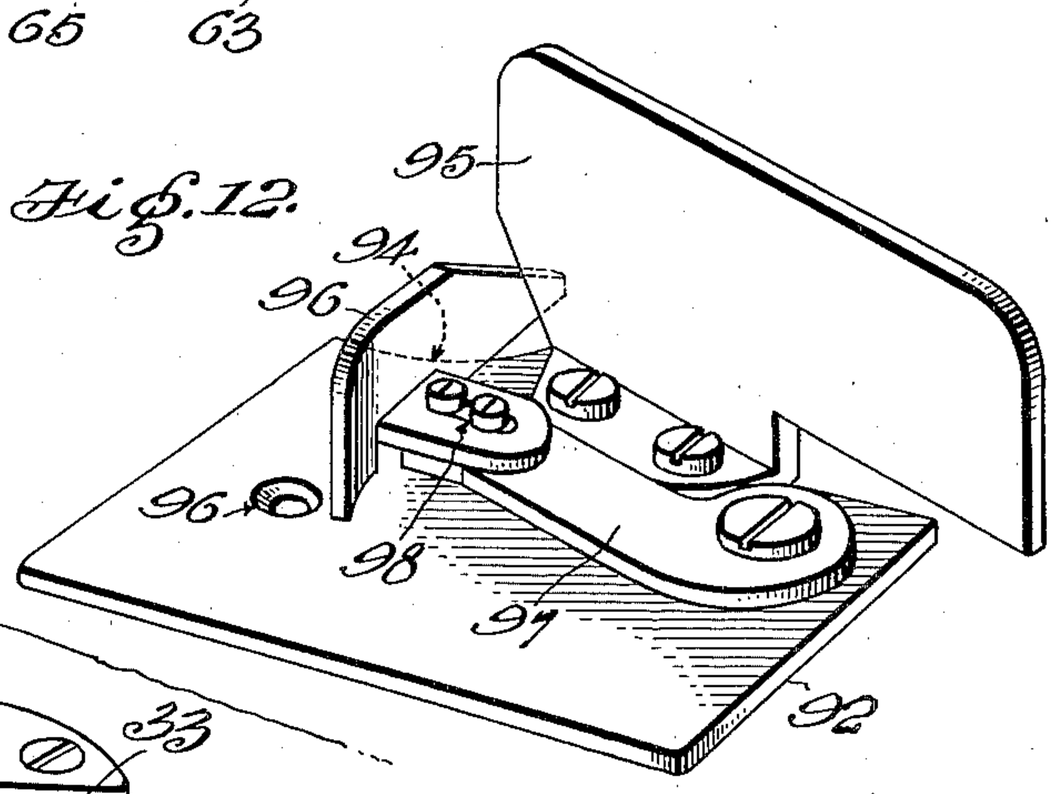


Fig. 13.

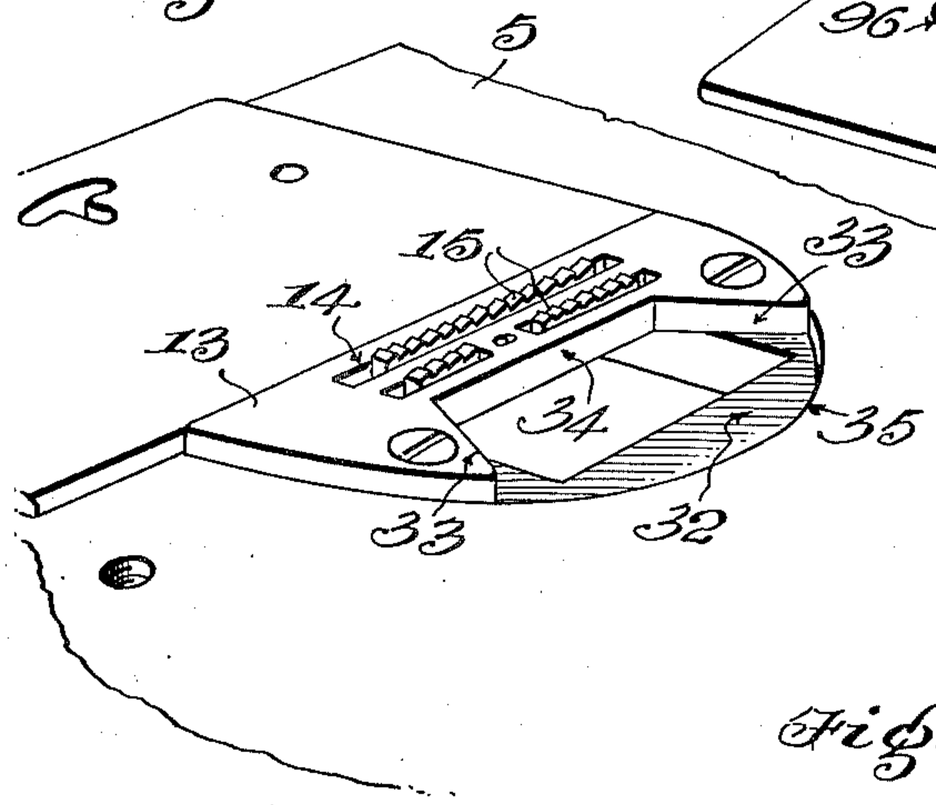
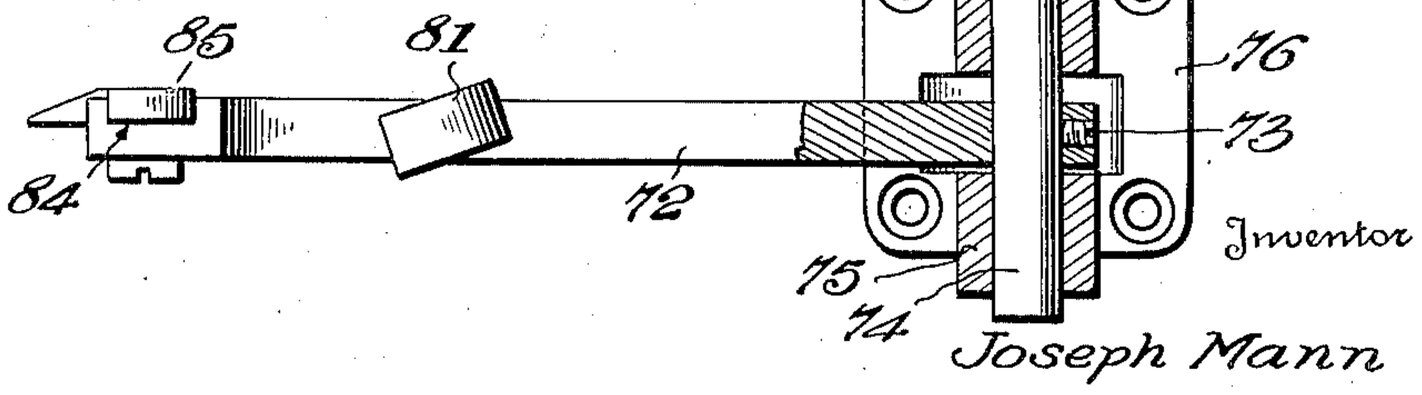


Fig. 14.



Inventor

Joseph Mann

By S. George Tate

Attorney

June 5, 1934. J. MANN 1,962,022

COMBINED SEAMING AND PINKING MACHINE

Filed April 10, 1933 8 Sheets-Sheet 8

Fig. 15.

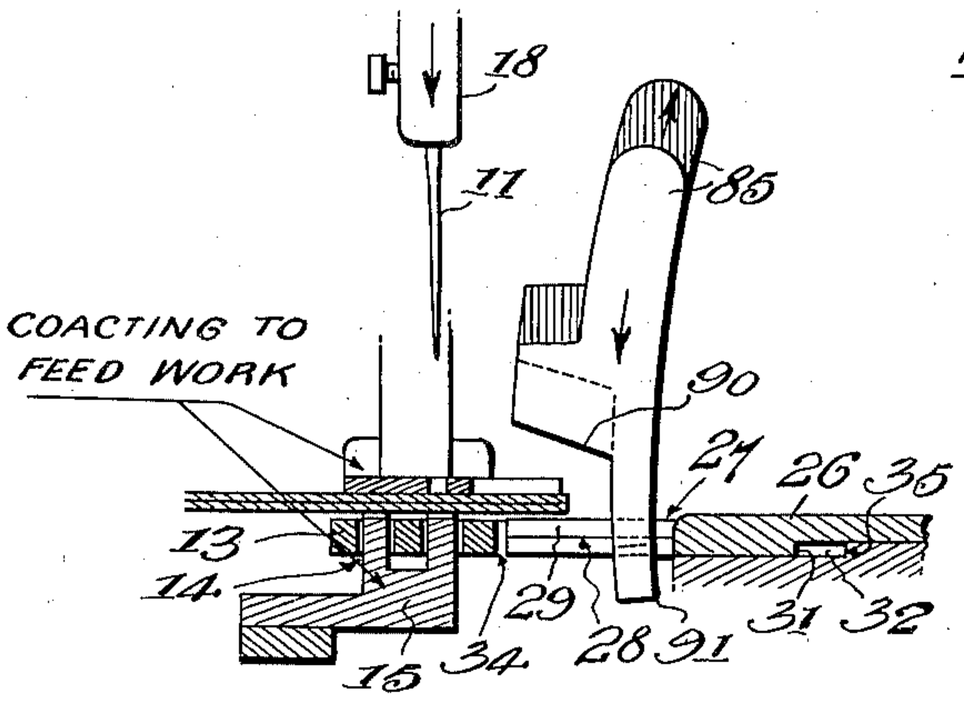


Fig. 16.

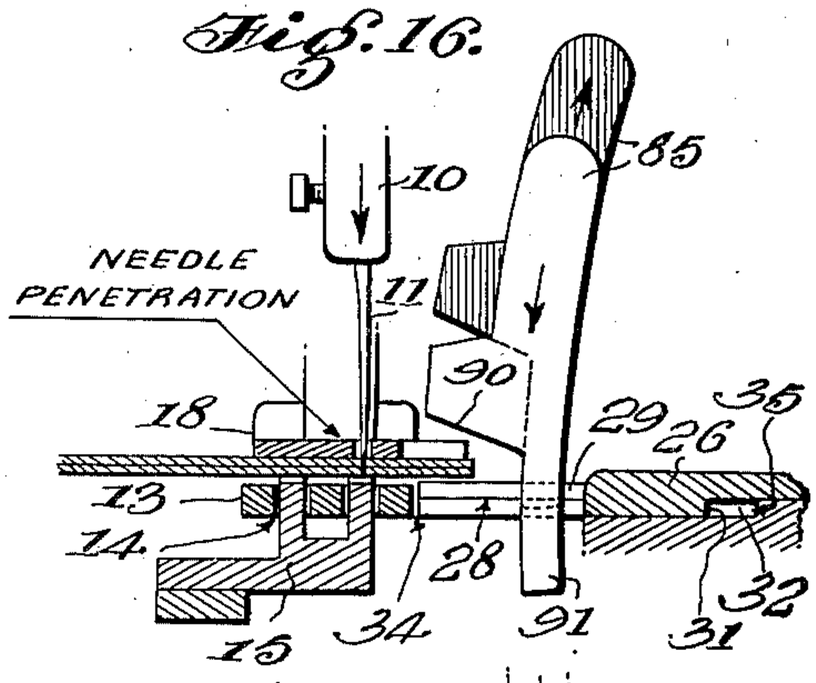


Fig. 17.

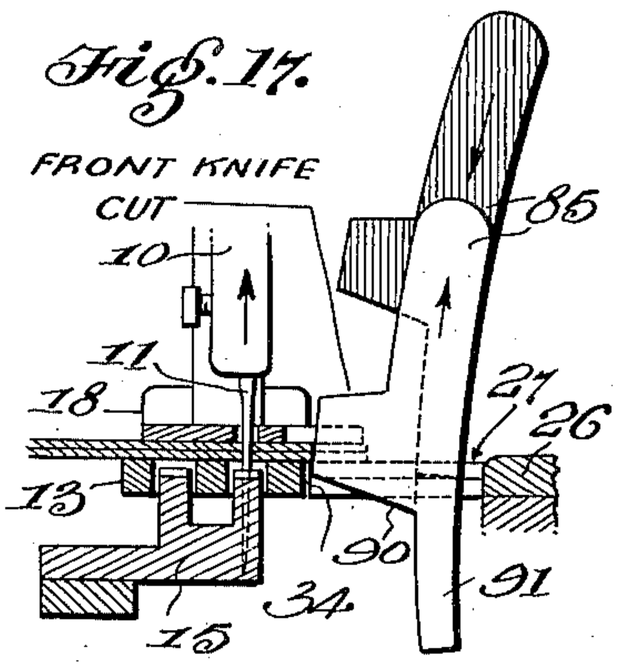


Fig. 18.

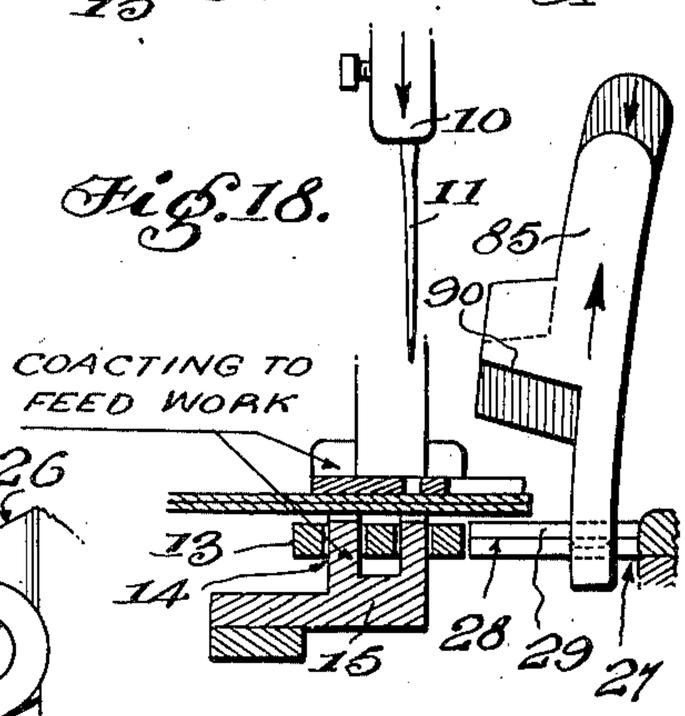


Fig. 19.

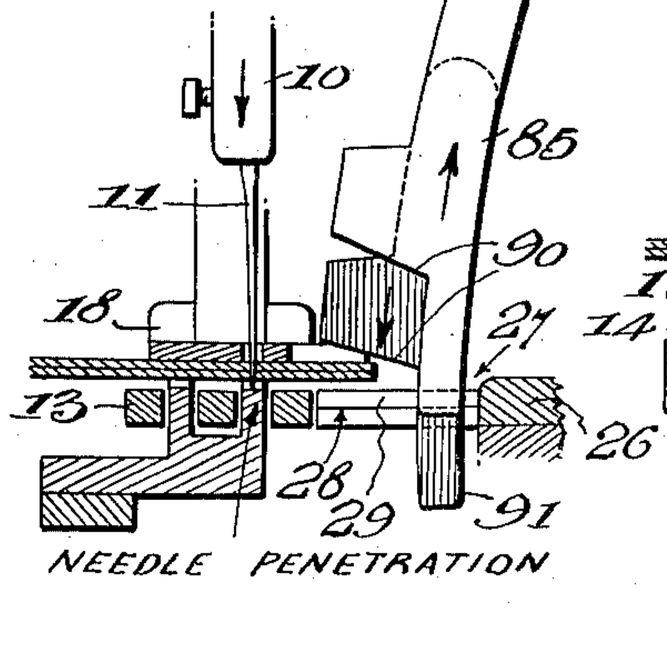


Fig. 20.

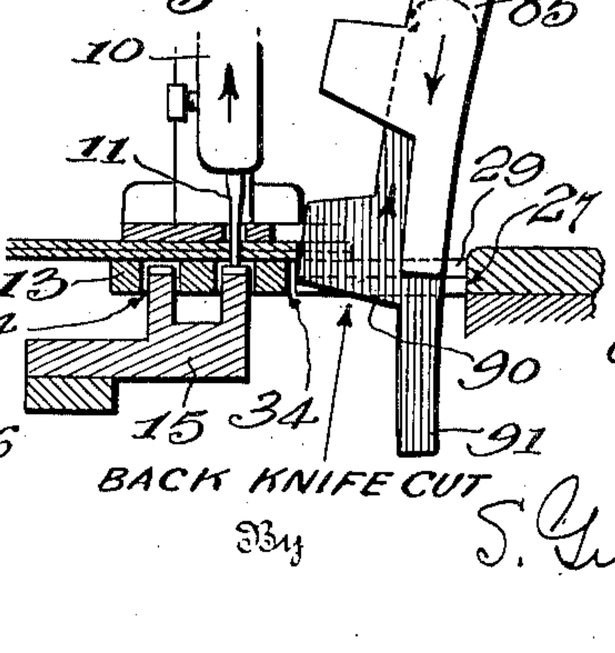


Fig. 21.

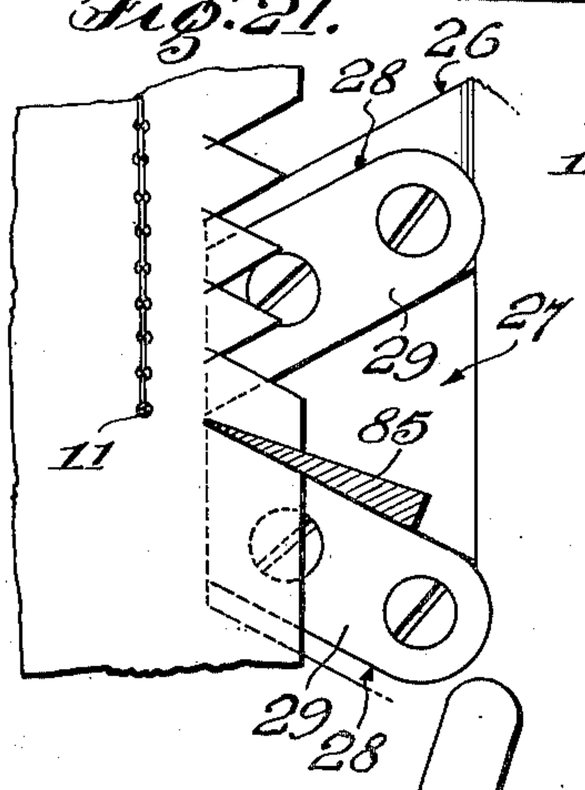
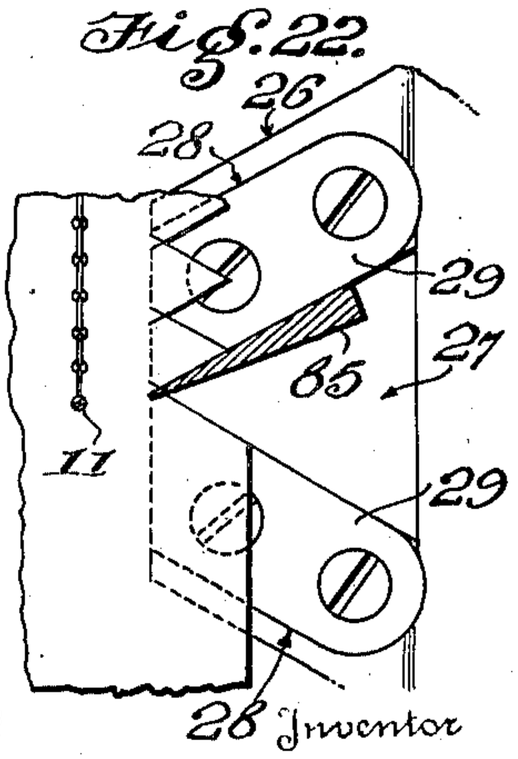


Fig. 22.



Inventor

Joseph Mann

By S. George Tate

Attorney

Patented June 5, 1934 1,962,022

UNITED STATES PATENT OFFICE

1,962,022

COMBINED SEAMING AND PINKING MACHINE

Joseph Mann, Philadelphia, Pa., assignor, by mesne assignments, to Lewis Invisible Stitch Machine Co., St. Louis, Mo.

Application April 10, 1933, Serial No. 665,435

41 Claims. (Cl. 112—122)

This invention relates to new and useful improvements in sewing machines especially adapted for simultaneously performing seaming and pinking operations. I am aware that machines of this nature have been produced heretofore but all such machines with which I am acquainted employ pinking knives or blades of the V-shaped type which effect a complete cutting of a pink or notch each time the knife or blade is brought into engagement with the work. The efficiency of pinking devices of this character is materially impaired because of the shape of the cutting knife or blade and the resulting difficulty in maintaining the cutting edges thereof duly sharp. It is true also that when this type of blade becomes even partially dulled it is impossible to make a clean cut at the angles defining the depth of the notches or pinks.

It is therefore an object of my invention to provide a combined seaming and pinking machine in which is provided novel means for forming individual successive cuts bearing angular relation so as to form the zig-zag cut or pinked formation and including simple relatively inexpensive and easily sharpened flat-type cutter elements.

Another object of the invention is to provide a combined seaming and pinking machine employing individual cutter elements of the flat type in which the parts are so constructed and cooperatively arranged that the individual cuts which form the notches or pinks are caused to intersect in the angles defining the depth of the notches or pinks and thus assure clean cutting at all times.

Another object of the invention is to provide a novel pinking or trimming attachment mountable and removable as a unit on and from a sewing machine and which is bodily shiftable for varying the distance between the sewing line and the pinked edge, the depth of the pinks or notches, or both said distance and said depth.

Another object of the invention is to provide a combined seaming and pinking machine embodying individual successively active cutting elements and ledger blade equipment cooperating therewith, and means for yieldably holding said elements in engagement with the associated ledger blade equipment during the cutting action to assure an efficient shearing relation.

Another object of the invention is to provide a combined seaming and pinking machine embodying a reciprccatory needle, coacting reciprocating cutting elements, and means for driving the needle and cutting elements in timed relation including clutch devices for silencing the cutting elements and locking said elements in a predetermined position in which they are silenced and adapted when shifted to reestablish the pinking operation to assure reestablishment of the timed relation between the needle and cutter element reciprocations.

With these and other objects in view which will more fully appear, the nature of the invention will be more clearly understood by following the description, the appended claims, and the several views illustrated in the accompanying drawings.

In the drawings:—

Figure 1 is a front elevation of a machine embodying the invention,

Figure 2 is a rear elevation,

Figure 3 is a plan view, the overhanging arm being broken away,

Figure 4 is an inverted plan,

Figure 5 is a left hand end view of the pinking attachment, portions of the sewing machine being shown in dotted line phantom,

Figure 6 is a detail perspective view illustrating one cutter element, its mounting and its driving connection,

Figure 7 is a detail perspective view of a cutter element,

Figure 8 is a detail perspective view of a portion of the pinking attachment base and illustrates the ledger blade equipment,

Figure 9 is an inverted perspective view of the base portion shown in Figure 8,

Figure 10 is a vertical cross section taken on the line 10—10 on Figure 3,

Figure 11 is a detail horizontal section taken on the line 11—11 on Figure 2,

Figure 12 is a detail perspective view illustrating the guard and guide unit,

Figure 13 is a detail perspective view of a portion of the sewing machine work support and the throat plate mounted thereon,

Figure 14 is a plan view of one cutter element and the pivotal mounting therefor, said mounting being shown in section,

Figures 15, 16, 17, 18, 19 and 20 are diagrammatic sectional views illustrating six events of the cycle of operation effective in forming one complete pink or notch; namely, a feed step, first needle penetration, front blade cut, second feed step, second needle penetration, and back blade cut,

Figure 21 is a diagrammatic plan view illustrating the position of parts shown in Figure 17,

Figure 22 is a diagrammatic plan view illus-

trating the position of parts shown in Figure 20,

Figure 23 is a diagrammatic plan view illustrating a completed pinked and seamed work portion, and

Figure 24 is a cross section of the work portion shown in Figure 23.

Figure 25 is a view diagrammatically illustrating the timed relation of the needle penetrations, the feed steps and the individual pink forming cuts.

Like numerals of reference designate corresponding parts throughout the several figures of the drawings.

In the drawings, 5 designates the frame base or work support of a sewing machine embodying my invention and which includes the usual frame standard 6 supporting an overhanging arm 7 and the sewing head 8 mounted on the free end of said arm.

A main or needle shaft 9 is rotatably mounted in the overhanging arm, and the needle bar 10 vertically reciprocable in the sewing head and carrying the needle 11, is given a complete reciprocation for each rotation of the shaft 9 by the driving connections generally designated 12.

A throat plate 13 is mounted on the work support base 5 and is slotted as at 14 to accommodate the intermittent 4-motion feed dog 15 to which feed movement is imparted by devices generally designated 16, and to which lift movement is imparted by devices generally designated 17, said devices 16 and 17 having the usual connection with the rotary shaft 9 as indicated in dotted lines in Figures 1 and 3 of the drawings. See also Figure 4. A presser foot 18 cooperates with the feed dog 15 in the usual manner, and beneath the throat plate 13 is mounted a looper or other complemental stitch forming means 19 driven by connections 20 from the rotary shaft 9.

All of the parts above described will be recognized as conventional, except insofar as they combine with the pinking mechanism to be described hereinafter, and the details of construction of these parts form no part of my present invention.

In the practical development of my invention, I provide a base plate 21 which is longitudinally slotted as at 22 to receive the clamp screws 23 by which it may be removably secured upon the work support base 5 as illustrated in Figures 1, 3 and 10 of the drawings. A longitudinal keyway 24 is formed in the under face of the base plate 21 to receive the guide key 25 secured to and projecting upwardly from the work support base 5. See Figures 3, 5 and 10.

The base plate 21 includes an extended nose portion 26 having a cut-out as indicated at 27 to provide operating clearance for the pinking cutters to be described in detail hereinafter, and the fingers defining this cut-out are recessed as at 28 to removably receive ledger blades 29 disposed in angular relation as illustrated in Figures 3, 8 and 9.

The fingers forming the end of the base plate nose 26 and defining the nose cut-out 27 also form abutment shoulders 30 which cooperate with the abutment boss 31 depending from said nose portion 26 to limit shifting movement of said base plate in a manner soon to be described. See Figures 8, 9 and 15.

The boss 31 depending from the base plate nose portion is slidable in a recess 32 formed in the upper surface of the work supporting base 5 and the throat plate 13 is cut out as at 33 to receive the abutment shoulder portions 30 of the nose portion and to provide a suitable abutment or movement limiting face 34 to be engaged by said abutment shoulders. The right hand end of the recess 32 serves a like purpose in engaging the adjacent portion of the boss 31 and by this equipment the degree of movement of which the base plate 21 is capable, toward and away from the sewing line, is suitably limited. The limiting stop shoulder formed by said recessed portion is indicated at 35. See Figure 13.

My improved pinking mechanism is in the nature of a unit attachment, its component parts being mounted wholly upon and bodily movable with the base plate 21. By shifting the base plate along its guided mountings and between the stop limits hereinbefore described, it is possible to vary the distance of the line of pinking from the sewing line, to vary the depth of the pinks or notches, or to vary both said distance and said pink or notch depth. For this purpose, I have provided means for effecting the shifting of said base plate 21. This means comprises an angled shifter lever 36 which is pivoted at 37 to the work supporting base 5 and link-connected as at 38 to the base plate 21. See Figures 1 and 3.

A forked bearing standard 39 is secured as at 40 upon the base plate 21 and in its forked arms are provided bearings 41 for rotatably receiving a horizontally disposed jack shaft 42. A large gear 43 is mounted on the jack shaft 42 and, with the small gear 44 mounted on the driver shaft 45, forms a part of a 1-to-2 ratio gear couple for imparting to the jack shaft 42 one rotation for each two rotations of the main or needle shaft 9.

It will be observed by reference to Figures 2 and 3, that the driver shaft 45 parallels the main or needle shaft 9 and has rotative bearing at one end in a bearing 46 secured as at 47 to the forked standard 39 and its other end in a bearing 48 supported on a standard 49 secured as at 50 upon the base 21. Rotation is imparted to the driver shaft 45 through the medium of a toothed pulley 51 mounted on the end thereof and driven by a belt 52 from a like size pulley 53 secured upon the main or needle shaft 9. The belt 52 is of course sufficiently flexible to permit the slight shifting movements of the base plate 21 without in any way effecting driving of the cutting devices from the main or needle shaft 9.

In order to permit silencing of the pinking mechanism at will, without disconnecting the belt and pulley of the power transmission, I provide a suitable clutch equipment which is so constructed that when it is shifted to effect silencing of the pinking mechanism operation it serves to lock the pinking cutters in a predetermined inoperative position, and, upon reclutching, to assure a reestablishing of the desired timed relation between the needle reciprocations and the reciprocations of the cutting elements.

The clutching devices above referred to include a driver hub 54 secured as at 55 upon the driver shaft 45 and including a driving flange 56. The flange 56 is apertured as at 57 to slidably receive driving pins 58 which project from a shifter sleeve 59 slidably mounted on the hub 54. It will be understood that the pulley 51 is loosely mounted on the end of the driver shaft 45 and imparts its rotation to the flange 56, hub 54 and shaft 45 only when the driver pins 58 are received in the sockets 60 as illus-

trated in Figures 2 and 11 of the drawings. When the sleeve 59 is shifted to withdraw the driver pins 58 from the pulley sockets 60 the pulley 51 may rotate freely about the driver shaft 45 without imparting rotation thereto.

It will be observed by reference to Figures 2 and 11 of the drawings that the sleeve 59 also carries a lock pin 61 which enters a socket 62 in a stationary or stop collar 63 supported upon the standard 49 each time the clutch sleeve 59 is shifted to the pinker unit silencing position thereby serving to lock the shaft 45, and consequently the pinking cutters, stationary. The single lock pin receiving socket 62 is so positioned with relation to the pinker unit cutting elements and the driving means therefor that said cutting elements will, upon silencing of the pinking mechanism, always be locked stationary in the elevated horizontally alined position. The driver pins 58 are not diametrically oppositely disposed, one thereof being slightly below an imaginary line intersecting the axis of the shaft 45 and the axis of the companion pin. For this reason it is necessary, after releasing the pins 58 from driving relation with the pulley sockets 60, to make a complete revolution of the pulley 51 before the pins and sockets will again register. Thus reestablishment of the timed relation between the needle reciprocations and the cutter element reciprocations is assured each time the clutch is shifted to throw the pinking unit into operation.

To provide for proper shifting of the clutch sleeve 59 the sleeve is grooved as at 64 to receive a forked shifter 65 carried by a shifter rod 66 slidable in a bearing 67 provided in the standard 49, said rod being link-connected as at 68 to a shifter lever 69 pivoted as at 70 on the work support base 5 and through the medium of which shifting of the clutch sleeve 59 may easily be effected.

My improved cutting devices which are supported upon the base plate 21 and driven by connections described above include a pair of eccentrics 71 secured in spaced relation on the jack shaft 42. It being desired that the cutting elements should reciprocate alternately, the eccentrics 71 are arranged 180 degrees apart in the direction of their rotation and thus as the cutting element driven by one eccentric is advanced toward the work the companion cutting element will be moved away from the work.

The pinking or cutting members each comprises a carrier arm 72 secured as at 73 on a pivot stud 74 having pivot bearing in a sleeve bearing 75 removably secured as at 76 upon the base plate 21.

Each carrier arm pivot stud 74 has a reduced end 77 slidable through a plug screw 78 secured in the end of the respective sleeve bearing 75, which reduced end forms a shoulder 79. A coil spring 80 is interposed between each shoulder 79 and its associated plug screw 78 and tends to force the stud in a direction of its axis in a manner causing the cutting element carried by the respective arm 72 to be yieldably held against the ledger blade with which it is associated, assuring perfect shearing relation. See Figures 3 and 14.

Each of the carrier arms 72 has an ear portion 81 which is connected by pitman 82 and strap 83 to one of the eccentrics 71, and by this means the rotation imparted to the jack shaft 42 is transmitted in the form of oscillatory movement to the pivotally mounted carrier arms 72. See Figures 1, 3, 5, 6 and 14.

At its free end each of the pivoted carrier arms 72 is recessed as at 84 to receive a cutter element 85 and is slotted as at 86 to receive a screw 87, said screw being adapted to pass through the slot and enter a tap 88 formed in the particular cutter element 85 to receive it. By this means the cutting elements 85 are secured to the ends of the carrier arms 72 in a manner permitting a degree of up and down adjustment of said elements relative to said carrier arms.

As will be apparent by reference to Figures 6 and 7 of the drawings, each of the cutter elements 85 includes a flat wall 89 having a portion thereof terminating in an angled and beveled cutting edge 90 and another portion thereof extended downwardly as indicated at 91 to form a guide finger which engages an associated ledger blade while the wall portion proper 89 is lifted out of engagement therewith. As hereinbefore described the flat continuous wall portions 89, 91 are yieldably held in engagement with the cooperating surface of the respective ledger blade 29 by the associated spring equipment 80 to assure efficient shearing relation of the ledger blade and the cutting edge 90 during pinking.

In order to facilitate feeding of the work to the combined seaming and pinking means and to protect the hands of workers from contact with the reciprocating needle and cutters, I provide a combined guard and guide unit disclosed in detail in Figures 3 and 12 of the drawings. This unit includes a base plate 92 which is secured to the work supporting base 5 by a single screw means as indicated at 93, the base plate 92 being provided with a curved positioning shoulder 94 which engages the adjacent upstanding shoulder presented by the throat plate 13 thus rendering additional securing means unnecessary. See Figures 3, 12 and 13. The unit also includes a rigidly mounted upstanding guard plate 95 and a guide member 96 supported upon an arm 97 pivotally mounted on the base plate 92 and to which said guide member is adjustably secured as indicated at 98. By use of the member 96, it is possible to guide the work to the seaming and pinking mechanisms, and the flange 95 serves efficiently to guard against contact with the reciprocating cutting elements.

In the foregoing description I have disclosed a simple and efficient combined seaming and pinking machine in which the pinking mechanism is constructed in the form of a unit shiftable bodily to vary the distance of the pinked edge from the sewing line or to vary the depth of the pinks and which includes simple individual alternately reciprocated pinking or cutting elements of the flat type easily sharpened, and clutch equipment by which the pinking mechanism may be silenced at the will of the operator and in a manner for locking the cutters in the inoperative position and for assuring reestablishment of the desired timed relation of needle and cutter element reciprocations when the clutch is again shifted to the operative position. The cutting elements bear such relation and the parts are so operated that the cutter elements form successive cuts bearing angular relation and cooperating to form the pinks, provision also being made for causing the successive cuts to intersect slightly and

thereby assure clean cutting of the fabric in the angles defining the depth of the pinks.

The parts of my improved mechanisms are so constructed and cooperatively arranged that when the needle is at its elevated position, the cutting elements likewise will be raised out of cutting position and horizontally alined, or in other words positioned with their cutting edges at the same elevation above the ledger blades. As has been described hereinbefore, the clutch equipment may be shifted to effect a silencing of the pinking mechanism only when the parts are in the position just mentioned.

I will now describe briefly the operation of my combined seaming and pinking machine presuming the parts to be in the position described in the preceding paragraph. In this description I make reference to "front" and "back" cutting elements. By "front" element I consider the cutting element first encountered by work being advanced in the direction of the arrow A in Figure 3. The front cutting element therefore is the cutting element lowermost in Figure 3 of the drawings and the back cutting element is the cutting element nearest the top of Figure 3. With the parts in the position stated, and the needle shaft moving in the direction indicated by the arrows on Figure 3, the first quarter turn of the needle shaft brings about a penetration of the needle into the now stationary fabric, the needle penetration having been preceded by a feed step of said fabric. See Figures 15 and 16. Just before the needle shaft completes a half turn the downwardly moving front knife starts to make its cut in the edge of the fabric, as indicated in Figure 17. At this time the back knife is moving upwardly. During the next half turn the needle returns to its elevated position and the cutter elements reverse their direction of travel and return to their position of alinement above referred to. It will be remembered that the jack shaft 42 makes one revolution for each two revolutions of the main or needle shaft 9.

With the needle and cutting elements elevated, the fabric is given another step feed as indicated in Figure 18 and during the second revolution of the main or needle shaft 9, the above sequence of operation is repeated except for reversal of direction of travel of the cutting elements. During the first quarter of rotation of the main or needle shaft 9, the needle again penetrates the work as indicated in Figure 19 at which time the back knife is descending and the front knife moving upwardly. At about the half revolution of the main or needle shaft 9, the back cutting element makes its cut as indicated in Figure 20 and during the completion of this second revolution the needle is again elevated and the direction of travel of the cutting elements reversed to return them to the alined position first mentioned and thus completing one cycle of operation resulting in the formation of one pink or edge notch in the fabric.

In Figure 21 of the drawings, I have illustrated in plan view the position of the parts shown in Figure 17, and in Figure 22 of the drawings I have shown in plan view the position of the parts illustrated in Figure 20.

From the foregoing, it will be apparent that the cycle of operations forming a single pink or edge notch in the fabric may be summarized as including six events, namely, (1) fabric feed step, (2) needle penetration, (3) front element cut, (4) fabric feed step, (5) needle penetration, and (6) back element cut.

From the foregoing and by reference to Figures 21 and 22 of the drawings, it will be observed that in the formation of the pinks the first cut in the edge of the fabric is made by the front knife and the angle of the cut formed by this knife relative to the line of stitching formed by the seaming mechanism may be said to be a receding angle in that it recedes toward the edge of the fabric in a direction diagonally opposite the feeding direction of the fabric. The companion of the cooperating cut later formed by the back blade or cutter element may be said to be disposed at a progressive angle, that is, diagonally in the direction of progression or feeding movement of the fabric. By thus forming the cuts tendency of the slitted edge portions of the fabric to roll under because of frictional engagement with the supporting parts is avoided. It will be apparent that should a cut of progressive angle such as that shown in the process of making in Figure 22 be made prior to the cut shown as being made in Figure 21, the resultant forwardly directed point of edge material, frictionally engaging the supporting devices therebeneath, would tend to roll under and disturb the making of the companion cut necessary to complete a given pink. With the corner of the slitted portion directed diagonally rearwardly or opposite the direction of feed this tendency of the resultant edge points to curl under is avoided.

This sequence of operation is illustrated in comparative diagram in Figure 25 of the drawings. In this figure the line NS indicates two revolutions of the main or needle shaft 9 during which two needle penetrations occur as indicated at NP. Beneath the line NS is a line indicating the work feeding action and it will be seen that a feed step is imparted to the work during each revolution of the shaft 9, each said step occurring intermediate each two needle penetrations as indicated at FS. Beneath the lines just mentioned, and which indicate two revolutions of the main or needle shaft 9, is a line JS representing a single revolution of the jack shaft 42 which occurs during the two revolutions of the shaft 9. Traversing the line JS, I have diagrammatically indicated the front and back knives and the approximate intervals at which they individually make their cuts.

This particular application has been directed to a combined seaming and pinking machine. Obviously, however, the mechanism which I have devised is adaptable to broader uses and may be employed for notching fabrics or the like independent of any seaming operation. Claims directed to the pinking or notching mechanism independent of combination with seaming means are embodied in my co-pending application for patent filed April 10, 1933, and identified by Serial No. 665,436.

It is of course to be understood that the details of structure and arrangement of parts may be variously changed and modified without departing from the spirit and scope of my invention.

I claim:—

1. A combined seaming and pinking machine including a reciprocable needle, pink cutting means disposed in cooperative relation to said needle, and means to move said cutting means to form individual straight-line cuts bearing angular relation whereby two such individually formed cuts cooperate to form a single pink.

2. A combined seaming and pinking machine including a reciprocable needle, pink cutting means disposed in cooperative relation to said needle, and means to move said cutting means to form individual straight-line cuts bearing angular relation and cooperating to form said pinks, said cuts intersecting in the angles defining the depth of said pinks.

3. A combined seaming and pinking machine including a reciprocable needle, pink cutting means disposed in cooperative relation to said needle and operable to form individual straight-line cuts in the edge of the work bearing angular relation, and work feeding means serving to feed the work between the individual cuts whereby to cause each individual cut to intersect its companion at an angle defining the depth of said pinks.

4. A combined seaming and pinking machine including a reciprocable needle, ledger blade equipment, pink cutting means disposed in cooperative relation to said needle, means to move said cutting means into and out of engagement with said ledger blade equipment to form individual straight-line cuts bearing angular relation whereby two such individually formed cuts cooperate to form a single pink, and means to yieldably hold said cutting means against said ledger blade equipment during the making of said successive cuts.

5. A combined seaming and pinking machine including a reciprocable needle, ledger blade equipment, pink cutting means disposed in cooperative relation to said needle, means to move said cutting means into and out of engagement with said ledger blade equipment to form individual straight-line cuts bearing angular relation and cooperating to form said pinks, said cuts intersecting in the angles defining the depth of said pinks, and means to yieldably hold said cutting means against said ledger blade equipment during the making of said successive intersecting cuts.

6. A combined seaming and pinking machine including a reciprocable needle, ledger blade equipment, pink cutting means disposed in cooperative relation to said needle and engageable with said ledger blade equipment to form individual straight-line cuts in the edge of the work bearing angular relation, work feeding means serving to feed the work between the individual cuts whereby to cause each individual cut to intersect its companion cut at the angle defining the depth of said pinks, and means to yieldably hold said cutting means against said ledger blade equipment during the making of said successive cuts.

7. A combined seaming and pinking machine including a reciprocable needle, individual reciprocable pink cutters disposed in cooperative relation to said needle, and means to reciprocate the cutters to form successive cuts bearing angular relation and cooperating to form said pinks.

8. A combined seaming and pinking machine including a reciprocable needle, individual reciprocal pink cutters disposed in cooperative relation to said needle, and means to reciprocate the cutters to form successive intersecting cuts bearing angular relation and cooperating to form said pinks.

9. A combined seaming and pinking machine including a reciprocable needle, work feeding means, individual pink cutters disposed in cooperative relation to said needle and reciprocable to form successive cuts in the edge of the work bearing angular relation, said work feeding means serving to feed the work in timed relation to said cutter reciprocations whereby to cause said successive cuts to intersect at the angle defining the depth of said pinks.

10. A combined seaming and pinking machine including a reciprocable needle, ledger blade equipment, individual reciprocable pink cutters disposed in cooperative relation to said needle, means to reciprocate said cutters into and out of engagement with said ledger blade equipment to form successive cuts bearing angular relation and cooperating to form said pinks, and means to yieldably hold said cutters against said ledger blade equipment during the making of said successive cuts.

11. A combined seaming and pinking machine including a reciprocable needle, ledger blade equipment, individual reciprocable pink cutters disposed in cooperative relation to said needle, means to reciprocate said cutters into and out of engagement with said ledger blade equipment to form successive intersecting cuts bearing angular relation and cooperating to form said pinks, and means to yieldably hold said cutters against said ledger blade equipment during the making of said successive intersecting cuts.

12. A combined seaming and pinking machine including a reciprocable needle, work feeding means, ledger blade equipment, individual reciprocable pink cutters disposed in cooperative relation to said needle, means to reciprocate said cutters into and out of engagement with said ledger blade equipment to form successive cuts in the edge of the work bearing angular relation, said work feeding means serving to feed the work in time relation to said cutter reciprocations whereby to cause said successive cuts to intersect at the angle defining the depth of said pinks, and means to yieldably hold said cutters against said ledger blade equipment during the making of said successive cuts.

13. In a combined seaming and pinking machine wherein is provided a reciprocable needle and a work support base, a pinker unit mounted on said base and including pinking means, means for operating the pinking means in time relation to the needle reciprocations, and means to bodily shift the position of the pinker unit to vary the distance between the needle and the pinking means, said pinker unit and said base having cooperating key and keyway equipment for guiding said distance varying movement.

14. In a combined seaming and pinking machine wherein is provided a reciprocable needle and a work support base, a pinker unit mounted on said base and including pinking means, means for operating the pinking means in timed relation to the needle reciprocations, and lever and link connections between said unit and said work support to bodily shift the position of said unit for varying the distance between the needle and the pinking means.

15. In a combined seaming and pinking machine wherein is provided a reciprocable needle and a work support base, a pinker unit mounted on said base and including pinking means, means for operating the pinking means in timed relation to the needle reciprocations, and lever and link connections between said unit and said work support to bodily shift the position of said unit for varying the distance between the needle and the pinking means, said pinker unit and said base having cooperating key and keyway

equipment for guiding said distance varying movement.

16. In a combined seaming and pinking machine, the combination of a reciprocable needle, reciprocable pink cutting means, means for driving the cutting means in timed relation to the needle reciprocations, and clutch means enabling silencing of the cutting means and including devices interengageable upon silencing of the cutting means to secure a predetermined stationary positioning of said cutting means.

17. In a combined seaming and pinking machine, the combination of a reciprocable needle, reciprocable pink cutting means, means for driving the cutting means in time relation to the needle reciprocations, and clutch means enabling silencing of the cutting means and including devices interengageable upon silencing of the cutting means to secure a predetermined stationary positioning of said cutting means and other devices bearing fixed relation to said first mentioned devices and active upon restoration of the clutched condition to assure reestablishment of the timed relation of needle and cutting means discontinued by said silencing.

18. In a combined seaming and pinking machine, the combination of a reciprocable needle, means including a needle shaft for reciprocating said needle, a base plate, a jack shaft rotatably mounted on the base plate, means for driving the jack shaft in timed relation to the needle shaft, individual pinker knives reciprocably mounted on the base plate, and means including the jack shaft for alternately reciprocating the knives to cause them to coact in forming pinks.

19. In a combined seaming and pinking machine, the combination of a reciprocable needle, means including a needle shaft for reciprocating said needle, a base plate, a jack shaft rotatably mounted on the base plate, means for driving the jack shaft in timed relation to the needle shaft, individual pinker knives reciprocably mounted on the base plate, and means including eccentric and pitman and strap connections between the jack shaft and said knives for alternately reciprocating the knives to cause them to coact in forming pinks.

20. In a combined seaming and pinking machine, a reciprocable needle, reciprocable pink cutting means, driving means to reciprocate the needle and the cutting means in timed relation, and clutch devices for silencing said cutting means disengageable from driving connection with said driving means only when said cutting means is elevated out of active cutting position.

21. In a combined seaming and pinking machine, a reciprocable needle, reciprocable pink cutting means, driving means to reciprocate the needle and the cutting means in timed relation, and clutch devices for silencing said cutting means disengageable from driving connection with said driving means only when said cutting means is elevated out of active cutting position and including means to lock said cutting means in silenced position.

22. A combined seaming and pinking machine including a reciprocable needle, means including a main rotary shaft to reciprocate the needle, a jack shaft, means for imparting rotation from the main shaft to the jack shaft, individual reciprocable pink cutters, and means actuated by the jack shaft for reciprocating the cutters to form successive cuts bearing angular relation and cooperating to form said pinks.

23. A combined seaming and pinking machine including a reciprocable needle, means including a main rotary shaft to reciprocate the needle, a jack shaft, means for imparting rotation from the main shaft to the jack shaft, individual reciprocable pink cutters, and means actuated by the jack shaft for reciprocating the cutters to form successive intersecting cuts bearing angular relation and cooperating to form said pinks.

24. A combined seaming and pinking machine including a reciprocable needle, work feeding means, means including a main rotary shaft to reciprocate the needle, a jack shaft, means for imparting rotation from the main shaft to the jack shaft, individual reciprocable pink cutters, and means actuated by the jack shaft for reciprocating the cutters to form successive cuts bearing angular relation, said work feeding means serving to feed the work in timed relation to said cutter reciprocations whereby to cause said successive cuts to intersect at the angle defining the depth of said pinks.

25. A combined seaming and pinking machine including a reciprocable needle, means including a main rotary shaft to reciprocate the needle, a jack shaft, means for imparting rotation from the main shaft to the jack shaft, individual reciprocable pink cutters, and means actuated by the jack shaft for reciprocating the cutters to form successive cuts bearing angular relation and cooperating to form said pinks and comprising cutter driving eccentrics on the jack shaft one for each cutter, and a pitman and strap connecting each cutter with an associated eccentric.

26. A combined seaming and pinking machine including a reciprocable needle, means including a main rotary shaft to reciprocate the needle, a jack shaft, means for imparting to the jack shaft one rotation for each two rotations of the main shaft, individual reciprocable pink cutters movable alternately to form successive cuts bearing angular relation and cooperating to form said pinks, cutter driving eccentrics on said jack shaft one for each cutter, and a pitman and strap connecting each cutter with an associated eccentric.

27. A combined seaming and pinking machine including a reciprocable needle, means including a main rotary shaft to reciprocate the needle, a jack shaft, means for imparting to the jack shaft one rotation for each two rotations of the main shaft, individual reciprocable pink cutters movable alternately to form successive cuts bearing angular relation and cooperating to form said pinks, cutter driving eccentrics on said jack shaft one for each cutter, and a pitman and strap connecting each cutter with an associated eccentric, said eccentrics being spaced 180° apart in the direction of rotation of the jack shaft and bearing such relation to the needle reciprocating devices as to cause the cutters to horizontally aline when the needle is at a high point in its travel.

28. A combined seaming and pinking machine including a reciprocable needle, means including a main rotary shaft to reciprocate the needle, a jack shaft, means for imparting to the jack shaft one rotation for each two rotations of the main shaft, individual reciprocable pink cutters movable alternately to form successive cuts bearing angular relation and cooperating to form said pinks, cutter driving eccentrics on said

jack shaft one for each cutter, and a pitman and strap connecting each cutter with an associated eccentric, said eccentrics being spaced 180° apart in the direction of rotation of the jack shaft and bearing such relation to the needle reciprocating devices as to cause the cutters to horizontally aline when the needle is at a high point in its travel, and clutch devices for silencing said cutters interposed in said means for imparting rotation to the jack shaft and disengageable only when said cutters are in said horizontally alined position.

29. A combined seaming and pinking machine including a reciprocable needle, means including a main rotary shaft to reciprocate the needle, a jack shaft, means for imparting to the jack shaft one rotation for each two rotations of the main shaft, individual reciprocable pink cutters movable alternately to form successive cuts bearing angular relation and cooperating to form said pinks, cutter driving eccentrics on said jack shaft one for each cutter, and a pitman and strap connecting each cutter with an associated eccentric, said eccentrics being spaced 180° apart in the direction of rotation of the jack shaft and bearing such relation to the needle reciprocating devices as to cause the cutters to horizontally aline when the needle is at a high point in its travel, and clutch devices for silencing said cutters interposed in said means for imparting rotation to the jack shaft and disengageable only when said cutters are in said horizontally alined position, said clutch devices including means to lock the cutters in the position at which they are silenced and for assuring reestablishment of the timed relation with the needle reciprocations discontinued by said silencing.

30. A combined seaming and pinking machine including a reciprocable needle, means including a main rotary shaft to reciprocate the needle, a jack shaft, means for imparting to the jack shaft one rotation for each two rotations of the main shaft, ledger blades bearing angular relation, individual reciprocable pink cutters movable alternately into and out of engagement with the ledger blades to form successive cuts bearing angular relation and cooperating to form said pinks, cutter driving eccentrics on said jack shaft one for each cutter, a pitman and strap connecting each cutter with an associated eccentric, and means to yieldably hold each cutter against its associated ledger blade while in cutting engagement therewith.

31. In a combined seaming and pinking or trimming machine, the combination of a reciprocable needle, a work supporting base, a throat plate on said work supporting base, pinking or trimming means operable adjacent the throat plate, means to reciprocate said needle and operate said pinking or trimming means in timed relation, and a guard and guide unit mounted on said base in position for guarding said pinking or trimming means and for guiding work being fed over the throat plate to said needle.

32. In a combined seaming and pinking or trimming machine, the combination of a reciprocable needle, a work supporting base, a throat plate on said work supporting base, pinking or trimming means operable adjacent the throat plate, means to reciprocate said needle and operate said pinking or trimming means in timed relation, and a guard and guide unit comprising a base plate mountable on and removable from said work supporting base, a guard flange upstanding in position to guard operation of said pinking or trimming means, and an upstanding guide flange for guiding work being fed over the throat plate to said needle.

33. In a combined seaming and pinking or trimming machine, the combination of a reciprocable needle, a work supporting base, a throat plate on said work supporting base, pinking or trimming means operable adjacent the throat plate, means to reciprocate said needle and operate said pinking or trimming means in timed relation, and a guard and guide unit comprising a base plate mountable on and removable from said work supporting base, a guard flange upstanding in position to guard operation of said pinking or trimming means, an upstanding guide flange for guiding work being fed over the throat plate to said needle, and a supporting arm carrying said guide flange and swingable to move said guide flange into or out of effective position.

34. In a combined seaming and pinking or trimming machine, the combination of a reciprocable needle, a work supporting base, a throat plate on said work supporting base, pinking or trimming means operable adjacent the throat plate, means to reciprocate said needle and operate said pinking or trimming means in timed relation, and a guard and guide unit comprising a base plate mountable on and removable from said work supporting base, a guard flange upstanding in position to guard operation of said pinking or trimming means, an upstanding guide flange for guiding work being fed over the throat plate to said needle, a supporting arm carrying said guide flange and swingable to move said guide flange into or out of effective position, and means to adjustably support the guide flange on the supporting arm to enable adjustment of the guiding relation between the guide flange and the needle.

35. In a combined seaming and pinking or trimming machine, the combination of a reciprocable needle, a work supporting base, a throat plate on said work supporting base, pinking or trimming means operable adjacent the throat plate, means to reciprocate said needle and operate said pinking or trimming means in timed relation, and a guard and guide unit mounted on said base in position for guarding said pinking or trimming means and for guiding work being fed over the throat plate to said needle, said throat plate having a positioning shoulder portion projecting above the work supporting base, and said guard and guide unit including a base plate having a positioning cut-out engageable with the throat plate positioning shoulder, and means to secure the base plate upon the work supporting base with the positioning shoulder and cut-out in unit positioning relation.

36. In a combined seaming and pinking machine wherein is provided a reciprocable needle, needle reciprocating means including a main or needle shaft, and a work support base; a pinker unit including a base plate slidably guided on and supported by the work support base and pinking means, means for operating the pinking means in timed relation to the needle reciprocations including a jack shaft and a driver shaft rotatably supported on the base plate, means for connecting the driver and jack shafts in driving relation, said driver shaft lying parallel to the needle shaft, pulley and belt equipment connecting the driver shaft and needle shaft in

driving relation, and means to bodily shift the position of the base plate to vary the distance between the needle and the pinking means.

37. A combined seaming and pinking machine including a reciprocable needle, pink cutting means disposed in cooperative relation to said needle and embodying two cutter devices disposed in spaced and angular relation and each limited in operation to a single plane of movement, work feeding means, and means to move said cutting devices to form individual cuts bearing angular relation whereby companion pairs of said cuts form single pinks.

38. A combined seaming and pinking machine including a reciprocable needle, pink cutting means disposed in cooperative relation to said needle and embodying two ledger blades disposed in spaced and angular relation and two cutter blades cooperative with said ledger blades and each limited in operation to a single plane of movement, work feeding means, and means to move said cutter blades to form individual cuts bearing angular relation whereby companion pairs of said cuts form single pinks.

39. A combined seaming and pinking machine, means to form a line of stitches, work feeding means, and work edge pinking means disposed in cooperative relation to said stitch forming means and comprising devices for first forming a cut in the edge of the work at a receding angle relative to the stitch line and for thereafter forming a cut at a progressive angle relative to the stitch line and cooperating with the first made cut to form a single pink in the edge of the work.

40. A combined seaming and pinking machine, means to form a line of stitches, work feeding means, and work edge pinking means disposed in cooperative relation to said stitch forming means and comprising devices for first forming a cut in the edge of the work at a receding angle relative to the stitch line and for thereafter forming a cut at a progressive angle relative to the stitch line and cooperating with the first made cut to form a single pink in the edge of the work, said work feeding means serving to feed the work before and after each cut and remaining ineffective during the making of each cut.

41. A combined seaming and pinking machine, means to form a line of stitches, work feeding means, and work edge pinking means disposed in cooperative relation to said stitch forming means and comprising devices for first forming a cut in the edge of the work at an angle relative to the stitch line and for thereafter forming a cut at an angle relative to the stitch line and to the first made cut to form a single pink in the edge of the work.

JOSEPH MANN.