

No. 634,135.

Patented Oct. 3, 1899.

J. GUTMANN, E. FALLER & K. MISCHKE.

BUTTONHOLE SEWING MACHINE.

(Application filed Oct. 3, 1898.)

(No Model.)

9 Sheets—Sheet 1.

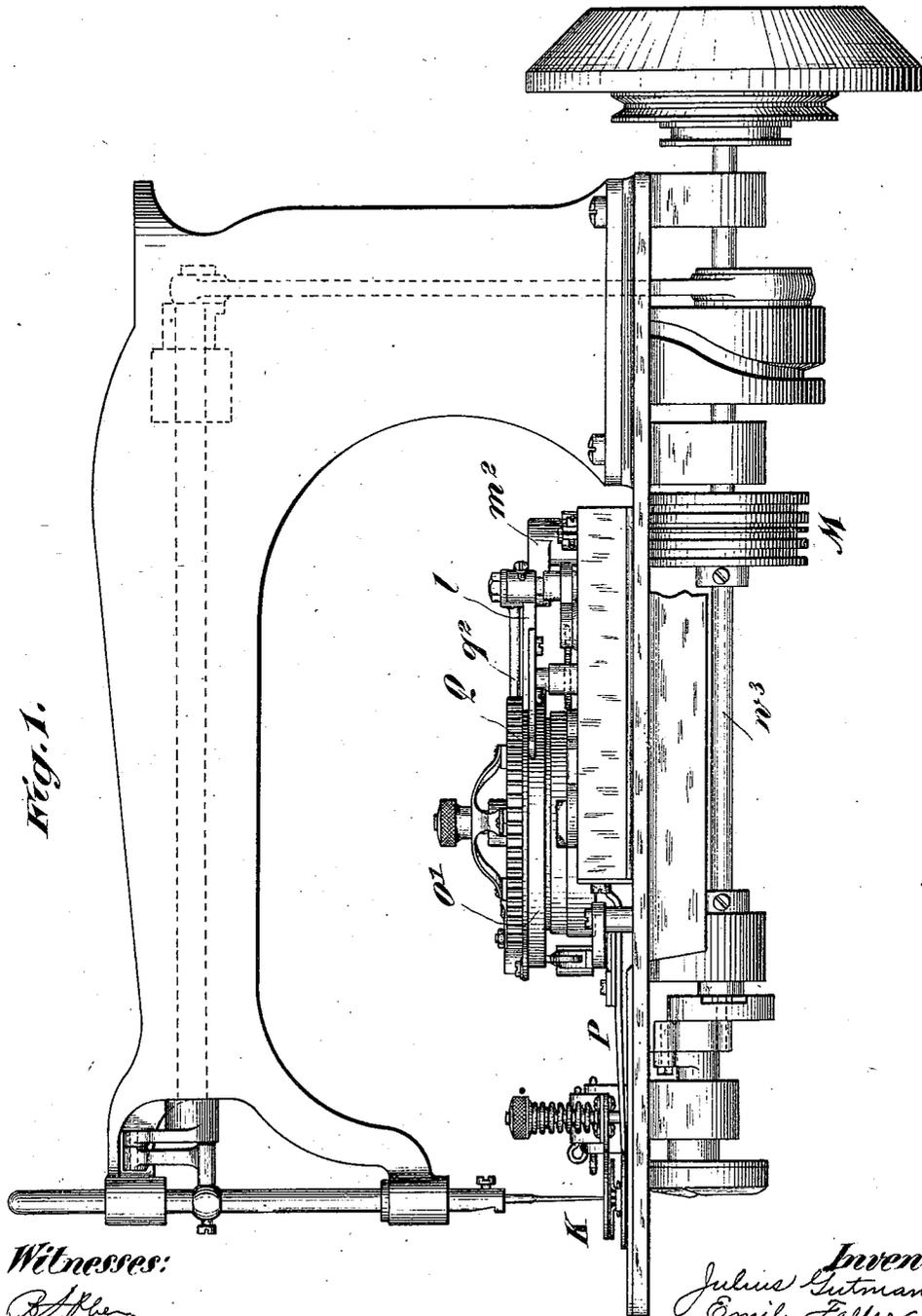


Fig. 1.

Witnesses:

Athen

W. Sommers.

Inventors.
Julius Gutmann.
Emil Faller.
Karl Mischke.
by [Signature]

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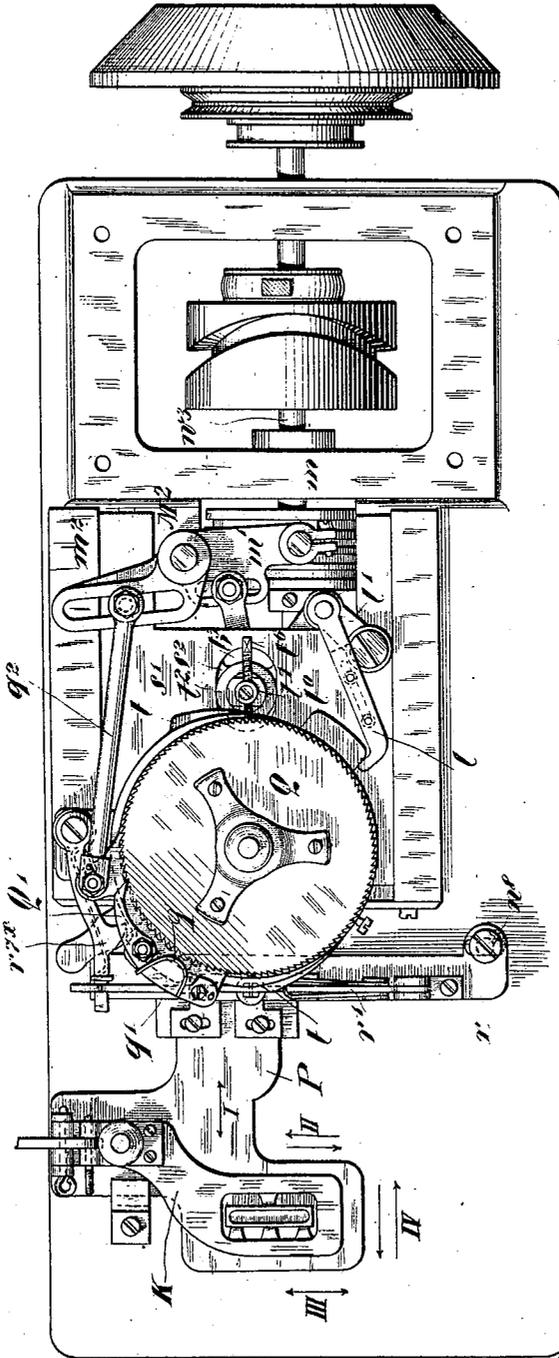


Fig. 2.

Witnesses:

A. Her.

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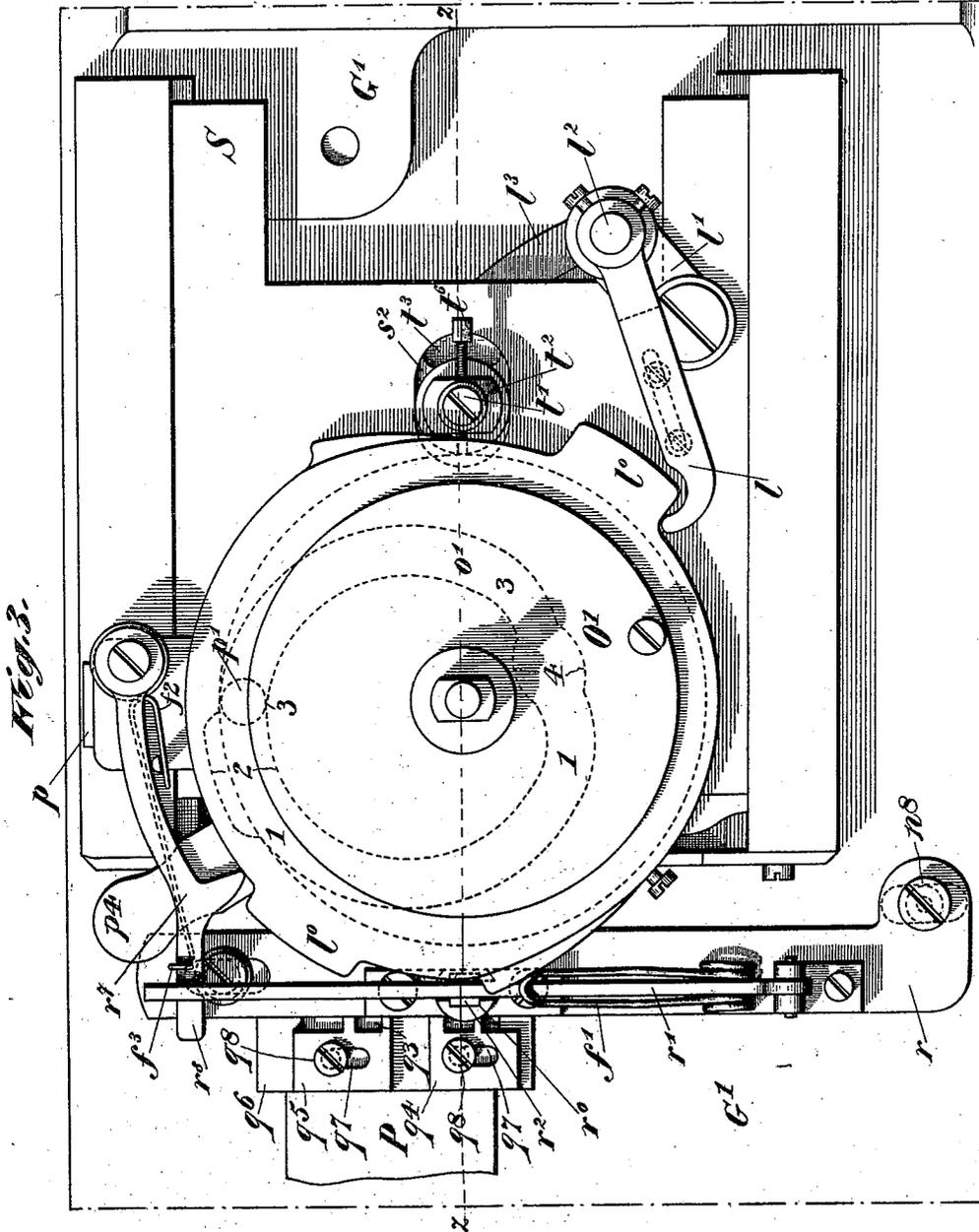


Fig. 3.

Witnesses:
B. Ober
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No. 634,135.

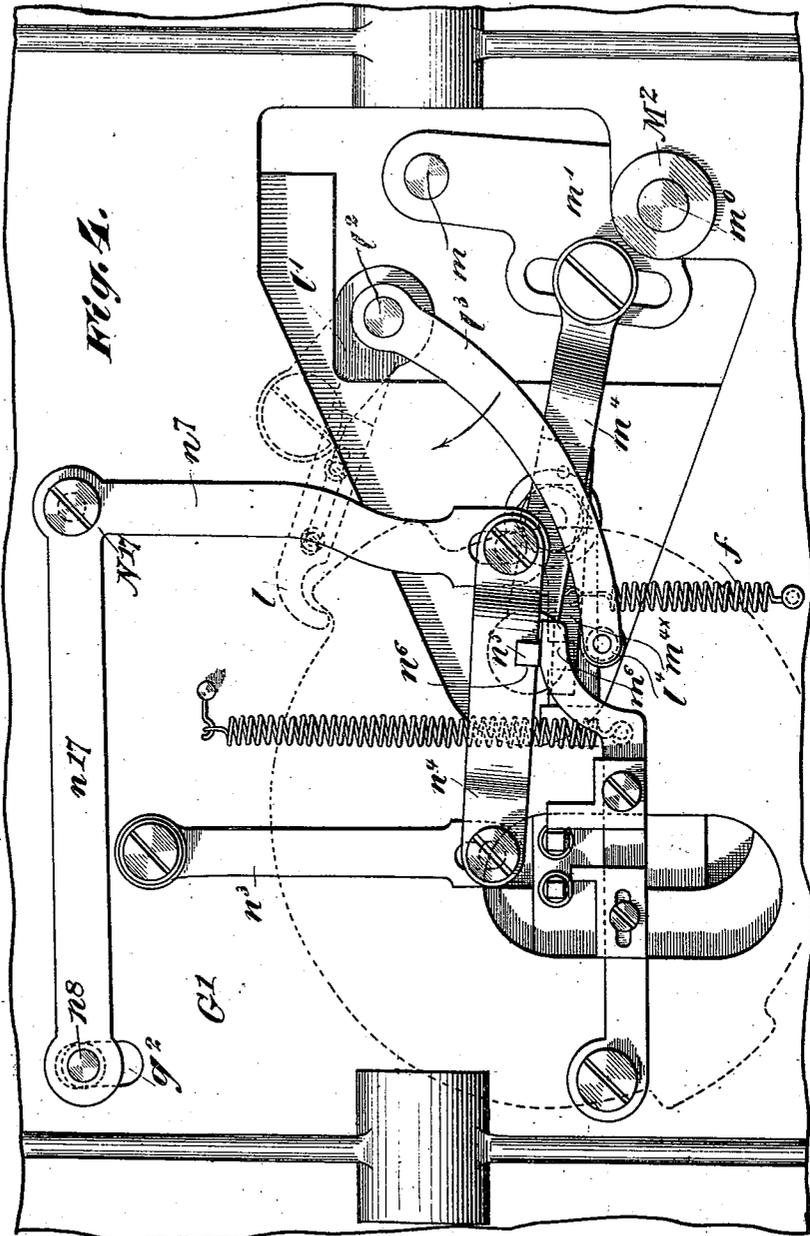
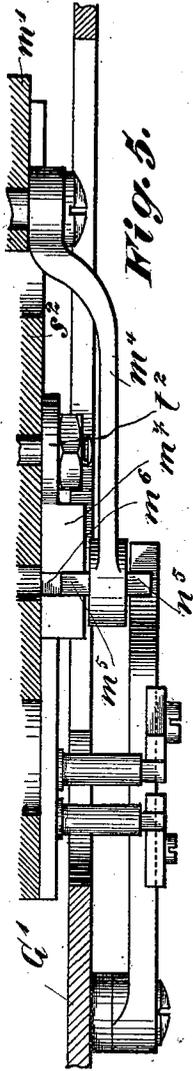
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BUTTONHOLE SEWING MACHINE.

(Application filed Oct. 3, 1898.)

(No Model.)

9 Sheets—Sheet 4.



Witnesses:

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K. Sommere*

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Patented Oct. 3, 1899.

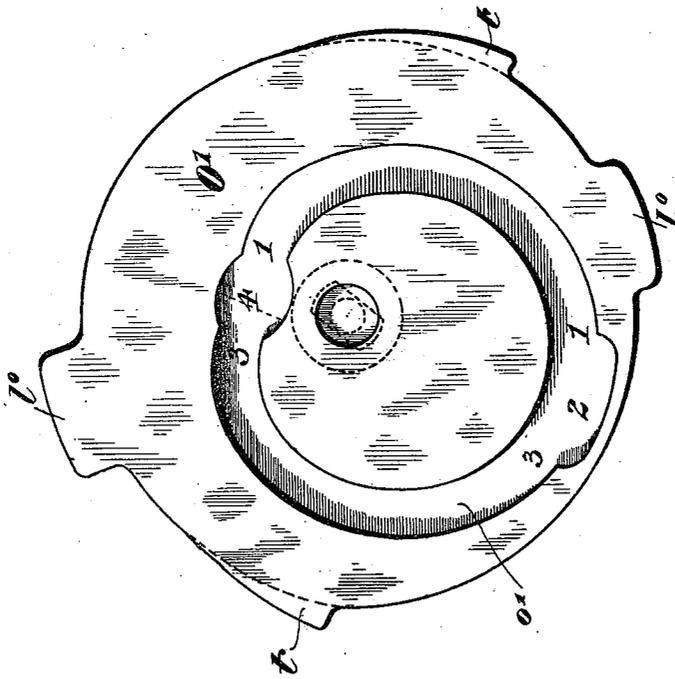
J. GUTMANN, E. FALLER & K. MISCHKE.
BUTTONHOLE SEWING MACHINE.

(Application filed Oct. 3, 1898.)

(No Model.)

9 Sheets—Sheet 5.

Fig. 6.



Witnesses:

A. Ober.
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No. 634,135.

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J. GUTMANN, E. FALLER & K. MISCHKE.
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(Application filed Oct. 3, 1898.)

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Fig. 8.

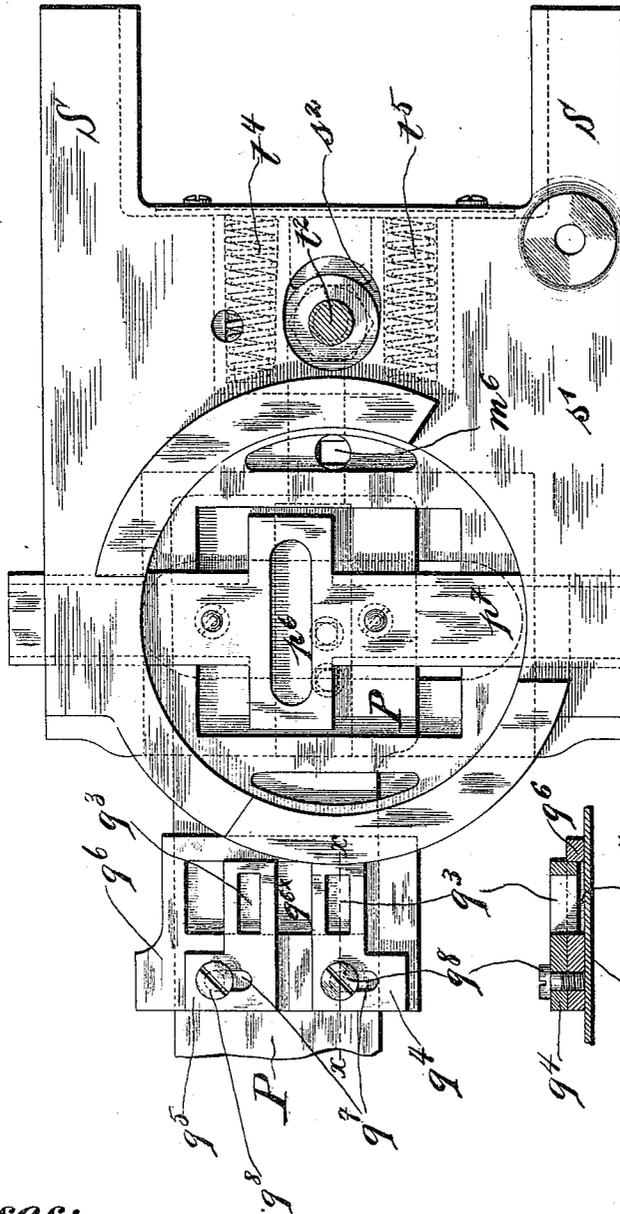


Fig. 8. a

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W. Sommers

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By [Signature]

No. 634,135.

Patented Oct. 3, 1899.

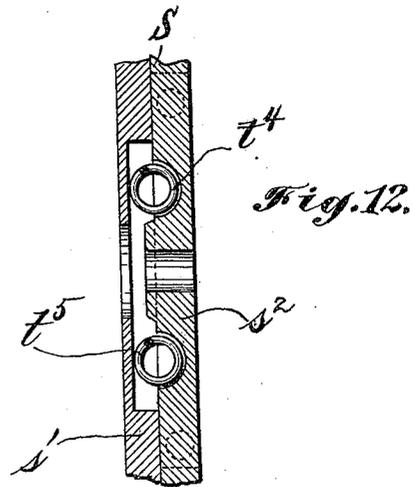
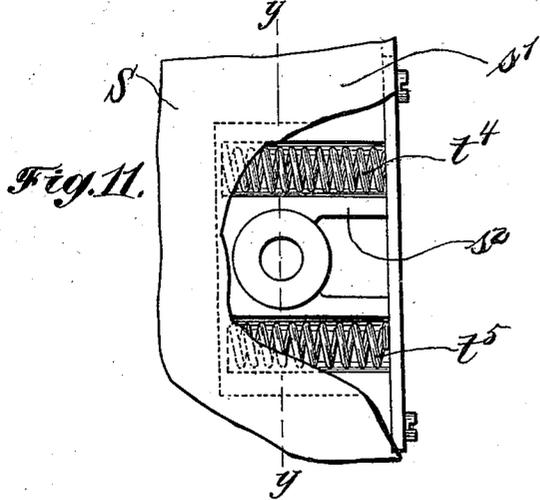
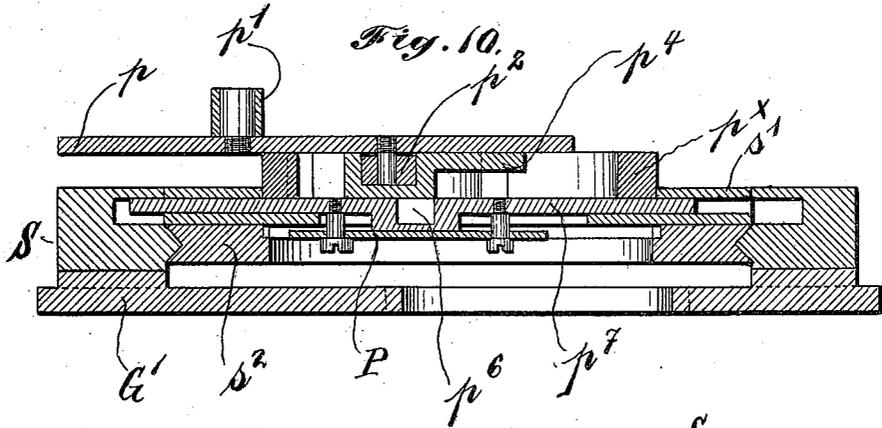
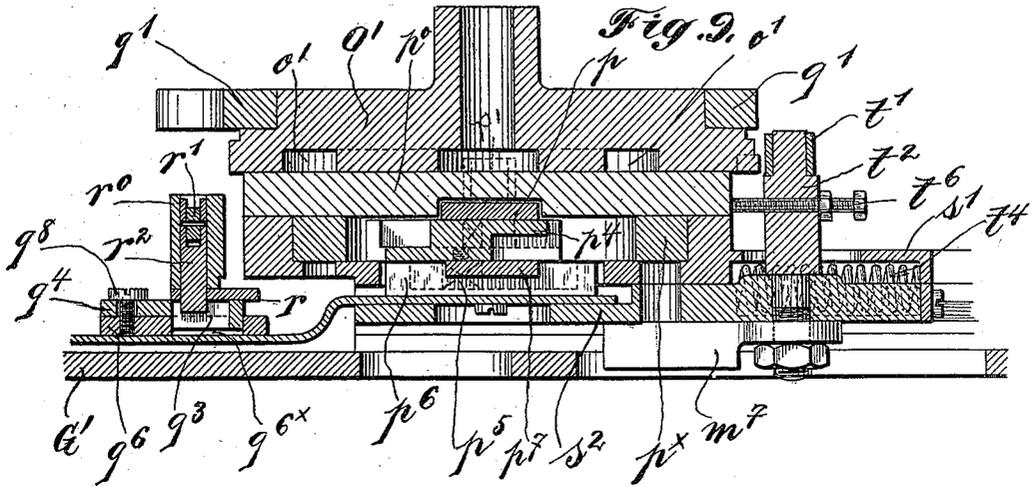
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(Application filed Oct. 3, 1898.)

(No Model.)

9 Sheets—Sheet 8.



Witnesses:

Arthur
W. Sommers

Inventors

Julius Gutmann,
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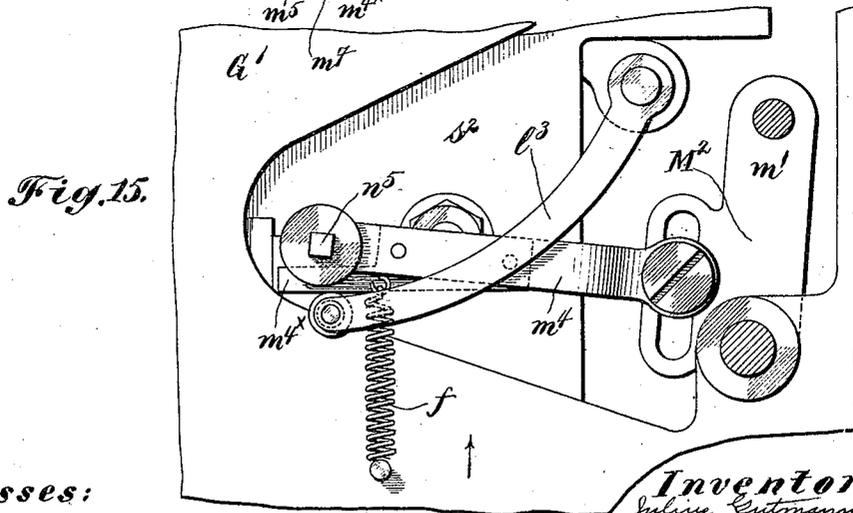
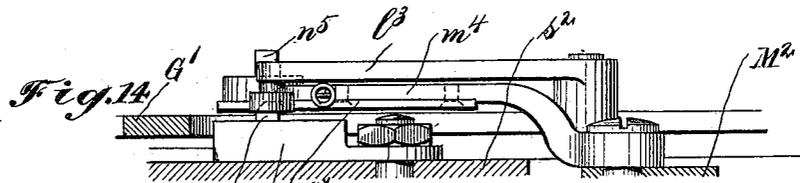
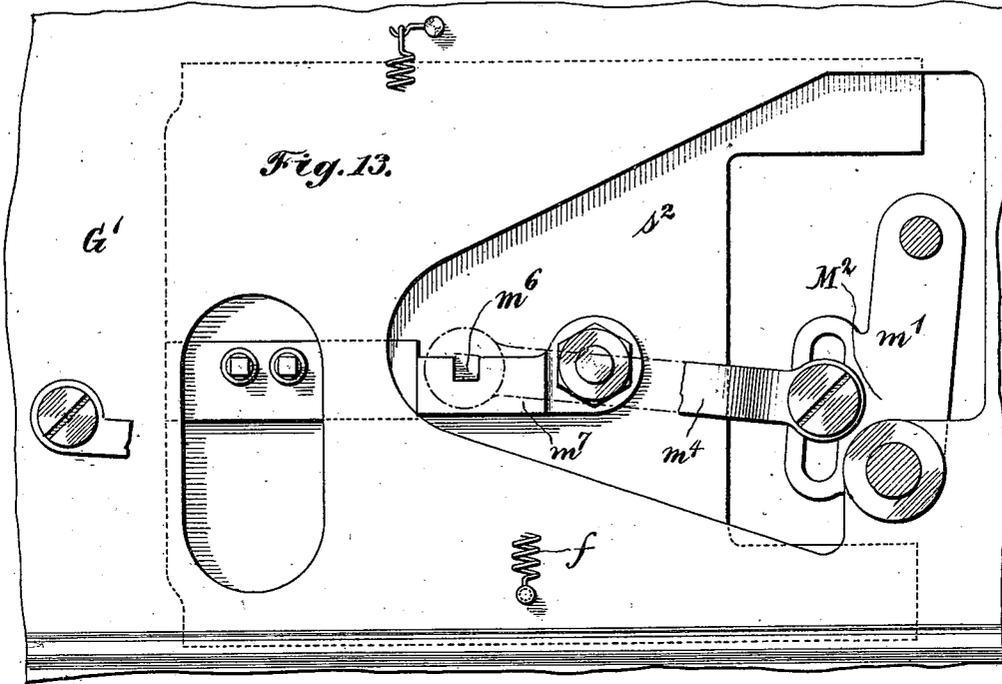
by
J. W. O'Connell

J. GUTMANN, E. FALLER & K. MISCHKE.
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(Application filed Oct. 3, 1898.)

(No Model.)

9 Sheets—Sheet 9.



Witnesses:

Attn.
W. Sommers

Inventors

Julius Gutmann.
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Wm. G. ...

by

Atty.

UNITED STATES PATENT OFFICE.

JULIUS GUTMANN, OF BERLIN, GERMANY, AND EMIL FALLER AND KARL MISCHKE, OF ZURICH, SWITZERLAND, ASSIGNORS TO THE FIRMA FABRIK FÜR SPEZIALNÄHMASCHINEN ACTIEN-GESELLSCHAFT, (PATENTE, JULIUS GUTMANN,) OF ZURICH, SWITZERLAND.

BUTTONHOLE-SEWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 634,135, dated October 3, 1899.

Original application filed August 31, 1897, Serial No. 650,163. Divided and this application filed October 3, 1898. Serial No. 692,530. (No model.)

To all whom it may concern:

Be it known that we, JULIUS GUTMANN, residing at Berlin, Germany, and EMIL FALLER and KARL MISCHKE, residing at Zurich, Switzerland, have invented certain new and useful Improvements in Buttonhole-Sewing Machines; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention has relation to that type of buttonhole-sewing machines shown and described in our Letters Patent of the United States dated May 9, 1899, No. 624,793, of which application the present one is a division or continuation and has relation to the mechanism which operates the work-holder and its application to a sewing-machine, the needle-bar of which receives a vertical reciprocating motion only instead of such a motion and a vibrating motion, and particularly in the application of said mechanism to the well-known Wheeler & Wilson buttonhole-sewing machine, and whereby the edges of a buttonhole are bound in the usual manner, while the ends are barred by stitches laid parallel to said edges, or substantially so.

In the accompanying drawings, Figure 1 is a side elevation, and Fig. 2 a top plan view, (the overhanging machine-arm being removed,) of a Wheeler & Wilson buttonhole-sewing machine with our improvements applied thereto. Fig. 3 is a view similar to Fig. 2, the feed-wheel and other parts being removed. Fig. 4 is an under side view of the bed-plate; Fig. 5, a detail longitudinal sectional view of said Fig. 4; and Fig. 6, a top plan view of the feed-disk. Figs. 7 and 8 are detail top plan views of the system of slides S, parts being removed in said Fig. 8. Fig. 8^a is a detail section on line *x x* of Fig. 8. Fig. 9 is a longitudinal section on or about line *z z* of Fig. 3. Fig. 10 is a transverse section taken on or about line *w w* of Fig. 7. Fig. 11 is a fragmentary detail plan view, and Fig. 12 is a section on line *y y* of Fig.

11. Fig. 13 is an under side view of the bed-plate of the machine, showing the ledge provided with the rectangular notch on the under side of slide S⁴ of the system of slides for one of the pins on coupling-lever *m*⁴. Fig. 14 is a fragmentary elevation, partly in section, of a portion of the mechanism shown in Fig. 15 as seen when looking in the direction of arrow, Fig. 15, which latter view is also a fragmentary under side view of the bed-plate of the machine.

The stitch-forming appliances shown in the accompanying drawings are of a well-known construction and operate to impart to the needle-bar a vertical reciprocation only and need, therefore, no detailed description.

As clearly shown in Fig. 2, the work-holder, consisting of a transversely-slotted work support P and a correspondingly-slotted cloth-clamp and stretcher-plate K of well-known construction and hereinafter referred to as the work-holder P K, is arranged to hold the work, with the buttonhole, transversely of the bed-plate. The said work-holder is connected with a disk O', provided in its under face with a cam-groove *o'*, (shown in dotted lines in Fig. 3 and in full lines in Fig. 6,) through a system of slides S, and said disk O' is connected with a feed-wheel Q in such manner as to adapt it to reciprocate thereon during the operation of barring a buttonhole, the connection between the parts being also such as to actuate the work-holder, as follows: 80 Supposing the parts to be in the position shown in Fig. 2 and the needle N to lie close to the right-hand edge above the near end of the buttonhole to commence the binding of said edge, as the needle N is reciprocated vertically the work-holder P K receives a reciprocating motion crosswise of the buttonhole, arrow I, Fig. 1, and simultaneously therewith a progressive feed motion in the direction of the right-hand arrow of the two arrows II through the left-hand portion 11 of the cam-groove *o'*, Figs. 2 and 6, thereby forming the zigzag binding-stitches. As the work-holder P K reaches the limit of its pro-

gressive feed motion—*i. e.*, the off or opposite end of the buttonhole—the said work-holder will receive a reciprocating motion lengthwise of the buttonhole, arrow III, Fig. 2, and simultaneously therewith a progressive feed motion crosswise of the buttonhole or in the direction of the near or lower one of the two arrows IV, Fig. 2, whereby one end of the buttonhole is barred by stitches laid parallel with the edges of the buttonhole, or substantially so.

During the barring of a buttonhole end the pin p' (shown in dotted lines in Fig. 3) lies in the concentric portion 2 of the cam-groove o' in disk O' , which portion 2 is made sufficiently wide to allow said pin p' to reciprocate with the work-holder, thus dispensing with coupling devices such as shown in Letters Patent granted to us June 20, 1899, No. 627,114, and in an application for patent of even date, Serial No. 692,529, with this said cam-groove having a similar concentric portion 4 diametrically opposite said portion 2.

When the off end of the buttonhole is barred, the parts are automatically returned into their respective positions for the binding of the opposite or left-hand edge of the buttonhole, during which operation the work-holder P K is again reciprocated in the direction of arrow I, Fig. 2, while the direction of its progressive feed motion is reversed by the other portion 3 3 of the cam-groove o' in disk O' and indicated by the left-hand arrow of the two arrows II, Fig. 2. When said left-hand edge of the buttonhole is bound, the mechanism which actuates the work-holder will again be in position for barring the opposite or near end of the buttonhole, the work-holder receiving a reciprocating motion in the direction of arrow III and a progressive feed motion in the direction of the upper arrow of the two arrows IV, and when said end is barred the work-holder will again be in the position from which it started.

The reciprocating motions crosswise and lengthwise of the buttonhole are imparted to the work-holder from a well-known switch-cam M on the lower machine-shaft w^3 and the continuously-vibrated switch-cam lever M^2 , the arm m' of which has a pin that works in the groove in the said switch-cam M.

As stated above, the work-holder P K receives its feed motion lengthwise of the buttonhole from the eccentric portions of the cam-groove o' in disk O' , in which groove works a pin p' , secured to a slide p , Figs. 7 and 9, of the system of slides S' . The slide p has a guide-block p^2 journaled to its under side, which works in an oblique groove p^3 , formed in a slide p^4 , itself provided with a like guide-block p^5 , that works in a groove p^6 , formed in a slide p^7 , which latter is guided in the slide s' . This slide s' and the lower slide s^2 , guided in suitable ways in the bed-plate G' , have motion independently of each other, as well as with each other, under the action of two springs $t^3 t^5$, seated in recesses

in slide s^2 . The described arrangement of slides s' s^2 relatively to each other and relatively to the slides p p^4 p^7 and their construction are fully illustrated in Figs. 7 to 12 and are well known, being used on the Wheeler & Wilson sewing-machines and will herein be referred to as the system of slides S' , the work-support P being connected to slide s' through slide p^7 , to which said work-support is rigidly secured, as shown in Figs. 9 and 10.

The reciprocating motion crosswise of the buttonhole in binding the edges thereof and the reciprocating motion lengthwise of the buttonhole in barring the ends thereof, as well as the required progressive feed motion, are imparted to the work-holder by mechanisms organized and operating substantially as shown and described in our application of even date with this and may therefore be only briefly referred to. We have, however, materially simplified certain portions of this mechanism, as hereinafter pointed out.

As shown in Figs. 4, 5, 13, 14, and 15, and as hereinabove stated, the reciprocations crosswise of the buttonhole in binding are imparted to the work-holder P K from the switch-cam M and switch-cam lever M^2 through a connecting-bar m^4 , connected with arm m' of said lever M^2 and provided near its free end with a square pin that projects from its opposite faces and with an offset or projection m^{4x} on its under side. The portion m^5 of the aforesaid pin in bar m^4 is held in engagement with a recess or slot m^6 in a ledge or shoulder on the under side of the lowermost slide s^2 of the system of slides S' , through which and the slide s' the reciprocations lengthwise of the bed-plate G' of the connecting-bar m^4 are translated through the intermediate slide s' to the slide p^7 , to which the work-support P is secured.

The disk O' , from the cam-groove o' of which the progressive feed motion lengthwise of the buttonhole is imparted to the work-holder P K when reciprocated crosswise of such buttonhole, receives its progressive feed motion likewise from the continuously-vibrating switch-cam lever M^2 , whose arm m^2 is connected by a rod q^2 with a collar or ring q' , adapted to oscillate on disk O' . The ring q' has pivoted thereto a pawl Q' , held in engagement with the teeth of the feed-wheel Q by a spring q , so that as the ring q' is oscillated on disk O' through connecting-rod q^2 the pawl imparts the required progressive rotation to the feed-wheel, as shown in our application for patent of even date herewith.

The reciprocating motion lengthwise of the buttonhole in barring an end thereof is imparted to the work-holder P K through the aforesaid switch-cam M, switch-cam lever M^2 , and connecting-bar m^4 in that said bar when one edge of a buttonhole is bound is shifted so as to move the portion m^5 of its square pin out of engagement with the slot in slide s^2 against the stress of its spring f into engagement with an element of a mechanism where-

by said reciprocating motion is imparted to the said work-holder. This is effected through a shifting-lever l in the path of peripheral projections l^0 on disk O' , Fig. 3, the pin of which lever carries below the bed-plate a shifting-lever l^8 , that carries at its free end a roller in contact with the offset m^{4x} on the under side of lever m^4 , so that when one of said projections l^0 acts upon said lever l the shifting-lever l^8 will shift the connecting-bar m^4 in the direction of arrow, Fig. 4, so as to move the pin portion m^5 out of slot m^6 and the portion n^5 into a notch n^6 in a link n^4 , one end of which is pivoted to one end of a link n^3 , whose other end is pivoted to the under side of the bed-plate G' . The other end of link n^4 is pivoted to the arm n^7 of a bell-crank lever N^{17} , whose arm n^{17} carries a pin n^8 , that projects through a transverse slot g^2 in said bed-plate and has secured thereto, above the bed-plate, a slide r , that carries a lever r' , acted upon by a spring f' , so as to move said lever toward said slide r . The lever r' has pivoted thereto a coupling-pin r^2 , guided in a sleeve r^0 on slide r , which has an opening for said pin to pass through.

To the work-support P is secured a transversely-slotted plate q^6 , and to the latter are secured two longitudinally-slotted coupling-plates q^4 q^5 , adjustable crosswise of the bed-plate G' by means of set-screws q^8 , passing through transverse slots q^7 in said coupling-plates, as shown and described in our application for patent of even date with this.

It will readily be seen that when the lever l is acted upon by a projection l^0 on disk O to uncouple the connecting-bar m^4 from slide s^2 and couple said bar to link n^4 and the lever r' is free to move downward under the stress of its spring f' the coupling-pin r^2 on said lever will move through the opening in slide r into the slot q^3 of one or the other coupling-plate q^4 q^5 at the time below said opening in slide r , thus coupling the work-holder P K with slide r , which imparts to said work-holder a reciprocating motion lengthwise of the buttonhole. During the binding of a buttonhole edge it is, however, necessary that the coupling-pin r^2 should be held clear of the coupling-plates q^4 q^5 , and one of our improvements lies in the simplification of this mechanism, whereby we are enabled to dispense with the spindle and its torsion-spring shown and described in our said application of even date with this. To this end the under face of the lever r' is inclined downwardly from its outer or off end toward its inner or near end, and the pawl r^7 , pivoted to a post on the bed-plate G' and held in engagement with the periphery of the disk O' by a simple spring f^2 , has an extension r^8 , that projects under the lever r and normally holds the same in its elevated position and the coupling-pin r^2 out of reach of the coupling-plates q^4 q^5 . It will be seen that when one of the peripheral projections l^0 acts upon the lever l to uncouple the connecting-bar m^4 from slide s^2 of the system of slides

S the companion or complementary projection l^0 diametrically opposite will act upon the pawl r^7 and move it outwardly along the incline on the under face of lever r , so as to allow its spring f' to force said lever down and move its pin r^2 into the slot of one or the other coupling-plate q^4 or q^5 .

The progressive feed motion crosswise of the buttonhole in barring one end thereof is imparted to the work-holder P K by one or the other of the projections t on disk O' acting upon a roller t' on a stud or post t^2 , secured to slide S , Figs. 2 and 3, substantially as shown and described in our application of even date with this.

Having thus described our invention, what we claim as new therein, and desire to secure by Letters Patent, is—

1. In a buttonhole-sewing machine such as described, the combination with the stitch-forming appliances, the work-holder, the switch-cam M , switch-cam lever M^2 , the feed-wheel Q connected with and adapted to receive its progressive rotation from said switch-cam lever, the feed-disk O' provided with a cam-groove o' having concentric portions diametrically opposite each other of greater width than its eccentric portions, the slides p and s^2 of a system of slides S , said slide p provided with a pin p' projecting into cam-groove o' , a connecting-bar connected with the switch-cam lever, and means for coupling said bar with said slide s^2 , whereby said work-holder receives a reciprocating motion crosswise of the buttonhole and a progressive feed motion lengthwise thereof when the aforesaid pin p' is acted upon by an eccentric portion of said cam-groove o' in disk O' ; of mechanisms adapted to impart to the work-holder a progressive feed motion crosswise of the buttonhole and simultaneously therewith a reciprocating motion lengthwise of said buttonhole, and a shifting-lever adapted to uncouple the aforesaid connecting-bar from the mechanism which imparts to the work-holder a reciprocating motion crosswise of the buttonhole and couple the same to the mechanism which imparts to said work-holder a reciprocating motion lengthwise of the buttonhole, substantially as and for the purpose set forth.

2. In a buttonhole-sewing machine such as described, the combination with the stitch-forming appliances, the work-holder, the switch-cam M , switch-cam lever M^2 , the feed-wheel Q connected with and adapted to receive its progressive rotation from said switch-cam lever, the feed-disk O' provided with a cam-groove o' having concentric portions diametrically opposite each other of greater width than its eccentric portions, the slides p and s^2 of a system of slides S , said slide p provided with a pin p' projecting into cam-groove o' , a connecting-bar connected with the switch-cam lever, and means for coupling said bar with said slide s^2 , whereby said work-holder receives a reciprocating motion

crosswise of the buttonhole and a progressive feed motion lengthwise thereof when the aforesaid pin p' is acted upon by an eccentric portion of said cam-groove o' in disk O' : of mechanisms adapted to impart to the work-holder a progressive feed motion crosswise of the buttonhole and simultaneously with a reciprocating motion lengthwise of said buttonhole, and a shifting-lever adapted to uncouple the aforesaid connecting-bar from the mechanism which imparts to the work-holder a reciprocating motion crosswise of the buttonhole and couple the same to the mechanism which imparts to said work-holder a reciprocating motion lengthwise of the buttonhole, and means whereby the operations of the aforesaid mechanisms are repeated to first bind one edge of a buttonhole, then bar one end by stitches laid as set forth, then bind the opposite edge and bar the opposite end of such buttonhole, substantially as described.

3. In a buttonhole-sewing machine such as described, the combination with the stitch-forming appliances, the work-holder, the switch-cam M , switch-cam lever M^2 , the feed-wheel Q connected with and adapted to receive a progressive rotation from said lever, the feed-disk O' provided with a cam-groove o' having concentric portions diametrically opposite each other of greater width than its eccentric portions, the slides p and s^2 of the system of slides S , said slide p provided with a pin p' projecting into the aforesaid cam-groove, a connecting-bar connected with the switch-cam lever, and means for coupling said bar with slide s^2 , whereby the work-holder receives a progressive motion lengthwise of the buttonhole and a reciprocating motion crosswise thereof when the aforesaid pin p' is acted upon by an eccentric portion of cam-groove o' in disk O' ; of mechanism adapted to impart to the work-holder a progressive feed motion crosswise of the buttonhole, a slide parallel with the major axis of the buttonhole arranged above the work-holder, means for coupling the latter to said slide, mechanism adapted to impart a reciprocating motion to the slide, a shifting-lever adapted to shift the aforesaid connecting-bar out of engagement with slide s^2 into engagement with the mechanism that reciprocates the last-named slide, substantially as and for the purpose set forth.

4. In a buttonhole-sewing machine such as described, the combination with the switch-cam M , switch-cam lever M^2 , the work-holder, the slide r and intermediate mechanism operated by the switch-cam lever and adapted to impart to slide r a reciprocating motion lengthwise of the buttonhole, the coupling-lever r' adapted to couple slide r with the

work-holder, said lever having its under face inclined downwardly from its free end; of the feed-wheel Q , revolved progressively by the aforesaid switch-cam lever, the feed-disk O' revoluble with said feed-wheel and having projections l^0 , and the pawl n^7 trailing on the periphery of said disk O' and provided with an extension in engagement with the inclined under face of lever r' , substantially as and for the purpose set forth.

5. The combination with the feed-wheel Q , the mechanism for imparting thereto a progressive feed motion, the disk O' provided with the peripheral projection l^0 , the work-holder P K the coupling-plates q^4 q^5 thereof, the slide r , the mechanism for reciprocating said slide and the actuating-bar m^4 ; of the levers l l^2 , the latter lever adapted to shift the aforesaid bar m^4 into engagement with the mechanism that reciprocates slide r and the former lever l lying in the path of the projections l^0 on disk O' , the pawl n^7 also in the path of said projections and provided with an extension n^8 , and the spring-actuated lever R' having its under face inclined as described and engaged by the extension n^8 of pawl n^7 , substantially as and for the purpose set forth.

6. In a buttonhole-sewing machine, the combination with the stitch-forming appliances, the work-holder, the system of slides S , a connection between one of the slides of said system and said work-holder, the progressively-revolving feed-disk O' provided with a cam-groove having concentric portions diametrically opposite each other of greater width than the eccentric portions, and a pin on slide p of the system of slides projecting into the cam-groove of disk O' ; of means for reciprocating the work-holder lengthwise of the buttonhole when said pin lies in a widened portion of the aforesaid cam-groove, and means operating independently of the aforesaid feed-disk for simultaneously imparting to the work-holder a progressive motion crosswise of the buttonhole on barring one end thereof, substantially as set forth.

In testimony that we claim the foregoing as our invention we have hereto signed our names in presence of the subscribing witnesses.

JULIUS GUTMANN.
EMIL FALLER.
KARL MISCHKE.

Witnesses to the signature of Julius Gutmann:

C. H. DAY,
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Witnesses to the signatures of Emil Faller and Karl Mischke:

MONTZ VESTH,
EMIL R. KUNZ.