

E. J. BOYLER.
 BUTTONHOLE SEWING MACHINE ATTACHMENT.
 APPLICATION FILED FEB. 5, 1910.

983,265.

Patented Feb. 7, 1911.

3 SHEETS—SHEET 1.

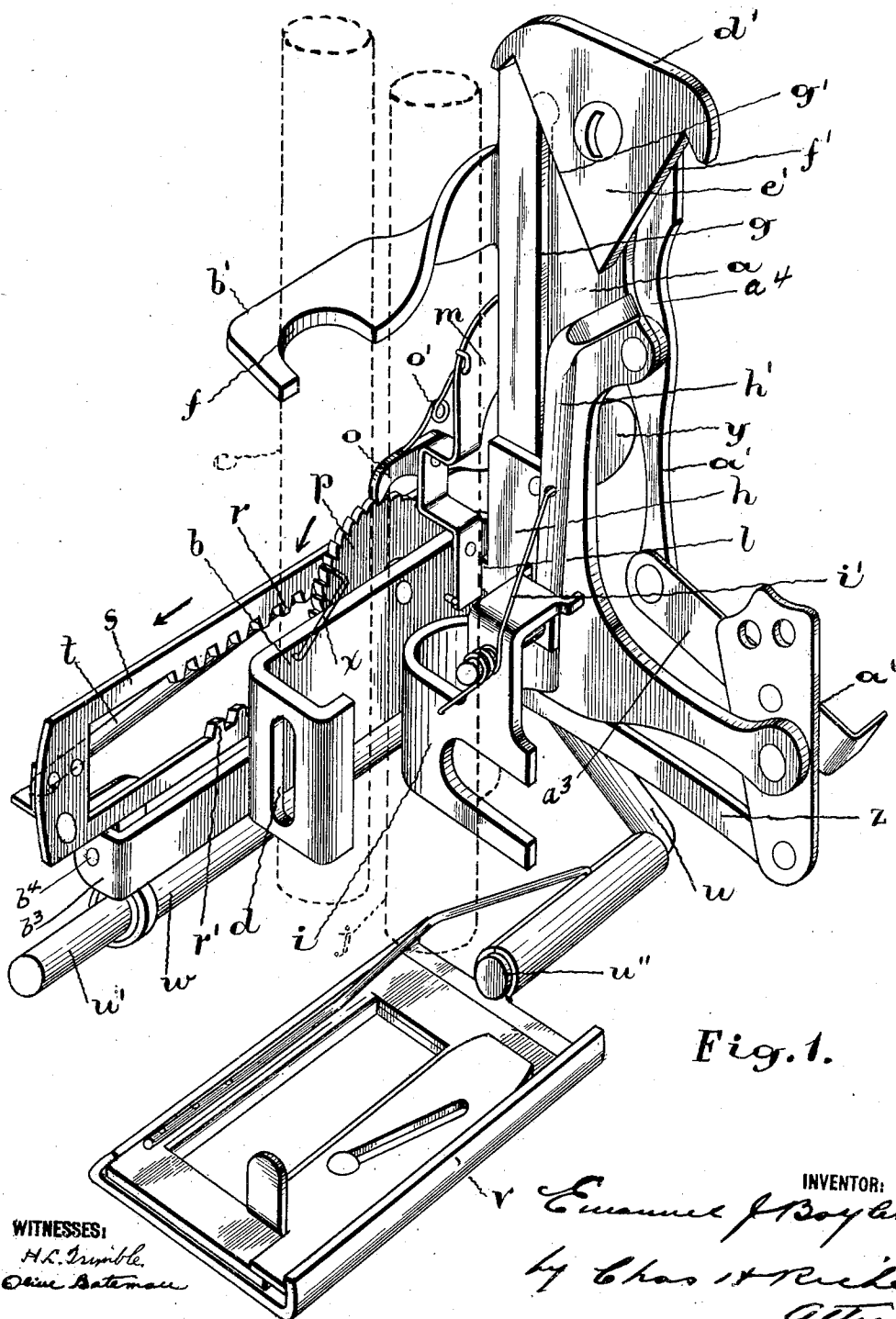


Fig. 1.

WITNESSES:
 H. L. Trimble
 Oliver Bateman

INVENTOR:
 E. J. Boyler
 by Chas. H. Riches
 Atty.

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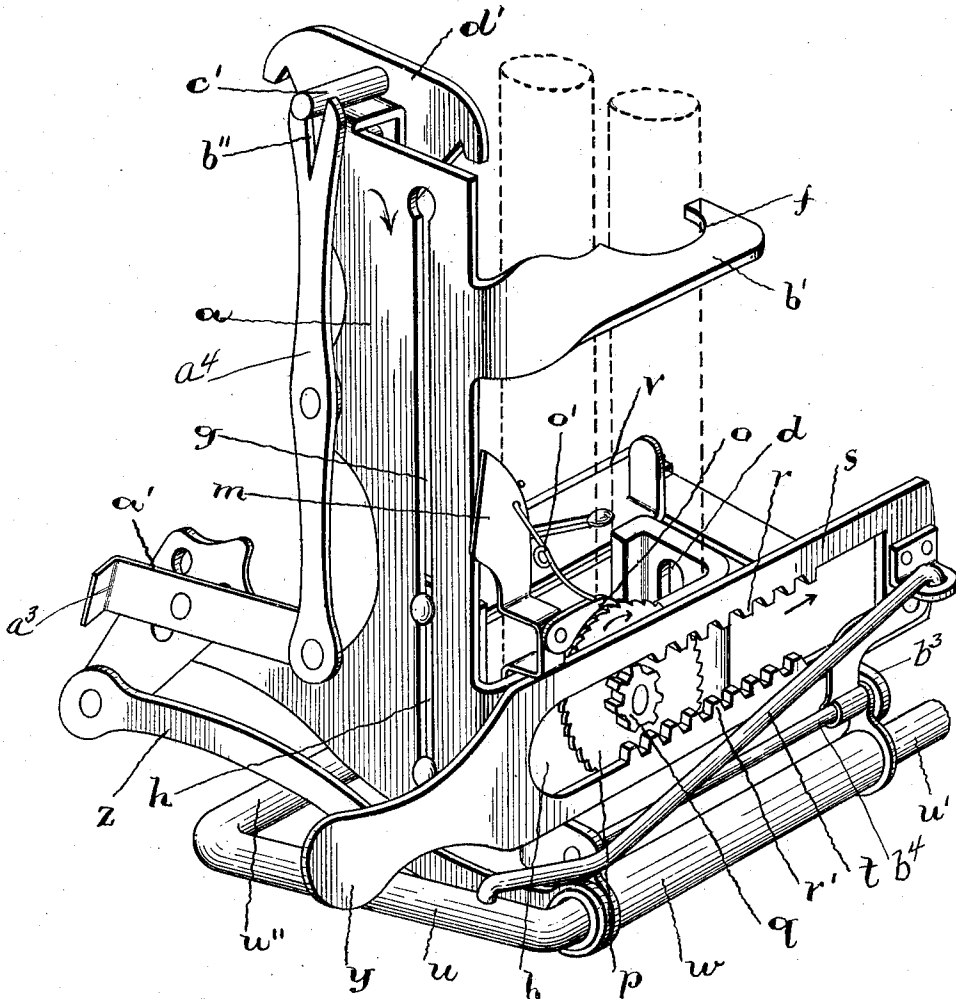


Fig. 2.

WITNESSES:

H. L. Grinnell.
Olive Battman.

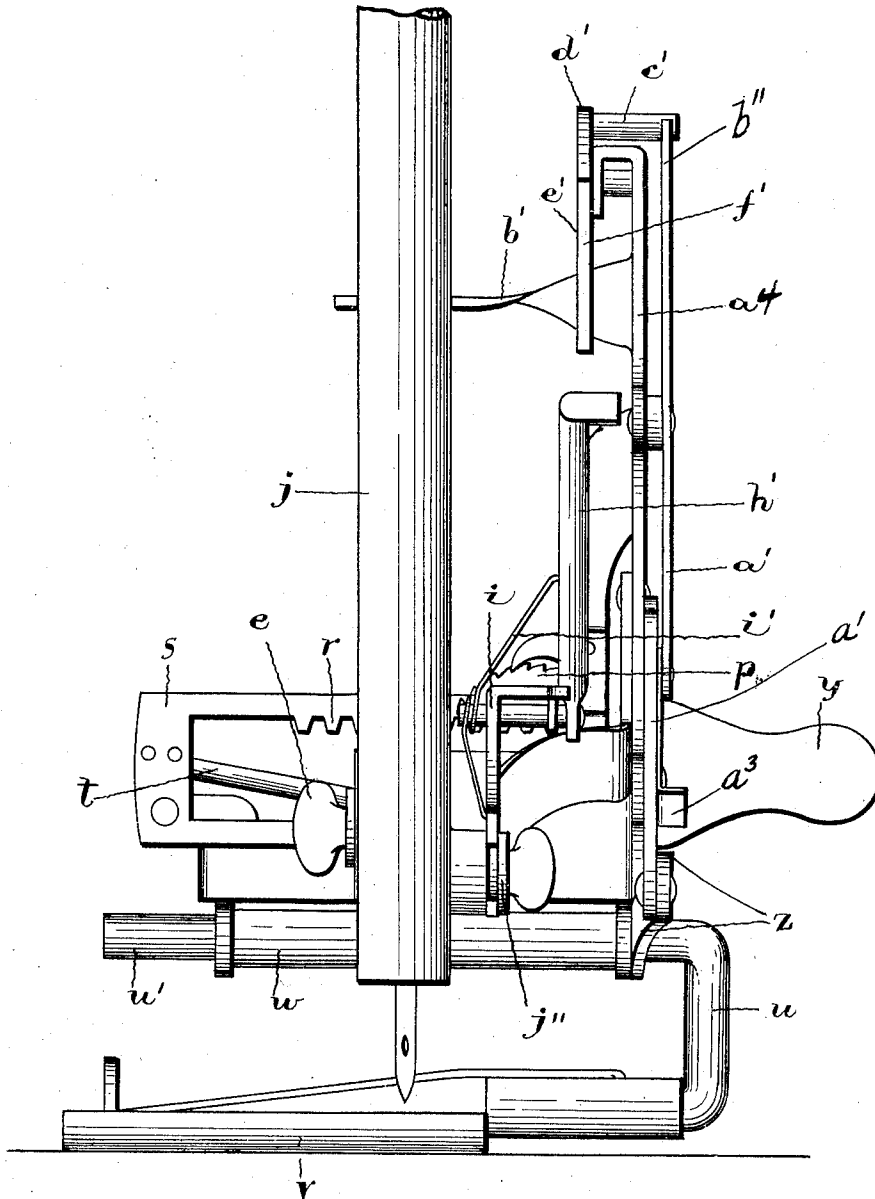
INVENTOR:

Emanuel J. Boyler
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 3 SHEETS—SHEET 3.



WITNESSES:
H. R. [illegible]
Olive [illegible]

Fig. 3. INVENTOR: *Emanuel J. Boyler*
 by *Chas. H. [illegible]*
 Atty.

UNITED STATES PATENT OFFICE.

EMANUEL J. BOYLER, OF HAMILTON, ONTARIO, CANADA, ASSIGNOR OF SIXTY-FIVE ONE-HUNDREDTHS TO WILLIAM KOHLER, OF SHELburne, CANADA.

BUTTONHOLE-SEWING-MACHINE ATTACHMENT.

983,265.

Specification of Letters Patent.

Patented Feb. 7, 1911.

Application filed February 5, 1910. Serial No. 542,181.

To all whom it may concern:

Be it known that I, EMANUEL J. BOYLER, of the city of Hamilton, in the county of Wentworth and Province of Ontario, Canada, have invented certain new and useful Improvements in Buttonhole-Sewing-Machine Attachments; and I hereby declare that the following is a full, clear, and exact description of the same.

In a concurrent application Serial No. 536,245, a button hole sewing device adapted for attachment to the base or stand of a sewing machine is shown and described as comprising means for advancing the material lengthwise of the button hole stitch by stitch, and moving it alternately in opposite directions transversely to the length of the button hole at each stitch during the operation of the needle bar.

My present invention relates to a button hole sewing device which will move the material in the same directions as the device described in the above application, and the object of my present invention is to simplify the construction of the parts, economize the space occupied thereby and arrange them for attachment to the presser bar of the sewing machine.

For an understanding of the invention reference is to be had to the following description and to the accompanying drawings in which:—

Figure 1, is a perspective view of the apparatus looking at it from the front. Fig. 2, is a perspective view of the same looking at it from the rear. Fig. 3, is a front elevation showing its attachment to the presser and needle bars.

Like characters of reference refer to like parts throughout the specification and drawings.

The main frame of the button hole sewing attachment consists of a vertical plate *a*, and two horizontal arms *b b'* extending at substantially right angles from the vertical plate and arranged one above the other. The lower arm *b* is formed to partly embrace the lower end of the presser bar *c* and the upper arm *b'* is formed with a semi-circular recess *f* to receive the upper part of the presser bar, the diameter of the recess being substantially the same as that of the presser bar.

Formed in the lower arm *b* is an elongated vertical slot *d* and passing through the slot

is a set screw *e* which enters a screw threaded hole in, and when tightened securely fastens the button hole sewing attachment to, the presser bar, the elongation of the slot providing for the vertical adjustment of the button hole sewing attachment on the presser bar.

In the vertical plate *a* is a vertical slide-way *g* guiding the movement of the slide *h*. The slide *h* is formed with a forked arm *i* by which the slide can be connected to the needle bar *j* by the needle bar clamp *j''*. The slide *h* is provided with a slider *l* engaging the rocker *m* pivoted to the arm *b* so as to swing back and forth as the slide is raised and lowered by the needle bar, the slider during the upward movement of the needle bar engaging the upper end of the rocker and moving the pivoted dog *o* to rotate the ratchet wheel *p* a corresponding distance, the downward movement of the needle bar causing the slider to engage with the lower end of the rocker and restore the latter and the pivoted dog to their passive position for the next upward movement of the needle bar to cause a further partial rotation of the ratchet wheel.

The ratchet wheel *p* is journaled to the arm *b* and is provided with a pinion *q* with which the teeth *r r'* of the rack bar *s* alternately engage. When the teeth *r* are in mesh with the pinion *q* the rack bar *s* is advanced in the direction indicated by arrow, and when the teeth *r'* are in mesh with the pinion *q* the rack bar is moved in the opposite direction.

Connected to the arm *b* is one end of a tension spring *x* the other end of which engages with the ratchet wheel *p* and prevents its revolution when relieved of the influence of the dog *o*. The dog *o* is pivoted to the rocker *m* and is tensioned by a spring *o'* which holds it in engagement with the teeth of the ratchet wheel *p*.

During the upward movement of the needle bar the slide is raised to bring the slider *l* into engagement with the upper end of the rocker *m* and move it from its passive position. This movement of the rocker causes the dog *o*, which is constantly in engagement with the teeth of the ratchet wheel *p*, to rotate the latter a corresponding distance, in the direction indicated by arrow in Fig. 1, and this rotation of the ratchet wheel causes a corresponding rotation of

the pinion q to advance the rack bar s in the direction indicated by arrow when the teeth r are in mesh with the pinion q or in the opposite direction when the teeth r' are in mesh. During the downward movement of the needle bar the slide is lowered to bring the slider into engagement with the lower end of the rocker and restore it and the dog to their passive position, the ratchet wheel being prevented from rotating by the spring tension x during the return of these parts. By this means the rack bar is advanced stitch by stitch during the operation of the needle bar.

Pivotaly connected to the rack bar s is one end of a coupling rod t , the opposite end of the coupling rod being detachably connected to the U-shaped traveling arm u . One member u' of the traveling arm is slidably contained in a sleeve w rockably suspended from a rod b^4 supported by the lugs b^3 of the arm b . The other member u'' of the traveling arm is provided with a cloth clamp v which stretches and securely holds the material surrounding the button hole. The movement of the rack bar s by means of the coupling rod t causes a corresponding movement of the traveling arm u , the member u' then freely sliding lengthwise through, and being guided by, the sleeve w . The lengthwise movement of the traveling arm causes the cloth clamp to be advanced in a corresponding direction and a corresponding distance to advance the material lengthwise of the button hole a distance of one stitch at each operation of the needle bar.

The arm u' is loosely, and, rotatably, supported in the sleeve w , the latter merely acting as guide for the movement of the cloth holding means, as it travels back and forth lengthwise of the button hole. When the parts are attached to a sewing machine, the rotation of the arm in one direction is prevented by the clamp v resting on the sewing machine, and the rotation in the other direction is prevented by the weight of the clamp v and arm u . When the parts are not attached to a sewing machine, it does not matter whether the arm u' rotates in the sleeve or not.

The distance between the faces of the teeth r r' is greater than the diameter of the pinion q so that when the pinion is in mesh with one set of teeth, it will be clear of mesh with the other set. The rack bar s is formed with a handle y by which it can be manually controlled to bring and hold either set of teeth in mesh with the pinion.

Connected to the sleeve m is one end of an arm z and connected to the other end of the arm is the lower end of a lever a' fulcrumed to a projection of the vertical plate a . The end of the lever a' is connected by a link a^3 to the lower end of a long lever a^4

fulcrumed to the plate a and having at its upper end a fork b'' in which operates the crank pin c' of the wrist plate d' . The wrist plate d' is pivoted to the upper end of the vertical plate a and is formed with a triangular projection e' , the sides f' g' of which are alternately engaged by the spring tensioned crank h' rockably connected to the slide h and maintained by a tension spring i' , in operative relation with the triangular projection. The crank h' alternately engages the opposite sides f' g' during the upward movements of the slide. When the crank h' engages the side f' , the wrist plate oscillates and causes the crank pin c' to move the upper end of the lever a^4 in the direction of arrow, shown in Fig. 2, and the lower end of the lever a^4 , the link a^3 , and the upper end of the lever a' in the opposite direction, the lower end of the lever a' and the arm z then moving in the same direction as the upper end of the lever a^4 and oscillating the sleeve in a direction away from the needle bar. When the crank h' engages the side g' of the wrist plate, the above described motion of the parts is reversed and the sleeve then oscillates toward the needle bar. The oscillation of the sleeve moves the cloth clamp back and forth at each upward stroke of the needle bar.

By means of the ratchet wheel and related parts, I am able to advance the cloth holding clamp stitch by stitch lengthwise of the button hole during the operation of the needle bar, and by means of the oscillation of the sleeve I am able to move the cloth transversely to the length of the button hole in opposite directions at each alternate stroke of the needle bar.

The construction and arrangement of the parts hereinbefore described may be varied and modified within the scope of the appended claims without departing from the principle of the invention, the essential feature of which is to move continuously the material lengthwise of the button hole stitch by stitch so that the button hole stitches may follow each other in proper sequence, and to move the material back and forth transversely to the length of the button hole so that the stitches may extend from the edge of the button hole to a selected distance therefrom to obtain a secure foundation for the stitches and to utilize the needle bar, and an intermediate means for causing the lengthwise and the transverse movements which occur when the needle is withdrawn from the material.

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

1. A button hole sewing attachment comprising means for holding the material, means, operable by the needle bar for moving the holding means lengthwise of the but-

ton hole stitch by stitch, an oscillating sleeve operable by the needle bar for guiding the holding means, and moving the latter transversely to the length of the button hole coincidently with the action of the lengthwise moving means, and means for securing the attachment to the presser bar of a sewing machine.

2. A button hole sewing attachment comprising a cloth holding means, an oscillating sleeve for guiding the cloth holding means, an arm one end of which is connected to the oscillating sleeve, a link and actuating levers for moving the arm, a wrist plate for actuating the levers, a slide operable by the needle bar, and means forming part of the slide for actuating the wrist plate.

3. A button hole sewing attachment com-

prising a cloth holding means, an oscillating sleeve for guiding the cloth holding means, 20 an arm, one end of which is connected to the oscillating sleeve, a link and actuating levers for moving the arm, a wrist plate for actuating the levers, a slide operable by the needle bar, means forming part of the slide for 25 actuating the wrist plate, a rack and pinion feed connected with and moving the holding means stitch by stitch lengthwise of the button hole, a ratchet wheel for the pinion, a rocker, a dog carried by the rocker to rotate 30 the ratchet wheel and pinion.

Toronto, January 17, 1910.

EMANUEL J. BOYLER.

Signed in the presence of—

OLIVE BATEMAN,

C. H. RICHES.