

(No Model.)

F. C. HALL.

BUTTONHOLE ATTACHMENT FOR SEWING MACHINES.

No. 513,504.

Patented Jan. 30, 1894.

Fig. 1.

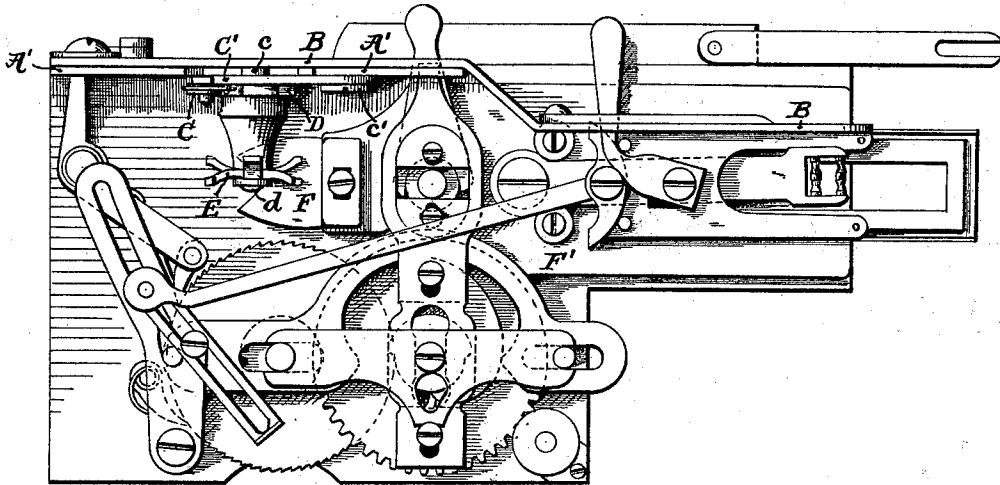


Fig. 2.

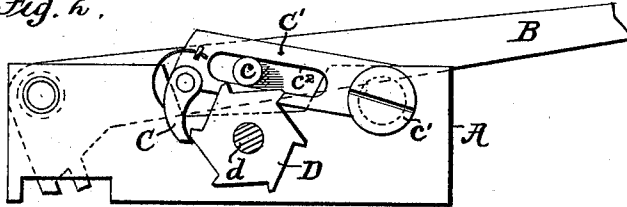


Fig. 3.

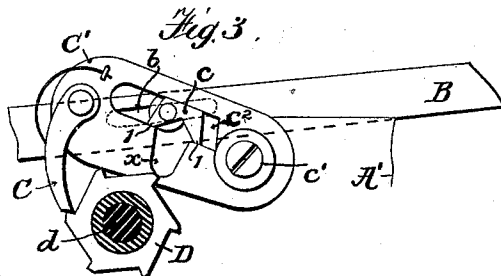
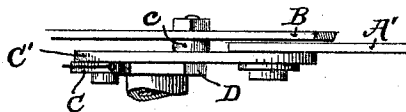


Fig. 4.



Witnesses

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FRANK C. HALL, OF PHILADELPHIA, PENNSYLVANIA.

BUTTONHOLE ATTACHMENT FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 513,504, dated January 30, 1894.

Application filed May 2, 1887. Serial No. 236,855. (No model.) Patented in Canada December 31, 1886, No. 25,657, and in England January 3, 1887, No. 60.

To all whom it may concern:

Be it known that I, FRANK C. HALL, a citizen of the United States, residing in the city of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Buttonhole Attachments for Sewing-Machines, (for which I have received Letters Patent in Canada December 31, 1886, No. 25,657, and in England January 3, 1887, No. 60,) fully described in the following specification and represented in the accompanying drawings.

The present invention relates to that class of button-hole attachment mechanisms that are adapted for use with an ordinary sewing machine when button holes are to be formed, and which is removable therefrom when other work is to be done; and it consists in certain improvements upon the mechanism set forth and illustrated in Letters Patent of the United States, dated July 26, 1887, No. 367,291.

In the accompanying drawings so much of the mechanism illustrated in said application, is shown in detail as will aid a ready understanding of the construction and operation of the present improvements, in connection therewith, wherein—

Figure 1, is a plan view of the button-hole attachment provided with my invention. Fig. 2, is a sectional elevation of a portion of an attachment showing particularly the vibrator and its immediate connections. Figs. 3 and 4, are side and plan views of the preferred form of the invention hereinafter particularly referred to.

No description will be given herein of the general structure and operations of the button hole mechanism taken for illustration in connection with the present improvement as the same is fully set forth and claimed in my said application, to which reference may be had therefor.

As in the mechanism set forth in the aforesaid application, the devices of the button hole mechanism are operated through the medium of a vibrating lever B, that is pivoted at or near its outer end to a vertical flange A' of the base plate of the attachment, its opposite or forked end being engaged by a screw stud or other projection on the needle bar of the sewing machine by which it is vibrated, as is well understood. This vibrating lever B, carries

a spring pawl C, projecting downward in engagement with a ratchet wheel D, mounted on a short horizontal shaft *d*, which shaft also supports a star wheel E, secured to the ratchet wheel so as to be moved therewith. This wheel E, is so constructed that its arms or rays engage with and move the vibrator F, F' at each reciprocation of the needle bar as is fully set forth in said application.

It sometimes happens that the needle bar in some varieties of sewing machines has such a limited reciprocating movement that the lever B, will not be vibrated sufficient to cause its pawl to impart any movement to the ratchet wheel it engages; so too, in sewing machines of different makes the throws of the needle bar vary considerably. It is therefore desirable in order to capacitate a single buttonhole attachment for use with any variety of sewing machine, to provide the attachment with means whereby the movement of the operating pawl C, carried by the vibrating lever B, shall be such as to impart the desired movement to its ratchet wheel; and to provide means whereby the movement of the pawl may be adjusted with respect to the movement of the needle bar so that the extent of movement of said pawl shall be, at all times, a suitable one.

The means for obtaining the necessary movement of the pawl where the throw of the needle bar is small is effected in the present case by mounting said pawl C, upon an auxiliary lever C' that is pivoted to said vertical flange A' upon a stud *c'*, as best seen in Fig. 2. This auxiliary lever C' is slotted at *c*² to receive a stud *c* projecting from and carried by the vibrating lever B, so that the vibrations of said lever will be imparted to the auxiliary lever, as will be seen. The vertical flange A' of course is cut away to permit the free passage of said stud *c*. From which construction it results that whatever the vibrating movement of the lever B, may be, the movement of the pawl C will be much greater, and thus if the throw of the needle bar is such as to impart a small vibration to the lever C the auxiliary lever C' will be vibrated to so much greater extent as to cause the pawl to be moved the distance requisite to impart the desired movement to the ratchet wheel. The construction moreover permits the ratchet

wheel and its immediate connecting devices
 to be mounted much farther removed from
 the plane of movement of the needle bar than
 otherwise could be done, a desideratum much
 5 sought for in this class of attachments. In
 order also that the extent of movement of the
 pawl C, may be varied as may be requisite in
 using the attachment with sewing machines,
 wherein the throw of the needle bar varies,
 10 the stud *c*, is preferably adjustably secured to
 the vibrating lever B. See Figs. 3 and 4. As
 therein shown the lever B, is slotted at *b*, and
 its stud *c*, is adjustably mounted therein by
 a set nut, as will be seen; so that by varying
 15 the position of the stud in its slot *b*, the ex-
 tent of movement imparted to the auxiliary
 lever C', thereby may be changed to suit the
 exigencies of the case. The engagement end
 of this stud in this example may be in the
 20 form of a disengaging slide block *c*, that is
 provided with an undercut portion forming
 bearing points *l* that permit one end of said
 block when in proper position to fall into a
 slot *x*, extending from the slot *c*², as will be
 25 readily seen. This construction causes the
 lever B, through its connections to vibrate the
 vibrator F, F', immediately upon the com-
 mencement of the downward movement of the
 needle bar, the disengaging sliding block *c*, in
 30 this movement being in the operative portion
 of the slot *c*², and upon the completion of the
 vibrating movement of the vibrator and just
 previous to the point of the needle coming in
 contact with the cloth this block *c*, will be in

such position in the slot *c*², that one of the 35
 bearing points *l*, will upon the further vibra-
 tion of the lever B, fall idly into the slot *x*,
 and thus discontinuing the movement of the
 pawl C, and stopping the action of the vi- 40
 brator while the needle is entering and with-
 drawing from the cloth. This lost motion be-
 tween the lever B and the vibrator F, F', per-
 mits each stitch to be completed and the tak-
 ing up of the slack thread before the cloth is 45
 vibrated and fed under the needle, thus per-
 mitting a more perfect control over the ten-
 sion on the thread and causing a more uni-
 form laying of the stitches. Thus the stud,
 or the disengaging slide block *c*, being mov- 50
 able in said slots *b* and *c*², permits the adjust-
 ment of the throw of the pawl C, as has been
 fully described.

What I claim is—

The combination of a vibrating lever B, a
 stud or block as *c*, having the bearing points 55
l, l, and carried by said lever, an auxiliary le-
 ver C', having slots *c*², and *x*, with which lat-
 ter lever said block engages, a pawl carried
 by said auxiliary lever, and a ratchet wheel
 with which said pawl engages, substantially 60
 as described.

In testimony whereof I have signed my
 name to this specification in the presence of
 two subscribing witnesses.

FRANK C. HALL.

Witnesses:

GEO. H. GRAHAM,
 WM. A. HARRIES.