

(Model.)

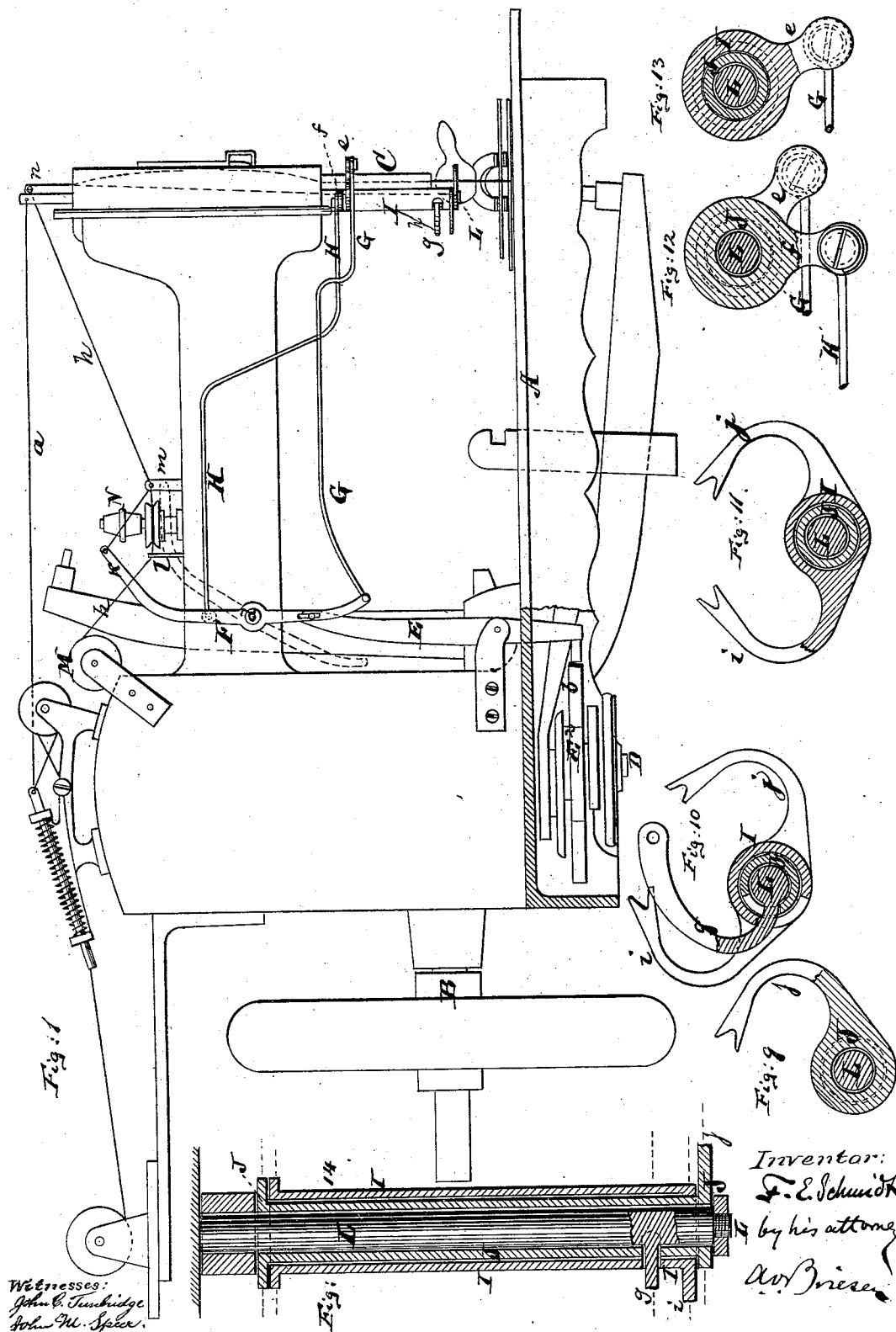
2 Sheets—Sheet 1.

F. E. SCHMIDT.

BUTTON HOLE SEWING MACHINE.

No. 273,318.

Patented Mar. 6, 1883.



(Model.)

2 Sheets—Sheet 2.

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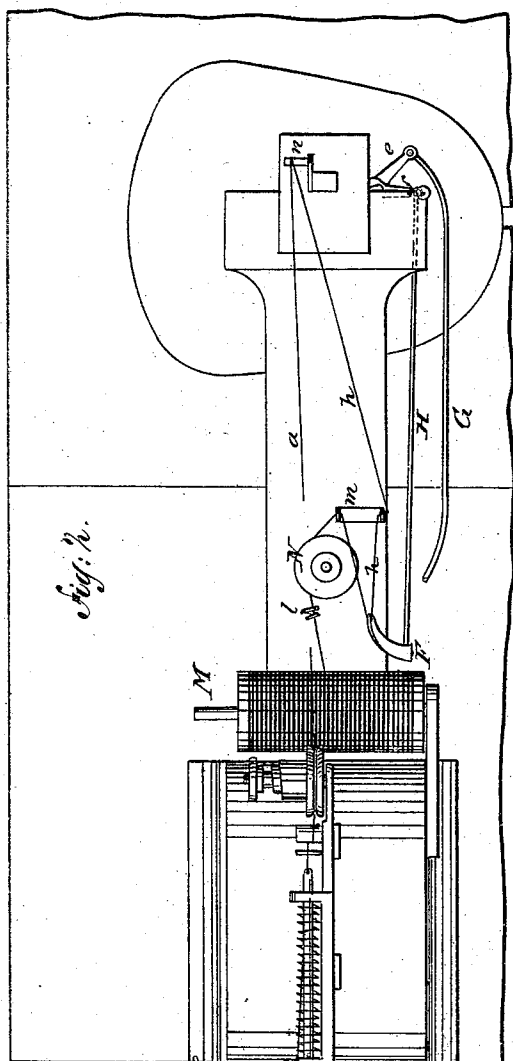


Fig. 1.

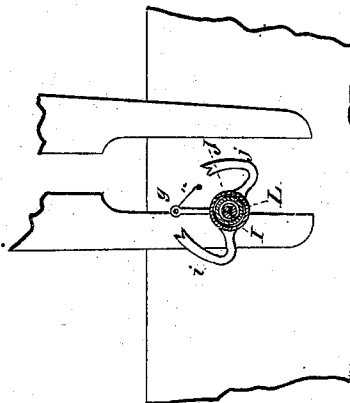
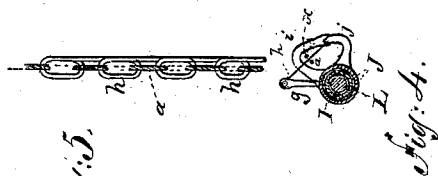


Fig. 3.



UNITED STATES PATENT OFFICE.

FRIEDRICH E. SCHMIDT, OF BROOKLYN, NEW YORK.

BUTTON-HOLE SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 273,318, dated March 6, 1883.

Application filed August 17, 1880. (Model.)

To all whom it may concern:

Be it known that I, FRIEDRICH ERNST SCHMIDT, of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Button-Hole Sewing-Machine, of which the following is a specification.

This invention relates to improvements in machinery for stitching the edges of button-holes, and is shown to be applied and applicable to such machines as are described in Letters Patent No. 36,617, but is also applicable to all other button-hole sewing-machines which have a needle-thread and shuttle-thread and a lower gimp or inlay thread which is bound in by the needle-thread.

The object of my present invention is to sew onto the edge of a button-hole a further fourth thread, which is laid in and held fast by the needle-thread, and which serves to improve the appearance of the side of the button-hole opposite to that to which the shuttle-thread and the gimp-thread are applied. In gentlemen's coats and other garments the two sides of the fabric having a button-hole are frequently exposed to view, and there is an objection to the present mode of stitching button-holes that one of the sides only has a perfect finish and the other not, and that one of the sides has proper strong binding, and the other not. By my invention a complete finish of both sides of the button-hole is insured, and less danger of destroying the stitch by ordinary wear incurred.

In the accompanying drawings I have endeavored to illustrate so much only of a sewing-machine of the well-known kind—in this case of the machine known as the "Humphrey machine"—as will enable any one skilled in the art to apply and understand my improvement, which really is in the nature of an attachment to a sewing-machine.

Figure 1 in the drawings represents a side elevation of the Humphrey sewing-machine having my improvement. Fig. 2 is a top view of the same. Figs. 3 and 4 and Figs. 6 to 14, inclusive, are detail views, showing parts of the improvement; and Fig. 5 is a diagram showing the stitch produced by this improvement.

Letter A represents the table or platform of the machine.

B is the driving-shaft, to which rotary motion is imparted by suitable mechanism.

C is the vertical reciprocating needle-bar, which carries the needle-thread *a* to the shuttle-thread below, in the usual manner, and which receives its motion by suitable or the well-known mechanism.

D is the vertical cam-shaft, carrying suitable cams, E, for moving the shuttle and laying the lower inlay or gimp thread. One of these cams, E², (see Fig. 6,) has a projection, *b*, (shown in Figs. 1 and 6,) for striking at proper intervals a lever, E, which connects with another lever, F, (clearly shown in Fig. 1,) both said levers being pivoted to the frame-work of the machine. The lever F joins, below its pivot *d*, with a connecting-rod, G, and above its said pivot with another connecting-rod, H. The rod G connects with a crank, *e*, that projects from a vertical tubular spindle, I, which is parallel and near to the lower portion of the needle-bar, and the rod H connects with a crank, *f*, that projects from a vertical tube, J, which is contained within the tube I.

A vertical rod, L, projecting downward from the frame of the machine, is embraced by and constitutes the support and guide of the tubes I and J, as indicated in Figs. 3 and 4, and on a larger scale in Fig. 14.

From the side of the rod L, at or near its lower end, projects through horizontal slots of the tubes I and J a horizontal arm, *g*, which has a hole in its end for the thread *h* (that is to be laid onto the fabric by the needle-thread) to pass through.

From the lower part of the tube I projects a forked hook, *i*, and from the lower part of the tube J projects a similar hook, *j*, as clearly shown in Figs. 3 and 9. The hook *j* is on a horizontal plane just below that of the hook *i*.

When the machine operates, the lever E is vibrated on its pivot, vibrating therefore also the lever F, causing said lever to oscillate the tubes I and J, so as to make the hooks *i* and *j* alternately overlap, as in Fig. 4, and bringing them apart, as in Figs. 3 and 11.

The diagram, Fig. 7, illustrates the position

of the cranks *e* and *f* at the time the hooks *i j* are in the position shown in Fig. 3, and the diagram, Fig. 8, illustrates the position of said cranks at the time the hooks are in the position shown in Fig. 4.

The thread *h*, which is to be laid on by the needle-thread *a*, is taken from a spool, *M*, and passed through suitable guides, *l m*, thence through the upper extension, *k*, of the lever *F*, thence back to the guide *m*, and thence through a loop, *n*, at the upper part of the needle-bar, and thence down through the hole in the arm *g*. A suitable tension device, *N*, is preferably introduced between the guides *l* and *m*, as shown in Fig. 2. After the needle descends with its thread *a* the hooks *i j* are spread apart, as in Fig. 3. After the needle has raised the thread *a* in ascending, the hooks *i j* are brought together, so as to overlap. The hook *i*, carrying in its fork the thread *h*, now pulls it past the upright needle-thread *a*, as shown in Fig. 4. The fork of the hook *j*, folding closely under the hook *i*, bends the thread *h* beneath *i*, thus taking off the thread *h* sufficient for the loop which is to be produced by the said thread *h*. In the position shown in Fig. 4 the thread *h*, held taut by the hooks *i j*, bears against the outer side of the thread *a*, and bends it inward, so as to crowd it nearer to the rod *L*, and holds it thus until the needle descends again; but the path of the needle is outside of the line *h*, as indicated by the point *x* in Fig. 4, and in this path the needle subsequently descends. Thus the thread *a* is looped over the taut thread *h*, and stitches it fast to the fabric, because the part of the thread *a* which had been pulled up is on the inner side and the part carried down by the needle on the outer side of that portion of the thread *h* which is held taut between the folding-hooks *i j* and the projecting arm *g*. As the needle descends, the hooks *i j* swing apart, and allow the needle-thread to fasten the thread *h* onto the fabric. When, after the reascending of the needle, the hook *i* is again swung toward the hook *j* it loops the thread *h* horizontally around the nee-

dle-thread, and thus by the continuous operation of the parts in manner described the threads *a h* appear on the surface of the fabric, (which is moved by a suitable feed,) substantially as indicated in Fig. 5, in which figure the dark thread *a* is the needle-thread, and the lighter thread *h* the upper finishing thread. At the time the hooks *i j* are apart the arm *k* of the lever *F* is thrown back, as indicated by full lines in Fig. 1, so as to hold the thread *h* properly taut; but when the hooks come together, as in Fig. 4, the lever *F* is swung into the position shown by dotted lines in Fig. 1, so as to give all necessary slack and enable the hooks to draw the thread *h* in the manner described. Afterward, upon the descent of the needle, the superfluous slack is taken up again by the backward movement of the arm *k* of the lever *F*.

Having thus described my invention, what I claim is—

1. In a sewing-machine having a reciprocating needle-bar, the combination of the overlapping-hooks *i j* and stationary perforated arm *g*, with mechanism for vibrating said hooks, substantially as described.

2. The combination of the lever *F* and rods *G H*, with the tubes *I J*, hooks *i j*, and thread-guide *g*, substantially as and for the purpose specified.

3. The lever *F*, having the projecting thread-holding part *k*, in combination with the rods *G H*, spindles or tubes *I J*, hooks *i j*, thread-guide *g*, and with the reciprocating needle-bar, substantially as described.

4. In a machine for stitching button-holes, the combination of the needle-bar and needle and fixed thread-guide *g*, with a pair of oscillating hooks, *i j*, and with means for supplying said hooks with a separate thread, *h*, to be laid on by the needle-thread, substantially as specified.

FRIEDRICH ERNST SCHMIDT.

Witnesses:

JAMES TURK,
SAML. R. BETTS.