C. A. HANSEN & G. HARLEY.

Button-Hole Stitching-Attachments for Sewing-Machines.

No. 144,672. Patented Nov. 18, 1873.

Fig. 1.

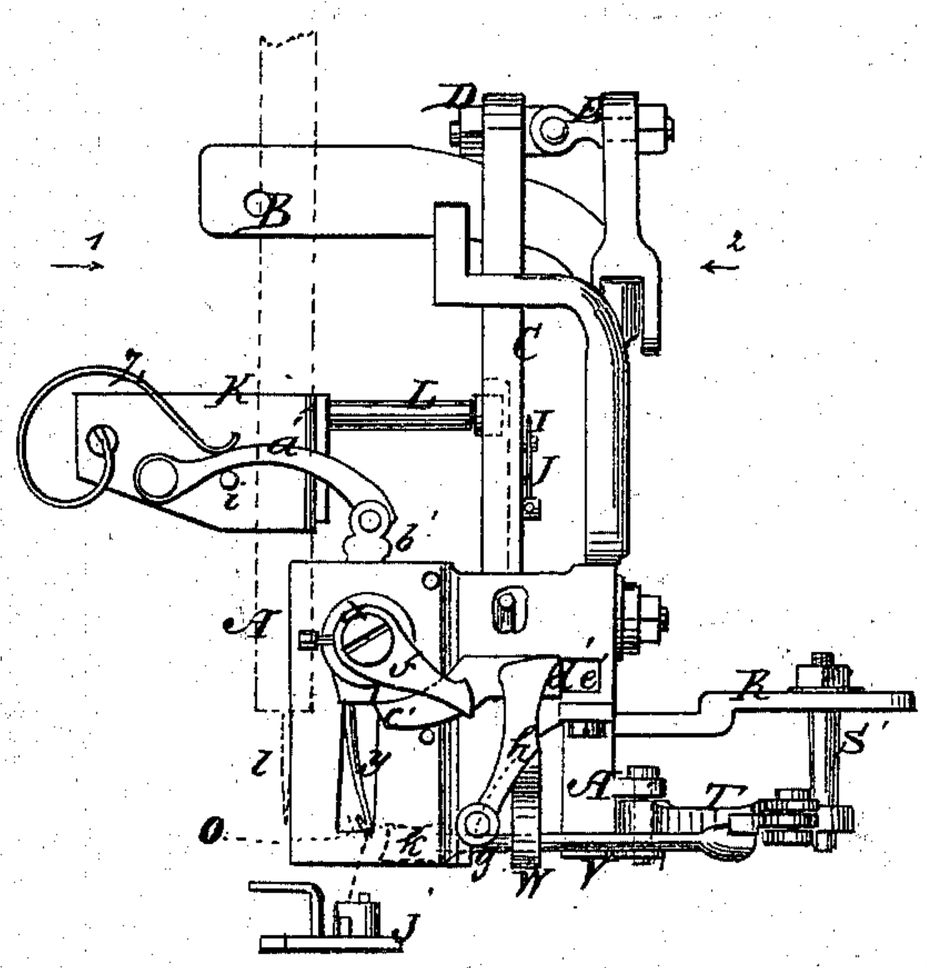


Fig. 2.

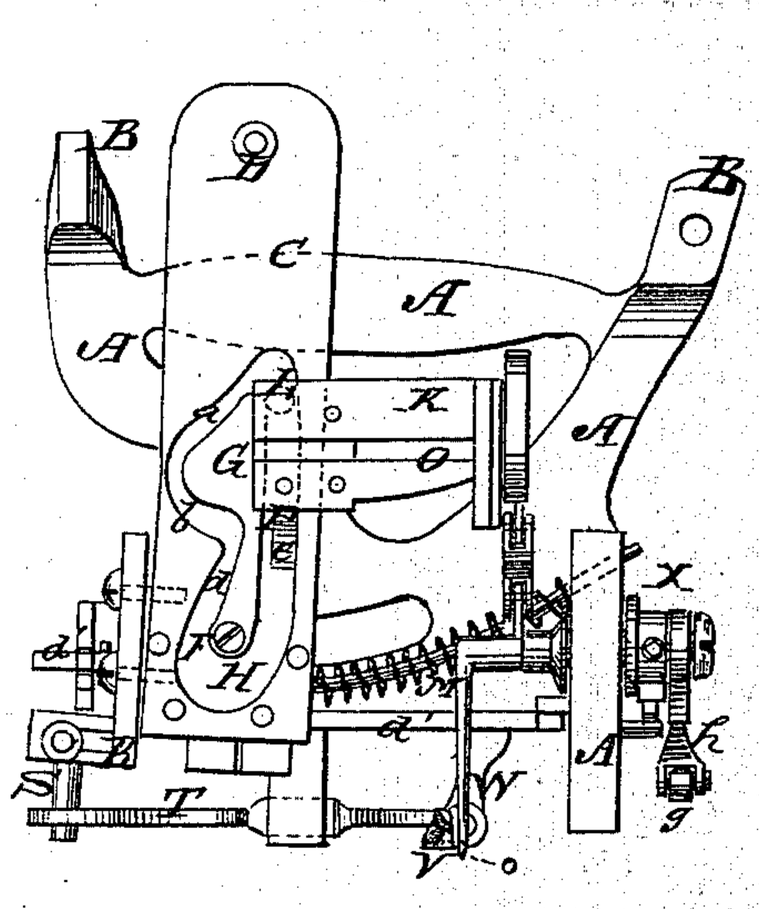


Fig. 3.

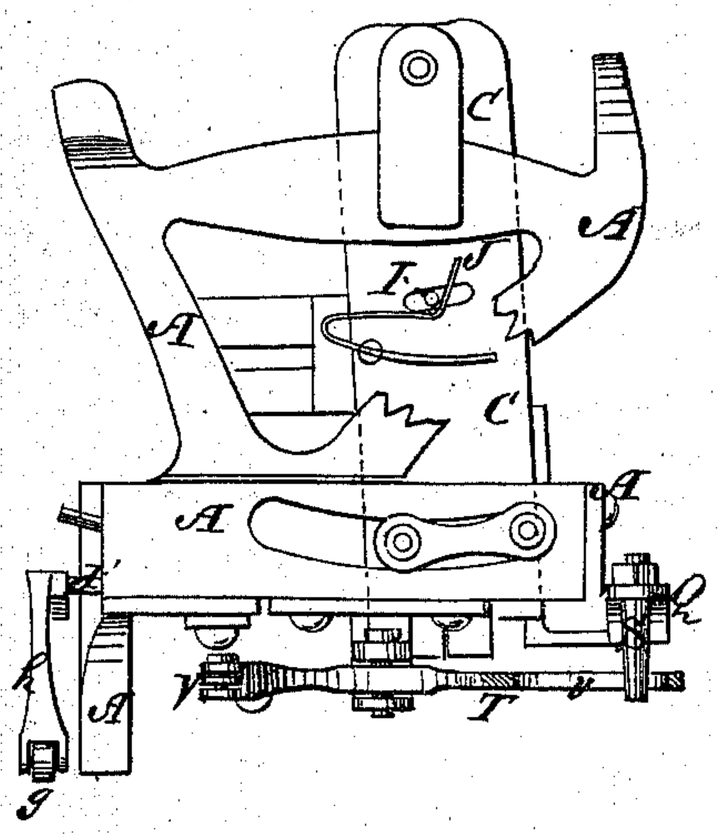
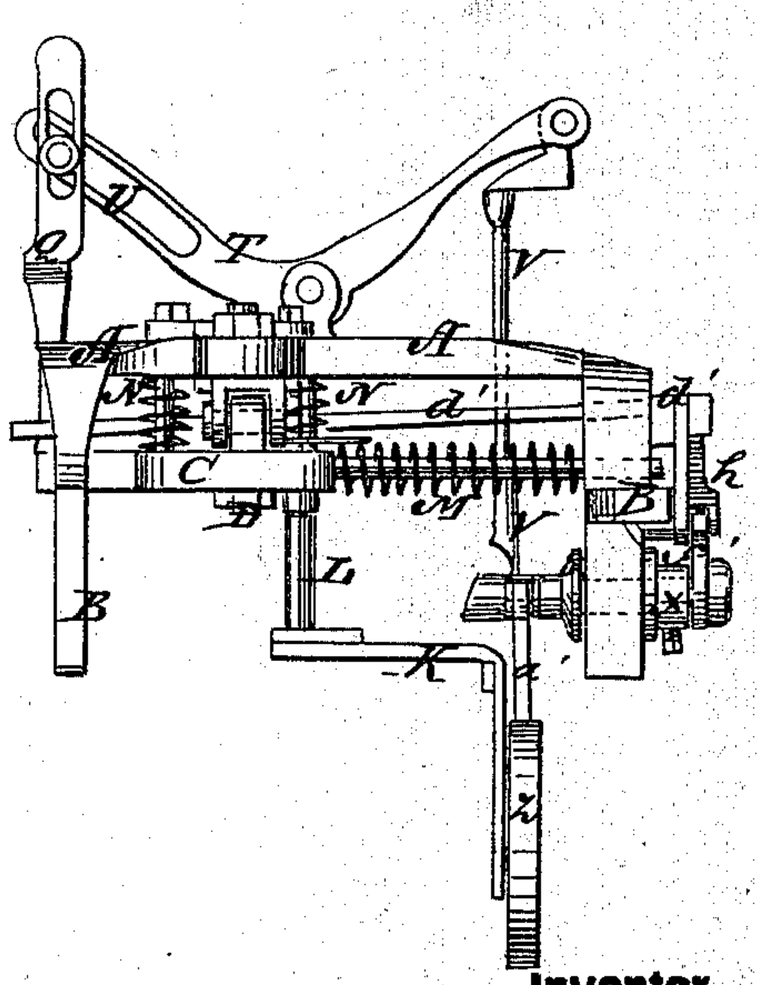


Fig. 4.



Witnesses.

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UNITED STATES PATENT OFFICE

CARL A. HANSEN AND GEORGE HARLEY, OF GUELPH, CANADA.

IMPROVEMENT IN BUTTON-HOLE-STITCHING ATTACHMENTS FOR SEWING-MACHINES.

Specification forming part of Letters Patent No. **144,672**, dated November 18, 1873; application filed June 7, 1873.

To all whom it may concern:

Be it known that we, CARL ADOLPHUS HANSEN and GEORGE HARLEY, of Guelph, in the Province of Ontario and Dominion of Canada, have invented a new and Improved Button-Hole-Stitching Attachment for Sewing-Machines, of which the following is a specification:

Our invention consists of apparatus mounted on a frame arranged to be attached to the head of a sewing-machine, and connected to the needle-bar to be operated, the said apparatus being arranged, as will be hereinafter particularly described, to cause a hook to pass down through the throat-plate, and engage the thread immediately after the shuttle has passed through the loop, draw it up through the button-hole, and present it to a pusher, which, by a portion of said apparatus, is caused to carry the loop beyond the needle, and hold it until the needle goes down through it and completes the stitch.

Figure 1 is a front elevation of the attachment. Fig. 2 is a side elevation, as seen looking in the direction of arrow 1. Fig. 3 is a side elevation, as seen looking in the direction of arrow 2; and Fig. 4 is a plan view.

Similar letters of reference indicate corresponding parts.

A represents a frame for supporting the apparatus above the table of the machine. It is attached to the head of the sewing-machine by screws passing through the projections B. C is a cam-plate arranged vertically, and pivoted, at the upper end D, to a stud, E, so as to oscillate in two directions at right angles to each other. This plate extends down to within a short distance of the machine-table, and has a wide cam-groove, F, in which is a switch or tongue, G, pivoted at the lower end H, and having a stud-pin, I, at the upper end, projecting through a slot in the plate, and having a spring, J, at the back of said plate, arranged with it to throw the tongue to the right, Fig. 2, when said tongue is free to be shifted. This vibrating plate C is employed to give motion to the pusher, which carries the loop from the hook to the needle; also, for releasing the looping-hook, as will be described hereafter, by its lower swinging end, to which said devices are connected, and it is operated by means of the needle-bar of the sewing-machine, (shown dotted,) the angle-plate K, the stud-pin L, and springs M and N. The angle-plate K is attached to the needle-bar, which fits in its angle, and receives a screw through the slot O. The stud-pin L is attached to one end of the angle-plate, so as to work in the slot F, to swing the plate C as the needle-bar goes down, by traversing the parts *a b d* of the cam-groove. The spring M throws the plate back when the stud-pin arrives at the bottom of the groove. In the ascent of the needle-bar and stud-pin L the latter pushes the tongue over, so as to pass up through the part *e* of the slot, and the spring J throws the tongue back as soon as the stud-pin passes above it, ready to cause the stud to go down on the other side and again throw the bar C. The movement of the bar C at right angles to the movement just above described is caused by the end of the stud-pin passing over the elevation P in the bottom of the groove, which swings it one way against the springs N, which return it again as soon as the stud-pin has passed said elevation. This bar C carries an arm, Q, which projects from a bracket, R, at its lower end, and this arm has a stud-pin, S, which works the vibrating lever T by moving forward and backward in the slot U of said arm as the bar C moves, and this bar carries, at its end opposite the one having the slot, the pusher V, which takes the shuttle-thread loop brought up through the throat-plate by the hook, and carries it over the cloth, and holds it while the needle goes down, said pusher being pivoted at one end to the vibrating lever, and working through the guide W in such relation to the hook *o* as to take the loop from it to the needle. This hook is mounted in a stock, X, which works in the slot *y* of the frame, and it is forced down to take the thread immediately after the shuttle has passed through the loop by the spring Z and lever *a'*, mounted on the angle-plate K. The lever is jointed to the head by a link, *b'*, which allows the head and hook to remain up while the needle goes down, and the head is held up until the proper time for it to go down by the arm *c'*, which is attached to bar *d'*, arranged in the slot *e'* in the frame, and connected to the swinging bar C, so that, when said bar is pushed back by the stud L and projection P just after the needle-bar begins

to rise, the arm c' will be pushed from under the stock, letting it and the hook fall instantly. Just before they reach the end of their movement the arm f' strikes a roller, g, in the lower end of an arm, h, projecting from bar d', which swings the hook forward at the lower end, under the thread, so as to insure the catching of it when said hook goes back. The hook is mounted in its head X, so as to allow it to be thus swung forward. It is raised up again to bring the thread up through the nipple j of the throat-plate by the pin i on the plate K. The loop thus brought up comes in front of the notched end k of the pusher, and is immediately pushed forward under the needle l, the pusher being set in motion during the first portion of the downward movement by the stud-pin L acting in the part a of the cam. As soon as the needle has passed down into the loop the stud-pin L arrives in the part d of the cam, and the pusher returns to the place of starting, ready for the next operation.

The bar d' is so connected to the bar C that, while it is pushed in the direction to withdraw the arm c' from the hook-stock, as before described, said bar d' is not moved in the other direction in which said bar C works.

Our attachment is also useful for embroidering on edges without change, and we propose to use it for that purpose.

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

1. The mechanism for operating the pusher, comprising the angle-plate K attached to the needle-bar, the stud-pin on the angle-bar, the swinging cam-plate C, tongue G, spring M, arm Q, and rock-lever T on the frame A, when constructed and combined substantially as specified.

2. The looping-hook stock arranged in the slot y of plate A, and provided with the trip holding-arm c' on the frame A, and connected, by the arm a' and link b', with the angle-plate K on the needle-bar, substantially as specified.

3. The cam-plate C, provided with arm c', bar d', springs N, and projection P, for releasing the hook-stock X, in the manner described.

4. The combination, as set forth, of arm f' of the hook-stock with arm h of bar d', for turning the hook.

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Witnesses:
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