

(Model,)

2 Sheets—Sheet 1.

C. M. BANKS.

BUTTON HOLE SEWING MACHINE.

No. 305,657.

Patented Sept. 23, 1884.

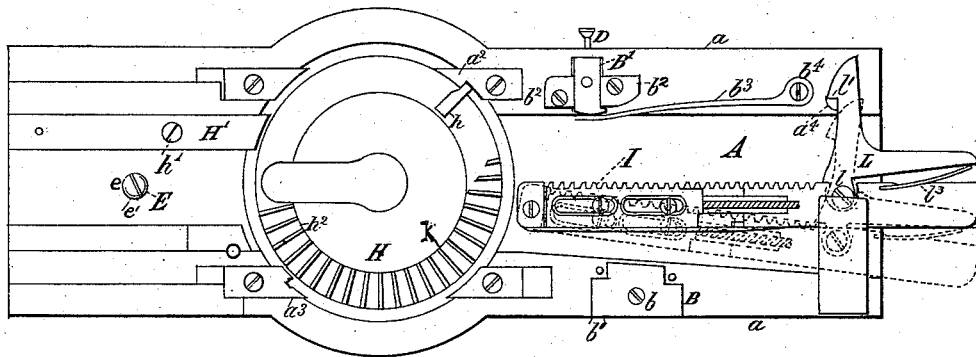


Fig 1.

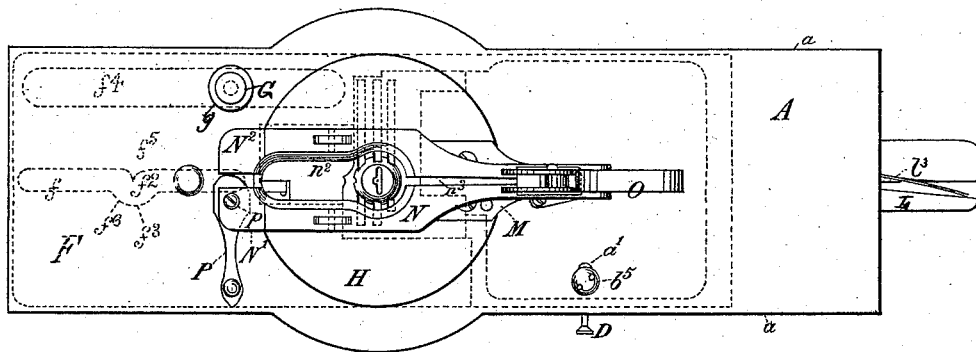


Fig 2.

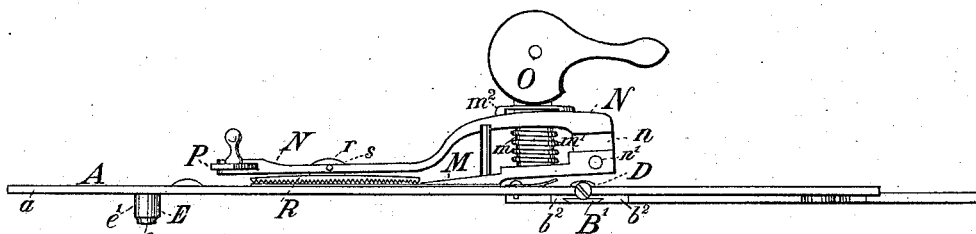


Fig 3.

WITNESSES:

Wm H Powell.
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Chas M. Banks
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ATTORNEYS

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2 Sheets—Sheet 2.

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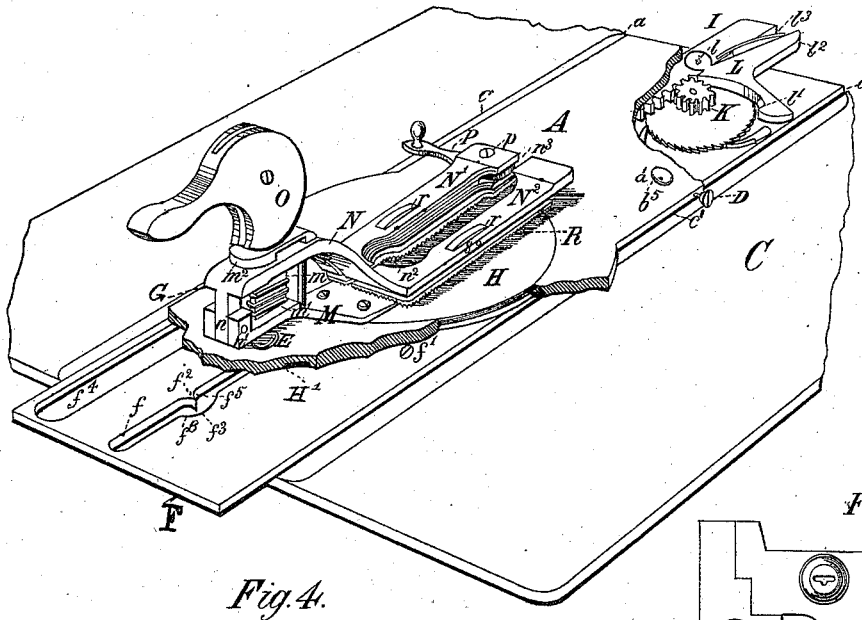


Fig. 4.

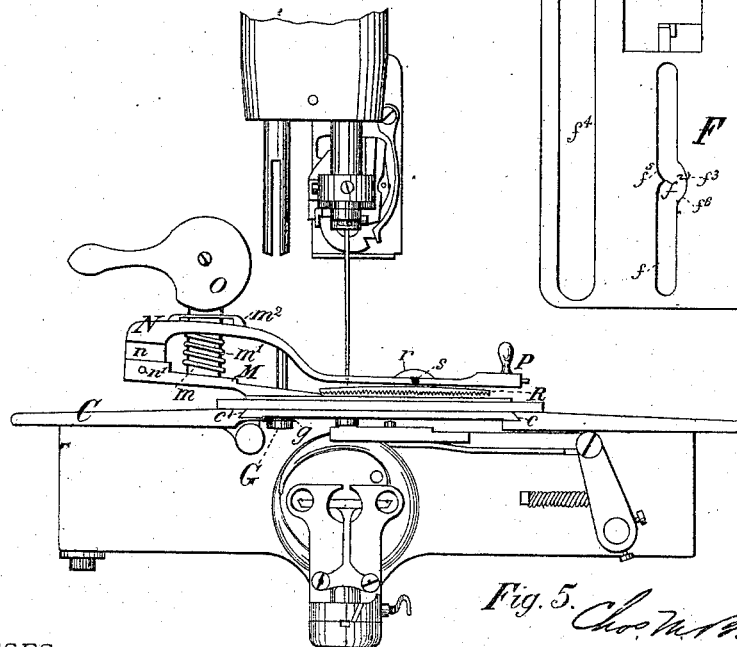


Fig. 5. C. M. Banks
INVENTOR

WITNESSES:

Wm. L. Powell
A. A. Comstock

By *Lawrence P. ...*

ATTORNEY 3

UNITED STATES PATENT OFFICE.

CHARLES M. BANKS, OF PHILADELPHIA, PENNSYLVANIA.

BUTTON-HOLE SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 305,657, dated September 23, 1884.

Application filed November 6, 1883. (Model.)

To all whom it may concern:

Be it known that I, CHARLES M. BANKS, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Button-Hole Attachments for Sewing-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, reference being had to the accompanying drawings, which form part of this specification, in which—

Figure 1 is an inverted plan, and Fig. 2 a plan, of feed-plate. Fig. 3 is a side elevation of the same. Fig. 4 is a perspective, (partly broken away,) and Fig. 5 a front or end, elevation, showing improvements applied to machine; Fig. 4, illustrating position of parts to begin stitching button-hole, and Fig. 5 position of feed-plate stitching around eye of button-hole. Fig. 6 is a detail plan.

My improvements relate to certain details of construction of the feed-plate of button-hole sewing-machines, whereby greater steadiness and certainty of movement of said plate are obtained, as hereinafter fully described.

My improvements relate, further, to an improved construction of the clamp or holder, whereby simplicity and economy of construction with efficiency of operation are obtained.

My improvements relate still further to certain details of construction hereinafter fully described.

In carrying my invention into effect, I provide a feed-plate having a straight rack on its under side, which gears with a feed-pinion suitably mounted on bearings beneath it, and through the medium of which a feed-movement in a straight line for said plate is obtained. Said feed-plate carries a rotary or swiveled disk, which is rotated by a dog connected with the feed-bar, in order to turn the fabric being operated upon while the eye or rounded end of the button-hole is being stitched. To prevent said disk from turning too far, stops are provided on it and the plate by which it is carried, and to hold it steady while permitting its free rotation a friction spring or brake is provided. After the feed-plate has moved along in a straight line, (during which time the straight edge of the button-

hole is stitched,) and before the swiveled disk begins its rotation, said feed-plate should be moved laterally in order to stitch the initial part of the eye; also, after the swiveled disk has made half a revolution, and before the stitching of the straight edge of the button-hole begins, said feed-plate should again be made to move laterally to stitch the final part of the eye. To produce these lateral motions of the cloth-plate the latter is secured to a guide-plate having a cam-groove, in which fits a guide-roller secured to said feed-plate. Said guide-plate is rigidly secured to the bed plate or frame of the machine, while the feed-plate is fastened to said guide-plate by means of the guide-roller already mentioned, and by means of a screw and washer, as hereinafter fully explained. Said feed-plate is also secured at one of its ends to the cloth-plate of the machine by means of bearings, one of which is flexible or yielding while the other is pivoted or swiveled, and which serve to hold the said feed-plate steadily while moving in a right line and while its swiveled disk is rotating, and which yet permit a lateral or vibratory movement of said feed-plate at the beginning and ending of the stitching of the eye of the button-hole.

The clamp or holder consists of a plate of tempered steel having an opening corresponding in shape to a button-hole, and having a longitudinal slit, which extends from one end of the plate nearly to the other end in line with the middle of the button-hole opening. This virtually forms two spring-jaws. To separate these jaws so as to cause them to spread the button-hole slit in the fabric, a cam-lever is attached to one in such a way that it will bear against the other. The clamp bar or plate is sustained at one end upon an arm, and provided with a cam-lever, by which it is moved down toward the cloth-plate, a lifting-spring being employed to raise it. To the under side of the clamp are centrally pivoted rocking shoes having their under surfaces serrated or roughened, so as to obtain a secure hold on the fabric in which the button-hole is to be stitched.

Referring to the accompanying drawings, A shows a feed-plate designed and adapted to fit in the opening in the cloth-plate of a sewing-

machine usually occupied by the ordinary throat-plate and shuttle-race slides. Instead, however, of sliding the edges a of the plate A directly into the cloth-plate opening in the usual manner, I affix to the under side of said plate A two retainers of peculiar construction. One of these is a block, B, centrally pivoted to the plate A by means of a screw, b , and having its outer edge, b' , beveled to fit the correspondingly-beveled edge c of the cloth-plate C. The other retaining-piece, B', is a dovetailed slide fitting between guides b^2 b^3 and held against the edge c' of the cloth-plate by means of a pressure-spring, b^4 , secured at b^4 to plate A. Said slide B' has a vertical stud, b^5 , which projects upwardly into an opening or recess, a' , in the plate A. A push-pin, D, fitted in a socket or opening in the edge of plate A, meets the stud b^5 , so that by pushing said pin D inwardly the slide B' may be moved toward the center or opposite side of plate A, to insert the latter in or withdraw it from position in the cloth-plate, such introduction and withdrawal being effected by a lateral or sidewise movement, instead of an endwise movement, as heretofore. In addition to this function of the yielding bearing B', which permits the feed-plate to be inserted and removed by a lateral movement, the said bearing and the pivoted bearing B co-operate in permitting the feed to vibrate or move sidewise under the guidance and control of the slot f in the plate F, as hereinafter described. At the opposite or outer end of plate A, and on its under side, is a pin, e , which should have an encircling sleeve or pulley, e' , for anti-friction purposes. So provided, the pin, with its encircling-sleeve, forms a roller, E, and such I shall hereinafter call it. This roller E fits and moves in a slot, f , in a plate, F, which said plate is fastened to the bed of the machine, below the plane of the feed-plate, by a screw, f' . The slot f is mainly straight, but at or about its middle part has a bend or cam formed by a projection, f^2 , on one of its edges and a corresponding recession, f^3 , in the other edge. Said plate F has also another slot, f^4 , through which passes a screw, G, holding a spring-washer, g , which bears against the plate F. The screw G enters the plate A, and with the assistance of the washer g holds said plate and the plate F together, while permitting the former to move on the latter, as hereinafter fully described.

H represents a swiveled disk fastened in the plate A, so as to be capable of being rotated in a horizontal plane around a central point. To limit the extent of rotation of the disk it is provided with a stop, h , which comes in contact alternately with stops a^2 a^3 on the plate A, and to hold it steady while rotating, and to prevent jumping its edge is pressed by a friction-spring, H', secured by a screw, h' , to the plate A. By means of said screw the pressure of spring H' may be adjusted. To the under side of the plate A is attached a pivoted sectional

rack, I, substantially the same in construction and mode of operation as shown and described in my Patent No. 286,989, dated October 23, 1883, and on the under side of the disk H is a segmental rack, k , the same as that shown and described in said application. The rack I engages with a pinion, K, rotated by means of levers, &c., and the rack k is engaged by a dog on the feed-bar of the machine, as described in said application. By these means a straight onward motion is imparted to the feed-plate A and a rotary motion to disk H. When the feed-plate A is moved onward, it travels in a straight line until the roller E meets, and rides on or against the side f^5 of cam f^2 , when it is deflected laterally while moving onwardly, during which time the needle is stitching the initial part of the eye of the button-hole. By the time the roller E has reached the apex of the cam f the pinion K has come into engagement with the sliding section of the rack I, and the feed-dog tooth has also engaged with the rack k . The cloth-plate A now comes to a state of rest, while its disk H is rotated until the stop h meets the stop a^2 . The cloth-plate again resumes its onward movement, and is at first deflected by the impingement of the roller E against the shoulder f^6 until the final part of the eye of the button-hole is stitched, thereafter traveling in a straight line until the end of the button-hole is reached. After the button-hole has been stitched the parts are restored to their normal position by swinging the pivoted rack I out of engagement with pinion K, sliding back the feed-plate A to its starting-point, and rotating the disk H by a reverse movement until stop h meets stop a^3 . The rack I is then caused to re-engage with the pinion I and work proceeded with as before. As an improved means of adjusting and fastening the said rack, I secure to its projecting free end a bell-crank lever, L, having a fulcrum-screw, l , and a shoulder, l' , which engages, when the rack and pinion are meshing, with a stud, a^4 , on the under side of plate A. To release said lever its arm l' is pressed toward the rack I against the influence of a spring, l^3 .

I shall now proceed to describe the clamp for holding the cloth on the feed-plate or on its swiveled disk.

M is an arm fixedly secured to said disk and projecting radially therefrom. The outer end of said arm is bifurcated to receive a pendant, n , of an arm, N, pivoted at n' therein. Said arm M has also a vertical post, m , encircled by a spiral spring, m' , which presses said arm N against a washer, m^2 , which surrounds the post m below an eccentric or cam lever, O, by means of which the arm N may be raised or lowered, vibrating on its pivot. Said arm N is a tempered steel bar or plate having a button-hole-shaped opening, n^2 . It has also a longitudinal slit or kerf, n^3 , which begins at its free or outer end and extends to the opening through which the post m passes. It is thus formed into or

with two spring-jaws, $N' N^2$, which may be distended apart to spread or open the button-hole opening in the cloth beneath. To produce such distention a cam-lever, P , is pivoted at p in one of said jaws, N' , and bears against the edge of the other jaw, N^2 .

To the under side of the jaws $N' N^2$ are secured shoes $R R$, whose lower surfaces are roughened. These shoes have central posts or studs, $r r$, by means of which and pins $s s$ they are pivoted to the jaws $N' N^2$, so that they can be rocked on or under said jaws, such construction causing the clamp to accommodate itself to varying thicknesses of fabric, the shoes resting flat on such fabric, even if the jaws $N' N^2$ should be inclined or at an angle with respect thereto.

What I claim as my invention is as follows:

1. The combination, with the sliding feed-plate A , carrying the rotary disk H , of bearings, one being flexible or yielding and the other pivoted or swiveled, which permit said feed-plate to be moved laterally, substantially as and for the purpose set forth.

2. The combination, with the sliding feed-plate A , carrying a rotary disk, and having movable bearings which permit said plate to move or vibrate sidewise, of the guide-plate F , having a cam-slot, f , and the guide-pin e , said guide-plate being adapted for attachment to the bed-plate, substantially as described.

3. The combination of cloth-plate C and feed-plate A , having bearings $B B'$, one of which is flexible or yielding and the other pivotal, guide-pin e , and screw and washer $G g$, with guide-plate F , having slots $f f'$, said feed-plate being secured in a sliding position in said cloth-plate by means of said bearings, and being guided in and held to said guide-plate by means of said pin, screw, and washer, substantially as shown and described.

4. The combination, in a button-hole sewing-machine, of a feed-plate carrying a rotary or swiveled disk, said plate having a straight rack, whereby it is moved in a straight line, and said disk having an annular or segmental rack, whereby it is rotated while the cloth-plate is at rest, with a guide-plate having a cam-slot, which receives a guide-pin or roller attached to said feed-plate, whereby the latter is caused to move laterally at the beginning and ending of the button-hole eye, or just before and after said disk makes its half-rotation, substantially as shown and described.

In testimony that I claim the foregoing I have hereunto set my hand this 12th day of October, 1883.

CHARLES M. BANKS.

Witnesses:

WILLIAM H. BOYER,
CHAS. MATHEWS, Jr.