3 Sheets—Sheet 1.

C. P. HOFFMAN & N. MEYERS.

Blind-Stitch Sewing-Machine.

No. 207,035. Patented Aug. 13, 1878.

FIG. 1.

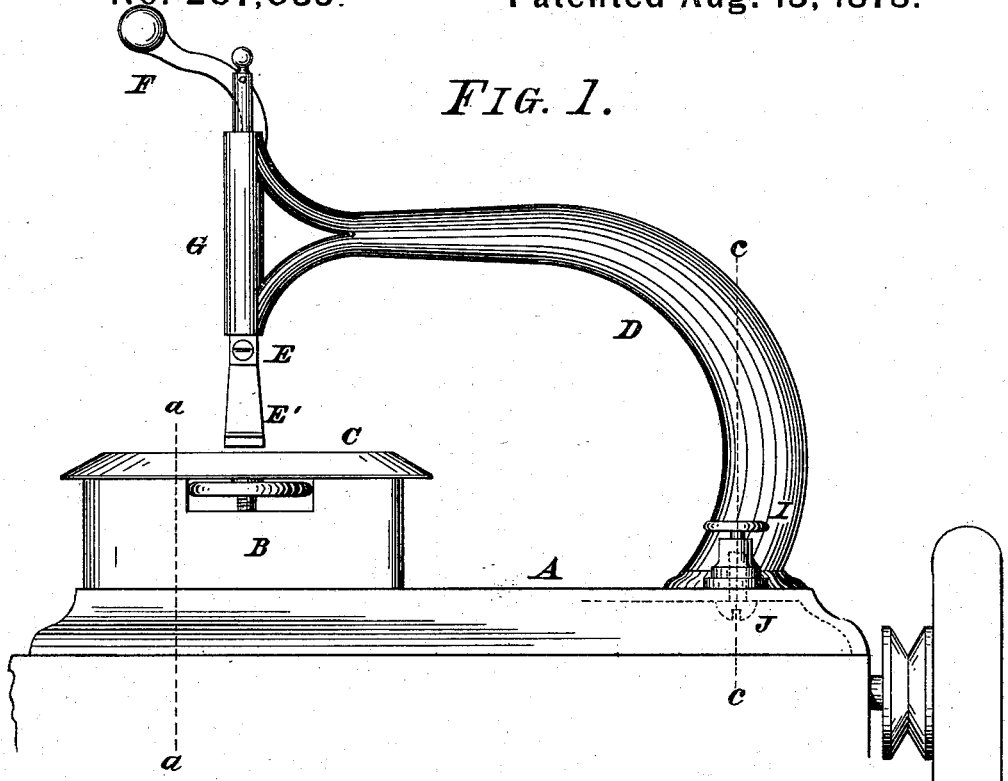
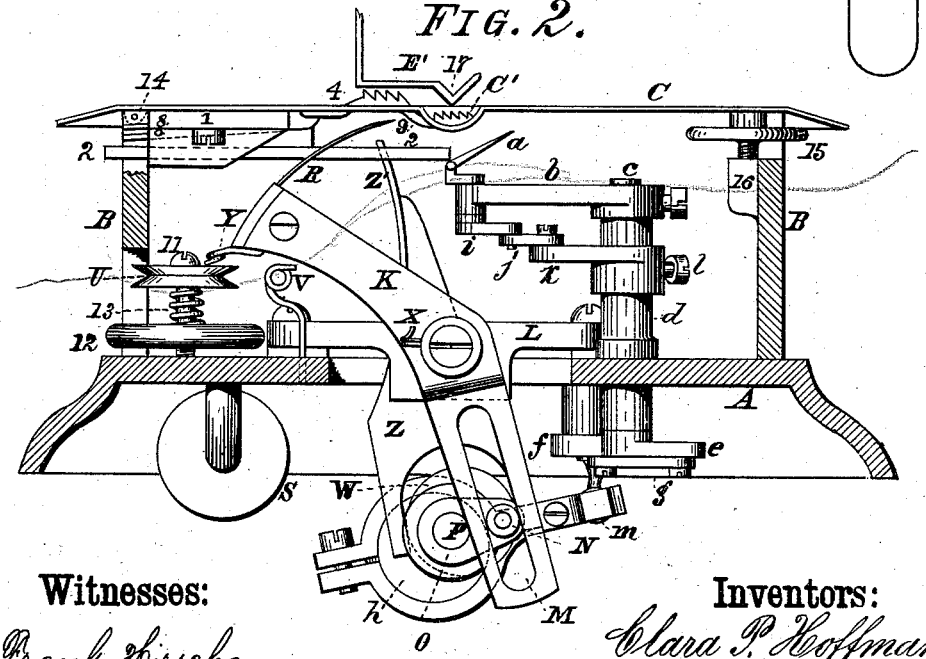


FIG. 2.



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by Michael J. Stark atty

3 Sheets—Sheet 2.

C. P. HOFFMAN & N. MEYERS.

Blind-Stitch Sewing-Machine,

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FIG. 3.

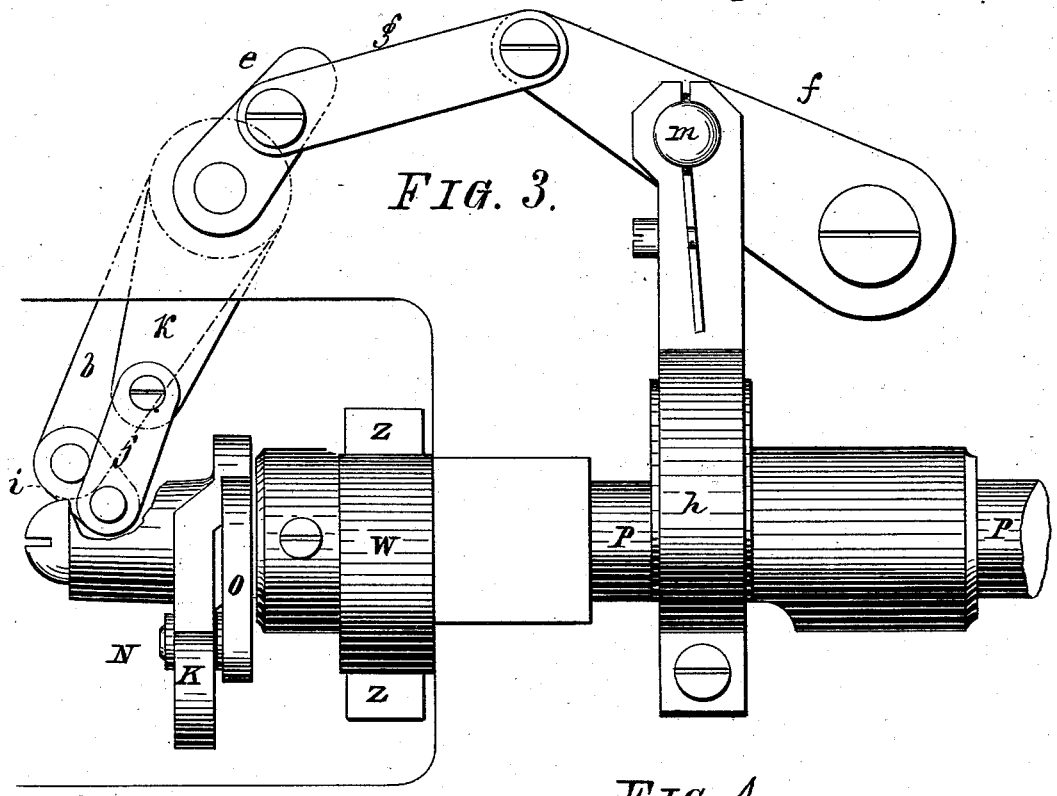
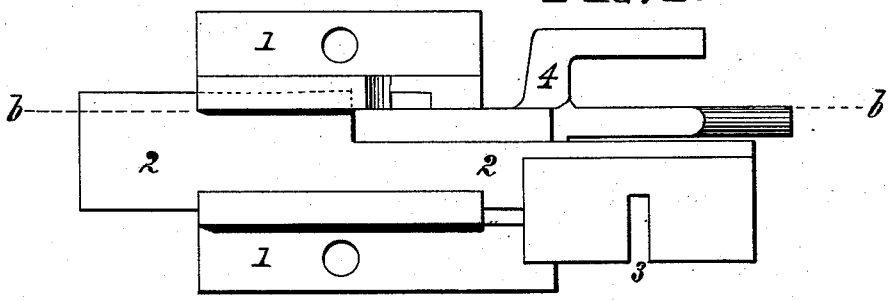


FIG. 4.



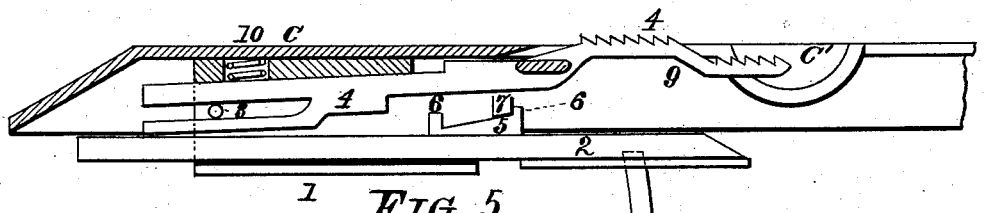
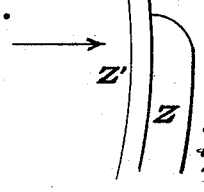


FIG. 5.



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3 Sheets—Sheet 3.

C. P. HOFFMAN & N. MEYERS.

Blind-Stitch Sewing-Machine,

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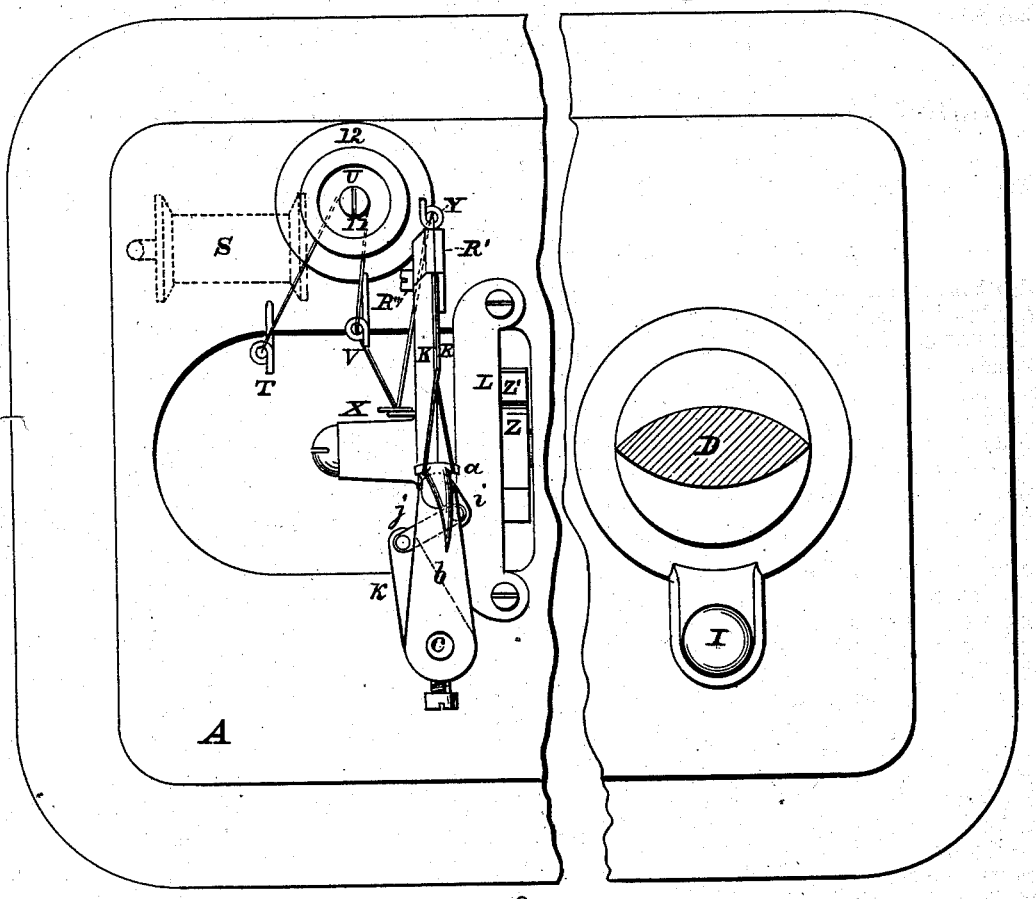

FIG. 6.

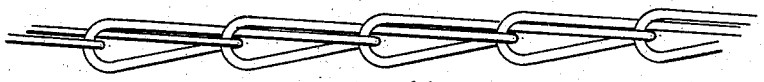

FIG. 7.

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UNITED STATES PATENT OFFICE.

CLARA P. HOFFMAN AND NICHOLAS MEYERS, OF BUFFALO, NEW YORK; SAID MEYERS ASSIGNOR TO SAID HOFFMAN.

IMPROVEMENT IN BLIND-STITCH SEWING-MACHINES.

Specification forming part of Letters Patent No. **207,035**, dated August 13, 1878; application filed April 18, 1878.

To all whom it may concern:

Be it known that we, CLARA P. HOFFMAN and NICHOLAS MEYERS, both of Buffalo, New York, have jointly invented certain new and useful Improvements on a Blind-Stitch Sewing-Machine; and we do hereby declare that the following description of our said invention, taken in connection with the accompanying sheet of drawings, forms a full, clear, and exact specification, which will enable others skilled in the art to which it appertains to make and use the same.

This invention has general reference to sewing-machines; and its object is the production of a machine capable of sewing a blind stitch—that is to say, a stitch that cannot be seen from the upper side of the cloth.

To this end our invention consists, first, in the peculiar stitch; second, in the peculiar arrangement of the needle located, together with the hook or loop-taker, below the table or cloth-plate; third, in the novel construction of the cloth-plate and presser-foot; fourth, in the novel construction and arrangement of the feed; and, lastly, in such novel arrangement of parts and details of construction as hereinafter first fully set forth and described, and then pointed out in the claims.

In the drawings hereinbefore mentioned, Figure 1 is a front elevation of a sewing-machine constructed in accordance with our invention. Fig. 2 is a sectional elevation in line *a a* of Fig. 1. Fig. 3 is a plan of the operating mechanism underneath the bed-plate. Fig. 4 is a plan of the feed mechanism. Fig. 5 is a transverse sectional view in line *b b* of Fig. 4. Fig. 6 is a plan of the operating mechanism above the bed-plate. Fig. 7 is a plan of the stitch.

Like letters of reference indicate corresponding parts in all the figures.

A is the bed-plate, and B a case inclosing the working parts above the bed-plate, said case carrying the cloth-plate C on top. Upon this bed-plate is pivoted the arm D, provided on its forward end with the presser-bar E, operated by the usual handle F, said presser-bar having a spiral spring within the casing G, acting in the well-known manner upon said bar.

The arm D is pivoted to the bed-plate by the bolt J, and may thus be swung away from the casing B to allow the latter being opened, and it is provided with a spring-bolt or similar means, I, whereby it is retained in position centrally over the said case B. This spring-bolt, when pulled upward, recedes from a countersink or recess in the bed-plate, and thus liberates said arm D, while, when it drops into said recess, it locks the same.

The sewing mechanism consists of a needle-bar, K, pivoted centrally underneath the cloth-plate C to a bracket, L, secured to the bed-plate A, and provided on its lower extremity with a slotted aperture, M, engaging the roller-pitman N on the crank O. This crank is secured to the extreme end of the shaft P, which, when revolving, vibrates the needle-bar K.

The needle R is curved to a circle having its center coinciding with that of the pivot of the needle-bar, and it is clamped to the end of said needle-bar by means of the plate R′ and tightening-screw R″ in the usual manner.

It is threaded from a commercial spool, S, through the loop T, tensioning device U, loop V, loops X and Y on the needle-bar K, and then through the eye of the needle.

The vibrating hook or loop-taker *a* is placed on a vibrating arm, *b*, fixed to the upper end of a shaft, *c*, passing through a hollow standard, *d*, to the lower end of which is fixed a crank, *e*. (Best seen in Fig. 3.) This crank connects with a lever, *f*, by means of a rod or link, *g*, and said lever *f* is vibrated by an eccentric, *h*, on the shaft P. The loop-taker *a* is pivoted on the extremity of the arm *b*, and its pivot has on its lower end a crank, *i*, which, by means of a link, *j*, connects with a stationary but adjustable arm, *k*, fastened to the hollow standard *d* by the set-screws *l*. (Shown in Fig. 2.)

The stationary arm *k* is shorter than the vibrating arm *b*, and the consequence thereof is that the loop-taker *a*, while vibrating or moving with the arm *b*, also performs a partial revolution around its own axis, so that at the moment when the needle has completed its forward stroke and just commences to recede the said loop-taker *a* stands at right angles to a line drawn through its pivot-center

and the center of the spindle *c*, while, after it has taken up the thread-loop from the needle it arranges itself in line with the needle. Thus, the said loop-taker performs a quarter-revolution around its axis every time it is vibrated by the arm *b*, the object of which will hereinafter be made to appear.

The arm *f* and eccentric *h* operating in different planes, the said eccentric is connected with the arm by a ball-and-socket joint, *m*, and said eccentric is on its periphery turned into a partial sphere, and the strap for said eccentric formed accordingly, so as to communicate the motion of the shaft P to the arm *f* in a perfect manner.

The feeding of the cloth is performed by mechanism operated by an arm, Z, pivoted to the bracket L behind the needle-bar K, said arm being vibrated by an eccentric, W, placed upon the shaft P.

The feeding mechanism, as illustrated in Figs. 4 and 5 on an enlarged scale, consists of the casing 1, having grooves within which reciprocates a slide, 2. This slide is notched on its forward end at 3 to fit the extremity of a spring, Z′, on the arm Z, and it serves to operate the serrated feed-bar 4 by means of the incline 5, having the projections 6 engaging the projection 7 on said feed-bar 4. This feed-bar is split or bifurcated on its rear end, and passes with the slotted part over the guide-pin 8, which pin serves as a fulcrum for said feed-bar 4. The forward end of the bar 4 is also bifurcated, and one branch downwardly bent at 9, so as to present a serrated part above the cloth-plate C and within the groove or depression C′.

The feed mechanism is a so-called four-motion feed, and operates in the following manner: The slide being actuated, its incline 5 will cause the feed-bar 4 to rise or drop, as the case may be, until the projections 6 engage the projection 7, when said bar will participate in the motion of the slide, thus producing a reciprocating and an up-and-down motion of the feed-bar 4.

To adjust the amount of feed the vibrating arm Z is provided with the spring Z′. Thus, by placing a stop (not s hown) on the sliding bar 4 on either end, to limit its motion, said spring would separate from the arm Z and allow the latter to complete its fixed stroke without moving the serrated feed-bar farther than to said stop.

To provide for the necessary friction on the serrated feed-bar 4, and thus to enable it to remain stationary while being raised or lowered by the incline 5, we have placed a spiral spring, 10, in a recess in the casing 1 at a point in front of the pin 8. This, while producing the desired result, also accomplishes another one, viz., that of depressing the feed-bar 4 on the serrated end in the return stroke of the feed mechanism.

The tensioning device consists of a screw-spindle, 11, Fig. 1, fixed upon the table A, upon which spindle the milled disk 12 revolves. On the upper end of this spindle are provided two disks, U, which are kept in close contact by means of a spiral spring, 13, interposed between said disks U and disk 12. By turning the latter disk it is caused to move up or down upon the screw-spindle, and thereby to either expand or compress the spiral spring, which will thereby press upon the said tension-disks U with more or less force, as the case may be.

The cloth-plate C, which, as heretofore mentioned, has a depression, C′, is pivoted to the casing B on one end, as shown at 14, Fig. 2, and on the opposite end provided with an adjusting-screw, 15, movably secured to said cloth-plate, and operating in a nut, 16, on said case B. By turning this adjusting-screw in the proper direction the cloth-plate C is either raised or lowered, for the purpose hereinafter to be referred to.

The presser-foot E′ has on its forward end a bend to press the cloth to be sewed into the depression C′ of the cloth-plate C.

The sewing by means of this machine is accomplished in the following manner: The cloth to be sewed is placed upon the cloth-plate C, and the presser-foot let down upon it to depress the same into the depression C′. The needle, stepping through this depressed part of the cloth, passes the thread to the loop-taker *a*. On account of the cloth-plate being rendered adjustable, the depth to which the needle penetrates the cloth may be so set that it will pass through any number of thicknesses without passing or piercing the uppermost layer thereof.

After the needle has passed through the depression in the cloth and commences to recede, the loop-taker catches the loop of the thread, and, while revolving into a position in line with the needle, spreads this loop, as illustrated in Fig. 6, and holds the same in that position until the needle has again reached the cloth, which, by the feed mechanism, has been caused to move ahead the distance of one stitch. Now the loop-taker returns to its normal position, casting off the loop previously made, to advance and take the new loop formed. In this manner a succession of stitches is produced, and the loop of one stitch drawn tight by the loop-taker and needle when making the next succeeding stitch.

The stitch as made by this machine is clearly illustrated in Fig. 7.

To the machine may be attached all the various appliances for binding, plaiting, tucking, ruffling, gathering, hemming, cording, &c., which attachments may hereafter form subjects of patents, and need, therefore, not be here described.

It will be readily observed that the various thicknesses of cloth are stitched together by the needle passing in and out of the cloth on the under side only, in contradistinction to those machines where the needle passes vertically through all the layers of cloth, and that, on account of the adjustability of the cloth-plate, the needle may be passed through any

reasonable number of thicknesses of cloth without puncturing the upper layer thereof, whereby we have produced the so-called "blind-stitch," which for many purposes is far more desirable than any other stitch now produced by a machine.

Having thus fully described our invention, we claim as new and desire to secure to us by Letters Patent of the United States—

1. The combination, with the shaft P, of the crank O, pivoted needle-carrier K, having the slotted aperture M, and the clamping-plate R′, needle R, cloth-plate C, having the slotted depression C′, and the presser-foot E′, having the V-shaped projection 17, as and for the purpose specified.

2. The combination, with the eccentric and strap *h*, of the lever *f*, rod *g*, crank *e*, stationary arm *k*, vibrating arm *b*, rod *j*, crank *i*, and loop-taker *a*, as and for the object specified.

3. The combination, with the vibrating needle-bar K, of the hollow standard *d*, shaft *c* with the crank *e*, arm *b*, arm *k*, connected with the crank *i* of the loop-taker *a* by the rod *j*, as and for the purpose described.

4. The combination, with the vibrating arm Z, provided with the spring Z′, of the slide 2, having the incline 5, with the stops 6 and the feed-bar 4, provided with the projection 7, as stated.

5. The combination, with the casing 1, of the notched slide 2, having the incline 5, with the projections 6, the slotted feed-bar 4, sliding upon the pin 8, and provided with the projection 7 and the spiral spring 10, the whole constructed and arranged to operate as and for the purpose specified.

6. The combination, with the arm D, carrying the presser-bar E on its forward end, of the stop-pin I, as stated, said arm being pivoted to the bed-plate A by the screw-bolt J, as specified.

In testimony that we claim the foregoing as our invention we have hereto set our hands and affixed our seals in the presence of two subscribing witnesses.

CLARA P. HOFFMAN. [L. S.]
NICHOLAS MEYERS. [L. S.]

Attest:
MICHAEL J. STARK,
FRANK HIRSCH.