

(Model.)

2 Sheets—Sheet 1.

C. H. BAYLEY.  
SEWING MACHINE.

No. 345,207.

Patented July 6, 1886.

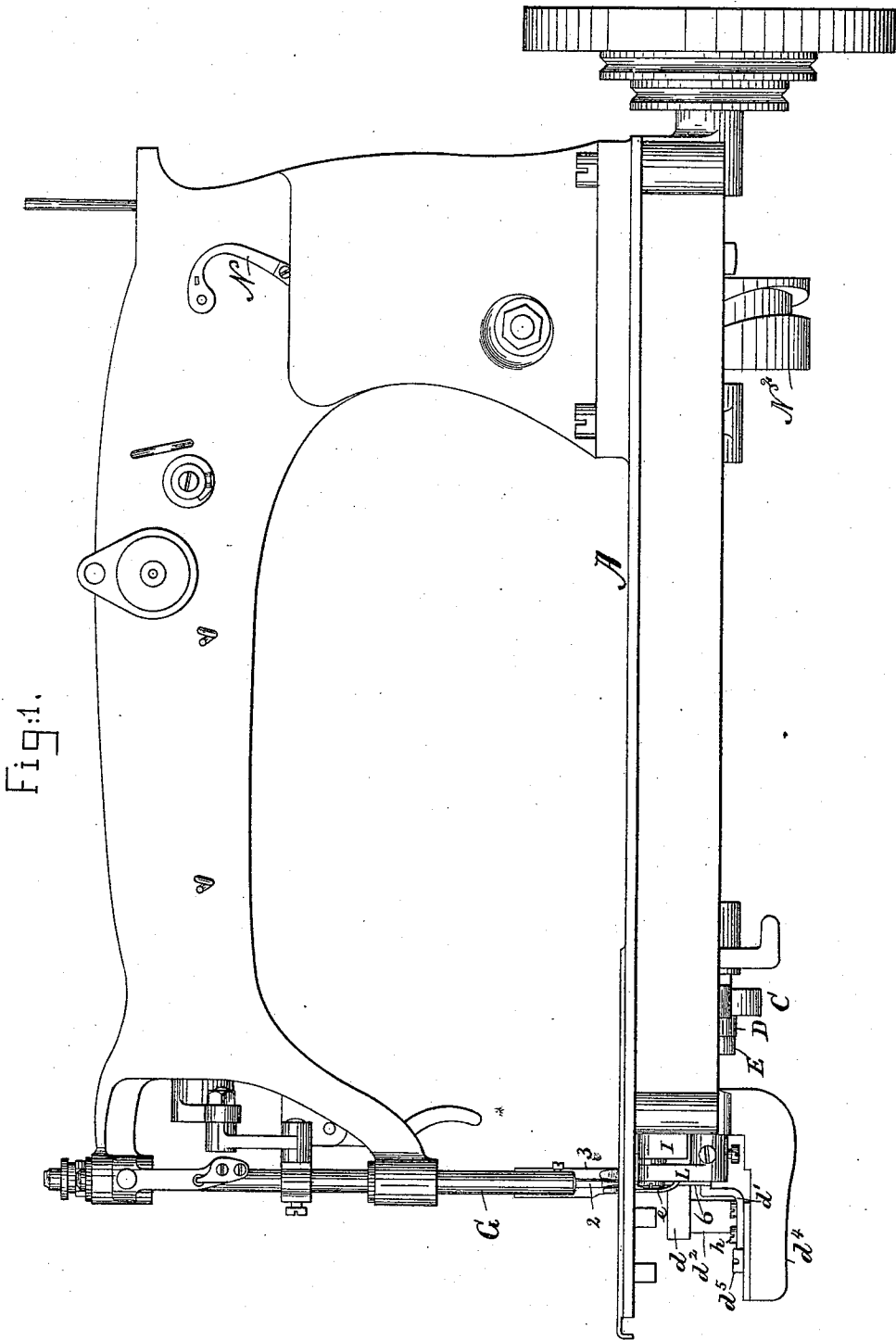


Fig. 1.

Witnesses.

*O. J. Meyer.*  
*John F. C. Prinkesh.*

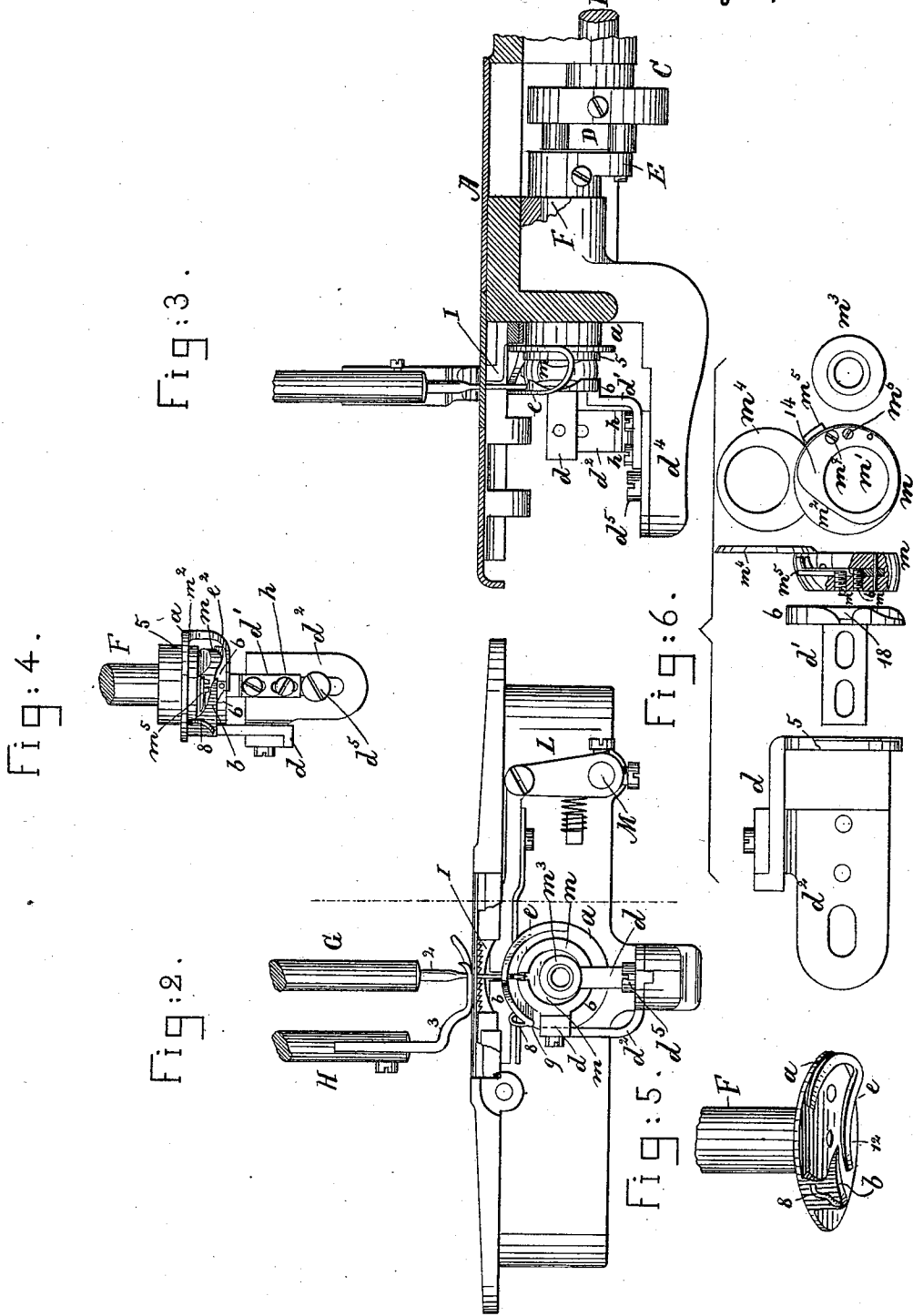
Inventor.

*Charles H. Bayley.*  
*by Crosby & Gregoroffsky*

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Witnesses.  
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Inventor.  
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# UNITED STATES PATENT OFFICE.

CHARLES H. BAYLEY, OF BOSTON, MASS., ASSIGNOR TO THE WHEELER & WILSON MANUFACTURING COMPANY, OF BRIDGEPORT, CONN.

## SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 345,207, dated July 6, 1886.

Application filed July 30, 1883. Serial No. 102,278. (Model.)

*To all whom it may concern:*

Be it known that I, CHARLES H. BAYLEY, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Sewing-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention relates to improvements in that class of sewing-machines in which a lock-stitch is made by an eye-pointed needle and a rotating hook fixed to the shaft which moves it, and which is adapted to take the loop of needle-thread and carry it about a bobbin-case containing the under or second thread.

In sewing mechanism using rotary hooks fixed to their actuating-shafts it is customary to hold the disk-bobbin in a recess at the face of the hook by a ring-slide, a spring on the ring-slide acting against the disk-bobbin, or against a case containing it, but in some classes of work and with some sizes of thread this is objectionable, as too much friction is liable to be exerted on the loop of needle-thread while it is being passed about the bobbin. Too great friction on the loop of needle thread between the bobbin and hook retards the passage of the said loop about the bobbin, so that it sometimes fails to pass beyond the center of the bobbin before the take-up commences to operate, in which case the needle-thread is drawn through the usual tension device from the spool, or the thread failing to be so drawn is broken, and if thread is so supplied the loop held by the hook is made longer than usual, and the take-up fails to draw it back and set the stitch correctly. The act of unwinding the under thread as the stitch is being made rotates the disk-bobbin in a direction opposite that of the rotation of the hook, and the rotation of the hook in contact with the disk-bobbin results in very considerable wear upon both, and in machines run at high speed hooks and bobbins have frequently to be renewed. To obviate the difficulties alluded to, I have produced a novel hook by which the loop of needle-thread is caught and carried about a bobbin-case without friction thereon between the said case and the hook, for in this my improved mechanism the bobbin-case and hook

never come in contact, for the said bobbin-case is held suspended between two holders having surfaces which are adjustable with relation each to the other, to thus accommodate two parts of the holder to the thickness of the bobbin, and both parts of the holder are together adjustable with relation to the face of the hook, to enable the bobbin-case to be placed in proper position in order that the point part of the rotating hook may take the loop of needle-thread and pass its bight between the holders and about the disk-bobbin. The point part of the hook, which takes the loop of needle-thread, may be made to take the said loop from either the right or left side of the needle, the latter being suitably set and threaded to work properly with the hook, and the hook may be rotated in one or the other direction to take the loop of needle-thread, provided the point of the hook is turned in the direction of its rotation.

In the present embodiment of my invention the point of the hook is adapted to turn toward the operator when taking the loop from the needle, and it also takes the said loop from the right-hand side or inside of the needle, the work or material being sewed being supposed to be fed away from the operator.

The front part of my improved hook is provided with a loop-retainer, which acts upon this part of the loop between the point part and the work, and causes it to be thrown forward from the disk of the hook to place it in proper line to be passed across the face of the bobbin and be held near the point part, so as to be readily discharged or cast off as soon as said point part of the hook is directed upward, it having passed its bottom center.

Figure 1 in side elevation represents a sewing-machine embodying my invention. Fig. 2 represents a partial front elevation of a sufficient portion of a sewing-machine of well-known construction to enable me to show my improvements added thereto; Fig. 3, a partial longitudinal section thereof; Fig. 4, a detail in top view of the hook, bobbin, and bobbin-case, and bobbin-holder; Fig. 5, a separate view of the hook; and Fig. 6 represents the parts of the bobbin-holder and disk-bobbin separately.

The bed-plate A, rotating shaft B, flange C, link D, and crank-arm E, connected with the hook-shaft F, needle-bar G, presser-bar H, presser 3, feed I, arm L, and feed rock-shaft M are of usual construction—such as are employed in the well-known Wheeler & Wilson machine, style No. 10—and so need not be herein further particularly described, as the said parts will all be operated as usual in said machine. The take-up lever N and the cam N<sup>2</sup> for moving it are also as in the said No. 10 machine.

My improved hook is composed, essentially, of a plate, *a*, at the front end of the hook-shaft, and a wedge-shaped point-piece, *b*, which is extended outward, and has an outer flat face substantially parallel with the face of the plate *a*, and located at such distance from the face of the said plate as to permit the loop caught and spread on the said point-piece to be passed about the bobbin-case *m*, and between the two ring-like or annular surfaces 5 6 of the arms *d d'* of the bobbin-holder, to be described. The point part *b* of the hook has a loop-retainer, 8, inclined outwardly and backwardly from the small end of the point part. The retainer 8 moves that part of the loop of needle-thread between the point part *b* and the work outward in line with the front of the bobbin-case, and retains the said loop near the front end of the said point part until the latter passes its lowest center, and the small end of the point part is directed upward, at which time the take-up commences to operate upon the needle-thread, the latter being at such time free with relation both to the said point part and the bobbin-case to be drawn up without obstruction.

The part of the loop just described is drawn between the face of the bobbin-case *m* and the surface 6 of the arm *d'* of the bobbin-holder, while that side or half of the said loop which extends from the eye of the needle to the point part *b* is permitted, as the hook is rotated, to slip from the heel underneath the point-part toward the disk *a*, and bring the said half of the loop spread and held by the point part between the rear side of the bobbin-case and the surface 5 of the arm *d* of the holder.

The point part *b* in its rotation carries the loop of needle-thread about the bobbin-case and bobbin, and retains its hold upon the said loop until in the rotation of the hook the point part *b* passes its lower or bottom center and is directed upward, when it releases the said loop and the usual take-up N, actuated by the cam N<sup>2</sup>, commences to draw up the loop of needle-thread, and as the take-up reaches its extreme backward position the stitch is completed.

The hook is provided with a guard or take-up, *e*, shaped, as shown in the drawings, so that the needle in its descent passes behind it. The point 12 of the guard and take-up *e* is directed toward the point *b*, and in its rotation the outer side of this guard acts against the

bobbin or under thread between the bobbin and throat-plate or work, moves the said thread outward and holds it taut, while the usual take-up for the needle-thread completes the stitch, the guard not coming in contact with the under thread until the take-up has nearly drawn up the loop of needle-thread not cast off about the bobbin-case and bobbin. This guard, besides taking up the slack in the bobbin-thread, also draws from the bobbin a length of thread equal to that consumed in making the last stitch. The guard in its rotation carries the bobbin-thread outside of the point *b*, as the said point arrives in position to enter the loop of needle-thread, and after the free end 12 of the said guard passes beyond the said bobbin-thread the bobbin, which just before was drawn up against the upper portion of the surfaces 5 6 of the bobbin-holder *d d'*, is permitted to fall by reason of the slack so given to the bobbin-thread, permitting the bobbin (the bobbin-thread between the work and bobbin being slack) to rest loosely between the surfaces 5 6 of the bobbin-holder, while the loop of needle-thread is being drawn above the bobbin, the said loop in passing under and about the bobbin having only, so far as the bobbin is concerned, to overcome its gravity. The guard leaves the bobbin-thread slack prior to the operation of the feed, so that the work may be fed while the said thread is slack, thus obviating strain on the work from the bobbin-thread during its feeding movement.

The bobbin-case *m* is composed of a circular shell chambered eccentrically at *m'*, (see Fig. 6,) and beveled at *m''* on its front edge, where that part of the needle-thread between the point part *b* of the hook and the work first strikes, thus facilitating the easy passage of the said loop about the bobbin-case and the bobbin *m''* therein. The cover *m'''* is pivoted to the thick part 14 of the bobbin-case, and the said thick part is also slotted to receive the tension-spring *m<sup>5</sup>*, connected therewith by a suitable screw, *m<sup>6</sup>*, and made adjustable by a second or tension-regulating screw, *m<sup>7</sup>*. This tension-spring has two fingers to direct the bobbin-thread after passing between one side of the said spring and the wall of the slot in the bobbin-case. This bobbin-case, in which the bobbin is supported only by the peripheries of its heads, which rest against the inner wall of the bobbin-case, is placed loosely between the bobbin-holder composed of the two arms *d d'*, provided, respectively, with ring-like surfaces 5 6. The arm *d* of the holder is connected with the slide *d<sup>2</sup>*, having a slotted foot adapted to be adjustably attached to the frame-arm *d<sup>1</sup>* by a screw, *d<sup>5</sup>*, which is attached and adjusted as the usual ring-slide or bobbin-holder of a Wheeler & Wilson machine. The arm *d'* of the bobbin-holder is adjustably attached to the slide *d<sup>2</sup>* by screws *h*, so that the said arm may have its ring-like or annular surface *b* adjusted to the proper distance from the surface 5 of the

arm *d*, to permit the bobbin-case to rest loosely between them, and by adjusting this slide *d'* with the two arms *d d'* the front of the bobbin-case can be placed exactly in the proper position with relation to the point part *b*, so that the latter may unerringly draw the loop of needle-thread about the bobbin-case.

As the loop of needle-thread is being passed about the bobbin-case, it is subjected by the bobbin case and holder to a friction measured by only the weight of the bobbin-case and bobbin. The ring-like surface *6* at the front of the bobbin-case is provided with a slot, as at 18, to enable the needle to descend close to the front of the bobbin-case, and the ends formed by making the said slot are beveled to prevent the loop of needle-thread catching thereon in its passage about the bobbin-case.

I do not desire to limit my invention to the exact shape of bobbin-case shown. The holder serves as a support for the bobbin-case at its front and rear sides and about its edges, so that the bobbin-case does not touch the hook, nor can the bobbin itself touch the hook.

I do not claim, broadly, the taking of the loop of under thread from the right hand or rear side of the needle. By the term "rotating hook" I mean to include only a hook having a point which travels in a true circle with relation to the axis of the shaft which directly moves it; or, in other words, I do not claim an elliptically-moving hook, or a hook made as a lever and carried by a crank.

I claim—

1. The combination, with the eye-pointed needle, feed mechanism, and means to operate them, and the bobbin and holder therefor, of the hook-shaft, its plate *a*, the wedge-shaped point-piece *b*, extending out from and then parallel with the plate, the loop-retainer *8*, inclined outward and backward from the small end of the point part, and the guard and take-up *e*, substantially as described.

2. The combination, with the eye-pointed needle, feed mechanism, and means to operate them, of the hook-shaft, its plate *a*, the wedge-shaped point-piece *b*, extending from the plate, as set forth, the loop-retainer, guard, and take-ups, and the bobbin and its case suspended between adjustable arms, substantially as shown and described.

3. In a sewing machine, the bobbin, bobbin-case, and bobbin-holder to hold the bobbin-case at each side, combined with a rotating hook provided with a guard and take-up, *e*, to act upon the bobbin-thread between the bobbin and work and draw the thread from the bobbin prior to feeding the work, thereby permitting the work to be fed without strain thereon from the under thread, substantially as described.

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

CHARLES H. BAYLEY.

Witnesses:

G. W. GREGORY,  
B. J. NOYES.