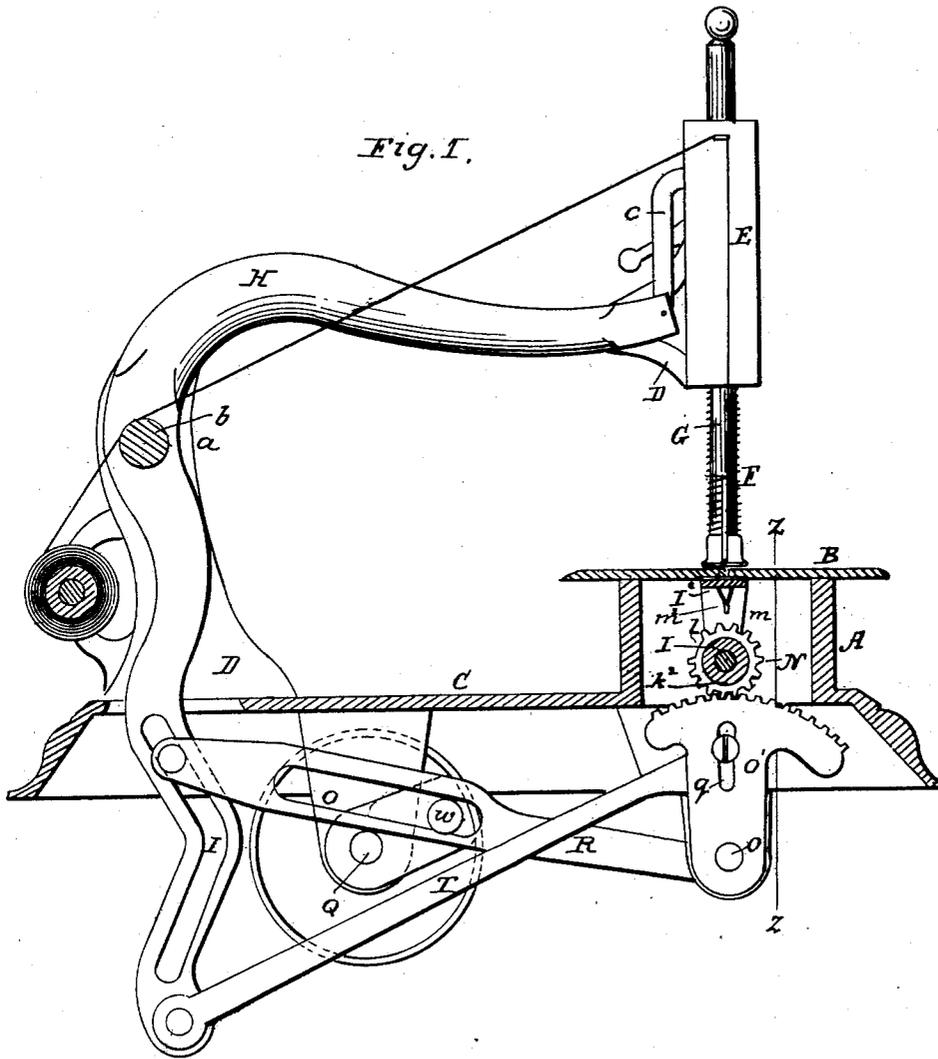


J. B. WINCHELL.

Sewing Machine.

No. 35,191.

Patented May 6, 1862.



Witnesses:
August Dietrich
Calvin S. Jacob

Inventor:
J. B. Winchell
 by
Mason Fenwick & Lawrence
his atty.

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3 Sheets—Sheet 2.

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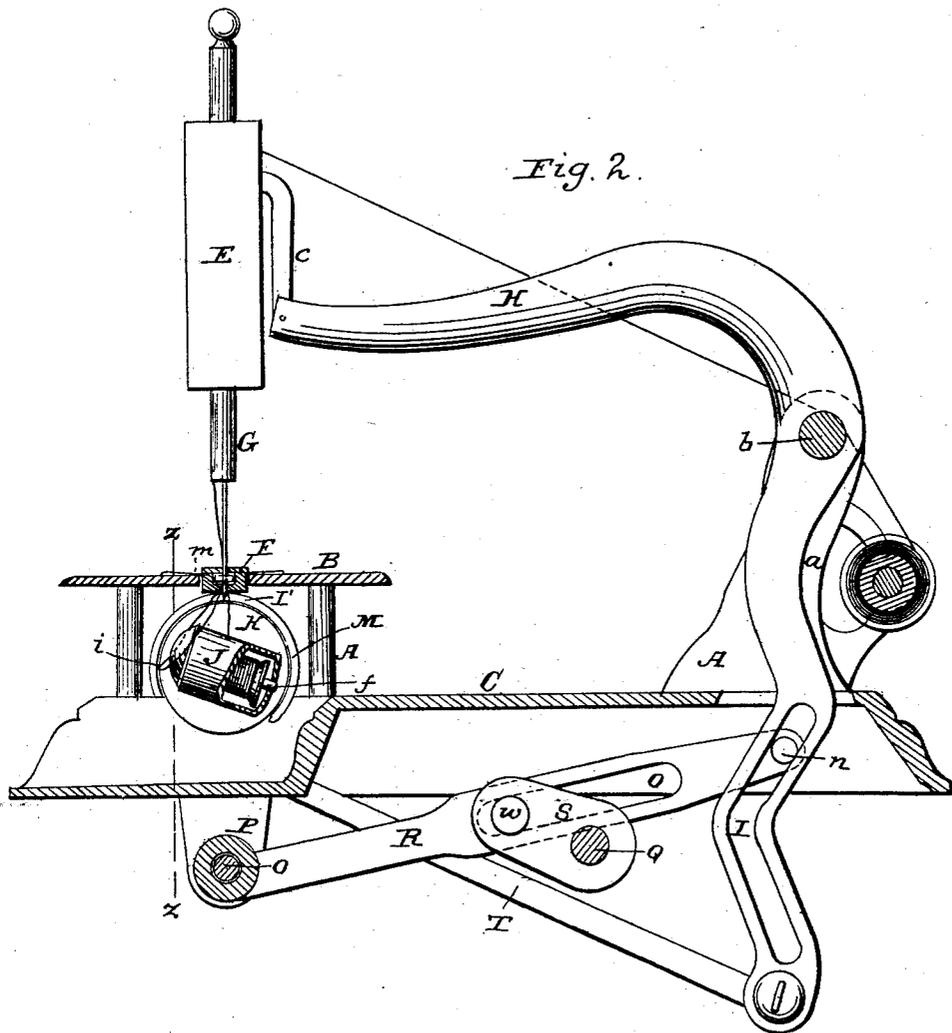


Fig. 2.

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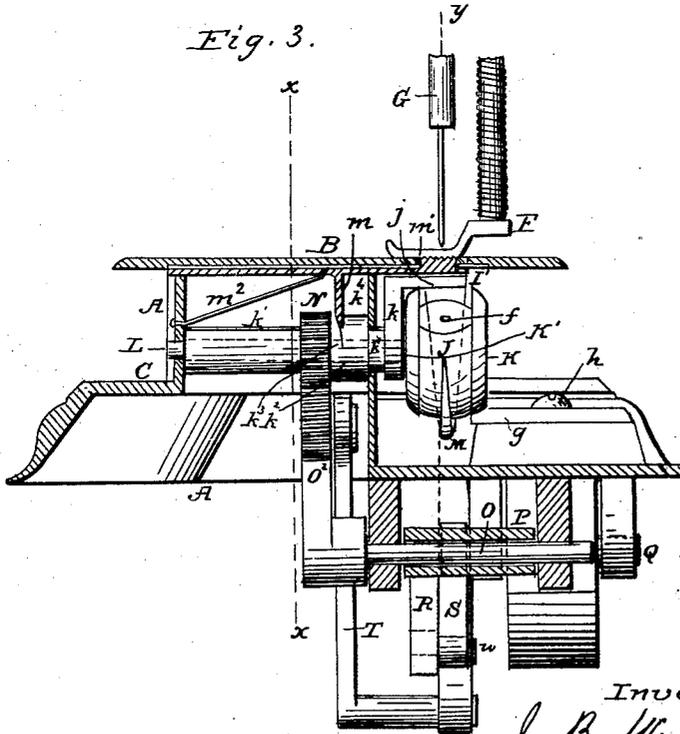
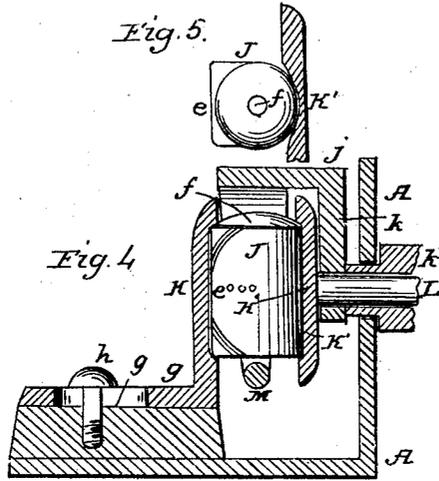
Gustavus Dietrich
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UNITED STATES PATENT OFFICE.

J. B. WINCHELL, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 35,191, dated May 6, 1862.

To all whom it may concern:

Be it known that I, J. B. WINCHELL, of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Double-Thread Lock-Stitch Sewing-Machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical longitudinal section of a sewing-machine with my improvements applied to it in the line *xx* of Fig. 3. Fig. 2 is also a vertical longitudinal section of the machine in the line *yy* of Fig. 3. Fig. 3 is a vertical transverse section of the same in the line *zz* of Figs. 1 and 2.

Similar letters of reference in the several figures indicate corresponding parts.

My invention consists, first, in so organizing a double-thread sewing-machine which employs a one-pointed hook or interlocking device that it continuously sews cloth or other material without changing the direction of its feed or the character of the sewing, whether the mechanism intermediate the driving-shaft and the shaft of the lower thread-interlocking device is set in motion by a forward or a backward revolution of the main shaft; second, in constructing a lower thread-case of nearly cylindrical form between its ends, and of rounded form at its termini, and with a movable axial pin, and arranging the said case between two disks, one of which has a dishing concave face and the other a partially-cylindrical concave face, so that an ordinary spool of cotton, instead of a bobbin, may be confined from moving in the path of a circle on its major and minor imaginary axes, and thus practicably be used, and, also, that the loop of the needle may be carried entirely around the case in a manner to effect an interlock of the upper thread with the lower thread before the stitch is drawn up into the cloth with but slight friction or bind upon the loop of the upper thread; third, in so constructing and arranging the mechanism intermediate the main shaft and the shaft of the interlocking device that the needle-bar produces two up-and-down movements and the interlocking device two circular reciprocating movements, and thus form two stitches during each revolution of a short crank-arm of the main shaft or pulley.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation with reference to the drawings.

A is the frame of the machine; B, the sewing-table, elevated above the bed-plate C by means of a rectangular hollow support of the frame, as shown.

D is the arm, which supports on its front end the guide-box E of an ordinary spring pressure-foot, F, and of the reciprocating needle-bar G, as shown. On the bar and guide-box, or at other suitable points, any of the approved tension devices may be arranged.

H is the needle arm or lever, pivoted to the upright *a* of the frame, and to the guide-box arm D, as at *b*. This lever extends forward and connects by a link, *c*, with the needle-bar. It also extends downward from its fulcrum and terminates below the bed-plate in form of an obtuse angle, or nearly a right angle. In this angular portion a slot, I, of a shape corresponding to the outline just named, is formed, as shown.

I' is a reciprocating feeder.

J is a thread-case of cylindrical form between its ends, except at one part, *e*, where it is flat, and it is tapered off at the corners, as shown in Fig. 4. The ends or heads of this case are bulging or semi-elliptic in form, and one of them is removable, like a cover, being fitted to a socket of the case, so as to form a smooth continuation of it. To the center of this movable head an axial pin, *f*, is attached, and in the fixed head a central bearing for the end of said pin to fit in is formed. The axial pin passes through the eye of a common spool of cotton, and when the spool is in the case J it revolves on the pin. Thus the necessity of winding upon a bobbin is obviated. The thread-case is arranged incliningly below the sewing-table and directly under the needle, between two concave disks, K K', the disk K being on its inner face of dishing concave form, and having at its base a horizontal slide, *g*, with longitudinal slot *g'* in it, and being confined by means of a set-screw, *h*, to a raised seat of the bed-plate, and capable of being adjusted as occasion may require. The disk K' is on its inner face concave, but in a partially-cylindrical form, and is attached fast to a still shaft, L, which has its bearings in the box-shaped support of the sewing-table C. Both

of these disks are stationary as to rotary motion; but the one, K, is adjustable longitudinally by means of the slot and set-screw, so that the thread-case shall be confined more or less snugly between the two disks. It is obvious that the flat side of the case, in connection with the partially-cylindric concavity of disk K', prevents any rotary motion of the same, and that the tapered corners and bulging ends of the case admit the outer edges of the disk to overlap a portion of the case, and also ease the passage of the needle-loop around it, and, also, that by thus having the disks overlap the case J the case will maintain its position, although it is not and must not be clamped tightly between the disks; it requiring to be sufficiently loose to allow the thread of the needle-loop to pass between it and the disks. Around this thread-case a hook, M, which is concentric in its movement with the axis of the still shaft L, is arranged midway of the space between the disks and outside or partly around the thread-case J. One end of this hook is sharp or pointed, and from said point it gradually widens, and near the terminus of said widened portion, on the under or inner side, a barb, *i*, is formed, as shown. Just beyond this barb a horizontal arm, *j*, is formed on the hook, and this arm attaches to a crank, *k*, the shaft *k'* of which is tubular and fits loosely round the still shaft L, as shown in Figs. 1, 3, and 4. This hook takes into the loop of the needle-thread and holds it, with its barb, until it has spread open wide enough to encircle the thread-case and has passed around the said case from the front to the rear end thereof, and then releases its hold upon the loop. The motions of the hook are peculiar, and the means for producing these motions are as follows:

N is a pinion on the tubular shaft *k'*. This pinion has teeth all around it, except at one point, as indicated at *l*. Alongside the pinion, and attached fast to it, a cam, *k²*, is constructed. This cam rises eccentrically from a cylindrical hub of the pinion, as at *k³*, and terminates in a narrow oblique vertical shoulder, *k⁴*. The cam portion of the pinion operates upon an angular tension, *m*, of the cloth-feeder I', and by its part *k³* elevates the feeder, so that its serrated portion *m'* rises through a slot in the table, above the surface of the table, and by its part *k⁴* slides the feeder forward. A spring, *m²*, made of rubber or other material, returns the feeder to its normal position after the feed of the cloth the distance of a stitch has been accomplished.

O is a horizontal shaft arranged transversely under the bed-plate of the machine, and nearly in the same vertical plane with the shaft *k'*, as shown.

P is a tubular shaft fitted loosely around the shaft O, between two fixed bearings of the bed-plate.

Q is a main shaft arranged some distance in rear of the shafts O P, on the under side of the bed-plate, as shown. On the shaft O,

which is a rock-shaft, an arm, O', of segment form at its terminus, is fastened. The circumference of this segment is toothed, and gears with the toothed pinion N. To the shaft P a connecting-rod, R, attaches, and therefrom runs back and connects by a pin, *n*, to the extension of the needle-arm H, said pin fitting loosely in the obtuse-angle slot I. It also connects, by means of a longitudinal slot, *o*, and a crank-arm, S, with pin *w* to the main shaft Q, the crank-arm being on the main shaft and the slot being in the connecting-rod. A further connection is made between the needle-arm and the reciprocating hook by means of a connecting-rod, T, which is pivoted at one end to the last extremity of the needle-arm extension, and at the other end to the face of the segment O', this last attachment being effected by a slot, *g*, in the segment and a set-screw pivot, so that the length of movement may be adjusted as occasion may require. By means of this last connection the segment is reciprocated, and it is of no moment whether the segment is first moved to the right or left or backward or forward by the other gearing, as the pinion of the hook-shaft will cause the hook to work in the proper manner, however the segment starts, and the same also is the case with the cam of the pinion with respect to the feeder.

From the foregoing description it will be understood that if the machine is driven from a pulley or crank on the main shaft in a forward or backward direction the needle will descend through the cloth and carry thread from the ordinary upper spool below the bed-plate in form of a loop, this motion being produced from the frictional contact of the pin *n* of connecting-rod R with the upper half of the angular slotted extension of needle-arm; that simultaneously with this movement of the needle the hook M is turned back to a position ready to return forward and take the loop of the needle-thread, this motion being produced by the pull of the lower end of the needle-arm, due to the aforesaid frictional contact against the segment O'. The contact and traverse of the pin *n* is due to the revolution of the crank-pin of the driving-shaft, such motion causing the crank-pin *w* to impinge against the slotted portion of the connecting-rod R, and thereby depress the same the distance that the pin *n* is said to have traversed the slotted extension of the needle-arm. The hook now returns and takes into the loop of the needle-thread, (the needle at the same time receding,) and moves through it its whole circumference, then reverses its motion, and almost immediately thereafter catches the loop with its barb and carries it, considerably spread open, around the lower thread-case; from front to rear end, and then releases the loop and reverses its motion. The loop of course interlocks by being thus carried round the lower spool-case with the thread, which extends up from the lower spool into the cloth. These last motions of hook and needle are produced by the frictional contact of the pin *n* with the lower

or remaining half of the obtuse-angle portion of the needle-arm, due to a further impingement upon and depression of the slotted portion of connecting-rod R by the crank-pin W of the driving-shaft Q, and by the consequent thrust of the angled end of the needle-arm against the toothed segment-arm. The same motions of the needle and hook and a feed of the cloth take place as the pin *n* ascends in the obtuse-angle slot of the needle-arm, and therefore two stitches are formed during every revolution of the main shaft or vibration of the rock-shaft P. The slack of the threads and the tightening of the stitches are controlled by the ordinary methods and the motions of the needle.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A sewing-machine organization which will interlock two threads and sew continuously in the same direction, without changing the direction of feed or the character of sewing, with

a single-pointed hook or interlocking device, substantially as described, whether the connecting mechanism intermediate between the upper needle and the hook or interlocking device is set in motion by either a back or forward revolution of the main shaft, substantially as set forth.

2. The combination of the specified lower spool-case and the specified disks between which it is arranged, and all the remaining specified operative parts of mechanism, substantially as and for the purposes set forth.

3. The combination of the angular slotted extension of the needle-arm, slotted connecting-rod R, main shaft Q, rod T, segment-arm O', and pinion N, or their equivalents, substantially as and for the purposes set forth.

J. B. WINCHELL.

Witnesses:

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CHARLES BERKER.