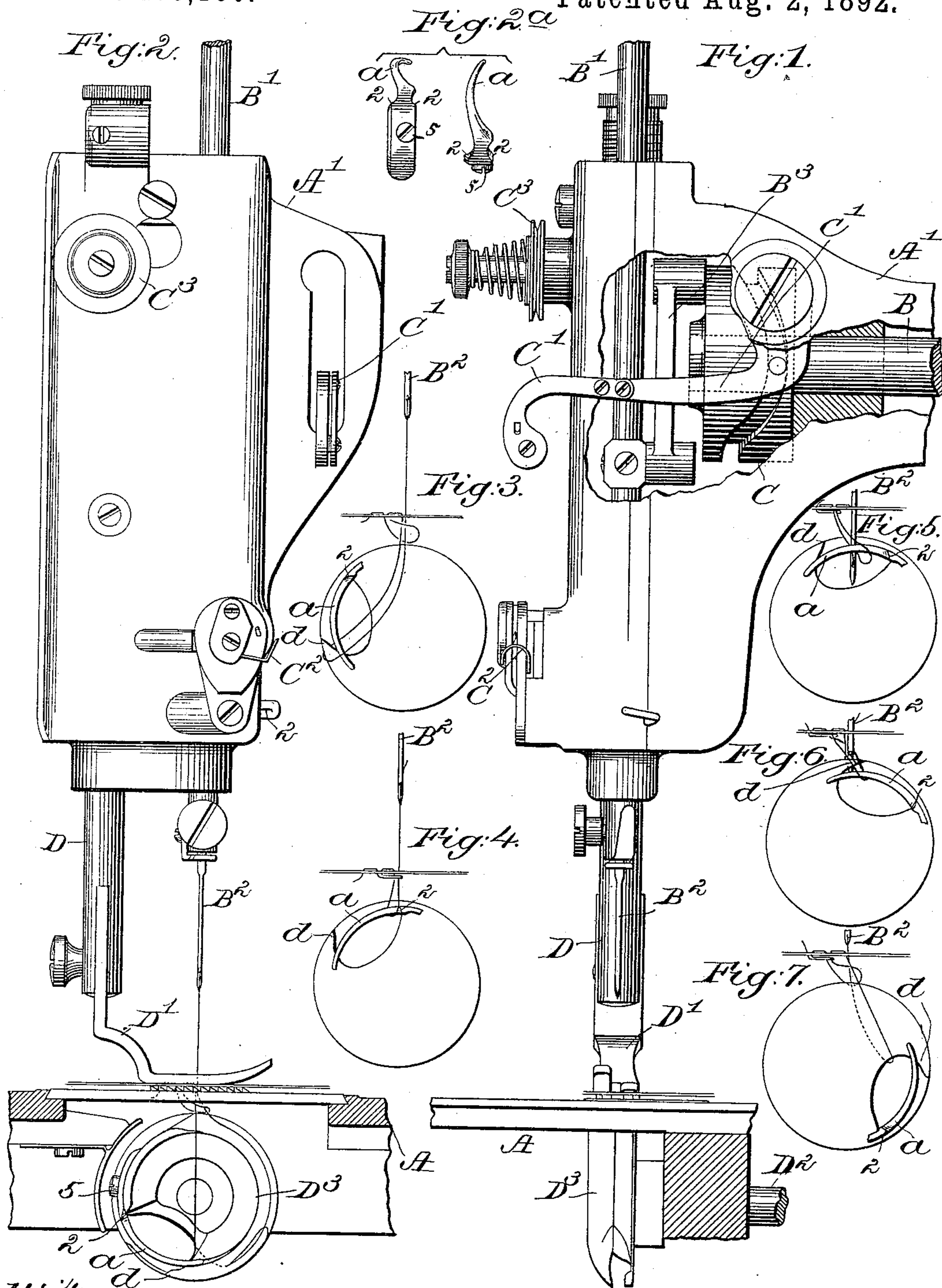


(No Model.)

W. F. DIAL.
LOOP TAKER FOR SEWING MACHINES.

No. 480,180.

Patented Aug. 2, 1892.



Witnesses.
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UNITED STATES PATENT OFFICE.

WILBUR F. DIAL, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO THE
WHEELER & WILSON MANUFACTURING COMPANY, OF SAME PLACE.

LOOP-TAKER FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 480,180, dated August 2, 1892.

Application filed November 2, 1891. Serial No. 410,595. (No model.)

To all whom it may concern:

Be it known that I, WILBUR F. DIAL, of Bridgeport, county of Fairfield, State of Connecticut, have invented an Improvement in Sewing-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

Parties using lock-stitch sewing-machines frequently find it desirable for some classes of work, especially children's work, to use a chain or loop stitch, and many attempts have been made to provide a lock-stitch machine with devices whereby it might be used to make a chain or loop stitch; but all such attempts known to me have been attended with more or less expense and have required the addition of complicated parts not adapted to be easily applied or removed by ordinary users when not needed.

Appreciating the advantages of an interchangeable-stitch machine, I have selected as a basis of my invention the so-called "Wheeler & Wilson hook," made as a single piece and capable of being run for stitching purposes at high velocity, and by experiment I have devised a single-piece loop receiver and discharger, which when it is desired to make a chain or loop stitch may be easily applied by a screw or in other suitable manner directly to and so as to form a part of the said hook.

It will be obvious to those skilled in the art that the loop receiver and discharger which I have referred to as adapted to be applied to the usual Wheeler & Wilson hook might be made as an integral part of the hook and yet not depart from my invention, as in such event it would only be necessary to remove the hook and hook-shaft of the old kind and substitute a hook of my improved pattern when it was desired to make a chain or loop stitch.

Figure 1 is a partial side elevation of a sewing-machine embodying my improvements. Fig. 2 is a partial front elevation and section of the machine shown in Fig. 1. Fig. 2^a shows the loop receiver and detainer detached, and Figs. 3 to 7 are diagrams illustrating my improved device in different positions to show

the manner of manipulating the needle-thread in the formation of a chain or loop stitch.

The bed-plate A, the overhanging arm A', the main shaft B in the said arm, the needle-bar B', provided with an eye-pointed needle B² and reciprocated by suitable link or other connection B³, the hub C on the main shaft B, it having a suitable groove to actuate the take-up lever C', the slack-thread controller C², the tension device C³, the presser-bar D, the presser-foot D', and the hook-shaft D², having at its forward end a rotating hook D³, are and may be all substantially as common to the Wheeler & Wilson machine, style No. 9, so the said parts need not be specifically further described further than to say that when the said hook has co-operating with it a bobbin and bobbin-case and a bobbin-holder a lock-stitch will be made. I have referred to these devices forming part of a well-known machine upon which I have chosen to illustrate my invention; but I desire it to be understood that the needle-bar, the feed used, and the take-up may be of any other usual or suitable form and that instead of the particular or exact form of hook referred to I may as a foundation upon which to build my invention use any other equivalent hook adapted to co-operate with a disk-bobbin and take a loop of needle-thread and cast the same about the disk-bobbin in the production of a lock-stitch—i. e., when the machine containing my improvements is to be adapted to make a lock-stitch and to be readily changed to make a chain or loop stitch.

In accordance with my invention I have devised a loop receiver and retainer, (shown as a finger *a*; represented separately in Fig. 2^a;) the said finger being so shaped and applied to the usual hook D³ at or near the heel thereof that the said loop or finger besides receiving and detaining the loop also expands and discharges the loop, the free end or point of the finger being inturned and terminating at a short distance from the regular point of the hook and near the inner wall of the cavity occupied by the bobbin in the face of the hook; but it will be understood that the particular shape of the cavity in which the

point of the finger enters is not material to this invention.

I desire particularly that it be understood that the finger or device *a* referred to, which
 5 is added to the hook *D*³ and which co-operates with the usual point *d* of the hook, (the point which first takes the loop of needle-thread from the eye-pointed needle,) does not
 10 pass from end to end continuously through the loop—*i. e.*, one end of the finger does not enter the loop and the finger then pass through the loop and the loop pass off the opposite end of the finger—as in other earlier
 15 plans in which it has been attempted to change a lock-stitch machine into a chain or loop stitch machine, but in accordance with my invention the loop taken by the point *d* of the regular hook, being discharged therefrom directly upon the point of the finger *a*
 20 and made to travel to the base 2 of the finger, as in Fig. 4, where it is attached to the heel of the hook, and in the further rotation of the hook, the finger *a* moving in unison with it, the loop
 25 cast upon the base 2 of the hook by an upward movement of the take-up is retarded slightly and expanded slightly, (see Fig. 5,) so that the eye-pointed needle at its next descent readily passes through the said loop, and in the further rotation of the hook to enable its point
 30 to enter the new loop to be formed at the eye of the needle, as in Fig. 6, the said finger guides the previously-formed loop and carries it out of the way of the point *d* of the hook in its rotation. As soon as the point *d*
 35 of the hook has entered the new loop (see Fig. 6) the previously-formed loop in the further rotation of the hook is discharged off the point of the finger (the same point over which it first passed) and the said previously-formed
 40 loop is left open and incomplete below the cloth, (see Fig. 7,) while the hook continues to rotate, expand the loop last entered by it, (see Figs. 7 and 1,) and cast it upon the finger, (see Fig. 3,) the previously-formed loop being
 45 drawn up by the take-up immediately after the last loop made is cast upon the finger and carried to its base, as in Fig. 4.

In the present form of my invention the usual hook has a threaded hole in its outer
 50 wall (not herein shown) near its heel, and when it is desired to make a chain or loop stitch it is only necessary to apply my improved finger *a* by a screw 5 or other suitable attaching means, removing the usual bobbin and bobbin-case from the machine, how-
 55 ever, before commencing to stitch.

It will be obvious that I might permanently attach the finger to the heel of the hook and when it is desired to change from a lock-stitch
 60 to a chain or loop stitch machine substitute one hook for the other. I desire also to state that the parts instrumental in forming the chain or loop stitch are the point of the hook, it being long enough to enter the loop of needle-thread
 65 and being so shaped as to spread the loop preparatory to discharging it upon the point of the finger, and the finger attached to what

may be called the "heel" of the hook, and therefore it is not essential to my invention, in so far as the production of the chain or loop
 70 stitch is concerned, as to what is the particular configuration of the hook or the casting to which the said point and the finger are connected, so long as the point of the hook takes the loop of needle-thread from the needle, and,
 75 moving continuously in one direction, or rotating, casts the said loop from its long point upon the point of the finger to the base thereof and so long as the finger in the further rotation of the hook in the same direction de-
 80 tains, spreads, guides, and casts off the said loop.

The particular stitch herein shown is that made by the Willcox & Gibbs sewing-machine, it having a half-twist in the loop at the under
 85 side of the material.

In the drawings I have, to represent the feed, shown only part of the usual serrated dog which in practice is attached to the usual
 90 feed-bar.

It will be noticed in my invention that the finger referred to has deposited directly upon it the loop of needle-thread caught and de-
 95 tained by the point of the hook and that said finger in the rotation of the hook not only holds but expands and then discharges the loop; but not until another loop has been formed by the needle.

I am aware that a rotating hook has been provided with two points and with wings or
 100 guards near them to act against and prevent a loop cast off from the point of one hook from being accidentally caught by the second point of the hook, the two hooks following one the other, as such a hook is shown in
 105 United States Patent No. 202,738, it being adapted to make two stitches during each complete rotation. I am also aware that a rotating hook has been provided with a finger outside the point of the hook to prevent
 110 the loop of needle-thread from being thrown off on the front side of the needle, said finger keeping the loop of needle-thread out of the way of the point of the hook.

Having described my invention, what I
 115 claim, and desire to secure by Letters Patent, is—

1. A shaft and a rotating hook, substantially as described, fixed thereto and having a point and a heel and having fixed to it at its heel
 120 end a loop-receiving finger having its point or free end located back of the regular point of the hook, the said finger receiving upon its point directly from the point of the hook the loop cast upon the finger, being free to pass
 125 substantially to the base thereof, the finger serving to detain and expand the loop so cast upon it until the needle has again descended and passed through the said loop and the regular point of the hook has entered a new loop
 130 of needle-thread, as and for the purposes set forth.

2. In a sewing-machine, the following instrumentalities, viz: a needle-bar having an

eye-pointed needle, means to reciprocate the same, and a rotating shaft provided with a hook fast thereon and having a loop-taking point, as *d*, to enter the loop of needle-thread and
5 having a loop-receiving finger, as *a*, fixed to it at its heel, said finger being secured thereto at a distance from the point of the hook in the direction of its rotation, the said finger terminating at its free end at a distance be-
10 hind the point *d* of the hook and within the circular path traveled by the beak of said hook, the said finger being adapted in the rotation of the hook to have cast about it from the point *d* of the hook the loop of needle-
15 thread, said finger by entering the loop serv-

ing to detain and spread the same while the needle in its next descent penetrates the loop held by the finger, the finger thereafter discharging the said loop, but not until after the point of the hook has passed through the loop 20 of needle-thread carried through the detained loop, substantially as described.

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

WILBUR F. DIAL.

Witnesses:

GEO. W. GREGORY,
EMMA J. BENNETT.