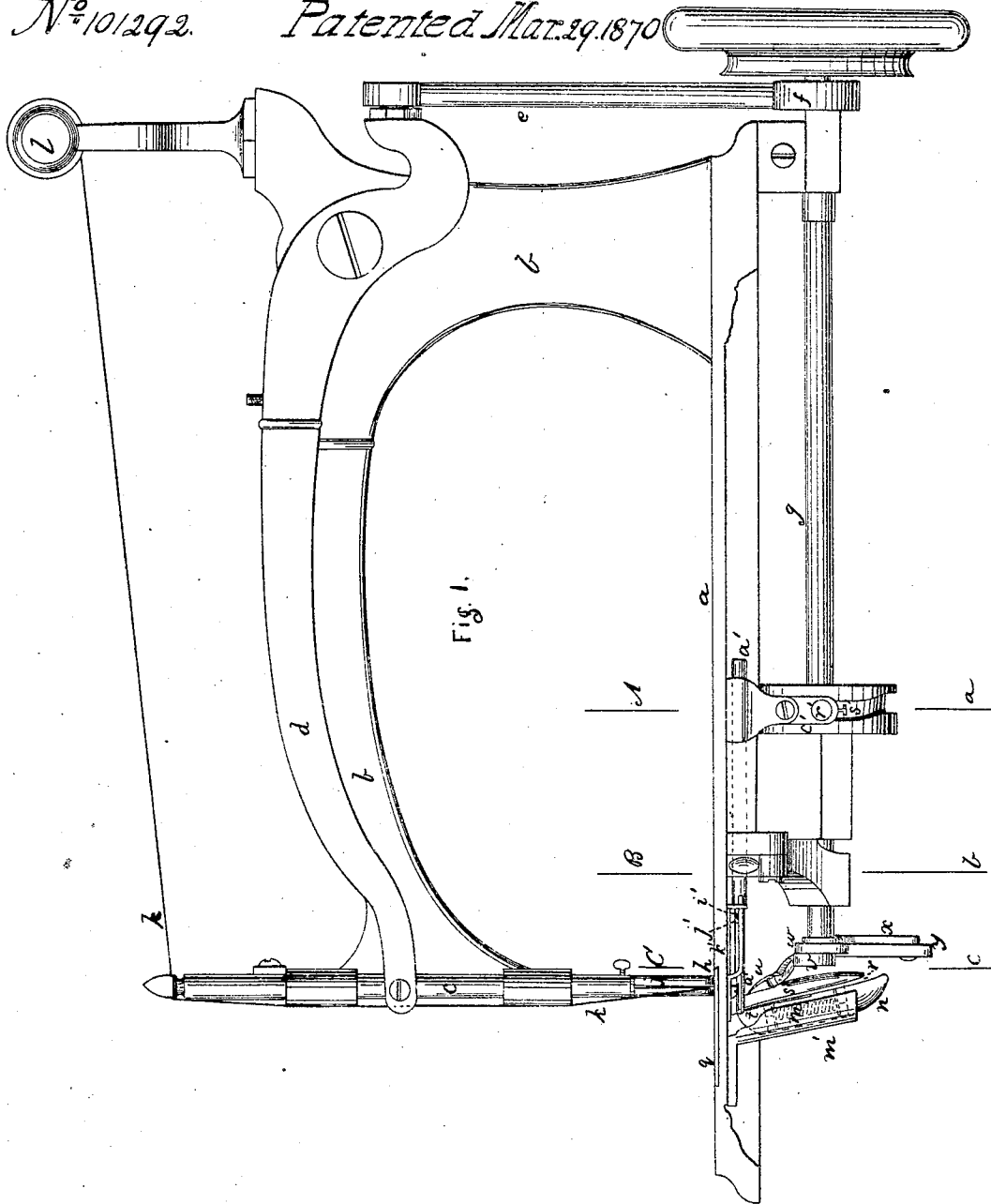


W. S. Mead *Sheet 1 - 3 Sheets.*
Sewing Mach.

N^o 101292.

Patented Mar. 29, 1870



Witnesses.

A. J. DeLacy
& B. Bishop.

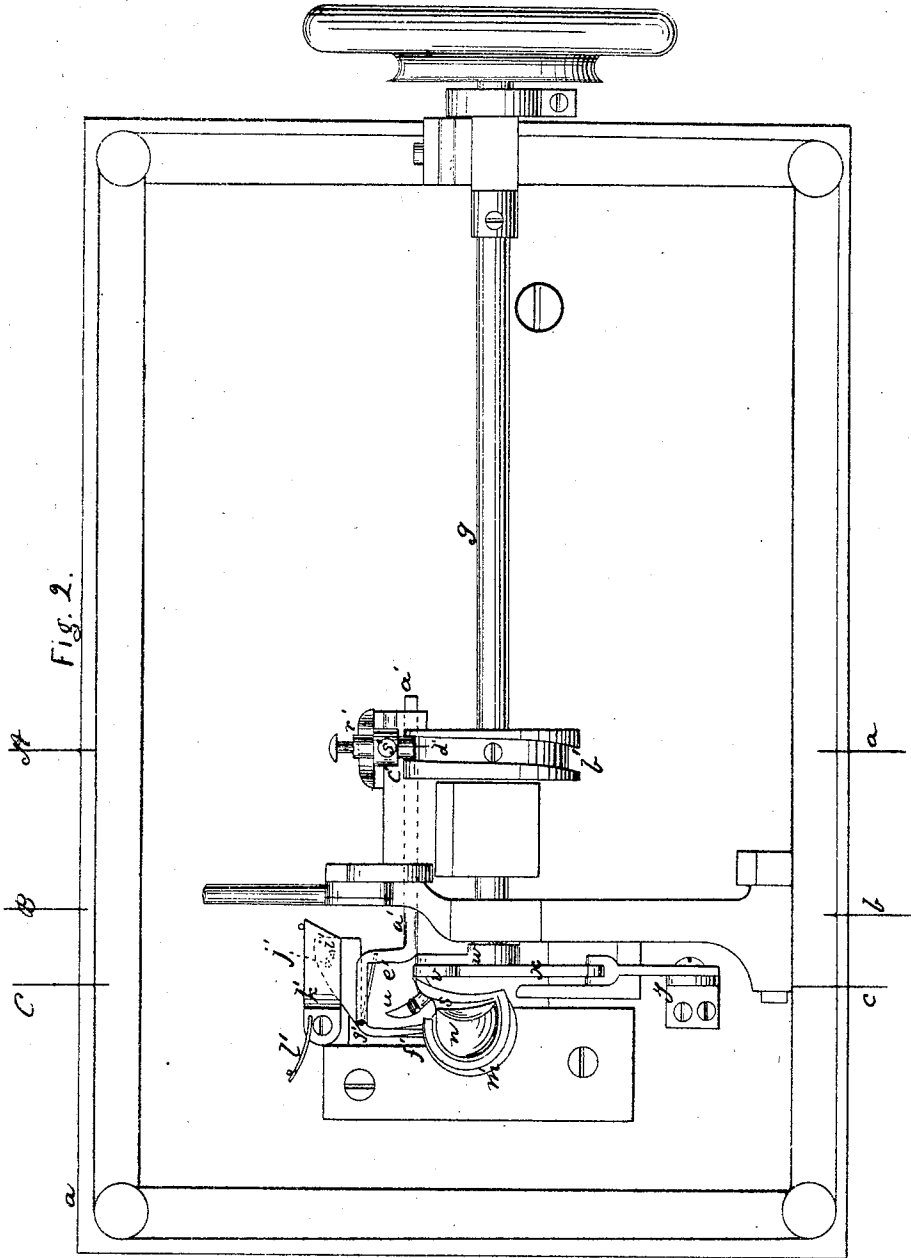
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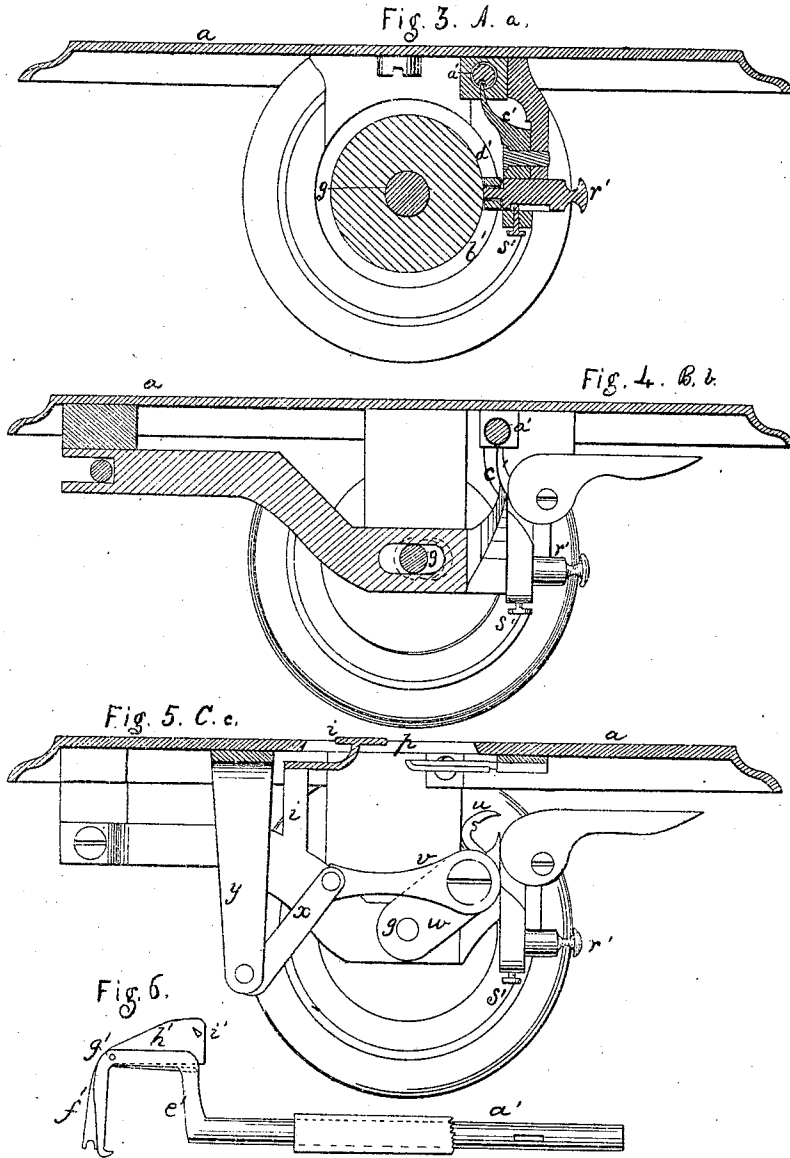
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Witnesses.

Wm. H. Bishop
E. C. Peckill

Inventor.

W. S. Mead

United States Patent Office.

WILLIAM S. MEAD, OF NEW YORK, N. Y

Letters Patent No. 101,292, dated March 29, 1870; antedated March 17, 1870.

IMPROVEMENT IN SEWING-MACHINE.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, WILLIAM S. MEAD, of the city, county, and State of New York, have invented certain new and useful Improvements in Sewing-Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings making part of this specification, in which—

Figure 1 is a front elevation;

Figure 2 is a bottom view;

Figures 3, 4, and 5, are cross vertical sections taken in the planes of the lines A a, B b, and C c, of figs. 1 and 2; and

Figure 6 is a separate view on an enlarged scale of the thumb-and-finger mechanism.

The same letters indicate like parts in all the figures.

My said invention relates to improvements on a machine described in and secured by Letters Patent granted to H. William Dopp on the 28th day of February, 1860, by means of which said improved machine three different kinds of stitches heretofore made by the machine described in the said Dopp patent can be formed much more rapidly with less liability to derangement and with less noise, viz., the rotary stitch, the latter having one of the threads appear on the under surface of the cloth as having been wound around the other in a spiral form.

In the accompanying drawings—

a represents the table of the machine, and

b, a standard and curved arm in the vertical front end of which the needle-bar *c* slides, in manner not materially different from other sewing-machines.

The needle-bar is reciprocated by a lever, *d*, which receives motion by an eccentric rod, *e*, from an eccentric, *f*, on the main shaft *g* below the table, or in any other suitable manner well known to constructors of sewing-machines.

The presser-foot *h* for holding the material to be sewed onto the table is mounted in the front end of the arm of the standard by the side of the needle-bar, in manner not materially different from other machines.

And the feeder *i* is arranged below and acts on the material through an aperture in the table, as is well-known, and the required motion is given to the feeder in manner represented in the accompanying drawings, and as is well known to persons skilled in the art.

The needle *j* is of the usual form, but may be shorter than used in other machines, by reason of the organization which co-operates with it for the formation of the stitches, and to be hereinafter described.

The needle-thread *k* is on a spool, *l*, and passes through suitable guides to the needle, and is to be con-

trolled by any of the known means for regulating the tension.

And the shuttle-thread on a spool, *m*, is mounted in a shuttle, *n*, the form of which may be varied, although I prefer to make it as represented in the drawings.

This shuttle, with its spool of thread, is dropped into a case or shuttle-holder, *m'*, secured to the under side of the table and close to the aperture in the table in which the needle works, and is inserted through an aperture, *p*, in the table, covered by a sliding plate, *q*.

When inserted the shuttle remains stationary during the operations of the machine, except a slight movement given to it by the thread, it being loosely fitted in the case for that purpose, and both the shuttle and the case are slightly inclined from a perpendicular line, as represented.

The horizontal section of the shuttle-case is very similar to a corresponding section of the shuttle, and has an opening, *r*, along its entire height in front and between the flat part *s* next to the needle and the curved back, which opening is for the passage of the loop of the needle-thread which is carried around it, as will be hereinafter described.

The shuttle-thread *t* extends from the shuttle over the upper edge of the flat part *s* of the shuttle-case to the cloth to be sewed.

So soon as the needle has descended and carried its thread below the table, the loop of this thread is taken by a hook, *u*, which opens out the loop and carries it around the shuttle to interlock the needle-thread with the shuttle-thread.

This hook is formed as represented, and projects from the front of a link, *v*, and near to that end of the link which is fitted to a crank-pin, *w*, on the end of the main shaft *g*; and the other or upper end of the hook *v* is hinged to one end of a radius-bar, *x*, the lower end of which is in turn hinged to a hanger, *y*, attached to the under side of the table.

The motion given to the hook by reason of the connections is such, in view of the inclined position of the plate *s* of the shuttle-case, that when it takes the loop of the needle-thread it is to the right of the upper end of the plate *s*; it carries the loop in front of the front edge of the said plate, and as it descends gradually carries it to the left of the said plate, so that one side of the said loop is passed to the left of front edge of the shuttle, and the other side of it between the shuttle and the said plate *s*, the front and lower edges of which are beveled or rounded to facilitate the passage of the thread, and, after the hook has carried the loop under and around the lower end of the shuttle, it liberates the loop preparatory to taking another. The peculiar motion of the hook, due to

the rotation of the crank, and the connection of the link on which it is formed with the crank and with the radius-bar, is represented in the accompanying drawings.

After the hook has taken the loop of the needle-thread, and whilst it is opening it and carrying it around the shuttle, the left-hand side of the loop is taken and carried around in front of and to the right of the other side of the loop, and, by this operation, the shuttle-thread is thereby carried around the needle-thread, so that when the stitch is formed the shuttle-thread is not only interlocked with the needle-thread but wound around at each stitch, and in what appears as a helix, thereby securing the stitch, so that it cannot be unraveled.

The instrumentality by which the last-named operation is performed may be termed the thumb-and-finger mechanism, to be next described.

There is a sliding bar, *a*, adapted to slide in suitable ways secured to the under side of the table, and this bar receives the required reciprocating motion from a cam-groove, *b*, in the periphery of a cam-wheel on the main shaft *g* by a rocking-lever, *c*, one arm of which engages the sliding bar, and the other arm carries a roller, *d*, which runs in the cam-groove *b*.

The left-hand end of this bar is bent, as shown at *e*, to permit the passage of the hook *u* in its revolutions before described, and at the extreme end of the said bar there is formed a hook termed the finger-hook, represented on an enlarged scale at fig. 6.

While the hook *u* is opening the loop of the needle-thread the bar *a* is moved from left to right, and in so moving the finger-hook takes the left-hand side of the loop and carries it around in front of and to the right of the other side, and there holds it until the needle again descends, that it may pass through such loop while so twisted, but to prevent the loop from escaping from the finger-hook during any part of the operation there is a thumb-piece, *f*, which closes the opening of the finger-hook until the loop is required to be liberated, that that stitch may be closed by the forming of the next loop.

This thumb-piece *f* is hinged to the upper surface of the finger-piece at *g*, and back of the hinge it is enlarged, as represented at *h*, and from the under face of this projects a pin, *i*, which, as the bar moves to the right and toward the end of that motion, passes under an inclined cam, *j*, which makes it close the finger-hook; and, as the loop should be thus held during the return-motion of the finger-hook, the cam *j* projects from the face of an arm, *k*, that vibrates on a stud-pin secured to the under face of the table, and the cam *j* is so formed that on the return motion the pin *i* passes on the other side, the arm being por-

vided with a spring, *l*, to permit the arm and cam to yield for that purpose.

The thumb-piece is operated to open the finger-hook and liberate the loop toward the end of the return motion, by the cam-form of the edge at *g* striking against the arm *k* near its stop-pin, or by striking any other stop.

As above described, the machine will form what has been above described as the rotary stitch.

It the shuttle be left in the shuttle-case, but without a shuttle-thread, or by simply cutting the shuttle-thread, the machine, without any alteration, will form the well-known chain-stitch, but with the shuttle and shuttle-thread in connection, by merely suspending the operation of the thumb-and-finger mechanism, the machine will form the lock-stitch the same as the well-known Wheeler and Wilson machine, and all that is necessary to be done to fit the machine for sewing the lock-stitch is simply to draw the friction-roller *d* out of the cam-groove *b*, leaving the finger-hook in the extreme position to the left.

And this disconnection is readily effected by having the friction-roller which runs in the cam-groove mounted on the end of a cylindrical rod, *r* fitted in the arm of the lever so that it can slide therein, a thumb-screw, *s*, or equivalent device, being used to secure the said rod with the roller in or out of the cam-groove.

Having thus described the construction and mode of operation of my improvements, that they may be distinguished from the machine described in the said Dopp patent improved thereby,

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

1. The mechanism of the finger-hook for crossing the loop of the needle-thread, with the thumb-piece for opening and closing the said hook to control the loop, substantially as described.

2. The combination of the hook for opening the loop of the needle-thread, the stationary shuttle, the thumb-and-finger mechanism for crossing and controlling the loop of the needle-thread, and the needle, substantially as and for the purpose described.

3. The cam for reciprocating the finger-hook and thumb-piece, and the lever and roller so arranged that it can be disconnected from the cam, in combination with the finger-hook and thumb-piece, substantially as described, by means of which the machine can be readily changed to sew seams with the rotary, the chain, or the lock-stitch, as set forth.

WM. S. MEAD.

Witnesses:

A. J. DE LACY,
A. B. BISHOP.