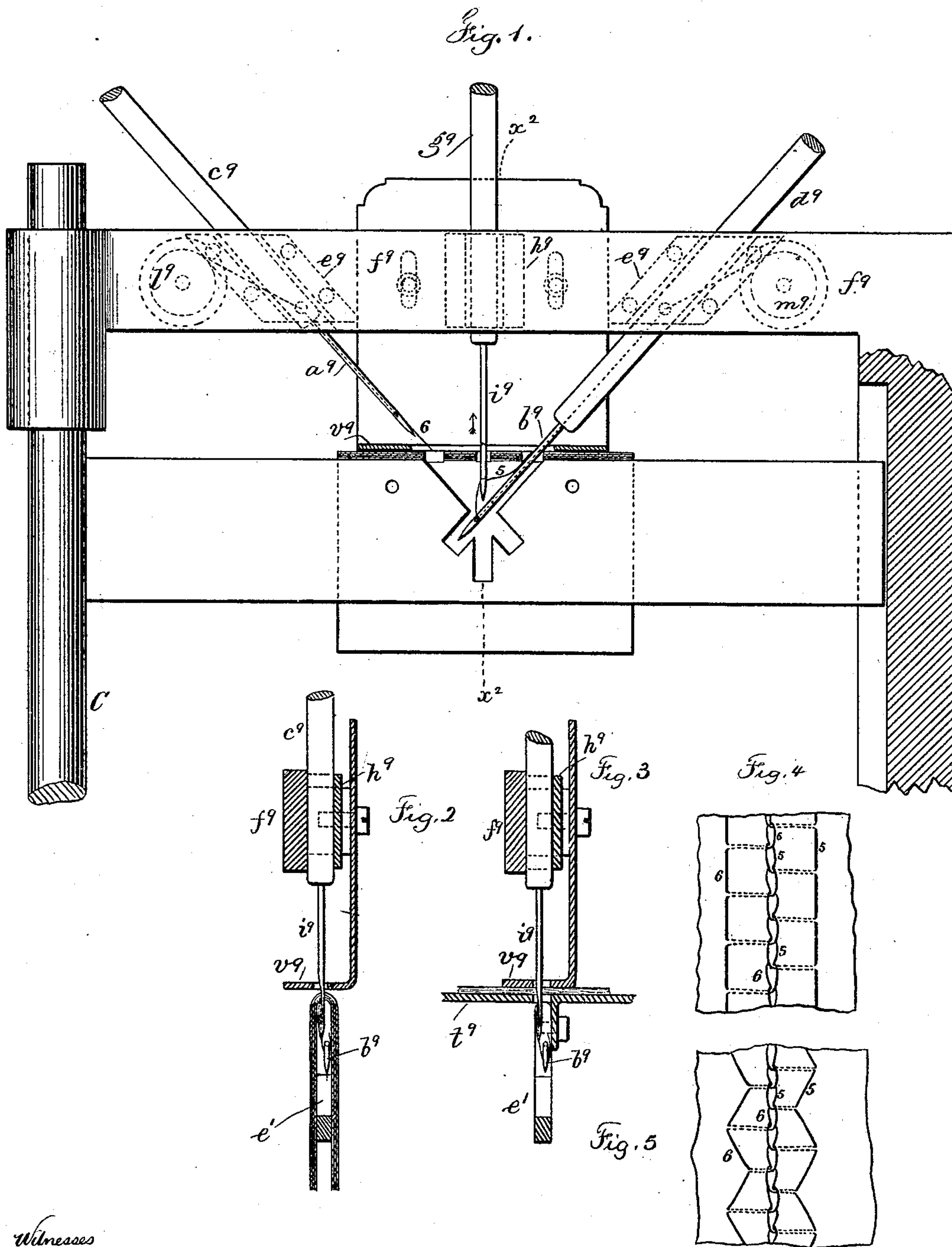


(Model.)

D. McC. SMYTH.
BOOK SEWING MACHINE.

No. 250,990.

Patented Dec. 13, 1881.



Witnesses

Chas. H. Smith
J. Hail

Inventor

David McC. Smyth
per Lemuel W. Perrell

UNITED STATES PATENT OFFICE.

DAVID McCONNEL SMYTH, OF HARTFORD, CONNECTICUT, ASSIGNOR TO THE
SMYTH MANUFACTURING COMPANY, OF SAME PLACE.

BOOK-SEWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 250,990, dated December 13, 1881.

Application filed May 16, 1881. (Model.)

To all whom it may concern:

Be it known that I, DAVID McCONNEL SMYTH, of Hartford, in the State of Connecticut, have invented an Improvement in Machinery for Sewing Books and other Articles, of which the following is a specification.

This invention relates to a mechanism for sewing books and other articles by the combined action of two eye-pointed needles and an intermediate looper. In this device the eye-pointed needles stand at an inclination and the looper is vertical, and the looper is pointed in cases where the sheet or other article to be sewed does not have a saw-cut or other opening for the passage of the looper. One needle is made to pass through the material, then the looper passes through the material and takes a loop of thread and draws it through the material. The needle just mentioned rises and the other needle then passes through the material, the looper descends and takes a loop of the second thread and as it draws up, the first loop taken is delivered off the looper around the second loop, similar to knitting. When this is applied to book-sewing one stitch can be taken in one of the folded sheets or signatures and the next stitch in the second signature, or both stitches can be taken in one signature and the second loop retained by the looper and delivered around the first loop of the second sheet or signature, and so on; and in sewing other articles than books the looper will have a penetrating point, and the sewing will progress one stitch after the other, and on one side the stitches will be straight and at right angles to the line of sewing; on the other side there will be three lines of stitches, the outside ones being similar to the lines of stitches by an ordinary sewing-machine, and the center line of stitches will be looped together like a chain-stitch.

In the drawings, Figure 1 is an elevation of the sewing mechanism. Fig. 2 is a section at the line $x^2 x^2$.

The needles a^9 and b^9 are at the ends of needle-bars c^9 and d^9 . These needle-bars slide in guides e^9 upon the head-block f^9 ; and g^9 is the bar of the looper i^9 . This also slides in a guide, h^9 , upon the head-block f^9 . The mechanism for giving motion to these parts may be

of any desired character, such as levers and cams receiving motion from a prime mover or revolving shaft. When these needles are used for sewing books the sheets or signatures are to be presented to the sewing mechanism by either of the sheet-holders that have been invented by me, or by any other suitable means.

I have shown the sheet-holding arm e' upon the shaft c . There may be four such arms, as in my said Patent No. 220,312, and the sheets are brought around in succession as supplied to such arms. The arms are made hollow or of two plates, with a space between that is sufficient for the needles to pass through and wide enough below for the loop of the needle-threads to spread and be taken by the looper; or the arm may be notched, as shown in the drawings, forming channels for the passage of the needles. The thread is supplied from the spools l^9 and m^9 , and it passes through any suitable tension device, and it is preferable to employ a take-up mechanism to keep the thread from being caught by the point of its own needle; but with book-sewing this is not always required.

The looping device may have a barb similar to that used with machine knitting-needles, or the looping-needle may be tubular, with a plunger or other device for closing the looping-eye. These needles, being well known, do not need further description. I remark, however, that the looper must have a needle-point, as shown, especially where the same is used for sewing fabrics, such as sails, or for embroidering shoes or other articles, so that it will penetrate the same.

It is now to be understood that in sewing by these needles the needle b^9 passes through the material diagonally. Then the looper-needle i^9 passes through vertically and takes a loop of the thread 5 from b^9 and draws it up. Then the needle b^9 is withdrawn, and the needle a^9 passes diagonally through the material, the looper i^9 again descends and takes a loop of the thread 6 from the needle a^9 , and as it draws up, the barb or hook of the looper i^9 is closed and sheds off the loop of thread 5 around the loop of thread 6, and then the needle a^9 is drawn up and the needle b^9 descends, and the looper

descends and takes a loop of thread 5, and the loop of thread 6 is shed off as the looper rises, and so on as the sewing progresses.

In sewing flat fabrics, instead of books, it is necessary to have a bed, t^9 , for the goods to rest upon, as seen in Fig. 3. This is to be flat or convex and slotted for the needles and the thread. If this bed is stationary, the sewing will be in lines, as before set forth, that are at uniform distances apart, and this can be used as a very strong and elastic stitch for sewing sails and other articles with three lines of stitching, as seen in Fig. 4; but if the bed is upon a vertically-moving shaft, c , as shown, then the width of the lines of stitching can be varied by raising and lowering the bed from time to time, so as to perform embroidery. These forms of stitching for embroidery are shown in Fig. 5.

In order to prevent the folded sheet being lifted as the threads are drawn up, a presser-foot, v^9 , is made use of above the back edge of the sheet. This is fastened to the stationary frame f^9 , that supports the needle-slides. The

same thing is made use of in sewing other articles upon a flat bed, t^9 , as shown in Fig. 3. In this case the presser-foot is, by preference, upon a sliding bar, and kept down by a spring-pressure, as in ordinary sewing-machines.

I claim as my invention—

1. The combination, in a sewing mechanism, of two diagonal and alternately reciprocating eye-pointed needles and an intermediate reciprocating looper taking the loops of needle-thread from the needles in succession and delivering one loop around the next, substantially as set forth.

2. The combination, with the diagonal reciprocating eye-pointed needles and intermediate looper, of a bed or support capable of vertical adjustment or motion, substantially as set forth.

Signed by me this 5th day of May, A. D. 1881.

DAVID M. SMYTH.

Witnesses:

CHARLES E. GROSS,
R. D. HUBBARD.