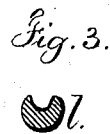
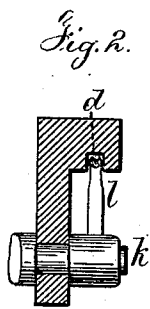
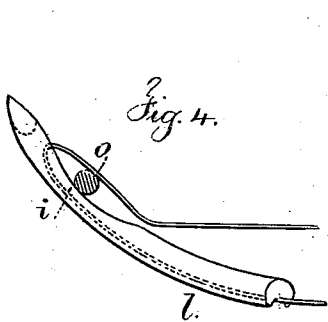
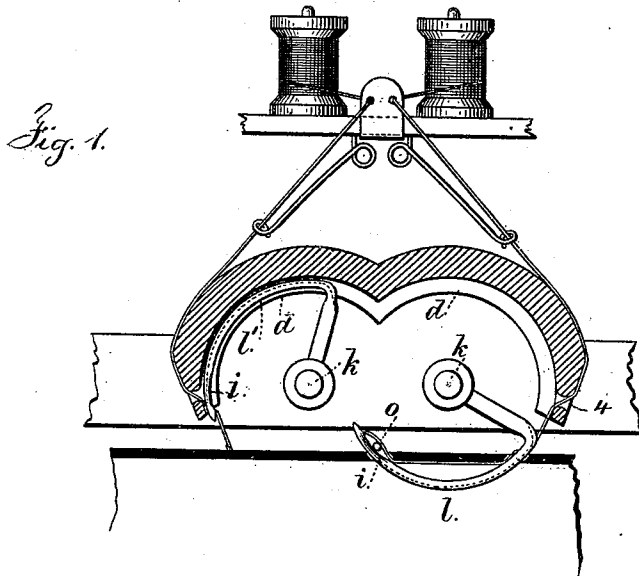


D. M. SMYTH.
Sewing Machine.

No. 234,732.

Patented Nov. 23, 1880.



Witnesses

Chas. H. Smith
Geo. D. Pinckney

Inventor

David M. Smyth.

per Lemuel W. Perrell

att'y.

UNITED STATES PATENT OFFICE.

DAVID M. SMYTH, OF HARTFORD, CONNECTICUT, ASSIGNOR TO GEORGE WELLS ROOT, OF SAME PLACE.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 234,732, dated November 23, 1880.

Application filed July 14, 1879.

To all whom it may concern:

Be it known that I, DAVID M. SMYTH, of Hartford, in the State of Connecticut, have invented an Improvement in Sewing-Machines, of which the following is a specification.

My improvement is especially useful in machines for sewing books, and relates to a peculiar needle and to the means for supporting the same while in use.

Circular needles have been used in sewing-machines and for book-sewing; and I hereby make reference to Letters Patent for book-sewing machines the application for which was filed February 3, 1879, for a means for giving motion to such needle and for receiving the loop of needle-thread.

The needles are used in pairs for book-sewing. The needle *l* passes through the back fold along between the paper and comes out at the fold, and the needle *o* takes the loop. Then the next sheet is placed in position and the needle *l'* operates in the same way, but in the opposite direction, and its loop of thread is also taken by the needle *o*.

My improvements relate to the peculiarity of the needle and to the means of supporting the same so as to prevent bending.

In the drawings, Figure 1 is an elevation of the needles and spools, with the needle-race in section. Fig. 2 is a cross-section of the needle-race. Fig. 3 is a cross-section of the needle in enlarged size, and Fig. 4 is a similar view of the side of the needle near its end.

The needle *l* or *l'* is an arc of a circle. The shank of the needle is radial and is attached to the shaft *k*.

The outer periphery of the needle is grooved of a depth sufficient to contain the thread, and the needle-race *d* is an arc of a circle of the same radius as the exterior of the needle, so that the needle can be turned first one way and then the other, and its exterior surface will be in contact, or nearly so, with the bottom of the groove forming such needle-race.

The eye of the needle is near the point, and passes from the groove toward the shaft *k* instead of laterally, as it has sometimes done, and the body of the needle behind its eye is removed, as at *i*, to form a recess, into which the needle *o* can pass and take off the loop of needle-thread. The thread passes through a

hole, *4*, near the end of the needle-race, and it is preferable to employ a spring or take-up between the hole *4* and the spool, to prevent the thread becoming caught or injured. The shank of the needle at its junction with the arc of the needle is made sufficiently thin to prevent the shank touching the edges of the needle-race.

It will now be understood that the needle is supported by the race, and hence that when the point of the needle comes into contact with the paper or other material to be penetrated, said needle cannot bow outwardly, as its tendency would be, but it is obliged to move endwise and penetrate the paper or other material; hence there is but little risk of breaking the needle or bending it out of shape.

The thread draws out of the groove in the periphery of the needle as the needle recedes, and lies in said groove as the needle passes forward into the goods.

I am aware that a curved needle having an arm to a central shaft, by which the needle is reciprocated, has been used.

I am also aware that looping-instruments that are not made with a penetrating-point have had a notch near the eye carrying the thread, and have swung in an arc of a circle.

I am also aware that separate needles have been curved and driven in a raceway by pushers or dogs acting at their back ends.

I claim as my invention—

1. A curved needle in the form of the arc of a circle, grooved on its outer periphery, having an eye near the point and a recess near the eye at the inner part of the needle, substantially as set forth.

2. An eye-pointed needle curved in the arc of a circle and having a shank extending to a central shaft, by means of which the needle is moved, and having a groove in its outer periphery, in combination with a needle-race that is an arc of a circle and is recessed to receive and support the needle, substantially as set forth.

Signed by me this 11th day of July, A. D. 1879.

DAVID M. SMYTH.

Witnesses:

GEO. H. DAY,
E. J. POST,