

(Model.)

D. McC. SMYTH.  
BOOK SEWING MACHINE.

No. 250,991.

Patented Dec. 13, 1881.

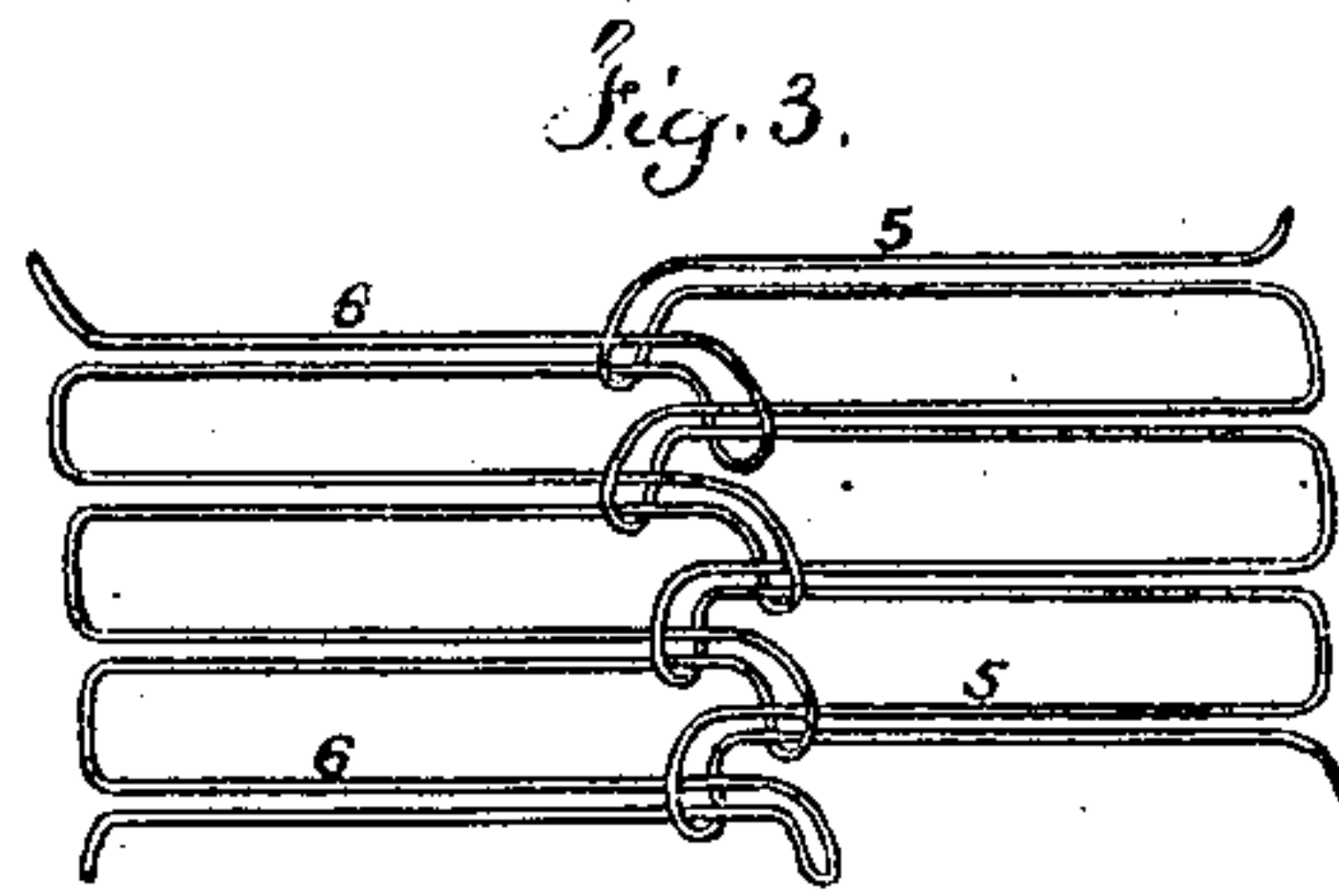
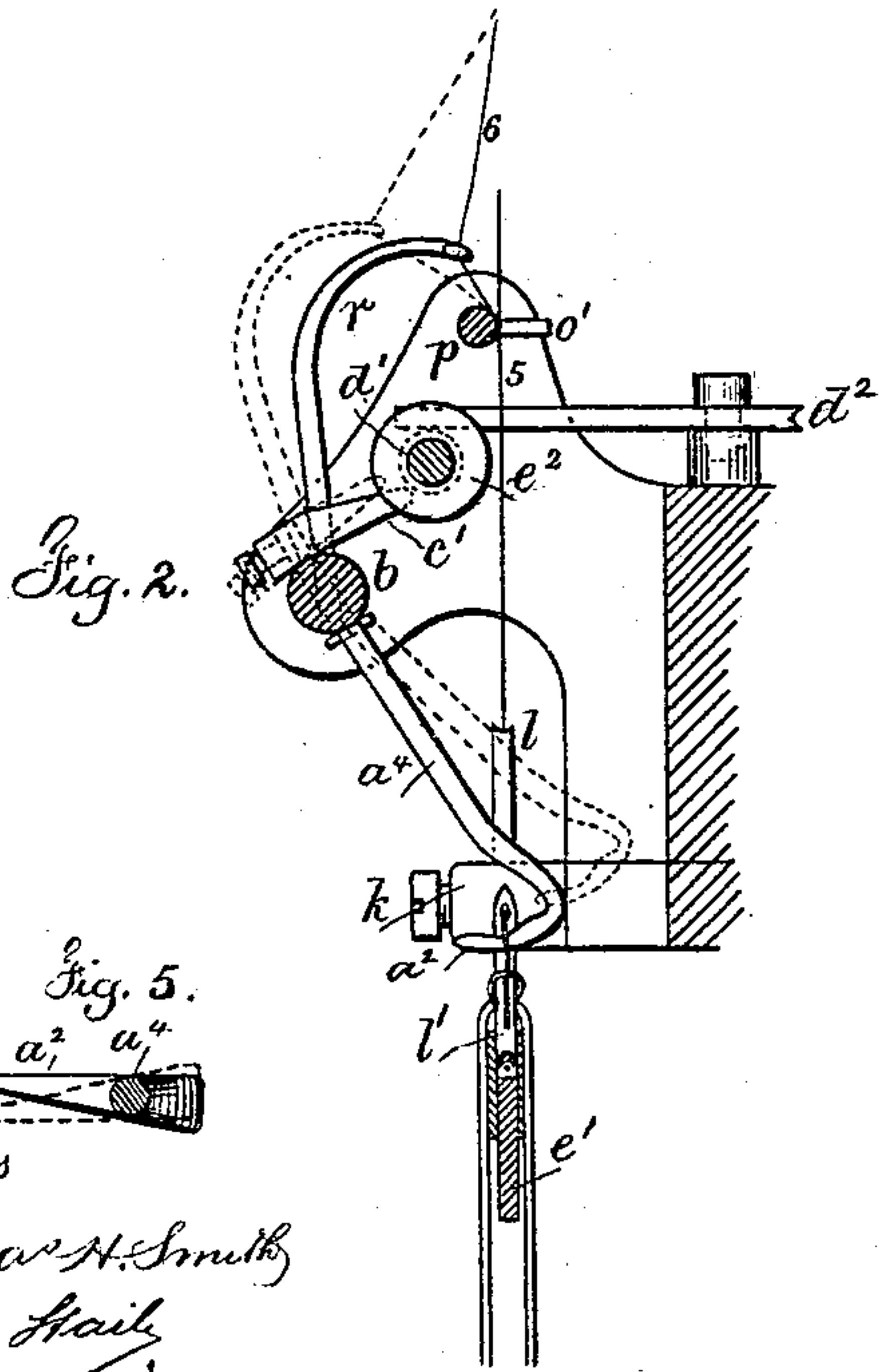
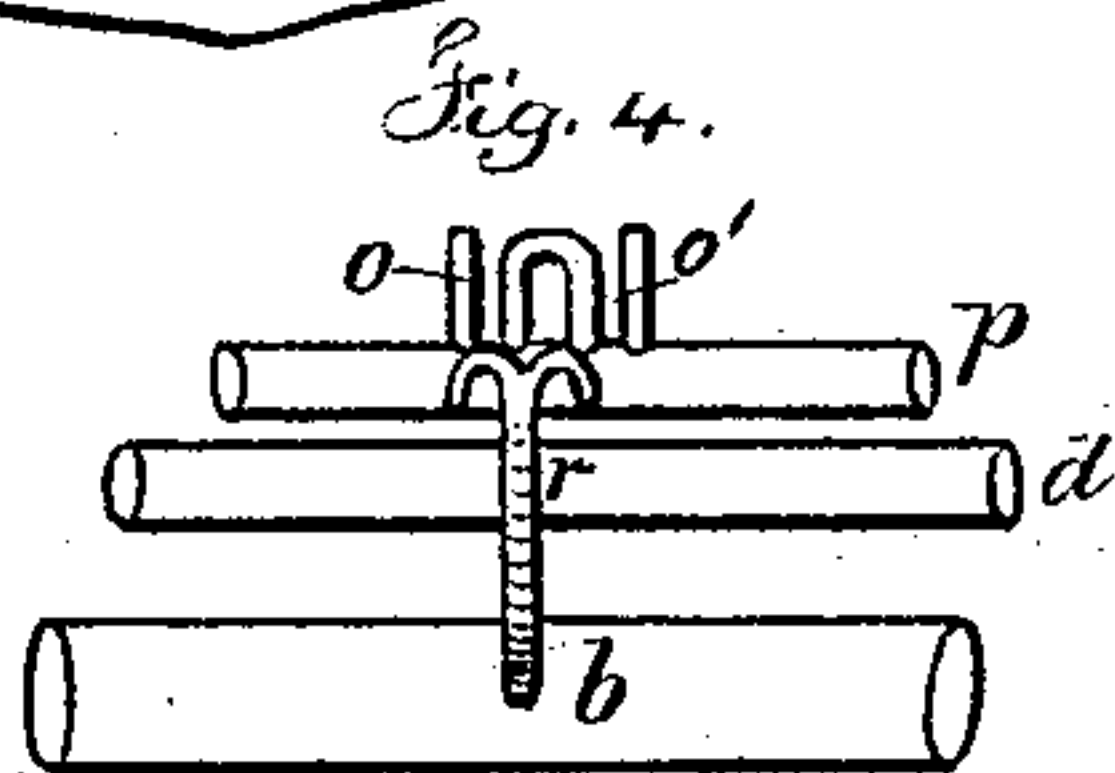
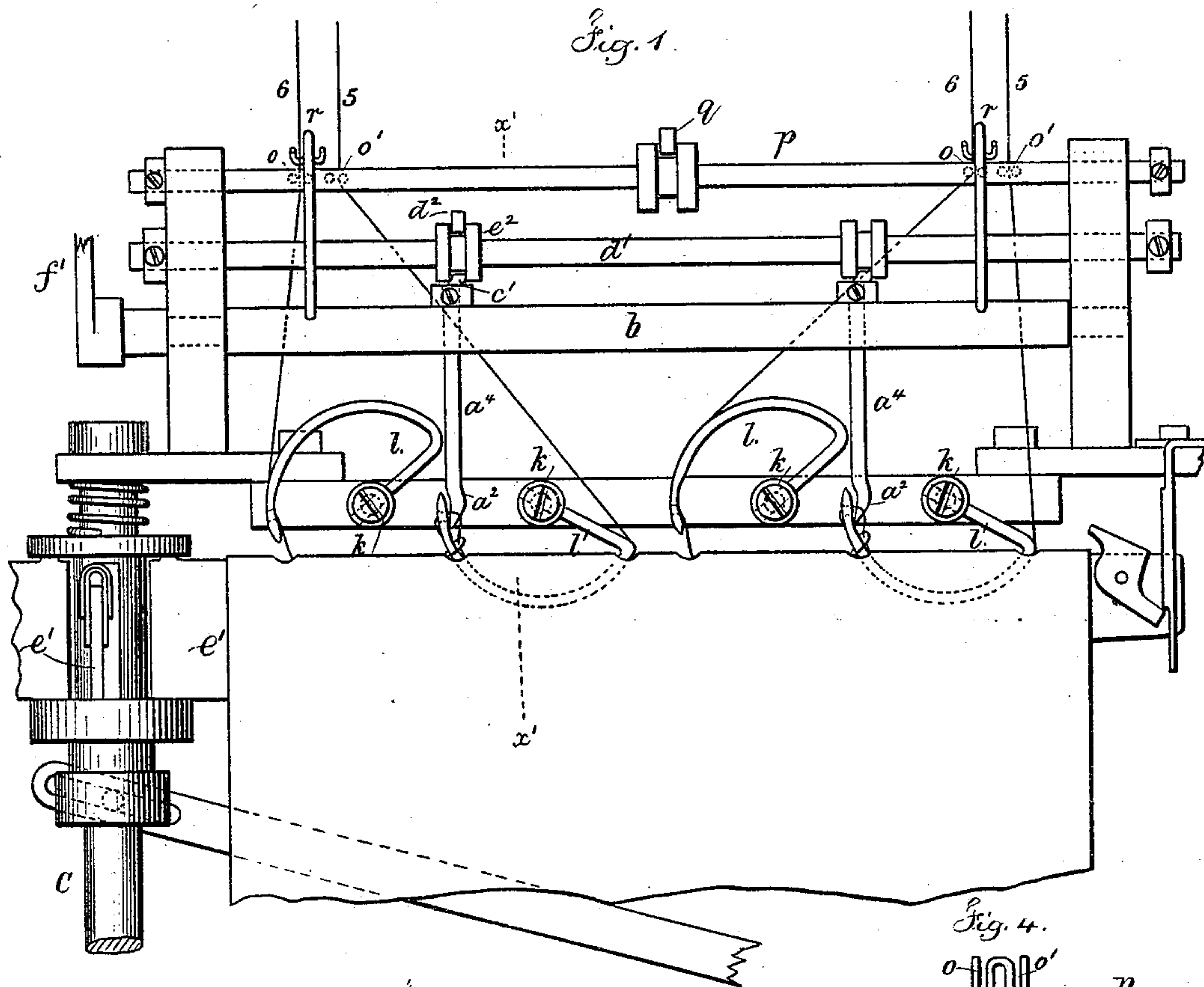


Fig. 5.

$a_1^2$   $a_1^4$



Witnesses

Chas. H. Smith

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Inventor  
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per Lemuel W. Perrell atty.



# 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. 250,991, 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 Book-  
5 Sewing Machines, of which the following is a specification.

This invention is an improvement upon the machine for which Letters Patent No. 220,312 were granted to me, and a reference is hereby  
10 made to the same, by which to more fully understand the construction and operation of the present devices.

My present invention relates to mechanism for performing the sewing of books with a double-loop stitch, in the manner set forth in my  
15 United States Patent No. 238,451.

In the drawings, Figure 1 is an elevation of the book-sewing needles and the mechanism for looping the thread. Fig. 2 is a section at  
20 the line  $x'x'$ . Fig. 3 represents the loops of thread in the manner they would appear if there were no sewed sheets covering the threads; and Fig. 4 is a plan showing the device for taking up the slack thread, and Fig. 5  
25 is a sectional plan of the looper in enlarged size.

I make use of the sheet-holder arm  $e'$  on the shaft  $c$ , and such shaft is moved around progressively, and also receives a vertical motion to bring the sheet up to its proper position for  
30 being sewed; and there are four semicircular needles, that act in pairs,  $l\ l'$ ,  $l''\ l'''$ , one pair entering and sewing one sheet and the other pair entering and sewing the next sheet. These operations, being similar to those in my said Patent No. 220,312, do not need further description; but instead of using a looping-needle, by  
35 which a cord is drawn into the threads of the sewing, I use loopers  $a^2$ , that are so moved that they go forward into the loops of thread from the needles  $l$ , hold such loops as the needles draw back, spread such loops behind them, so that the points of the needles  $l'$  pass into such  
40 loops; then the loopers go back, drop the loops of thread from the needles  $l$  over the needles  $l'$ , and then go forward again and take loops of thread from the needles  $l'$ . Those needles withdraw, leaving their threads over the loopers  $a^2$ , and they spread these loops, and the needles  $l$  then pass into the loops from  $l'$ , and these are  
45 dropped and loops taken from  $l$ , and so on.

Each looper  $a^2$  is upon a shank,  $a^4$ , that passes through the rock-shaft  $b$ , and is provided with an arm,  $c'$ , at the upper end; and  $d'$  is a rod with a grooved hub,  $e^2$ , upon it, that receives  
55 the end of the arm  $c'$ , and to this rod  $d'$  an endwise motion is given at the proper time by the lever  $d^2$ , that is connected to and moved by a cam or other device upon the actuating shaft of the machine.

There is a lever,  $f'$ , (see Fig. 1,) extending  
60 from the rock-shaft  $b$ , and this is moved at the proper time by a suitable cam or other mechanism.

It is to be understood that the parts are to be so timed and moved that the rock-shaft  $d'$   
65 gives to the looper the forward and backward movement at the proper times to take the loops of thread from the needles  $l$  and  $l'$ , respectively, and to drop those loops over the next set of needles; but in order to spread the loop of  
70 thread behind the looper and to turn the point of the looper so as to take a loop on one side from one needle and then on the other side from the next needle, the said looper and its shank receives a slight turning motion in the rock-  
75 shaft  $b$  by the arm  $c'$ , being moved by the endwise motion of the shaft  $d'$ , which motion is given between the time one loop is taken and that loop is dropped upon the next needle. By  
80 this turning movement the point of the looper is caused to pass close to the needle in taking the loop, and the heel of the looper is turned aside, so as not to strike the needle on the backward movement.

It is important to pull up each loop of thread  
85 as it is dropped from the looper around the needle. To effect this object the threads 5 5 and 6 6 from suitable spools pass between the guides  $o\ o'$ , and these are on a sliding bar,  $p$ , to which end motion is given at the proper time  
90 by a lever,  $q$ , or otherwise, to bring either thread adjacent to one of the hooks  $r$  upon the rock-shaft  $b$ . These parts are so moved that as the loopers go back and drop the loops of thread from the needles  $l'$  over the needles  $l$  the hook  
95  $r$  draws upon the threads 5 of the needles  $l'$ , pulling up their loops around the needles  $l$ , and before the looper moves back to drop the loops of the needles  $l$  over the needles  $l'$  the bar  $p$   
100 has been slipped endwise, moving the threads



6 into the path of one hook of the double hooks  $r$ , and as the loopers go back and drop the loops of  $l$  over  $l'$ , the threads 6 of the needles  $l$  are drawn upon to tighten the loops around  $l'$ , and so on.

A cord or strip may be drawn into the saw-cut at the back of the book, beneath the interlaced loops, if desired.

The machine may have more than two pairs of needles, for quarto books three or four pairs of needles will generally be used.

The sewing-machine may be made large enough for the largest sheets, and portions be disconnected when sewing smaller sheets.

I claim as my invention—

1. The combination, in a machine for sewing books, of a pair of curved needles acting in opposite directions, with a looper that takes the loop from one needle and delivers it over the other needle, substantially as set forth.

2. In a book-sewing machine, the looper having a shank, in combination with a rock-shaft

through which the shank passes, and mechanism, substantially as specified, for rocking the shaft and for partially turning the looper and its shank, substantially as set forth.

3. The combination, in a sewing-machine, of two semicircular needles acting in opposite directions, one looper to take the loops from one needle and deliver them over the other needle, and mechanism, substantially as specified, for pulling up the loops of thread around the needles successively, substantially as set forth.

4. The sliding bar  $p$  and thread-guides  $o o'$ , in combination with the double books  $r$ , the rock-shaft  $b$ , the looper  $a^2$ , and the pair of needles acting in opposite directions, and mechanism, substantially as specified, for actuating the parts, substantially as set forth.

Signed by me this 7th day of April, A. D. 1881.

DAVID McCONNEL SMYTH.

Witnesses:

GEO. T. PINCKNEY,  
CHAS. H. SMITH.