

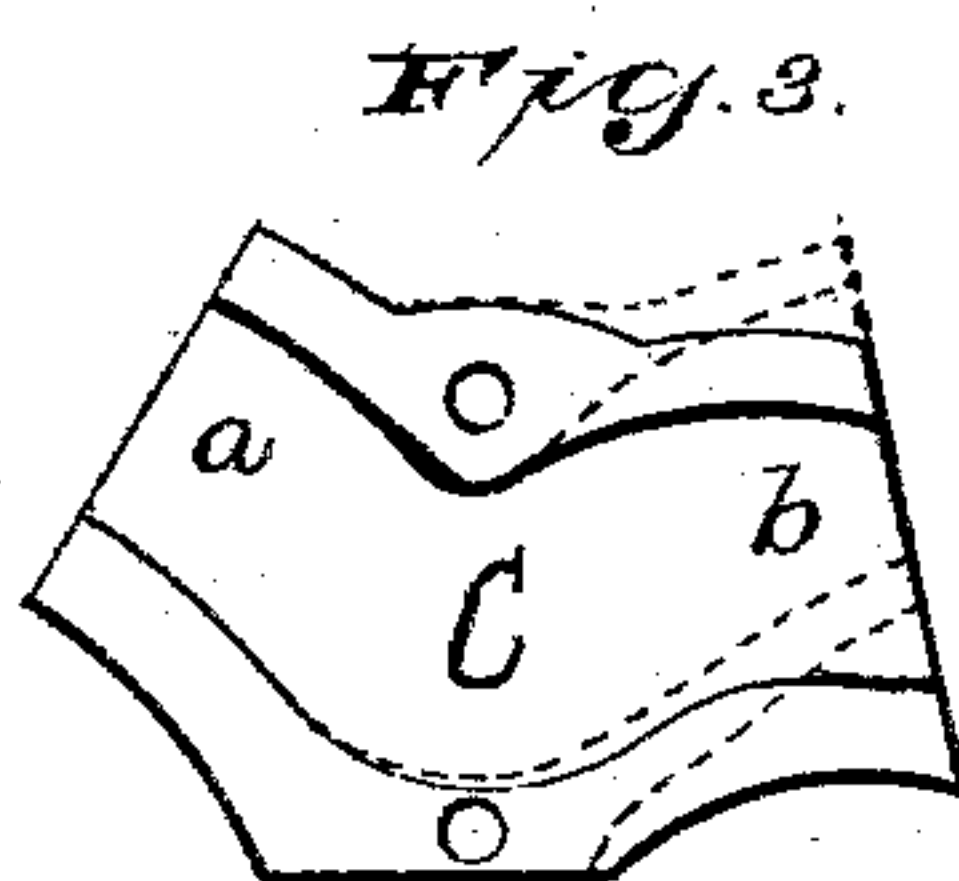
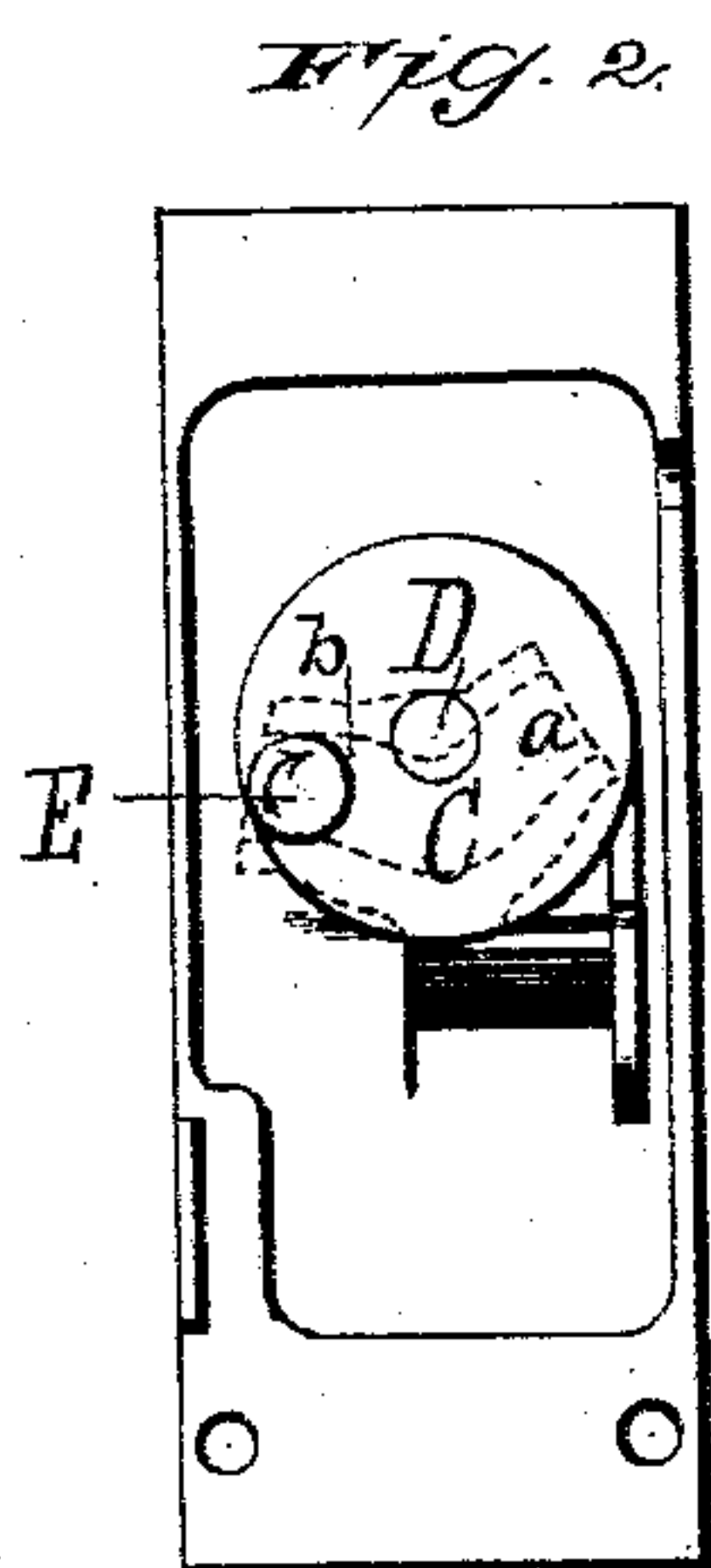
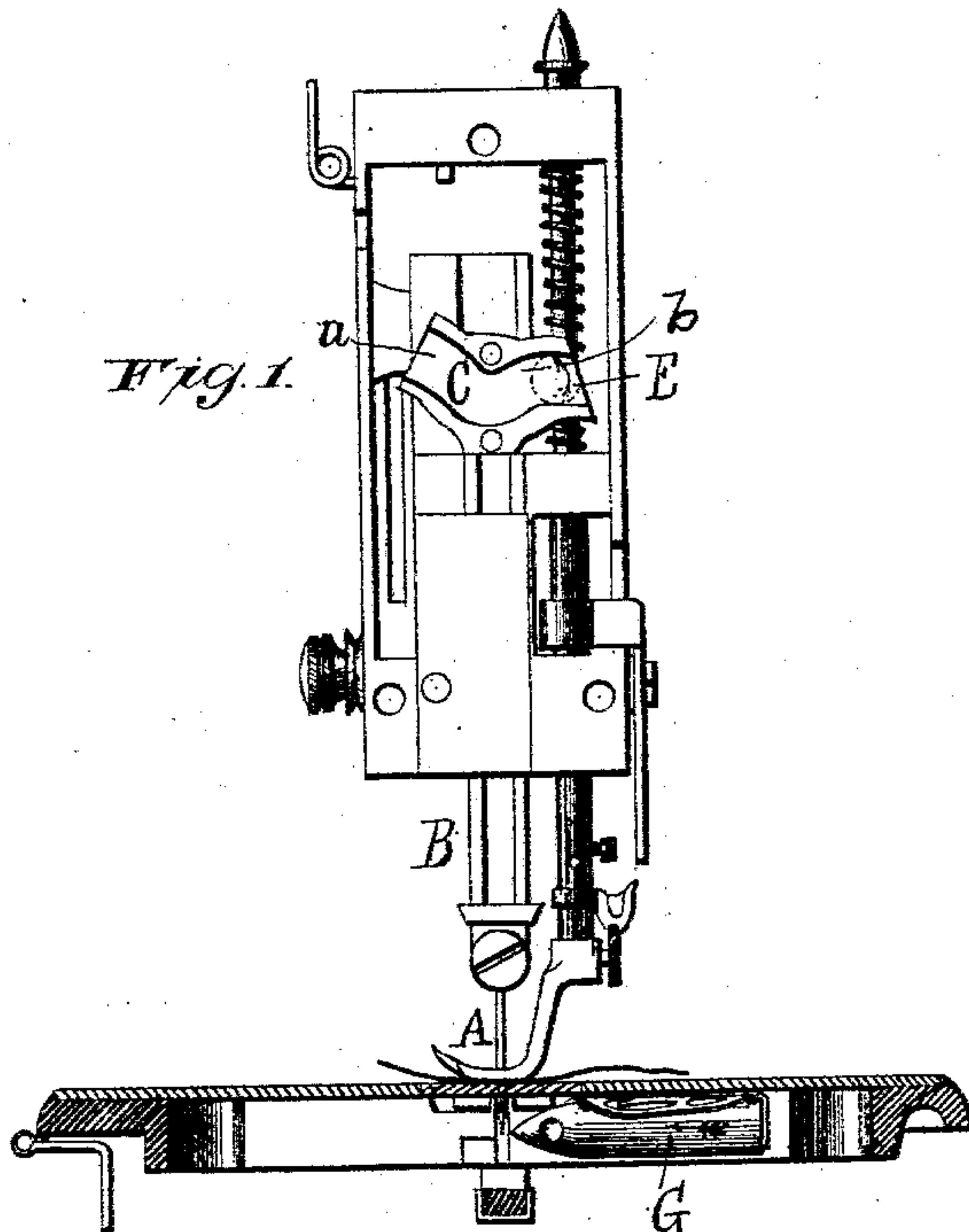
(No Model.)

E. S. CRAM & E. C. COVELL.

SEWING MACHINE.

No. 315,742.

Patented Apr. 14, 1885.



WITNESSES  
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By their attorney,  
J. S. Brown.



# UNITED STATES PATENT OFFICE.

ELISHA S. CRAM AND EDGAR C. COVELL, OF LACONIA, ASSIGNORS OF ONE-HALF TO JOHN S. CRANE AND B. FRANK DRAKE, OF LAKE VILLAGE, NEW HAMPSHIRE.

## SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 315,742, dated April 14, 1885.

Application filed February 28, 1884. (No model.)

*To all whom it may concern:*

Be it known that we, ELISHA S. CRAM and EDGAR C. COVELL, of Laconia, in the county of Belknap and State of New Hampshire, have  
5 invented an Improvement in Sewing-Machines; and we do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification.

10 The purpose of our invention is to enable a sewing-machine to be run backward without the shuttle being allowed to enter the needle-thread loop, which, if taken by the shuttle in the backward movement of the machine, will  
15 break the needle-thread. Sewing-machines generally are so constructed and organized that the shuttle takes the needle-thread loop when the machine is run backward.

By our present invention we effect the purpose by a peculiar construction of the cam by  
20 which the needle-bar is driven with the eccentric or crank pin on the needle-driving shaft, substantially as hereinafter specified.

In the accompanying drawings, Figure 1 represents a vertical section through the sewing-machine head and cloth-plate, looking out toward the shuttle and needle, the view showing our improvement; Fig. 2, a similar section of the sewing-machine head in the same plane,  
30 but looking in the opposite direction to the view shown in Fig. 1; Fig. 3, a face view of our improved needle-driving cam, it being shown in full lines, while the usual form of the cam is indicated by dotted lines in the same  
35 figure.

Like letters designate corresponding parts in all of the figures.

Let A represent the needle of a shuttle sewing-machine; B, the needle-bar; C, the driving-cam on the needle-bar; D, the needle-driving shaft; E, the crank-pin or eccentric engaging with the cam on the needle-bar, and G the shuttle.

45 All the parts of the sewing-machine are or may be constructed as usual, except the cam C on the needle-bar.

The groove of the cam C has two parts, *a* and *b*. The part *a*, being the forward half, (with a machine organized as that shown in the drawings,) is the part in which the crank-pin E ascends and lifts the needle-bar to raise the nee-

dle when the machine is run forward in sewing; and the part *b*, being the rear half, is the part in which the crank-pin descends. When the sewing-machine is run backward, however,  
55 the crank-pin ascends in the rear part, *b*, and descends in the front part, *a*, and it is in this backward movement of the machine that views in Figs. 1 and 2 are taken. The forward part, *a*, of the cam-groove has a rapid upward turn,  
60 so that through the first quarter of a circle the crank-pin in ascending therein travels nearly in its own circular pathway coincident therewith, thus not lifting the needle, and thereby giving time for the shuttle to pass through the  
65 needle-thread loop, and the usual construction of the rear part, *b*, of the cam-groove is nearly of the same or corresponding shape, or with a similar abrupt rise outward, as indicated by dotted lines in Fig. 3, so that when the machine  
70 is turned backward the ascent of the needle-bar is correspondingly retarded, thus delaying the raising of the needle till the shuttle enters the needle-thread loop; but the timing of the motions of the parts affected is such that the  
75 shuttle does not pass entirely through the said thread-loop before the continually-ascending needle pulls up the thread-loop and causes the thread to be broken. Now, our improved construction of the cam is such that in turning  
80 the machine backward the raising of the needle-bar and its needle is hastened sufficiently to cause the needle-thread loop to be so far raised that the point of the shuttle when it reaches the needle, as shown in Fig. 1, cannot  
85 enter the said needle-thread loop. We effect this by giving the rear part, *b*, of the cam-groove substantially the form shown in Fig. 1, and by full lines in Fig. 3, it being much more depressed than with the usual construction,  
90 and, in fact, extending outward nearly at right angles to the line of motion of the needle-bar. The form of the groove may vary somewhat, and may be to any extent, provided that it quicken the ascent of the needle as and to the  
95 effect herein specified; and our invention is intended to embrace any construction of cam or cam-groove which will effect the result and fulfill the purpose herein set forth. In some sewing-machines the motions are reversed as  
100 to the forward and back motions of the driving-shaft D, and the position of the parts of



our improved cam-groove are affected thereby, requiring in some machines the front, while in other machines the back of the groove has the special form given by our invention.

5 We claim as our invention—

1. The combination, with the stitch-forming mechanism of a sewing-machine having a shuttle adapted to take the loops of the needle-thread in the regular motion of the machine, 10 of means, as the crank-pin E and the cam C, constructed with its reverse-motion needle-raising part *b* extended in a direction substantially at right angles to the line of the needle's motion, whereby the needle is caused to carry 15 its thread-loop up away from the shuttle when the motion of the machine is reversed.

2. In a shuttle-sewing machine, the needle-driving cam C, constructed with its rear or reverse-motion needle-raising part *b* extended in a direction substantially at right angles to 20 the line of the needle's motion, in combination with the crank-pin E, needle-bar A, and shuttle G, whereby the needle is caused to carry its thread-loop up out of the way of the shuttle when the motion of the machine is reversed. 25

The above specification signed by us this 26th day of February, 1884.

ELISHA S. CRAM.  
EDGAR C. COVELL.

Witnesses:

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EDGAR F. REEVES.