

C. S. CUSHMAN.  
SEWING-MACHINE.

No. 169,965.

Patented Nov. 16, 1875.

Fig: 3

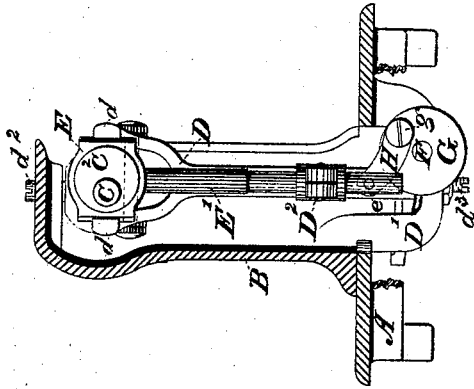


Fig: 4

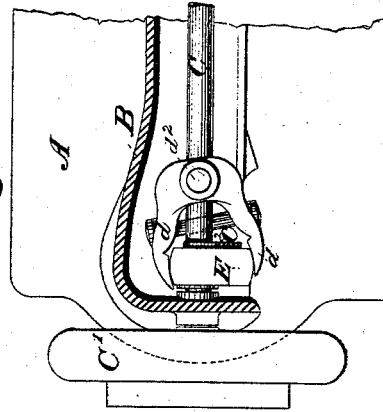


Fig: 1

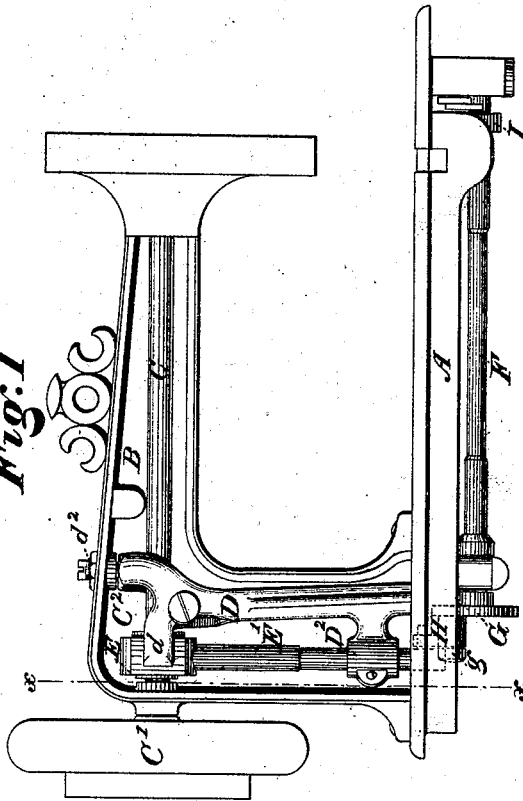
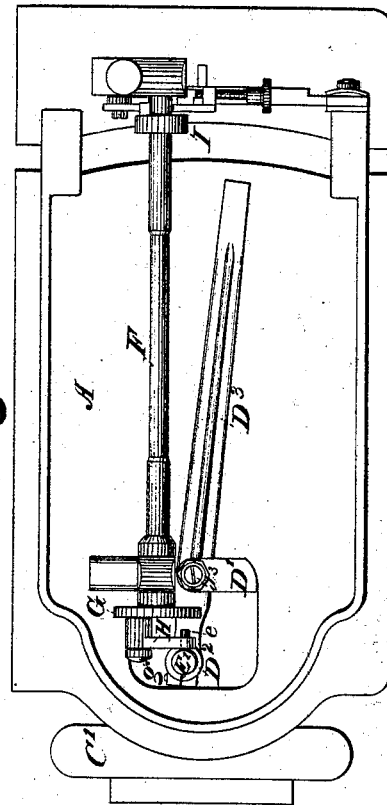


Fig: 2



Witnesses:

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# UNITED STATES PATENT OFFICE.

CYRUS S. CUSHMAN, OF PHILADELPHIA, PENNSYLVANIA.

## IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 169,965, dated November 16, 1875; application filed June 26, 1875.

*To all whom it may concern:*

Be it known that I, CYRUS S. CUSHMAN, of the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a specification:

The object of my invention is to provide a simple and efficient device for operating the shuttle-lever and feed-shaft of a sewing-machine; to which ends my improvements consists in certain novel combinations of an operating eccentric, and its strap and rod, with a vibrating shaft, guide, shuttle-lever, connecting-link, and feed-shaft, as hereinafter fully set forth.

In the accompanying drawing, Figure 1 is a side view of so much of a sewing-machine as is sufficient to exemplify my improvements; Fig. 2, an inverted plan view of the same; Fig. 3, a vertical transverse section of the same at the line *x x* of Fig. 1; and Fig. 4 a partial top view, with the frame in section.

My improvements are shown as applied to a machine, the bed-plate A, needle-arm B, main-shaft C, and balance-wheel and pulley C', of which are of the ordinary construction. To carry out the objects of my invention I provide a vertical rock-shaft, D, the upper end of which is journaled in the needle-arm B, and the lower in a bearing, D', a projection of the needle-arm extending below the bed-plate. Set-screws *d*<sup>2</sup> and *d*<sup>3</sup>, at its upper and lower ends, respectively, enable lost motion at these points to be taken up when required. The rock-shaft D is provided with an aperture near its upper end to allow the driving-shaft C to pass through it, and is provided with projecting jaws *d d*, which embrace the strap or tablet E of an eccentric, C<sup>2</sup>, mounted upon said shaft. The sides of the tablet E are segments of a cylinder, and the inner faces of the jaws *d d* are correspondingly curved to fit over them. The vertical length of the curved sides of the eccentric-strap must be sufficiently great to enable the jaws *d d* to remain in contact with them during the entire traverse of the eccentric. The eccentric rod E', which is firmly

secured to the tablet E, passes through a guide, D<sup>2</sup>, projecting from the rock-shaft D, and has a stud, *e*, projecting from it at right angles near its lower end. The guide D<sup>2</sup> may be provided with a slot and screw for taking up lost motion, if desired. The shuttle-lever D<sup>3</sup> is permanently secured to the rock-shaft above its lower journals, so as to vibrate horizontally beneath the bed-plate A. A feed-shaft, F, is mounted horizontally in bearings beneath the bed-plate, and carries upon its end nearest the rock-shaft a crank-wheel, G, and a cam, I, for operating the feed-motion upon its opposite end. A crank-pin, *g*, upon the wheel G, is connected by a link, H, with the stud *e* of the eccentric rod E'.

In the operation of the machine the rotation of the driving-shaft C and its eccentric C<sup>2</sup> will impart an oscillating or vibrating movement to the rock-shaft D, and, consequently, to the shuttle-lever D<sup>3</sup> attached thereto, by reason of the relative arrangement of the jaws *d d* of the rock-shaft and the curved-sided eccentric strap E. The traverse of the eccentric will, at the same time, impart a vertical movement to its rod E', which, being governed by the guide D<sup>2</sup> on the rock-shaft D, is thereby caused to vibrate with said shaft, as well as to move in a vertical line. These combined movements of the eccentric rod impart a vibrating or oscillating movement to the feed-shaft F through the medium of the connecting-link H.

The arrangement herein described provides only for an oscillation or partial rotation of the feed-shaft, but the latter may be rotated entirely around its center by a different relative location of the parts and the provision of a rigid connection, instead of a pivoted one, between the link H and the eccentric rod.

It will be seen that the mutual action of the device specified operates both the shuttle-lever and feed-shaft with direct connections and simple mechanism.

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

1. The combination of the operating eccentric, the cylindrically-sided strap, and the

eccentric rod, with the vibrating rock-shaft, the jaws embracing the strap and the guide for the eccentric rod, substantially as set forth.

2. The combination of a feed-shaft and an eccentric rod, with a vibrating rock-shaft and an eccentric arranged upon the driving-

shaft, substantially as and for the purpose set forth.

CYRUS S. CUSHMAN.

Witnesses:

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