

(No Model.)

E. B. ALLEN.
VIBRATING SHUTTLE SEWING MACHINE.

No. 577,406.

Patented Feb. 23, 1897.

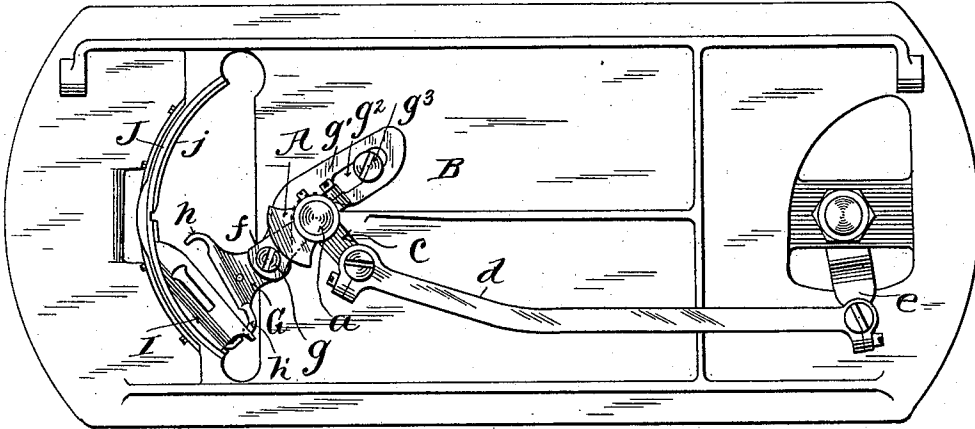


Fig. 1.

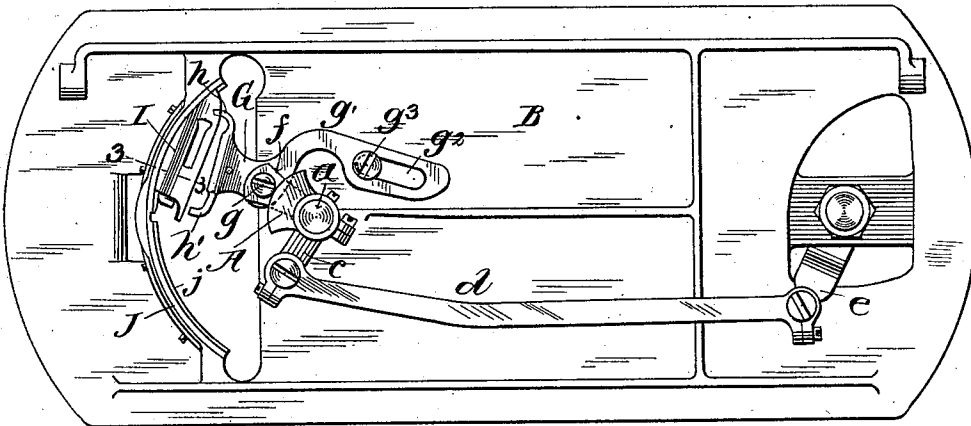


Fig. 2.

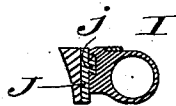


Fig. 3.

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EDWARD B. ALLEN, OF ELIZABETH, NEW JERSEY, ASSIGNOR TO THE SINGER MANUFACTURING COMPANY, OF NEW JERSEY.

VIBRATING-SHUTTLE SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 577,406, dated February 23, 1897.

Application filed October 10, 1896. Serial No. 608,437. (No model.)

To all whom it may concern:

Be it known that I, EDWARD B. ALLEN, a citizen of the United States, residing at Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Vibrating-Shuttle Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

10 In the operation of vibrating-shuttle sewing-machines in which the shuttles are loosely held in the carriers to permit the loops of needle-thread to pass freely over the shuttles more or less noise is produced by the rattling
15 of the shuttles in the carriers and against the driving-horns of the latter and which alternately come into contact with the opposite ends of the shuttles.

20 My invention has for its object to obviate this objection by providing a shuttle-operating mechanism for vibrating-shuttle machines which will be silent in operation and in which the shuttles will always be positively held and controlled.

25 In carrying my invention into effect I provide the curved face of the shuttle-race with a supporting-rib, which is preferably of dovetailed or other undercut form in cross-section and which enters a corresponding groove
30 formed in the curved outer face of the shuttle, the weight of which latter is thus mainly supported by said rib. The shuttle is moved back and forth by a driver which swings in the arc of a circle of smaller radius than the
35 circle from which the arc of the shuttle-race is described, so that as the said driver vibrates to and fro its two horns will be alternately engaged with and disengaged from the shuttle, thus holding the latter positively at
40 all times as it is moved back and forth against its race. The shuttle-shell is provided with holes into which the points of the said horns can enter, said horns being of such length that the entering one will engage the shuttle
45 before the withdrawing one leaves it, and thus the shuttle will always be in positive engagement with the driver as well as with the shuttle-race, and from this construction it results that the shuttle can be noiselessly op-
50 erated, even at the highest rates of speed.

In the accompanying drawings, Figures 1

and 2 are bottom views of a Singer vibrating-shuttle machine embodying my invention, the parts being in different positions in the two views. Fig. 3 is a detail section on line 3 3
55 of Fig. 2.

A denotes a lever or rocker pivoted on the stud *a*, fixed to the work-plate B, and provided with a crank-arm *c*, connected by a pitman *d* with an operating crank-arm *e*, which, 60 in the machine herein shown, is rigid with a vertical rock-shaft operated from a crank on an upper rotating driving-shaft, this being the usual construction in the well-known Singer vibrating-shuttle machines. The rocker A 65 has a second arm *f* with which the shuttle-carrier has heretofore been rigidly connected, but to which in my present invention the shuttle-driving lever G is pivotally attached by a pin or screw *g*, said lever having the 70 horns *h* and *h'* to engage the shuttle I and the tailpiece *g'*, provided with a slot *g²*, entered by a pin or screw *g³*, fixed to the work-plate B.

When the rocker A is moved back and forth, the lever G will be moved bodily with it, but 75 will at the same time be caused to vibrate more or less on its pivot *g*, the amount of this vibration depending on the shape of the slot *g²* and the position of the stationary screw *g³*, beneath the head of which the tailpiece *g'* slides 80 freely. As the lever G, moving bodily back and forth with the rocker A, is thus vibrated on its pivot *g* its horns *h* and *h'* will be automatically engaged with and disengaged from the holes or recesses in the shuttle into which 85 they enter, the horn *h* being lifted from the shuttle, as shown in Fig. 1, when said shuttle is performing the first part of its forward movement, to permit the forward part of the shuttle to pass through a loop of needle- 90 thread, and the horn *h'* being lifted from the shuttle, as shown in Fig. 2, to permit the loop of needle-thread to escape over the heel of the shuttle. Thus the shuttle-driving lever G, the outer end of the operating-arm of which 95 describes a partial circle of a smaller radius than the radius of the circle from which the arc of the curved shuttle-race J is struck, is so moved relative to the path in which the shuttle travels as to cause the alternate en- 100 gagement and disengagement of the horns of the shuttle-driver and shuttle just described,

the horn *h* engaging the shuttle just before the horn *h'* is disengaged therefrom, so that the shuttle is always in positive engagement with its driver.

- 5 The shuttle-race *J* is provided with a rib or flange *j*, preferably of dovetail or other undercut form in cross-section, and the shuttle *I* is provided with a groove of corresponding form to receive said rib or flange, which thus
10 serves to hold the shuttle in positive connection with its race and to support the main weight of the shuttle. As the said rib or flange enters the said groove in the shuttle with a close sliding fit, and as the said shuttle is, as above described, always in engage-
15 ment with its driver, any rattling of the shuttle against the race or driver, when in operation, is effectively prevented, and the shuttle is vibrated or moved back and forth smoothly
20 and quietly, even at the highest rates of speed.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. The combination with a curved shuttle-race and a shuttle fitted to run against the
25 same, of a two-horned vibrating-shuttle driver which swings from or on a center or pivot nearer to the said race than the center from which the arc of the shuttle-race is described,
30 and means for vibrating said shuttle-driver on its pivot and for moving it back and forth bodily; whereby said shuttle-driver will be so moved relatively to said shuttle as to cause
35 its horns to be alternately engaged with and disengaged from said shuttle as the latter is moved to and fro.

2. The combination with a curved shuttle-race and a shuttle fitted to run against the
40 same, of a two-horned shuttle-driver, a rocker or vibrating lever to which said driver is pivoted between the fulcrum or center of motion

of said rocker or lever and said shuttle-race, and means for vibrating said driver on its pivot and for moving it back and forth bodily; whereby the horns of the driver are
45 caused to be alternately engaged with and disengaged from said shuttle as the latter is moved to and fro.

3. The combination with a curved shuttle-race having an undercut rib and a shuttle
50 fitted to run against the same, and having a groove into which said rib closely fits, of a two-horned shuttle-driver, a rocker or vibrating lever to which said driver is pivoted between the fulcrum or center of motion of said
55 rocker or lever and said shuttle-race, and means for vibrating said driver on its pivot and for moving it back and forth bodily; whereby the horns of the driver are caused to be alternately engaged with and dis-
60 engaged from said shuttle as the latter is moved to and fro.

4. The combination with a curved shuttle-race having an undercut rib and a shuttle
65 having a curved face grooved to receive said rib, of a rocker or vibrating lever, a two-horned shuttle-driver pivoted to said rocker or lever at a point between the pivot of the latter and said shuttle-race, said shuttle-driver having a tailpiece provided with a slot,
70 and a fixed pin entering said slot and serving to vibrate said driver on its pivot to cause its horns to be alternately engaged with and disengaged from said shuttle as said driver is carried back and forth bodily by said rocker
75 or lever.

In testimony whereof I affix my signature in presence of two witnesses.

EDWARD B. ALLEN.

Witnesses:

HENRY CALVER,
JOSEPH F. JAQUITH.