

3 Sheets—Sheet 1.

SHUTTLE OPERATING MECHANISM FOR SEWING MACHINES.

Patented Feb. 18, 1890.

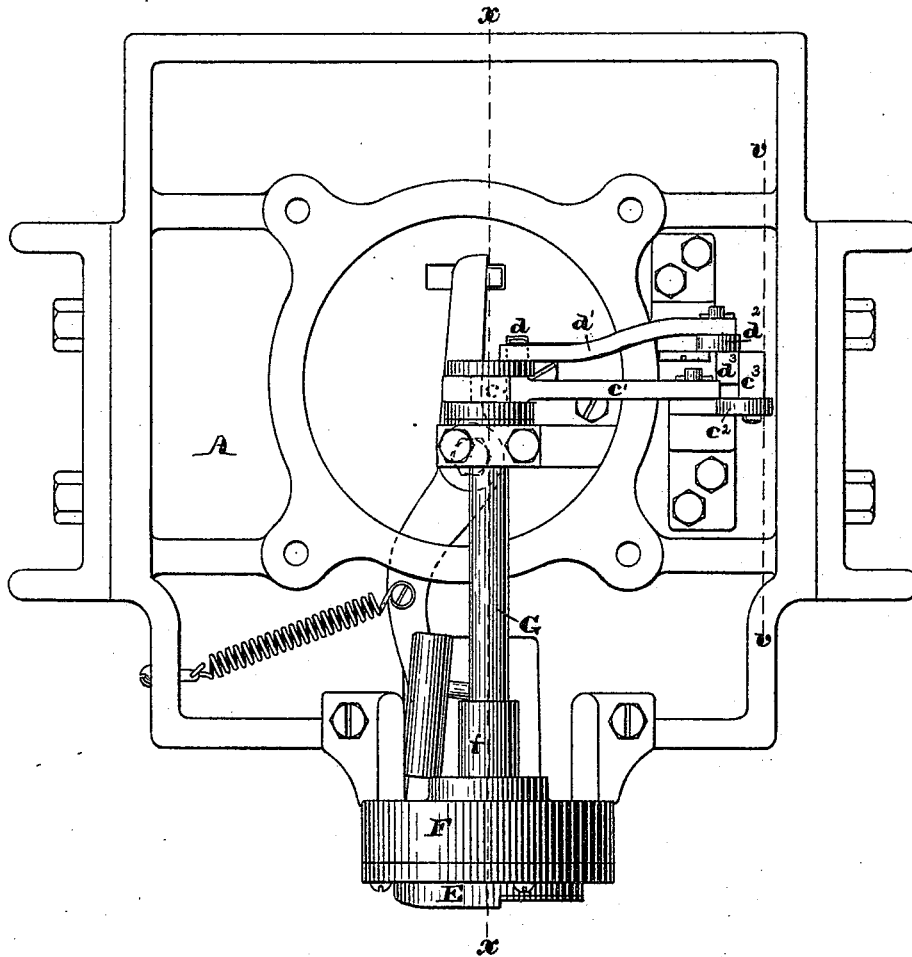


Fig.1.

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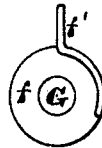


Fig. 6.

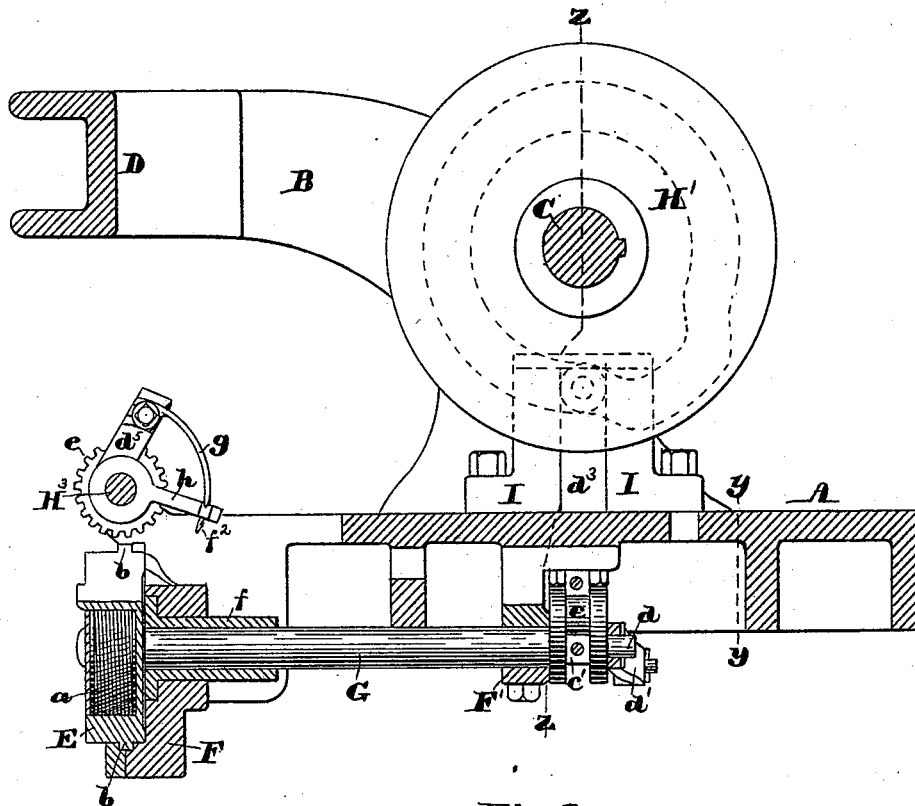


Fig. 2

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(No Model.)

3 Sheets—Sheet 3.

J. E. BERTRAND.

SHUTTLE OPERATING MECHANISM FOR SEWING MACHINES.

No. 421,808.

Patented Feb. 18, 1890.

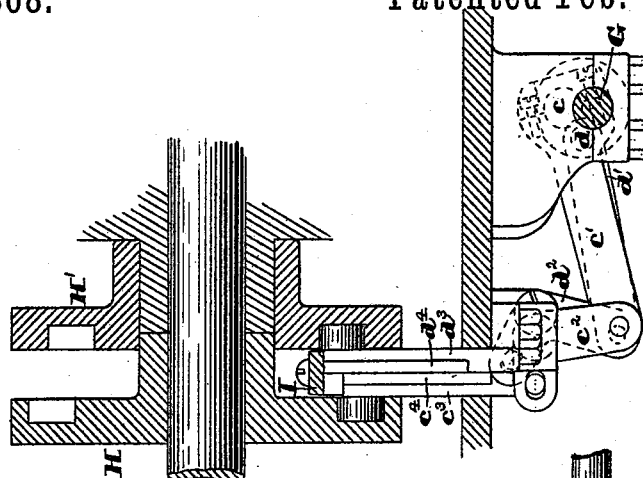


Fig. 4.

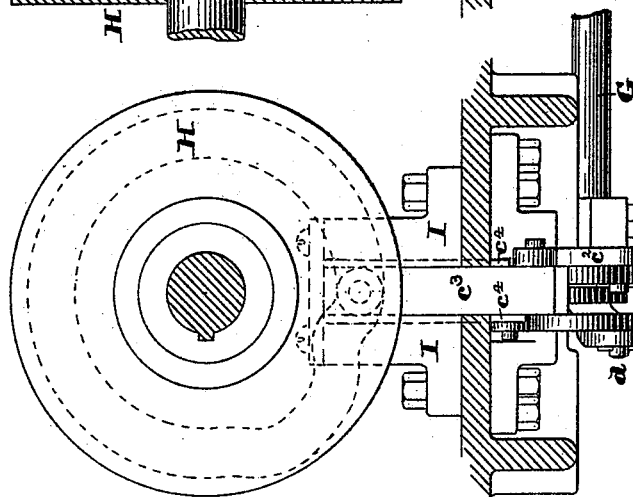


Fig. 5.

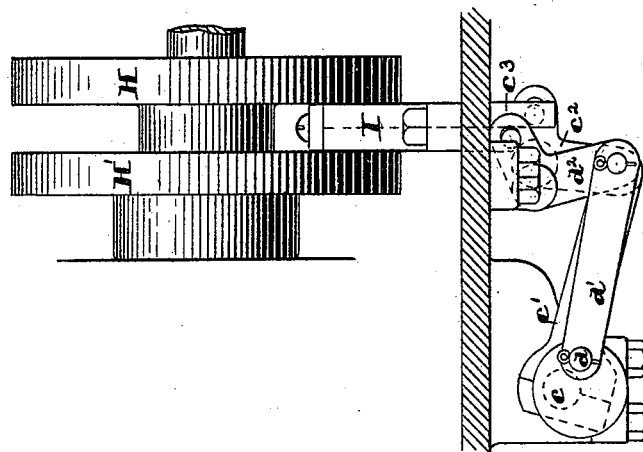


Fig. 6.

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UNITED STATES PATENT OFFICE.

JOSEPH ELI BERTRAND, OF BOSTON, ASSIGNOR OF ONE-HALF TO MELLEN BRAY, OF NEWTON, MASSACHUSETTS.

SHUTTLE-OPERATING MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 421,808, dated February 18, 1890.

Application filed July 29, 1889. Serial No. 319,014. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH ELI BERTRAND, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and
5 useful Improvement in Sewing-Machine Shuttle-Operating Mechanisms, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to sewing-machine
10 shuttle-operating mechanisms; and it consists of certain novel features of construction, arrangement, and combination of parts, which will be readily understood by reference to the description of the drawings and to the claims,
15 to be hereinafter given, and in which my invention will be clearly pointed out.

Figure 1 of the drawings is an inverted plan of the bed of the machine with the shuttle-operating shaft and portions of mechanism
20 for operating the same and illustrating my invention. Fig. 2 is a vertical section on line *xx* on Fig. 1. Fig. 3 is a partial section on line *yy* on Fig. 2, looking toward the front of the machine. Fig. 4 is a partial vertical
25 section on line *zz* on Fig. 2, looking toward the rear of the machine. Fig. 5 is a partial section on line *vv* on Fig. 1, looking toward the center of the machine; and Fig. 6 is a front end view of the shuttle-driver.

This invention covering the shuttle-operating mechanism forms a part of the machine shown and described in another application of mine of even date herewith, and is shown and partially described therein, but not
35 claimed, and hence only so much of the machine is shown in the drawings and described in the specification of this case as may be necessary to the clear understanding of the shuttle-operating mechanism.

In the drawings, A is the bed of the machine, to be supported upon a suitable column. (Not shown.)

B is one of the side frames.

C is the cam-shaft, and D is the front T-
45 girt.

E is the shuttle, of the revolving-hook pattern, having formed therein a chamber to receive the bobbin *a* in a well-known manner. This shuttle has formed upon its periphery a

50 lip *b*, which fits into a corresponding groove

in the shuttle-holder or race F, secured to the front of the bed A in a fixed position.

G is the shuttle-operating shaft, mounted in a bearing in the shuttle-holder or race F and another bearing in the stand F', and has
55 firmly secured upon its front end the sleeve *f*, upon the front end of which is formed the curved wing *f'*, which engages with the shuttle in advance of its hook to impart the motion of the shaft G to the shuttle.

The object of this invention is to impart
60 to the shuttle an intermittent rotary motion always in the same direction—that is, give to the shuttle a complete revolution for each stitch, with a standstill between each two
65 revolutions of sufficient length for the needle and awl to be moved upward through the work, feed the work, receive the thread in the barb of the needle, draw the loop of thread
70 through the work, and be moved to their rear most positions to form the loop below the work through which the shuttle is to pass. To accomplish this, I form upon the rear end of the shaft G two crank-pins *c* and *d*, arranged
75 nearly quartering to each other, as indicated in Figs. 3 and 4. The crank-pin *c* is connected by the link *c'* to the longer arm of the elbow-lever *c²*, the shorter arm of which is pivoted to the lower end of the vertically-sliding bar *c³*, fitted to a bearing in the stand
80 I and carrying at its upper end an anti-friction roll, which fits into and is acted upon by the path of the cam H, as shown in dotted lines in Fig. 5 and in full lines in Fig. 4. The crank-pin *d* is in like manner con-
85 nected by the link *d'* to the longer arm of the elbow-lever *d²*, the shorter arm of which is pivoted to the lower end of the vertically-sliding bar *d³*, also fitted to a bearing in the stand I and carrying at its upper end an anti-
90 friction roll which fits into and is acted upon by the path of the cam H. (See Figs. 2 and 4.) The bars *c³* and *d³* are mounted in the same stand I, side by side with their inner faces in contact, and are guided in their ver-
95 tical movements by the lips *c⁴* and *d⁴*, respectively, which fit into vertical grooves in the stand I, as shown.

The paths of the cams H and H' (shown in dotted lines in Figs. 2 and 5, respectively) are
100

made of such shape that the path of one cam shall not serve as a resistance to the operation of the other cam and with the two crank-pins set nearly quartering to each other and the axis of their shaft, one or the other of the cams is always acting to advantage upon the shaft G to rotate it, thus avoiding completely any trouble from dead-centers, and a complete revolution of the revolving shuttle or looping-hook is obtained in about one quarter of a revolution of the cam-shaft, and then the shuttle or hook remains in a state of rest during the remainder of the revolution of said cam-shaft, and then has another complete revolution in the same direction imparted thereto with another corresponding standstill succeeding it. This is a very important feature of my invention, as the shuttle or hook has no retrograde or backward movement given to it, but is always moved in the same direction but with an intermittent motion, it remaining in a state of rest after each complete revolution a sufficient length of time for the needle and awl to advance from their most rearward positions, pierce the material to be sewed, receive the thread above the work, and recede to its rear-most position to form and spread the loop below the work for the passage of said shuttle or hook.

H³ is the needle-operating shaft, having firmly secured thereon the pinion *e* and the needle and awl carrying radius-arm *d*³, in the end of which is set the needle *f*² and awl *g*, and loosely mounted thereon the needle and

awl guide and stay *h*, all of which, as they form no part of the present invention, will not be further described here.

The subject-matter of this specification is shown and described but not claimed in an application of even date herewith, and filed July 29, 1889, Serial No. 319,015.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a sewing-machine, the combination of a revoluble bobbin-carrying shuttle, a shaft for driving said shuttle, provided with two cranks set at right angles, or nearly so, to each other, two path-cams, a system of rods and lever connecting one of said cams with one of said cranks, and a similar system of rods and lever connecting the other of said cams with the other crank, whereby said shuttle may be intermittently revolved always in the same direction without loss of power on account of dead-points.

2. In a sewing-machine, the combination of the shuttle or hook *E*, the driver *f*, the shaft *G*, having two crank-pins *c* and *d*, the links *c'* and *d'*, the levers *c*² and *d*², the sliding bars *c*³ and *d*³, and the cams *H* and *H'*.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 22d day of July, A. D. 1889.

JOSEPH ELI BERTRAND.

Witnesses:

N. C. LOMBARD,
WALTER E. LOMBARD.