

D. H. CAMPBELL.
Sewing Machine.

No. 241,608.

Patented May 17, 1881.

Fig. 1

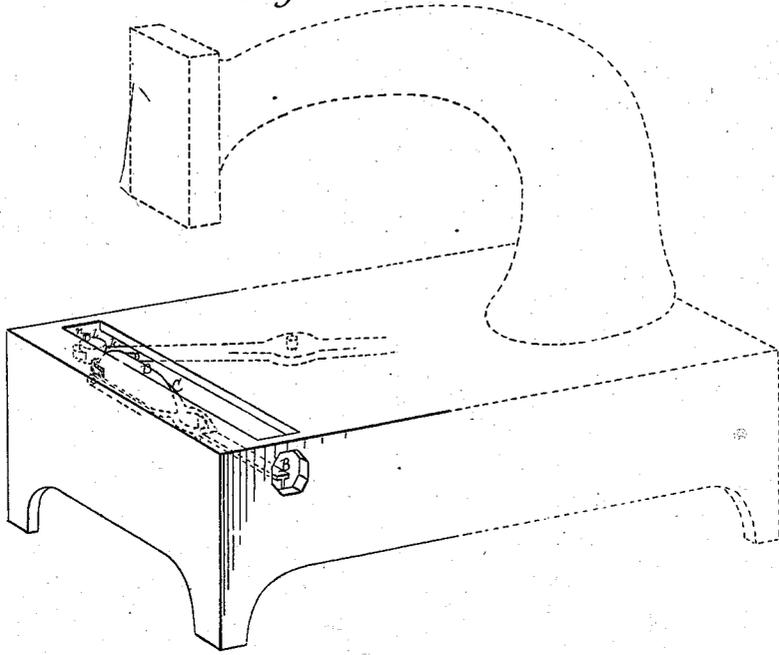


Fig. 2.

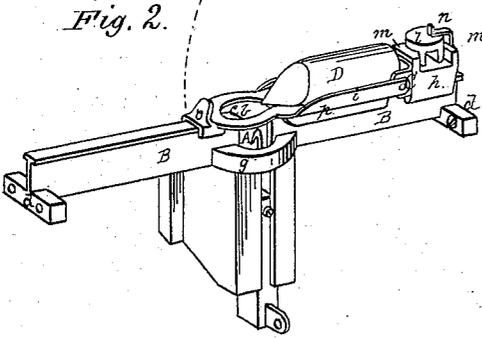


Fig. 3.

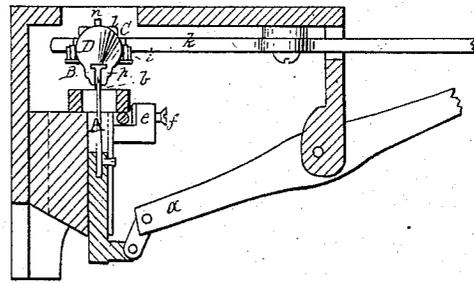


Fig. 4.

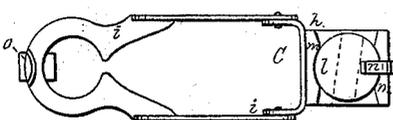


Fig. 5.

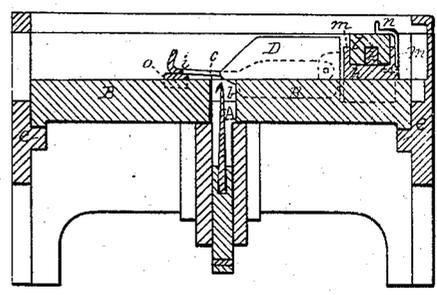
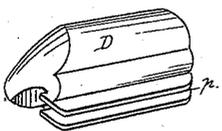


Fig. 6



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UNITED STATES PATENT OFFICE.

DUNCAN H. CAMPBELL, OF PAWTUCKET, RHODE ISLAND, ASSIGNOR OF
THREE-FOURTHS TO HENRY B. METCALF, FRANK E. COMEY, AND
DANIEL McNIVEN, ALL OF SAME PLACE.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 241,608, dated May 17, 1881.

Application filed May 13, 1879.

To all whom it may concern:

Be it known that I, DUNCAN H. CAMPBELL, of Pawtucket, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Sewing-Machines; and I do hereby declare that the following specification, taken in connection with the drawings furnished and forming a part thereof, is a clear, true, and complete description of my invention.

My said improvements are specially adapted to wax-thread machines, involving the use of a hook-needle and a shuttle, which I term "centrally-pointed," because its point is in line with the path of the needle, and the latter and the axis of the shuttle occupy the same plane; and my present invention partially consists of the combination, with a hook-needle and a centrally-pointed shuttle, of a single supporting-rail parallel with the axis of the shuttle, and broken away centrally to afford a path for the needle in the plane occupied by the axis of the shuttle. A shuttle-rail of this character not only directly supports the shuttle, but the portion thereof in front of and adjacent to the needle operates as a stop to prevent the loop drawn down by the needle from being unduly thrown forward during the passage of the shuttle. This shuttle-rail may be so constructed as to receive a shuttle fitted thereto and securely hold it against all movement except its proper longitudinal movement to and fro, and I hereinafter show and describe such a rail; but I do not limit the above-mentioned portion of my invention thereto, because I am well aware that a rail of the general character above set forth may be so constructed as to only confine the shuttle against undue lateral movement, and not to have any holding control over it, as when passing through a loop, and which would require additional co-operative devices to prevent its rising from the rail.

For enabling the rail to have proper control over the shuttle with reference to confining it against all undue lateral or vertical movement, my invention further consists in the combination, with a hook-needle and a centrally-pointed shuttle provided with a longitudinal web

on its lower side and a longitudinal T-recess therein, of a T-rail which is embraced within the recess of the shuttle, and broken away centrally to afford a path for the needle in the plane occupied by the axis of the shuttle.

I am well aware that flat-sided shuttles with T-shaped and dovetailed splines on their flat sides occupying corresponding grooves in the sides of their shuttle-races have heretofore been employed in connection with eye-pointed needles, and that in combination with hook-needles shuttles with laterally-projecting points have been heretofore mounted on dovetailed slides by means of splines on the shuttles; but in these latter cases the slides and the needle occupy different planes, which necessitates the laterally-projecting shuttle-point and additional mechanism for enabling the shuttle to properly engage with the loop.

Any suitable shuttle-driver may be employed for operating a shuttle mounted on a rail as previously set forth.

I am well aware that the shuttle-driver may be variously constructed and mounted, either upon the rail or independently of it, and also that the driver may engage with the heel of the shuttle, and with one or both sides of its neck.

My invention further consists in the combination, with a shuttle and a single shuttle-supporting rail broken away centrally to afford a path for a needle, of a shuttle-driver mounted on said rail; and, further, in a shuttle-driver of peculiar construction, in that it is composed of a slide adapted to be mounted on a rail and a hinged bridle which engages with the front portion of the shuttle. The slide engages with the heel of the shuttle in its forward movement, and the bridle engages with the neck of the shuttle in its backward movement. Said bridle, being hinged, is readily lifted for permitting the shuttle to be removed by sliding it beyond the end of its rail. The shuttle-driver thus mounted on a rail may be driven by a vibrating lever connected therewith by means of a link; but I have combined with the shuttle-driver, mounted on its rail, a slotted cylindrical hub-block fitted to concave

bearings on the shuttle-driver, and a vibrating lever which occupies the slot in the hub-block, and that combination of mechanism constitutes another feature of my invention.

5 For accurately adjusting the rail it is mounted in frames provided with adjusting-screws, and said frames, in combination with a shuttle-supporting rail, broken away centrally to afford a path for a needle, constitutes another
10 portion of my invention.

To more particularly describe my improvements, I will refer to the accompanying drawings, in which—

15 Figure 1 represents, in isometrical projection, so much of a sewing-machine embodying my invention as is necessary for its illustration. Fig. 2 represents, in perspective, the shuttle rail, the needle, its guide, the shuttle, and its carrier detached. Fig. 3 represents
20 the front of a part of the machine shown in Fig. 1 in central vertical section. Fig. 4 represents the shuttle-driver in top view, detached. Fig. 5 represents the rail, shuttle, driver, &c., in longitudinal section. Fig. 6 is a view of
25 the shuttle, detached.

The hook-needle A is mounted in guides, and is operated by a vibrating lever, *a*, as heretofore, being raised from below for taking and carrying down a loop.

30 The shuttle-rail B is located at right angles to the needle, and is broken away centrally at *b*, to afford a path for the needle, and to also afford a surface, *c*, which operates as a stop for preventing a loop from being moved unduly forward by the shuttle after being released or
35 cast off by the hook-needle. This rail may be variously constructed; but if it supports the shuttle and is broken away centrally to afford a path for the needle it will embody a prominent portion of my present invention, however
40 otherwise constructed. The rail shown in the drawings is T-shaped, and is embraced by a shuttle having a web recessed correspondingly, as hereinafter described. It being important
45 that the rail be accurately adjusted, I have shown it to be provided with a flange, *d*, at each end, which flanges occupy beds or frames *e* on the inner surfaces of the frame of the machine, and the set-screws *f* in said frame bearing
50 against the flanges admit of the desirable adjustment of the rail. The rail being divided into two parts at the path of the needle is rendered firm and solid by means of a ring-web, *g*, which incloses the needle-path.

55 It will be seen that the supporting-rail, the point of the shuttle, and the path of the needle occupy the same vertical plane, which secures the accurate central entrance of the shuttle to a loop and the perfect control of the
60 lower side or end of the loop by the rail.

The shuttle-driver C is mounted directly on the rail B, and is composed of a slide, *h*, recessed to embrace the upper portion of the rail, and a bridle, *i*, is hinged to the slide and
65 ranged to engage with the neck of a shuttle on

both sides thereof. So far as I know a shuttle-driver composed of a slide adapted to be mounted on a rail of any kind, and provided with a hinged bridle, as shown, was never made prior to my present invention. For operating
70 this shuttle-driver I have combined with it and its vibrating lever *k* a cylindrical hub-block, *l*, slotted transversely to receive the end of the lever, and fitted to concave or semi-cylindrical bearings *m* on the slide. The hub-block is
75 maintained in its seat by the button *n*. This construction affords a smooth and even motion, the pressure by the lever always being exactly in line with the longitudinal center of the shuttle-driver and the rail. For preventing
80 any lateral movement or strain upon the front end of the hinged bridle I have provided it with a saddle, *o*, which rests upon the rail and extends downward slightly on each side thereof.

The centrally-pointed shuttle D is similar to
85 others heretofore made by me, as shown, for instance, in my application for patent filed January 30, 1878, in that it has a longitudinally-recessed web, *p*, which operates as a cast-off for releasing the loop from a hook-needle; but
90 in this machine I have for the first time utilized said recessed web as a medium of connection with a supporting-rail. The particular recess in a centrally-pointed shuttle-web, as shown, is novel in that it is T-shaped in cross-section,
95 so as to embrace its rail and be thereby limited to a strictly longitudinal movement, and be also capable of operating as a cast-off. The point of the shuttle when in working position is closely adjacent to the upper surface of the
100 rail, and as the shuttle enters and opens the loop laterally the end of the rail adjacent to the path of the needle holds the loop from moving forward, but permits it to freely open, rendering the shuttle very positive in its action,
105 and enabling it to pass through with but little friction on the thread.

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

1. The combination, with a hook-needle and
110 a centrally-pointed shuttle, of a single supporting-rail parallel with the axis of the shuttle, and broken away centrally to afford a path for the needle in the plane occupied by the axis of the shuttle, substantially as described. 115

2. The combination, with a hook-needle, and a centrally-pointed shuttle having a longitudinal web on its lower side, and a longitudinal
115 T-recess therein, of a T-rail which is embraced within the recess of the shuttle, and is broken
120 away centrally to afford a path for the needle in the plane occupied by the axis of the shuttle, substantially as described.

3. The combination, with a shuttle and a single shuttle-supporting rail broken away centrally to afford a path for a needle, of a shuttle-driver mounted on said rail, substantially as
125 described.

4. A shuttle-driver for sewing-machines, composed of a slide adapted to be mounted on
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a rail, and a hinged bridle which engages with the front portion of the shuttle, substantially as described.

5 5. The combination, with a sliding shuttle-driver mounted on a rail, and its operating-lever, of a cylindrical hub-block fitted to concave bearings on the driver, and slotted to receive the operating-lever, substantially as described.

10 6. The combination, with a shuttle-support-

ing rail, of frames at each end provided with adjusting-screws, whereby said rail may be accurately adjusted for guiding the shuttle with reference to the path of the needle, substantially as described.

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Witnesses:

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