D. H. CAMPBELL.

Sewing Machine.

No. 241,611. Patented May 17, 1881.

Fig. 1.

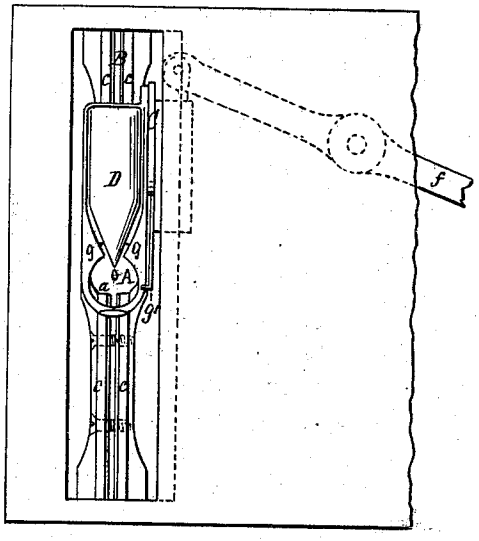


Fig. 2.

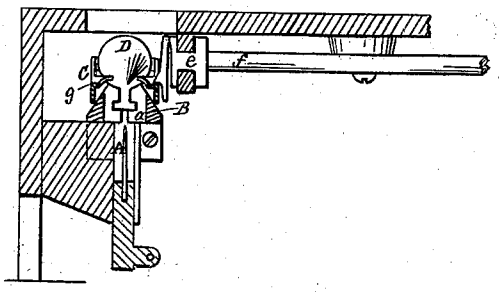


Fig. 4.

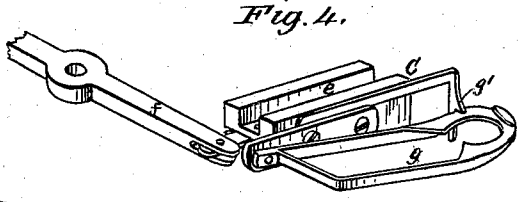


Fig. 3.

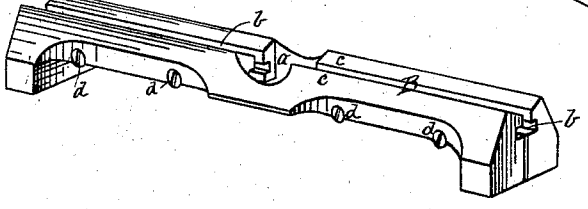


Fig. 5.

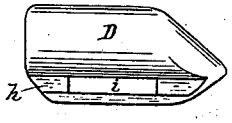
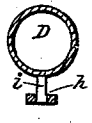


Fig. 6.



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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. 241,611, dated May 17, 1881.

Application filed May 14, 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 full, clear, and complete description of my invention.

My improvements relate to the shuttle, its race, and its driver, and they are particularly applicable to wax-thread machines in which a hook-needle and a centrally-pointed shuttle are employed.

In certain other applications for Letters Patent filed by me May 13 and 14, 1879, and respectively designated as Cases "No. 1," "A," "B," "C," and "E," I have shown and described certain novel features in centrally-pointed shuttles, and in the methods of mounting and of operating them. In all the machines devised by me up to the time of making my present invention the shuttles have been provided on their under side with a longitudinal web extended from end to end, and recessed from one end to the other radial to the axial line of the shuttle. In all of said machines the sides of the web on each side of this web-recess operate as a cast-off, by which, when the hook-needle slightly ascends beneath the shuttle, the loop is freed from the needle, and in some of said machines said recess is of value in co-operating with the needle only; but in others the recess is also occupied by a shuttle-rail, on which the shuttle moves to and fro. In those prior machines, wherein the shuttle-recess referred to is not used as a means for mounting the shuttle on a central rail, additional recesses have been provided in the sides of the body of the shuttle for mounting it in its race. I have termed the shuttle used by me a "centrally-pointed shuttle," because its point and axis occupy the same plane as the path of the hook-needle used therewith.

I have now devised a centrally-pointed shuttle of the character referred to, which differs from any other heretofore made, so far as my knowledge extends, in that it has a longitudinal T-shaped web on its under side for engagement with a race reversely recessed for receiving the web of the shuttle, and confining it against undue lateral or vertical movement, while free to move longitudinally. Such a shuttle may be also so constructed that a portion of this web may operate as a cast-off for the hook-needle, or, as provided for in a certain other application for Letters Patent filed by me, (Case E,) the shuttle-driver may be relied upon for that service independently of the shuttle; and my invention partially consists in a shuttle provided with a longitudinal T-shaped web, which is broken away centrally to afford space within which the point of a hook-needle may enter for casting off a loop.

I am well aware that heretofore, in combination with an eye-pointed needle, a flat-sided shuttle has been provided with a T-shaped spline for occupying a correspondingly-grooved side of its race; but in such case the axis of the shuttle and the path of the needle occupy different planes, and the portion of the race which is cut away to afford a path for the needle does not operate as a stop for the loop, because the eye of the needle exercises the entire retaining control thereof.

Splined or dovetailed shuttles have also heretofore been employed in combination with hook-needles; but in such cases the point of the shuttle is projected laterally, so as to occupy a plane to the one side of the axis of the shuttle for intersecting the path of the needle, and therefore additional mechanism is requisite for enabling the shuttle to properly enter and pass through its loop, whereas a centrally-pointed shuttle (having its axis and its point in the plane occupied by the path of a hook-needle) enters the loop centrally, and forces it open equally, to the right and the left, and the loop is stopped from moving forward with the shuttle by abutting against the surface of the rail, as arranged by me and shown in my several applications for patent hereinbefore referred to.

The shuttle-rail employed by me with this shuttle is novel in that it is provided with a

T-shaped longitudinal recess for receiving the T-shaped web of the shuttle, and is broken away centrally to afford a path for a needle in the plane occupied by the axis and point of the shuttle, and also to afford adjacent to said path a surface which operates as a stop for preventing a loop from being unduly moved forward by the shuttle in its passage, and such a rail, in combination with a shuttle having a T-shaped web, constitutes another portion of my invention.

For accurate adjustment of the shuttle on its rail, and compensating for wear from time to time, my invention further consists in the combination, with a shuttle having a longitudinal T-shaped web, of a rail provided with a T-shaped recess to receive the web, and composed of two parallel sections which are adjustable by means of screws with reference to each other and to the web of the shuttle.

My invention further consists in the combination, with a centrally-pointed shuttle provided with a T-shaped web, a rail broken away to afford a path for a needle and recessed to receive the web of the shuttle, of a suitable shuttle-driver.

In certain other applications for Letters Patent filed by me, as hereinbefore designated, I show shuttle-drivers of varied construction, which may be used in the combination last stated; but I have devised and herein show a novel driver, which consists of a slide mounted on guides independent of the shuttle-rail, and a frame, which surrounds the shuttle longitudinally, is pivoted to its slide, and is locked by a latch for maintaining it in proper working relations with the shuttle.

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

Figure 1 represents the front portion of the bed of a machine embodying my improvements, with a portion of the frame broken away to show the shuttle and the adjacent parts. Fig. 2 represents the same in vertical section. Fig. 3 represents the shuttle-rail, detached. Fig. 4 represents the shuttle-driver, detached. Figs. 5 and 6 represent the shuttle respectively in side view and cross-section.

The hook-needle A, as heretofore, rises from below and carries a loop downward.

The shuttle-rail B is broken away centrally at *a*, to afford a path for the needle, and the rail in front of the needle is squared off, to afford a good contact for a loop, to prevent its moving forward with the shuttle. The rail is provided with a central longitudinal T-shaped recess, *b*, for the reception of the shuttle-web, hereinafter described. This rail may be solidly constructed, but I prefer to divide it longitudinally into two parts, as shown at *c c*, and to connect them with lateral screws *d*, by which they may be set, with relation to each other and to the web of the shuttle, for attaining accurate adjustment. The ends of the rail are provided with flanges and secured by screws to the frame of the machine, and the screws should be so arranged as to afford a vertical and lateral adjustment of the rail.

The shuttle-driver C is mounted in guides wholly independent of the rail, and is composed, in part, of a slide, *e*, connected by a link to the vibrating lever *f*. This driver is novel so far as relates to the frame *g*, which wholly surrounds the shuttle, engages with the heel and neck thereof, and is pivoted to the slide. It has, also, a spring-latch, *g'*, on the slide, which engages with the front part of the frame, and for maintaining it in proper contact with the shuttle during its forward movement. In a certain other application for Letters Patent (Case A) I have shown a hinged bridle, which engages only with the neck of the shuttle, and is hinged to a slide, which engages with the heel of the shuttle. The frame being lifted admits of the withdrawal of the shuttle by sliding it along the rail outward through a hole in the side of the machine.

The shuttle D, centrally pointed in the sense hereinbefore set forth, is unlike any heretofore made by me or others, so far as I know, in that it has a longitudinal T-shaped web, *h*, on its under side, in line with and below its point. This T-shaped web may be employed solely as a means for securely mounting the shuttle on its rail, or it may be broken away centrally, longitudinally, and laterally, as at *i*, so that a hook-needle may rise into the space thus afforded for casting off a loop, as with a web longitudinally recessed throughout its length, as heretofore provided for by me. The recess *i* in the web may be dispensed with as a cast-off, if other means be provided for that purpose, as set forth in another application for Letters Patent (Case E) filed by me. When not recessed for use as a cast-off the web may be much reduced in size, so as to project but little from the shuttle, and its retaining-shoulders can then be reduced to a minimum, so that but little if any contact will occur between it and a loop, especially if the latter be retained by the needle until the shuttle has passed through, as provided for by me in another application for Letters Patent. (Case E.)

It will be seen that the axis of the shuttle, its point, and the path of the needle all occupy the same vertical plane.

The operation of the several parts will be readily understood in view of the detailed description.

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

1. The combination, with the centrally-pointed shuttle having a T-shaped web on its lower side, of the shuttle-race grooved to receive the shuttle-web, and broken away centrally, and the hook-needle having its path centrally located within the race and coincident with the axis of the shuttle, substantially as described.

2. A centrally-pointed shuttle provided with a longitudinal T-shaped web broken away centrally to operate as a cast-off for a hook-needle, substantially as described.

3. The combination, with a centrally-pointed

shuttle having a longitudinal T-shaped web on its under side, of a shuttle-rail recessed to recive the web of the shuttle, broken away centrally to afford a path for a needle in the plane occupied by the axis and the point of the shuttle, and which has adjacent to said path a surface which operates as a stop for preventing a loop from being carried forward by the shuttle, substantially as described.

4. The combination, with a shuttle having a T-shaped web on its under side, of a rail, recessed to receive said web, composed of two parallel sections and provided with screws for adjusting the same with reference to each other and to the web, substantially as described.

5. The combination, with a centrally-pointed shuttle provided with a T-shaped web on its under side, a shuttle-rail broken away centrally to afford a path for a needle in the plane occupied by the point and axis of the shuttle, and recessed to receive the web of the shuttle, of a shuttle-driver, substantially as described.

6. The shuttle-driver mounted on independent guides consisting of a slide, a frame pivoted to the slide for surrounding the shuttle, and a latch for maintaining the frame in proper relations with the shuttle, substantially as described.

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