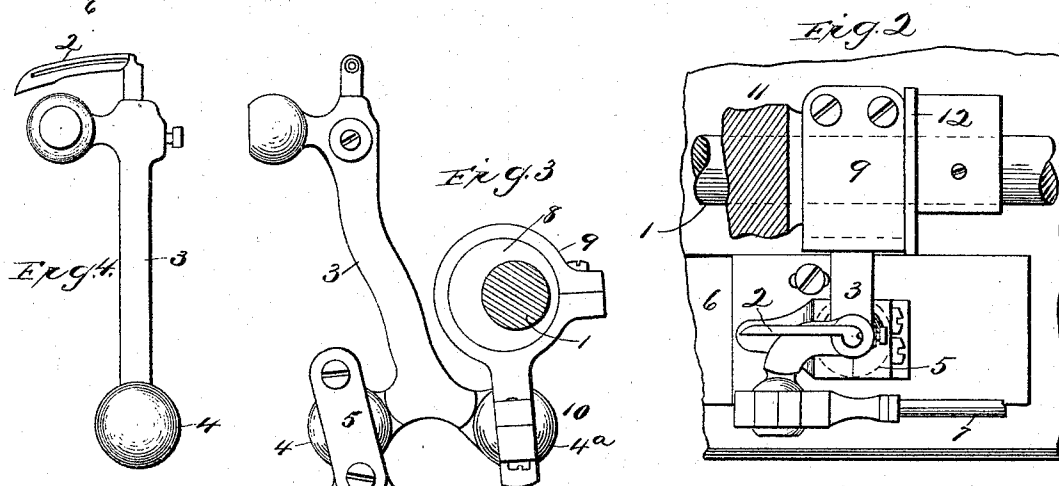
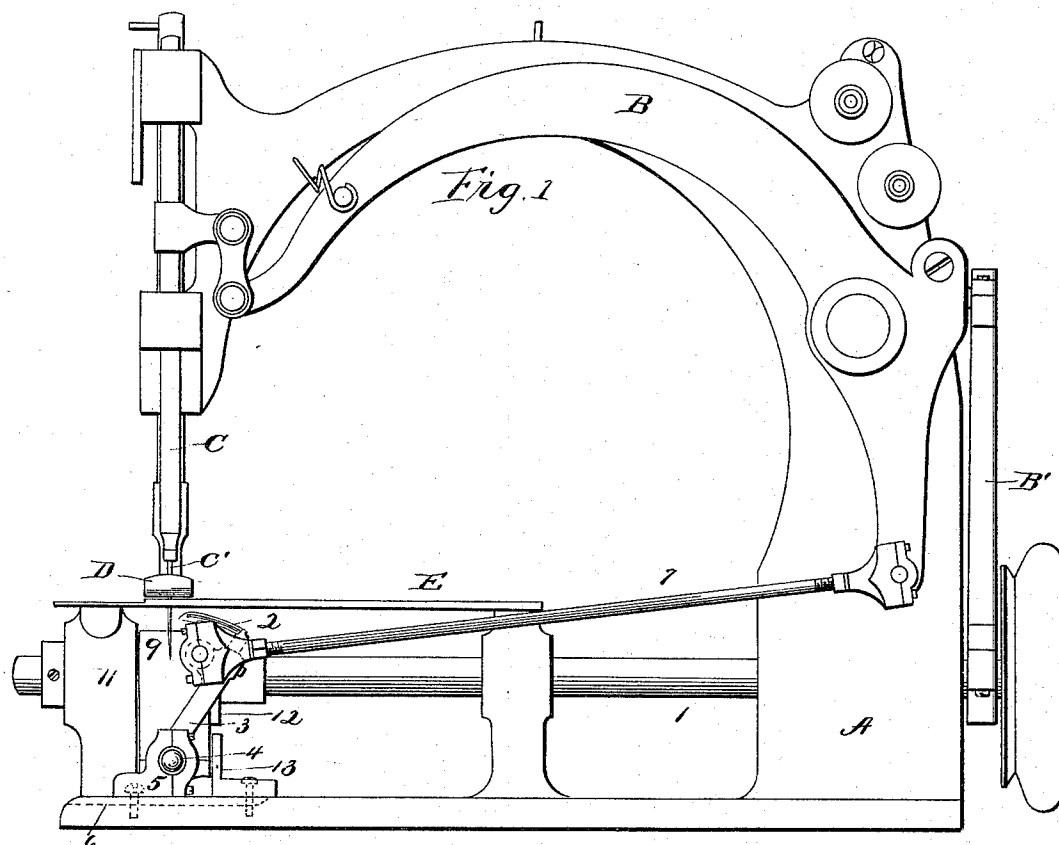


(No Model.)

J. M. MERROW.
SEWING MACHINE.

No. 541,977.

Patented July 2, 1895.



witnesses
J. M. Fowler Jr.
Thomas Durant

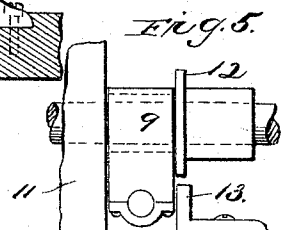


Fig. 5 is a detailed view of a mechanical component, showing a cross-section of a housing and internal parts. It is labeled with numbers 1, 2, 3, 4, 5, 6, 9, 10, 11, 12, 13, and 14.

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UNITED STATES PATENT OFFICE.

JOSEPH M. MERROW, OF HARTFORD, CONNECTICUT.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 541,977, dated July 2, 1895.

Application filed October 28, 1893. Serial No. 489,384. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH M. MERROW, of Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Sewing-Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the figures and letters of reference marked thereon.

This invention relates particularly to that class of chain-stitch sewing-machines in which a looper is employed to co-operate with a needle in forming the stitches, and is specially designed for use in connection with double chain-stitch machines, wherein the looper carries the lower thread. In machines of this class the looper is usually made to traverse through an orbit about the needle and in a plane intersecting the latter when at the end of its downstroke, the motion of the looper and the form and dimensions of its orbit being controlled by two actuating mechanisms or devices operating in different directions, the one effecting a longitudinal movement and the other a lateral movement of the looper, whereby as the needle begins to ascend the looper is advanced on one side of the needle and passes between the latter and the needle-thread, and as the needle descends the looper is retracted on the opposite side of the needle, the latter passing down between the looper and the lower thread carried thereby.

The object of the present invention is to simplify and improve the looper mechanism, and at the same time render it more substantial and durable, so that it can be run continuously at a higher rate of speed than has heretofore been attained, to which end the invention consists in the new mechanism and combinations of mechanism hereinafter fully described, and pointed out in the claims.

In the drawings, Figure 1 is a front elevation of a sewing-machine with the improvements applied thereto. Fig. 2 is a top plan view, and Fig. 3 a side elevation, of the looper mechanism. Fig. 4 is a detail view of the looper-carrier and looper. Fig. 5 is a detail view showing the guide for the eccentric-strap.

Similar letters and numerals of reference in the several figures indicate the same parts.

In order to illustrate an adaptation of the new looper-mechanism, it is shown applied to

a well-known style of sewing-machine, in which A is the frame; B, the needle-lever, receiving motion from an eccentric on the main shaft through a pitman B'; C, the needle-bar, carrying needle C' and connected through a link to the needle-lever; D, the presser-foot, and E the work-plate.

The feed mechanism has been omitted from the drawings in order to avoid obscuring the other parts.

The parts hereinabove particularly mentioned are such as are in common use on sewing-machines, and their operations are so well understood that it is deemed unnecessary to furnish a more complete and detailed description of them. They are here shown merely as accessories and may be changed or varied at will without affecting the present invention.

The looper 2 is of the usual construction. It is provided with an eye for the lower thread and is detachably secured in the looper-carrier 3 by a clamping screw or other means.

The looper-carrier 3 is operatively held to the frame of the machine by means of a universal joint, which permits of a free oscillation of the looper-carrier in any direction, said joint or bearing being preferably a ball and socket, the ball or spherical member 4 being made integral with the looper-carrier and the socket in the form of a divided bearing 5, the latter being adjustably secured to the frame, as by fitting its base within a groove 6 and securing it in position by screws or bolts.

The position and motion of the looper-carrier are controlled and produced by two actuating mechanisms, the one operating to oscillate the looper-carrier in a direction longitudinally of the looper and the other in a direction transverse thereto or laterally of the looper, the universal joint permitting both of said motions taking place at the same time.

The longitudinal motion of the looper is in the present instance effected through a connecting-rod 7, attached at one end by a ball-joint to the looper-carrier and at the opposite end by a similar joint to an extension of the needle-lever. The lateral motion of the looper, by which it is carried on opposite sides of the needle while reciprocating longitudinally, in the present instance is produced by an eccentric 8 on the main shaft 1, the strap 9 of said eccentric being connected by a universal or ball joint 10 to the looper-carrier.

The preferred form of looper-carrier is that shown in the drawings, in which the spherical members 4 and 4^a of the universal joints are formed upon the looper-carrier, with that one 5 4 which is sustained in a fixed bearing beneath the looper in a line drawn perpendicularly through the looper and the center of the fixed bearing when the looper is at the center of the arc through which it traverses, so that 10 the vibrations or oscillations will be performed equally on opposite sides of the perpendicular. The movable bearing in the eccentric-strap for the reception of the spherical member 4^a is located to one side of the spherical member 4 at substantially right angles to 15 a line drawn through the looper and member 4, the relation of the parts to the position of the eccentric being such that at the half-stroke of the eccentric, as indicated in Fig. 3, the looper will stand in a plane perpendicular to a line drawn through the axes of 20 the two spherical members 4 and 4^a. The spherical member to which the connecting-rod 7 is attached is also preferably formed integral with the looper-carrier and is located 25 near the upper end thereof.

It is of importance that the movements of the looper-carrier derived from the two actuating mechanisms and representing a mean 30 between said two motions should be regular and at all times accurately controlled, and inasmuch as during the longitudinal movements of the looper, they being the greater in extent, the looper-carrier oscillates in the two 35 bearings, of which one is fixed and the other movable, it is important that said movable bearing should be accurately guided and maintained in a fixed plane of movement. A convenient and effective arrangement for so 40 guiding the movable bearing is provided, one in which the eccentric-strap is caused to reciprocate between parallel guides or ways, such as are formed by the upright 11 on one side and a collar or plate 12 and block 13 on 45 the opposite side. The collar 12 is adjustably secured to the shaft and is movable longitudinally thereof to take up wear. The block 13 is adjustably secured to the frame and forms one side of the guideway for the lower end 50 of the eccentric-strap, in which the movable bearing is situated. By these means the eccentric-strap is prevented from shifting or twisting laterally and the movable bearing for the looper-carrier is confined to a fixed 55 plane or line of movement. The importance of this will be appreciated when it is considered that any looseness in the joints or diversion of the movable bearing from a fixed line of motion will influence the orbit of the 60 looper and seriously interfere with its co-operative relation with the needle.

The looper may be adjusted vertically in its carrier and its point may be swung laterally, so as to stand nearer to or farther from 65 the needle, by loosening the clamping device and shifting the stem of the looper in the looper-carrier.

It will be observed that the improved looper mechanism is composed of but five essential parts, including the looper and excluding the 70 actuating mechanism. These are the looper, the looper-carrier, the fixed bearing, the movable bearing, and the connection through which motion is communicated to the looper-carrier, and, further, that the orbit or path 75 traversed by the looper is a circle or ellipse developed upon the surface of a sphere of which the fixed bearing is the center.

The lateral oscillations of the looper-carrier are positively produced in both directions, 80 the movements laterally of the looper being performed in an arc of which the fixed bearing is the center and the movements in a transverse plane or longitudinally of the looper being performed in an arc about the 85 same center—to wit, the fixed bearing—and this is permitted by the arrangement of the movable bearing, through which the lateral oscillations of the looper are produced, to one side of but in line with the fixed bearing. 90

Having thus described my invention, what I claim as new is—

1. The combination in a sewing machine, of an integral looper-carrier, provided with members of three universal joints, the opposite 95 member of one of said joints constituting a fixed bearing for the looper-carrier upon which it is free to oscillate, the opposite member of another of said joints constituting a movable bearing, and the opposite member of 100 the third of said joints forming the point of connection with the actuating devices for oscillating the looper carrier, in one direction, and actuating devices engaging the movable bearing; substantially as described. 105

2. The combination in a sewing machine of the integral looper-carrier provided with two spherical members forming parts of universal joints; a looper secured to the looper carrier on a line perpendicular to a line connecting 110 said spherical members; a fixed bearing for one of said spherical members; a movable bearing for the other spherical member; actuating devices engaging said movable bearing, the latter being guided to move in a fixed 115 plane; and actuating devices engaging the looper-carrier for oscillating the latter in a plane at right angles to the movement of the movable bearing; substantially as described.

3. The combination in a sewing machine of 120 the looper carrier 3 provided with spherical members 4 and 4^a, the fixed bearing 5, the vertically reciprocating bearing 10 connected to and driven by the main shaft and the pitman 7 connected to the looper carrier above 125 the plane of its pivotal members 4 and 4^a, with mechanism for actuating said pitman whereby the looper carrier is oscillated about the fixed bearing 5; substantially as described.

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Witnesses:

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