

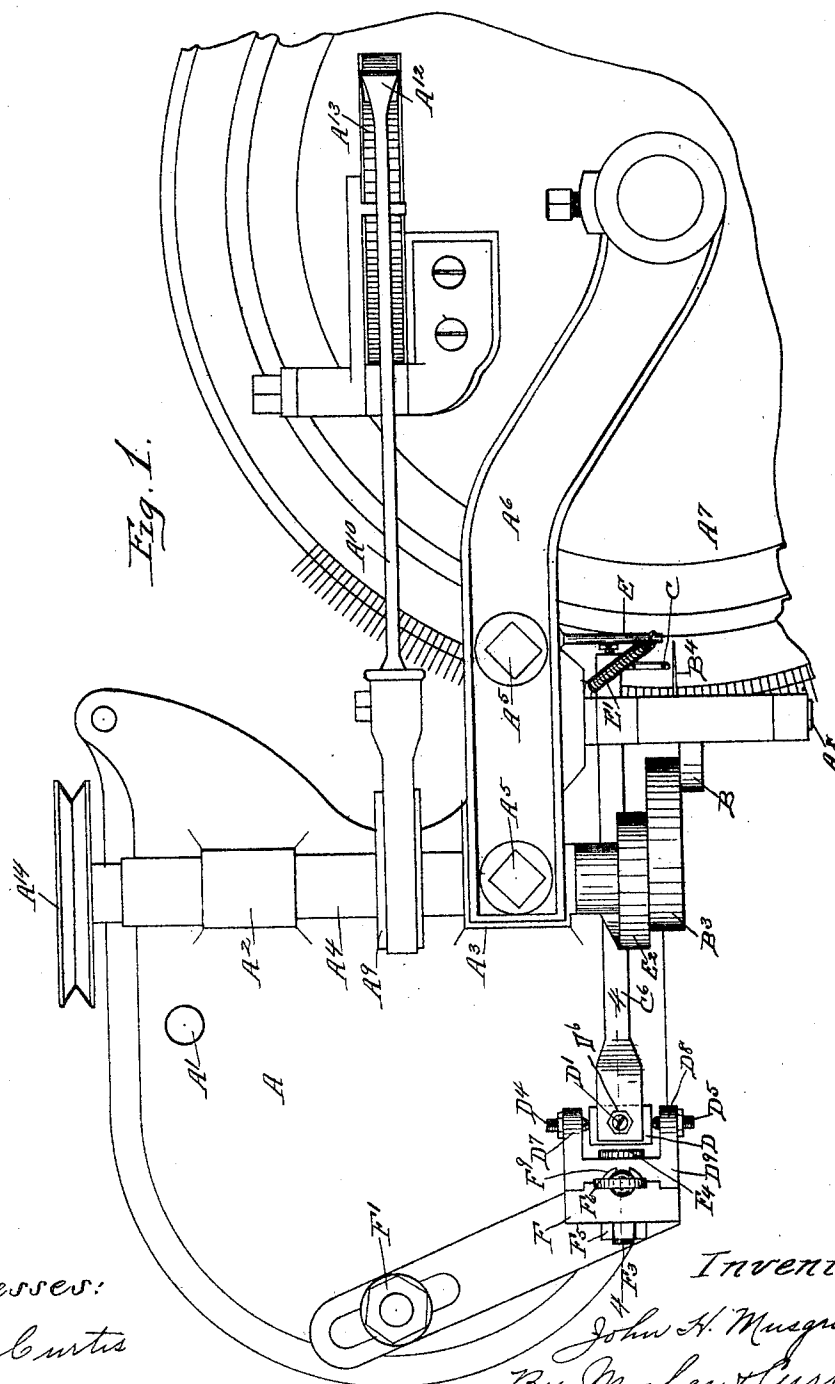
(No Model.)

2 Sheets—Sheet 1.

J. H. MUSGROVE.
MACHINE FOR SEWING LOOPED FABRICS.

No. 581,758

Patented May 4, 1897.



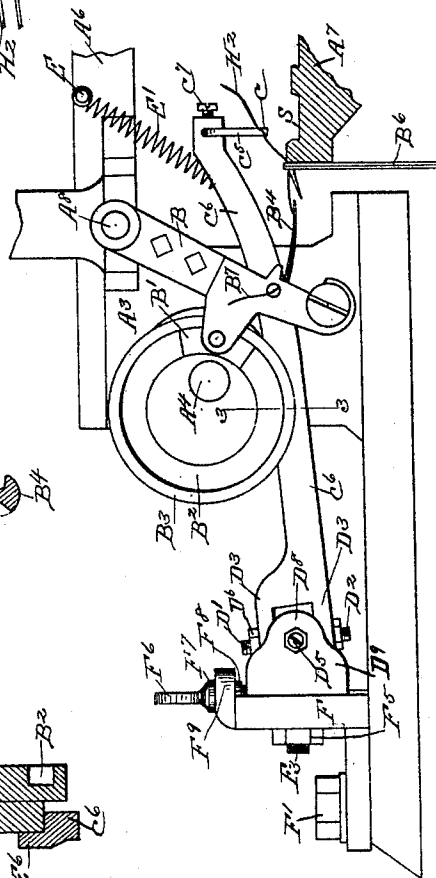
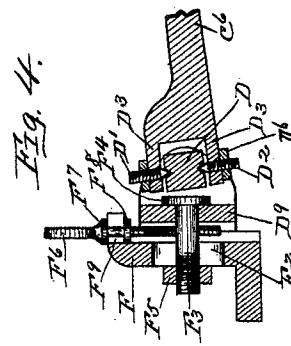
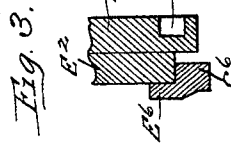
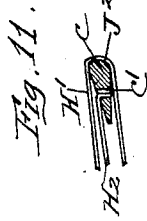
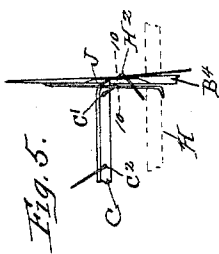
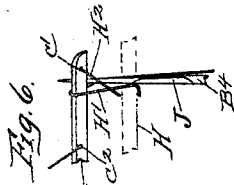
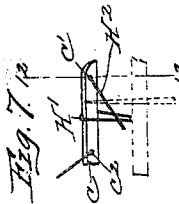
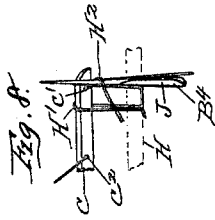
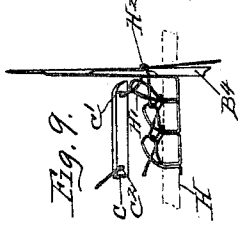
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UNITED STATES PATENT OFFICE.

JOHN H. MUSGROVE, OF PITTSFIELD, MASSACHUSETTS.

MACHINE FOR SEWING LOOPED FABRICS.

SPECIFICATION forming part of Letters Patent No. 581,758, dated May 4, 1897.

Application filed February 1, 1896. Serial No. 577,670. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. MUSGROVE, a citizen of the United States, residing at Pittsfield, county of Berkshire, and State of Massachusetts, have invented certain new and useful Improvements in Machines for Sewing Looped Fabrics, of which the following is a specification.

The invention relates to such improvements; and it consists of the novel construction and combination of parts hereinafter described and subsequently claimed.

Reference may be had to the accompanying drawings, and the letters of reference marked thereon, which form a part of this specification.

Similar letters refer to similar parts in the several figures therein.

Figure 1 of the drawings is a top plan view of my improved machine with a portion of the fabric-supporting pin-plate broken away. Fig. 2 is a side elevation of the same, showing one pin and a small portion of the plate in vertical section. Fig. 3 is a vertical section, taken on the broken line 3 3 in Fig. 2, of the looper-lever and lever-actuating mechanism. Fig. 4 is a vertical section, taken on the broken line 4 4 in Fig. 1, on an enlarged scale. Figs. 5, 6, 7, 8, and 9 are top plan views of the looper and sewing-needle provided with threads, showing some of the different positions assumed by such parts in sewing looped fabrics. Fig. 10 is a cross-section of the needle, taken on the broken line 10 10 in Fig. 5. Fig. 11 is a cross-section of the looper, taken at the line 12 12 in Fig. 7.

The object of my invention is to unite the edges of two pieces of knit fabric by a series of two-thread double-loop through-and-through stitches, which will produce an elastic and durable seam.

My invention consists of the novel looper mechanism hereinafter described and subsequently claimed.

A is the base-plate, provided with bolt-holes A', by means of which the plate can be bolted to some fixed support.

The uprights A² and A³, integral with the base-plate, contain the bearings for the driving-shaft A⁴, rotary therein. Secured to the upper side of the upright A³ by bolts A⁵ is the

bracket A⁶, which supports the rotary pin plate or ring A⁷ and its operating mechanism in the usual manner. The upright A³ is also provided with a horizontally-projecting stud A⁸, which supports the needle-lever B, oscillatory thereon. The needle-lever is provided with a cam-follower B', fitting the cam-groove B² in the cam B³, fixed eccentrically upon the drive-shaft.

The lower oscillatory end of the lever is provided with a curved needle B⁴, adapted to move to and from the pins on the pin-plate as they are brought successively into line with it in the usual well-known manner by an intermittent rotary movement of the pin-plate, which intermittent movement may be imparted by hand or by the usual mechanism, of which I have shown the actuating-cam A⁹, fixed on the driving-shaft, and the connecting-link A¹⁰, provided with a dog or pawl A¹², engageable with the ratchet-wheel A¹³.

The remaining parts being well known are not shown.

The oscillatory movements of the needle are adapted to thrust the needle through the loops of fabric B⁶ impaled on the pins, and carry the needle-thread B⁷ through the loops in the usual manner.

A¹⁴ is a driving-pulley fixed upon the driving-shaft.

C is the looper, having a thread-aperture C' at or near its end and a second thread-aperture C² a short distance from the end aperture. The shank C⁵ of the looper is supported by the apertured lever C⁶, and may be secured at any desired angle or degree of inclination therein by the set-screw C⁷. The other end of the looper-supporting lever is connected with an adjustable support by a universal joint.

The universal joint comprises the block D, which is supported by the conical bearing-points D¹ and D², which form a horizontal axis upon which the block is free to rock.

The lever is provided with a pair of ears D³, one above the other, and the block with recessed bearings adapted to receive the conical bearing-points D' and D², which are respectively tapped into the lever-ears and provided with lock-nuts D⁶ in the usual well-known manner. The bearing-points D' and

D² are located in the same vertical plane and, together with the block D and the bearing-points D⁴ and D⁵, similar in construction to the points D' and D³, form the universal joint.

5 It is very important, as will be seen hereinafter, to secure an exact adjustment of the looper relatively to the sewing-needle, and while the looper is made capable of a partial adjustment relatively to the looper-lever by
10 means of the set-screw C' it is not well adapted for nice adjustment and if relied upon alone would require many experiments and become a slow, uncertain, and inconvenient means. I therefore make the sup-
15 porting-fulcrum of the lever adjustable both horizontally and vertically by screw-threaded mechanism, whereby a very fine and exact ad-justment may be quickly obtained.

The horizontal adjustment of the support-
20 ing-fulcrum is obtained by means of the bearing-points D⁴ and D⁵, the positions of which can be easily varied in a horizontal di-rection relatively to the lever by advancing one and backing the other. These bearing-
25 points are tapped into the ears D⁷ and D⁸, integral with the yoke D⁹, which is movable ver-tically upon the bracket F, rigidly secured to the main frame of the machine, as by the bolt F'. The bracket is provided with a ver-
30 tical slot F², adapted to receive the bolt F³, which is vertically movable therein, and passed through an aperture in the vertically-movable yoke. The head F⁴ of the bolt bears upon the yoke, and a nut F⁵ is adapted to
35 bear upon the bracket and clamp the yoke thereto.

As a means for steadily and accurately moving the yoke vertically upon the bracket when the parts are not tightly clamped to-
40 gether I provide a thumb-screw F⁶, which passes through a screw-threaded aperture in the bolt F³ and is provided with the collars F⁷ and F⁸, adapted to engage the guides F⁹ on the bracket. By turning the thumb-screw in one
45 direction the bolt, yoke, and fulcrum-sup-port are moved vertically upward, and when the screw is turned in the opposite direction such parts are moved vertically downward. This form of construction enables me to se-
50 cure in a convenient manner an accurate universal adjustment of the fulcrum-support, which produces a corresponding adjustment of the looper for the reason that the looper-lever is actuated in a horizontal or vertical
55 direction by means of cams which are lo-cated intermediately of the fulcrum and looper, as will be apparent hereinafter. This is of much importance for the additional reason that the fulcrum end of the lever is
60 more accessible for the purposes of adjust-ment than the looper end.

The looper end is surrounded by other im-portant mechanisms and not as accessible.

An approximate adjustment can first be
65 obtained by approximately apportioning the length of the vertical looper-shank and by means of the set-screw C', after which an ex-

act adjustment can be procured and main-tained by the adjustment of the fulcrum-sup-port, as before explained.

The looper-lever is connected with an ele-vated fixed support consisting of the wire E by means of the coil-spring E', which draws the lever up against the lower peripheral edge of the cam E², fixed upon the drive-shaft.
70 The periphery of this cam is so shaped as to cause, in connection with the spring, the de-sired vertical movements to be imparted to the looper-lever and looper, and the inner side surface of this cam is so shaped as to
75 cause, in connection with the spring and a lug on the looper-lever adapted to bear upon such surface, as shown in Fig. 3, the desired horizontal movements to be imparted to the looper-lever and looper.

In my improved machine I make use of a horizontal looper for the reason that the con-struction of the pin-plate now in use and for which my improved mechanism is adapted
80 is such that the pins are raised only a short distance above the inclosed bed S, and a ver-tical looper cannot be given sufficient move-ment to produce such an elastic seam as is desirable.

By employing a horizontal looper I can ob-
85 tain the desired relative movement of the looper transversely of the sewing-needle to obtain the requisite feed of the looper-thread to secure elastic stitches.

The operation of the stitch-forming mech-
90 anism, starting from the position shown in Fig. 5, whereat the needle has taken a loop from the looper and commenced to retreat, having been forced through the fabric over one of the pins in the pin-plate past the looper,
95 is as follows: As the needle retreats the thread curves outward from the needle and the point of the looper enters between the thread and needle and advances across the needle to the position shown in Fig. 6. As the needle re-
100 treats to the outer side of the fabric H it leaves a loop H' upon the looper, as seen in Fig. 7. As the needle again advances through the fabric it passes under the looper-thread H², as indicated by dotted lines in Fig. 7,
105 whereupon the looper retreats from the needle, as indicated in Fig. 8, until the loop H' slips off the looper upon the looper-thread, as seen in Fig. 9, the looper-thread being passed around the needle. Then as the needle re-
110 treats the looper advances to the position shown in Fig. 5 to secure from the needle another loop H', as before explained, and the operation is repeated for each stitch.

The formation of the double-thread stitch
115 is shown at Fig. 9, the position of the fabric being indicated by dotted lines and the stitches left loose and exaggerated in form for the purpose of illustration of the various positions relatively assumed by the needle and looper
120 threads. This form of construction enables me to force the looper across the needle, as shown in Fig. 7, a sufficient distance to leave the interlocked loops forming the seam loose,

thereby producing a seam which is as elastic in the direction of its length as is the knitted or looped fabric.

5 To insure the successful operation of the mechanism in the manner shown and described, it is essential that the needle be provided with a plane beveled surface J, inclined to the axis of the eye of the needle to insure the uniform entrance of the looper-point
10 above the needle and beneath the needle-thread, as seen at Fig. 5. For a similar reason the back or inner side J² of the looper is made thicker and higher than the front edge, so that the loop H' will slip freely from the
15 looper over the looper-thread and to facilitate the entrance of the needle between the looper and the looper-thread as the needle passes to the position indicated by the dotted lines in Fig. 7. The back of the looper is also
20 rounded at its end to facilitate the slipping of loop H' therefrom in passing from the position shown in Fig. 8 to that shown in Fig. 9.

What I claim as new, and desire to secure by Letters Patent, is—

25 1. In the stitch-forming mechanism of a machine for sewing looped fabrics, and in

combination: a looper, looper-supporting lever movable upon both a fixed horizontal and a vertical axis, means for adjustably changing the elevation of the horizontal axis; 30 means for adjustably changing the position of the vertical axis horizontally and transversely of the looper-lever, and means for operating the lever, substantially as described.

2. In the stitch-forming mechanism of a 35 machine for sewing looped fabrics, and in combination: a looper, looper-lever, lever-operating mechanism; a bracket secured to the frame of the machine; a yoke movable on the bracket; a yoke actuating and control- 40 ling screw; a universal-joint connection between the lever and yoke; and adjustable screw-bearings between the several members of the universal joint, substantially as described.

45 In testimony whereof I have hereunto set my hand this 10th day of January, 1896.

JOHN H. MUSGROVE.

Witnesses:

CHAS. M. MUSGROVE,
WM. A. MUSGROVE.