(No Model.) 3 Sheets—Sheet 1.

J. H. MORLEY.

MACHINE FOR SEWING FLAT BUTTONS TO FABRICS.

No. 253,618. Patented Feb. 14, 1882.

Fig 1.

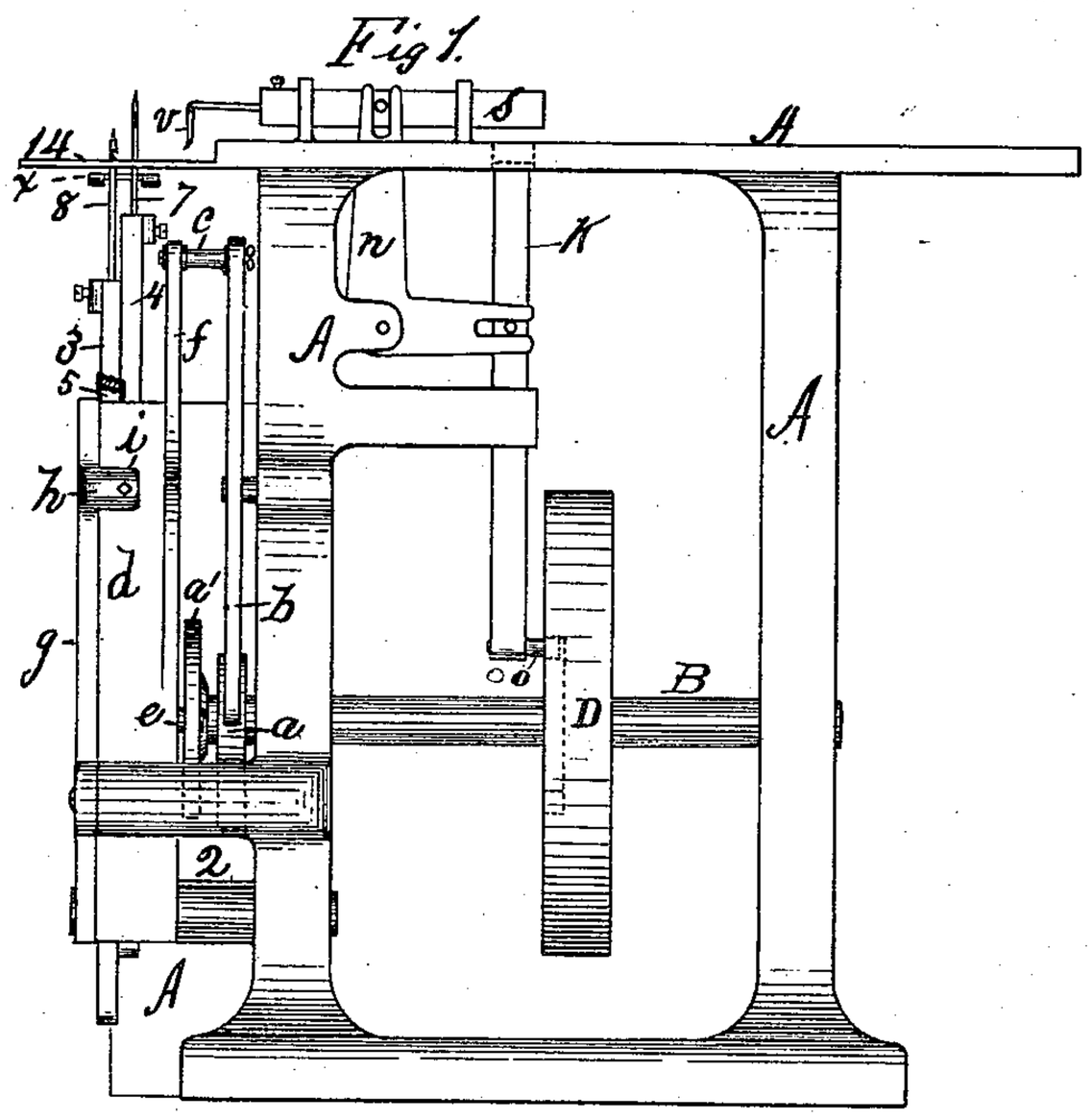
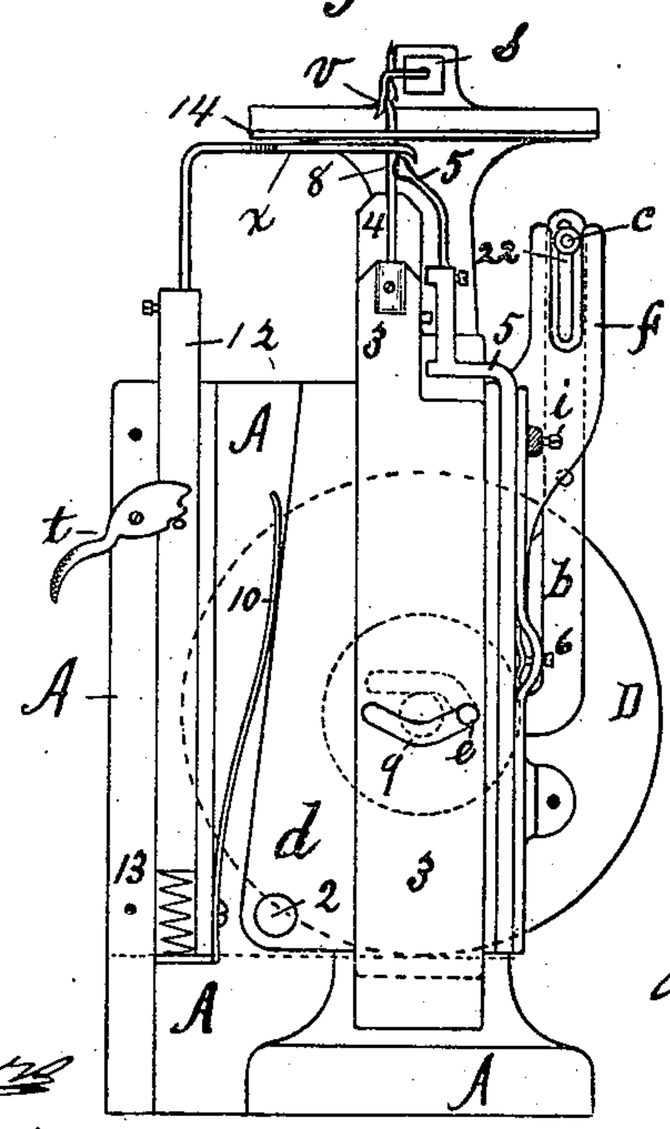


Fig 2.



Witnesses
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(No Model.) 3 Sheets—Sheet 2.

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Fig 3

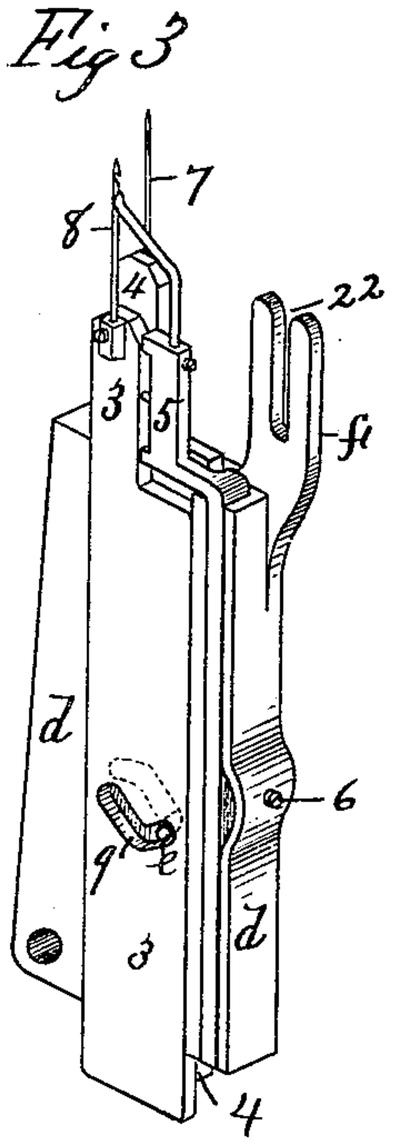

Fig 4

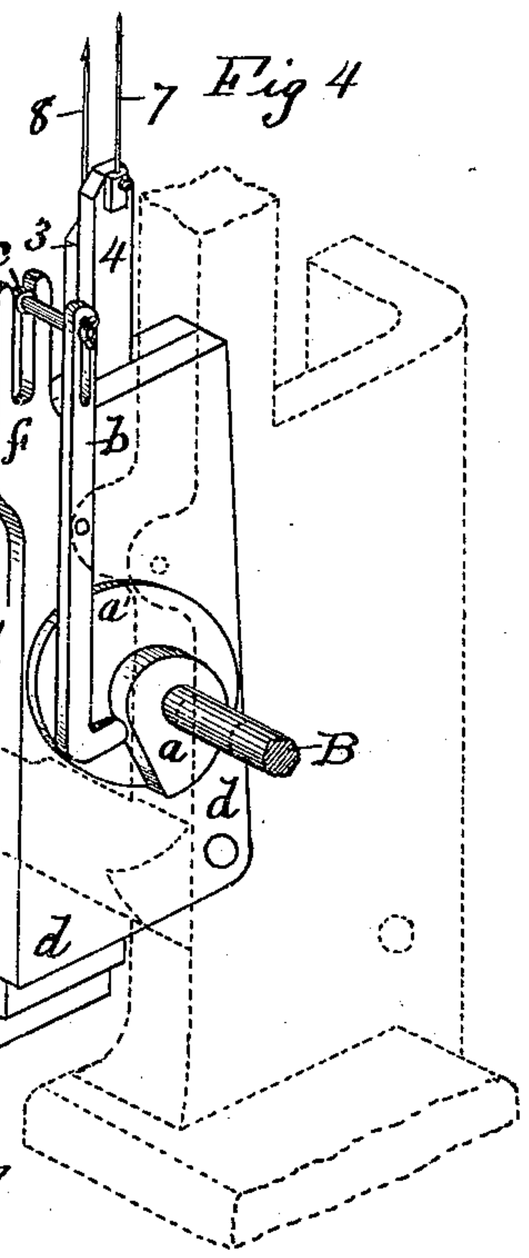

Fig 6

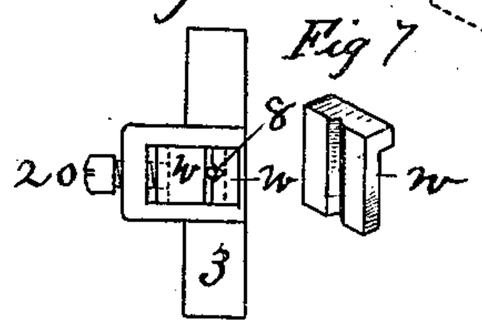

Fig 7

Fig 5

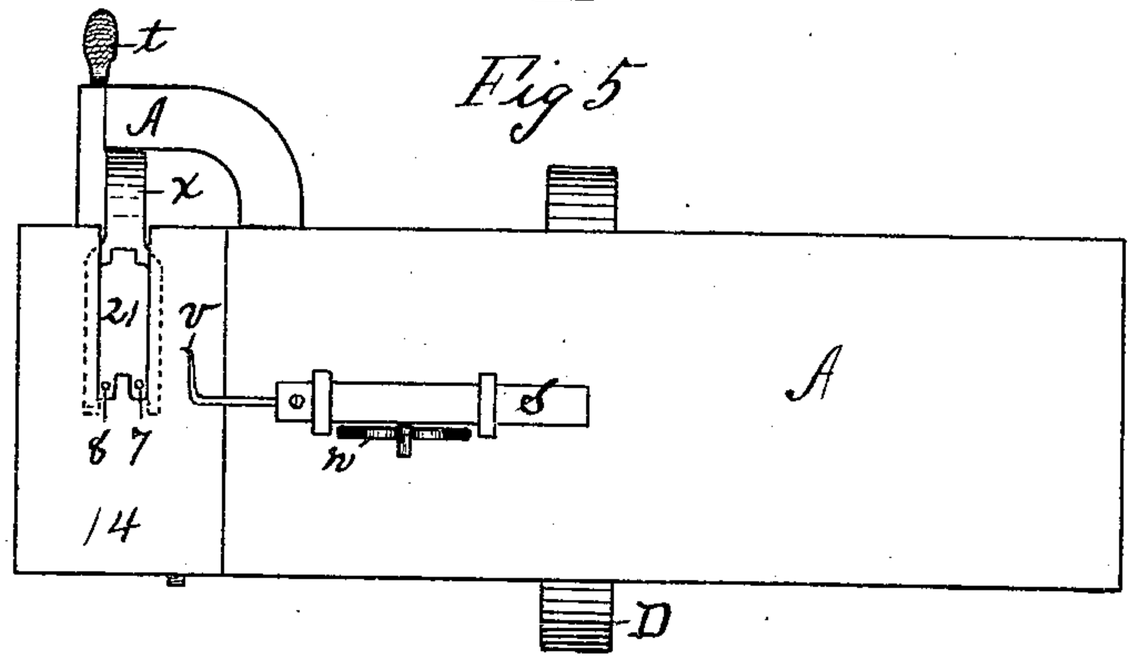

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Fig 8

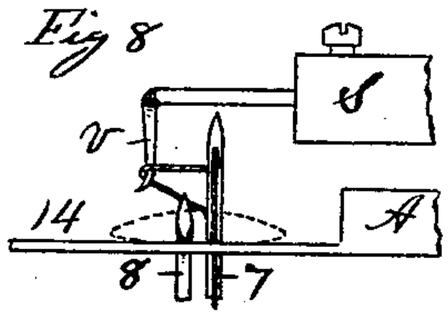


Fig 10

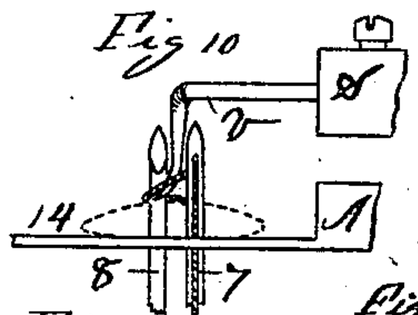


Fig 12

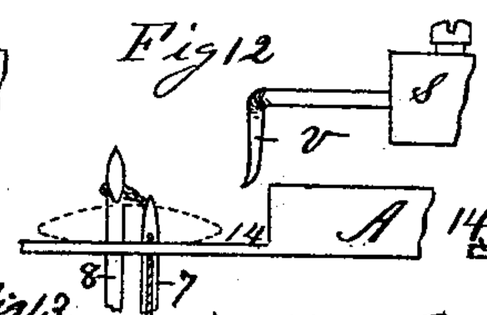


Fig 14

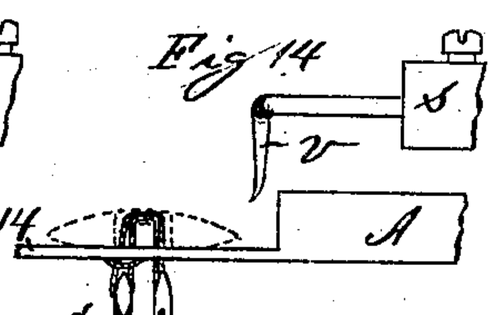


Fig 9

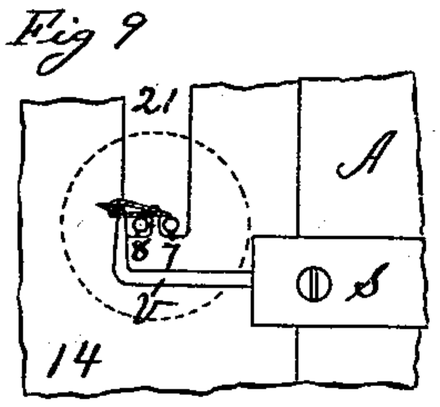


Fig 11

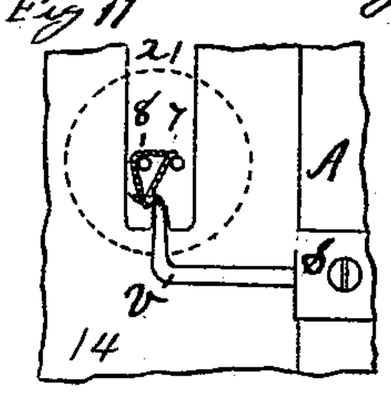


Fig 13

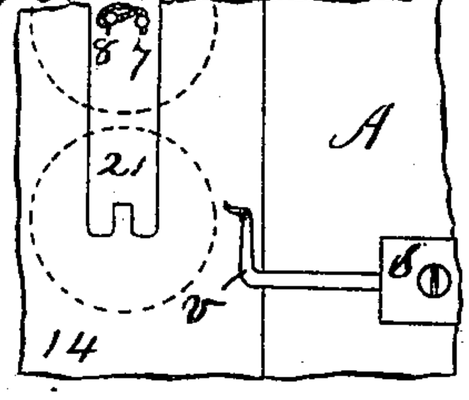


Fig 15

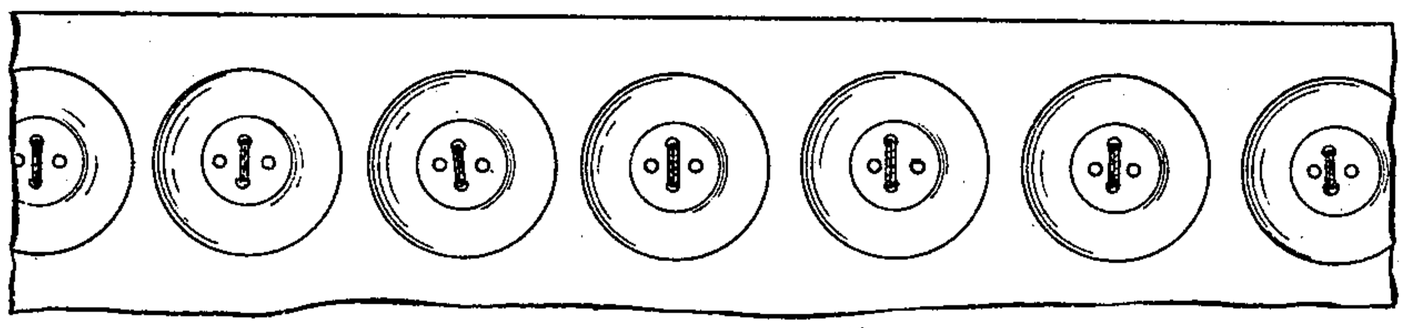
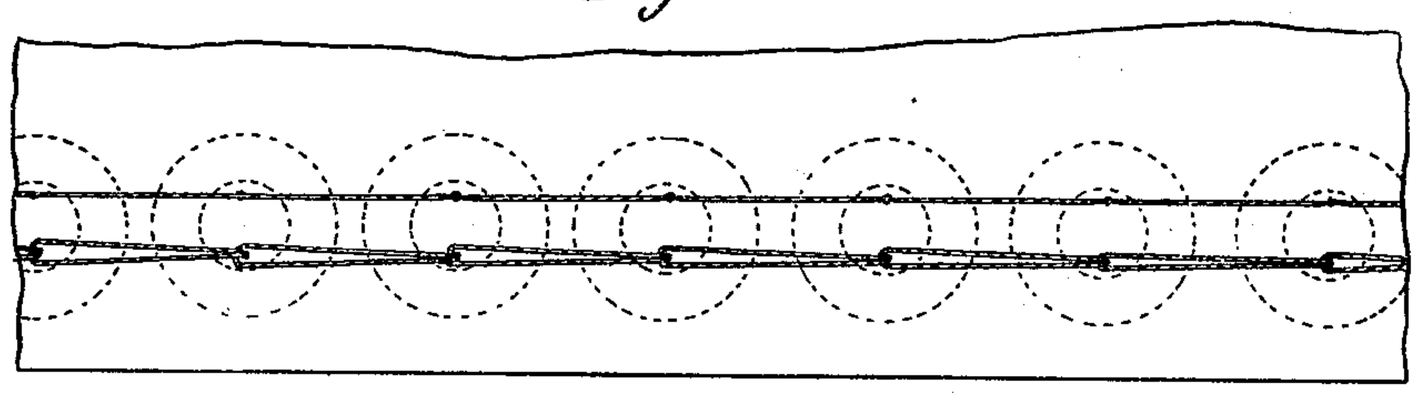


Fig 16



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UNITED STATES PATENT OFFICE.

JAMES H. MORLEY, OF HOLYOKE, MASSACHUSETTS, ASSIGNOR TO THE MORLEY SEWING MACHINE COMPANY, OF MAINE.

MACHINE FOR SEWING FLAT BUTTONS TO FABRICS.

SPECIFICATION forming part of Letters Patent No. 253,618, dated February 14, 1882.

Application filed March 25, 1881. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. MORLEY, a citizen of the United States, residing at Holyoke, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Machines for Sewing Flat or Drilled-Eyed Buttons onto Fabrics, of which the following is a specification.

This invention relates to the details of construction of a needle-feed sewing-machine in which an eyed needle and a hook-needle are used in combination with a loop-carrier operating above the work and at right angles to the vertical line in which the needles move when they pass through the fabric, the object being to sew buttons onto fabrics by carrying a double thread from the under side of said fabric up through a button and across that part of the button between the holes therein, and thence down through the fabric, and so sewing on one button after another in a line with a continuous thread, and to feed said fabric along to place said buttons at any desired distance one from the other.

In the drawings forming part of this specification, Figure 1 is a side elevation of a sewing-machine embodying my improvements. Fig. 2 is a front elevation of the same with the front plate of the machine removed. Fig. 3 is an isometric view of the pivoted needle-bar case detached from the machine. Fig. 4 is a rear isometric view of the pivoted needle-bar case and a portion of its operating devices, and showing part of the frame of the machine in dotted outlines. Fig. 5 is a plan view. Fig. 6 is a plan view of the end of a needle-bar. Fig. 7 represents a needle-adjusting block. Fig. 8 is a view showing the position of the loop-carrier with the loop of the thread carried from the eyed needle across the path of the hook-needle after the eyed needle has reached its highest point and been retracted to throw out the loop. Fig. 9 is a plan view of the same. Fig. 10 is a view of the parts show in Fig. 8 after the hook-needle has reached its highest point and the needles in feeding have moved somewhat away from the loop-carrier. Fig. 11 is a plan view of the same. Fig. 12 is a view of the parts shown in Fig. 8 at the conclusion of the feed-motion, the loop-carrier having moved back and the needles having been partially drawn out of the button. Fig. 13 is a plan view of the same, showing in a dotted line the position of the next button. Fig. 14 is a view of the position of the parts shown in Fig. 8 after the stitch through the button is completed. Fig. 15 is a plan view of the top side of the fabric with a row of buttons sewed on, and Fig. 16 is a view of the under side of the same.

Like letters and numerals refer to like parts in the several figures.

In the drawings, A is the frame of the machine. B is the driving-shaft. D is a driving-pulley having a cam-groove formed in one side of it. (Shown in dotted lines in Fig. 1.) *a* is a feed-lever cam on shaft B. *a'* is a crank-disk, also on shaft B, carrying a crank-pin, *e*. *b* is a feed-lever pivoted to frame A. *c* is a feed-lever stud adjustable vertically in a slot in lever *b*. *d* is a needle-bar case pivoted to frame A at 2. *f* is a vertical slotted arm on the needle-bar case *d*. *g* is a front cap secured upon the end of the machine and over the needle-bar case and its parts. *h* is a short arm on the edge of cap *g*, in which is a set screw, *i*, adjustable to and from the edge of the needle-bar case over which its stands. The front face of the needle-bar case *d* is grooved vertically to receive the flat needle-bars 3 4 and the cast-off bar 5. An adjustable screw, 6, is set in the edge of the needle-bar case and operates against a spring between its point and the side of the cast-off bar, as shown in Fig. 2, to retain the cast-off bar closely in position. Said needle-bars, as aforesaid, are flat and lie one against the other, as shown in the several figures. The inner one, 4, has secured in its end the eyed needle 7, and the outer one, 3, carries the hook-needle 8. Through each of said needle-bars is cut a crank-pin slot, 9, in needle-bar 3, and the one in bar 4 is shown in dotted lines on said bar 3 in Figs. 2 and 3. The rear side of the needle-bar case *d* next to the crank-disk *a'* is cut away to permit the end of the crank-pin *e* to enter said slots, first passing through that in bar 4 and next entering that one in bar 3, as shown, and to move in a circle around the axis of the shaft B, and thus cause vertical reciprocating motions to be given to both of said needle-bars in the order described hereinafter.

In Fig. 6 is shown enlarged a plan view of

the upper end of one of the needle-bars, in which provision is made for setting the needle at different points relative to the vertical central line of the needle-bar, so that the needles may be spread from or made to approach each other to adjust them to operate through buttons which are drilled with more or less spread of holes. The said adjustment is provided for by enlarging the chamber in the end of the needle-bar which receives the shank of the needle, so that with said needle-shank there may be placed in said chamber one or more blocks, *w*, properly grooved to have the needle-shanks fit them. Thus, if it be desired to move the needle 8 to the right, the block *w* beyond the needle is removed and placed in that position occupied by the needle, said needle will take a position equal to the thickness of the removed block farther away from the left side of the bar, and vice versa.

The cast-off 5 is operated by any of the well-known devices employed for that purpose.

A spring, 10, secured to frame A, bears against the needle-bar case to throw it toward the adjusting-screw *i*.

A presser-foot bar, 12, is fitted in frame A, carrying, by the aid of a spring, 13, the presser-foot *x* up against the under side of the needle-plate 14.

A presser-bar-moving lever, *t*, of ordinary construction, is pivoted in the frame A, as shown in Fig. 2.

Any suitable take-up may be used with this machine.

A bar, *k*, is fitted to be operated with vertical reciprocating movements in frame A by its connection, by means of a stud, *o*, in its lower end, with the cam-groove in the side of pulley D, the end of said stud *o* being adapted to enter said cam-groove.

An elbow-lever, *n*, is pivoted to frame A, as shown in Fig. 1, and its ends are slotted and engage, one with a pin in the side of the bar *k* and one with a pin in the side of a horizontal loop-carrier bar, *s*, adapted to have a reciprocating longitudinal motion on the top of frame A. To one end of said bar *s* is attached a loop-carrier, *v*, of the form shown in the several figures, and adapted to have its downhanging point *z* carried back and forth by the ends of the needles, as hereinafter described.

A needle-plate, 14, is secured to frame A, and has a slot, 21, made in it, at the base of which a small point projects between the needles 8 and 7, as shown in Fig. 5.

The operation of my machine in sewing flat or drilled-eyed buttons onto fabrics is as follows: First, the degree of feed-movement of the needles is fixed by determining the oscillatory movement of the needle-bar case *d* on its pivot at 2 in frame A. The starting-point of the feed-motion is from the position the needles are shown in Fig. 5, and the adjustment of the feed is to determine the distance said needles shall swing from said point in Fig. 5 toward the open end of slot 21 in the cloth-plate 14. The feed-lever *b* is vibrated on its pivot by the action of cam *a* on shaft B against the lower end of said lever. The stud *c* is secured adjustably in the upper end of said lever, and its free end enters a vertical slot, 22, in the end of arm *f* on the needle-bar case *d*. The adjusting-screw *i* in arm *h*, Fig. 1, is turned against the edge of the needle-case until the points of the needles will move up through the needle-plate about at the base of the slot 21 in the needle-plate, as shown in Fig. 5. The fabric to which the buttons are to be sewed is placed between the needle-plate and the presser-foot, the needles at this time standing quite down out of the way.

The eyed needle is threaded as in an ordinary machine, the thread being drawn from a spool over any suitable intermediate tension device. Now, by slightly turning shaft B the needle-bar 4, carrying the threaded-eyed needle, is first moved up through the fabric, and the needle-bar 3, carrying the hook-needle, then begins to move up and passes through the fabric, the eyed needle having reached its highest point. Shaft B is now stopped, and a button is placed by hand or by the use of some suitable feeding device down over the points of the two needles upon the fabric. Shaft B is again started, and the eyed needle first begins to draw downward out of the fabric. This movement causes a loop to be formed on the side of the needle above the button. As soon as said loop is thrown out the loop-carrier moves across the path of the eyed needle, catching upon its point said loop and carrying it across the path of the hook-needle, whose point has risen high enough to intercept the lower part of the loop. The relative positions of the needles, the loop-hook, and loop at the above-described period in the operation of the said parts, is illustrated in Figs. 8 and 9. The machine now feeds by the swing of the needle-bar case *d* and the needles carrying the fabric with the button along toward the open end of the slot 21. As the points of the needles swing under the loop-carrier in feeding, as just described, the end of the hook-needle rises farther up and presses against the lower part of the loop, its upper part being held back by the loop-carrier, and both needles have risen to an equal height, and the hook-needle has been carried so high through the loop that the latter passes around it below its hook, and the loop and needles are in the positions shown in Figs. 10 and 11. The loop-carrier now moves back toward its starting-point, the points of the needles, as above described, having been by the feed-motion, as above described, swung beyond and across the track of said loop-carrier, thus causing said loop-carrier on its back stroke to pass behind them, whereas on its forward stroke it passes in front of them, thereby carrying the loop over the hook-needle. The eyed needle is moving downward while the machine feeds its length of stitch, passing out of the fabric, leaving the

loop over the hook-needle, as shown in Figs. 12 and 13, the loop being drawn into the hook by the action of a proper take-up and held there until it passes down through the button and fabric, as shown in Fig. 14, when the thread is slackened. The hook-needle now passes quite out of the fabric, drawing the loop with it. The needle-frame now swings back to its starting-point, bringing the points of the needles again in proper position to move up again through the fabric.

A cast-off, 5, or one such as is used on an ordinary wax-thread sewing-machine, is employed to cast the loop off from the hook-needle, when the second and succeeding stitches are made in like manner as the first, except that in making the subsequent stitches the hook-needle passes up through a previously-made loop.

Figure 15 illustrates the appearance of the top side of a strip of fabric upon which buttons have been sewed, as just described, and Fig. 16 illustrates the under side of said fabric, showing the appearance of the stitch thereupon.

What I claim as my invention is—

1. The combination, in a needle-feed machine for sewing flat or drilled-eyed buttons to fabrics, with an eyed needle and a hook-needle, two independent needle-bars, a pivoted needle-bar case carrying both needle-bars side by side, and operating mechanism, of a loop-carrier located above the work on the cloth-plate to move forward and back across the line of the feed-motion of said needles, substantially as set forth.

2. The combination, in a needle-feed sewing-machine, of the needle-bar case *d*, pivoted in frame A, a hook-needle and an eyed needle, two needle-bars standing side by side, and of appliances, substantially as described, for imparting to said needle-bars differential vertical movements, and for imparting to said needle-bar case a vibratory movement in said frame, substantially as set forth.

3. The combination, in a sewing-machine, with a movable needle-bar case, of the crank-disk *a'*, having fixed in it the crank-pin *e*, and two needle-bars having cam slots in them of varying form, in both of which slots said crank-pin operates simultaneously, substantially as set forth.

4. The combination, with the needle-bar case pivoted to frame A, and having the slotted arm *f* thereupon, of the feed-lever *b*, having the stud *c* adjustably secured thereto, cam *a* on shaft B, and spring 10, substantially as set forth.

5. In a needle-feed sewing-machine, the combination with two independent needle-bars arranged side by side, and mechanism to operate said needle-bars vertically, and needle-feed mechanism, substantially as described, of a loop-carrier to catch and hold the thread-loop while the ends of the needles swing away from it, substantially as set forth.

6. The combination, in a sewing-machine, of two needle-bars, a hook-needle and an eyed needle, and operating mechanism, of a movable needle-bar case and feed mechanism, and of a loop-carrier having a reciprocating movement across the line of movement of said needles, substantially as set forth.

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Witnesses:
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J. D. GARFIELD.