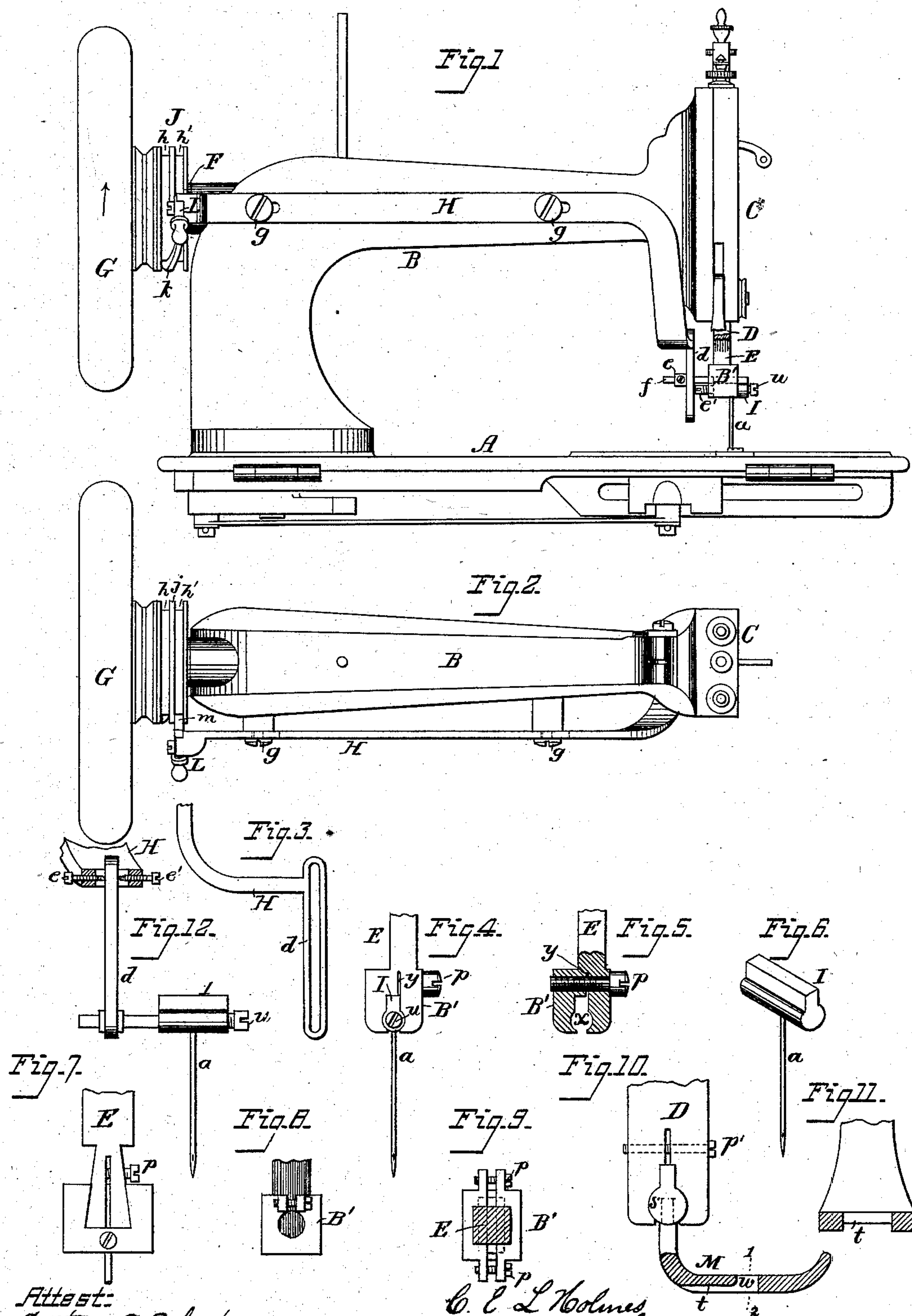


(No Model.)

C. E. L. HOLMES.
SEWING MACHINE.

No. 254,975.

Patented Mar. 14, 1882.



Attest:
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UNITED STATES PATENT OFFICE.

CHARLES E. L. HOLMES, OF NEW YORK, N. Y.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 254,975, dated March 14, 1882.

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To all whom it may concern :

Be it known that I, CHARLES E. L. HOLMES, of the city, county, and State of New York, have invented certain Improvements in Sewing-Machines, of which the following is a specification.

My invention relates to that class of sewing-machines, or attachments therefor, which are so constructed as to impart to the needle both vertical and horizontal reciprocating movements, whereby to make what are ordinarily termed "cat-stitches," or "button-hole" or "overseaming" stitches.

My invention consists in certain devices, hereinafter fully described, whereby the desired movements are effected with little friction and with precision, such devices being so constructed that, if desired, they may be effectively applied in connection with many ordinary well-known forms of machines with but little alteration of the latter.

In the drawings forming part of this specification, Figure 1 is a side view of a sewing-machine illustrating my invention. Fig. 2 is a plan of the arm and attachments; Fig. 3, a detached view, showing the end of the slide-bar; Fig. 4, a detached view, showing the end of the needle-bar and needle; Fig. 5, a section of the end of the needle-bar; Fig. 6, a perspective view, illustrating a needle and holder; Figs. 7, 8, and 9, views showing modified forms of needle bars and holders, Fig. 9 being a cross-section through the needle-bar; Fig. 10, a view in part section of the presser foot and bar; Fig. 11, a section on the line 1 2, Fig. 10; Fig. 12, a view illustrating a modification of the needle-sliding appliances.

While the devices which I have invented may be constructed for use with sewing-machines of any character, I have illustrated them in connection with an ordinary Singer machine, A being the bed-plate, and B the overhanging arm supporting a head, C, in which are the presser-foot bar D and needle-bar E, deriving its vertical motion from the rotating shaft F, carrying at the end the fly-wheel G.

Beneath the plate A the shuttle is reciprocated by any suitable appliances in a line parallel to a bar, H, sliding or vibrating at

one side of the arm B. The needle *a*, in place of being secured to the needle-bar E, is connected to a carrier, I, which is movable upon the needle-bar in any suitable manner. As shown in Figs. 1, 2, 4, and 5, the needle-bar terminates in an enlargement, B', having a horizontal socket, *x*, open at the lower edge, and wider above said edge, adapted to receive a carrier, I, of corresponding form. This carrier is connected to or has its bearing upon the bar H in such a manner that the vibration or reciprocation of said bar will impart a reciprocating horizontal movement to the needle. For instance, in Fig. 1 a rod, *f*, projecting horizontally from the rear of the carrier, is provided with a stop, *e*, and the carrier is provided with a stop, *e'*, and between said stops passes a bar, *d*, projecting vertically from the bar H, the reciprocation or vibration of which will cause the bar *d* to play between said stops, moving the carrier horizontally back and forth.

The stops *e e'* are adjustable, thereby insuring an increased movement to the carrier in proportion as the stops are brought closer together. By the adjustment of said stops the needle may be carried to any desired horizontal position at one side or the other of the central line of the needle-bar, to be reciprocated horizontally in such position without necessarily varying the extent of its horizontal reciprocation.

The bar may be slotted, as shown in Fig. 3, and the rod *f* may extend through the slot. An equivalent construction is shown in Fig. 12, where the vertical rod *d*, instead of being fixed to the bar H, is secured fixedly or adjustably to the carrier I, and extends upward between the screw-stops *e e'*, adjustable upon the bar H.

Means may be employed for vibrating the bar H upon a pivot at the side of the arm B, so that it will move once to each complete vertical reciprocation of the needle-bar; or, preferably, the bar H may slide in one direction or the other once with every complete movement of the needle-bar. In either case the bar H acts directly upon the carrier, and is a simple and effective means of conveying motion from the actuating device to the carrier with-

out the lost motion apt to result, and the irregular work caused by the employment of the usual more complex intermediate devices.

When a sliding bar is used it may be slotted 5 to receive screws *g g*, which serve both as guides and as means of connecting it to the arm B, and in such case I prefer to communicate motion to the bar through the medium of a cam, J, secured to the shaft F, and provided 10 with two grooves, *h h'*, separated by a rib, *j*, broken at one point to receive a vibrating switch, *k*.

A stud, *m*, double-pointed in cross section, constitutes the end of a crank-lever, L, piv- 15 oted to the end of the bar H, which lever may be swung so as to carry the stud into one of the grooves of the cam, in which it will operate until transferred to the other groove by its contact with the switch *k*. By 20 this means the slide is moved once at each rotation of the shaft, during which time the needle passes once down and up.

The needle may be secured in the carrier I by means of a set-screw, *n*, as shown in Figs. 1, 4, 25 and 12; but I have found it advantageous to make the carrier I of soft metal, and to cast the same directly to the shank of the needle, thereby not only securing a firm attachment, but so fixing the needle in relation to the car- 30 rier that no further adjustment is necessary. This mode of attachment is shown in Fig. 6.

To prevent the needle from being forced out of its position, the carrier should fit as tightly 35 within its socket as possible without creating such friction as would interfere with its movement. To secure this result, as well as com- pensate for wear of the parts, I propose to split the needle-bar and provide it with means 40 whereby the split end may be adjusted so in effect as to contract the socket. Thus in Figs. 4 and 5 the needle-bar is split at *y* and a screw, *p*, serves to bring the divided ends upon the carrier with any desired pressure. Figs. 7, 8, 45 and 9 show equivalent constructions where the carrier is socketed. In Fig. 7 the screw *p* expands the end of the bar in the socket of the carrier. In Figs. 8 and 9 the carrier is con- tracted upon a cylindrical enlargement on the end of the bar, the result being the same in all 50 these cases. A like construction may be employed in securing the presser-foot M to the presser-foot bar D, which is split and clamped by a screw, *p'*, to a projection, *s*, formed or cast upon the presser-foot and adapted to a 55 lateral socket of the said bar, as shown in Fig. 10; but I do not here claim this, as it may form the subject of a separate application for Let- ters Patent.

I have found that wide cat-stitches, which 60 lie loosely upon the upper face of the cloth, are apt to catch upon the rear edge of the slot *w* of the presser-foot. To prevent this I cut away the under side of the presser-foot at the rear of the slot *w*, forming a flat groove, *t*, 65 through which the stitches may pass without striking the edge of the slot, while the fabric

is firmly pressed at the sides against the feed device.

While I have described the modes of attach- 70 ing the needle and presser-foot in connection with an overseaming-machine, such modes are equally available in connection with other ma- chines where the needle is to be connected fix- edly to the needle-bar, and serve to secure readily the parts in place without nice adjust- 75 ment by the operator.

It will be apparent that the construction of devices above described is such as will per- mit their ready application to a Singer or other similar machine without any other alterations 80 than those that can be made by an ordinary mechanic, that the operation of the needle is effected positively and with accuracy, and that the various adjustments may be readily made.

It will further be seen that by turning the 85 lever L the stud *m* may be moved away from the cam J, and the machine instantly converted into a plain-stitch sewing-machine, and that by reversing the operation the cat-stitching may be resumed without further adjustment. 90

By the arrangement of the movable needle in line with the needle-bar I am enabled to se- cure a more perfect action, as when the needle is set to one side of the bar there is always 95 more or less strain tending to deflect it, and the attachments yield, owing to the greater le- verage. The avoiding of any such irregulari- ties is of special importance in this class of machines, where the needle must be brought into exact position in relation to the shuttle 100 at whatever point it may descend. By extend- ing the rigid bar from the cam to the carrier, and beneath the head, I am enabled to com- municate motion directly to the carrier sliding upon needle-bars which extend through the 105 heads of the machines, and can therefore secure the advantages resulting from placing the needle in line with the needle-bar. This arrange- ment further permits the operating parts to be covered by the head, so that the light silks and 110 fine fabrics used to a great extent in orna- mental sewing are prevented from coming into contact with the oiled surfaces, which is not the case when the bar and its guides and ap- purtenances are at the side of the head. 115

I claim—

1. The combination, in a sewing-machine, of a needle-bar sliding in stationary bearings, and extending through and below the head, a needle-carrier sliding on said bar, a cam, and a 120 rigid bar connected to said carrier beneath the head, and interposed between the cam and carrier and serving as a means of communicating motion directly from one to the other, substan- tially as set forth. 125

2. The combination of the slotted needle-bar carrier holding a needle in line with the needle-bar and extending through said slot, and appliances, substantially as described for re- ciprocating the carrier. 130

3. The combination, with the needle of a sewing-machine, of a metal head or carrier cast

upon the same and adapted to a socket in the part to which it is to be attached, and to guide the needle sliding in said socket, substantially as set forth.

5 4. The combination of the needle-bar having a transverse socket, open at the under side, formed directly in said bar, as specified, and a needle-carrier adapted to said socket, and appliances, substantially as described, for
10 reciprocating said carrier.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHAS. E. L. HOLMES.

Witnesses:

CHARLES FOSTER,
WILLIAM PAXTON.