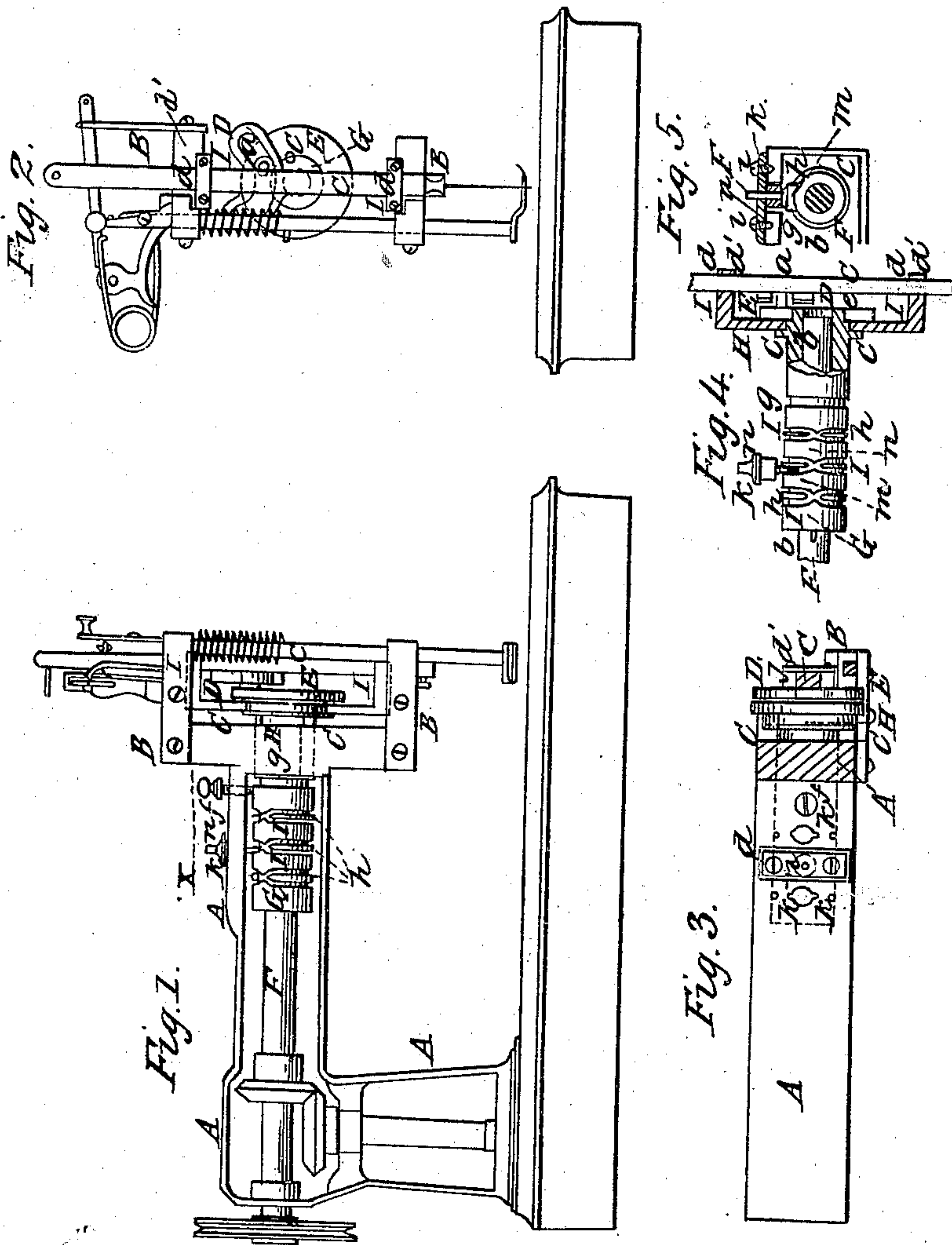


C. F. DUNBAR.
Sewing Machine.

No. 88,282.

Patented March 30, 1869.



Witnesses:
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UNITED STATES PATENT OFFICE.

CHARLES F. DUNBAR, OF ERIE, PENNSYLVANIA.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 88,282, dated March 30, 1869.

To all whom it may concern:

Be it known that I, CHARLES F. DUNBAR, of Erie, in the county of Erie, and in the State of Pennsylvania, have invented new and useful Improvements in Sewing-Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 is a side elevation, and Fig. 2 an end elevation, of a sewing-machine, showing my improvements. Fig. 3 is a plan or top view, and Figs. 4 and 5 represent parts detached.

In all the figures like parts are indicated by the same letters of reference.

My improvements relate to that class of sewing-machines in which the needle is made to move in a straight line in performing its office; and they consist in mechanism for giving to the needle a reciprocating movement in a direction at right angles with the motion of the work as it is fed, which movement is made to take place during the time that the needle is entirely clear of the work—in fact, while it is changing from its upward to its downward motion—and while the work is being fed for a new stitch, so that a zigzag stitch is produced, the angles of which are dependent on the relative proportions of the feeding of the work and the movement laterally of the needle. This zigzag stitch is exactly adapted to the sewing together, without lapping, the selvage edges of sheeting, carpets, awnings, tents, light sails, &c., and, with the proper regulation of feed and speed, will form a complete binding for button-holes. The same stitch will also whip and fell down the edges of fabrics when lapped ever so slightly, so that, as in the case of tents and sails, a joint or seam of double thickness can be made as narrow as desirable, which shall be firmly sewed on both edges at once under one feeding of the work.

My improvements also consist in being so easily adjusted that any of the hereinbefore-named class of machines can be adapted to receive it, and all that is required to change the nature of the stitch to produce or stop the lateral motion of the needle is to turn a screw.

In the drawing, A is the standard supporting the parts of a sewing-machine. B B are the heads, through which, in machines as com-

monly made, the needle-staff C is made to slide vertically by means of its skeleton cam D and an anti-friction roller-stud, *a*, on the crank-plate E, fast on the end of the shaft F; but in my improvements the crank-plate is not attached to the shaft, but, with the needle-staff, is arranged and operated as follows:

On the main shaft, F, is fitted a sleeve, G, so as to have a free lateral motion, while rotation is secured by a feather and groove, *b*, or an equivalent device. A collar or shoulder, *c*, is formed around the sleeve, against which rests the bar or plate H, so fitted to the sleeve as to turn freely without play.

The bar or plate H carries at each end a block, I, which is made to receive the needle-staff C, so that the two blocks form guides for the staff, which is held in place by the straps and screws *d d'* so tightly as to prevent lateral motion, while it may slide freely up and down. The blocks I I are received by and are free to slide in grooves in the heads B B.

On the end of the sleeve, so as to embrace the bar or plate H between itself and the collar *c*, is placed the crank-plate E. It is secured to the sleeve by a screw, *e*, Fig. 2, tapped half into each, so as also to form a key to keep the plate fast on the sleeve.

When the needle-staff is placed in the blocks I I and the straps *d* screwed on, the roller-stud *a* will be within the skeleton cam D, and the sleeve, crank-plate, bar H, blocks I, and needle-staff will form a whole, as seen in Fig. 4, which may be taken entirely off from the shaft F at pleasure.

When the sleeve and its adjuncts are in place, and it is desired to have the needle make only an up-and-down movement, a set-screw, *f*, tapped through the top plate of the standard A, is turned down into the groove *g*, turned or cut around the sleeve at the proper place, as seen in Figs. 1, 3, 4, the sleeve being free to turn without lateral play and give motion to the needle.

Around the sleeve G are three or more sets of double cam-grooves, *h h*, so constructed that the grooves of each pair are made to cross each other once in the periphery of the sleeve, each pair thus in reality constituting but a single continuous groove, interrupted only at their crossings, as seen distinctly in Fig. 4.

The blank space *i* or wall separating the

grooves in each set regulates and governs by its width the distance that the sleeve will slide on the shaft F, which distance will be equal to the distance from the center of one groove to the center of the other in the same pair.

K is a plate, having a socket projecting from its under side through one of the holes *k k* in the top plate of the standard A, which holes are made so as to be over their respective grooves in the sleeve G.

A swivel-toed stud, *m*, is fitted to be received in one of the grooves *h*, while its stem *n* passes up through the socket and plate I, and is free to turn therein when the toe *n* is deflected from a right to an oblique position, as will be hereafter set forth.

When it is desired to cause the needle to move laterally and make a zigzag stitch, or a whipping or a button-hole stitch, the screw *f* is turned out of the groove *g*, so as to be entirely free of the sleeve, and the swivel-toed stud *m* is put down through the proper hole *k* into one of the grooves *h* of the proper set or pair. The plate I and its socket are put down through the hole, so as to receive the spindle or stem *n*, and the plate is then screwed down by the screws *l l*, or secured by an equivalent device. As the cam-sleeve G revolves the toe *m* keeps its groove until this narrows, when the point of the toe, being deflected obliquely by contact with the inclined side or wall of the groove at this point, will be caught by the end of the center wall *i* and sent still farther over into the other groove, which, as the stem *n* is immovable laterally, must move to keep the stud *m*, and consequently must move the sleeve and the crank-plate E and the blocks I I, causing them to slide in the heads B B, carrying the needle-staff with them.

The sleeve and crank-plate are so set with reference to each other that the movement of the sleeve takes place while the roller-stud *a* is at its highest point on the plate E and the needle-staff is clear up.

It will be seen that when the needle has been thus moved it will descend and make a stitch

and rise again before another lateral movement will carry it into the vertical plane it occupied before the first movement. Each alternate descent and rise of the needle is thus made in the same perpendicular line, the distance between the two lines being equal to the lateral traverse of the sleeve G on the shaft F.

It may be expedient in some machines to dispense with the sleeve G, or it may be impracticable to fit the shaft with a sliding sleeve, as herein set forth. In such a case the grooves *h* will be formed directly on the shaft, and the shaft itself, bearing the crank-plate, needle-staff, and blocks I I, will be made to traverse in its bearings, being allowed to slide through the eye of its miter-wheel on a feather, while the miter-wheel shall be firmly held in a permanent bearing of its own.

It is plainly seen that as the lateral movement or shifting of the needle takes place in the same vertical plane with the throw of the shuttle, there is no possibility that the shuttle may miss the loop carried down by the needle, as would happen were the needle to be moved or shifted laterally in any other plane.

Having thus fully described my improvements, what I claim therein as new, and desire to secure by Letters Patent, is—

1. The revolving and reciprocating sleeve G, provided with a series of crossing grooves arranged on the shaft F, in combination with the swivel-toed stud *m n* and needle-carrying slide H I, as and for the purpose set forth.

2. The screw *f*, in combination with the sleeve G, provided with crossing grooves *b b* and with a groove, so that the needle-carrying box may be held stationary or be made to reciprocate, as and for the purpose set forth.

In testimony that I claim the above-described improvements in sewing-machines I have hereunto signed my name this 13th day of January, 1868.

CHARLES F. DUNBAR.

Witnesses:

CHARLES HERRON,
GUY C. HUMPHRIES.