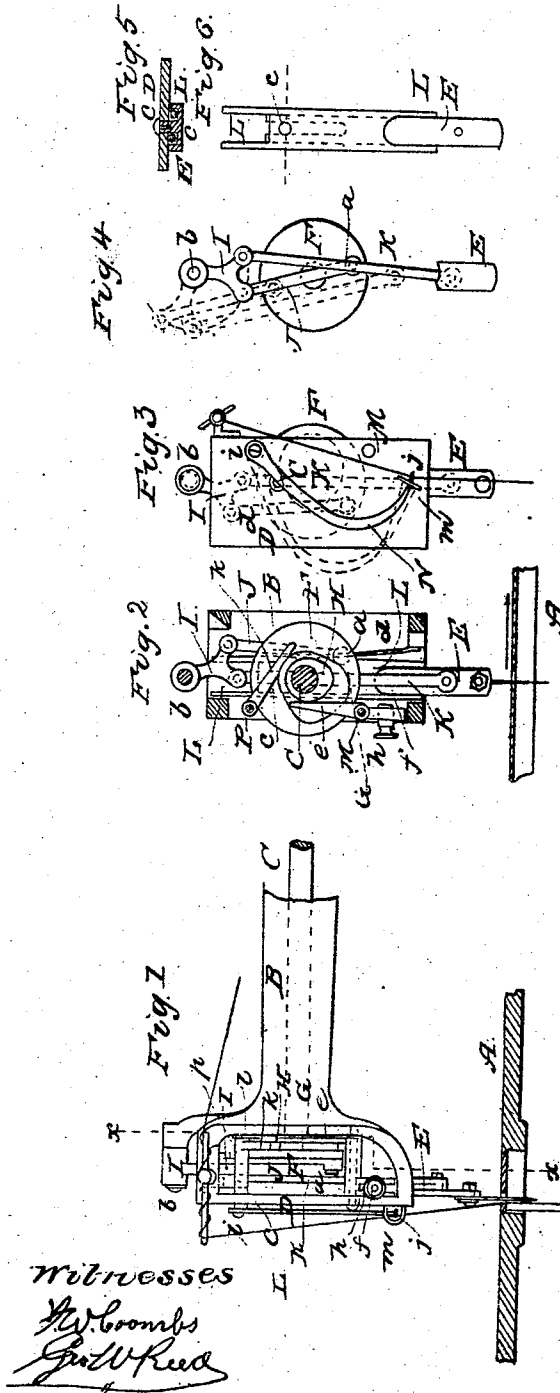


SCOFIELD & SIMMONS.

Sewing Machine.

No. 41,790.

Patented March 1, 1864.



UNITED STATES PATENT OFFICE.

A. G. SIMMONS AND CHAS. SCOFIELD, OF UTICA, NEW YORK.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 41,790, dated March 1, 1864.

To all whom it may concern:

Be it known that we, ADOLPHUS G. SIMMONS and CHARLES SCOFIELD, of Utica, in the county of Oneida and State of New York, have invented certain new and useful Improvements in Sewing-Machines; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a front view of part of the stationary arm, the needle-movement, feed mechanism, and take-up of a sewing-machine illustrating our invention. Fig. 2 is a vertical section in the plane indicated by the line *x* in Fig. 1. Fig. 3 is a side view of the face-plate and take up. Fig. 4 is a side view of the needle-operating mechanism. Fig. 5 is a horizontal section of the needle-operating mechanism. Fig. 6 is a side view of the needle-bar and of the oscillating sheath in which it slides.

Similar letters of reference indicate corresponding parts in the several figures.

The first part of our invention relates to the employment for operating the needle of a rocker which produces what is called the "loop motion" to commence the formation of the loop, and to obtain time for the passage of the shuttle or looper into or through it by the point of connection of the needle-bar passing a little beyond a position directly below the axis of oscillation of the rocker; and it consists in a certain arrangement of the said rocker and of its connections with the needle and with a crank or its equivalent on the main shaft or other rotating shaft of the machine, whereby the central stud or bearing of the rocker is relieved of strain at the time of the entrance of the needle into the cloth.

The second part of our invention relates to the employment of the needle to produce the feed movement of the cloth; and it consists in a certain mode of applying and operating the needle-bar, whereby the needle is caused to produce the feed in a more effective manner than in the needle-feeds heretofore employed.

The third part of our invention relates to the take-up or apparatus for controlling the slack of the needle-thread; and it consists in a certain mode of applying and operating such take-up, whereby it is rendered entirely independent of all parts of the needle-operating mechanism.

To enable others skilled in the art to make and use our invention, we will proceed to describe its construction and operation.

A is a portion of the bed-plate of the sewing-machine.

B is a part of the stationary arm, which is hollow, and contains the bearings for the main shaft C, which has secured upon it, at the end next the face-plate D and needle-bar E, a wrist-plate, F, and the cams G and H, the said plate carrying the crank-wrist *a*, for operating the needle-rocker I, the cam G producing the movement of the take-up and the cam H producing the feed-movement.

J is a rod which connects the rocker with the crank-wrist *a*, and K is a rod which connects the needle-bar with the rocker.

The needle-rocker I is substantially like that which forms part of the subject-matter of Letters Patent granted to S. S. Burnet and W. Broderick, dated November 30, 1858, but the arrangement of its connections is very different. In Burnet and Broderick's arrangement the crank-shaft is nearly on the same level with but distant horizontally from the stud or its equivalent on which the rocker works, and the rod which connects the rocker with the crank works nearly at right angles to the rod which connects it with the needle, and the latter rod and the rocker operate like a toggle, and the whole of the force that is employed to produce the penetration of the needle is made to act upon the stud on which the rocker oscillates; but in our arrangement the stud *b*, upon which the rocker oscillates, is arranged directly over and some distance above the crank-shaft C, and the rod J, which connects the rocker with the crank-wrist, is attached to the rocker at a higher point than the rod K, which connects the rocker with the needle-bar E, as shown in Figs. 2 and 3, and in red outline in Fig. 4, and the consequence is that when the crank-wrist, in its revolution, has passed a little beyond its highest position, and brought the point of the needle to a position to enter the cloth or other material to be sewed, the two rods are nearly parallel, as shown in Fig. 4 in red outline, and they continue nearly in this condition till the needle has penetrated to its greatest depth, as shown in Figs. 2 and 3, and hence the force necessary to drive the needle into and through the material is transmitted from the rod J through the rocker I to

the rod K without bringing any perceptible pressure on the stud *b*, and hence the said stud and rocker will wear much longer. This is of especial advantage in machines for sewing in leather and other heavy goods which are difficult of penetration.

To provide for the use of the needle for feeding the cloth or other material, the needle-bar E is fitted to slide longitudinally within a sheath, L, which is pivoted near its upper end by a pivot, *c*, to the face-plate D, and which has an oscillating motion upon the said pivot in a plane parallel with the desired direction of the feed-movement produced by the cam H with the aid of a spring, *d*, which is shown in Fig. 2. The cam H acts upon the arm *e* of a rock-shaft, M, which works in suitable bearings in the arm B and face-plate D, and the spring *d* drives the sheath L and the arm E of the rock-shaft M back again as the surface of the cam recedes. The cam H is so formed that it produces the above-described movement during a small portion of the revolution of the main shaft C, and is so set that it produces the said movement while the needle is at its greatest penetration, and so leaves the needle free from lateral strain during the whole of its movement, except that part in which it is well able to bear it—viz., while the stiff part, near its head, is in the cloth. The length of the feed is varied by moving the stud *f* in the arm *g* nearer to or farther from the rock-shaft, which is slotted for this purpose. The stud *f* is secured in the required position in the slot of the arm *g* by means of a nut, *h*, fitted to a screw-thread on the said stud. The feed, whether long or short, is always performed during the same portion of the revolution of the main shaft, and consequently always by the same stiff portion of the needle.

N is the take-up, consisting of a long arm, rocking on a center, *i*, on the outer side of the face-plate D, and having an eye, *j*, at its extremity, through which the thread passes on its way to the needle. This lever is firmly secured to a rock-shaft, P, which works in bearings in the stationary arm B and face-plate D,

and another arm, *k*, of the said rock-shaft, is held in contact with the cam G by means of a spring, *l*, which is coiled around the rock-shaft and secured to the stationary arm B, and as the needle rises to draw up the loop through the cloth, the said arm N is moved aside, as shown in blue outline in Fig. 3, by the action of the cam G upon the arm *k*, and draws the thread double and in the form of a loop through a stationary eye, *m*, which is secured to the face-plate D, and so draws up the slack of the loop independently of any action of the needle-operating mechanism, and enables the needle-thread to be kept tight after the stitch is made and until the eye of the needle has reached the cloth in commencing the next stitch, making it impossible for a loose loop of thread to remain upon the upper surface of the work, as sometimes happens with other kinds of take-up.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The arrangement of the rocker I and its connections J K, with the crank-wrist and needle-bar, substantially as herein described, whereby at the time of the needle entering and passing into the cloth or other material to be sewed the said connections are brought parallel or nearly so with each other and the stud or center bearing of the rocker is relieved of pressure and strain, substantially as herein specified.

2. The arrangement of the needle-bar to slide in an oscillating sheath, L, operated by a cam, H, rock-shaft M, arms *e g*, and spring *d*, or their equivalents, substantially as and for the purpose herein specified.

3. The take-up N to draw the thread through the eye *m*, attached to a rock-shaft, P, and operated independently of the needle-operating mechanism by means of a cam, G, and spring *l*, substantially as and for the purpose herein specified.

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CHAS. SCOFIELD.

Witnesses:

WM. H. PRATT,
B. F. BROOKS.