G. LITTLE.

MODE OF OPERATING SEWING MACHINES.

No. 28,287. Patented May 15, 1860.

Fig. 2.

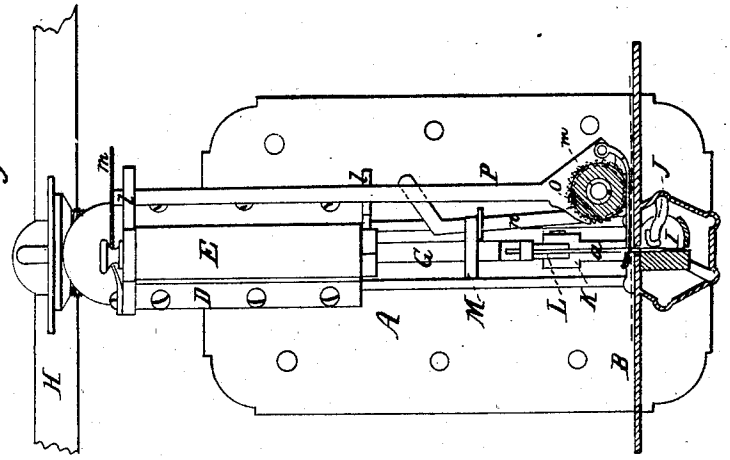


Fig. 3.

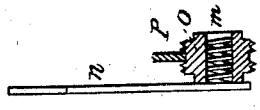
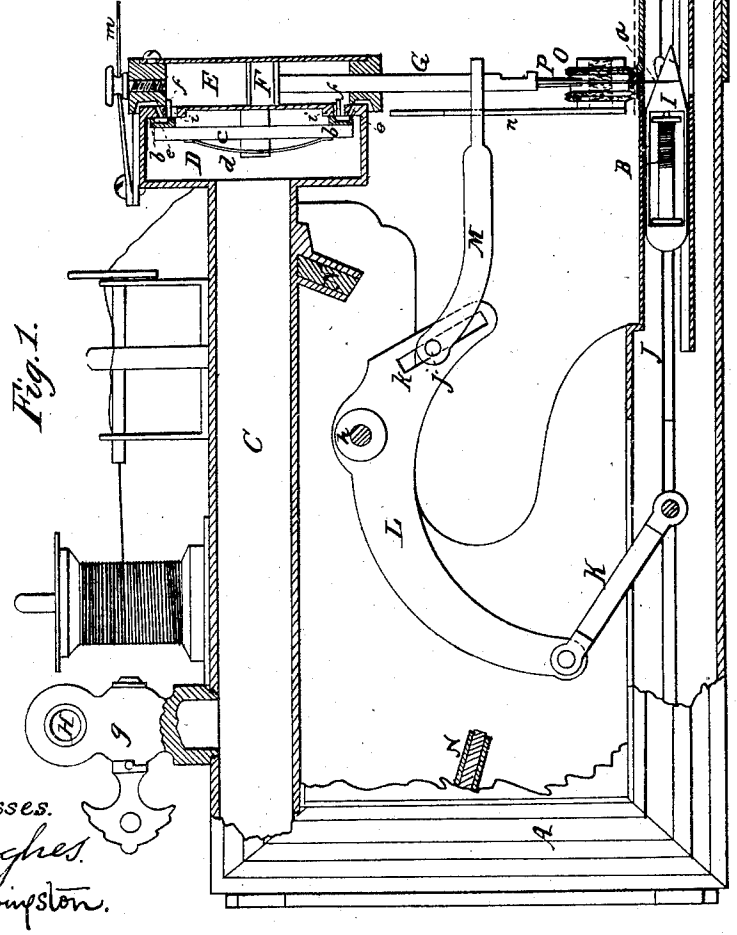


Fig. 1.



Witnesses.
Mich. Hughes.
M. M. Livingston.

Inventor.
George Little

UNITED STATES PATENT OFFICE.

GEORGE LITTLE, OF NEW YORK, N. Y.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **28,287**, dated May 15, 1860.

To all whom it may concern:

Be it known that I, GEORGE LITTLE, of the city, county, and State of New York, have invented a new and Improved Mode of Operating Sewing-Machines; and I 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—

Figures 1 and 2 are vertical sections at right angles to each other of a sewing-machine with my invention applied.

Similar letters of reference indicate corresponding parts in both figures.

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

A B C is the framing of the machine, having its stationary arm C hollow and furnished at the end with an air-chest, D, which may be kept supplied with compressed air through the hollow arm C by opening a stop-cock, *g*, which connects the said arm with a pipe, H, coming from a reservoir in which the air is compressed by suitable mechanical agency.

To the air-chest D is bolted the upright air-cylinder E, which is bored truly to receive the piston F, and which has a stuffing-box in the bottom, through which passes the upright straight needle-bar G, to whose head the piston F is firmly secured. The needle-bar has the needle *a* attached to its lower end like the needle-bar of other sewing-machines.

The cylinder E is provided within the air-chest D with two flat valve-seats—one near each end—each provided with an induction-port, *i*, leading into the cylinder, and an eduction-port, *e*, leading to the atmosphere, each of said valve-seats being fitted with one of two slide-valves, *b b*, which are connected by a rod, *c*, the said valves or the rod being fitted to suitable guides, and held up to their seats by a spring, *d*, applied to their rod *c*. Each valve is furnished with a pin, *f*, which projects through its port *i* far enough into the cylinder to be struck by the piston as the latter in its reciprocating motion, produced by the admission of the air to the cylinder on its opposite sides alternately, arrives near the end of the stroke, so that in completing its stroke toward the top or the bottom end of the cylinder the piston may move the valves to open the induction-port at that end to the air-chest D and bring the induction-port at the other end into communication with the eduction-port, to permit the exhaust to the atmosphere of the compressed air which has already acted on the piston, by which means the reciprocating movement of the piston within the cylinder is kept up, and the necessary movement of the needle-bar G to operate the needle is obtained.

The necessary movement of the shuttle I or of a looper and of the feeding device may be obtained from the reciprocating needle-bar in various ways. I have represented the shuttle-driver J as connected by a rod or link, K, with one arm of a lever, L, which works on a fixed fulcrum, *h*, attaching it to the framing, and whose opposite arm contains a slot, *k*, in which works a pin, *j*, carried by an arm, M, which is rigidly attached to the needle-bar G. By the movement of the pin *j* in the slot *k* the lever L is caused to receive the necessary movement to operate the shuttle-driver. The length of movement of the lever L is controlled by two buffers, N N, of wood, cork, india-rubber, leather, or other material of a moderately-yielding character, attached to the framing in such positions that the lever may strike them, and the movement of the said lever being thus controlled, controls the length of stroke of the piston F and the needle-bar.

The feed mechanism represented consists of a toothed or serrated roller, O, having a groove which receives in it a fork at the lower end of a presser-rod, P, which is fitted to slide up and down in guides *l l*, attached to the arm C or air-chest D, and which has a spring, *m*, applied to its upper side in such a manner as to keep the roller pressing on the upper surface of the cloth or other material to be sewed, and to make the said roller confine the said material to the surface of the bed B of the machine. The said roller is fitted to a pivot, *m*, which is composed of a spiral spring which in its normal condition is slightly larger than the central opening bored in the roller to receive it, but which is sprung into the opening of the roller. The said spiral pivot has attached to it an arm, *n*, which is received within a slot in the arm M, and which is caused by the vertical movement of the said arm M to receive an oscillating movement about the axis of the roller. The spiral pivot *m* moves with the arm *n*, and in moving in one direction the friction between the said pivot and the bore of

the feed-roller tends to coil up the former into a smaller diameter, and so permits it to move freely within the roller without turning the latter; but in moving in the other direction the friction between the said pivot and the bore of the feed-roller tends to uncoil the former and make it fit the roller so much tighter as to compel the roller to turn with it, notwithstanding the most copious application of lubricating material between them, and in this way the roller is permitted to roll over the cloth or other material as it turns in one direction, but caused to carry the said material along the bed B as it turns in the other direction.

This mode of driving sewing-machines by compressed air is specially adapted for manufacturing establishments where several machines are used, in which case the machines may be arranged in a row or rows, with one pipe, H, running the whole length of each row, and connected by a stop-cock, *g*, with each machine. The machines may each be stopped and started by opening and closing its stop-cock.

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

The adaptation of a cylinder, piston, piston-rod, and valves to and constituting a part of a sewing-machine, the whole combined, constructed, arranged, and operating substantially as set forth.

GEORGE LITTLE.

Witnesses:
MICH. HUGHES,
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