2 Sheets—Sheet 1.

L. GRISWOLD.

SEWING-MACHINE.

No. 184,860. Patented Nov. 28, 1876.

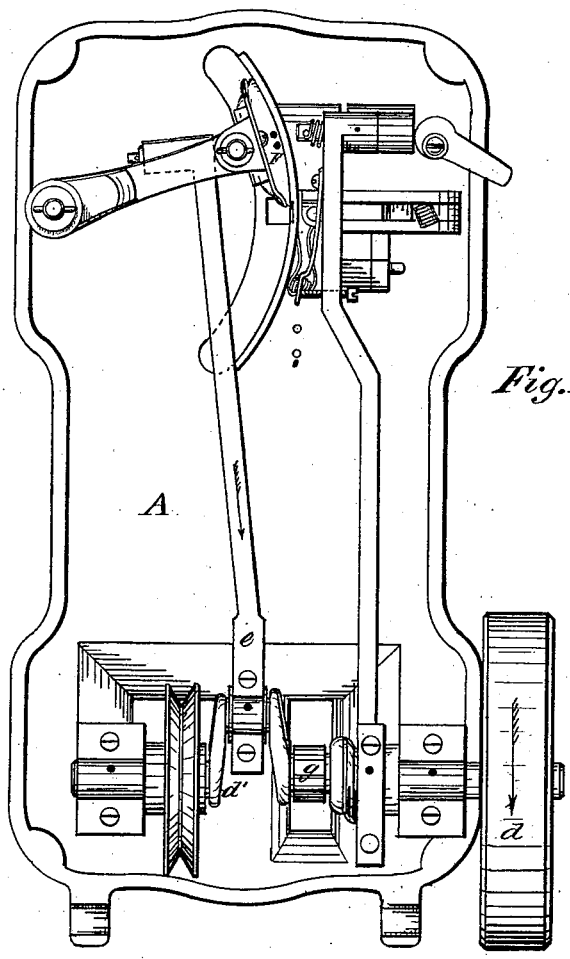

Fig. 1

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Leo Griswold, Inventor;
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2 Sheets—Sheet 2.

L. GRISWOLD.

SEWING-MACHINE.

No. 184,860. Patented Nov. 28, 1876.

Fig. 2

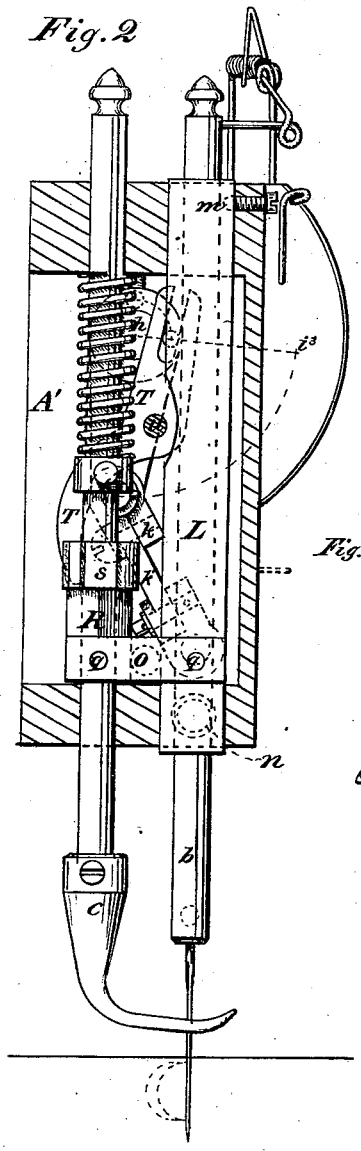

Fig. 3

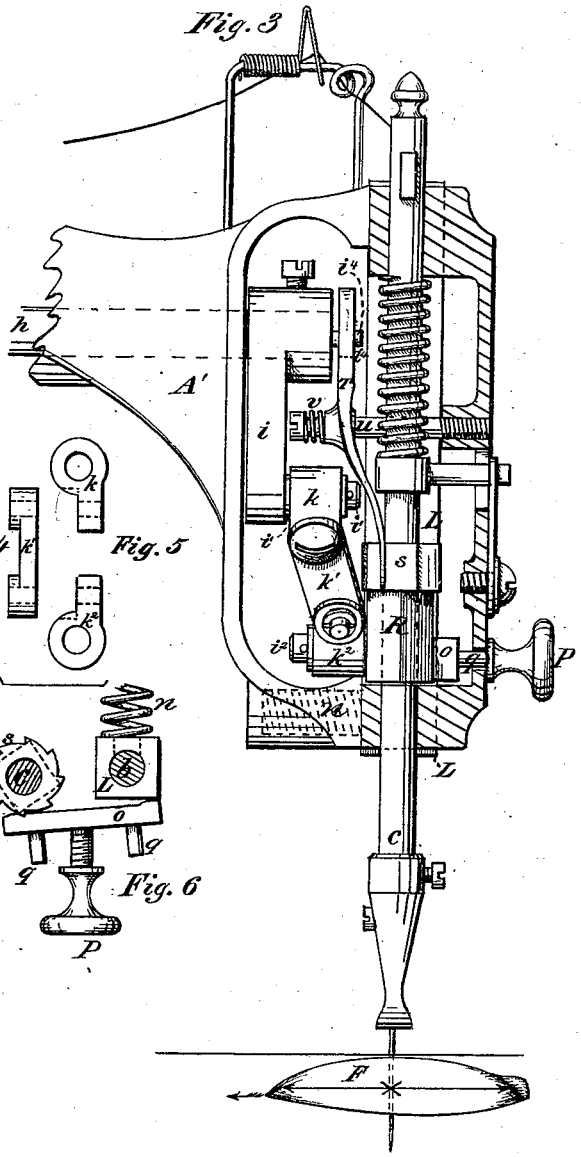

Fig. 4

Fig. 5

Fig. 6

Witnesses:

Thos. L. Livingston

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Atty

UNITED STATES PATENT OFFICE.

LEO GRISWOLD, OF JOHNSTOWN, NEW YORK.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **184,860**, dated November 28, 1876; application filed May 1, 1876.

To all whom it may concern:

Be it known that I, LEO GRISWOLD, of Johnstown, in the county of Fulton and State of New York, have invented a Sewing-Machine, of which the following is a specification:

The object of my invention is to so construct sewing-machines having vibrating needle-bars, needle-bar guides, and their equivalents, (which are designed to sew a zigzag stitch,) by means of certain new and simple devices, whereby the stitch may be varied (by means of a screw or its equivalent) from a straight seam to an extreme zigzag, or any intermediate width of seam, as desired, being entirely under the control of the operator.

To enable those skilled in the art to fully understand and construct the same, I will proceed to describe it as follows:

Figure 1 is an inverted plan view of my invention, showing the triple crank-shaft and connecting-rods which actuate the shuttle and feed devices. Fig. 2 is an end sectional view, and Fig. 3 exhibits a side sectional elevation, of the needle-bar head, to which my invention is applied. Figs. 4 and 5 are elevations of the universal-jointed connecting-rod which actuates the needle-bar vertically. Fig. 6 is a plan view of the device which imparts a zigzag motion to the needle-bar. By simply turning the milled thumb-screw the needle-bar may be held in a fixed lateral position as long a time as required.

A represents the bed-plate of my sewing-machine, and A′ the arm-head, which is fitted to receive the needle-bar *b* and feed presser-foot *c*, and their respective appendages. *d* is fly-wheel, which is affixed to the triple crank-shaft *d′*. *e* is a connecting-rod, one end of which is fitted to a crank on shaft *d′*, and the opposite end imparts the requisite motion to the shuttle F, in the usual manner. A connecting-rod is also fitted to crank shown at *g*, Fig. 1, which imparts an oscillatory motion to the shaft *h*, which is fitted to oscillate in the horizontal bearings of the arm and head A′. A crank, *i*, is secured to the oscillating shaft *h*, and said crank has a pin, i^1, which is inserted into one piece, *k*, of the universal-jointed connecting-rod. (Shown at k k^1 k^2, Figs. 2, 3, 4, and 5.) The parts k k^1 k^2 are connected together, and so fitted in the joints by means of rivets, screws, pins, or the like, that the lower joint k^2, which is fitted to the pin i^2 affixed to the vibrating needle-bar *b*, may readily accommodate itself to the alternate motion and vibration of the said needle-bar. The vibrations of the crank *i* are shown by dotted arc and radial lines in Fig. 2 at i^3. The needle-bar *b* is fitted to slide vertically in a sleeve or guide, L, which, in turn, is fitted in the head A′, so as to vibrate longitudinally with respect to the shuttle-race at its lower end, the upper end of said sleeve L being pivoted to the screw *m*, Fig. 2. A spring, *n*, presses against the rear side and at the lower end of the guide L, as shown in dotted lines in Figs. 2 and 3, and in plan view, Fig. 6, and tends to keep the guide L at all times against the lever-plate *o*, which rests on the fulcrum-screw P. (Shown in Figs. 3 and 6.) The lever-plate is provided with steady or guide pins *q* *q*, which enter holes in the face-plate of the head A′, as will be readily inferred by reference to Figs. 2 and 3. The opposite end of the lever-plate *o* rests on the intermitting rotary sleeve R, which is provided with eight teeth, *s*, or any suitable number, and half that number of angles or sides. Now, a pawl or click, T, is pivoted to the stud-pin or bolt *u* near its center, and engages with a crank-pin, i^4, affixed to the crank *i*, as shown in Figs. 2 and 3, near its upper end. The lower or opposite end is brought in contact with the ratchet or toothed wheel *s*, and rotates the same intermittently at every return stroke of the needle-bar, as will be readily inferred from a glance at the drawing. Each stroke of the pawl moves the ratchet one tooth; therefore, it will be observed, that alternately an angle and a flat side of the sleeve R are brought in contact with the lever-plate *o*. Now, when the screw P is withdrawn from contact with the plate *o*, the angles and sides of the sleeve R do not move or actuate the said plate, consequently the guide L will convey the needle-bar in one fixed point; but, if the fulcrum-screw P be forced against the plate *o*, the guide L will be made to vibrate at each return stroke of the needle-bar *b*, by the alternate action of the quadrangular surfaces and angles coming in contact with the lever-plate *o*,

alternately compressing and releasing, in a measure, the spring *n*.

The sleeve R may be fitted so as turn very readily on the feed presser-bar *c*, and I prefer this manner of operation in lieu of other expensive devices to retain the sleeve R in position.

The pawl T is readily brought in contact with the ratchet *s* by means of the spring *v* on the pin or screw *u*, as shown in Fig. 3.

The vibrations of the needle are parallel with the shuttle course or race, for the obvious reason that the shuttle may at all times pass through the loops formed by the upper thread. It will also be readily inferred that the needle has no lateral motion while the same is in contact with the fabric while it is being sewed, or during the formation of the stitch, but only when the needle is withdrawn from the work does the same make a step to to the right or left, as already described.

I disclaim the use of a swinging needle-bar when the same is used for the purpose of feeding or propelling the fabric or the material being sewed, my invention being distinguished from that class just referred to in the fact that my needle does not vibrate until it is withdrawn from the work; then it steps to the right or to the left. It will also be observed that the needle-bar *b* steps or vibrates in a lateral direction with respect to the motion of the feed which carries the fabric to be sewed.

I claim as my invention—

1. In combination, the pivoted needle-bar guide L, vibrating crank i^4, pawl T, provided with a slot in its upper end, ratchet *s*, sleeve R, plate *o*, screw P, and spring *n*, whereby the proper vibratory motion is imparted to the said needle-bar, and the amount of such motion is adjusted as and for the purpose set forth.

2. In combination with a pivoted needle-bar guide, L, plate *o*, screw P, ratchet *s*, sleeve R, and spring *n*, the universal-jointed connecting-rod $k\ k^1\ k^2$, and vibrating crank *i*, substantially as and for the purpose set forth.

3. The combination of the universal-jointed connecting-rod $k\ k^1\ k^2$, vibrating crank *i*, needle-bar guide L, and needle-bar *b*, as set forth.

4. In combination with the quadrangular sleeve R, plate *o*, screw P, and spring *n*, the pivoted needle-bar guide L, as set forth.

5. In combination with the needle-bar guide L, pivoted as described, the spring *n*, lever-plate *o*, fulcrum-screw P, universal-jointed connecting-rod $k\ k^1\ k^2$, and vibrating crank *i*, operating substantially in the manner and for the purpose set forth.

LEO GRISWOLD.

Witnesses:
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