W. WEITLING.

Sewing Machine.

No. 45,777. Patented Jan. 3, 1865.

Fig: 1.

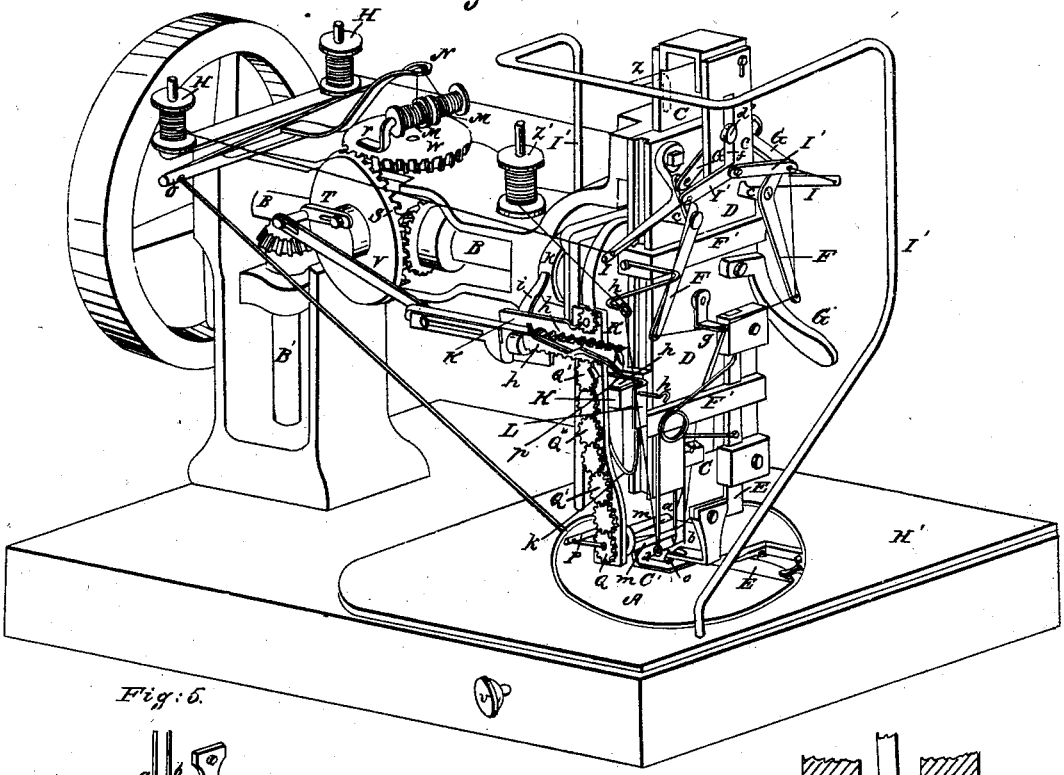

Fig: 5.

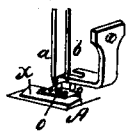

Fig: 6.

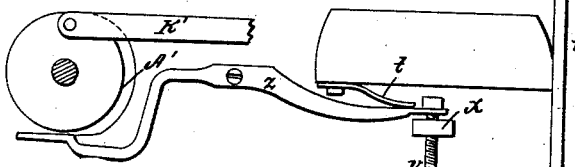

Fig: 7.

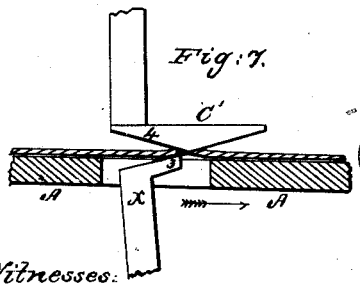

Fig: 2.

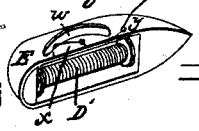

Fig: 3.

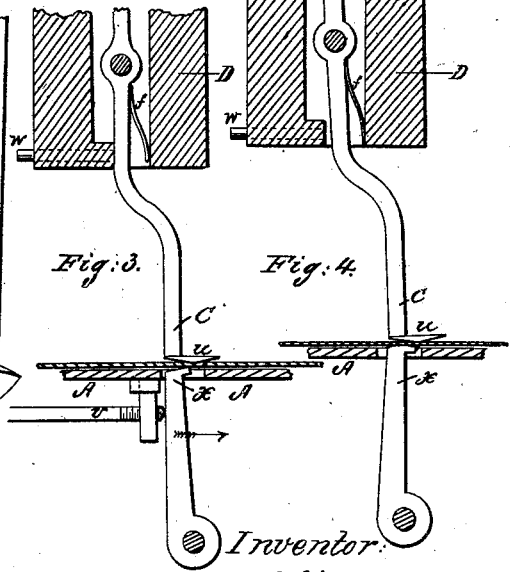

Fig: 4.

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UNITED STATES PATENT OFFICE.

WM. WEITLING, OF NEW YORK, N. Y.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **45,777**, dated January 3, 1865.

To all whom it may concern:

Be it known that I, WILLIAM WEITLING, of the city, county, and State of New York, have invented certain new and useful Improvements in Sewing-Machines, the same being adapted to the stitching of button-holes; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, in which—

Figure 1 represents a perspective view of the entire machine. Fig. 2 represents a perspective view of my improved shuttle. Figs. 3, 4, 5, and 6 represent detached views hereinafter to be referred to. Fig. 7 represents an enlarged view of my feeding-pads.

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

A represents the bed-plate of the machine.

B represents the main shaft from which the several parts of the machine are operated.

The needle-bar C works within the standard D, and is operated from the shaft B by the ordinary cam motion. It has two needles, *a b*, secured to its lower end, the needle *a* constituting the needle proper, which penetrates the cloth near the edge of the button-hole, and the needle *b*, which serves as a thread-carrier and passes through the button-hole. Both needles, on rising, form loops on the lower side of the cloth, through which the shuttle E passes in the ordinary manner, which requires no further description.

To facilitate the forming of the loops, I use a special device for slacking the needle-threads when the needles rise, and for tightening them when they have arrived at the highest point and previous to their again descending. This operation is performed by means of the levers F, which turn on their pivots *c*, and whose lower ends serve as thread-guides of the needle-threads. These two levers are operated by means of the toggle-joints G, which are pivoted at *e* to the short arms of the levers F, and whose center pin, *d*, passes through the slot *f* of the needle-bar, and the action of the latter thus in descending forces inward or toward each other the lower ends of the levers F, by which the needle-threads are slacked, so as to form loops when the needles begin to rise, and in rising the levers F are spread and pull or tighten the needle-threads after the needles have risen to their highest positions and previous to descending.

The needle-threads are represented in red lines on the drawings. They pass from the spools H through the guide-rods I, thence through the guides I′, thence through the eyes at the lower ends of the levers F, thence through the guide *g*, and finally to the needles *a b*.

In connection with the two needle-threads and shuttle-thread described, I use two additional threads, (shown on the drawings in blue lines,) which are twisted by the operation of a revolving double-thread holder, and which are interlaced with the needle-threads, so as to form a button-hole stitch. The double-thread carrier, by means of which this operation is performed, is secured to a plate, K, which is hinged to a bracket, L, by means of the pivot *h*, and can turn on said pivot to some extent. The threads shown in blue on the drawings pass from their spools M through the guides N, O, and P; through the hollow axle of the wheel Q, and thence through the two revolving thread-carriers *m*, which are secured to a disk, *n*, of the shaft of the wheel Q, and as the latter revolves the two threads, escaping from the thread-carriers *m*, are twisted, and when thus twisted are presented at proper intervals to the needles *a b*, both of which pass through the loop formed by the twisting of the said two threads, and which is laid upon the surface of the cloth and is interlaced with the needles and shuttle-thread. This operation is performed in the following manner: The extension of the pivoted plate K is provided with a curved arm, *i*, which is acted upon by the cam *k* in such a manner that the revolving thread-carriers *m* are pushed toward the needles to present their twisted threads when said needles descend, and that they are pushed outward when said needles rise, the plate K turning in said operation on its pin *h*.

The operation of turning the twisted-thread carriers *m* may be effected in various ways. In the mode illustrated in the drawings I use a number of gear-wheels, Q, which are operated by means of a sliding rack, R, the latter receiving its reciprocating motion from the bevel-wheel S by means of the crank T and pitman U. The reciprocating motion of the rack imparts a revolving motion to the wheels Q′, which is transmitted to the wheel Q and

to the double-thread carrier. To impart to the latter a continuous revolving motion, I cause the rack R to operate alternately on the upper one of the series of wheels Q′ and upon Q″, the latter being geared with the wheels Q′ by intermediate gearings on the rear side of plate K, the rack R being raised and lowered at the end of each stroke by the action of the inclined cams *p*, which come in contact with stationary projections *r* on the plate K, and thus bring the rack R alternately in gear with the pinions Q′ and Q″, whereby a continuous revolving motion of the pinion Q and double-thread carrier *m* is obtained.

It is evident that the two threads, as they pass from their bobbins M, will be twisted by such continuous rotation of the thread-carrier before they reach the latter, which, if not counteracted will stop their operation. I counteract this by securing their spool-holder V to the face of a horizontal revolving wheel, W, which, by its rotation, untwists said threads in the same degree as they are twisted by the rotation of the double-thread carrier, the said wheel W being turned from any of the gearing of the machine.

My feeding device consists of two feeding-pads acting on each other, and thus on the fabric which they hold. They have both smooth feeding-surfaces, and are essentially different in their construction and operation from the feeding devices used heretofore.

The lower feeding-pad, X, Figs. 3, 4, 5, and 7, is secured to a horizontal shaft, Y, and is operated in the usual manner by a lever, Z, and cam A′, the latter being secured to the lower end of the shaft B′, and operates at the same time the shuttle by means of pitman K′. The feeding-surface of the pad X is perfectly smooth, as represented in Figs. 3, 4, and 7, and terminates at its side in a chisel-edge, 3, (shown on an enlarged scale at Fig. 7,) which as the pad is moved forward presses the cloth against the inclined side, 4, of the pad C′, the cloth by the said operation being pinched between the chisel-edge and the inclined side of the cloth-presser, as shown at Fig. 7. The upper pad or cloth-presser, C′, has also a smooth feeding-surface. It is pivoted to the standard D at 3′, and is retained in its position by the pressure of the spring *s*. The face *u* of the cloth-presser C′ is angular, and it is so adjusted that the chisel-edge 3 of the pad X acts at the proper time and place against the angular side or sides of the cloth-presser to pinch the cloth in feeding; but when the feeder X is pressed in the direction of the arrow it thus presses the cloth against the inclined face of the cloth-presser C′, and the latter yields to a small extent, and the two, pinching the cloth between them, are moved into the position represented in Fig. 4 and in an enlarged view at Fig. 7 when they have fed the cloth the desired length. The lower pad, X, on being released from the action of the cam A′, Fig. 6, is restored to its former position (represented in Fig. 3) by means of the spring *t*. (Shown in Fig. 6.) The cloth-presser C′ is thus also released, and the spring *s* causes it to return to its original position, while the cloth is held stationary by the needles, which in the meantime have passed through it.

This feeding device presents great advantages over those used heretofore, as it does not act by friction like the rough-faced feed which pushes the cloth under a stationary cloth-presser; but in my device the cloth is firmly gripped on both sides, carried the length of the stitch, and is again released, thereby avoiding friction and greatly insuring and facilitating the operation of the machine. The length of the stitch or feed is regulated by means of the set-screw *v*, and the position of the pad or cloth-presser C′ is adjusted by means of the screw *w*.

My shuttle is represented in a perspective view in Fig. 2. Its principal novelty consists in the formation in its upper part of a curved slot, *w*, which serves as a guide for the shuttle-thread in the manner shown in the drawings. In the shuttles used heretofore the thread passes directly from the spool through the eye *x*. The length and the line of direction of the thread from the circumference of the spool to the eye *x* vary constantly as the thread is unwound and passes from one end of the spool to the other, and consequently the tension of the thread is constantly varying. To equalize the tension, I use the curved slot *w*, and the thread passes from the spool D′ through said slot, thence on the outside of the shuttle through the eye *x*, and thence on the inner side of the shuttle and through the eye *y*, as represented in red lines on Fig. 2. By giving the slot *w* the shape of a circular segment, to which the eye *x* is the center, the length of the thread between the spool and the eye *x* will be very nearly the same at all points, and an equal and invariable tension is thus obtained.

o represents two guide-pins, which rest upon the bed-plate A and astride of the hole through which the needle *b* passes. They are intended as guides for the cloth when the latter is fed to the needles, and they extend through the slit of the button-hole. These guide-pins may either be secured to the plate A or to the rod E′, which extends downward from the face-plate, and which is secured to the adjustable frame F′ of the cloth-presser, and can consequently be raised and lowered with the same. By this arrangement the operation of adjusting the cloth is greatly facilitated, as the bed-plate is perfectly smooth and presents no obstruction. The frame K of the revolving double-thread carrier is also secured to the adjustable frame F′ of the cloth-presser C′, and consequently the latter, the frame K, and the pins *o* are all raised and lowered simultaneously by the rising and lowering of said frame, which is effected by means of the lever G′.

H′ represents a plate or hanging table. It has a circular opening, which fits around the circular bed-plate A. It is supported by two

rods or arms, l′, from which a side rod, *z*, extends, the vertical prolongation of which serves as the pivot on which the table turns, and said pivot is so located as to be in a perpendicular line which passes through the piercing-needle *a*. The application of this table greatly facilitates the operation of sewing button-holes, as the cloth has to be turned frequently, and the turning can thus be effected without moving the cloth and by simply turning the table by hand.

Z′ represents the spool which contains the cord to be laid around the edges of the button-hole. It passes from said spool through the guides 2 in the manner shown by the green lines on the drawings, and thence between the two needles *a b*.

Having thus fully described the nature of my invention, what I claim herein as new, and desire to secure by Letters Patent, is—

1. The combination, in a sewing mechanism, of one or more revolving thread-leaders and their supports with the adjustable frame, of the cloth-presser, so that all of them may be raised and lowered by the same mechanism, substantially as and for the purposes set forth.

2. Supporting the bobbins which supply the revolving double-thread carrier on a revolving table, for the purpose of preventing the threads from twisting before reaching the double-thread carrier, substantially as and for the purposes described.

3. A feeding device feeding the fabric by the action of a chisel-edged pad against the inclined under surface of an upper reciprocating pad or cloth-presser, thus operating by a pinching and direct angular pressure instead of by vertical pressure, substantially as and for the purposes set forth.

4. The combination of the levers F and toggle-arms G with the needle-bar C and thread-guide *g*, constituting my thread-delivering regulator, substantially as and for the purposes described.

5. The application to a sewing mechanism of the turning table H′ upon the plate-bed A, serving as a support to the fabric, and having the needle as the center of motion when said table is suspended to the needle-arm, substantially as and for the purposes described.

6. Securing the guide-pins *o* to the adjustable frame F′ of the cloth-presser, so that they can be raised and lowered together with said cloth-presser, substantially as and for the purposes described.

7. A feeding device with smooth surfaces operating by the angular motion of two parts acting on each other, and thus gripping the fabric between them and moving it forward, substantially as described.

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Witnesses:

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