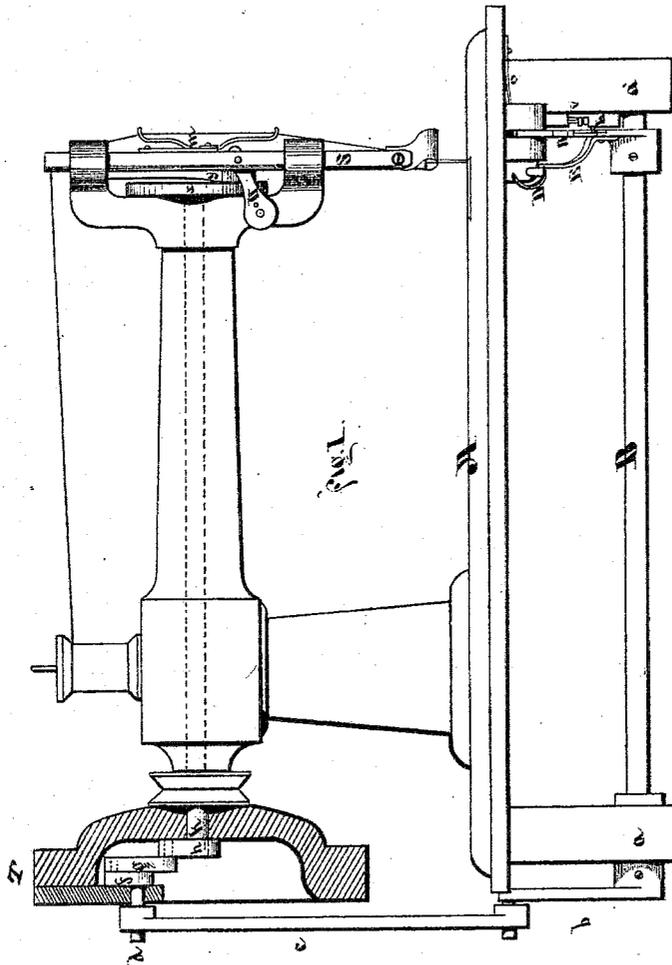


JOHN B. PRICE & CHARLES E. BILLINGS.

Improvement in Sewing Machines.

No. 124,854.

Patented March 19, 1872.



Witnesses

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Inventors

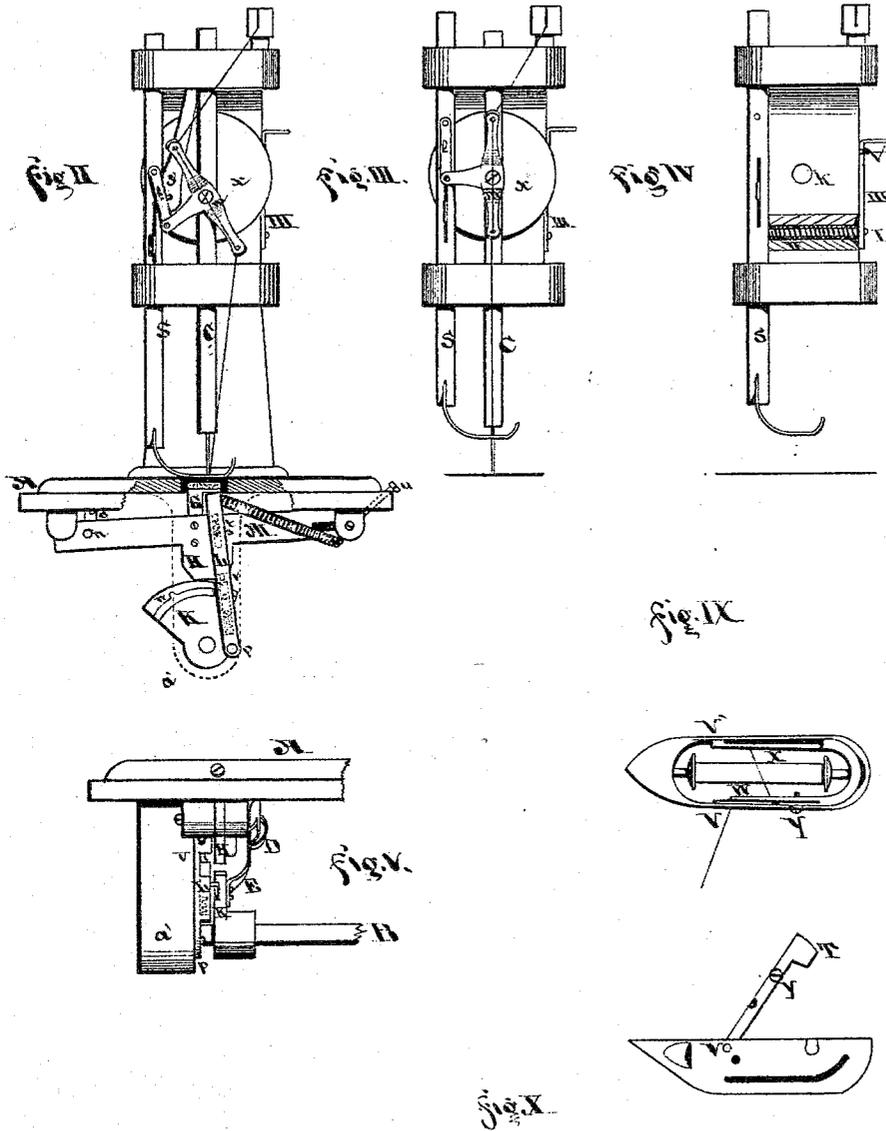
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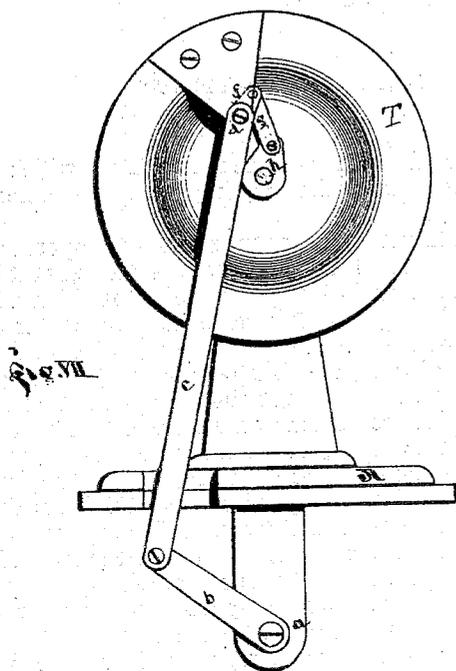


Fig. VII.

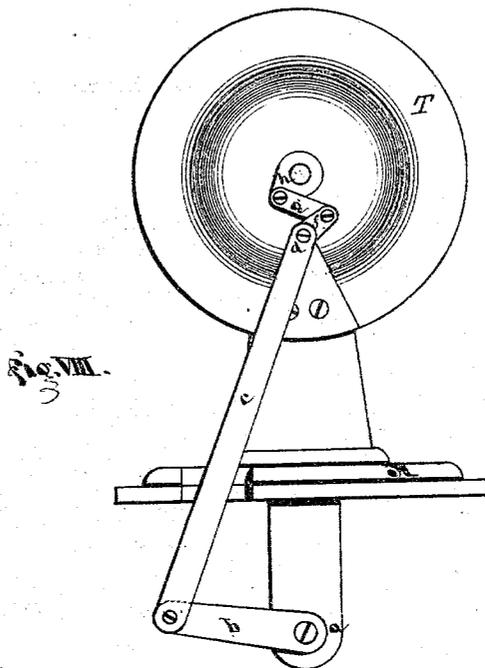


Fig. VIII.

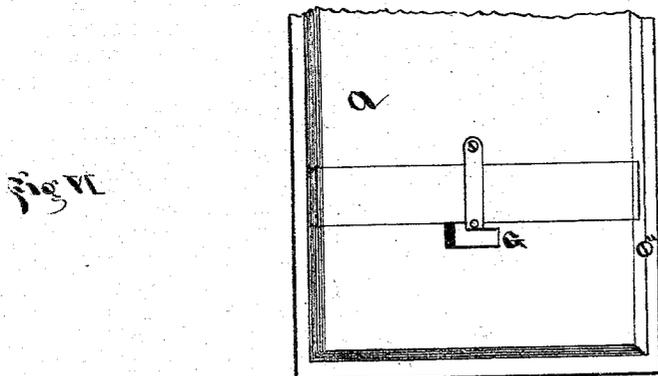


Fig. IX.

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UNITED STATES PATENT OFFICE.

JOHN B. PRICE AND CHARLES E. BILLINGS, OF HARTFORD, CONNECTICUT.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 124,854, dated March 19, 1872.

SPECIFICATION.

To all whom it may concern:

Be it known that we, JOHN B. PRICE and CHARLES E. BILLINGS, of Hartford, Hartford county, Connecticut, have invented certain Improvements in "Sewing-Machines," of which the following is a specification:

Nature and Objects of the Invention.

Our invention relates to the mechanism for moving the shuttle, needle, and feed devices when combined to form a new and improved sewing-machine; and also relates to the arrangement of an adjustable "presser-bar." And further, our invention also relates to certain improvements in the "shuttle."

Description of Accompanying Drawing.

Figure I is a side view and partial section of our improved machine. Fig. II is an end view, showing the feed device and the "take-up" motion when the foot of the "presser-bar" is upon a thin fabric. Fig. III is a partial front view, showing the presser-bar raised. Fig. IV shows the spring operating the "presser-bar" and the device for raising the same. Fig. V is a detail view of parts of the "feed-motion." Fig. VI is a partial plan view, showing the rubber "feed-plate." Fig. VII shows the "needle operating mechanism" in one position, and Fig. VIII shows it in another position, and Figs. IX and X show the construction of the "shuttle."

General Description.

A is the bed of the machine, beneath which the rock-shaft B is hung in bearings *a a'*. Motion is given to this shaft from the driving-pulley of the machine by means of the arm *b*, connection *c*, and pin *d* on the pulley. This shaft B operates the shuttle, and also the feed, in the manner hereafter described. The pin *d* also carries the small crank *f*, which operates, by means of the connection *g*, the central crank *h*, which is attached to a shaft, *k*, which extends to the front of the machine and operates the needle-bar C, and with it the "take-up" device, consisting of the connection *l* and the three-armed pivoted lever *m*, by means of the crank *x* and the connection *y*. The "shuttle-carrier" D is attached to the shaft B by means of the arm E, and has a regular reciprocating

motion, derived from the rock-shaft *b*, which is operated from the driving-pulley, as before mentioned.

The motion given to the needle-bar, operated by the mechanism described, is such that it is carried to its lowest point while the shuttle is being brought backward toward the center of the machine, and the "needle" remains in this position while the shuttle is passing through and returning through the loop of the thread, which loop is formed by the action of the "take-up" device operated with the needle-bar, and the needle then returns up, completing its stroke, and arriving at its highest point at the same time that the "shuttle" completes its forward movement and is about to be returned. During this upward movement the "take-up" device draws up the loop and takes from the spool sufficient thread for the new stitch.

The "feed" is operated from the shaft B by means of devices we will now describe. The feed-plate G is formed of rubber, held up against the under side of the fabric which is being sewed, underneath the foot, by means of the bar H, which is operated by the cam K and the spring *o*. This bar H is pivoted at one end to a projection beneath the bed of the machine by slotting over a pin passing through the said projection. It is provided with a pin, *n*, to form a stop to its motion in one direction, and adjustable screw-stop *u* for the opposite direction, its throw across the machine being regulated to correspond with the length of the stitch required. By means of the cam K and spring *o* this bar H has an up-and-down motion, and by means of mechanism we will now describe a reciprocating motion is given to it at the proper times. The bar L is pivoted to the bed of the machine at *p*, near the bearing of the shaft B, and extends upward, and by means of a pin, *s*, and slot *t*, is attached to the "feed-bar" H, in such a manner that the said bar H has its up-and-down motion independent of any action on the bar L; but the latter is made to drive the feed-bar H in one direction, horizontally, by the spring-catch *v*, which catches in the notch *w* on the back of the cam K, and carries the "feed-bar" H a short distance horizontally against the spring M, and then, loosening its hold on the "feed-bar" H, said bar H is released so that the spring M can pull it back horizontally, thus

giving a slight reciprocating movement to the feed-plate.

The "take-up" device consists of the three-armed lever *m* pivoted to the needle-bar *C*, and operated by the action of the "needle-bar," the lower arm of the lever being connected to the presser-bar *S* by the connection *l*. The operation of this take-up device is to form the loop by carrying down the thread at a rapid rate when the shuttle is about to pass through, and then remain still while the needle is stationary and the shuttle passing through, and then drawing the thread up rapidly again when the needle-bar rises. It also, by its arrangement, takes the thread nearly in a direct line with the spool, thus being an improvement over take-up devices that take the thread horizontally. Any desirable tension device is arranged between the "take-up" and the spool.

In the drawing, a screw is arranged with a slotted head, through the slot of which the thread passes. The device for keeping the foot of the "presser-bar" down on the fabric, and for raising the same when not in use, consists of the shaft *I* passing through the front of the frame, having the arm *II* projecting into a slot in the presser-bar, and having on its opposite end the hand-lever *III*. This shaft has a spring, *IV*, coiled around it, one end of said spring being made fast to the shaft and the other end being fastened to the frame. A torsional spring-pressure is thus brought on the "presser-bar." By pressing the hand-lever *III* back of the catch *V* the presser-bar and foot may be taken entirely away from a fabric. This "take-up" is adjusted automatically to the thickness of the cloth, for any additional thickness raises the bar and the point to which the connection *l* is pivoted thereon, so that this point bears a corresponding relation to the surface of the fabric, and the take-up is moved in the same manner as previously described.

The operation of the before-described devices in relation to the movement of the shuttle and needle, and constituting the general operation of the machine, we will now show.

Supposing the shuttle to be at the extreme forward end of its stroke and the needle at the extreme upper end of its stroke, then the "feed" will be at its highest point and the catch *V* will have caught the notch in the cam *K*; then, as the driving-pulley is turned, the needle will commence to pass downward, and the action of the feed-bar *H*, operated by the cam *K* and the bar *L* bearing the catch *V*, is to move back with the shuttle a short distance against the spring *M*, carrying the feed and fabric with it, until the catch *V* looses its hold and the spring *M* pulls the feed-bar *H* back. As the backward movement of the shuttle is

continued the feed-bar *G* is allowed to drop by the cam *K* and is carried down by the spring *o*. Just previous to the shuttle arriving at the center the needle is brought to its lowest point. The loop is formed by the action of the take-up as the shuttle passes through, as before mentioned. The needle then returns to its highest point and the "feed" device to the point it occupied at the start. The take-up draws up the loop, and one revolution of the machine is accomplished.

The shaft *k* has attached to it, at one end, a disk, *x*, to which the needle-bar is connected by the link *y*, and at the other end the crank-arm *h* is attached, which is connected to the crank *f* by the link *g*. This crank *f* is attached to the pulley *T*, which turns loosely upon the shaft *k*.

In Fig. VII the central crank *h* is shown on its upper dead point, and it will be seen that no motion will be imparted to this crank *h* by the motion of the pulley until the upper dead-point of the crank *f* is passed, as shown in Fig. VIII, as the movement of the crank *f* and connection *g* is, until that time, around the pin of the crank *h* as a center, without moving the shaft *k*. In this manner we give the desired motion to the "needle-bar" before mentioned.

Now, having described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The device for giving the proper motion to the needle, consisting of the shaft *k*, its crank *h*, loose pulley *T*, crank *f*, and link *g*, arranged in relation to each other, and operating substantially as set forth.
2. The combination of the elements of the preceding claim with the shuttle-carrier, rock-shaft *B*, arm *b*, and connection *c*, when arranged and operating as set forth.
3. The device for operating the "feed," consisting of the cam *K* on the shaft *B*, combined with the bar *H* having the springs *o* and *M* arranged as shown, and the bar *L*, arranged with the spring-catch *V*, operating in connection with the cam *K*, all operating together to give an up-and-down and reciprocating motion to the feed, substantially as set forth.
4. The device for lifting and adjusting the presser-bar foot, consisting of the shaft *I* having spring *IV* around it, and the arms *II* and *III*, arranged and operating as shown.
5. The combination of the needle-motion, shuttle-driving motion, feed-motion, and feed-plate, constructed and arranged, as shown, to operate as hereinbefore specified.

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