Sheet 1 - 2 Sheets.

W. A. Mack.

Sewing Machine.

No. 45059 Patented Nov. 15, 1864.

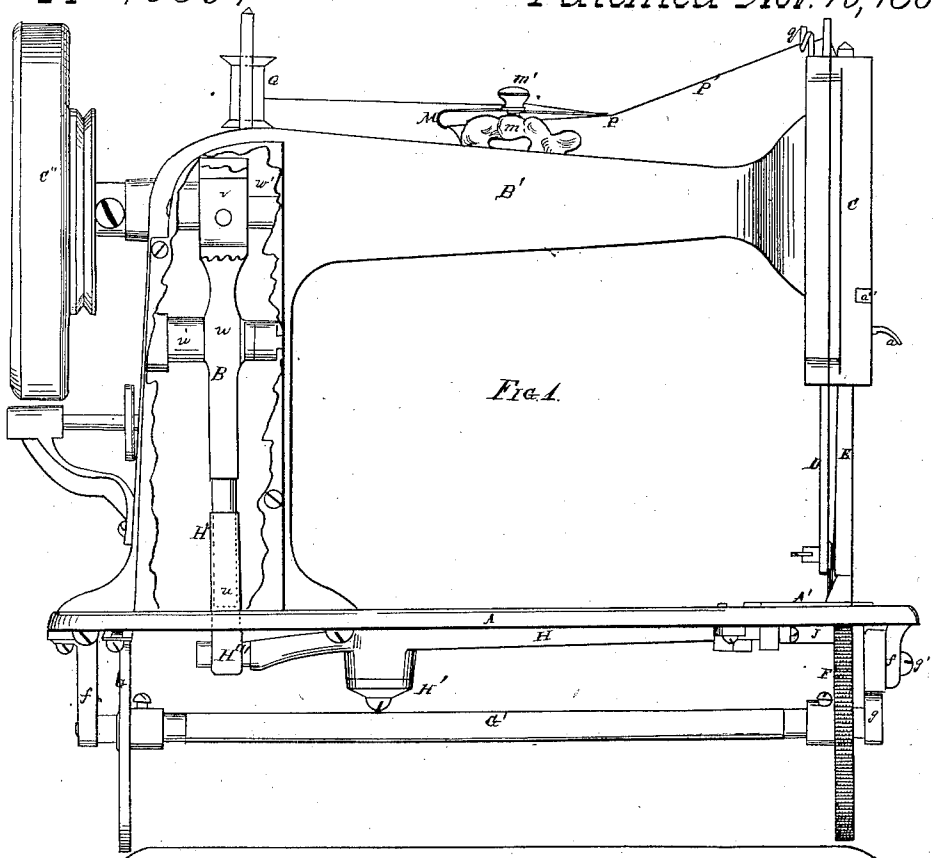


Fig. 1.

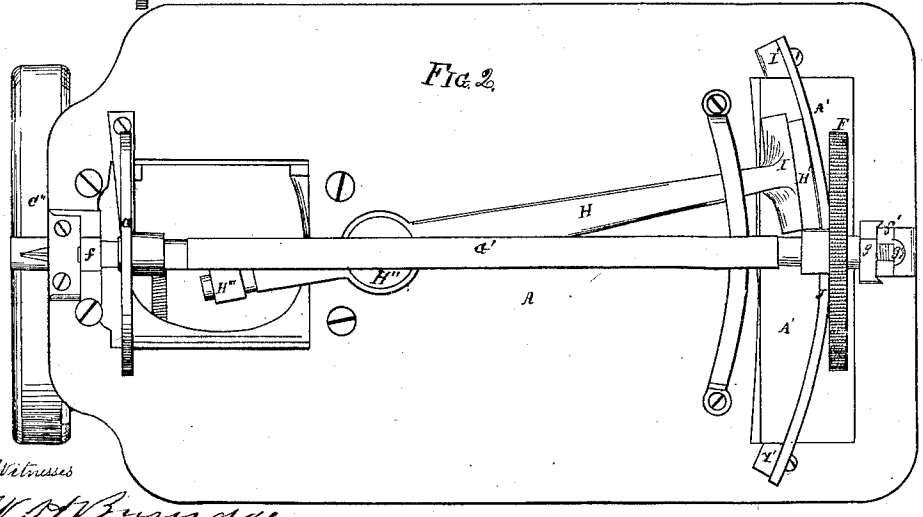


Fig. 2.

Witnesses

W. A. Burnaby

C. W. Cornell

Sheet 2 - 2 Sheets.

W. A. Mack.

Sewing Machine.

No. 45059 Patented Nov. 15, 1864.

Fig. 3.

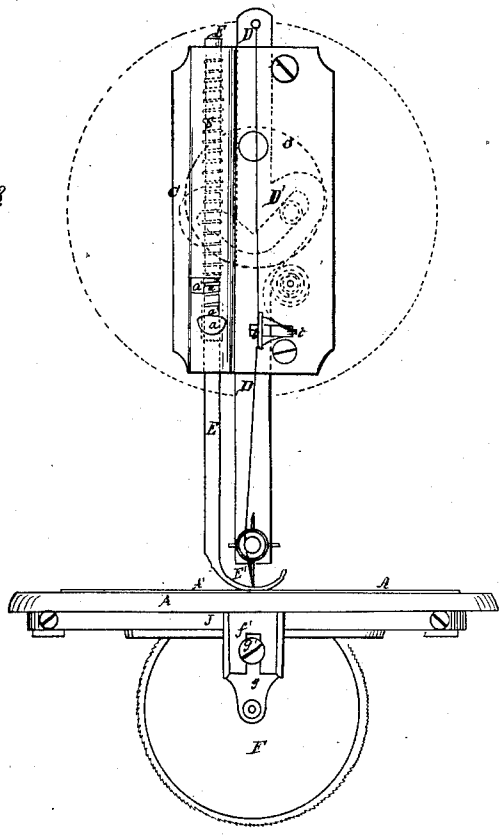


Fig. 6.

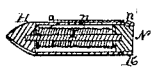


Fig. 4.

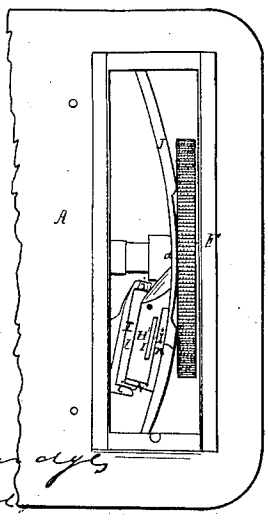


Fig. 5.

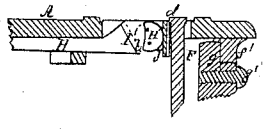
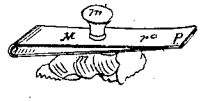


Fig. 7.



Witnesses

W. H. Burroughs

G. W. Cornell

UNITED STATES PATENT OFFICE.

W. A. MACK, OF CLEVELAND, OHIO.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **45,059**, dated November 15, 1864.

To all whom it may concern:

Be it known that I, W. A. MACK, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Sewing-Machines, being an improvement on a patent granted to me the 19th day of May, 1863; and I do hereby declare that the following is a full and complete description of the construction and operation of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a side view of the machine. Fig. 2 is a view of the under side. Fig. 3 is an end view. Figs. 4, 5, 6, and 7 represent detached sections.

Like letters of reference denote like parts in the different views.

My improvement relates to the manner of carrying the shuttle, in connection with the shuttle-race, to the construction of the shuttle in relation to giving the desired tension to the lower thread, and also to the manner of giving tension to the upper thread from the spool.

A is the platform or bed-plate of the machine, near one end of which is the standard B, that curves round, forming a horizontal arm, B′, which is connected to the head C. This head forms a case for the crank-wheel C′, needle-bar D, and pressure-bar E, as indicated by the dotted lines in Fig. 3. The crank-wheel C′ is secured to the end of the shaft that extends through the arm B′, and is connected with the driving-wheel C″, which operates the needle-bar, there being a wrist, *c*, on the crank-wheel, that works in a slot of the cam D′ of the needle-bar, as represented.

The pressure-bar E is adjusted by means of a spiral spring, (indicated at S,) which produces the required pressure of the foot-piece E′ on the cloth, and it is raised by the thumb-piece *a*, secured to a shoulder, *a′*, of the bar, on which the spring rests, moving in a slot, *a″*, the end of the bar extending through the top of the head.

On the under side of the bed-plate F is the primary, and G the secondary, feed-wheels on the shaft G′, one end of which is supported by an arm, *f*, secured to the bed-plate, and the end on which is the primary feed-wheel rests in an adjustable bearing, *g*, which is secured in place by a screw, *g′*, in a slot of an arm or lug, *f′*, fastened to the bed-plate.

H is a vibrating arm or lever pivoted at H″. The end I holds the shuttle, and the other end is inserted in a hole in the head of the socket or thimble H‴, Fig. 1. This socket receives the pendent end of the lever *u*, which vibrates upon the stud *u′* by the action of the cam *v* upon the driving-shaft. The upper end, *w′*, of the lever is forked, so as to receive the cam between the forks. The vibration of the lever *u* is transmitted to the arm H by its connection. As the lever *u* fits loosely in the socket, so that the socket may turn, and also slide up and down on the end of the lever *u*, forming a compensating-joint, this allows the lever *u* and arm H to be readily adjusted to each other in the various positions assumed when in operation. The shuttle end of the arm H branches out, and is formed into a head or holder, I, in which the shuttle H′ rests, and is carried back and forth. (Represented in Figs. 2, 4, and 5.) Fig. 4 is a view at the end of the bed-plate underneath the needle and pressure bars, with the adjustable plates A′ removed, showing the top of the shuttle as it is held in the holder close to the shuttle-race J. (Represented also in Fig. 5.)

The holder is formed with end pieces, *i i*, between which is an inclined plane, (indicated by the dotted line *l* in Fig. 5,) on which the shuttle rests, that, together with the end pieces and in connection with the shuttle-race J, keeps the shuttle from moving in the holder and retains it in the required position as it is being operated.

The shuttle-race J consists of a polished metallic piece, forming the segment of a circle, the face of which is at right angles to the plane of the vibrating arm, vertical on both sides, and extends up close to the plates A′ inside of the feed-wheel F, with a needle-slot, *d*, through the center, the ends being secured to lugs I′ on the bed-plate. The shuttle is so formed that it fits close to the race J from the heel to the point the whole length of its movement, and as it is stationary in the holder and its weight entirely supported by the vibrating arm, and only one side moving against the race, very little friction is produced. This arrangement is in every way an improvement over the manner of vibrating the shuttle in my former patent, in which the shuttle is moved back and forth in an angular trough, forming the shuttle-race. The shuttle thus moving produces

friction and wears it away on the outside, and its surface is apt to be roughened by its weight resting and rubbing on the angular trough, which is liable to chafe and cut the thread in forming the stitch. The trough admits of an accumulation of dust and dirt, causing the machine to operate with less facility, and it cannot be so easily cleaned, nor the shuttle taken out and put in, as readily as with my improvement.

The shuttle is differently constructed in regard to adjusting the tension of the thread. In place of a rib upon the upper margin, with holes through which the thread is laced, there is an adjustable spring, *n*, (seen in Figs. 4 and 6,) along the top of the shuttle close to the shuttle-race, one end of which is put through an opening or hole, *o*, in the shuttle, and the other end is fastened in at the heel end of the shuttle by the screw N, which has a groove, *n'*, round the shoulder, into which the end of the spring passes as the heel of the shuttle is closed by the screw shown in Fig. 6, which is a section of the shuttle. The spring is thus retained in place on the shuttle with both ends free, giving elasticity to the spring, and by means of which it can be adjusted. The screw N forms a bearing for one end of the bobbin L, the other end turning in the solid end of the shuttle, as represented. The thread from the bobbin passes through an opening, I'', in the shuttle alongside or under the spring, through holes in the spring, as in Figs. 4 and 6, the thread being laced through two or more holes, as may be required to produce the desired tension. As the spring is not rigidly fastened at either end, it yields readily to the unevenness of the thread, producing a most even and uniform tension, and it is likewise perfectly adapted to different-sized threads, coarse or fine, without any change of setting.

The tension of the upper thread from the spool in connection with the needle is regulated by a spring, M, arranged above the arm B' about the middle, secured to the bracket *m* by a screw, *m'*. A perspective view of this spring is seen in Fig. 7, representing a flat piece bent together at the two ends, forming a flat point, *p*, and it is kept in that form on the bracket *m* by the screw *m'*.

Near the point, through the upper part of the piece forming the spring, is a hole, *r*, through which the thread from the spool Q is put and passed between the ends forming the point of the spring, as indicated by the red line *p'*, and by which the thread is regulated, as it is drawn from the spool, in the most uniform manner, and from the elasticity of the spring it is equally well adapted to various-sized threads, so that the thread may be changed without removing the screw and changing the spring, the same spring as adjusted being perfectly adapted to give the desired tension to any sized thread. The thread extends through the guide *q* and through the top of the needle-bar down through the guide *t* and spring *t'* on the outside of the head C, as noted by the red line in Fig. 3, the spring *t'* taking up the loose thread from the needle. These devices altogether, in giving tension to the thread and taking up the loose thread from the needle, regulate the thread in the most uniform and perfect manner.

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

1. The arrangement of the shuttle-holder I, race J, and shuttle H', in combination with the vibrating arm H, socket H''', lever *u*, and cam *v*, constructed and operating as and for the purpose set forth.

2. The spring *n*, in combination with the screw N and shuttle, as and for the purpose described.

W. A. MACK.

Witnesses:
W. H. BURRIDGE,
G. W. CROWELL.