2 Sheets—Sheet 1.

A. WARTH.

Sewing Machine.

No. 56,646. Patented July 24, 1866.

Fig. 1.

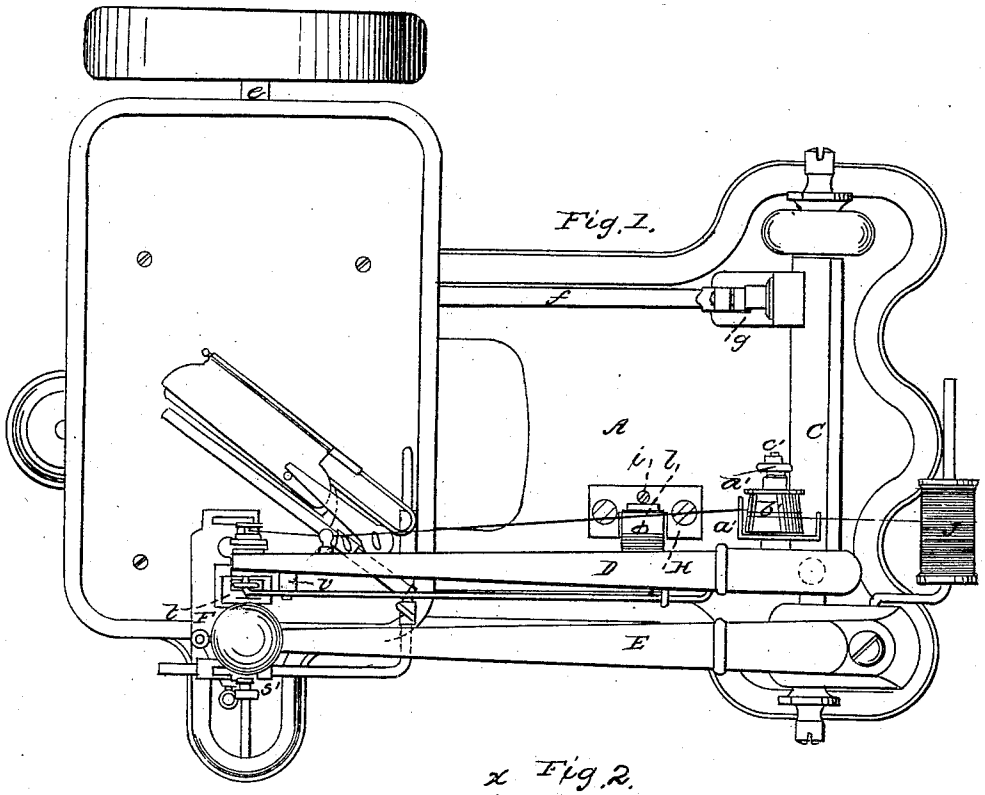
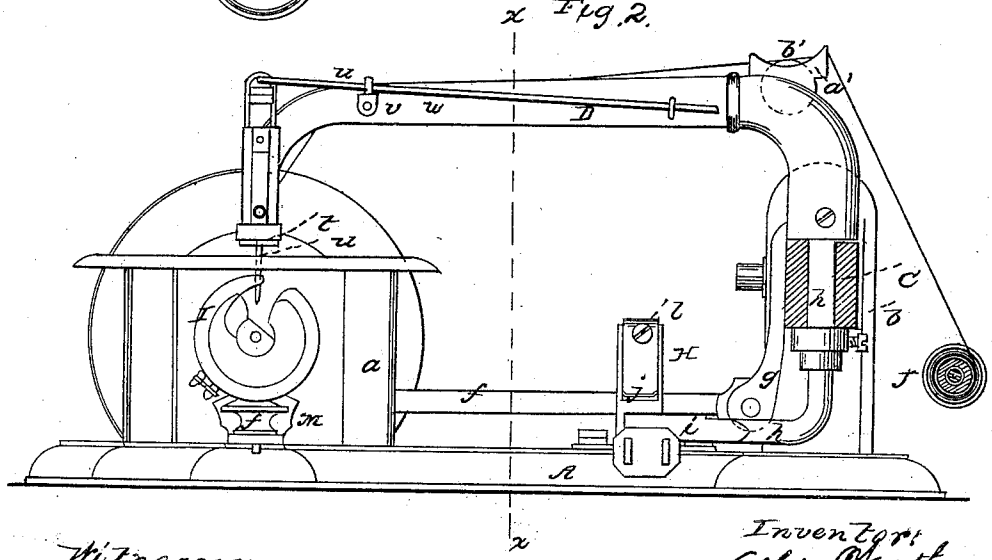


Fig. 2.



Witnesses:
D. B. Stimpson
Wm. Drewin

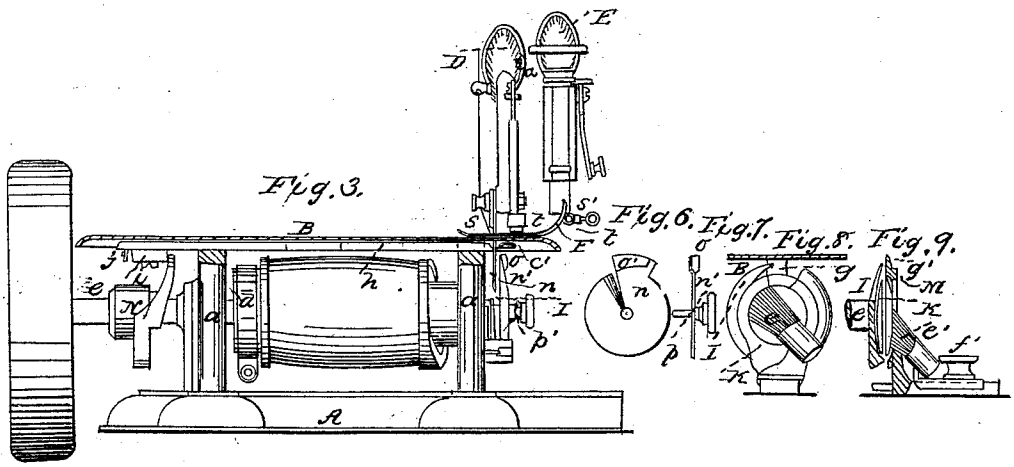
Inventor:
Albin Warth
Per Munn & Co
Attorneys

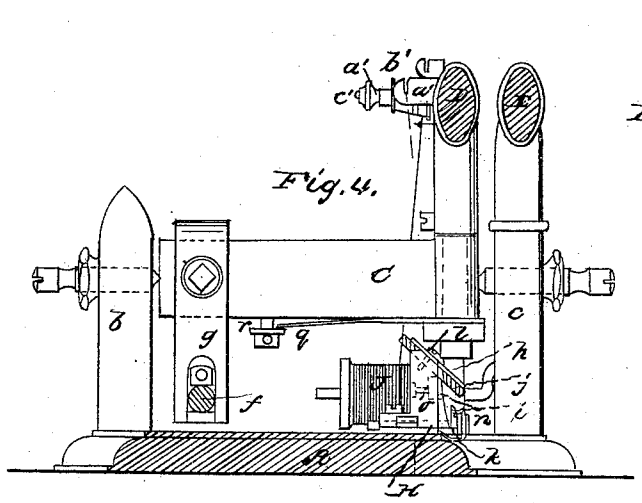
2 Sheets—Sheet 2.

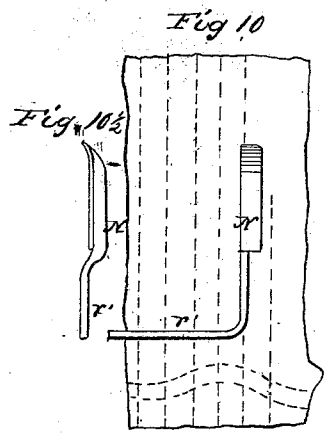
A. WARTH.

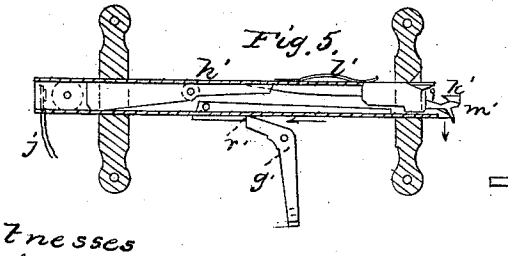
Sewing Machine.

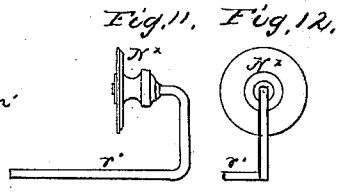
No. 56,646. Patented July 24, 1866.











Witnesses
J. M. Blaughton
Wm. Trewin

Inventor
Albin Warth
per Munn & Co
attorneys.

UNITED STATES PATENT OFFICE.

ALBIN WARTH, OF STAPLETON, NEW YORK.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **56,646**, dated July 24, 1866.

To all whom it may concern:

Be it known that I, ALBIN WARTH, of Stapleton, in the county of Richmond and State of New York, have invented a new and useful Improvement in Sewing-Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 represents a plan or top view of this invention. Fig. 2 is a side elevation of the same, partly in section. Fig. 3 is a sectional front elevation of the same. Fig. 4 is a transverse section of the same, the line *x x*, Fig. 2, indicating the plane of section. Fig. 5 is a detached plan or top view of the chain-stitch attachment. The remaining figures are details, which will be referred to in the proper places as the description progresses.

Similar letters of reference indicate like parts.

This invention relates particularly to certain improvements in that class of sewing-machines known as the "Wheeler & Wilson" machines.

The invention consists, first, in the arrangement of a friction-spring in combination with the vibrating needle-arm in such a manner that said needle-arm is prevented from changing its position spontaneously during the time it is relieved from the action of the inclined plane or planes; second, in the arrangement of a set-screw or other suitable fastening in combination with the oscillating needle-arm in such a manner that by said set-screw or other fastening the vibrating motion of the needle-arm can be arrested at any desired moment, and the machine can be used like an ordinary sewing-machine of the same class; third, in the arrangement of a lip extending from the needle-holder close down on the back of the needle in such a manner that the needle is strengthened in its position and the required feed-motion can be produced with a comparatively weak needle; fourth, in the application of a guard to the top edge of the bobbin-holder in such a manner that the loops, on passing off from the revolving hook, are prevented from jumping up and being caught again by said hook, which, when not avoided, is liable to cause a serious interruption of the operation of sewing; fifth, in the arrangement of a friction-brush or other equivalent friction device in combination with the bobbin and bobbin-holder in such a manner that when the motion of the rotating hook is suddenly stopped (which happens, for instance, if the needle strikes a very thick seam and the driving-belt slips, or from other causes) the bobbin is prevented from flying round by the reaction, and the disturbance created by this motion is avoided; sixth, in substituting for the ordinary feeding-bar a mechanism for forming a chain-stitch, and which operates under the cloth-plate and in combination with the self-feeding needle in such a manner that by a slight change in the mechanism the chain-stitch mechanism can be thrown in or out of gear, and the machine serves to make the chain or the lock stitch, at the option of the operator; seventh, in the arrangement of a protector provided with a pocket or cap to receive the point of the revolving hook, and applied, in combination with said hook, in such a manner that it protects the hook and prevents it from catching in the loop of the needle-thread, and that it does not interfere with the operation of the chain-stitch mechanism; eighth, in the arrangement of a side-surface cam, in combination with a suitable spring and with the slide which carries the chain-stitch mechanism and with a movable stop, in such a manner that when the stop is thrown back or out of gear with the slide the cam imparts to said slide a reciprocating motion; but if the movable stop is thrown in, so as to retain the chain-stitch slide, the shaft on which the cam is mounted revolves without obstruction.

A represents the bed of my machine, from which rise four standards, *a a b c*, two of which support the cloth-plate B, whereas the other two form the bearings for the center points of the rock-shaft C, which carries the needle-arm D, and one of these last-named standards also supports the arm E, the front end of which forms the socket for the stem of the presser-foot F.

An oscillating motion is imparted to the rock-shaft C by the action of an eccentric, *d*, on the driving-shaft *e*, which connects with said

rock-shaft by means of a rod, *f*, and arm *g*, in the usual manner. From said rock-shaft rises the arm D, to the end of which the needle *n* is secured; but this arm, instead of being rigidly connected to the rock-shaft, is provided with a shank, *h*, (see Fig. 2,) which extends through a socket in said rock-shaft, so as to form a tappet, *i*, which, by coming in contact with the inclined planes *j k*, imparts to the needle-arm the desired vibrating motion, thus allowing to the needle-arm an independent lateral vibrating motion in a plane at right angles to its usual up-and-down motion.

The inclined planes *j k* are best seen in Fig. 4 of the drawings. They are made of leather or other suitable material, and secured to a standard, H, which rises from the bed of the machine. The inclined plane *j* is held in place by a set-screw, *l*, and if the same is made of leather or other flexible material it may be strengthened or stiffened by securing to its back a thin plate of steel or other suitable material. The inclined plane *k* is formed by the edge of a thick strip of leather or other suitable material, which is secured in a suitable socket in the standard H.

When the needle-arm rises the tappet *i* strikes the inclined plane *j* and turns said needle-arm in the direction of the arrow marked near it in Fig. 4, and when the needle-arm descends the tappet strikes the inclined plane *k* and causes said arm to vibrate in the direction opposite to the arrow marked near it in said figure. By the vibrating motion thus imparted to the needle-arm and to the needle the desired feed-motion of the fabric to be sewed is produced, and this feed-motion is regulated by an adjustable pad, *m*, which is secured in the standard H, under the inclined plane *j*, and which is set in or out by set-screws *o*. Another pad, *p*, which is secured to a lip rising in front of the inclined plane *k*, prevents the tappet *i* moving any farther than desirable, as the same strikes said inclined plane. The pads *m* and *p*, as well as the inclined planes *j k*, are made, by preference, of leather, to render them yielding and prevent unnecessary wear of the tappet *i*.

A friction-spring, *q*, which is applied to the shank *h* of the needle-arm, and which acts on the under side of the rock-shaft, detains said needle-arm in any position in which it may be brought, and prevents it from moving spontaneously when the tappet is not in contact with either of the inclined planes. A set-screw, *r*, allows of regulating the tension of this friction-spring, and by means of this set-screw the friction-spring and also the needle-arm can be made rigid with the rock-shaft when it is desired to use my machine with an ordinary feeding device.

The needle *n* is secured to the needle-arm by a clamping-screw of the ordinary construction; but from the head of said screw projects a lip, *s*, close down on the back of the needle, so as to strengthen the same and produce the desired feed-motion without being liable to bend. An adjustable spring-pad, *t*, which is applied to the needle-arm and subjected to the action of a spring, *u*, may be used to assist the needle in producing the requisite feed-motion. When not in action this spring-pad is raised by a button, *v*, which, when turned, bears on the under side of the spring *u*.

The stitch of my sewing-machine is produced by the combined action of the needle *n* and of the revolving hook I. The needle-thread is taken from the spool J and passed over the tension-regulator, which is composed of a thread-guide, *a'*, and india-rubber roller *b'*, which is placed loosely on a pin, *c'*, between two flanges, one of which is movable on the pin and subjected to the action of a nut, *d'*, whereby the roller can be compressed between the two flanges and the power required to revolve it on its pin can be adjusted. The thread-guide *a'* is constructed of a piece of sheet metal with two flanges or lips which are situated on opposite sides of the roller *b'*, and which are provided with slots, through which the thread passes. In its course through the tension-regulator the thread is wound two or more times round the roller *b'*, so that by the action of the thread said roller is compelled to revolve, and at the same time the thread is prevented from slipping or gliding over the roller. By turning the nut *d'* the tension of the thread can be increased or decreased at pleasure.

The lower thread is taken from the bobbin K, which is held in the cavity of the revolving hook I by the annular bobbin-holder M in the usual manner.

In order to prevent the bobbin from being rotated in the wrong direction if the machine is turned wrong, or from flying round by the reaction of its thread if the machine is suddenly stopped or if the belt slips, I have applied a friction-brush or other friction device, *e'*, which is secured to the bed of the machine by the same screw, *f'*, which also holds the bobbin-holder in its place. To the upper edge of the bobbin-holder I have secured a guard, *g'*, which projects up close under the cloth-plate B. The object of this guard is to prevent such loops which drop prematurely from the revolving hook from being caught by said hook. This guard I use in addition to the ordinary friction pad or brush already applied to the Wheeler & Wilson machine, and made to bear on the circumference of the hook for the purpose of preventing the loops dropping off prematurely from said hook.

The guard and friction-brush are shown particularly in Figs. 8 and 9.

In the place usually occupied by the ordinary feed-mechanism, which is not required in my machinery, I introduce the chain-stitch mechanism, a detached view of which is shown in Fig. 5. This mechanism consists of a slide, *h'*, to which a friction-roller, *i'*, is secured, and a spring, *j'*, presses this roller up against the

face of a cam, N′. (See Fig. 3.) To the slide *h′* is secured the hook *k′*, which is intended to catch the loop of the needle-thread and to hold it open until the needle on its subsequent descent passes again through the same. The shank of the hook is pivoted to the slide *h′*, and a spring, *l′*, which acts on said shank, has a tendency to force the hook back in the direction of the arrow marked near it in Fig. 5. As the slide is made to move in the direction of the arrow marked near it in said figure, the hook *k′* catches the loop of the needle-thread, and as soon as the hook has passed the needle a nose, *m′*, projecting from the shank of the hook, by coming in contact with the edge of the groove in which the slide moves, causes said hook to move against the action of the spring *l′*, and to take up its position right behind the needle, thus keeping the loop of the needle-thread in the proper position to allow the needle to pass through it on its subsequent descent.

While the chain-stitch mechanism is being used I remove the bobbin-holder from the revolving hook and attach the protector *n′* which is shown in Figs. 6 and 7. This protector is provided with a cap, *o′*, to catch over the point of the revolving hook and prevent the same from interfering with the loops of the needle-thread. Said protector is held in position by a set-screw, *p′*, which is tapped into the end of the driving-shaft, and which is shown in position in Fig. 3 of the drawings.

The cam N′, which imparts the requisite motion to the slide *h′*, is mounted on the driving-shaft, and its working-face is on its outside, so that said slide can be forced back against the action of the spring *j′*, and if it is held in that position the chain-stitch mechanism is thrown out of gear.

For the purpose of retaining the slide *h′* when the same is forced back, a stop-lever, *q′*, is pivoted to the under surface of the cloth-plate B, and by turning this lever so that it catches behind the shoulder *r′* of the slide *h′* said slide is held back and the chain-stitch mechanism is thrown out of gear.

By using the needle-feed I am enabled to apply the chain-stitch mechanism in a convenient position under the cloth-plate, where it can be readily thrown in or out of gear and where it is not in the way of any other part of the sewing mechanism.

With the sewing mechanism as above described I have combined a guide, N or N*, which is to be used particularly in quilting or in making a series of parallel seams, either rectilinear or curved. For rectilinear seams I use the guide N, (see Figs. 10 and 10½,) and for curved seams the guide N*. (See Figs. 11 and 12.) The guide N consists of a flat piece of sheet metal with a curved rounded edge, and secured to an L-shaped shank, *r′*, which is fastened by a set-screw, *s′*, in the socket *t′*, which is secured to the presser-foot F, as seen in Figs. 1 and 3. The guide N* consists of a wheel with a rounded edge and mounted on the end of a V-shaped shank, *r′**. In using either of these guides their edges are made to travel in the seam already made, and by their action the material to be sewed is guided in the direction indicated by the seam, so that each succeeding seam will be parallel to that first made. These guides are particularly valuable for such work as securing the lining of coats or for quilting in general, and they save much time and labor generally required in marking out said seams.

For curved seams the guide N cannot be used, and in this case the revolving guide N* must be substituted. It must be remarked that these guides are only applicable for machines with the needle-feed; at least they do not work accurately when used in combination with ordinary feed mechanisms. By the use of these guides I am enabled to produce a series of parallel seams, either curved or rectilinear, without previously marking off said seams and with little loss of time or attention.

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

1. The arrangement of a friction-spring, in combination with the vibrating needle-arm, constructed and operating substantially as and for the purpose set forth.

2. The arrangement with said spring of a set-screw or other equivalent fastening, in combination with the vibrating needle-arm, constructed and operating substantially as and for the purpose described.

3. The arrangement of a lip, *s*, extending from the needle-holder on the back of the needle, substantially as and for the purpose set forth.

4. The guard *g′*, applied to the top edge of the bobbin-holder M, substantially as and for the purpose set forth.

5. The friction-brush *e′*, or its equivalent, in combination with the bobbin K and bobbin-holder M, constructed and operating substantially as and for the purpose described.

6. In combination with a Wheeler & Wilson sewing-machine, when such machine is so constructed that the needle is made to feed the material, the devices herein shown, or their equivalents, for producing a chain-stitch.

7. The protector *n′*, in combination with the revolving hook I and chain-stitch mechanism, constructed and operating substantially as and for the purpose set forth.

8. The side-surface cam N′, in combination with the chain-stitch slide *h′*, spring *j′*, and stop-lever *q′*, constructed and operating substantially as and for the purpose described.

ALBIN WARTH.

Witnesses:
M. M. LIVINGSTON,
W. HAUFF.