No. 51,383. PATENTED DEC. 5, 1865.

E. E. BEAN.

WAXED THREAD CHAIN STITCH SEWING MACHINE.

2 SHEETS—SHEET 1.

Fig. 1.

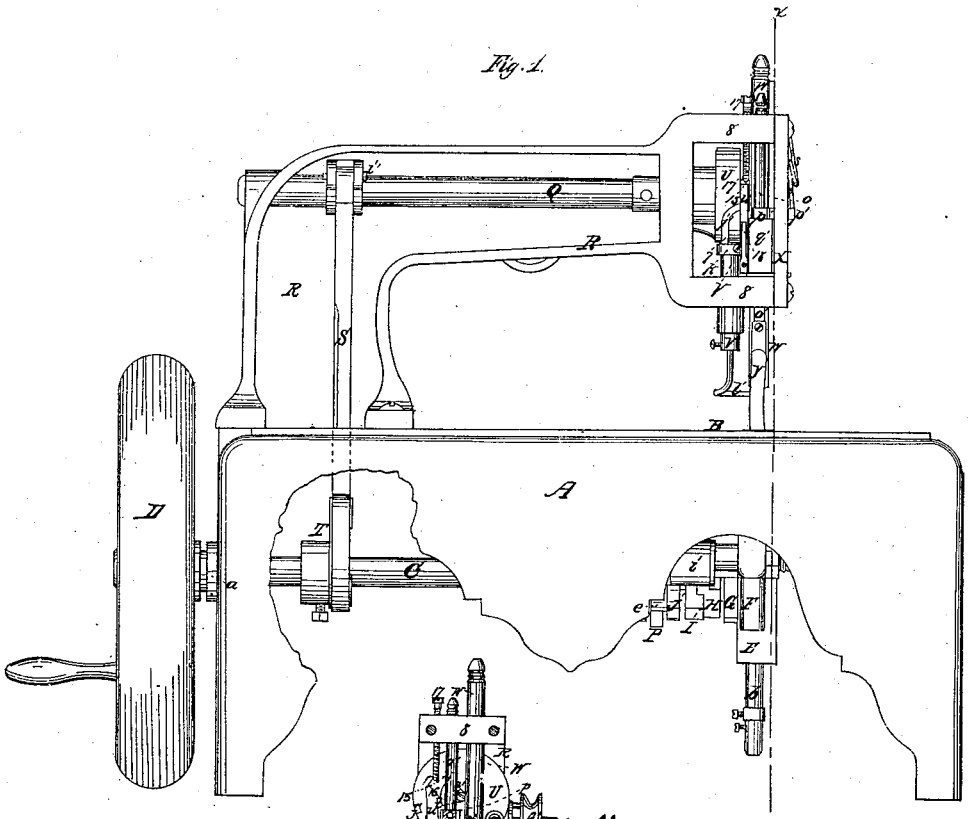
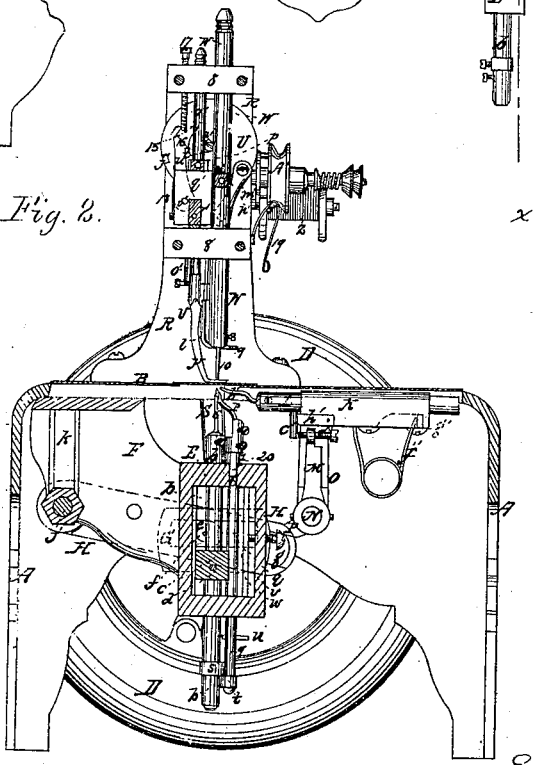


Fig. 2.



Witnesses.

P. E. Tuckermacher

N. W. Stearns

Inventor.

E. E. Bean

No. 51,383. PATENTED DEC. 5, 1865

E. E. BEAN.

WAXED THREAD CHAIN STITCH SEWING MACHINE.

2 SHEETS—SHEET 2.

Fig. 4

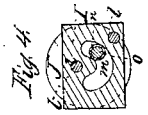


Fig. 5

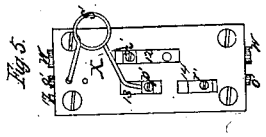
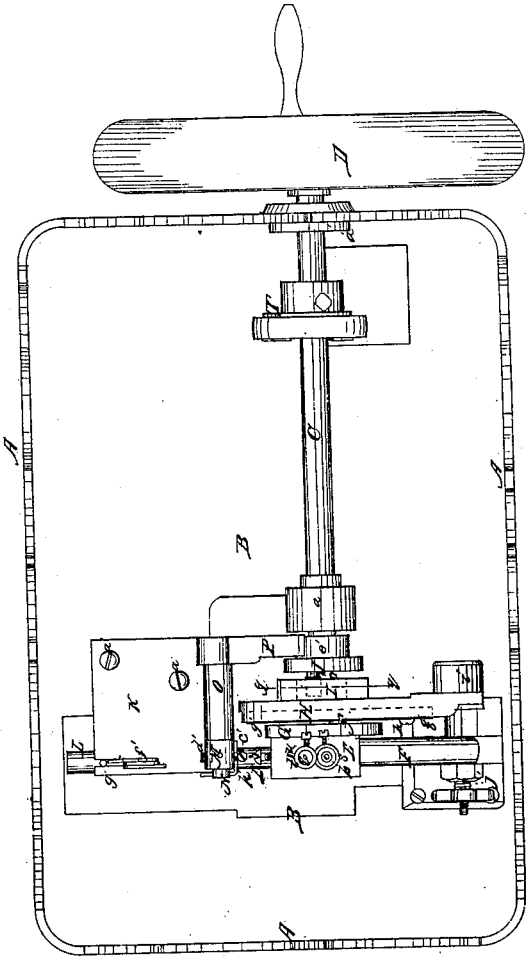


Fig. 3



Witnesses.

P. C. Dieckmann

N. W. Stearns

Inventor.

E. E. Bean

# UNITED STATES PATENT OFFICE.

EDWIN E. BEAN, OF ABINGTON, ASSIGNOR TO HIMSELF AND JACOB CHICKERING, OF ANDOVER, MASSACHUSETTS.

## IMPROVEMENT IN WAXED-THREAD CHAIN-STITCH SEWING-MACHINES.

Specification forming part of Letters Patent No. **51,383**, dated December 5, 1865.

*To all whom it may concern:*

Be it known that I, EDWIN E. BEAN, of Abington, in the county of Plymouth and State of Massachusetts, have invented certain new and useful Improvements in Chain-Stitch Wax-Thread Sewing-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a side elevation of my improved waxed-thread sewing-machine, a portion of the frame being broken away to show the eccentric on the driving-shaft. Fig. 2 is a vertical transverse section through the same on the line *x x*, of Fig. 1. Fig. 3 is a plan of the under side of the machine. Fig 4 is a section on the line *y y* of Fig. 3; Fig. 5, detail, to be referred to hereinafter.

In that class of sewing-machines known as "chain-stitch wax-thread" machines as at present constructed, a number of large cams are employed to drive the various moving parts. These cams, however, occupy much space, and their friction is such as to occasion considerable noise and also require a large amount of power to drive them.

My invention, which relates only to chain-stitch wax-thread sewing-machines, has for its object to overcome these difficulties and to dispense with the employment of cams, thereby enabling me to simplify the machine and reduce the number of parts, as well as the amount of power required to drive it; and my invention consists in actuating the needle-lever by means of a crank-pin on the driving-shaft working in a curved slot in the needle-lever, or parts connected therewith, in combination with a hooked needle and "cast-off;" and my invention also consists in operating the awl, presser-foot, and thread-guide of a chain-stitch wax-thread sewing-machine by means of a single shaft in the "neck" of the machine, which shaft is suitably connected with the driving-shaft, thereby enabling me to dispense with the levers and cams heretofore used for this purpose; and my invention furthermore consists in certain other details, which will be particularly described hereinafter.

To enable others skilled in the art to understand and use my invention, I will proceed to describe the manner in which I have carried it out.

In the said drawings, A is the frame, and B the bed-plate, of the machine.

C is the driving-shaft, which runs in suitable bearings, *a*, and carries at its outer end the fly-wheel D.

*b* is the needle-stock, which carries the needle G and moves up and down in suitable bearings in the frame E, which is supported by a bracket, F, secured to the under side of the bed-plate.

G is a plate, (shown dotted in Fig. 2,) a block, *c*, projecting from which slides up and down within the frame E, and is secured by a pin, *d*, to the needle-stock *b*. A slot (shown dotted in Fig. 2) is cut through the plate G, in which works a slide, *e*, on a pin, *f*, projecting out from a slide, *g*, which is made adjustable in a groove in the needle-lever H by means of a set-screw, *h*, Fig. 3. The needle-lever H is pivoted at *i* to a stud, *j*, which is made adjustable with a screw and nut in the slot *k* in the bracket F.

I is a plate, which is secured to the needle-lever H by screws *l*, Fig. 4, and has cut through it a curved slot, *m*, (Fig. 4) in which works the roll *n* on the crank-pin *o*, projecting from the disk J on the end of the driving-shaft, and thus, through the connections explained, as the driving-shaft is revolved, the required vertical motions are imparted to the needle without the employment of a large cam, the friction of the roll *n* in the curved slot *m* being very little and requiring very little power to operate it, while at the same time much space is economized.

*p* is the cast-off, which passes between the loop and the needle, so as to throw the loop out of the hook before the next loop is brought down in a well-known manner.

*q* is the stock of the cast-off, which has its bearings in the frame E, and is prevented from turning by means of the pin *r*, which moves in a slot, 20, Fig. 2. The required movements are imparted to the cast-off by means of the collar *s* on the needle-stock *b*, which strikes alternately against the collar *t* and pin *u* on stock *q*. This stock *q* is prevented from falling by its own weight by means of a strip of leather, *v*, which is pressed against it by the plate *w* and set-screw *z*.

The length of throw of the needle-stock can be varied by loosening the screw *h* and moving the slide *g* with its pin *f* toward or from the center *i*, as may be required.

K is a plate secured to the under side of the

bed-plate by screws $a'$, one end of which is bored out for the reception of a shaft, L, which carries at its inner end a bent pin, $b'$, the end of which is notched so as to embrace the thread and feed the material forward, as will be further described.

$c'$ is a pin projecting down from the shaft L, and against this pin rests a screw, $d'$, on the end of an arm, M, which is attached to a rock-shaft N, which passes through the bent portion O of the plate K and carries at its opposite end the lever P, the outer end of which is depressed by a projection (not shown) on the collar $e'$, which thus rocks the shaft N and causes the screw $d'$ to carry forward the shaft L, and bring the pin $b'$ into contact with the thread, and thus feed forward the material as required. This feeding of the material takes place immediately after the needle has been drawn down with the loop and while the presser-foot is raised from off the material.

$f'$ is a spring which bears against a pin, $g'$, and serves to return the shaft L to its original position, a piece of leather, $h'$, being interposed between the plate K and pin $c'$, so as to cushion it when retracted by the spring.

I will now describe the manner in which the thread-guide, awl, and presser-foot are operated.

Q is a rock-shaft having its bearings in the neck R of the machine.

S is a rod, one end of which is pivoted to a short arm or crank, $i'$, on the shaft Q, and the opposite end is connected to the strap of an eccentric, T, on the driving-shaft C, and thus, as the driving-shaft is revolved, a rocking motion is given to the shaft Q. This shaft carries at its outer end a disk, U, in which is cut a cam-groove, $j'$, in which works a pin, 7, projecting up from a crank, $k'$, on the top of a vertical shaft, V, which has its bearing in the outer portion, 8, of the neck R, and carries at its lower end the thread-guide $l'$ through an eye, 9, Fig. 2, in which the thread is passed; and thus as the disk U is rocked the curved portion of the groove $j'$ strikes the pin 7 and turns the shaft V and thread-guide $l'$, so as to carry the thread into the hook of the needle 6, which is at that time, through the connections explained, projected up into a position to receive it through the hole made by the awl in the material being operated upon.

W is the awl-shaft, which has its bearings in the portion 8 of the neck R, and carries at its lower end the awl 10. To this shaft W is pivoted the connecting-rod $m'$, the opposite end of which is pivoted at 11 to the disk U, and thus, as the disk is rocked, the awl-shaft is moved up and down at the required times to make the holes in the leather for the needle to pass up through.

$n'$ is a guide-block, which is secured to the shaft W and works in a vertical slot, 12, Fig. 5, in the plate X.

Y is the presser-foot, the shaft $o'$ of which has its bearings in the portion 8 of the neck R, and has secured to it a guide-piece, $p'$, which works in a vertical slot, 13, Fig. 5, in the plate X. This shaft $o'$ passes through and is secured to a block, $q'$, which is steadied by a guide-piece, $r'$, also working in a vertical slot, 14, Fig. 5, in the plate X.

$s'$ is a spring, one end of which is fast to the plate X, while the other end bears against the guide-piece $p'$ and keeps the presser-foot Y in the position represented in Figs. 1 and 2.

$t'$ is a lifting-dog, the upper edge, 15, of which engages with a latch, $u'$, pivoted, at $v'$, to the block $q'$, and thus as the disk is rocked the block $q'$, and with it the presser-foot, is lifted until the inclined portion 16 of the latch $u'$ comes into contact with the lower end of the screw 17, when the latch is forced outward and disengaged from the lifting-dog $t'$, and the shaft $o'$ is carried down by the spring $s'$, so as to bring the presser-foot Y into the position seen in Figs. 1 and 2, holding it firmly down onto the material during the time that the awl is making the hole and the needle is in the material. The presser-foot is raised the instant the needle has descended with the loop beneath the leather, so as to leave the leather free to be fed forward by the pin $b'$ striking against the thread, as before explained.

A spring, 18, serves to press the latch $u'$ up against the lifting-dog $t'$.

The motions of the awl, thread-guide, and presser-foot are all properly timed with respect to each other, and, as they are all three actuated by the disk U, there is no danger of their becoming disarranged independently of each other, which is liable to happen where they are operated by separate cams and levers; and by thus avoiding the use of the cams and levers heretofore employed for this purpose I am enabled to greatly simplify the machine and reduce the friction, noise, and power required to drive it, while a less quantity of oil is required to lubricate it, on account of the reduced amount of bearing-surfaces, one eccentric only on the driving-shaft being employed, instead of the two large cams heretofore used; and it will be seen that the construction of this machine is such that all the working parts are easily accessible for the purpose of oiling or cleaning them.

By the employment of a single shaft in the neck of the machine, instead of a lever or levers, as heretofore, I am enabled to place the neck at any required height above the table to accommodate different kinds of work, which could not be done where levers were employed, on account of the increased motion required for their lower extremities.

Instead of the shaft Q being rocked, as above described, it may be connected by gears with the driving-shaft and revolved, the connections with the awl-shaft, presser-foot, and thread-guide being slightly varied, so as to allow of the disk U being revolved.

The waxed thread is led from the spool Z, over the wheel A', and through the eye at the

end of the wire 19 to the thread-guide $l'$ in the ordinary manner.

I am aware that some of the devices employed in the above-described sewing-machine, have been used in lock-stitch sewing-machines for sewing leather; but such machines were more complicated and expensive. I therefore confine myself to their use only in chain-stitch wax-thread sewing-machines.

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

1. Actuating the needle-lever of a chain-stitch wax-thread sewing-machine by means of a crank-pin, *o*, on the driving-shaft, and curved slot *m*, in combination with a hooked needle, 6, and cast-off *p*, substantially as and for the purpose set forth.

2. In a chain-stitch wax-thread sewing-machine, the shaft Q, for operating the awl, presser-foot, and thread-guide above the table, in combination with a hooked needle, 6, and cast-off *p* below the table, substantially as described.

3. In a chain-stitch wax-thread sewing-machine, the disk U, awl-shaft W, and connecting-rod $m'$ above the table, in combination with a hooked needle, 6, and cast-off *p* below the table, substantially as set forth.

4. Operating the presser-foot Y by means of the latch $w'$, lifting-dog $t'$, on the disk U, and screw 17, substantially as described.

5. Operating the thread-guide $l'$ by means of the cam-groove $j'$ in the disk U, in combination with the crank $k'$ on the shaft V, substantially as set forth.

6. Operating the awl, presser-foot, and thread-guide by means of the same shaft, substantially as and for the purpose set forth.

Witnesses: E. E. BEAN.
P. E. TESCHEMACHER,
N. W. STEARNS.