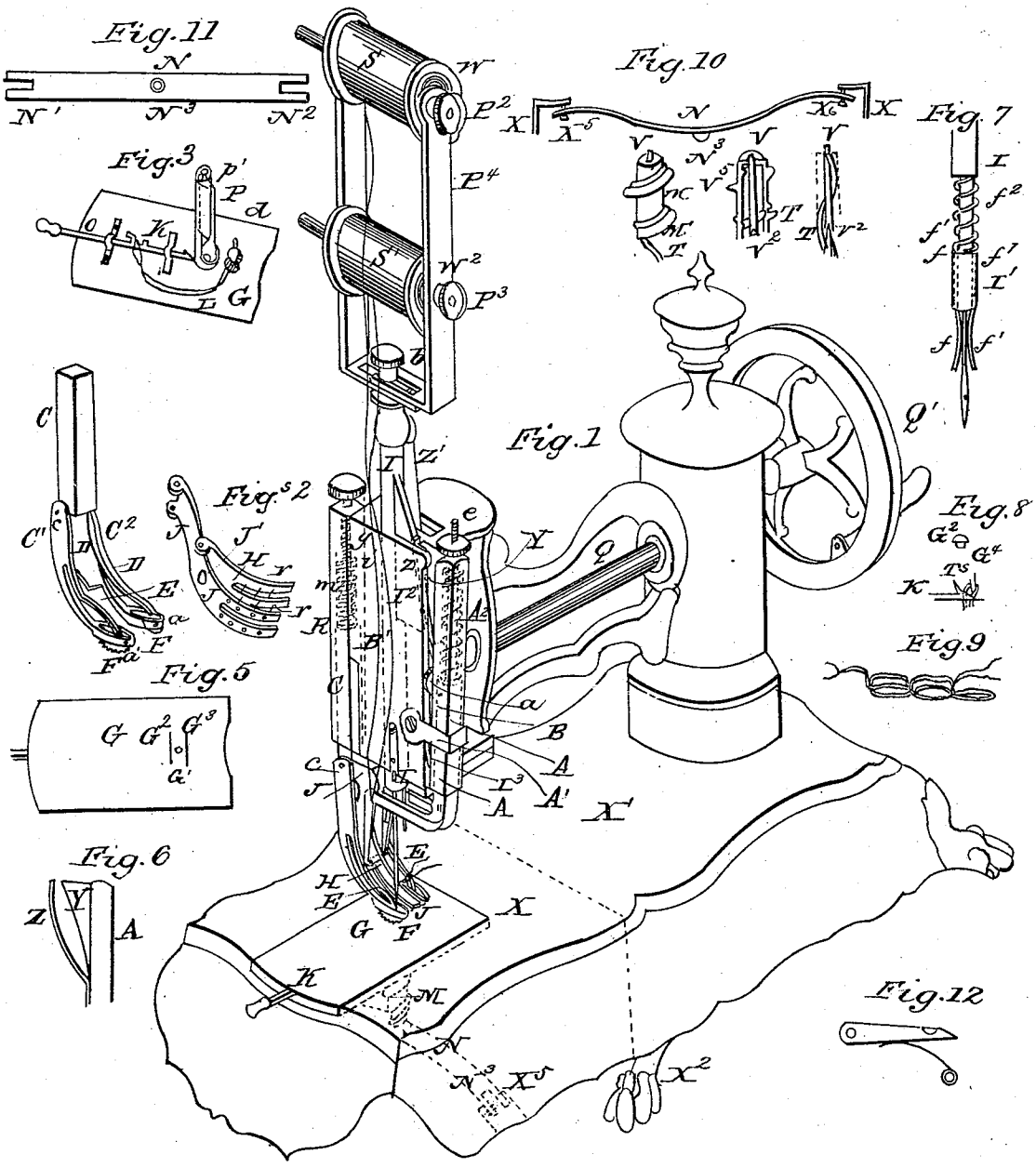
W. T. BARNES.

Sewing Machine.

No. 20,688. Patented June 29, 1858.



WITNESSES

S O Gould

G H Goodrich

INVENTOR

W T Barnes

UNITED STATES PATENT OFFICE.

W. T. BARNES, OF BUFFALO, NEW YORK.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **20,688**, dated June 29, 1858.

To all whom it may concern:

Be it known that I, WILLIAM T. BARNES, of the city of Buffalo, in the county of Erie and State of New York, have made certain new and useful Improvements in Sewing-Machines; and I do hereby declare that the following is a full and clear description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which make a part of this specification, in which—

Figure 1 represents a sectional perspective view of the sewing-machine. Fig. 2 represents the feeder and its appendages. Fig. 3 represents the adjustable looper-plate G, (reversed.) Fig. 4 represents a general view of the looper, the looper cut in twain, and the end of the looper and guide T, which is partly on the inside of the looper. Fig. 5 represents a top view of the adjustable looper-plate with the indentures or grooves in which the teeth of the feeder-hand H operate. Fig. 6 represents the upper end of the tube A with a spring attached thereto. Fig. 7 represents the lower end of the needle-bar with the spring f^2, the cloth extenders or stretchers f and f' attached thereto, and also the needle placed therein in the needle-bar. Fig. 8 represents the hole in the adjustable looper-plate in which the needle operates, and the rest for the upper end of the looper, the strip T, which operates in said step, and also the cutter in the act of cutting the thread. Fig. 9 represents the seam that is formed by sewing with the machine. Fig. 10 represents a side view of the looper-spring. Fig. 11 represents a top view of the looper-spring. Fig. 12 represents a movable step that may be made to take the place of the one that is in the adjustable looper-plate G.

The same letters indicate the same parts in all of the figures.

To enable others skilled in the art to make and use my improved sewing-machine, I will proceed with the description thereof.

I construct my improved sewing-machine of metal or other material. It may be constructed of any desirable size.

The feeder C, as represented in Fig. 2, consists of two sections, the section of the plate J with its appendages, and the section C with its appendages. The section of the plate J has a hinged hand, H, which is hinged to the plate J by means of the pivot h. The hand H has teeth r with points like that of a needle. These teeth operate in the small holes of the plate J, (they also slant as in so many circles from a common center, N,) the ends of the teeth passing through the said hole and through the cloth which is placed under the feeder and operate in the channels or grooves which are in the adjustable feed-plate G, Fig. 5. The plate J has a hole or aperture, J′, for the end of D′ of the spring D to operate in. The plate J is attached to C by means of the pivot c, as represented in Fig. 1, there being sufficient room between the arm C′ and the bar C and the arm C^2 and the bar C for the two ends of J, Fig. 2, to be placed therein. The section C is provided with two arms, C′ and C^2. These arms have at their ends two little open boxes, t and t', for the introduction of two little semicircular serrated feeder-guides, F and F′. These feeder-guides are attached in the said boxes by the pivots a' and a^2. There are two springs, E and E′, made to rest on the tops of the said guides, Figs. 2 and 1, for the purpose of producing a desirable pressure on the cloth by means of said springs operating on the feeder-guides F and F′. The feeder-guide F′ is represented in an unnatural position, Fig. 2, in order to show more clearly the shape of the end of the spring E′. The springs E and E′ may be attached to the arms C′ and C^2 in any of the known ways, and may be made of good spring steel or brass. The spring D, Fig. 2, is affixed to the back side of the feeder-bar C by a screw, pivot, or otherwise, and is made of steel or other material. On the lower end of said spring D is a projection, D′, which operates against H through the hole J′. The feeder-bar C is made square, (but may be made otherwise, so long as the principle is carried out,) and is made to fit in the lower end of the tube R, Fig. 1, sufficient room being left between the top of said bar and the top of said tube for the insertion of the spiral spring m, the screw y, and the plate I. The spiral spring m is made of spring steel or brass, and rests on the top of the feeder-bar C. The spring m has affixed on its top a plate, I. The lower end of the screw y rests against the plate I, the other end passing out of the top of the tube R at n', as shown at Fig. 1. The said screw y is used for regulating the pressure on the cloth. The tube R may be attached to the head-piece B′ in any of the known ways.

The lower end of the adjustable feed-lever B, Fig. 1, is provided with two arms, *g g*, which meet at a common point, where they (the ends of the arms) are covered by a revolving friction-roller, O. The pressure of this roller (by the motion of the tube A) gives the feed to the cloth. In the lower end of the lever-tube A the end of the feeder-lever B is inserted, which is made to fit the said tube. On the end of the feeder-lever is affixed the rod *e*, which passes out of the top of the said tube A, and has a screw-groove cut on its upper end for the application of a movable nut, *k*. On the part of the rod *e* which is inside of the tube there is encircling a spiral spring, A^2, the lower end resting on the top of the feeder-lever B and the upper end against the upper end of the said lever-tube A. The upper end of the lever-tube A, Fig. 6, consists of the projecting piece Y and the spring Z. The projecting piece Y is affixed to the side of the tube A, and is hollowing on its edge, to give room for the spring Z, as shown in Fig. 6. The spring Z is made of a good quality of spring steel or brass, and is affixed to the lower end of the projecting piece Y. Said spring is between the projecting piece Y and the projecting piece I^2 of the needle-bar, as shown in Fig. 1. The lever-tube A is attached to the head-piece B′ by means of the band A′, which band is attached to the head-piece by a screw or pivot. Between the lower side of the lever-tube A and the head-piece B′ is a spring, I^3, which is placed there for the purpose of forcing the lower end of the said lever-tube out.

Near the upper end of the needle-bar I is affixed a wedge projecting piece, I^2, Fig. 1, which is formed in the shape of a right-angled triangle—right-angled at its lower corner next to the bar. This projecting piece forces and operates against the projecting piece Y of the tube A, which is inverted, as represented, being right-angled at its upper corner next to the tube A. In the lower end of said needle-bar are attached two extenders or stretchers, *f* and *f′*, Figs. 1 and 7. These extenders pass up through the part of the needle-bar I′, Fig. 7, (through holes made of sufficient size to allow them to operate freely,) as indicated by the dotted lines. These extenders are directly opposite to each other, one on each side of the needle in a line parallel to the front of the machine, where the ends turn out, so as to allow a spiral spring, f^2, to rest on their tops, and also for the purpose of preventing their getting out of their proper positions. There may be a ring affixed to said hooks which turn out, and the spring f^2 rested thereon. The lower ends of the said extenders *f′* and *f* have a notch in each of them, so that when they (the extenders) press on the material to be sewed it (the material) will not get out of place. The middle of each of the said extenders is bent in, so as to make the distance from middle to middle shorter than the distance from the bottom end of one to the bottom end of the other, or the distance from the top end of one to the top end of the other. The spring f^2 is made of a good quality of spring steel or brass. The lower end of it rests on the ends of the extenders *f* and *f′*, and the upper end presses against the part I of the needle-bar.

On the top of the needle-bar I there is a frame-work, P^4 and P^5, Fig. 1, in which are two spools, S and S′. Said frame-work consists of two parts, P^4 and P^5. Each of these parts is slitted at the lower side end, which is placed so as to slide against each other when the screw *b* is in its proper place. The screw *b* passes through between the slits into the top of the needle-bar, whereby the frame-work P^4 and P^5 is attached to the said needle-bar. The spools S and S′ have an axle placed in each end of them, on which they revolve. Each of said axles has a small spiral spring with a washer, W, encircling it. The said washers are placed against the sides of the spools, against which they press by means of their (the washers') springs. The pressure against the sides of the spools is made in a more or less degree by the screws P^2 and P^3, which screws pass through the spools, axles, &c., as shown at Fig. 1. The frame-work P^4 and P^5 may be adapted to contain any number of spools to give the two threads equal tension and to allow them to be drawn by the needle in the same line, as seen in Fig. 1.

In Fig. 4 the first cut represents a general view of the looper M. The second or middle cut represents a half of the looper, &c., and the third cut represents the end of the looper and guide T and the needle in the hole V′ of the rod V. The looper mechanism M is hollow, and has a spiral protuberance or strip, T, affixed on its internal face, as represented in Fig. 4. There is a soft metallic rod, V, passing up the center of said looper, which is affixed in the bottom of the looper. (Figs. 4, 3, and 10 are represented in inverted positions. They are represented in their proper positions in Fig. 1.) There is in the top of the rod V a little hole, V^2, in which the needle hits in its descent and causes the lowering of the looper. The rod or piston V may be made longer, so as to come near the needle-hole in the plate G, and the greater part of the piston made cylindrical, with a slit down the side to give room for the threads or thread to commence the formation of the loop. When the looper is moving up or down, there may be a revolving cap on the bottom of it for it to revolve on, while the piston moves down and up with said looper without revolving. The piston may be then made cornered on its surface, and the hole P′ made cornered to accord with it. (They are now made round.) The piston, when made as above stated, will be less liable to be missed by the needle in its descent. On the outside of the looper M is a spiral flange, on which a spring may be made to operate. The frame-work P, Fig. 3, is made on the under side of the adjustable plate G, (which is represented upside down in the drawings,) for the looper mechanism M

to work on. There is a hole, p, on the bottom of the frame-work, in which the rod V is inserted. The protuberance or strip T follows in the course or track p', which serves as a guide to the motion of it, (the looper.) The strip T rests in a little step by the side of the needle-hole G′, when it is pressed up by the spring N, Fig. 10. The slit d on the side of the frame-work P is made to allow the thread to bend out.

In Fig. 10 the spring N is an inverted side view. In Fig. 11 it is a top view. In the middle of the spring N is a little round cavity for the end of V of the looper to rest in. Said spring has two slits, N′ and N², Fig. 11, one on each end, so as to suit the pins X⁵ and X⁶, Fig. 10. The heads of these pins do not fit close to the ends of the spring N, but are, as represented in Fig. 10, at a distance from it. The ends of said spring are made curving to suit the curving projection of the sides X X of the arm.

Fig. 3 represents the plate G reversed. The thread-cutter K, same figure, is by means of straps or bands fastened to the adjustable looper-plate G. The inner end of said cutter is formed something similar to that of a half-spear at the spear end. The handle is made of sufficient length to reach out beyond the end of the plate G, so that the application of power may be convenient, as represented in Fig. 1. The said cutter K is made of a good quality of steel, and made with a sharp edge. The spring L is affixed to the said looper-plate at one end, while the other end is placed in a notch in the thread-cutter K. Said spring causes the thread-cutter to return after having had power applied to it, (the cutter.) The adjustable looper-plate G, Fig. 5, has two grooves or channels, G² and G³, one on each side of the needle-hole G′, in which the teeth r of the hand H, Fig. 2, operate. These channels or grooves are made to prevent otherwise defacing or scratching the said looper-plate G, Fig. 5. The bottoms of said channels are made to come to a point, so that when the said needle-pointed teeth operate in them they are not blunted. They are also made in a straight line to guide the feeder-hand H aforesaid in a straight line. The said looper-plate G fits in the arm X, Fig. 1. It is made grooving on its upper side corners, while that of the arm X is made grooving on the under side corners, so as to allow the plate G to fit in it. The said plate is made tapering, being broadest at the outer end, so that it can be taken out when repairing is necessary. The arm X, Fig. 1, is made open from the feet X², and the dotted line dividing it from the bed-plate X′. The said arm may be affixed to the bed-plate in any of the known ways. The said arm is made the width of the bed-plate, but may be made smaller. It may also be made longer.

The step G⁴, Fig. 8, for the end of the looper, may be replaced by a movable step with a spring, as represented in blue ink in Fig. 12.

Power is applied to the wheel Q′, Fig. 9, in any of the known ways. The end of the arms Z′ is attached to a crank which is affixed to the end of the shaft Q, which shaft is turned by the said wheel. The turning of the said shaft on its axis causes the up-and-down motion of the needle-bar I and the parts attached thereto. The above method is in common use. When the needle-bar I moves up, the projecting piece I² presses against the spring Z, which lessens noise and friction, and forces the projection Y of the tube A out by acting as a wedge against it. The tube A, when forced out at the top, causes the arms g g, with roller O, to act as a lever (being attached by the band A²) against the feeder apparatus. When the material is to be sewed, the feeder apparatus is raised up and the material placed under it. The feeder apparatus then puts the desired pressure on the material by screwing or unscrewing the screw y, the spring m acting on the top of the feeder-bar or guide-bar C, which is under said screw. Then, when the said needle-bar I is rising up, the said roller O presses against the hand H, by the tube A being forced out, as before explained, causing the teeth r of the said hand H to penetrate the material, pushing it back at the same time, which movement makes the boxes t and t' rise, and the springs E and E′ keep the guides F and F′ in their proper positions, and the material is forced under the said guides the length of the stitch, the said guides preventing the material from moving out of its proper direction. After the teeth of the feeder-hand H, Figs. 2 and 1, have penetrated the material the ends of them pass into the channels or grooves G² and G³, Fig. 5, which prevent the material from getting out of its proper place or from moving laterally toward the needle; and when the needle-bar I is descending it gives room for the projection Y, which is made to occupy the space thus gained by means of the spring I³ forcing the lever-tube A in the space, which consequently causes the pressure of the roller O to be quitted, and the feeder is allowed to assume its former place. When the pressure of O is quitted, the spring D, which is on the back of the feeder or guide-bar C, forces the teeth of the feeder hand H out of the material, so as to allow the said teeth to pass the cloth in preparation for the feeding of another stitch, during which time the guides F and F′ press against the material by means of their springs E and E′, so as to keep the material from moving. Then, when the material is motionless, part of the needle passes through it in making the stitch, and the material is kept steady and stretched by means of the extenders f and f'. In the downward motion of the needle-bar the lower ends of said extenders f f' strike into the cloth, and they being narrower between their centers, as shown in Figs. 7 and 1, when the end of the needle-bar goes between them, (the notched ends of the extenders resting in the material,) forces the

notched ends of them out, thereby stretching the cloth. They return to their usual positions by the spring f^2, which presses on their ends. The length of the stitch is regulated by the nut k, which is on the rod e of the feeder-lever B. The said nut k lengthens or shortens the leverage of the arms $g\ g$ of the feeder-lever B.

The feeder apparatus may be adapted to sew thick or thin material by screwing or unscrewing the screw y at the top of the tube R and the nut k at the top of the feeder-lever B. Any thread or threads may be used that is or are desirable to sew with this machine. The tensity of the thread or threads is in a more or less degree regulated by the screws P^2 and P^3. When they are screwed, the springs belonging to them press more forcibly by their contraction against the washers W on both sides alike. When the needle-bar descends, the needle passes between the slit or aperture in the feeder-hand H, and also that of the plate J, Figs. 2 and 1, into the needle-hole G′ in the adjustable looper-plate G, Fig. 5. After the needle has passed into said hole it hits in the hole V′ of the piston or rod V, (third cut of Fig. 4,) which piston is in the middle of the looper mechanism M. This looper mechanism is placed on its frame-work P, Fig. 3, the piston V is inserted in the hole p on the lower end of said frame-work, (the looper-plate in Fig. 3 is represented upside down,) and the end of the looper T follows in the spiral course or track P′. When the looper is placed on said frame-work, the lower end of the piston V rests in the little circular hollow N^3, which is in the middle of the spring N, Figs. 10 and 11. When the end of V is placed against the spring N, the spring forces the end T of the looper into a little step, G^4, by the side of the needle-hole G′, Figs. 8 and 3. When the needle in its descent hits the upper end of the rod V, it forces the looper down, the upper end of the looper (the strip T) passing across the line of motion of the needle and passing close by the needle, revolving on the principle of a screw, the rod V moving perpendicularly to the plate G. When the needle descends, the thread is tightly drawn on its sides, which tightens the stitch, as in the usual way; but when the needle is ascending or returning the thread bends out in the space d against the side of the rod d' in the proper position for the end of the looper T (which is also ascending on its track, being forced by the spring N) to pass between one side of the thread and side of the needle, as represented in the third cut of Fig. 4. From thence the end of the looper (the end of T) goes in the little step G^4 by the side of the needle-hole G′, the needle continuing to rise and draw the slackened thread up and around the upper end of the looper, and to form the loop which is spread and held firm by the end of the looper, (the strip T,) which is broadest at its upper end for that purpose, and also the step aforesaid. It thus holds the loop in the proper position for the reception of the needle in its next downward course. After the needle in its next downward motion has passed in the loop thus formed it hits the rod V, as aforesaid, thereby lowering the looper, the end of which, being forced out of the step aforesaid, drops the now formed stitch, which is the common loop-stitch. A seam that is sewed with two threads is represented in Fig. 9. To sew a seam with two or more threads, the ends are inserted in the eye of an eye-point needle of the usual form, and the material that is to be sewed is placed under the feeder, which feeder is formed with an opening for the needle and cloth-stretchers $f\ f'$ to operate in, and also to show the line of the seam, so that the material can be directed. When all is ready that is pertaining to the machine, it is put in motion. After the seam is sewed of sufficient length the needle is withdrawn and the thread-cutter K is forced inward, which cuts or dissevers the thread or threads without injuring the needle or unthreading it and leaves sufficient thread to fasten the end of the seam. The threads may, however, be drawn through on the upper side, and then when either thread is separately pulled or strained the others or other will prevent the raveling of the seam. When the thread or threads are required to be cut, the needle is withdrawn, and force being applied to the said spear or cutter K, Fig. 5, it passes between one thread of the loop (if one thread is being sewed with, as shown in Fig. 8) and the end of the looper, (the strip T.) The thread of the loop is prevented from rising by means of a notch, T′. The said cutter or breaker K, being V-shaped, wedges into the loop as it is moved forward into the loop, and acts on the principle of the wedge and cuts and breaks the thread or threads of the loop at the same time.

Having thus fully described my improvements in sewing-machines, I do not wish to be understood as claiming any particular mode of operating my improvements in sewing-machines, nor any precise shape of parts, as these may be varied without changing the principle of my invention.

I disclaim the patent of T. J. W. Robertson, dated May 22, 1855, and the patent of S. S. Turner, dated August 22, 1854; but

What I do claim is—

1. The looper strip or point T, when secured to the revolving rod or piston V, and arranged and operating in combination with the step or looping-aperture G^4, spring N, and cylinder P, in the manner and for the purpose specified.

2. The cloth-guiding apparatus F F′, $a'\ a^2$, and t and t', as constructed, arranged, and operating, in combination with the feeding device, for the purpose specified.

WILLIAM T. BARNES.

Witnesses:

CHARLES HINSON,

GEORGE HINSON.