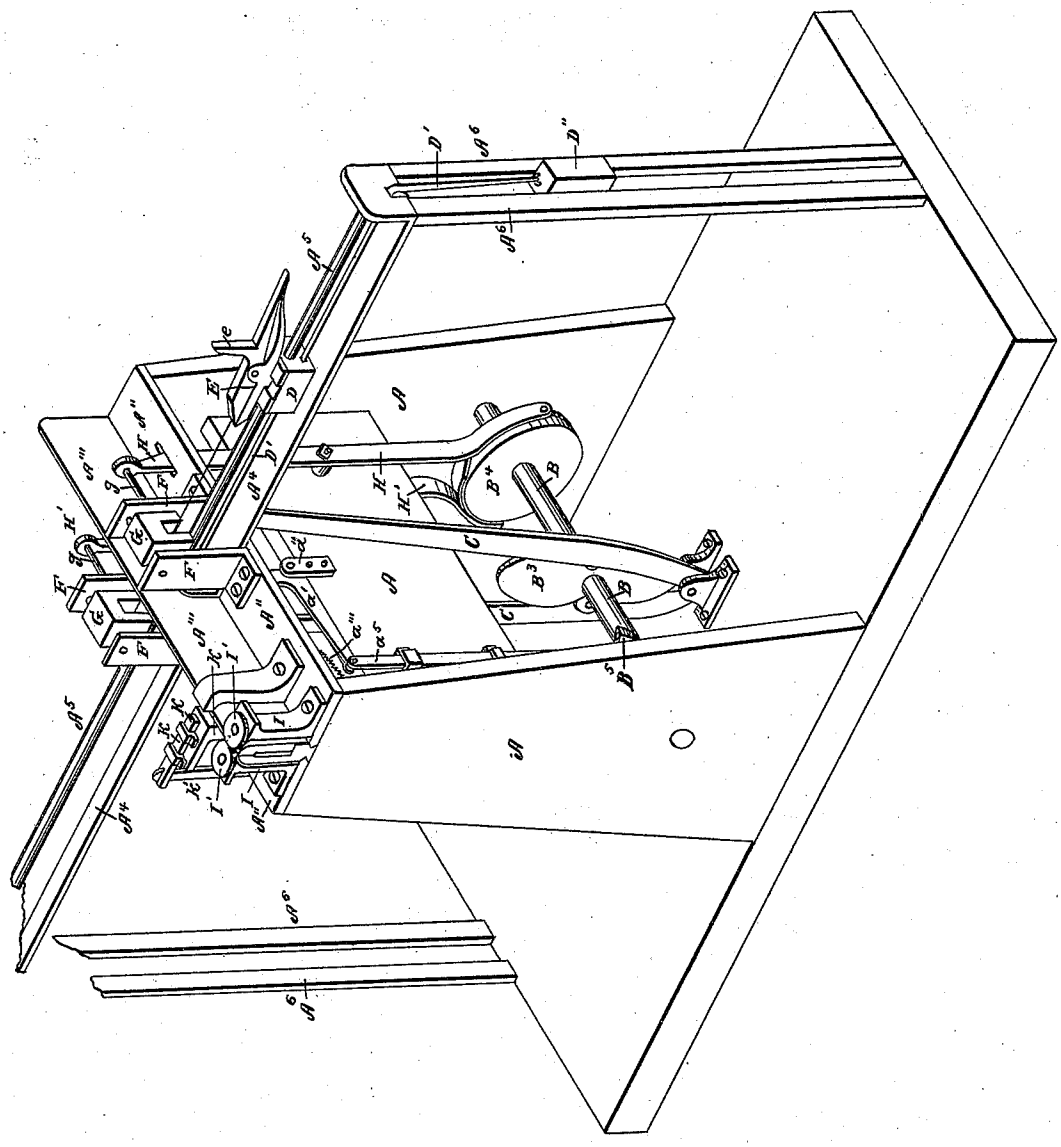
J. J. GREENOUGH.

Sewing Machine.

2 Sheets—Sheet 1.

No. 2,466.

Patented Feb. 21, 1842.



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2 Sheets—Sheet 2.

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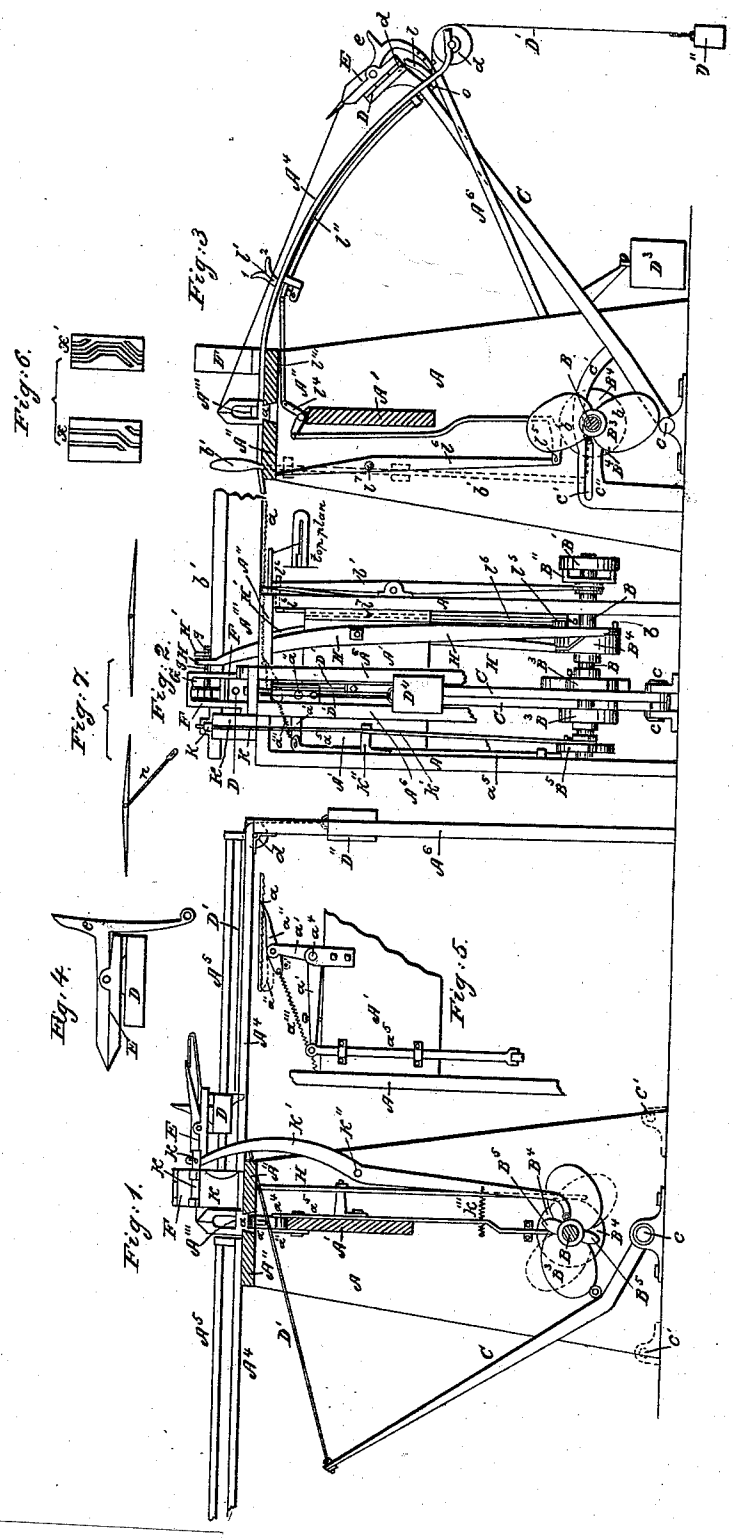

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UNITED STATES PATENT OFFICE.

J. J. GREENOUGH, OF WASHINGTON, DISTRICT OF COLUMBIA.

MACHINE FOR SEWING OR STITCHING ALL KINDS OF STRAIGHT SEAMS.

Specification forming part of Letters Patent No. **2,466**, dated February 21, 1842.

To all whom it may concern:

Be it known that I, J. JAMES GREENOUGH, of the city of Washington, District of Columbia, have invented a new and useful Machine for Sewing or Stitching all Kinds of Straight Seams, &c.; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making a part of the same.

Drawing No. 1 is an isometrical view of the machine. Drawing No. 2: Figure 1 is a vertical cross-section; Fig. 2, a side view; Fig. 3, a cross-section of another modification of the machine, together with the stop-motion; Fig. 4, a modification of the pinchers, dispensing with the spring; Fig. 5, clamp-motion; Fig. 6, diagrams of the thread of the worm-wheel; Fig. 7, needles.

The letters of reference are the same on all the figures.

A frame is constructed with two outside standards, A, connected by a brace, A′. On the top of these standards are fastened two ribs, A″ A″, beveled on their inner edges, between which the clamp A‴ plays. This clamp is of similar construction to those now used in pricking-machines.

To the center of each of the ribs is fastened a guide, A^4, extending out horizontally on each side at right angles to the ribs, and sustained at their extremities by uprights A^6. These guides are turned up at each end and support rods A^5. A round horizontal shaft, B, has its bearings in the standards at the lower part of the frame. On this shaft, outside the frame, is a loose pulley, B′, connected with the driving-power. This is thrown in and out of gear with the shaft by means of the common bayonet, B″, (or any usual mode,) connected with the spring-shipper *b*′.

At or near the center of the shaft B is placed one or more cams, B^3, projecting on each side of the shaft. On the same shaft, near the rear standard, is a wheel, B^4, around the periphery of which an eccentric groove runs. Near the front standard is a cam, B^5, for pricking, and shifting the clamp. These cams are all so formed as to give the motions hereinafter described. They are made with bosses and set-screws, so as to be adjustable.

Directly under the guides on the base of the machine are the fulcra of the arms C. These may be placed at *c*, as in the drawings, or at any point (see *c*′ in dotted lines, Fig. 1) found most desirable. These arms extend up nearly to the ribs A″, and at the point opposite the center of the shaft there is a friction-roller attached to each, against which the cam B^3 acts. Cords D′ are attached to the upper ends of these arms, which cross under the clamp and are connected with the slides D. Another cord passes from each of these slides over a pulley, *d*, at the end of the guide down to a weight, D″. (A spring may be substituted for this weight, if desirable.) A variation of this part of the machine is shown in Fig. 3. The arms C extend up through a slot which runs the whole length of the guide, and the piece D is firmly attached thereto, instead of sliding on the rod A^5, which is in that case omitted. The arrangement below is reversed, so that the cam B^3 draws the arm up to the center. This is effected by a bar, C′, connected with the arm and passing over or under the shaft having a friction-pulley on its ends, against which the cam on the side of the shaft opposite the arm acts. This arm may be guided horizontally by the slot C″. When spring-pinchers are used, the weight D* may be substituted for D″. The guide in this modification is curved to conform to the movement of the pinchers. In all other respects the machine is like that first described.

Pinchers E are connected with the slides or pieces D, so as to be perfectly steady, but having a lateral motion at right angles to that of the slides. The under half of the pinchers, which is connected with the slide or piece D, may be formed into a spring behind the joint. This springs acts upon the upper half and keeps the jaws closed. The upper jaw has a groove on its face running lengthwise, to receive the needle and hold it steady. It also has a projection, *e*, for opening the jaws, as hereinafter described.

Fig. 4 is a modification of the pinchers to dispense with the spring. The lower half only extends out to the joint, the upper half projecting beyond and turning down at right angles. To the lower end is attached the strap which is connected with the weight D″. (This s also shown in Fig. 3.)

Frames F are attached to the ribs at the point where the guides join them. In these frames slide shifters G over the pinchers, when they are brought up to the center, and having pro-

jections extending down nearly to the piece D, between which the pinchers are received. A rod, g, is connected with each of these shifters, which runs through the side of the frame and through a slot in the top of an upright lever, H or H′, and having set-screws on each side of this lever, so as to regulate the vibrations of the shifter for any length of stitch. The levers H and H′ extend down, one on each side of the wheel B^4. Opposite the center of the shaft studs project from them and enter the groove in the periphery of the wheel B^4. A rack, a, is formed on the under side of the clamp A'''. On the upright arm of a bent lever, a', the arms of which are at right angles to each other, is a pawl, a'', which is held up against the rack by a spring, a''', which also serves to keep the bent lever back to its place. (This is shown in part in dotted lines in Fig. 2, and the entire arrangement is delineated separately in Fig. 5.) The horizontal arm of the bent lever lies on the top of the cross-brace A′, and is connected with it by its fulcrum at a^4. To the other end of this arm is attached a rod, a^5, which extends down through eyes in which it slides to the cam B^5.

Instead of the above arrangement, an endless screw or worm-wheel may be used to move the clamp, the thread of which is so shaped that it will only give motion to the clamp during a small part of its revolution. When the machine is required to "back-stitch," the thread of the screw has a backward turn, so as to cause the clamp to recede half the distance of its progression every other stitch. (The form of the thread of these screws is shown in the diagrams, Fig. 6, in which the screw is represented as unrolled. x is for stitching, x' for back-stitching.) This screw can be connected with the shaft B on any of the common ways well known to mechanics, and works into the rack on the clamp. Two standards, I I, are fastened to the front end of the ribs, on the top of which and just level with the upper edge of the clamp are two horizontal rollers, I′. These rollers may be made to approach or recede from each other by means of screws, if necessary.

Between the rollers and the frames F is the picker. On top of the standard K an awl-holder, k, slides horizontally on a level with the top of the clamp. In this is inserted the awl. At the outer end of this awl-holder k an upright lever, k', is attached, which extends down past the cam B^5, which acts upon it. The fulcrum of this lever is at k'', and near the lower end is a spring, k''', which draws it toward the cam.

Fig. 7 is the needle to be used in this machine. It is made of steel, gradually tapered from the center to a point at each end. At the center is drilled the eye, which may have a countersink and groove on one or both sides. A leader, n, made of small wire, may be used, if necessary, when the thread is found to wear too fast. This leader is riveted into the eye of the needle, so as to turn, and has an eye formed at its other end, into which the thread is fastened.

When the machine is used with one needle, the pinchers are not allowed a lateral motion, (the shifters G, frames F, and upright levers H H′, and wheel B^4 are dispensed with,) one arm only is allowed to vibrate at a time. This will be readily perceived without further illustration.

Operation: As the cam-shaft B revolves the cam B^3 acts on the arms C and brings the pinchers up to the center, one being just two stitches behind the other. The pinchers enter between the projections on the shifters, and run the needle through the leather till the projection e strikes the shifter and opens the jaws, thus relieving the needle. At this instant the groove on the wheel B^4 changes the lever H forward and H′ in the opposite direction. This, through its connection with the shifter, shifts the two pinchers laterally to the opposite needles, when the cam B^3 relieves the arms, and the weights draw out the pinchers. As soon as the projection e is relieved from the shifter the pinchers seize the needles and draw them out to the length of the thread. While the thread is being drawn out the cam B^5 strikes the rod a^5, which communicates its motion by means of the bent lever and pawl to the clamp, progressing it one stitch, and immediately after the same cam throws out the lower end of the lever k', and forces the awl through the leather.

The apparatus for stopping the machine is as follows: Near the outer end of the guide A^4, Fig. 3, is an upright lever, l, the fulcrum of which is on the guide. About two inches from the frame there is another lever l', the top of which is forked. The fulcrum of this lever is on a piece extending below the guide. These levers are connected by a rod, l'', which is attached to l below the fulcrum and to l' above the fulcrum. To the inner end of this rod is jointed a connecting-wire, l''', which couples it with the bell-crank l^4 on top of the brace A′. From this bell-crank a cord extends down to a hook, l^5, on the lower extremity of a vertical lever, l^6, nearly opposite the top of the wheel B^4, on the side of which is a stud, b. The lever l^6 turns on a pivot at l^7, and its upper end is turned to a right angle, and passes horizontally through the standard beside the spring-shipper b'. On the side of the piece D is a pin, d. (Shown in dotted lines at Fig. 3, it being on the opposite side.) When the pinchers are drawn up to the center, the pin d strikes the arm 1 of the forked lever l' and carries it forward sufficiently to bring the hook l^5 into range with the stud b on the wheel, and also to bring the arm 2 of the forked lever up, so as to be struck by pin d on its return. If the thread is so short as not to let the pinchers back far enough to strike this lever, the hook remains down in range with stud b, which, when it comes round, acts on the shipper by means of the lever l^6, and stops the machine. If the thread at any time breaks during the operation, the arm is allowed to fall back so

far that the pin *d* strikes the lever *l*, and this will have the same effect, it will be perceived, as leaving the forked arm forward.

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

1. The employment of a weight or spring, substantially as herein described, to draw the needle and thread through the article which is being sewed, so as to accommodate the movement to the varying length of the thread.

2. The combination of the pairs of pinchers, one on each side of the work, so as alternately to draw the thread back and forth, as described.

3. For the purpose of working with two needles at the same time, giving to the pinchers a simultaneous lateral movement, to change the needles from one pair of pinchers to the other, as described.

4. The making and using a needle with one eye and two points, the eye being at or near the middle thereof.

5. The arrangement of the apparatus for stopping the machine, either when the thread breaks or becomes too short, as described.

J. J. GREENOUGH.

Witnesses:

GEO. STRICKLAND,

W. P. N. FITSGERALD.