

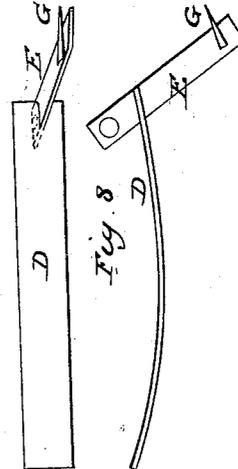
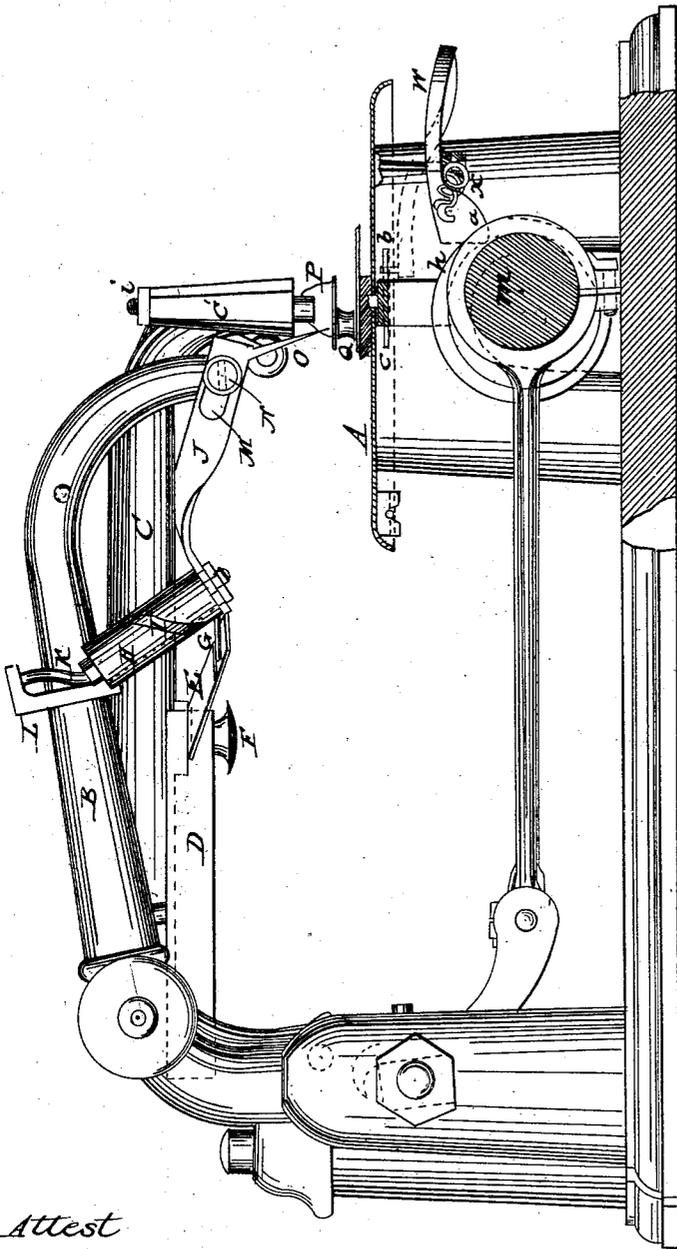
J. McCLOSKEY.

Button Hole Sewing Machine.

No. 55,688

Patented June 19, 1866.

Fig. 1.



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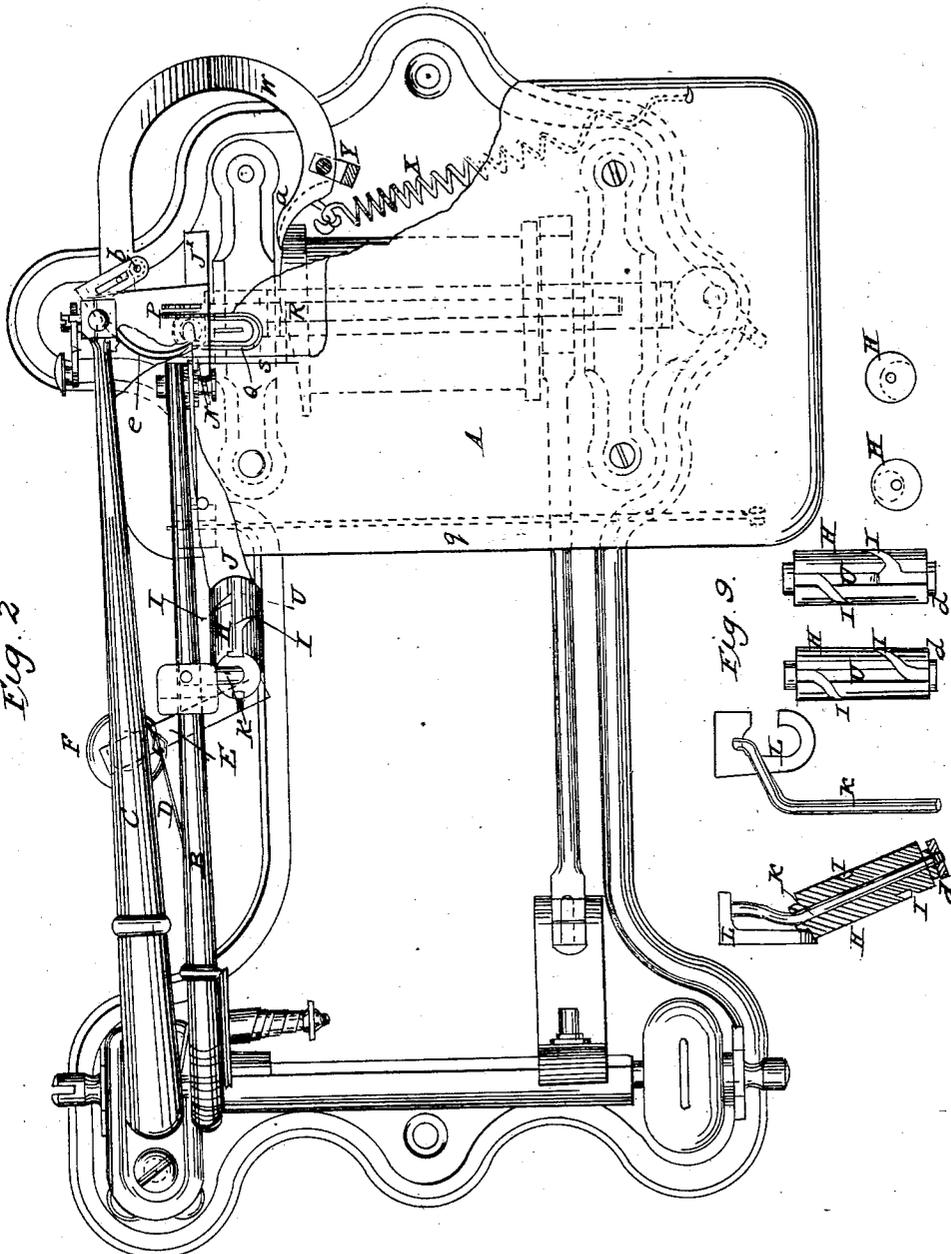


Fig. 2

Fig. 9

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3 Sheets—Sheet 3.

Button Hole Sewing Machine.

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Fig. 3.

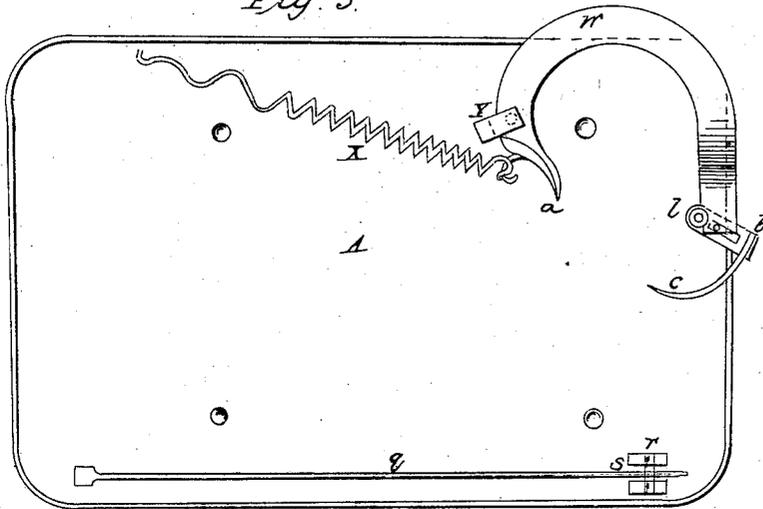


Fig. 10.

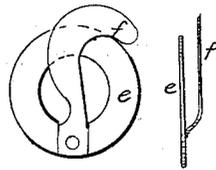


Fig. 4.

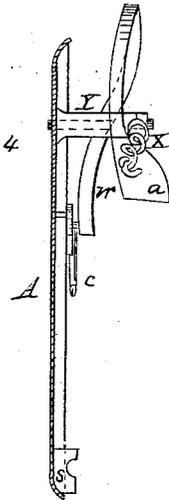


Fig. 11.

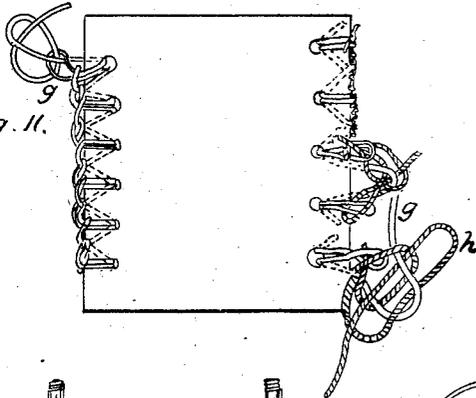


Fig. 7.

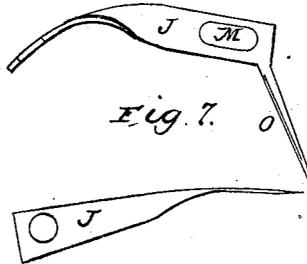


Fig. 12.

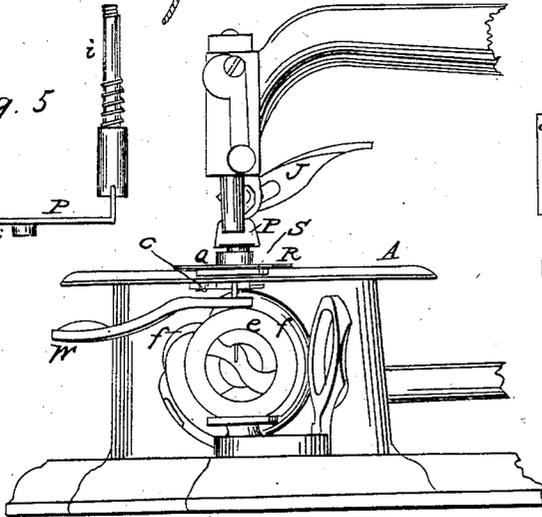


Fig. 5.

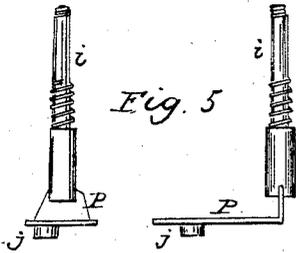
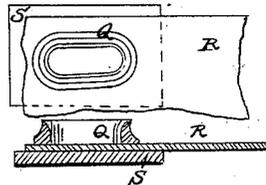


Fig. 6.



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UNITED STATES PATENT OFFICE.

JOHN McCLOSKEY, OF NEW YORK, N. Y.

IMPROVEMENT IN BUTTON-HOLE SEWING-MACHINES.

Specification forming part of Letters Patent No. 55,688, dated June 19, 1866.

To all whom it may concern:

Be it known that I, JOHN McCLOSKEY, of the city, county, and State of New York, have invented a new and useful Improvement in Button-Hole 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, Sheet 1, is a side elevation of a sewing-machine to which my improvement has been applied. Fig. 2 is a top view thereof, a portion of the cloth-table being broken away to show the horizontal looping-needle C. Fig. 3, Sheet 2, is an under-side view of the cloth-table, showing the needle-looper and its shank. Fig. 4 is an edge view of the parts shown in Fig. 3. Fig. 5 shows the presser-foot in two detailed views. Fig. 6 shows a plan and a sectional edge view of the button-hole guide. Fig. 7 shows the upper needle in two views. Fig. 8 shows, in two views, a detailed representation of the spring-finger which rotates the cylinder H. Fig. 9 shows the details of the barrel H and its supporting parts in six views. Fig. 10, Sheet 3, shows a plan and an edge view of a rotating hook. Fig. 11 represents two different stitches which can be made by means of my invention. Fig. 12, Sheet 6, is a side elevation of the sewing-machine.

Similar letters of reference indicate like parts.

The object of this invention is to produce a button-hole sewing-machine. It is here shown applied to a Wheeler & Wilson sewing-machine, the hook patented by J. McCloskey June 20, 1865, and represented in Fig. 10, being put in the usual place of the bobbin of the machine when a certain kind of stitch is to be made, as hereinafter explained.

The reciprocating needle is alternately advanced and drawn back so as to make its descents alternately in one of two parallel lines, one forward of the other. In one line it penetrates the cloth in which the button-hole is cut, and in the other it descends into the button-hole. This movement of the needle is made by means of an eccentric operated by an attachment on the needle-arm whose movements upward are made to turn a cylinder, whose lower

end carries the eccentric that alternately advances and withdraws the needle. The lower thread is carried by a curved looper which moves in a horizontal plane and is operated by the same cam which operates the feeding devices. This looper may be dispensed with when a button-hole is to be sewed with the upper needle-thread only.

The stuff or cloth in which the button-hole is made is turned and advanced as the sewing proceeds by means of a movable guide consisting of a frame that resembles the button-hole in form. This guide has short hooks or projections on its bottom edge, which attach it to a movable bed of flexible material that lies on the cloth-table and is acted on by the feeding-dog. The cloth to be sewed is confined between the guide and the movable bed by the same projections which connect them to each other. The needle descends through a perforation made in the presser-foot, and such perforation has a circular flange, which projects downward and is inclosed within the guide, the presser-foot itself resting on the guide and holding it and its bed upon the cloth-table over the slots through which the feeding-points work.

In this example my invention is shown applied to a Wheeler & Wilson sewing-machine, whose cloth-table is seen at A. To the needle-arm B, I attach a block, L, from which extends a spindle, K, on which revolves a cylinder, H, that is held on the spindle by a nut. The cylinder has on it two straight grooves, U U, which extend from top to bottom on opposite sides of its circumference. The grooves U are connected by spiral grooves J J, which are severally cut through the divided circumference of the cylinder. On the lower end of the cylinder I form an eccentric, *d*, (seen in Fig. 9,) on which is fitted loosely the upper end of shank J of the reciprocating needle O in such a manner as that the shank and needle will be pushed forward and back during a complete revolution of cylinder H, such complete revolution being made during the time that the needle-bar makes two full reciprocations—that is to say, descends twice through the cloth-table and rises twice. The needle-shank J is held up against the end of the needle-bar by a set-screw, N, which goes through an oblong slot, M, that allows the shank to be moved to and fro thereon by the eccentric.

The cylinder H is rotated by means of a finger, G, working in the grooves aforesaid, the finger being projected from an elastic stock which consists, in this example, of a stiff arm, E, that is pivoted to the under side of the presser-arm C by a screw-pin, F, and of a semi-elliptical spring, D, one end of which is connected to the arm E, at right angles therewith, so that its free end may bear against the side of the presser-arm toward the rear.

The spiral grooves I traverse, respectively, opposite sides of the cylinder, each extending from a point below the upper end of one of the straight grooves U to a point above the lower end of the other straight groove. The straight grooves in their lower parts are of the same depth; but they gradually become shallower as they ascend from the lower to the upper mouths of the spiral grooves, which are sunken deeper than the parts of the straight grooves which are next below them, thereby making a sudden fall in the upper part of said straight grooves opposite the place where the spiral groove begins. It follows from this mode of constructing and arranging the grooves that when the cylinder is moving downward with the finger G in one of the straight grooves U the inclination in the bottom of such groove will gradually cause the finger to be forced back until it reaches the rise l, where the groove is again deepened, when the finger will be forced by the spring D into such deeper part of the groove, the rise l serving to prevent its return into that part of groove U which it has just left and to direct it into the adjacent spiral groove when the needle-bar makes its next ascent. The next ascent of the needle-bar carries the cylinder upward past or against the finger G, which, being directed as aforesaid, by the rise l, into the adjacent groove I, turns the cylinder half a revolution, or until the spiral groove reaches the lower part of the other straight groove I, into which it passes by going over a like rise made at the lower mouth of the spiral grooves, whose bottoms are raised gradually as they descend until they meet the lower parts of the straight grooves. From this construction it follows that the cylinder makes half a revolution in the ascent and descent of the needle-bar and completes its revolution in the next ascent and descent of said bar. The eccentric d on the lower part of the cylinder is arranged so that its greater and lesser radii coincide with a diametrical line which goes through both straight grooves U, thereby bringing the greater and also the less radius directly under the parts of the cylinder traversed by the spiral grooves.

When the cylinder is turned so as to bring the greater throw of the eccentric toward the needle, the shank J thereof, and consequently the needle, is projected forward so as to enter the slots in the presser-foot and in the table of the machine in an advance position. When, on the contrary, the cylinder is turned so as to bring the smaller throw of the eccentric to-

ward the needle the shank and needle will have been drawn back, so that the needle will enter the said slots in a less advanced line.

The straight grooves U are extended to the top and bottom of cylinder H, beyond the mouths of the spiral grooves, so that finger G is received by the grooves U after the spiral grooves I have passed it. Consequently the cylinder H ceases to rotate so soon as the finger reaches the straight grooves, during both the rise and fall of the needle-bar and before the needle-bar has completed either movement, so that when the needle reaches the cloth the action of the eccentric, whether to push it forward or to draw it back, has been completed, and the needle's path remains unchanged until after it has been raised above the cloth, because it is only during the middle part of the movements of the needle-bar, when it is out of the cloth, that it is moved by the eccentric. When the needle is projected forward by the eccentric it goes through the edge of the button-hole, and at its next descent it goes through the loop or loops there presented to it without entering the cloth.

The finger G yields when the inclines of the straight and spiral grooves are passing it, being connected with the spring D, which presses it forward constantly against the bottoms of the grooves with force sufficient to cause the cylinder H to rotate, as described.

The presser-foot P is connected to the post C' of the presser-bar by a pin, i, that goes through said post, and in such a way as to have a yielding pressure. The presser-foot has an oblong slot through which the needle passes, and a hollow flange or ring, j, Fig. 5, extends downward from the edge of said slot and is confined within the top of the hollow button-hole guide Q, on which the presser-foot rests. This guide may be of metal or other stiff material, and its shape conforms to the general form of the button-hole to be made. Its height depends principally on the depth of the flange j and partly on the length of the needle. Its lower edge has several sharp points, which take hold of a movable bed, S, made of any suitable material which has a soft surface, so that the feeding-points of the machine can engage it on one side and the points from the guide penetrate it on the other. The cloth R, in which the button-hole is to be made, is held between the movable bed S and the guide Q, being penetrated by the points of the guide. From this construction it follows that the guide and cloth will be moved along with the bed S in whatever direction the latter is impelled by the feed-points.

The hollow flange j of the presser-foot is a little less than the smaller diameter of the guide Q, and the inside of the guide and the outside of the flange being continuous curved lines, it follows that when the feed takes place the guide will be moved continually against the flange and will revolve around it, thereby pre-

senting the cloth to the needle in a path whose curve is the curve of the guide.

When a button-hole is to be sewed the cloth is so arranged beneath the guide that the edge of the latter will rest on the cloth outside of the button-hole, the guide being made wide enough to leave a margin each side of the cut for the needle to enter, and the center of the movable bed S being so cut away as never to be in the path of the needle.

The letter C designates a curved needle which works beneath and parallel with the cloth-table A. It is so placed and operated as to enter the loop of the upper thread when it is distended upon the revolving-hook, just before that loop is thrown off. At that time the curved needle enters said loop and carries into it its own thread, which is distended across its inner side, so that the upper needle at its next descent goes between the curved needle and the lower thread, and the revolving hook *j*, coming round at this time and seizing the upper thread, draws it through the loop of the lower thread and makes a double chain on the under side of the cloth. The lower needle C, is vibrated across the path of the upper needle by means of that part of a Wheeler & Wilson sewing-machine on which the feeding-cam is formed. The needle C is rigidly secured to a slotted stock, *b*, that is pivoted at *l* to the under side of the cloth-table. The slot in its stock *b* receives a pin on the end of a vibrating lever, W, which is pivoted to a bracket, Y, that hangs down from the cloth-table in front of the pulley and cam shaft *m*. The short end *a* of the lever W is drawn by a spring, X, against the outer edge of the rim of the feeding-cam Z, which operates the lever at the proper time to vibrate the lower needle. The rim of the feeding-cam Z is made of the required shape to produce the proper motion of the lever.

When the lower needle, C, is used, in connection with needle O, for sewing a button-hole, a stitch is produced like that represented at *g h* in Fig. 11, on the right-hand side of the figure, the needle O being reciprocated so as to go through the cloth at the edge of the button-hole, and then through the hole alternately at each descent, forming, in connection with the revolving hook and with the lower needle, a chain-stitch of the character here shown, the thread of the upper needle being designated by the letter *g*, and of the lower needle by the letter *h*.

The button-hole may be sewed with a single thread—that is to say, with only the thread of the upper needle—by means of the hook *f*, (shown in detailed view in Fig. 10, and also shown in Fig. 12, where it is seen in its proper place in the machine.)

This hook, which is the subject of a patent granted to me June 20, 1865, is for this purpose connected with a ring, *e*, of about the size of the bobbin of a Wheeler & Wilson sewing-machine, whose place therein it occu-

pies when work is to be done with the upper thread only, the hook *f* being put loosely in the machine, its end pointing in a direction contrary to that of the ordinary hook *j^x* of that machine, behind which it goes, and being bent back from the plane of the ring *e*, to which it is attached, so that while its ring *e* is before the ordinary hook *j^x* the hook *f* will come behind said hook *j^x*, its end, which is quite blunt, being kept toward the left by frictional contact between its ring *e* and the covering-ring of the machine. As the loop of the upper thread is cast off from the revolving hook *j^x* this hook *f* receives it and spreads open the loop, and holds it open until the needle descends through that loop again, when the further revolution of the hooks releases that loop to repeat the same operation with the next, thereby forming the chain-stitch with the upper thread alone. It is clear that if the supplementary hook *f* is used with an upper needle, which descends through the edge of a button-hole and through the hole in alternation, the chain of the stitch will be formed along the rim of the button-hole. When the supplementary hook *f* is used to sew with the upper thread only the lower needle, C, is removed.

Tension is put on the thread of the lower needle by means of a rod, *q*, placed beneath the cloth-table, one end of said rod being fixed and the other being allowed to press against a block which has a groove, *s*, in the direction of the rod, to receive it and keep it from accidental displacement. The thread runs across the block transversely to and beneath the rod, in a groove, *r*, which is cut in the block at right angles to and of the same depth as groove *s*. The rod is made elastic, and is arranged so as to press against the thread with force enough to hold it, except when the said lower needle draws the thread out.

By means of this invention work can be embroidered and ornamented, both with two threads and with one only, the stitch produced forming a double line of sewing by reason of the alternating forward movement of the needle O.

By changing the form of the guide Q any form of slit or cut can be worked, as, for instance, an eyelet-hole.

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

1. The grooved cylinder H, constructed substantially as described, for moving the needle forward and backward alternately, attached to or moved with the needle-arm of a reciprocating-needle.
2. The grooved cylinder H, in combination with the yielding finger G, substantially as described.
3. The eccentric on the lower end of the grooved cylinder for alternately moving the needle forward and backward, substantially as described.
4. Connecting the reciprocating needle O

with the grooved cylinder by means of an arm, J, applied substantially as above described.

5. The hollow flange *j* on the under side of the presser-foot, in combination with the guide Q, substantially as described.

6. The combination of the movable bed S with the loose guide Q, operating in conjunction, substantially as described.

7. The combination of the supplementary hook *f* with the needle O and the devices which move it forward and backward, substantially as above described.

8. The horizontal lower needle, C, made and operated substantially as described, in combination with the revolving hook *j* and a reciprocating needle O, moved forward and backward alternately, substantially as described.

JOHN McCLOSKEY.

Witnesses:

J. VAN SANTVOORD,
GUSTAVE DEITERICH.