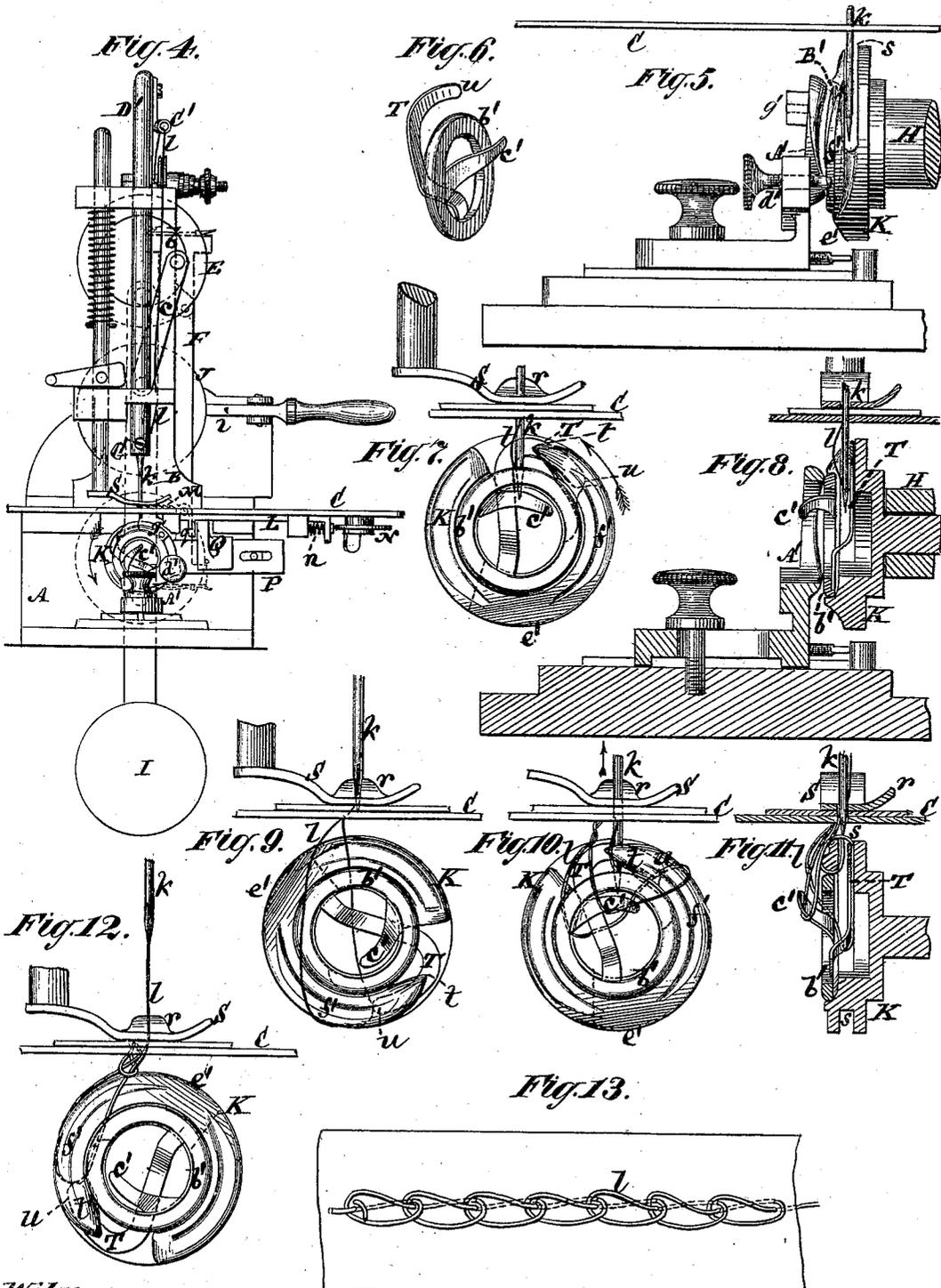




J. McCLOSKEY.  
SEWING-MACHINE.

No. 176,660.

Patented April 25, 1876.



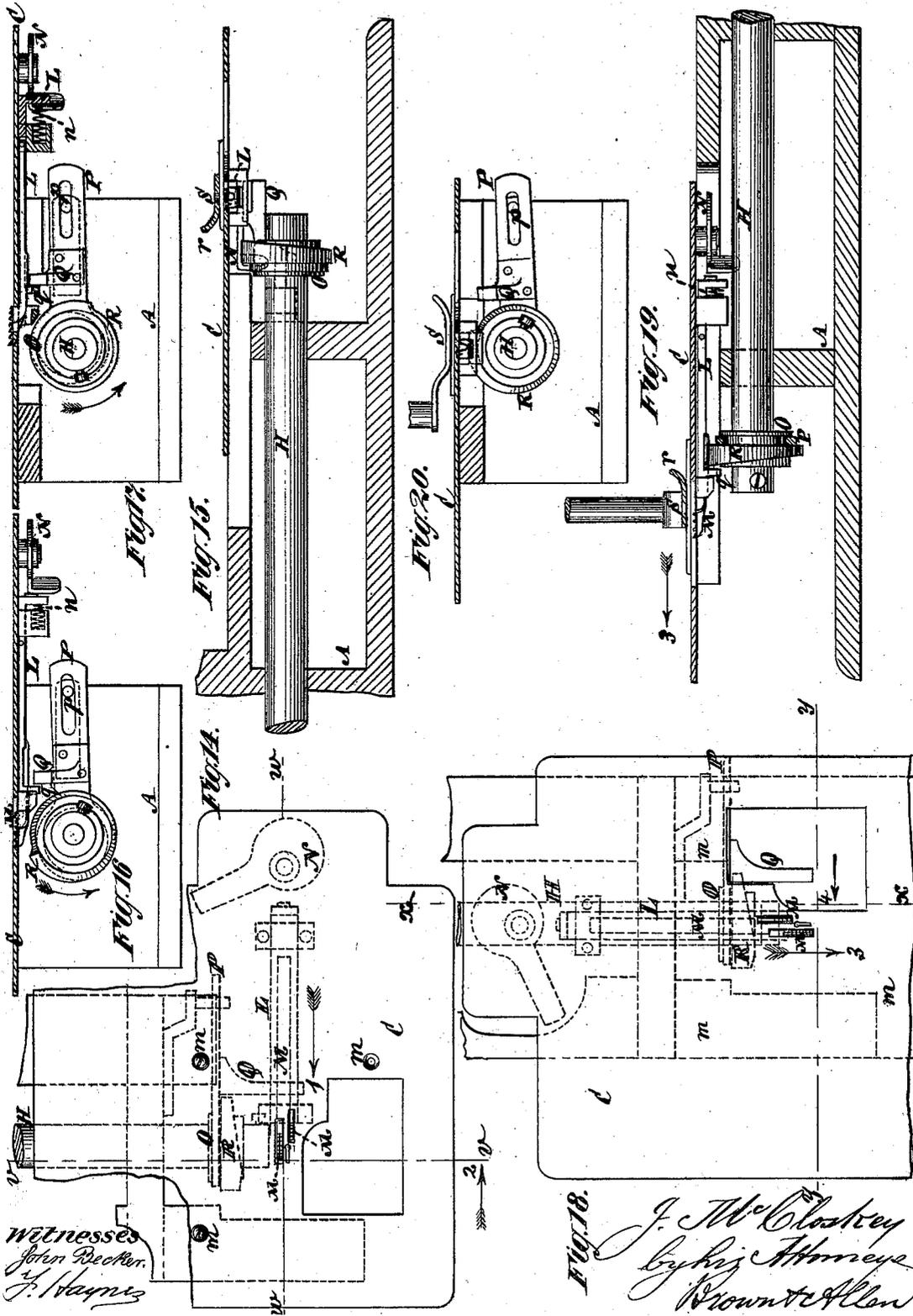
Witnesses  
John Becker  
Fred. Noyes

J. McCloskey  
by his Attorney  
Brown & Allen

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Witnesses  
John Beaton  
J. Hayes

Fig. 18.  
J. McCloskey  
by his Attorneys  
Brown & Allen

# UNITED STATES PATENT OFFICE.

JOHN McCLOSKEY, OF NEW YORK, N. Y.

## IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 176,660, dated April 25, 1876; application filed June 5, 1875.

### *To all whom it may concern:*

Be it known that I, JOHN McCLOSKEY, of the city, county, and State of New York, have invented certain new and useful Improvements in Sewing-Machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, which forms part of this specification.

One feature of this invention consists in novel mechanism for imparting a positive motion to the shaft (which actuates the needle-bar) continuously and without interruption throughout the entire revolution of the same, whereby a more steady, effective, and free motion of the said shaft is secured than has hitherto been found practicable. The invention further comprises certain novel and advantageous combinations of parts for operating the feeding-dog, for feeding the cloth in directions at right angles, or thereabout, to each other, and for, in other ways, facilitating the convenient and efficient operation of the machine.

Furthermore, the invention consists in certain loop detaining and transposing devices in connection with a rotating hook and a reciprocating needle for working a single thread to produce a chain-stitch, and, when a bobbin is used within the rotating hook, for producing a double or locked-thread stitch.

Figure 1 represents a side view of a sewing-machine having my invention applied; Fig. 2, a rear view of the same; Fig. 3, a vertical transverse section on the line *a' a'*; Fig. 4, a front view; Fig. 5, a side view of the rotating hook, with bobbin and screw for producing a double or locked-thread chain-stitch. Fig. 6 is a view, in perspective, of a supplementary hook for use in connection with the main rotating hook, the same forming a loop retaining and transposing device for the production of a single-thread chain-stitch. Fig. 7 is a front view of said hooks, in combination with the sewing-needle and presser-foot at the commencement of a stitch. Fig. 8, a vertical section of the same in a plane at right angles to the last-named figure; Figs. 9, 10, and 12, face views of like devices, in different positions, Fig. 12 showing the finishing action of the interlacing of the loops, before the tension,

however, is applied to lock them. Fig. 11 is a vertical section in a plane at right angles to Fig. 10, with the parts mainly in a corresponding position, but the rotating hook slightly in advance. Fig. 13 is a plan illustrating the chain-stitch produced. Fig. 14 is a plan of the feeding-mechanism and devices pertaining thereto, arranged to feed in transverse relation with the rotating-hook shaft, as indicated by the arrow, 1. Fig. 15, a longitudinal vertical section of similar parts, on the line *v v*, looking in direction of the arrow 2; Fig. 16, a front view of said devices, with the cloth-plate in section; Fig. 17, a transverse vertical section on the line *w w* in Fig. 14; Fig. 18, a plan of the feeding devices arranged to feed in direction of the length of the rotating-hook shaft, as indicated by arrow 3; Fig. 19, a longitudinal vertical section on the line *x x*, looking in direction of the arrow 4; and Fig. 20, a transverse vertical section on the line *y y*.

A is the bed portion of the machine; B, the goose-neck thereof, and C the cloth plate or table. D is the shaft which operates the needle-bar by means of a crank, *b*, and connecting-rod *c* at the forward end of said shaft. The rear end of the shaft D carries a double crank, E-E, the wrist-pins *d e* of which are at right angles to each other, or thereabout, and are coupled, by independent connecting-rods F G, with a corresponding double crank or wrist-pins, *f g*, carried by a lower driving-shaft, H. This combination of double cranks with their wrist-pins at right angles to each other, and rods connecting them, avoids all dead-center action in the driving of the machine, as incidental to a single-crank driving arrangement, and is much smoother and steadier; also, noiseless. The one, G, of the connecting-rods may be extended below its attachment to its lower wrist-pin, and be provided with a pendulous weight, I, which assists the rear or outside cranks in passing their dead-centers, and keeps the rod G in steady connection with its wrist-pins. Said pendulous weight, however, has a more important advantage when the rod F, either by accident or design—as, for instance, in case of the breakage of it or its wrist-pin—is dispensed with, and said rod F may be made with opening and

closing jaws at its ends, as clearly shown in Figs. 2 and 3, to admit of its removal. In this case—that is, when the driving-power is communicated through a single rod, G—then the power is conveyed to said rod by a crank or wrist pin, *h*, on a pulley, J, that becomes the driver instead of the shaft H, and which is made capable of sliding, by means of a clutch, *i*, to throw said wrist-pin *h* into or out of connection with the rod G at a point intermediate of its length. When the driving-power is thus applied, then the pendulous weight I assists, by the momentum it receives, in carrying the upper and lower cranks over their dead-center.

The shaft H carries at its forward end a rotating hook, K, which may be similar to that used in an ordinary Wheeler and Wilson machine, for operation in connection with the reciprocating needle *k*, which works the sewing-thread *l*; but said hook operates in connection with other devices, as hereinafter described, for changing the stitch.

The feed too, which is a four-motion one, is made capable of being changed, so as either to feed the cloth in a transverse relation with the shaft H, as indicated by arrow 1, in Fig. 14, or in parallel relation with said shaft from back to front of the machine, as indicated by arrow 3 in Figs. 18, 19.

To provide for this change in the direction of the feed, the cloth-plate C is attached by screws *m*, or other suitable fastenings, to the bed-portion A, arranged so that said plate may be readily detached and turned to occupy positions at right angles with each other, as shown in Figs. 14 and 18, and the same screws or fastenings may be used to hold it in either position, according to the direction of feed required. Said plate C, too, has the sliding bar L of the feed, which carries the rising and falling feeding-dog M, and which is controlled, as regards its back movement, by a spring, *n*, carried by it; also, the eccentric or other adjustable stop N, which regulates the length of feed to vary the size of the stitches, so that when changing the positions of the cloth-plate, as above described, these several devices are in their places and in proper working position for feed in either of the two directions specified. To give the several requisite four-motions of the feed, the weight of the pivoted dog M, and the action of the spring *n*, serve to effect the falling and back motions of said dog. To give the rising and forward motions thereto the following devices are employed:

On the shaft H, back of the rotating hook, is an eccentric, O, which reciprocates a bar, P, backward and forward, with freedom to rise and fall, by means of a free pin and slotted connection, as at *p*, of said bar in its rear. This gives the lift and forward motions to the feeding-dog M, when the feed is transverse to the shaft H, by means of an arm, Q, arranged to project from the face of the bar P, and so that when moving forward, in common with

the bar P, it lifts the forward portion of the dog M to bite on the cloth, and acts against a projection, *q*, on the slide L to give forward feed to said dog.

When it is required to feed parallel with the shaft H—that is, from back to front of the machine instead of across it, the cloth-plate C having been changed from the position represented for it in Fig. 14 to that shown for it in Fig. 18—then, to give the rising and forward motions to the dog M, a cam, R, also arranged on the shaft H, back of the rotating hook, operates, instead of the arm Q of the bar P, on the feeding-dog M to both lift the latter and to move it forward, the lift being produced by a rise or swell on the periphery of the cam, (see more particularly Figs. 16 and 17,) while the forward motion is produced by a beveled or spiral construction of the face of the cam. (See Figs. 14, 15, 18, and 19.) Thus the peripheral portion of said cam acts on the under side of the forward portion of the pivoted dog M and the cut-away or spirally-constructed face of the cam on the projection *q* of the slide L, which carries the dog. Furthermore, to effect the feed of the cloth in the two directions specified, the presser-foot S is not only turned up on its front end to provide for the free entrance of the cloth between it and the plate C, when the feed is in transverse relation with the shaft H, but said presser-foot is constructed with a back turned-up portion or rear lateral bent lip, *r*, to provide for the free entrance of the cloth between the presser-foot and the cloth-plate when the feed is in direction with or parallel to the length of the shaft H—that is, from the back to front of the machine.

That part of the invention which relates to the enchaining of the loops of the needle-thread—or, in other words, to the production of a simple chain or tambour stitch, as shown in Fig. 13—is more particularly illustrated in Figs. 6, 7, 8, 9, 10, 11, and 12 of the drawing. It refers to a combination, with a rotating hook, K, such, for instance, as used in a Wheeler and Wilson machine for taking the loop from a needle-thread—of a flat hook, T, made of a piece of thin sheet metal, and arranged to enter the groove *s*, provided in the main hook K for the entrance of the needle *k*, and so that the outer surface of the supplementary flat hook T lies behind the needle in its movement up and down within the main or rotating hook K, and so that the needle may pass between the flat hook T and the nose *t* of the main hook, as in a former invention of mine for making a locked-thread chain-stitch, for which Letters Patent were granted June 29, 1865.

In this previous invention the flat hook, the nose of which, as in the present case, points in a reverse direction to that of the main hook, was formed with a pivot which fitted into the eye of the bobbin that was inserted into the central cavity in the face of the main or rotating hook, and said bobbin and flat hook held

in place by an ordinary bobbin-ring, the operation being as follows: When the machine was set in motion the friction between the rotating hook, the bobbin, and a shoulder or disk connected with the main hook caused the blunt nose of the flat hook to remain in contact with the back of the throat of the main or rotating hook, to secure the joint rotation of the two hooks, so that the loop of the needle-thread would not only be extended by the rotating hook, but its side, which passed over the inner side or back of the bobbin, escaped past the heel of the rotating hook and the bend of the loop escaped past a separate brush or pad, which acted as a check, whereby the inner side of the loop back of the bobbin, instead of being drawn upward on the outer side of the needle, slipped over and passed behind the flat hook, and was thereby conducted behind the needle, so as to surround the new or next loop formed by the needle in its passage through the cloth; and, as the previous loop was drawn up toward the cloth by the extension of the new loop, said previous loop was drawn tightly around the new loop, thereby enchaining the loops with a locking-thread through them on the under side of the cloth.

Such is, substantially, the operation of the enchaining devices shown in Figs. 6, 7, 8, 9, 10, 11, and 12, of the accompanying drawing; but the bobbin within the rotating hook, as also a separate brush for detaining the thread, are dispensed with, and the flat hook T, the nose *u* of which points in the reverse direction to that of the main hook K, forms a part of, or is attached to, a ring, *b'*, which is fitted with a circular opening in the face of the main hook K, and so that the flat hook T lies within the groove *s* thereof, back of the path of the needle. Furthermore, said ring *b'* is formed or otherwise provided with a loop-detaining wing or arm, *c'*, bent to project outward, or in front of the ring, and taking the place of the separate brush previously used.

When the machine is in operation the blunt nose of the hook T remains in contact with the back of the throat or heel of the main hook K, so that the two hooks rotate in common.

Figs. 7 and 8 represent the main hook as about to catch the loop of the needle-thread *l*, which, as said hook continues its motion, is extended as represented in Fig. 9, and ultimately carried round the main hook; but, as the inner side of such loop escapes past the heel of the rotating hook, as shown in Fig. 10, it slips over and passes behind the flat hook T behind the needle *k*, while the other or outer side of the said loop, that has been detained by the wing or arm *c'* of the ring *b'*, passes off said wing, and, as a new loop, is carried down by the needle. (See Figs. 10 and 11.) The old loop, in the further operation of the parts, is made to surround or enchain within it the new loop, as shown in Fig. 12, and as the operation is continued the tension tightens the tambour or chain-stitch thus produced.

*A'* is the ring-frame, which holds the ring *b'* to its place in the main hook K, said ring-frame corresponding with the ordinary bobbin-ring used in well-known revolving hook and bobbin machines; but said ring-frame is here provided with a screw or loop check, *d'*, on the one side of it, and the face of the main hook K is constructed from its nose backward to the beveled portion *e'*, which gives the twist to the loop, with an approximate bearing-surface or channel, *f'*, for the point of the screw *d'*. This screw *d'* serves, when the ring *b'* with its hook T and wing or arm *c'* is dispensed with, to detain the loop of the needle-thread when a bobbin, *B'*, Fig. 5, carrying a locking-thread, is substituted for the ring *b'* in the main hook, for the same purpose as the wing or arm *c'* of the ring *b'*—namely, to produce an enchaining of the needle-thread loops, but with a locking-thread interlacing them. This is done by the point of the screw *d'* holding onto the outer side of the loop for a greater or less length of time, while the channel or surface *f'* travels past the point of the screw. Said screw or loop check *d'* may also serve as an additional loop-check or detainer in case of any breakage of the arm or wing *c'* when a single thread is being worked, and the ring *b'*, carrying the hook T, is substituted for the bobbin. In such case the screw *d'* may have an advance position given it by inserting it through an eye or boss, *g'*, or a change of position may be adopted for the screw *d'* in any case, according to the distention required for each loop, in succession, before it is liberated to enchain with or surround a new loop.

No restriction is here placed upon the direction of the main hook's rotation, which may be reversed, the other parts being made to correspond.

The needle-thread *l*, instead of passing through a short eye or guide on the upper portion of the needle-bar, as is usually the case, is passed through a tubular guide, *O'*, arranged to extend both in front and in the rear of the needle-bar *D'*, and carried by the latter, whereby snarling or twisting of the needle-thread, as so frequently occurs when a mere loop or short eye-guide is used, is avoided.

I do not, in this application, claim the mechanical movement constituted by the double system of wrist-pins *d e*, and their connecting-rods F G, aside from their combination and arrangement with reference to the needle-driving mechanism of a sewing-machine, as the aforesaid mechanical movement forms the subject-matter of another application filed by me on or about August 20, 1875.

I do not, in any wise, claim a single set of two wrist-pins, and a connecting-rod, used in connection with eccentrics, united by a second connecting-rod, and arranged for the specific purpose of throwing the single set of wrist-pins past their dead-centers, as I am aware that such is old, and, moreover, differs essentially from my herein-described combination, the latter exerting a positive and continuous

driving action upon the needle-operating shaft D, each set of wrist-pins and connecting-rod acting alternately to drive the shaft during the one-half of the revolution of the same.

What I do claim as my invention is—

1. The combination, with the shaft D, which actuates the needle-bar, of the crank, wrist-pins *d e*, arranged at right angles, or thereabout, with each other, the correspondingly-arranged wrist-pins *f g*, and the connecting-rods F G, substantially as described.

2. The needle-driving mechanism, comprising the double system of wrist-pins *d e*, the permanent connecting-rod G, the detachable connecting-rod F, and the weight I, attached to the wrist-pin of the rod G, whereby the needle-shaft may, on occasion, be driven either by a single rod and its connected wrist-pins, or by the double system of rods and pins, as described.

3. The arm or driver O, attached to the sliding and rocking eccentric bar P, in combination with the feed-operating eccentric O, the slide L, and the feeding-dog M, substantially as and for the purpose specified.

4. The flat or inner hook T, attached to or forming part of a ring or center-piece, *b'*, having a loop-detaining wing or arm, *c'*, in combination with the revolving hook K, for operation with reference to the needle, substantially as and for the purpose set forth.

5. The rotating hook K, provided with a groove or channel, *f'*, in combination with the ring-frame A and its loop-detaining screw or stop *d'*, substantially as and for the purpose set forth.

JOHN McCLOSKEY.

Witnesses:

HENRY T. BROWN,

MICHAEL RYAN.