No. 780,725. PATENTED JAN. 24, 1905.

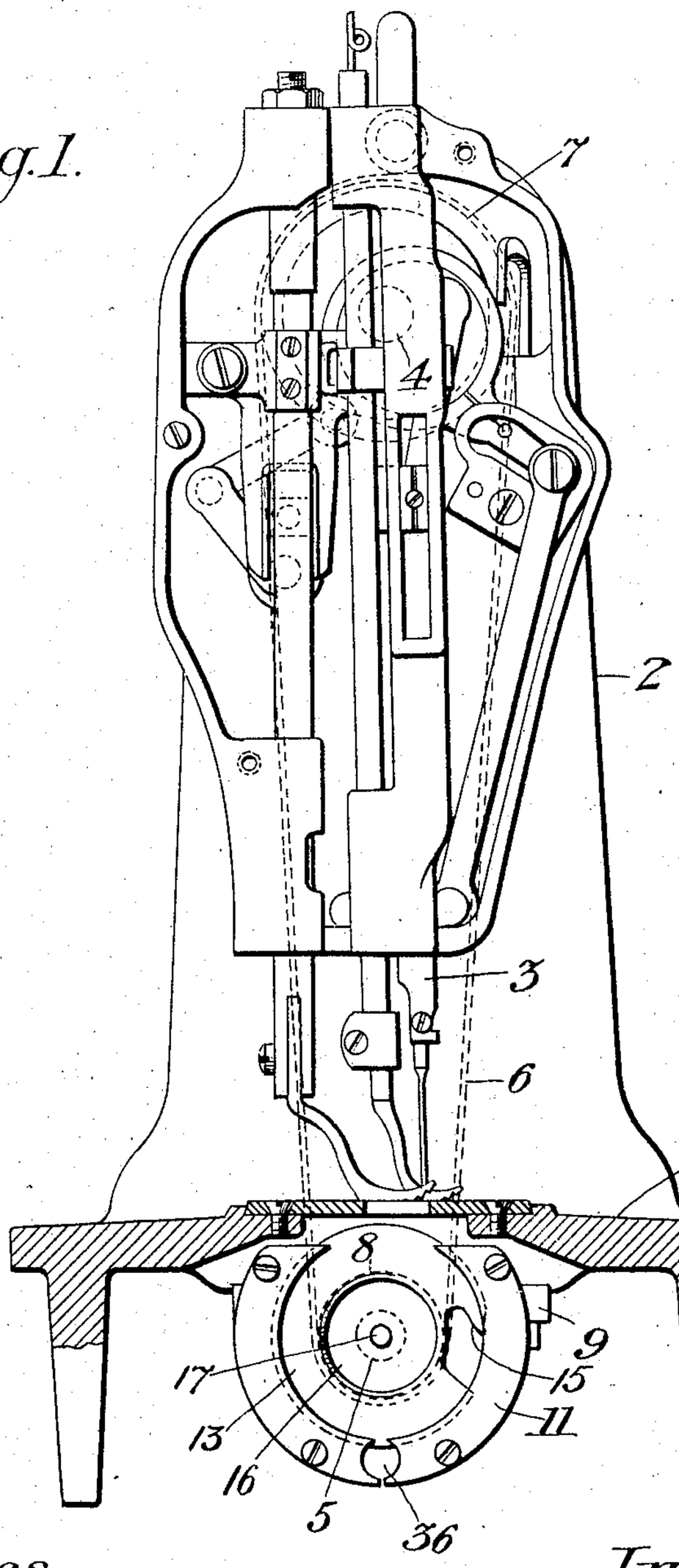
D. NOBLE.

SEWING MACHINE LOOP TAKER DRIVER.

APPLICATION FILED DEC. 2, 1903.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses:

Ada C. Briggs

E. C. Tinckel.

Inventor:

Donald Noble

by Wm. V. Tinckel

Atty.

No. 780,725. PATENTED JAN. 24, 1905.

D. NOBLE.

SEWING MACHINE LOOP TAKER DRIVER.

APPLICATION FILED DEC. 2. 1903.

2 SHEETS—SHEET 2.

Fig. 2.

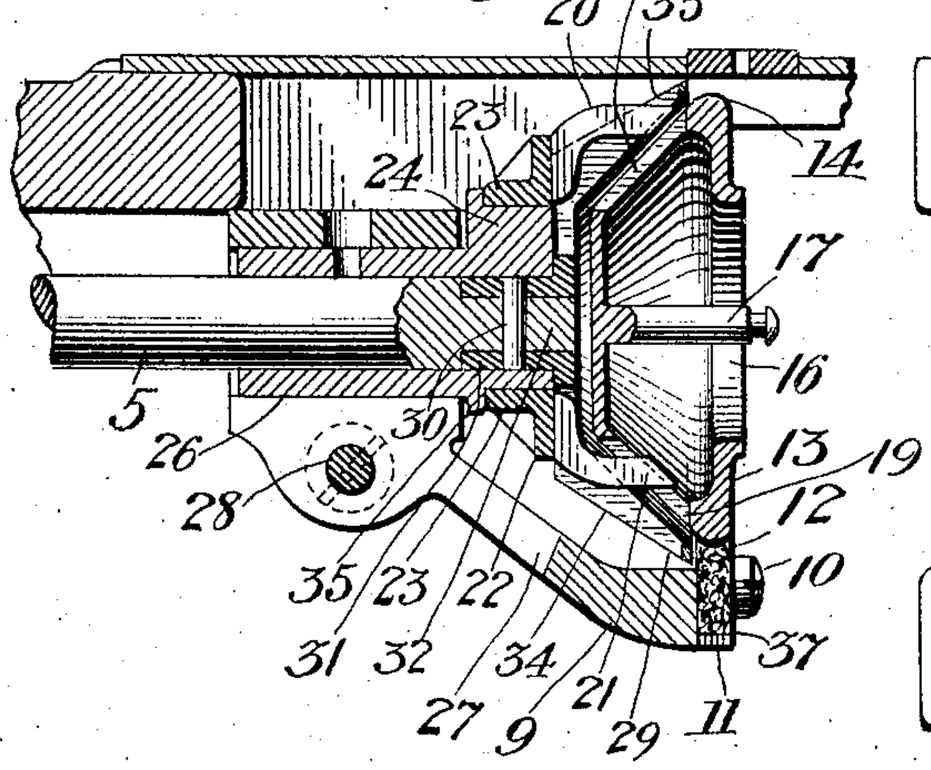


Fig. 3.

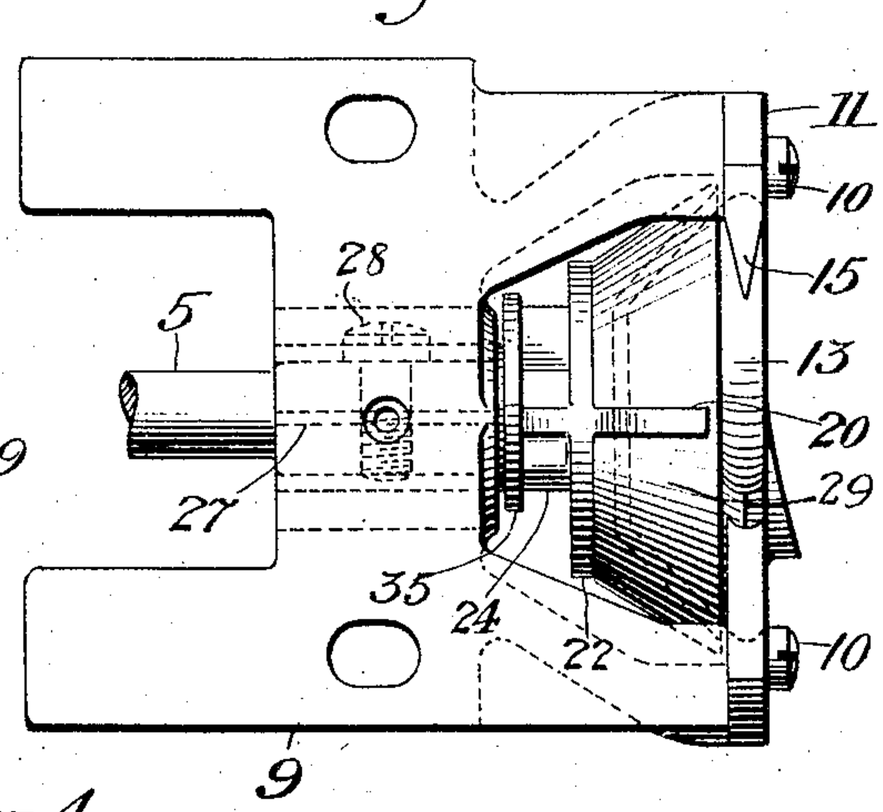


Fig. 4.

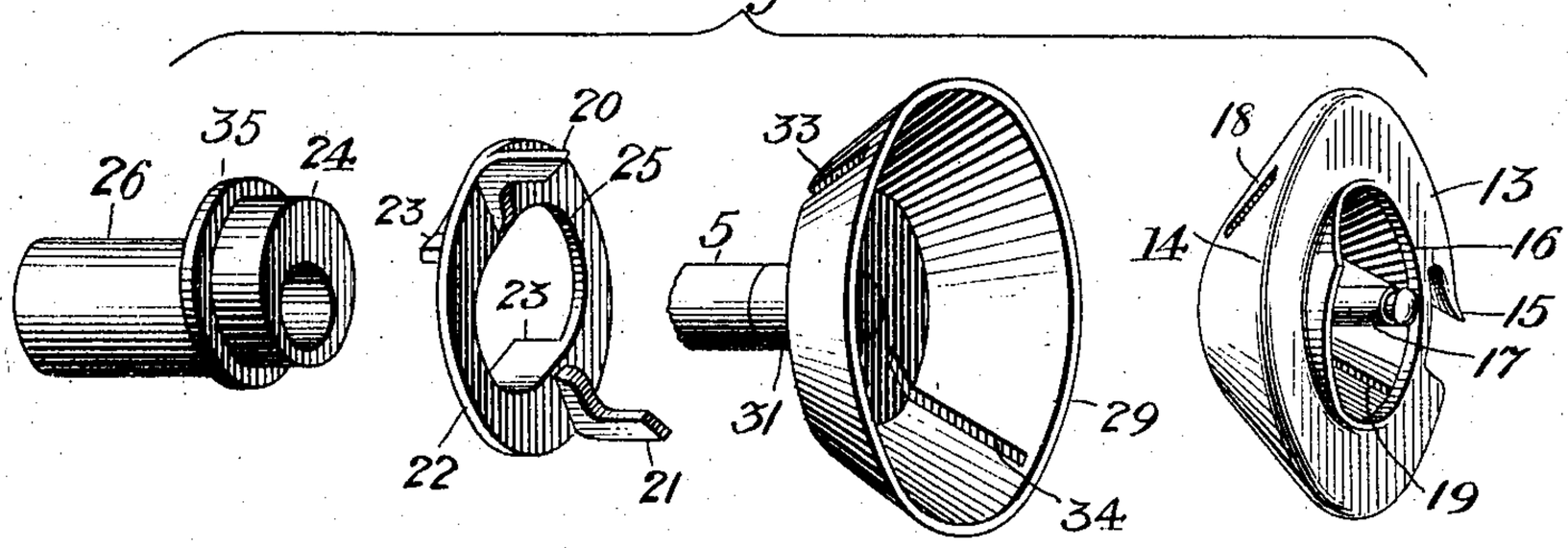


Fig. 5.

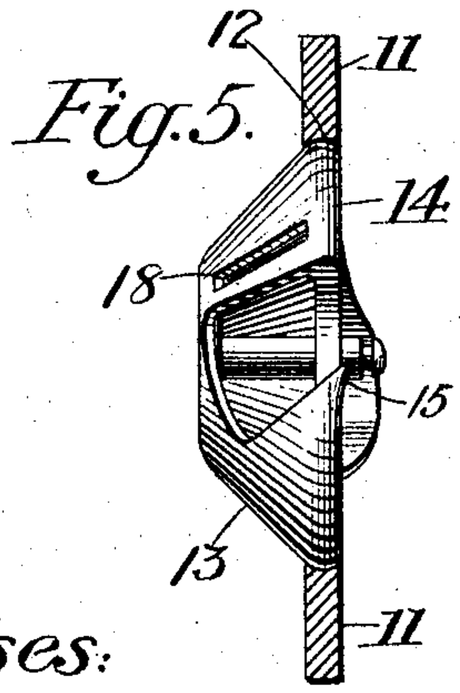
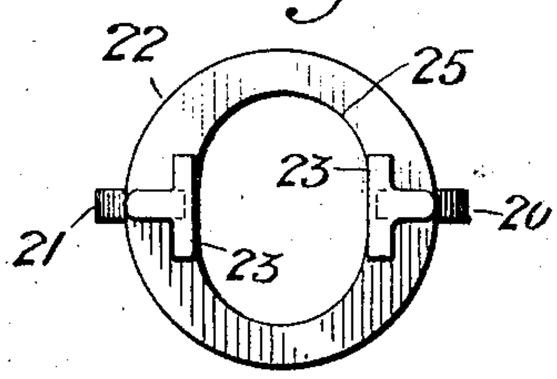


Fig. 6.



Witnesses:
Ada C. Briggs
E. A. Finckel.

Inventor:
Donald Noble
by Wm. N. Finckel
Atty.

No. 780,725. Patented January 24, 1905.

UNITED STATES PATENT OFFICE.

DONALD NOBLE, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO WHEELER & WILSON MANUFACTURING COMPANY, OF BRIDGEPORT, CONNECTICUT, A CORPORATION OF CONNECTICUT.

SEWING-MACHINE LOOP-TAKER DRIVER.

SPECIFICATION forming part of Letters Patent No. 780,725, dated January 24, 1905.

Application filed December 2, 1903. Serial No. 183,533.

To all whom it may concern:

Be it known that I, DONALD NOBLE, a subject of the King of Great Britain, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented a certain new and useful Improvement in Sewing-Machine Loop-Taker Drivers, of which the following is a full, clear, and exact description.

This invention relates to lock-stitch sewing-machines in which is used a loop-taker rotating within a raceway. Various mechanisms have been devised for rotating such loop-takers so as to prevent obstruction of the free passage of the needle-thread around it.

The present invention consists of a loop-taker driver which has a right-line reciprocation in addition to its rotary motion and is adapted to engage the loop-taker alternately at opposite points, so as to be free of contact with it at the place where the needle-thread is approaching and passing, the construction of said driver and coöperating parts being such as to completely house and protect the engaging ends of the driver from injury and prevent catching any loose ends of thread and winding same up and clogging the mechanism, all as I will proceed now more particularly to set forth and finally claim.

In the accompanying drawings, illustrating the invention, in the several figures of which like parts are similarly designated, Figure 1 is an end elevation of a Wheeler & Wilson upper-feed sewing-machine with the face-plate removed and the bed-plate, partly in section, provided with this invention. Fig. 2 is a vertical section of the loop-taker mechanism. Fig. 3 is a plan view of the loop-taker-supporting hanger or bracket with the loop-taker mechanism mounted therein. Fig. 4 is a detail perspective view of the loop-taker and parts of the driving mechanism detached. Fig. 5 is a detail horizontal section through the loop-taker raceway, showing the loop-taker in elevation circumferentially mounted therein. Fig. 6 is a rear elevation of the loop-taker claw.

The invention is herein shown in connection with an upper or needle feed machine; but of course it is not thus limited, since it is applicable to machines having any approved form of feed mechanism either above or below the work-support.

1 is the bed-plate of the machine, and 2 the overhanging arm, in which is mounted in any approved manner the reciprocating needle-carrying bar 3.

4 is the upper or driving shaft.

5 is the lower or hook-driving shaft, suitably journaled beneath the bed-plate and connected with the upper shaft 4 by a belt 6, which runs over pulleys 7 and 8, secured, respectively, on said shafts. The relative proportions of said pulleys 7 and 8 are such that the lower or hook-driving shaft 5 will make two revolutions to one of the upper shaft 4.

9 is a hanger or bracket attached to the under side of the bed-plate and having secured thereon by screws 10 a raceway 11, having an inner rounded groove 12, within which is journaled the loop-taker or hook 13, the periphery 14 of the latter being rounded in cross-section to correspond with said groove. The loop-taker or hook 13 is provided with a suitably-shaped loop-seizing point 15 and has a central opening 16 and post 17 to accommodate the bobbin-case, (not shown,) and said post 17 is rigid with the hook and projects from the center thereof. The back of the hook is shaped similar to the frustum of a cone and is provided with radial slots 18 and 19, preferably located diametrically opposite each other, which coöperate with fingers 20 and 21, extending from the hook-driver claw 22. Said claw 22 is also provided with flat bearing-lugs 23, which straddle and coöperate with a stationary eccentric 24, and it has an elongated opening 25 to admit of a sliding action upon the eccentric. This eccentric is formed on the end of a bushing 26, surrounding the hook-driving shaft 5, and held in place within the bracket 9 in any suitable manner, preferably by slitting said bracket, as shown at 27, and drawing its parts together by a screw 28 after the manner of a pinch-joint.

29 is a frusto-conical flange secured rigidly on the end of the hook-driving shaft 5, as by

a pin 30, which passes through a hub 31, formed on said flange and fitted over the reduced or shouldered end 32 of said shaft. This flange is herein referred to as the "hook or loop-taker receiver."

33 and 34 are radial slots in the receiver 29, with which the fingers 20 and 21 of the hook-driver claw 22 are in constant engagement and beyond which they are alternately projected, so as to enter the slots 18 and 19 in the back of the hook 13. It will be observed that the radial slots 33 and 34 do not extend clear through the outer edge of the receiver, the latter at its front edge, as shown in Fig. 4, having a continuous unbroken wall, against which the upper thread-loop draws in its passage around the hook, thus guarding said thread against being caught and broken by contact with both the slots in the receiver and the fingers guarded thereby.

The eccentric 24 is provided with a flange 35 at its rear, against which the edges of the bearing-lugs 23 abut, so as properly to hold the fingers 20 and 21 in operative relation with the radial slots 33 34 in the receiver 29.

The raceway 11 is preferably made of two sections for convenience in adjustment to take up wear, an aperture 36 being left between these sections, wherein suitable absorbent material 37, saturated with oil, may be placed to lubricate the periphery 14 of the hook.

The operation is as follows: Rotation of the shaft 5, and consequently the receiver 29 mounted thereon, carries the hook-driver claw 22 around the eccentric 24, which causes the fingers 20 and 21, coöperating respectively with the slots 33 and 34 in the receiver and the slots 18 and 19 in the back of the hook, to successively enter and withdraw from said slots during the rotation of the hook, and thereby rotate said hook. The arrangement of the fingers is such that one finger will be securely entered within one of the slots before the other finger, coöperating with the opposite slot, can withdraw, the effect being to cause said fingers to alternate in driving the hook. Sufficient throw of the eccentric 24 is provided to allow ample space for the thread loop to pass between the back of the hook and ends of the fingers, and said eccentric may be adjusted by rotating the bushing 26 to produce the openings or space between the ends of said fingers and back of the hook at the proper time to allow the passage of the thread loop, as will be readily understood, the timing of said eccentric being such that while the loop is passing between the end of the finger 20 and the back of the hook the latter is being driven by the finger 21 and while said loop is passing between the latter finger and the hook the first-mentioned finger 20 will effect the driving. The receiver being positively driven and the fingers of the driver-claw being in constant engagement with its slots effects the rotation of the driver-claw about the eccentric, and since said driver-claw has a sliding motion upon the eccentric while the receiver has a fixed axis of rotation it follows that the fingers must engage first one and then the other of the slots in the hook, it being understood that the hook has its slots alined with those in the receiver. Moreover, it is to be noted that the driver-claw has a compound movement—namely, the rotary movement imparted to it by the receiver and the reciprocating motion imparted to it by the eccentric—and that its connection with the hook-receiver and hook is constant and there are no pivots or other joints liable to wear and so disturb the timing of the coöperating parts. In power-machines driven at high speeds these advantages are of the utmost importance in securing evenly-stitched seams without skipping and without liability of broken and snarled threads. This compound movement of the driver-claw may be described as an "up-and-down and sidewise" movement, and it is effected in a single vertical plane, as opposed to the vibrating or rocking motion common to prior constructions using a pivotal claw.

What I claim is—

1. In a sewing-machine, a radially-slotted loop-taker, and a loop-taker driver comprising a rotary receiver for the loop-taker having opposite radial slots, a stationary eccentric, a driver-claw having an elongated opening and mounted upon said eccentric and capable of rotating around it and provided with oppositely-arranged forwardly-projecting fingers in constant radially-shifting engagement with the slots in the receiver, whereby said driver-claw is revolved about said eccentric and by said eccentric moved radially to bring its fingers into alternate engagement with the slots in the loop-taker as said receiver and loop-taker are rotated, the outer wall of the receiver beyond the slots being continuous and unbroken and thereby guarding the mechanism against injury and liability of thread-clogging.

2. In a sewing-machine, a hook-driving rotary shaft, a hook-receiver fast on said shaft and provided with opposite radial slots bounded upon all sides by the solid wall of the receiver, a hook having radial slots and arranged in said receiver, a raceway in which the hook is supported and rotates, a stationary eccentric, a flange thereon, and a driver-claw loosely mounted upon said eccentric and confined thereon between its flange and the receiver, and having fingers projecting therefrom and in constant radially-shifting engagement with the receiver-slots whereby said driver-claw is revolved about said eccentric and by said eccentric moved radially to bring its fingers into alternate engagement with the slots in the hook as said receiver and hook are rotated.

3. In a sewing-machine, a hook-driving

shaft, a frusto-conical hook-receiver fast thereon and provided with opposite radial slots, a frusto-conical hook having radial slots and arranged in said receiver, a supporting-raceway for said hook, a stationary eccentric, and a driver-claw loosely mounted upon said eccentric and provided with an elongated opening and eccentric-engaging lugs, and also having fingers projecting from it and in constant radially-shifting engagement with the receiver-slots and adapted thereby to alternately engage the slots in the hook as said receiver and hook are rotated, said driver-claw being carried around said eccentric by the rotating hook-receiver.

In testimony whereof I have hereunto set my hand this 1st day of December, A. D. 1903.

DONALD NOBLE.

Witnesses:
ABBIE M. DONIHU,
C. N. WORTHEN.