No. 785,168. PATENTED MAR. 21, 1905

M. HEMLEB.

REVOLVING HOOK SEWING MACHINE.

APPLICATION FILED MAY 7, 1904.

3 SHEETS—SHEET 1.

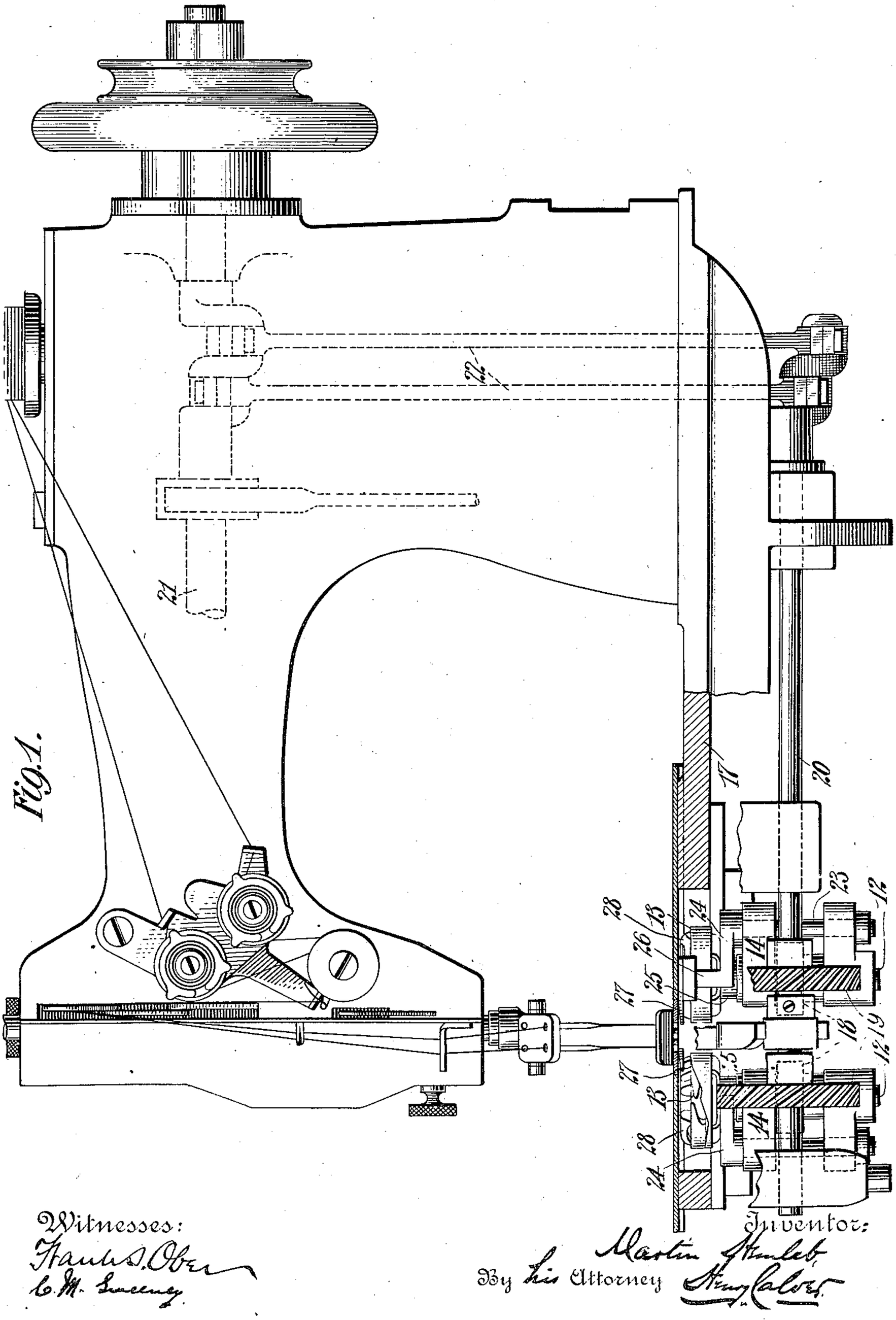

Fig. 1.

Witnesses:
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C. M. Sweeney.

Inventor:
Martin Hemleb,
By his Attorney Strong & Coleman.

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3 SHEETS—SHEET 2.

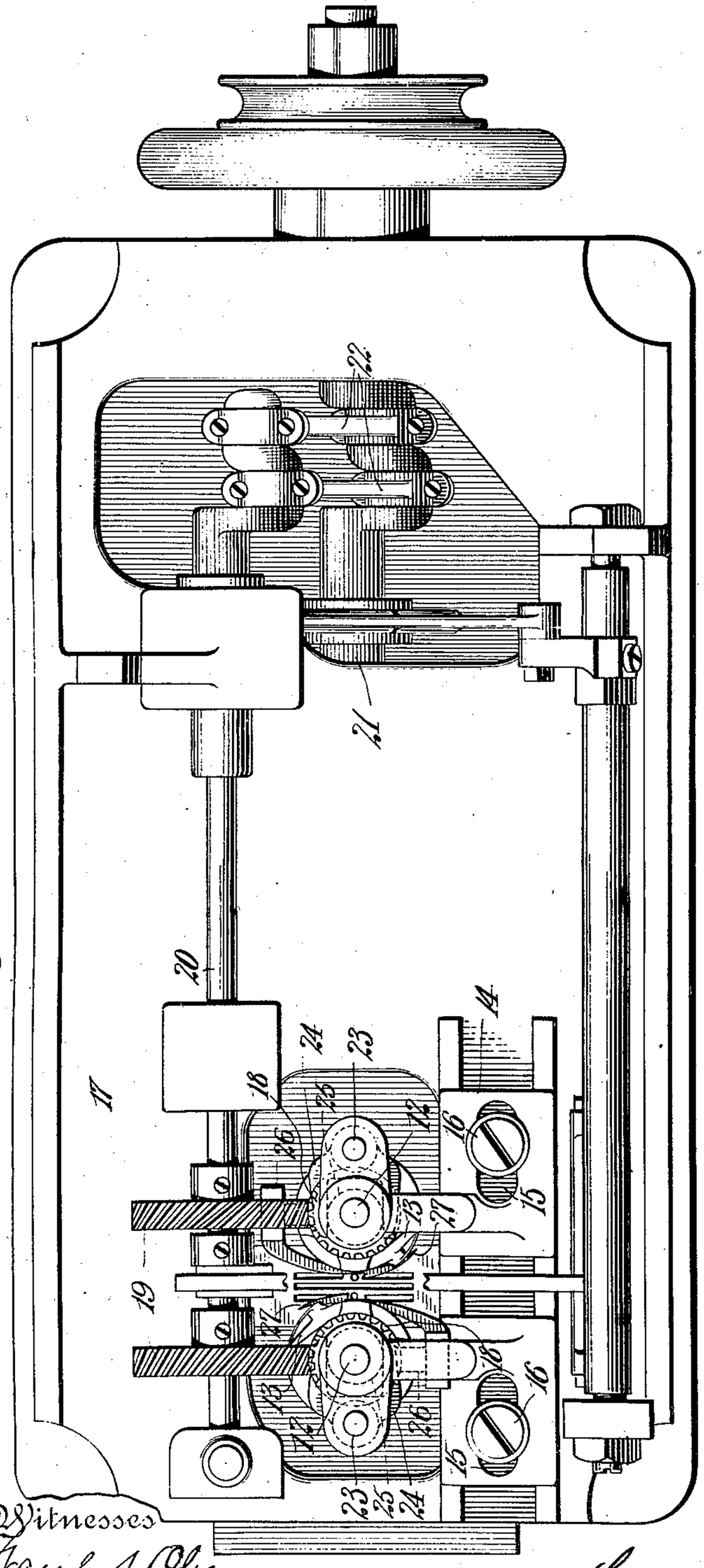

Fig. 2.

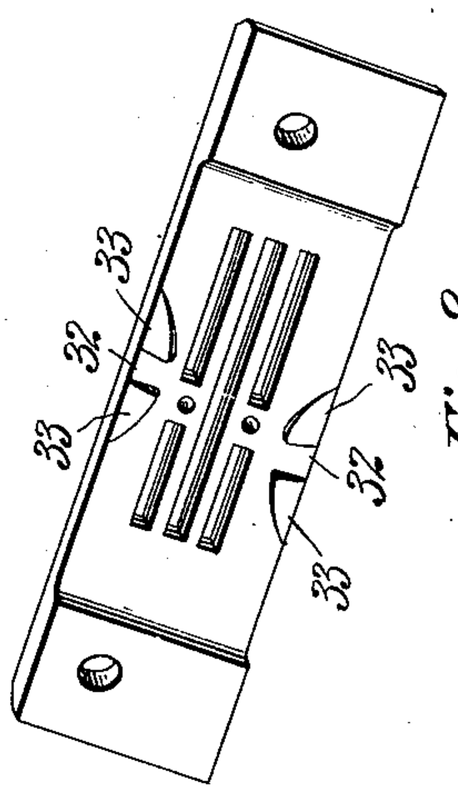

Fig. 8.

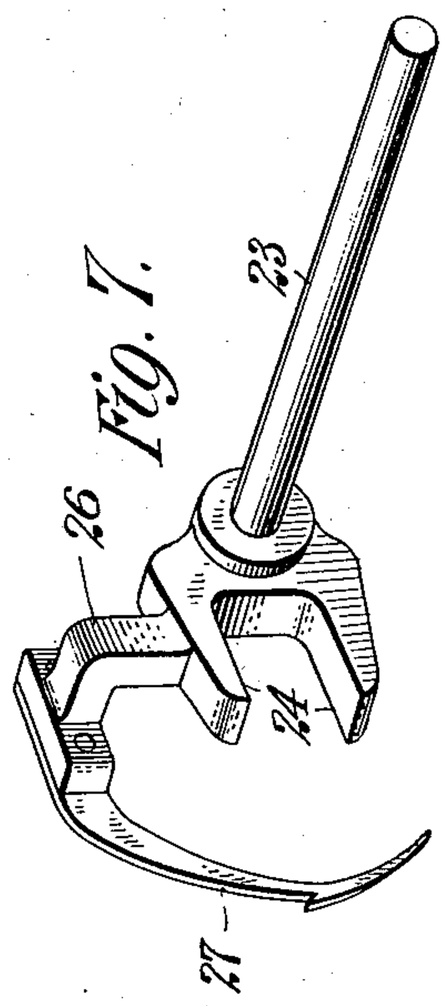

Fig. 7.

Witnesses
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3 SHEETS—SHEET 3.

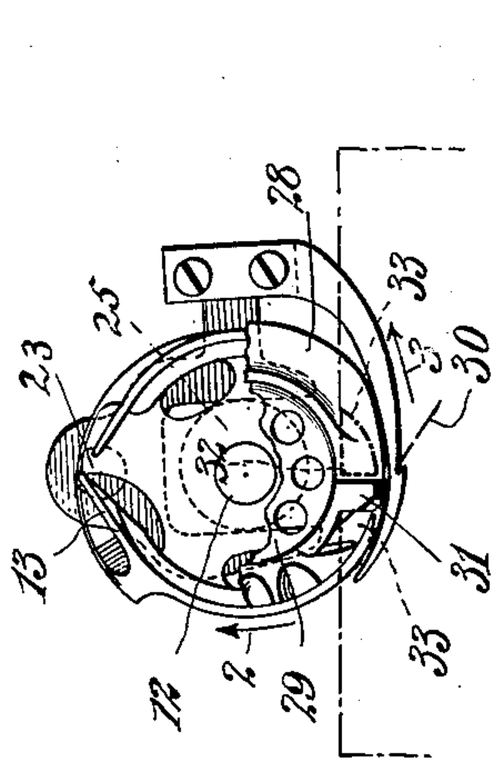

Fig. 5.

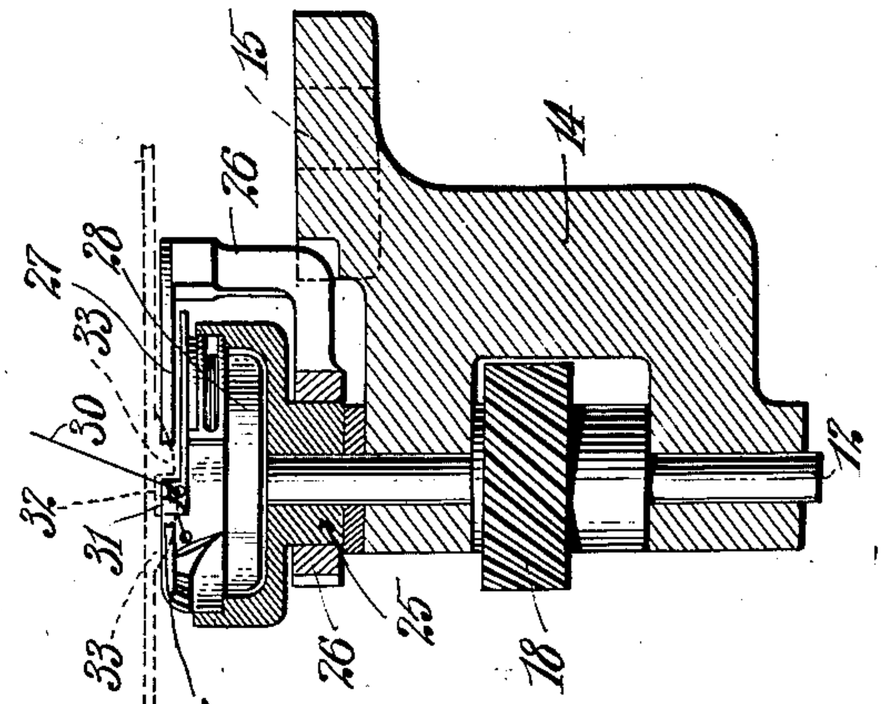

Fig. 6.

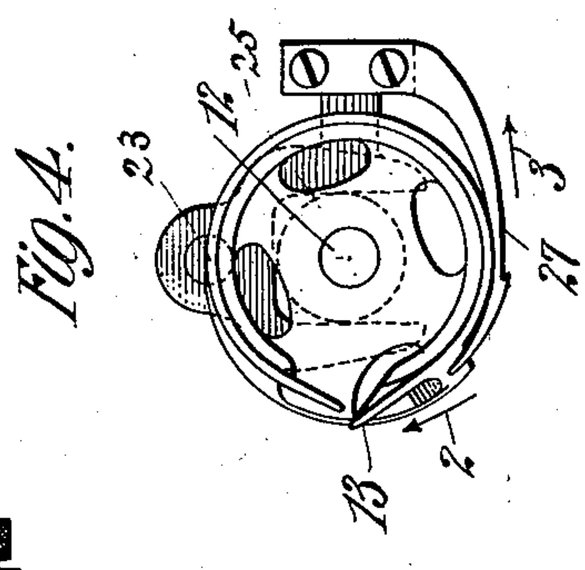

Fig. 4.

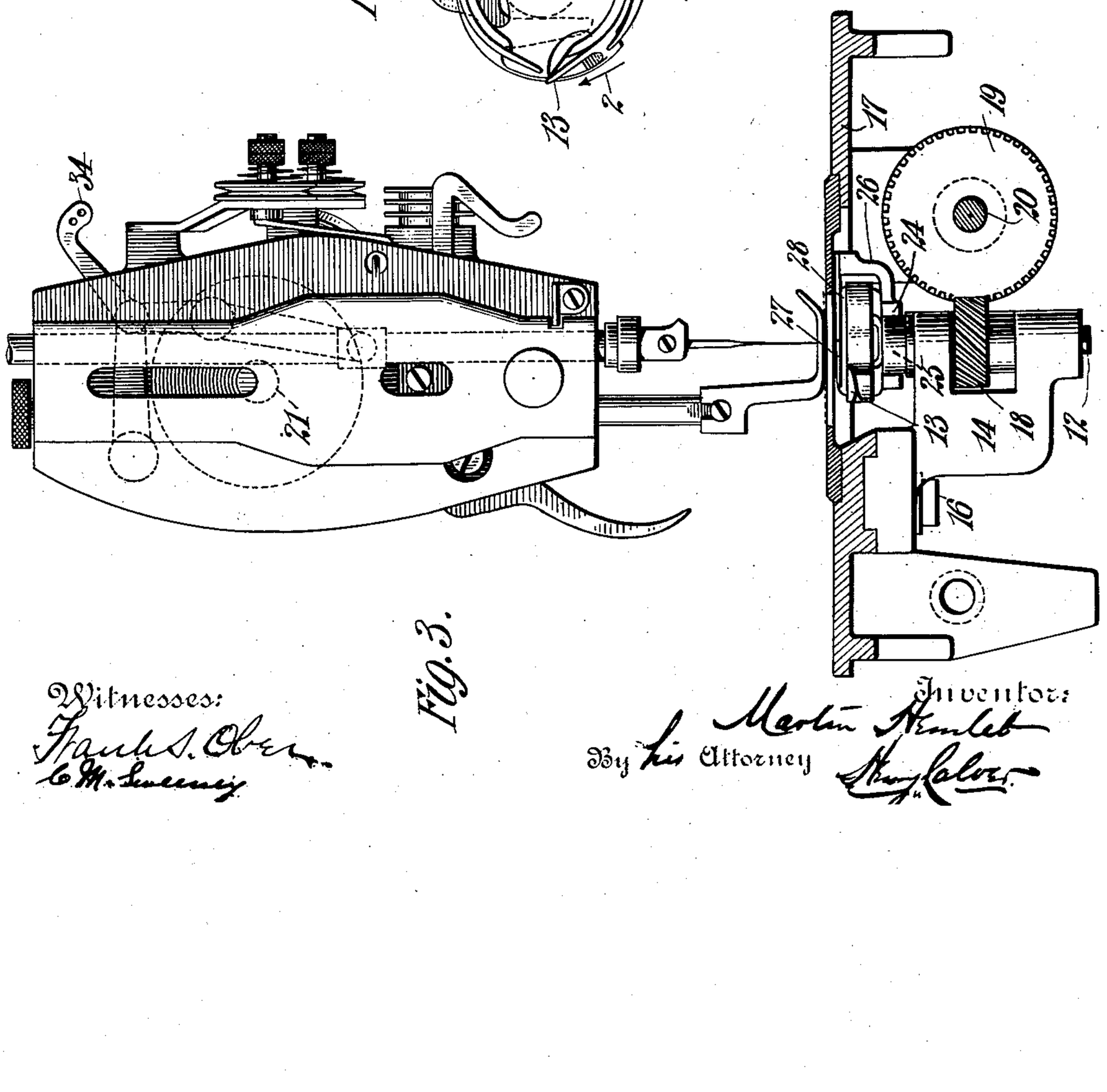

Fig. 3.

Witnesses:
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C. M. Sweeney

Inventor:
Merlin Hemleb
By his Attorney
Thos. Lalor

No. 785,168. Patented March 21, 1905.

UNITED STATES PATENT OFFICE.

MARTIN HEMLEB, OF ELIZABETH, NEW JERSEY, ASSIGNOR TO THE SINGER MANUFACTURING COMPANY, A CORPORATION OF NEW JERSEY.

REVOLVING-HOOK SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 785,168, dated March 21, 1905.

Application filed May 7, 1904. Serial No. 206,929.

To all whom it may concern:

Be it known that I, MARTIN HEMLEB, a citizen of the United States, residing at Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Revolving-Hook Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to revolving-hook lock-stitch sewing-machines, and more particularly to that class of such machines in which the hooks or loop-takers are arranged horizontally and receive within them centrally-located bobbin-cases, which are restrained from rotating with the hooks or loop-takers by engagement with stationary lugs or projections on the throat-plates or other suitable parts of the machines.

The present invention has for its object to provide a take-up or stitch-tightening and pull-off device or thread-controller for the bobbin-thread which is so timed in its operation relative to the needle-thread take-up as to properly set the lock-stitches in the work and then pull off bobbin-thread for the next succeeding stitch and which is also so timed relative to the movements of the revolving hook and needle as to assist in opening the thread-passages between the stationary lug or projection and the bobbin-case, which restrains the latter from moving with the hook, as also to hold the bobbin-thread to the proper side of the descending needle, so as to avoid the formation of twisted or knotted stitches. Also in the preferred form of the invention the bobbin-thread controller or take-up is mounted in the bracket in which the hook-shaft and hook are mounted and is operated from a cam or eccentric on the hook-shaft, and as the said bracket is detachably and preferably adjustably secured to the bed of the machine the thread-controller is always in operative relation to the hook or loop-taker notwithstanding that the position of the latter on the bed or work plate of the machine may be changed, as is desirable in two-needle machines to vary the distance apart of the lines of stitching, and if it becomes necessary or desirable to remove the hook-shaft and hook from the machine by removing the supporting-bracket the operative relation of the hook and thread-controller will be undisturbed. In other words, the invention in its preferred form may be said to be "self-contained" in a single adjustable or removable bracket.

In the accompanying drawings, Figure 1 is a side view, partly broken out, of a two-needle machine embodying the invention. Fig. 2 is a bottom view, and Fig. 3 a front end view, partly in horizontal section, of the same. Fig. 4 is a detail plan view showing the rotary hook and the rocking thread-controlling hook. Fig. 5 is a similar view of these parts, but showing also a portion of the bobbin-case in full lines and a portion of the throat-plate in dotted lines. Fig. 6 is a detail sectional view showing the rotary hook and its shaft and bearings with the bobbin-case in elevation and with the throat-plate represented in dotted lines. Fig. 7 is a detail view of the oscillating thread-controlling hook, the yoke by which it is carried, and the rock-shaft to which said yoke is attached; and Fig. 8 is a detail under side perspective view of the throat-plate.

The two-needle machine herein illustrated is the same in general construction and operation as that shown and described in United States Patent No. 741,035, dated October 13, 1903, and the description of this machine herein may therefore be limited to the novel features comprising the present invention and the parts immediately coöperating therewith.

The hook-shafts 12, carrying the rotary hooks or loop-takers 13, are mounted in brackets 14, which are separate from or independent of the bed or work plate of the machine and which are adjustably secured by means of slots 15 and set-screws 16 to the said bed or work plate 17 and are connected by spiral gears 18 and 19 to the lower rotating shaft 20, so as to have a two-to-one rotating movement relative to the said shaft 20, which is in turn operated from the main or needle-bar driving-shaft 21, so as to rotate coincidently therewith by the pitmen 22, connecting twin cranks on said shafts. From this construction it results that

two rotations will be imparted to the hooks or loop-takers to each reciprocation of the needle-bar and needles operated from the shaft 21. As the invention is adapted for use in a single-needle machine as well as in the two-needle machine herein illustrated, the said invention will now be described in its single form, although herein shown in duplicate.

Mounted in a bracket 14 is a rock-shaft 23, provided with a yoke 24, embracing an eccentric 25 on a rotating hook-shaft 12, said yoke having an arm 26, to which is attached a take-up and pull-off or thread-controlling hook 27, working adjacent to the periphery of the rotating hook or loop-taker 13, which receives the centrally-arranged bobbin-case 28, containing the bobbin 29. The thread-controlling hook 27 is arranged slightly above the top of the rim of the said rotating hook or loop-taker in such position as to engage the lower thread 30, running from the bobbin-case to the work, said thread issuing from said bobbin-case just below said hook 27, so as to pass beneath and then outside of said hook on its way up through the throat-plate to the work.

The bobbin-case 28 is provided on its upper face near its periphery with a small lug or projection 31, which is loosely received in a recess or notch 32 between depending lugs or projections 33 on the under side of the throat-plate, so that the said bobbin-case is thus held stationary while the hook or loop-taker 13 rotates around it. The rotation of the hook or loop-taker 13 in the direction of the arrow 2 in Figs. 4 and 5 frictionally presses the lug or projection 31 on the bobbin-case against one of the depending throat-plate lugs or projections 33; but just before a loop of needle-thread is to pass between the lug 31 and the lug 33, against which said lug 31 is frictionally pressed by the rotation of the hook or loop-taker 13, the thread-controlling hook 27 is moved slightly by its operating-eccentric 25 in the direction denoted by arrow 3, Figs. 4 and 5, or in a direction opposite to the direction of rotation of the loop-taker 13, and by pulling on the tensionally-held bobbin-thread the said thread-controlling hook 27 rocks the bobbin-case slightly, so as to open a free thread-passage between the lug 31 on the bobbin-case and a lug 33 on the throat-plate, the opposing lug 33 preventing too great a rocking movement of the said bobbin-case. As soon as the loop of needle-thread has passed through the thread-passage just referred to and before the said needle-loop is ready to be finally cast off from or over the bobbin-case the reverse rocking movement of the thread-controlling hook 27 in a direction opposite that denoted by the arrow 3, Figs. 4 and 5, will enable the rotating loop-taker 13 to frictionally restore the bobbin-case to its first position, thus opening a thread-passage between the other side of the lug 31 and a lug 33 for the final escape of the loop of needle-thread from the bobbin-case and around the bobbin-thread. The rotating hook or loop-taker 13 now performs its second or idle rotation while the stitch is being tightened by the take-up 34 and the work is being fed by the feed-dog of the machine, and after the said take-up 34 has drawn up the locked threads of the stitch to the upper surface of the work and is about to draw needle-thread from the spool for the next succeeding stitch the take-up and pull-off or thread-controlling hook 27 again engages the bobbin-thread, and by pulling thereon in opposition to the pull of the said needle-thread take-up 34 draws down the locked threads into the work and finally sets the stitch and pulls off bobbin-thread for the next succeeding stitch. The parts are so timed that this final take-up movement and the pull-off action of the thread-controller 27 occur just as the needle is entering the work for the next stitch, and thus the said thread-controller 27 is utilized to hold the bobbin-thread to the proper side of the path of the point of the descending needle, so as to avoid an improper twisting or knotting of the threads, which might occur but for the action of the said thread-controller to the impairment of the appearance of the seam being formed.

The invention is not to be understood as being limited to the details herein shown and described, as these may be varied considerably without departing from the essence of the invention.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. In a lock-stitch sewing-machine, the combination with a stitch-forming mechanism comprising a hook or loop-taker rotating in a horizontal plane and a normally stationary bobbin-case within said hook or loop-taker, of a horizontally-swinging bobbin-thread take-up and pull-off device arranged adjacent to the rim of the said horizontally-rotating loop-taker and engaging the lower thread between the bobbin-case and the throat-plate, means for imparting two rotations to the said loop-taker to each reciprocation of the needle, and means for reciprocating said pull-off and take-up device at each rotation of said loop-taker so as to enable it to open a thread-passage at one rotation of the said loop-taker and to perform a take-up and pull-off movement at the next rotation of said loop-taker.

2. In a lock-stitch sewing-machine, the combination with a stitch-forming mechanism comprising a hook or loop-taker rotating in a horizontal plane, of a shaft by which said hook or loop-taker is carried, a bobbin-case in said hook or loop-taker, an adjustable bracket, independent of the bed or work plate of the machine, in which said shaft is mounted, a bobbin-thread-controlling device and means for operating the same, also mounted in said bracket, said controlling device comprising a vertical rock-shaft and a horizontally-vibrat-

ing hook moving with said shaft and engaging the bobbin-thread between the bobbin and the work, and means, independent of said controlling device, for restraining rotation of said bobbin-case with said hook or loop-taker.

3. In a lock-stitch sewing-machine, the combination with a stitch-forming mechanism comprising a hook or loop-taker rotating in a horizontal plane, and a bobbin-case in said hook or loop-taker, of a rotating shaft by which said hook or loop-taker is carried, a detachable and adjustable bracket, which is independent of the bed or work plate of the machine, in which said shaft is mounted, a bobbin-thread-controlling device, a rock-shaft also mounted in said bracket and provided with a yoke carrying said thread-controlling device, and an eccentric, on the rotating hook-carrying shaft, embraced by said yoke.

4. In a lock-stitch sewing-machine, the combination with a needle and its operating mechanism, of a hook or loop-taker rotating in a horizontal plane, a bobbin-case in said hook or loop-taker, means for imparting two rotations to said hook or loop-taker to each reciprocation of said needle, a bobbin-case in said hook or loop-taker, a bobbin-thread-controlling device mounted adjacent to said hook or loop-taker, and means for imparting a vibration to said thread-controlling device to each rotation of said hook or loop-taker.

5. In a lock-stitch sewing-machine, the combination with a stitch-forming mechanism comprising a vertically-reciprocating needle and a horizontally-rotating hook or loop-taker, of a shaft by which said hook or loop-taker is carried, a bobbin-case in said hook or loop-taker, a bracket, separate from the frame of the machine, in which said shaft is mounted, means for imparting two rotations to said shaft to each reciprocation of said needle, a horizontally-vibrating bobbin-thread-controlling device also mounted in said bracket, adjacent to said hook or loop-taker, and an eccentric on said shaft operatively connected with said thread-controlling device and serving to impart a vibration to said thread-controlling device to each rotation of said shaft.

In testimony whereof I affix my signature in presence of two witnesses.

MARTIN HEMLEB.

Witnesses:
HENRY J. MILLER,
H. C. KORNEMANN.