(No Model.)

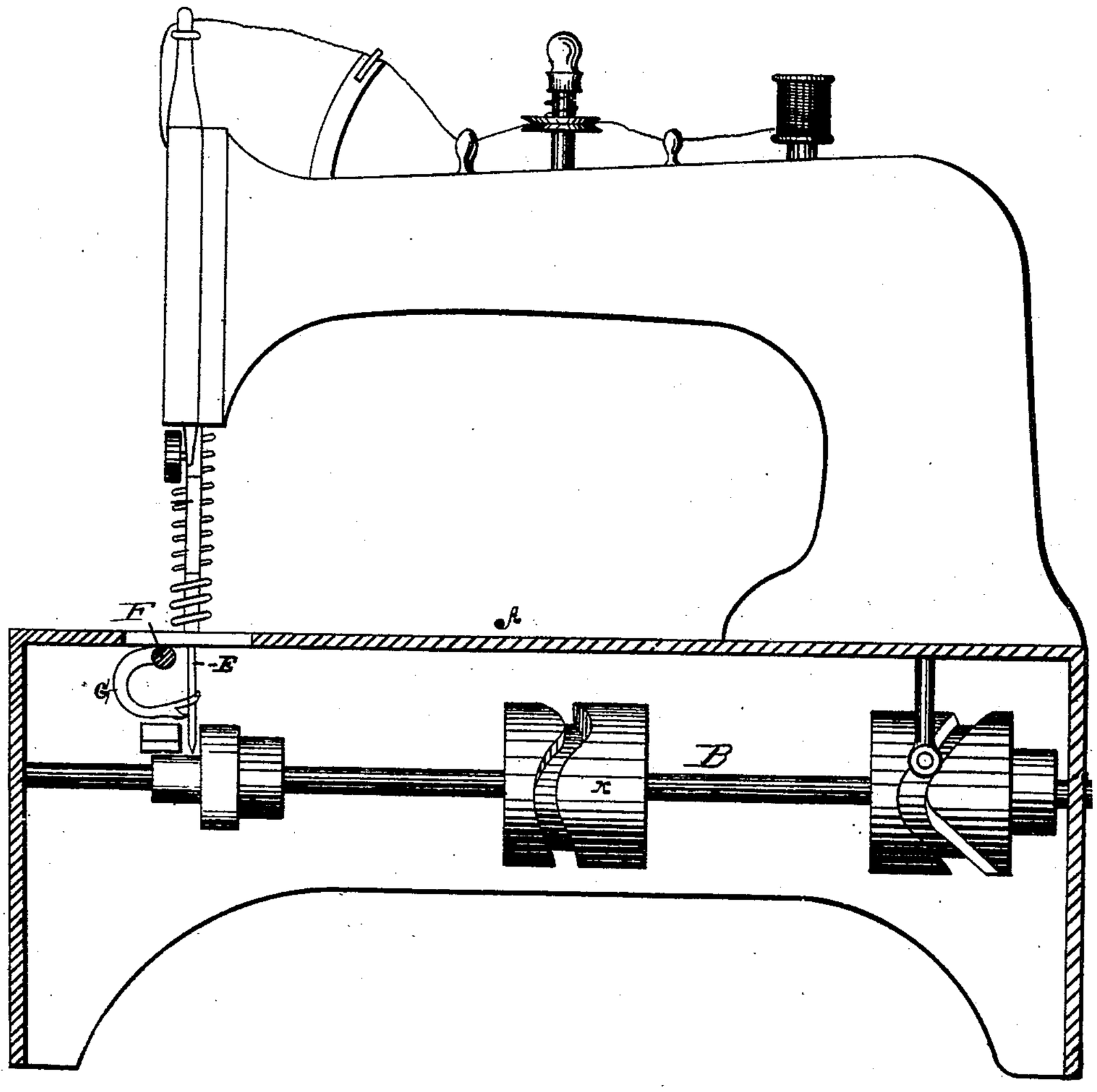
4 Sheets—Sheet 1.

E. KOHLER.

SEWING MACHINE.

No. 270,814. Patented Jan. 16, 1883.

Fig. 1.



Witnesses
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(No Model.) 4 Sheets—Sheet 2.

E. KOHLER.

SEWING MACHINE.

No. 270,814. Patented Jan. 16, 1883.

Fig. 2.

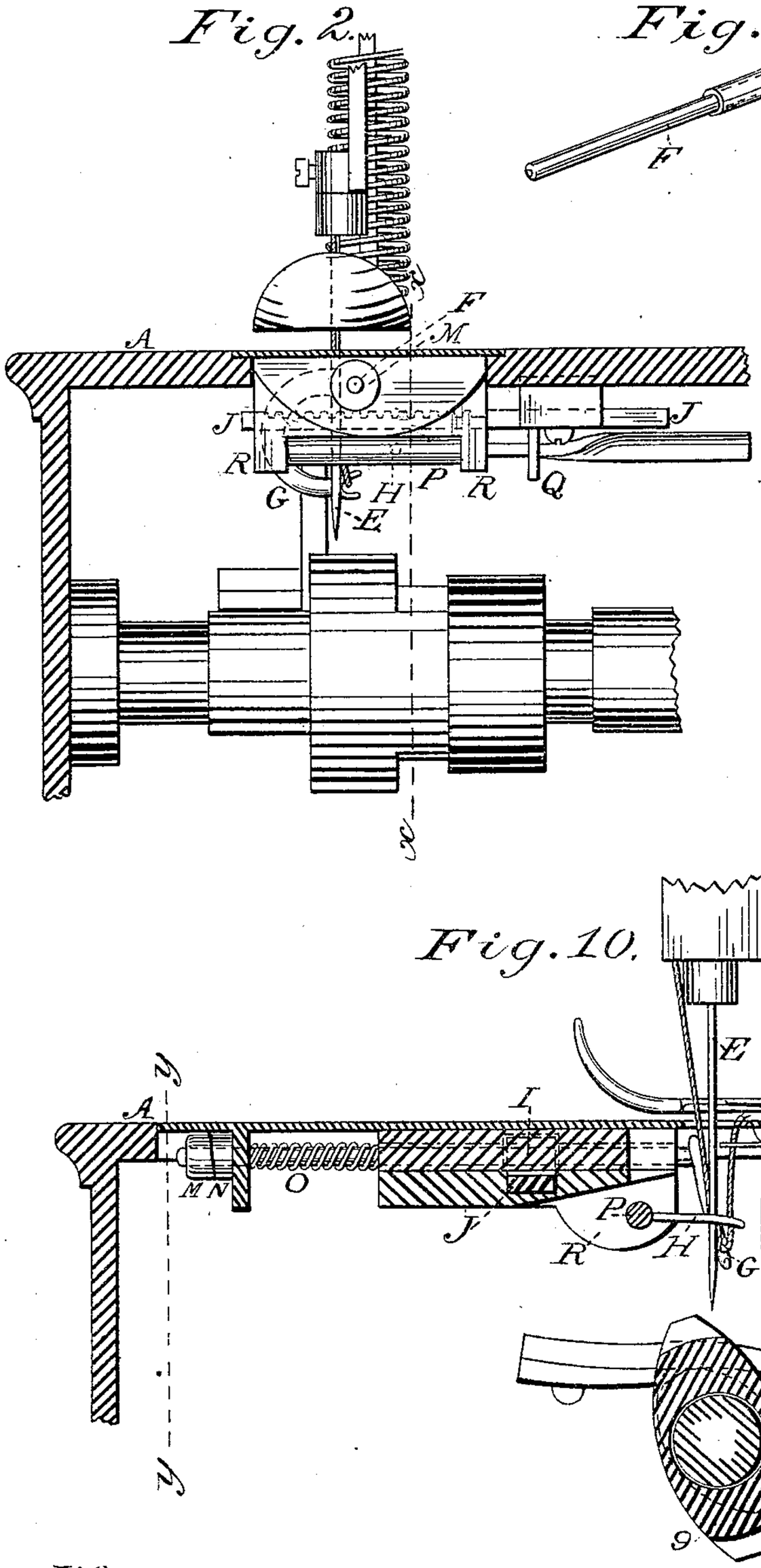

Fig. 4.

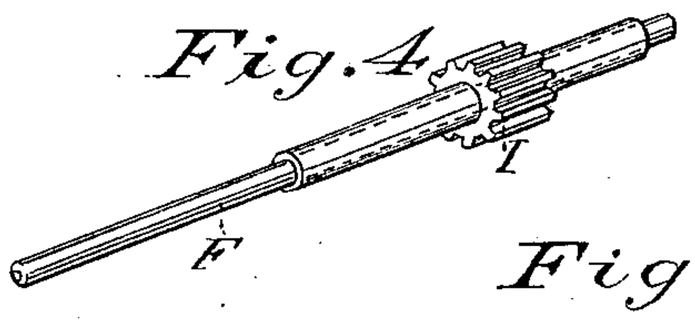

Fig. 3.

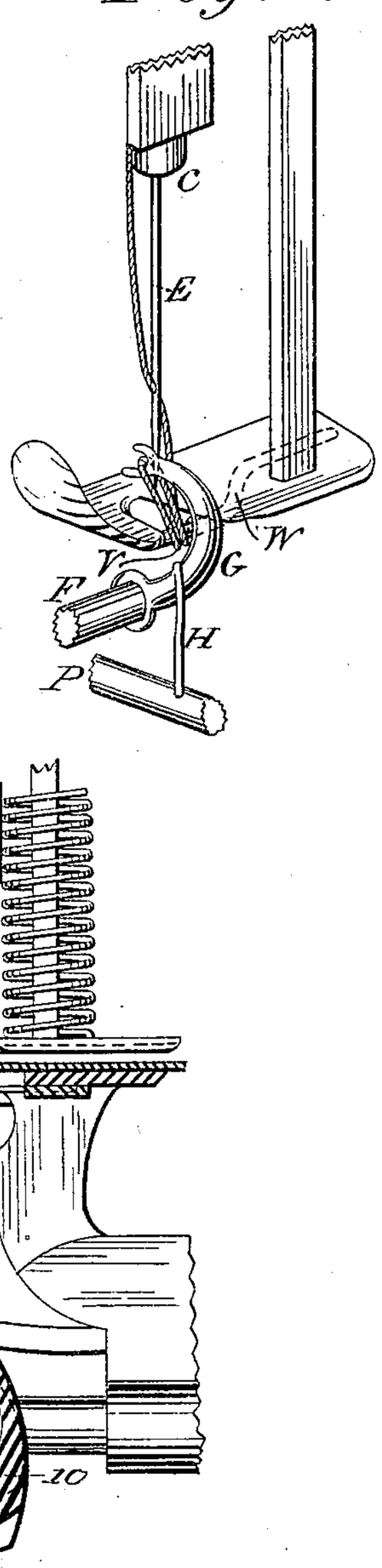

Fig. 10.

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(No Model.) 4 Sheets—Sheet 3.

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Fig. 5.

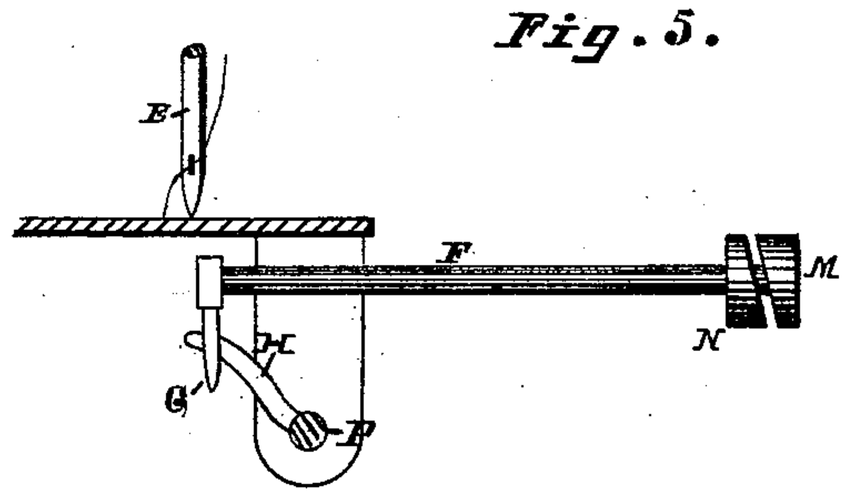


Fig. 6.

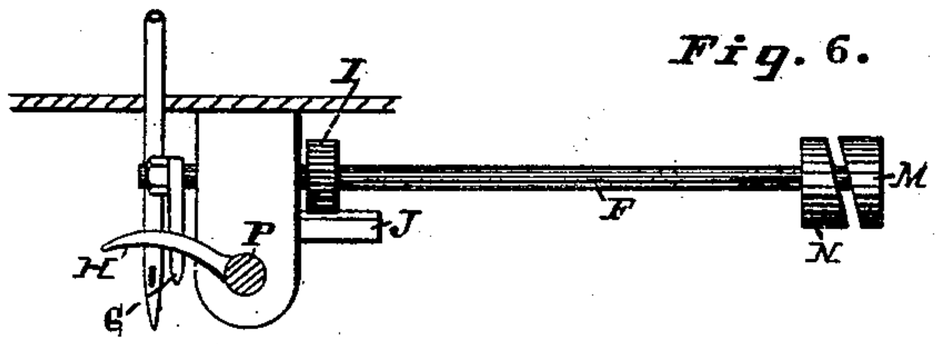


Fig. 7.

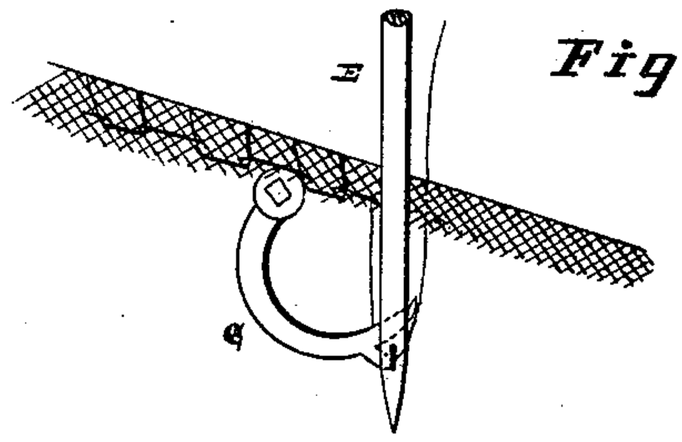
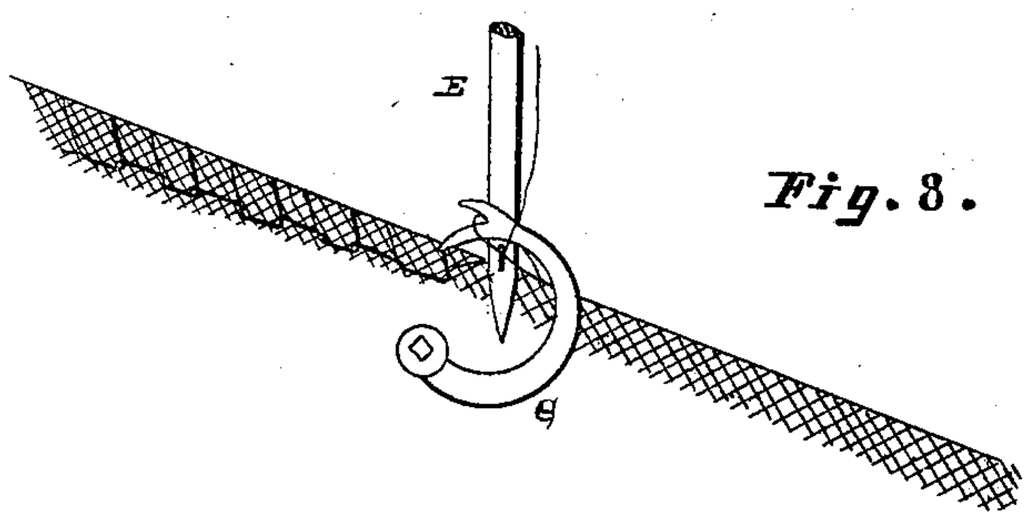


Fig. 8.



Witnesses

Geo. H. Strong.

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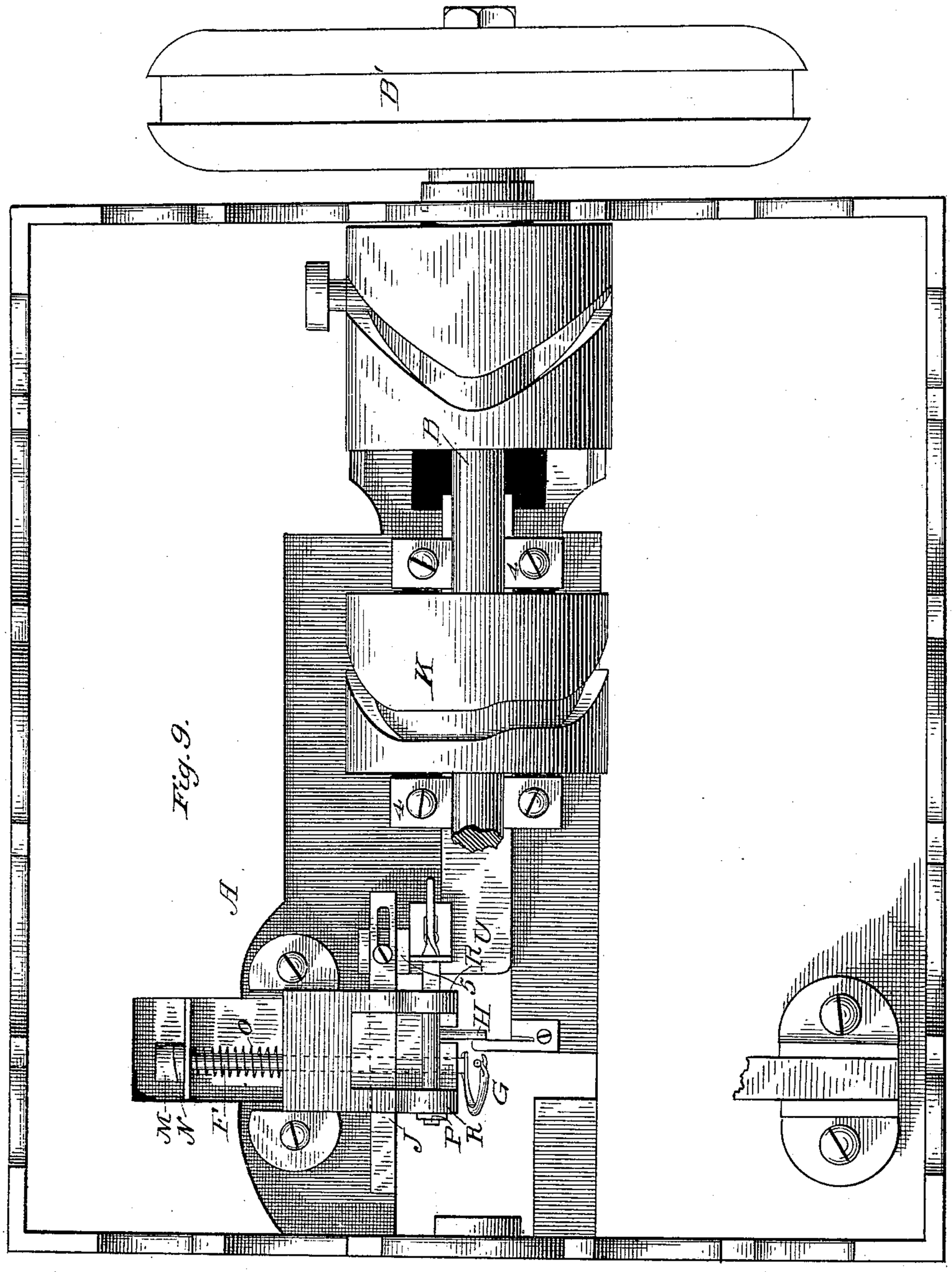
(No Model.) 4 Sheets—Sheet 4.

E. KOHLER.

SEWING MACHINE.

No. 270,814. Patented Jan. 16, 1883.



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by Ellis Spear
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UNITED STATES PATENT OFFICE.

EDWARD KOHLER, OF OAKLAND, CAL., ASSIGNOR OF THREE-EIGHTHS TO HARRISON P. EAYRS AND MICHAEL GRUNEWALD, BOTH OF SAME PLACE.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 270,814, dated January 16, 1883.

Application filed September 27, 1881. (No model.)

To all whom it may concern:

Be it known that I, EDWARD KOHLER, of Oakland, Alameda county, State of California, have invented a new and useful Improvement in Sewing-Machines; and I do hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to an improvement in sewing-machines intended more especially for sewing heavy fabrics, such as carpets and bags.

My invention consists in certain improvements in detail and in various novel features of construction, which will now be more fully described.

In the drawings, Figure 1 is a longitudinal section partly in elevation; Fig. 2, a cross-section on the line *y y* of Fig. 10; Fig. 3, a perspective view of the presser-foot, vertical needle, and pivoted hook; Fig. 4, a perspective of the shaft and pinion, on which is mounted the hook. Figs. 5, 6, 7, and 8 represent detail views; Fig. 9, a bottom view, and Fig. 10 a cross-section on line *x x* of Fig. 2.

The machine when in use is mounted upon a frame or standard, the top forming a table, A, and ordinarily the machine is intended to be operated by hand through a balance-wheel having a crank. (Not shown in the drawings.)

In the end standards of the frame is mounted a driving-shaft, B, on which the driving-wheel B′ is keyed at a point outside the frame. Above the frame is the ordinary arm containing the connection with the needle-bar, (which is not shown in the drawings,) motion being imparted to the needle-bar by a vertical arm moving in a cam-groove on a wheel keyed to the driving-shaft. This mechanism is of a kind commonly employed in sewing-machines. The needle-bar reciprocates vertically in guides, as shown, the needle being secured thereto by a set-screw, and the table of the machine is slotted in the usual manner to permit the descent of the needle and the operation of the feed.

Working in guides below the table of the machine is a shaft, F, on the end of which is a curved hook, G, having a finger at its end and adapted to operate in connection with the needle. The movement of this shaft and hook is accomplished by means of a wheel, K, on the driving-shaft having a cam-groove in its face, in which works a pin on the face of a slide-bar, U, reciprocating longitudinally in guides 4 4, Fig. 9, attached to the lower side of the table.

To a standard, 5, on the slide-bar is adjustably secured a rack, J, which is thus caused to reciprocate with the slide-bar.

On the shaft F is a pinion, I, the shaft being placed transversely to the rack and slide-bar, and through this rack and pinion the shaft F receives a partial rotation in opposite directions when the driving-shaft is caused to turn.

The movement of the hook is so timed that it passes on one side of the needle when such needle is near its lowest point, and receives the loop then formed on the end of such needle and carries it up through the slot in the table (the vertical needle having receded) to a position below and on the other side of such vertical needle now ready to begin its descent. In its descent the vertical needle E passes through the loop carried by the hook and locks it in place.

It will be understood that as the cloth is fed below the presser-foot the hook carries the loop up over the edge of the cloth, so that when locked in place by the needle E it forms a binding along the edge of the cloth.

In order to retain the loop upon the hook I provide a guard, H, (illustrated in Fig. 3.) This guard is mounted on a shaft, P, journaled in ears R R depending from a plate secured to the lower side of the table, and has at one end a spiral twist, as shown. The guard H is mounted upon such shaft midway between the ears. The shaft P is given a partial rotation sufficient to carry the guard up with and above the hook by means of the guide-plate Q, carried by the slide-bar, which, bearing on the inclined edge of the spiral, gives the shaft P the necessary partial rotation. A spring may be used to retract the shaft to its former position, if desired, or the opposite motion of the guide-plate will have the same effect. This guard as it passes up with the hook is directly above and nearly in contact with the loop, so that such loop cannot slip off the finger of the hook.

It is necessary to give to the shaft F, which

carries the hook, a lateral movement, as the hook is obliged to change its position when receiving the loop from the needle, since it operates upon one side of the needle in receiving the loop in order to pull the loop in the same direction in which the needle is threaded and on the other side in releasing it. This lateral movement of the shaft is accomplished by means of an inclined cam, M, on the end of such shaft. This cam bears upon the surface of a projection, N, which may be correspondingly inclined or provided with a shoulder, as desired, and which is secured to a plate attached to the bottom of the table, against which plate bears one end of a spiral spring, O, which returns the shaft to normal position as soon as pressure of the cam is released. It will be understood that the cam is operated by the revolution of the shaft, through the rack and pinion, as before explained.

The feed is accomplished by means of the cams 9 10, Fig. 10, on the driving-shaft, the necessary eccentric rotary movement being given to the feed-plate by means of such cams 9 10, which extend in different directions, and are mounted upon the driving-shaft, one of which impels the feed-bar longitudinally, while the other raises it vertically, and thus gives it the necessary motion to impel the cloth. I have not, however, considered it necessary to illustrate this feed mechanism more fully, because it forms no part of my invention, and the relation of the operating-cams to the ordinary feed-plate will be readily understood by all those skilled in the art.

It will be understood that the usual or any proper form of tension device is mounted upon the arm of the machine through which the thread passes, and that the presser-foot is provided with the usual mechanism to raise and lower it to receive the cloth.

In the sewing of bags by my machine the operation can be performed with great rapidity, because it is not necessary, after finishing each bag, to stop the machine and adjust any of the parts before commencing work upon another bag; but the machine will continue to form the interlocking stitch whether the fabric be in position below the presser-foot or not, and any number of bags may thus be sewed and connected together by stitching, which may afterward be separated, as desired.

I am aware that in English Patent No. 974 of 1857 is shown a vertically-reciprocating threaded needle combined with a spiral needle operating below the table by a rack and pinion, the spiral needle having an under thread, and the stitch being formed from both threads below the table; and I am also aware that in English Patent No. 549 of 1868 a spiral or cork-screw-shaped threadless lower needle is given a combined rotary and lateral movement on its shaft by means of a rack and pinion, so as to carry the thread above the table to be fastened by an ordinary vertical needle; and these devices I do not claim, my invention being restricted to specially-devised improvements.

Having thus described my invention, what I claim is—

1. The combination of the straight needle E, and mechanism, substantially as described, for operating the same, the slide-bar U, having the rack J, the horizontal rock-shaft F, having the pinion, the cams M N, and the hook G, mounted on said shaft F, said hook operating to seize the loop formed by the needle, carry the same above the table and over the edge of the fabric in position to be locked by the needle-thread at the subsequent descent of the needle.

2. A sewing-machine having a vertically-reciprocating needle carrying a single thread, in combination with the threadless hook mounted on a horizontal rock-shaft, F, below the table, adapted to enter the loop formed by the vertical needle and to carry the same above the table and around the edge of the fabric to be locked by the subsequent passage of the needle through such loop.

3. The combination of the vertical needle E, the hook G, pivoted below the table, and the guard H, mounted on the shaft P, such shaft having the spiral twist, substantially as and for the purposes set forth.

4. In combination with the presser-foot and with the needle E and hook G, the spring-tongue V, attached to the presser-foot, and the groove W, substantially as and for the purpose set forth.

In witness whereof I hereunto set my hand.

EDWARD KOHLER.

Witnesses:
H. E. POPE,
LEE D. CRAIG.