(No Model.)

5 Sheets—Sheet 1.

J. G. GREENE.

OVEREDGE SEWING MACHINE.

No. 472,046. Patented Apr. 5, 1892.

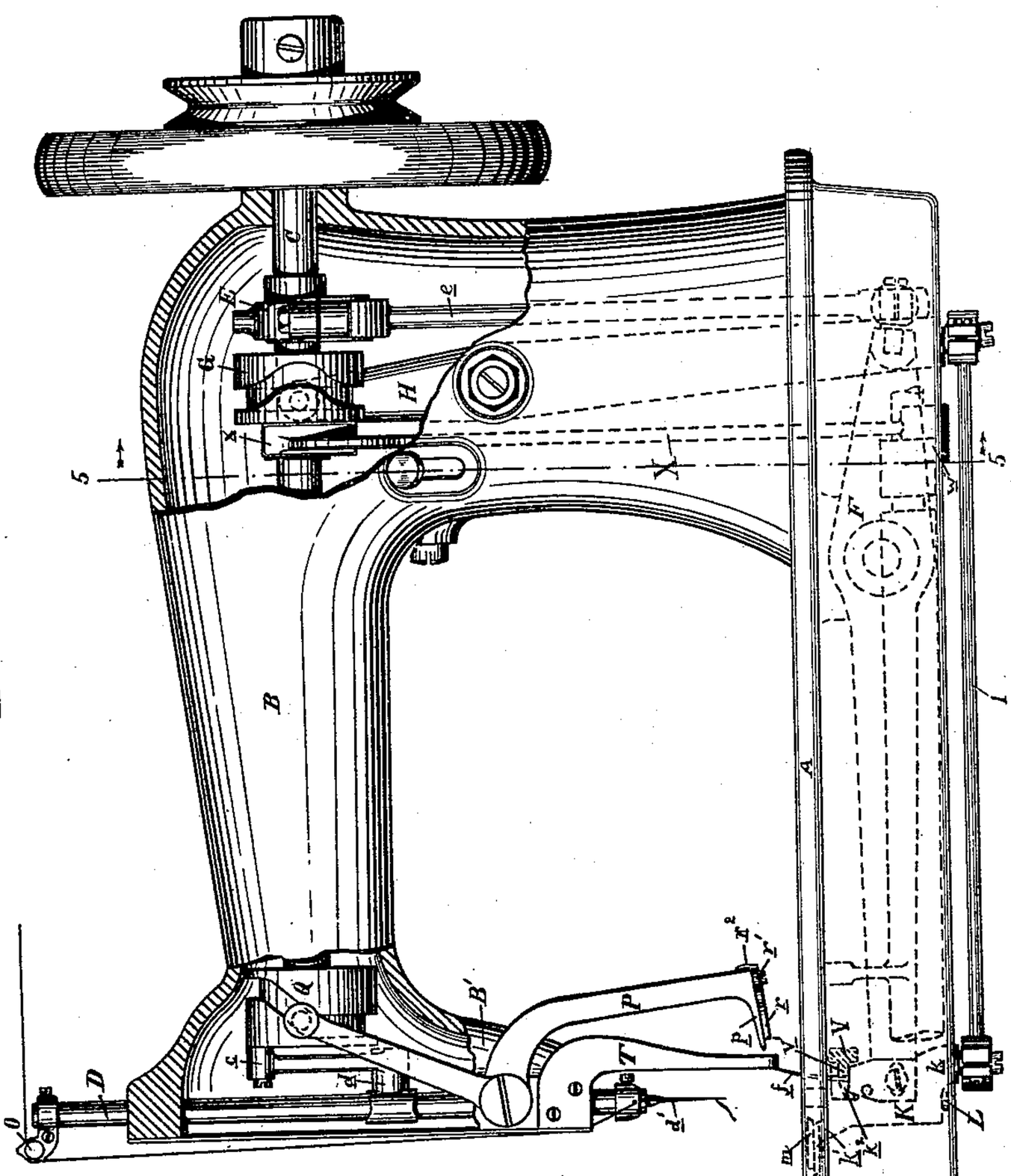

Fig. 1.

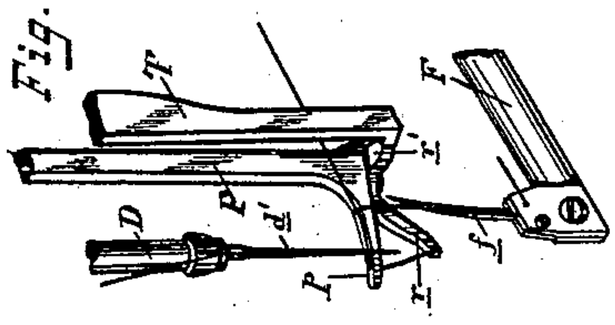

Fig. 8.

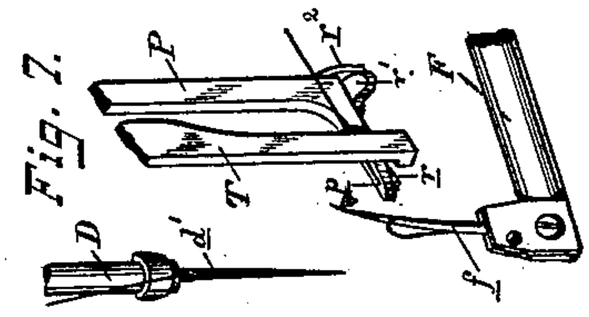

Fig. 7.

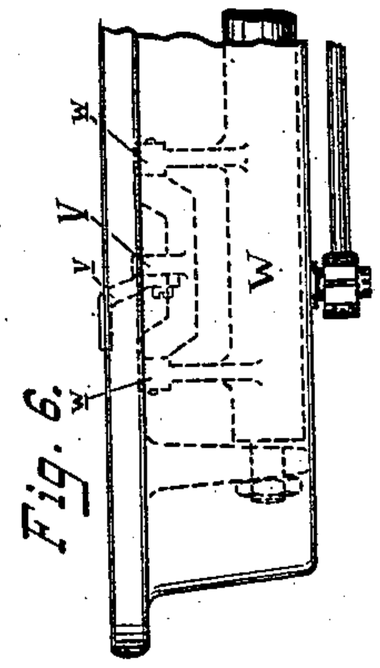

Fig. 6.

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(No Model.) 5 Sheets—Sheet 2

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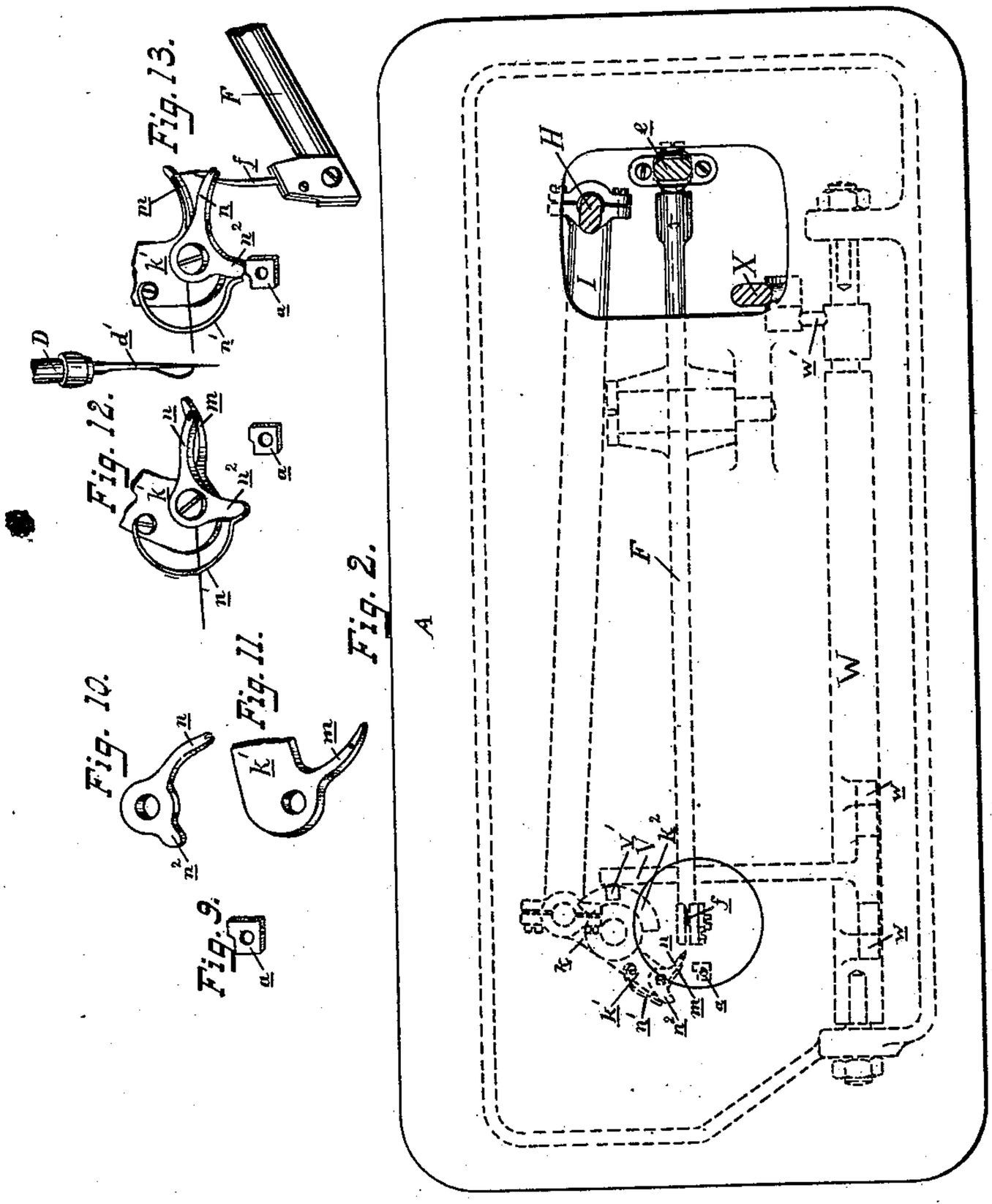
OVEREDGE SEWING MACHINE.

No. 472,046. Patented Apr. 5, 1892.



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OVEREDGE SEWING MACHINE.

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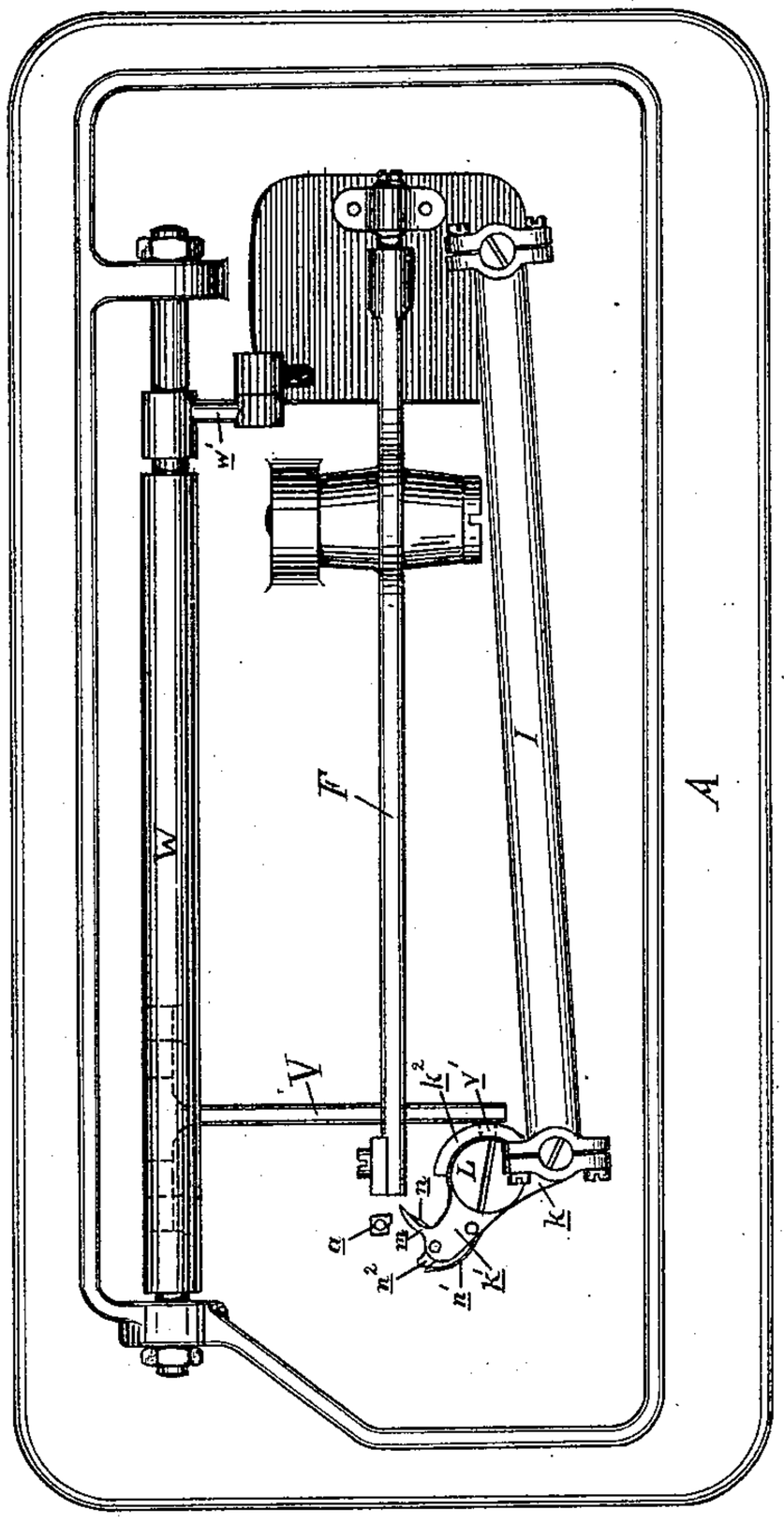
Fig. 3.



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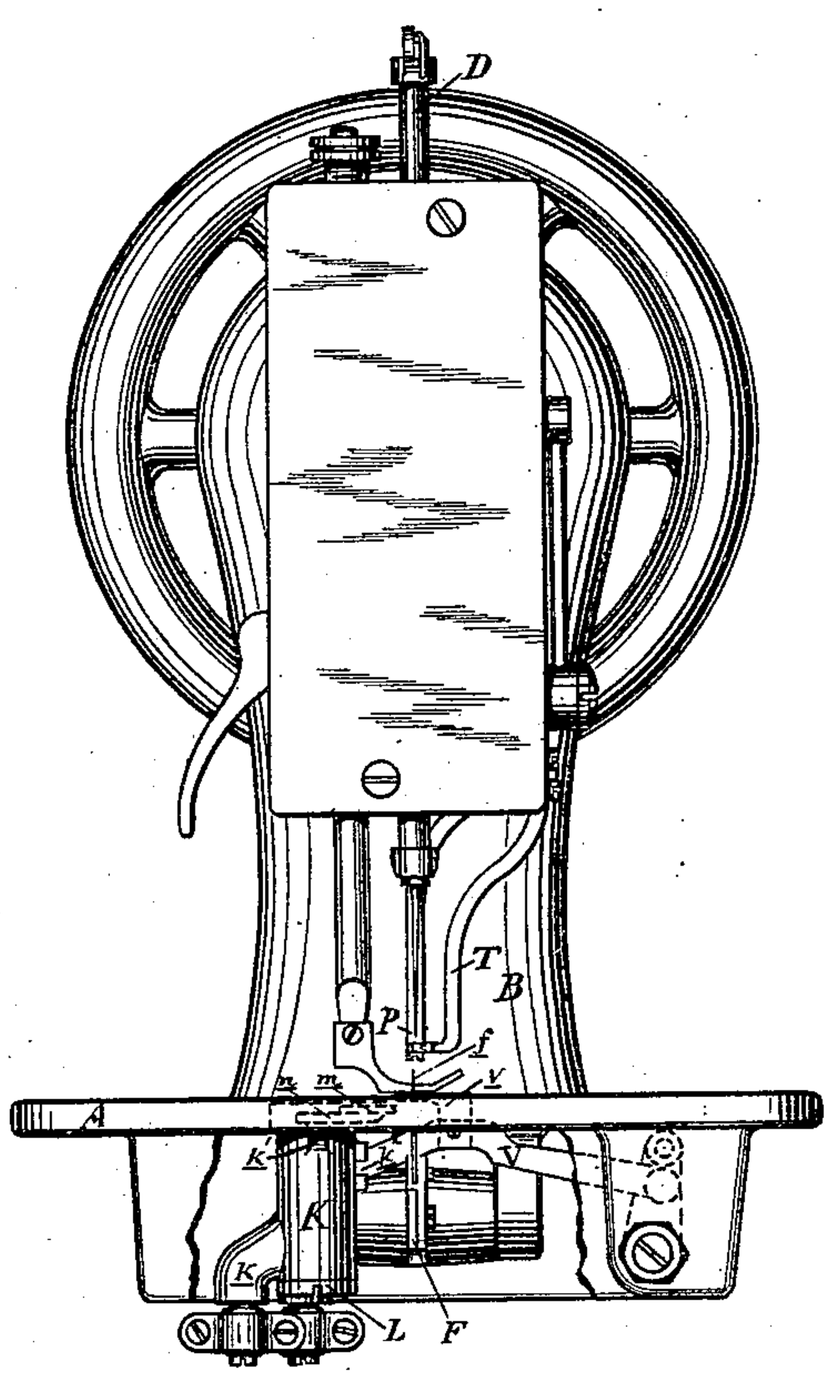
OVEREDGE SEWING MACHINE.

No. 472,046. Patented Apr. 5, 1892.

Fig. 4.



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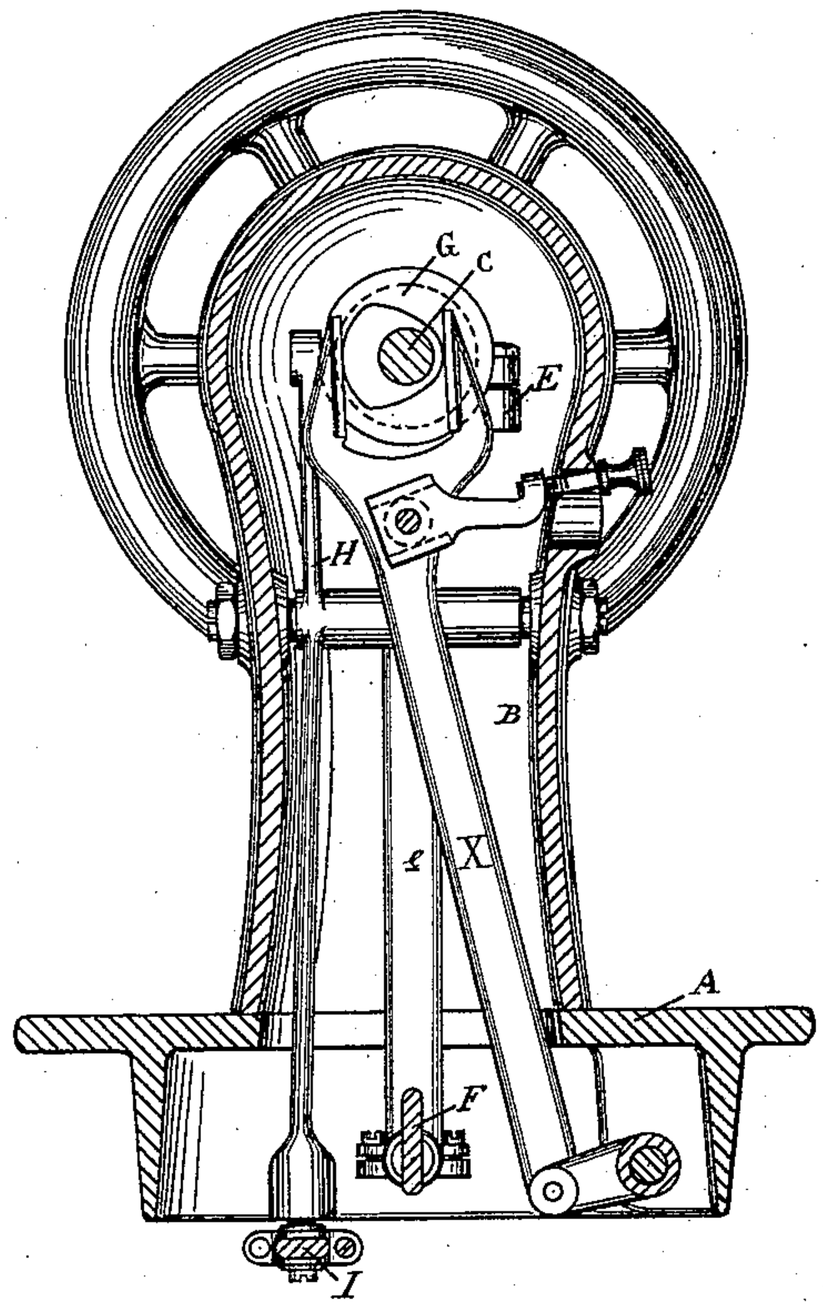
J. G. GREENE.

OVEREDGE SEWING MACHINE.

No. 472,046. Patented Apr. 5, 1892.

Fig. 5.



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UNITED STATES PATENT OFFICE.

JAMES G. GREENE, OF ELIZABETH, NEW JERSEY, ASSIGNOR TO THE SINGER MANUFACTURING COMPANY OF NEW JERSEY.

OVEREDGE SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 472,046, dated April 5, 1892.

Application filed October 28, 1891. Serial No. 410,082. (No model.)

To all whom it may concern:

Be it known that I, JAMES G. GREENE, 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 Overedge Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention has for its object to provide a stitch-forming mechanism by which the four-thread overseam fully set forth in my application, Serial No. 402,371, filed August 11, 1891, may be made. To this end I employ, in connection with an ordinary eye-pointed needle arranged above the work, a second eye-pointed needle arranged beneath the work and two thread-carrying and spreader-accompanied loopers, one arranged above and the other beneath the work. These needles and loopers are successively operated, so that the upper or puncturing needle first descends through the work, and as it begins to rise its loop is entered by the lower looper, the loop of which is opened by its spreader for the upward passage thereinto of the lower needle arranged to carry its thread over the edge of the work, the loop of the lower needle as the latter descends being entered by the upper thread-carrying looper, the loop of which latter is opened by its spreader to permit the upper or puncturing needle in its next descent to pass through the same, this cycle of operations being constantly repeated in the operation of the machine.

In the accompanying drawings, Figure 1 is a side view, partly in section, of a sewing-machine embodying my invention. Fig. 2 is a plan view of the same with the arm broken away. Fig. 3 is a bottom view, and Fig. 4 is a front end view, of the same. Fig. 5 is a vertical section on line 5 5, Fig. 1, looking in the direction of the arrows adjacent to said line. Figs. 6 to 13, inclusive, are detail views to show various parts.

A denotes the work-plate; B, the arm, and C the main or driving shaft, journaled in the upper part of the arm and having at its forward end a crank *c*, connected by a pitman *d* with the needle-bar D, carrying the eye-pointed needle *d'*, these parts being of ordinary and well-known construction.

E denotes an eccentric mounted on the main shaft C and connected by a rod *e* with the rear end of a lever F, pivoted beneath the work-plate and carrying at its forward end the lower eye-pointed needle *f*. The connection between the rod *e* and lever F is a loose one afforded by a ball-and-socket joint to permit the parts to move freely on each other. On the shaft C is also mounted the grooved cam G, entered by a pin or roller at the upper end of a vertical lever H, to the lower end of which is attached the rear end of a pitman I, connected at its forward end to an arm *k* of a rocker K, journaled on the stud L and provided with a second arm *k'*, carrying the lower eye-pointed looper *m*. The said arm *k'* also carries the pivoted loop-spreader *n* for the looper *m*, said spreader being of well-known form and being normally held in place with its fork above the eye of the looper by a spring *n'*, bearing against the tail-piece n^2 of the said spreader. A stop *a* on the work-plate and arranged in the path of movement of the said tail-piece serves to turn the spreader on its pivot against the stress of the spring *n'*, as shown in Fig. 13, to cause said spreader to open the loop of the looper *m* for the passage of the lower needle *f*. The upper eye-pointed thread-carrying looper *p* is attached to the lower end of a lever P, pivoted to the head or depending portion B' at the forward end of the arm B and operated by a grooved barrel-cam Q at the forward end of the main shaft C.

The looper *p* is provided with a pivoted spreader *r*, having a tail-piece *r'*, against which presses a spring r^2 to hold said spreader in line with the said looper and with the fork of the former beneath the eye of the latter.

T is a depending arm attached to the head B' and having its lower end arranged in the path of movement of the tail-piece *r'* of the spreader *r* to serve as a stop to operate said spreader to cause it at the proper moment to open the loop of thread carried by the looper *p* for the passage of the upper needle *d'*. (See Figs. 1, 7, and 8.) I prefer to employ an ordinary needle-bar take-up O for drawing up

the loops of the puncturing-needle d'. Ordinary take-up or check springs (not shown) will be sufficient for the lower threads.

The feeding mechanism herein shown consists of a suitable feed-dog v, attached to a feed-bar V, jointed to arms w at the forward end of a rock-shaft W, having at its rear end an arm w', to which is connected the bar X, operated by the cam x on the shaft C. The feed-bar V is provided with a pin or roller v', entering a cam-groove k^2, formed in the vertical rocker K, which operates the lower looper. This feeding mechanism is essentially the same as that employed in the well-known "Singer vibrating-shuttle machine," and therefore forms no part of my invention.

The stitch-forming mechanism constructed as above described is timed to operate as follows: The work being placed in position with the edge thereof a suitable distance inside or to the right of the upper or puncturing needle d' and the machine being started said needle first descends, carrying its thread through the work near the edge thereof, and as the said needle rises and throws out a loop the latter is entered by the lower looper m, which carries a loop of its own thread through the needle-loop, the looper-loop being then opened by the spreader n. The lower eye-pointed needle now rises, carrying a loop of its own thread through the loop of the lower-looper thread and past (or inside of) the edge of the work, and the upper looper then advances and seizes the loop of the lower-needle thread, and said needle is then retracted, the lower looper, having been retracted as soon as the lower needle has taken its loop. The upper looper having passed a loop of its own thread through the lower needle's loop, is now forward in position beneath the upper needle, and the upper looper's loop being opened by the spreader r is thus held until the upper needle has entered the same, when the said looper is retracted. Thus the operation continues, producing an overedge-stitch seam of which only one thread is passed through the material, while the other three threads are enchained or interlooped therewith and with each other, the tensions of the lower-needle thread and of the two looper-threads being so adjusted relative to the tension of the upper-needle thread and to each other as to draw the loops of the latter to the edge of the work and thus form a "purl" along the said edge on both sides of the work, making an overedge or button-hole seam having a finished appearance on both sides.

I claim—

1. An overseaming-stitch-forming mechanism consisting of an eye-pointed needle arranged above the work-plate of the machine, an eye-pointed needle arranged beneath the work-plate of the machine, a thread-carrying looper arranged above the work-plate of the machine and provided with a loop-spreader, and a thread-carrying looper arranged beneath the work-plate of the machine and also provided with a loop-spreader, combined with mechanism for operating said needles, loopers, and spreaders.

2. In an overseaming sewing-machine, the combination, with a vertically-reciprocating puncturing eye-pointed needle arranged above the work-plate of the machine, of a horizontally-reciprocating thread-carrying looper and co-operating spreader beneath said work-plate and arranged to enter the loops of upper-needle thread, a vertically-reciprocating eye-pointed needle also placed below said work-plate and arranged to enter the loops of lower-looper thread, a horizontally-reciprocating thread-carrying looper and co-operating spreader placed above said work-plate and arranged to enter the loops of lower-needle thread, and mechanism for successively operating said upper needle, lower looper and spreader, lower needle, and upper looper and spreader in the order named.

3. In an overseaming sewing-machine, the combination, with the driving-shaft C, provided with the crank c, the eccentric E, and the cams G and Q, of the needle-bar D, connected with said crank and carrying the eye-pointed puncturing-needle d', the rod e, the lever F, to the rear end of which said rod is connected and which is provided at its forward end with the lower eye-pointed needle f, the lever H, the rocker K, the lower looper and spreader carried by said rocker, the pitman I, connecting said rocker with said lever H, the lever P, the upper looper and spreader carried by said looper, and suitable operating devices for said spreaders.

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

JAMES G. GREENE.

Witnesses:
CHAS. ELKIN,
L. L. BURRITT.