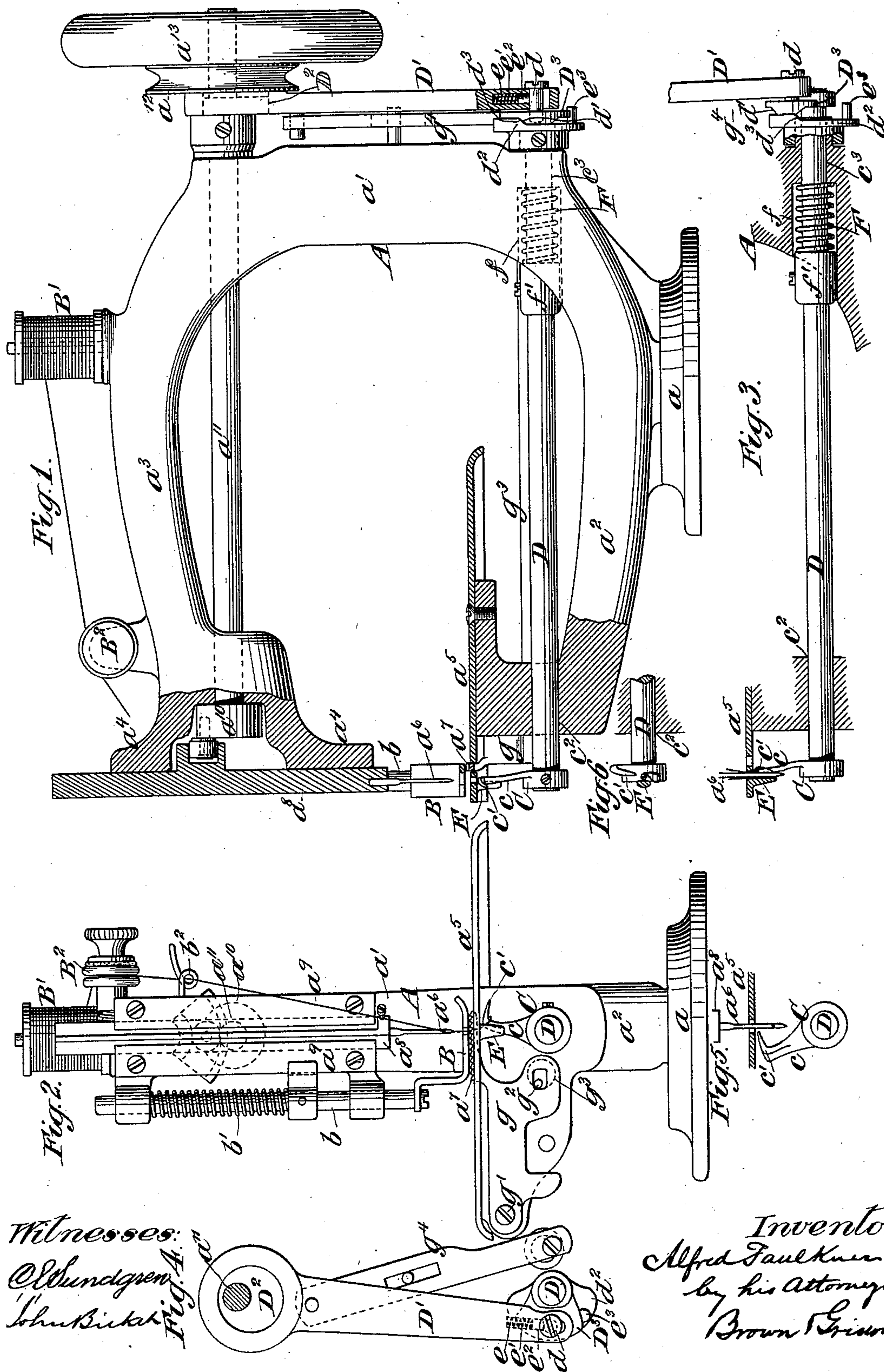


A. FAULKNER.  
SEWING MACHINE.

Patented June 11, 1889.



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# UNITED STATES PATENT OFFICE.

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## SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 404,965, dated June 11, 1889.

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*To all whom it may concern:*

Be it known that I, ALFRED FAULKNER, of Jersey City, in the county of Hudson and State of New Jersey, have invented a certain new and useful Improvement in Sewing-Machines, of which the following is a specification.

I will describe in detail a sewing-machine embodying my improvement, and then point out the novel features in claims.

In the accompanying drawings, Figure 1 is a side elevation, partly in section, of a sewing-machine embodying my improvement. Fig. 2 is an end elevation of the same, the parts being shown in the same relative position. Fig. 3 is a sectional view in elevation of the lower part of the mechanism, as shown in Fig. 1, certain of the parts being shown in a different position from that which they occupy in Fig. 1. Fig. 4 is a detail view of a certain crank-motion employed in the machine. Fig. 5 is a detail view showing certain of the parts in a different position from that which they occupy in Fig. 2. Fig. 6 is a detail, partly in section, of a looper and certain adjacent parts, the same being shown in plan.

Similar letters of reference designate corresponding parts in all the figures.

A designates the frame of the machine, and  $a$  a base-piece therefor. The frame A comprises an upright portion  $a'$ , a lower arm  $a^2$ , an upper arm  $a^3$ , and a head  $a^4$ . These parts may all be made integral with each other. Upon the arm  $a^2$  is carried a cloth-plate  $a^5$ , provided with suitable apertures, through which work the needle  $a^6$  and a feeder  $a^7$ . The feeder  $a^7$  is carried by a lever  $g$ , fulcrumed at  $g'$  and deriving motion from a crank  $g^2$ , mounted on a rotary shaft  $g^3$ . The shaft  $g^3$  derives motion from an arm  $g^4$ , pivotally connected to an eccentric  $D^2$ , deriving motion from the main shaft. The needle is carried in a vertically-reciprocating needle-bar  $a^8$ , working in suitable guideways  $a^9$  upon the head  $a^4$ . Motion is transmitted to the needle-bar by a crank  $a^{10}$ , mounted upon a shaft  $a^{11}$ , which shaft derives motion from a pulley  $a^{12}$ , mounted thereon and driven in any suitable manner. Upon the shaft  $a^{11}$  is also a fly-wheel  $a^{13}$ .

B designates a presser-foot mounted upon

a presser-bar  $b$ , which latter operates with a yielding pressure through the medium of a spring  $b'$  in the usual manner. Thread is supplied to the needle from a spool  $B'$  after passing through a tension device  $B^2$ , of ordinary construction, and an eye  $b^2$ .

This machine is designed to sew a chain-stitch, and in order to form a loop upon the under side of the material being sewed I provide a looper C. This looper has imparted to it an oscillating motion about an axis, and also has a bodily longitudinal movement in the direction of the length of the machine. It is provided with an upwardly-extending approximately straight or bar-like portion  $c$ , and at its upper end with a hook  $c'$ , extending at approximate right angles to the direction of the length of the portion  $c$  and in the direction of oscillation of the looper. The hook portion  $c'$  is slightly offset to one side or toward the front end of the machine. The looper is mounted upon a rock-shaft D, which rock-shaft is journaled, as shown at  $c^2$  and  $c^3$ , in the arm  $a^2$  of the frame. An oscillating or rocking motion is transmitted to the rock-shaft D by means of an eccentric-rod  $D'$ , operated from the eccentric  $D^2$ , mounted on the main shaft  $a^{11}$ . The eccentric-rod  $D'$  connects near its lower end with a crank-pin  $d$ , extending from a crank disk or segment  $D^3$ , rigidly mounted upon the rock-shaft D. When the main shaft  $a^{11}$  is rotated, a rocking motion is imparted to the rock-shaft D, and consequently an oscillating or reciprocating motion is imparted to the looper C. The motion of the parts is so timed that when the looper C has been moved to its farthest extent in one direction the needle has reached its lowest point, carrying with it a loop of thread. At the moment of "dwell" of the needle the return movement of the looper C occurs, and the hook portion  $c'$  thereon enters the loop of thread and draws it forward. The needle then passes upwardly, and the forward feed of the goods occurs. When the needle returns on its downstroke with another loop of thread, it passes through the loop taken up by the looper, and the looper picks up the loop just brought down by the needle in the manner just described.

It is essential that the loop of thread brought



down by the needle should be opened out sufficiently to allow the looper to properly take up the loop, and also that the loop should be opened out upon the proper side of the needle. It is further essential that the looper after it has picked up the loop should be brought into such a position that the needle upon its next descent will pass through the loop already picked up by the looper. To accomplish the first of these objects I provide a guide E, extending downwardly from the work-plate  $a^5$ , which guide has a vertical face which is coincident with the wall of the aperture through which the needle passes in its up-and-down stroke and which is toward the front end of the machine. When the needle starts upon its upstroke, the guide E maintains the thread close against the needle and prevents the opening out of the loop upon that side. All of the opening of the loop therefore occurs upon the other side of the needle or toward the rear, and is therefore in a position to be readily taken up by the looper. It is to be borne in mind in this connection that the looper travels upon one side of the needle only—that is, upon the inner or rear side. The bodily longitudinal movement of the looper is for the purpose of bringing the loop thereon into a proper position to be entered by the descending needle. To accomplish this the rock-shaft D is moved lengthwise. This movement is accomplished in the following manner:

Upon the inner side of the crank disk or segment  $D^3$  is a cam-surface  $d'$ . Rigidly mounted upon the frame A is a cam  $d^2$ , having a cam-surface  $d^3$ , the cam-surface of which will be in the path of the cam-surface  $d'$  upon the crank disk or segment  $D^3$  when the latter is reciprocated. The action of these two surfaces one against the other causes the crank disk or segment  $D^3$  to be moved away from the frame A, and the rock-shaft D to be moved longitudinally in one direction, the direction of such movement being in the example of my improvement shown such as to move the looper C away from the guide E. This movement occurs when the looper is being moved into the position shown in Figs. 3, 5, and 6, or, in other words, into a position where it leaves its loop of thread. In Fig. 3 it will be observed that the crank disk or segment  $D^3$  and the cam  $d^2$  have parallel or flat portions beyond the cam-surfaces  $d'$   $d^3$ , which contact with each other when the crank disk or segment has been rotated far enough. These parallel portions are maintained thus in contact during that portion of the movement of the looper which occurs after the needle has taken the loop from the looper and until the needle has returned and the looper has taken another loop off from the needle. When this last has occurred, the longitudinal movement of the rock-shaft D in the other direction occurs, the parallel portions of the cams being no longer in contact. This movement of the rock-shaft is brought about by a coil-spring

F, surrounding the rock-shaft and arranged in a suitable cavity  $f$  in the frame A. This coil-spring abuts near one end against the end wall of said cavity and at the other against a collar upon the rock-shaft. When the rock-shaft D has been moved by the spring, the looper C will be thrown into a position shown more clearly in Fig. 1—that is to say, the rear portion of the hook  $c'$  will be brought into contact with the guide E. The loop upon the looper is therefore brought directly into the path of the descending needle, and the latter passes readily through it. A dwell occurs at this point in the movement of the looper, the same being occasioned by means of the slotted connection which the eccentric-rod  $D'$  has with the crank-pin  $d$ , as shown more clearly in Fig. 1, and which admits of a considerable lengthwise movement of the eccentric-rod without imparting rotary motion to the shaft.

I have shown the lower portion of the eccentric-rod as provided with a longitudinally-extending cavity  $e$ , in which is arranged a coil-spring  $e'$ , acting upon a pin  $e^2$ , which bears upon the crank-pin  $d$ . This arrangement tends to hold the crank disk or segment in close contact with a stop-pin  $e^3$  upon the cam  $d^2$  while the independent motion of the eccentric-rod occurs. The stop  $e^3$  operates to prevent the rotation of the crank disk or segment  $D^3$  too far in one direction.

It will be observed that the looper having but a very short range of movement forms but a very small loop, only sufficient, in fact, to enable the needle to pass through it. Owing to this, no "take-up" is necessary on the machine, the movement of the needle being sufficient of itself to form a very tight stitch. The small size of the loop also admits of the use of either coarse or fine thread without any alteration of the tension.

It is apparent that as the loop of thread does not have to pass over the looper a number of loopers may be arranged on the same rock-shaft and co-operate with a number of needles.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a sewing-machine, the combination, with a reciprocating needle, of a rock-shaft, a hooked looper mounted thereon, a cam disk or segment on said rock-shaft, a rigid cam adjacent to said cam disk or segment and against which the latter normally bears, and an eccentric-rod operated from the main shaft to impart rocking motion to said cam disk or segment, substantially as specified.

2. In a sewing-machine, the combination, with a reciprocating needle, of a rock-shaft, a hooked looper mounted thereon, a cam disk or segment on said rock-shaft, a rigid cam adjacent to said cam disk or segment and against which the latter normally bears, an eccentric-rod operated from the main shaft and provided with a longitudinally-extending cavity near its lower end, a coil-spring arranged in



said cavity, a pin also in said cavity, said eccentric-rod being provided with a slot, and said crank disk or segment being provided with a pin extending through said slot, against  
5 which pin the pin first named bears, substantially as specified.

3. In a sewing-machine, the combination, with a reciprocating needle, of a rock-shaft, a hooked looper mounted thereon, a cam disk or  
10 segment on said rock-shaft, a rigid cam adjacent to said cam disk or segment and against

which the latter normally bears, an eccentric-rod operated from the main shaft to impart rocking motion to said cam disk or segment, and a stop for limiting the movement of said  
15 cam disk or segment in one direction, substantially as specified.

ALFRED FAULKNER.

Witnesses:

FREDK. HAYNES,

ARTHUR H. GAMBLIN.