(No Model.) 2 Sheets—Sheet 1.

A. H. KINDER.

THREAD CUTTING MECHANISM FOR SEWING MACHINES.

No. 588,153. Patented Aug. 17, 1897.

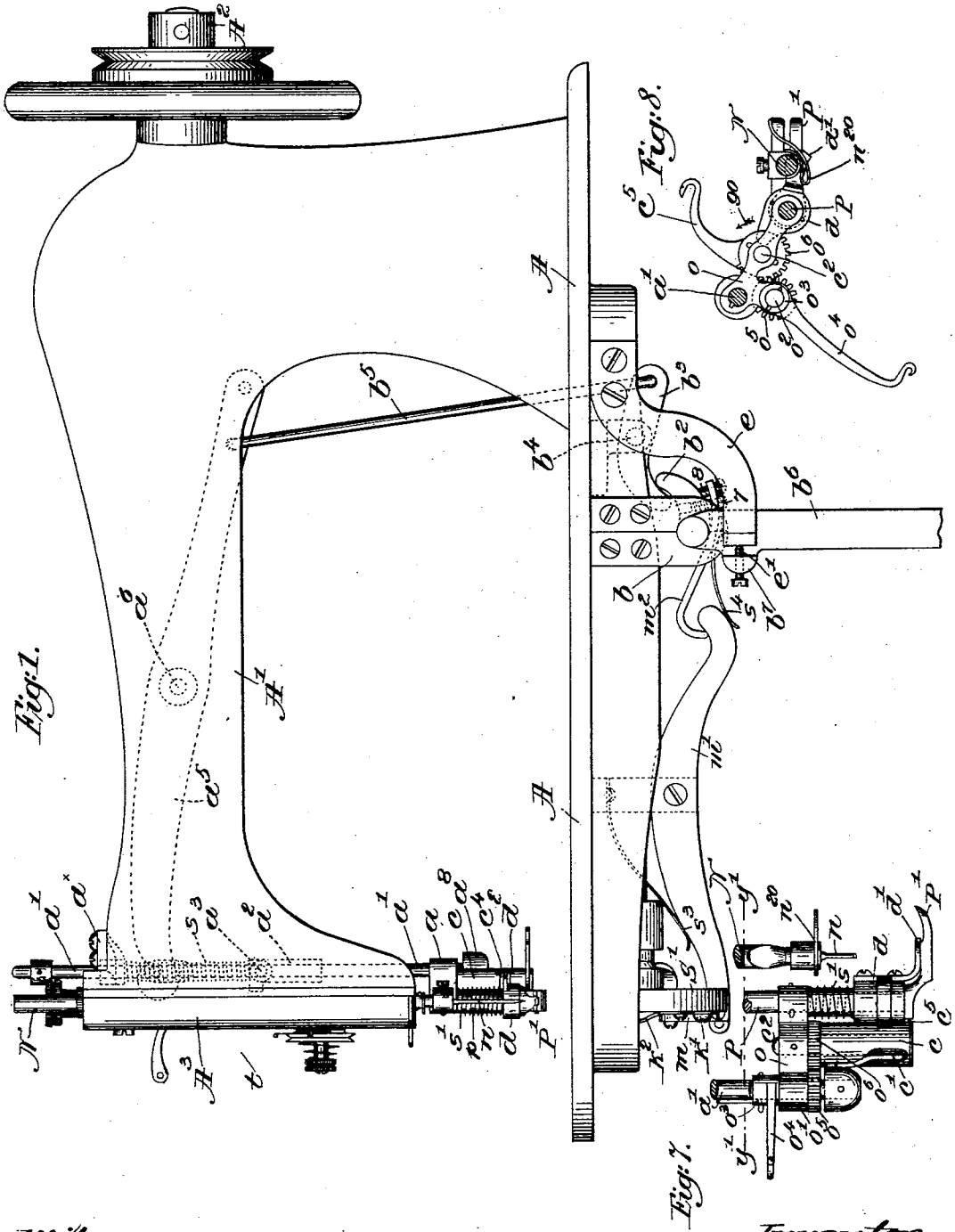


Fig. 1.

Fig. 8.

Fig. 7.

Witnesses.
A. C. Harmon
Fred S. Gunnleaf.

Inventor.
Arthur H. Kinder.
by Crosby & Gregory. Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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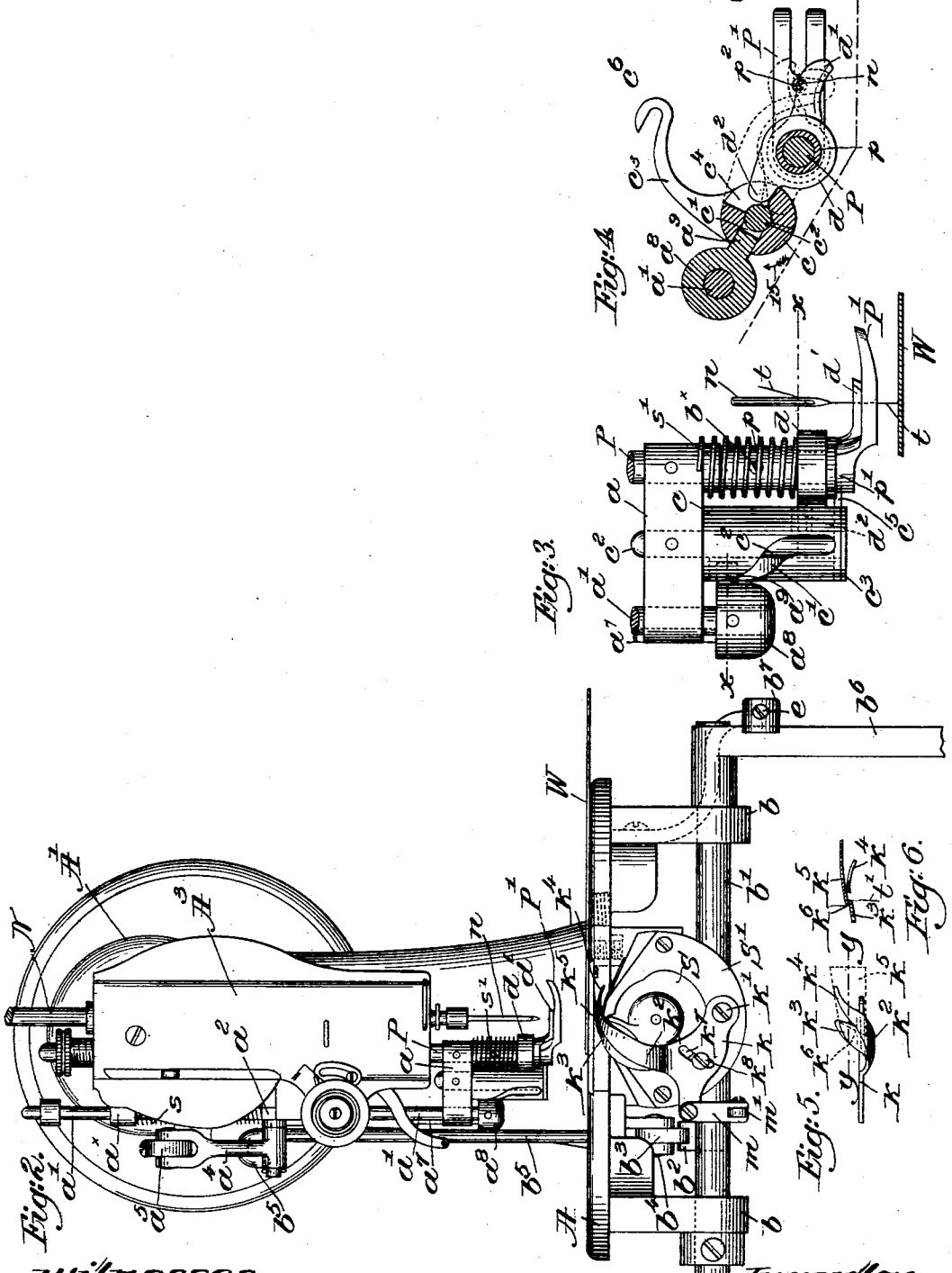


Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

Witnesses.
A. C. Harmon.
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Inventor:
Arthur H. Kinder.
By Crosby & Gregory.
Attys.

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UNITED STATES PATENT OFFICE.

ARTHUR H. KINDER, OF BOSTON, MASSACHUSETTS.

THREAD-CUTTING MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 588,153, dated August 17, 1897.

Application filed September 20, 1895. Serial No. 563,060. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR H. KINDER, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Thread-Cutting Mechanism for Sewing-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

In many classes of work it is very desirable to cut or sever the thread as close as possible to the work whether using an upper or under thread, or both, in order to leave but little trimming to be afterward effected, and it is very important that the operator can sever the thread without having the attention taken from the stitching. Particularly is this latter result desirable when the work has heavy embroidery applied thereto or when ornamental stitching is being done.

This invention has for its object the production of thread-cutting mechanism for sewing-machines whereby the upper or under thread, or both, can be severed close to the work and under full control of the operator, means being also provided for drawing off the thread prior to cutting it, so that a sufficient end will be left when sewing is begun again.

Figure 1, in side elevation, represents a sufficient portion of a sewing-machine to be understood with one form of my invention applied thereto. Fig. 2 is a left-hand end view of the machine shown in Fig. 1. Fig. 3 is an enlarged front view of the upper-thread-cutting mechanism shown in Figs. 1 and 2. Fig. 4 is a sectional view thereof, taken on the irregular line $x\ x$, Fig. 3. Fig. 5 is a plan view of the under-thread cutter detached, which is shown in Figs. 1 and 2. Fig. 6 is a vertical section thereof on the line $y\ y$, Fig. 5, showing the manner of severing the thread. Fig. 7 is a front elevation of a modified form of upper-thread-cutting mechanism; Fig. 8, a section thereof taken on the line $y'\ y'$, Fig. 7.

Referring to the drawings Figs. 1 and 2, the bed-plate A, overhanging arm A′, needle-actuating shaft A^2, the head A^3, needle-bar N, carrying an eye-pointed needle n, presser-bar P, shuttle S for the under thread, and its raceway S′ may be and are all of usual and well-known construction and operation, the shuttle-actuating devices being omitted to more clearly show the parts of my invention.

To the presser-bar P, I have secured a laterally-extended stand a (see Figs. 1, 2, and 3) below the head A^3 and having an opening in it for a slide-bar a', extended through the stand and also through a bracket or bearing $a^\times$, Figs. 1 and 2, secured to the side of the arm A′ adjacent the head. A spiral spring s, surrounding the bar a' between the bracket $a^\times$ and a collar a^2, fast on said bar, normally tends to depress it from its elevated position (shown in Figs. 1 and 2) when not in use. The collar a^2 has a stud a^3, on which is pivoted a link a^4, connected to the outer arm of a lever a^5, fulcrumed in the overhanging arm at a^6. (See dotted lines, Fig. 1.)

Depending from the bed-plate are suitable bearings b for a rock-shaft b', having fast thereto a toe b^2, adapted to coöperate with a lever b^3, pivoted below the bed-plate at b^4 and connected at its rear end by a link b^5 with the rear or inner arm of the lever a^5, so that when the parts are in the position shown in Figs. 1 and 2 the outer end of the lever a^5 will be elevated, raising the slide-bar a' against the action of its spring s.

The slide-bar has a longitudinal spline or rib a^7 thereon moving in a suitable seat or recess in the stand to prevent rotation of the bar, and the latter has rigidly secured to its end below said stand a collar a^8, provided with a pin or stud a^9 to enter a cam-slot c' in a cam c, rotatable on a depending post c^2, fixed to the stand a and held in place by an annular head c^3.

As best shown in Figs. 3 and 4, the presser-foot P′ is provided with a tubular shank p to embrace the presser-bar below the stand a and held in place by a suitable screw $b^\times$, the presser-foot forming at its junction with the shank a shoulder p', on which rests the cutter-carrier, shown as a hub d, having secured thereto a cutting-blade d', adapted to move back and forth across the needle-hole p^2 of the presser-foot, the hub being provided with a lug or projection d^2 to enter a slot c^4 in the cam c.

An arm c^5, having a hooked end c^6, extends laterally from the cam c (see Figs. 1 and 4)

and is movable therewith into dotted-line position, Fig. 4, when the cam is turned in the direction of the arrow 15, the cam also turning the cutter-carrier d in the opposite direction, bringing the cutter d' into the dotted-line position, Fig. 4. At such time the cutter is at one side of the needle-hole p^2 and the hooked end of the arm a^5 at the opposite side and below the point of the needle when the latter is raised. It will be obvious that depression of the slide-bar a' will, by the slot-and-pin connection c' a^9, turn the cam c in the direction of the arrow 15 into dotted-line position shown in Fig. 4, which is the normal position of the parts during the stitching of the material.

When the operator desires to cut the thread, he moves a knee-lever b^6, fast on the rock-shaft b', into the position shown in Fig. 1 to lift the slide-bar a' by the means described, and the movement of the stud a^9 from the bottom to the top of the cam-groove c' turns the cam oppositely to the arrow 15, first moving the arm c^5 so that its hooked end will engage the thread t between the needle and the presser-foot, the length of the slot c^4 being sufficient to allow partial rotation of the cam and the arm c^5 before the cutter d' will be moved across the presser-foot P' into full-line position, Figs. 3 and 4, severing the thread at the presser-foot. The arm c^5 acts as a pull-off to draw through the needle-eye a sufficient length of thread to begin the stitching. A spring s', surrounding the tubular shank p, between the stand a and the cutter-carrier d, maintains the latter seated upon the shoulder p' of the presser-foot. The thread t is then severed close to the upper side of the work W, Figs. 2 and 3, it being understood that as soon as the knee-lever b^6 is released by the operator the parts will return to their normal inoperative position. (Shown in dotted lines, Fig. 4.)

By providing the pull-off, as described, I obviate any tendency of the short end of the thread pulling out of the needle-eye after the cutter d' has severed the thread.

To limit the amount of rotation of the rock-shaft b', I have secured to the machine a bracket-arm e in the path of a set-screw e', extended through a lug b^7 on the knee-lever, and by adjusting the set-screw e' the throw of the lever can be regulated with great nicety.

In order to sever the under thread on a two-thread machine, such substantially as shown in Figs. 1 and 2, I have pivotally mounted on the shuttle-race S' at k' a cutter-carrier k somewhat like a bell-crank lever in shape, bent or curved at k^2 around the shuttle and bifurcated to form a knife or cutter k^3, and a guide k^4, adapted to slide under and press yieldingly against the under side of a fixed cutter-blade k^5 at one side of the needle-path below the work-support, the knife-blade k^3 and the guide k^4 normally being at the opposite side of the said path. The carrier k is slotted at k^7 to receive therein a guide-screw k^8, screwed into the shuttle-race, and the said plate is pivotally connected by a short link m to a lever m', the outer end of which is depressed by a spring s^3, while its inner end is held between an arm m^2 and a spring s^4, attached to the said arm, the latter being held adjustably on the toe b^2 by screws 7 and 8. (Shown only in Fig. 1.) Movement of the rock-shaft b' will, through the described connections, swing the carrier k up or down on its pivot k' to move the cutter or knife k^3 across or back from the needle-path. The movement of the said cutter across the needle-path is so timed as to take place as the upper thread is severed, and the guide k^4 directs the thread under the fixed cutter k^5, the movable blade k^3 passing under the edge of the blade k^5 to sever the thread, as shown in Fig. 6, adjacent the under side of the material. After the thread has been cut between the edges of the blade k^5 and the blade k^3 the cutting mechanism resumes its normal position, the blade k^3 and guide k^4 moving back from the stationary blade k^5, so that the operator can manipulate the under thread when beginning to stitch.

In Figs. 7 and 8 I have shown a modified form of upper-thread-cutting mechanism with means to draw off a greater portion of thread prior to severing it. The stand or bracket o, which is secured to the presser-bar P, has an offset bearing o' for a short shaft o^2, to the upper end of which is secured a collar o^3, having a laterally-extended hooked arm o^4, while beneath the stand a pinion o^5 on the shaft meshes with a segment gear or pinion o^6, fast on the cam c, which latter, with the post c^2, the hooked arm c^5, the slide-bar a', and the connections between the slide-bar and cam and between the cam and cutter-carrier d are substantially the same as are shown in Figs. 1, 2, 3, and 4. When the cam c is turned in the direction of the arrow 90, Fig. 8, the arm o^4 is swung in the opposite direction, so that when the cutting-blade d' has severed the thread the arms c^5 and o^4 will be in the extended position shown in Fig. 8. As shown in Fig. 7, the arm is adapted to swing in a plane above the presser-foot P', but below the needle n when the latter is lifted, so as to draw off the thread to one side, while the arm o^4 is adapted to engage the thread above a thread-guide n^{20} on the needle-bar N and to swing away in the opposite direction, so that by the combined effect of the two arms a much larger length of thread is pulled off before it is severed.

When the slide-bar a' is depressed, the arms c^5 o^4 are returned to normal inoperative position on opposite sides of the thread ready to engage and draw it off at the next operation of the severing mechanism.

An inspection of either Figs. 3 or 7 will show that the lower end of the cam-groove c' is parallel to the path of the presser-bar, so

that the reciprocations of the latter during the stitching will not cause the cam to be rotated on its foot c^2.

I claim—

1. In a thread-cutting mechanism for sewing-machines, a work-support, an eye-pointed needle to penetrate the material, a presser-foot, a cutting-blade pivoted to move about the shank of said foot, and at substantially right angles to and across the path of the thread, said foot having a rest to sustain the thread when severed, a pull-off to engage the needle-thread between the point of the needle and the cutting-blade to draw off a sufficient portion from the source of supply before the said blade is moved to cut said threads, and means to actuate the pull-off and cutting-blade, substantially as described.

2. The combination with stitch-forming mechanism comprising an eye-pointed needle and shuttle, a work-support, and a presser bar and foot, of a laterally-movable cutting-blade mounted to swing parallel to the work-support across the presser-foot and in contact therewith to sever the needle-thread held against said foot, a fixed guide beneath the work-support at one side of the under thread, a coöperating cutting-blade and means to move it parallel to the work-support to sever the said under thread, a common actuator controlled by the operator, and connections between said actuator and the cutting-blades, to positively move said blades simultaneously when the operator desires to sever both threads, substantially as described.

3. In a cutting mechanism for sewing-machines, a presser-bar and its attached presser-foot, a cutting-blade mounted on said bar to swing across the presser-foot and sever the thread, a stand secured to the presser-bar, a cam on said stand, connections between said cam and the cutting-blade, to swing the latter back and forth, a slide-bar longitudinally movable in the stand, a stud thereon to enter the groove of the cam and partially rotate the latter, and means controlled by the operator to move the slide-bar, substantially as described.

4. In a cutting mechanism for sewing-machines, a presser-bar and its attached presser-foot, a cutting-blade mounted on said bar to swing across the presser-foot and sever the thread, a stand secured to the presser-bar, a cam on said stand, connections between said cam and the cutting-blade, to swing the latter back and forth, a hooked arm or pull-off adapted to be swung across the path of the thread, to draw the same through the needle-eye prior to its being severed, and means to partially rotate the cam, to operate the said pull-off and thereafter move the cutting-blade to sever the thread, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ARTHUR H. KINDER.

Witnesses:
JOHN C. EDWARDS,
AUGUSTA E. DEAN.