

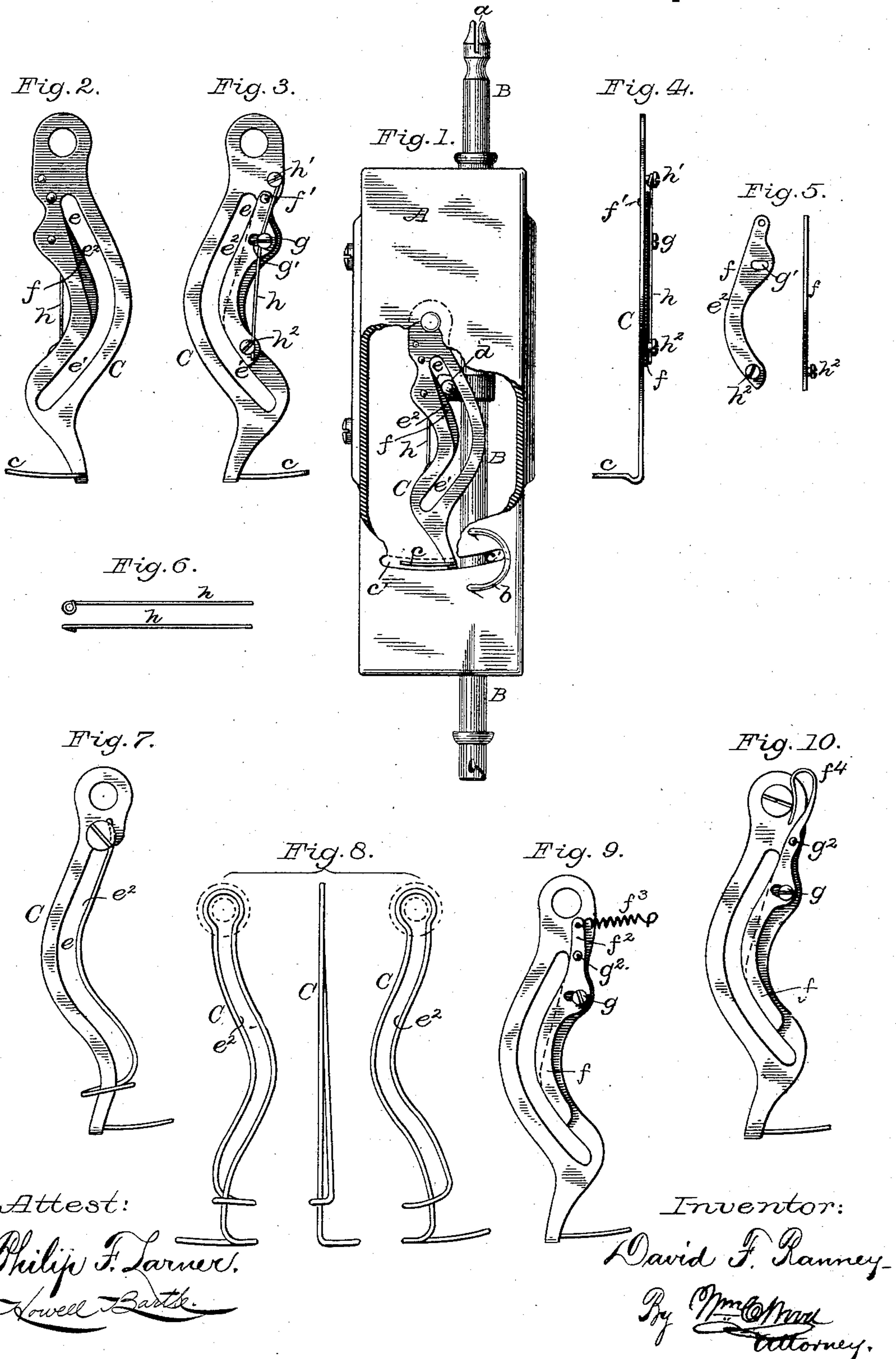
(No Model.)

D. F. RANNEY.

TAKE-UP MECHANISM FOR SEWING MACHINES.

No. 327,410.

Patented Sept. 29, 1885.



UNITED STATES PATENT OFFICE.

DAVID F. RANNEY, OF FLORENCE, MASSACHUSETTS, ASSIGNOR TO THE
FLORENCE MACHINE COMPANY, OF SAME PLACE.

TAKE-UP MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 327,410, dated September 29, 1885.

Application filed October 8, 1884. (No model.)

To all whom it may concern:

Be it known that I, DAVID F. RANNEY, of Florence, (in the city of Northampton,) county of Hampshire, and State of Massachusetts, have invented certain new and useful Improvements in Take-Up Mechanisms for Sewing-Machines; and I do hereby declare that the following specification, taken in connection with the drawings furnished and forming a part of the same, is a clear, true, and complete description of the several features of my invention.

My improvements pertain to that class of thread-controllers or take-up mechanisms in which a thread eye or finger is located at the end of a pivoted lever or arm having a curved cam-slot for the reception of a pin projecting from the needle-bar, so that when said bar is vertically reciprocated the thread-lever is vibrated to and fro in a vertical plane. Heretofore said slotted thread arm or lever has either been wholly controlled by said needle-bar pin, or partially by said pin and partially by a spring, so that the slack thread may be controlled by the spring at such times as the thread should be relieved from the positive action of the pin in the cam-slot—as, for instance, during the final upward movement of the needle-bar and its initial downward movement. So far as my knowledge extends, the springs heretofore employed with such cam-slotted thread-arms have been so applied as to exert a constant pressure or strain upon the thread arm, and to cause the stud or pin on the needle-bar to be constantly engaged by one particular side of the cam-slot, except whenever the power of said spring is overcome by the tension on the thread, and as a result the stud and slot are liable to be unevenly worn, and the sudden shifting of contact of the stud or pin from one side of the slot to the other occasions much noise, and it is well known that the springs of such take-ups are exceedingly liable to be broken or so strained as to become ineffective. The objects of my invention are to lessen the liability of uneven wear at the points of contact between the needle-bar stud and the slot, to render the operation of the stud and arm practically noiseless, and to reduce to a minimum the

liability of breakage of or injury to the parts which afford resilient action upon the thread.

For accomplishing these ends I have for the first time devised a thread-arm having a curved cam-slot, which has a yielding or spring face at such portions thereof as will, when proper so to do, enable said arm to resist the positive action of the needle-bar stud, and then to exert a yielding or spring tension upon the thread. I employ a spring in some form for affording said yielding face; but instead of having a spring secured at one end to the frame of the machine, and at the other to the thread-arm, I employ a spring or its equivalent which is either mounted upon said thread-arm or constitutes an integral part thereof, although certain portions of my invention can be employed in connection with a spring which is attached at one of its ends to the frame or other stationary portion of the machine.

To more particularly set forth my invention I will refer to the accompanying drawings, and after describing the several thread-arms therein illustrated, the features deemed novel will be specified in the several claims hereunto annexed.

Figure 1 is a front view of a sewing-machine head having a portion thereof broken away for disclosing my thread-arm in its best form as applied thereto. Figs. 2 and 3 are respectively front and rear views of the thread-arm detached. Fig. 4 is an edge view of the same. Fig. 5 is a side and edge view of the plate which affords the yielding face of the cam-slot. Fig. 6 is a side and top view of the spring which controls the yielding face. Fig. 7 is a side view of one of my thread-arms having a yielding cam-face composed wholly of spring-wire. Fig. 8 in several views illustrates one of my thread-arms composed of a single piece of spring-wire, and therefore embodying an integral yielding face for its cam-slot. Fig. 9 is a rear view of one of my thread-arms, having a yielding face for the slot, afforded by a plate controlled by a spring attached at one of its ends to said plate, and at its opposite end to a fixed portion of the machine. Fig. 10 illustrates in side view one of my thread-arms, having the yielding cam-face

on a plate which is pivoted on the arm, and has a spring integrally formed thereon.

It is to be understood that while I prefer and hereinafter make specific claim to the mechanism particularly illustrated in Figs. 1 to 6, inclusive, I am aware that approximately desirable results will accrue by the use of the other forms of thread-arms illustrated, each of which embodies what I deem to be a broadly novel feature—viz., a thread-arm having a cam-slot, which at one or more points is provided with a yielding face for contact with the usual stud or pin on the needle-bar by which said arm is vibrated.

Referring to Fig. 1, the head A of a sewing-machine is shown to be of a common form and provided with a needle-bar, B, which is reciprocated in the usual manner, and has a thread-slot at *a*, over and through which the thread passes on its way to the needle, behind the usual thread-guard *b*, in conjunction with which the thread-arm C operates for properly controlling the slack thread, said arm having the usual bent finger, *c*, at its lower end, projecting outwardly through a curved slot, *c'*, in the front face of the head, adjacent to the thread-guard *b*.

The thread-arm C is, as heretofore, pivoted to the inner front side of the head of the machine, so as to be vibrated to and fro in a vertical plane by a stud or pin, *d*, which projects from the needle-bar in the usual manner, and occupies the curved cam-slot *e* in said arm. As the slack thread should be positively controlled during the first portion of the upward stroke of the needle, the lower portion of the cam-slot, as at *e'*, has rigid or unyielding sides or faces; but before the needle completes its upward movement the face or side *e''* of the upper portion of the cam-slot yields to the tension of the thread, and controls the same under a yielding strain until after the needle-bar makes its initial downward movement, and also until the stud *d* on the needle-bar has passed the curve in the cam-slot and reached the lower or unyielding faces thereof. This yielding cam-face *e''* is formed upon the edge of a curved plate, *f*, which is freely pivoted at its upper end, as at *f'*, to the thread-arm, so that it can swing thereon. This plate *f* is limited in its vibratory movement on the thread-arm by means of a fixed stud, *g*, projecting from said arm, and occupying a short transverse slot, *g'*, in said plate. The yielding capacity of said plate is durably afforded by the practically-straight wire spring *h*, having an eye at one end, by which it is secured to the thread-arm by means of the pin or screw *h'*, and at its opposite end said spring bears against a screw or stud, *h''*, projecting from the free end of said plate, the intermediate fixed stud, *g*, serving as a fulcrum or seat for said spring, which therefore normally forces the plate *f* toward the cam-slot of the thread-arm, so that its inner edge, *e''*, can serve as a yielding face to one side of the upper portion of the cam-slot.

It will be seen in Fig. 3 that the cam-slot is

uniform in width throughout its length, and that said width being but little greater than the diameter of the needle-bar stud or pin *d*, the latter will reciprocate smoothly therein and with but little noise, because of the minimum of lost motion which is possible between the stud and the faces of the cam-slot. Instead of having a continuous but variable spring-pressure upon the thread-arm, and a constant spring-pressure against the needle-bar stud, as heretofore, my yielding cam-face plate can only be actuated by its spring at such times as may be actually requisite, and it will be seen that the thread will be controlled by the thread-arm without deflecting the spring at such other times, as the quantity of slack thread will admit of the full vibratory movement of said arm.

In Fig. 7 I show the thread-arm C with its cam-slot *e* uniform in width throughout its length, as before described; but one entire side of said slot has a yielding capacity, because it is composed of light spring metal secured at its upper end to the shank of the arm near its pivotal point, its lower end being provided with an elongated guide-eye, which freely embraces the adjacent lower portion of the arm. With this form of thread-arm I have the yielding face *e''*, which operates like that previously described in connection with Figs. 1 to 5, and although the lower portion of the cam-slot has a similar yielding face which has no special value, such a thread-arm can be relied upon for obtaining fairly desirable results.

In Fig. 8 I show the thread-arm C composed wholly of spring-wire in one piece, although at its pivotal point an eyelet-bushing, as indicated in dotted lines, can be used to good advantage. With a thread-arm thus constructed a yielding face, *e''*, is obviously afforded at the proper portion of the cam-slot, and, like the arm Fig. 7, the lower portion of this cam-slot has yielding faces.

Although the arms, Figs. 7 and 8, may be very cheaply constructed, I prefer to employ the plate *f*, because with it I can locate the yielding face *e''* at the exact point in the slot where it is most desirable, and have unyielding faces at the lower portion of the cam-slot for securing a positive action of the take-up during the initial upward movement of the needle-bar.

I have hereinbefore indicated that certain portions of my invention can be employed in connection with a spring which at one end is attached to some stationary portion of the machine—as, for instance, as illustrated in Fig. 9, wherein the upper end of the plate *f* has a tail-piece, *f''*, extended beyond its pivot *g''*, and a retractile spiral spring, *f'''*, under tension is secured at one end to said tail-piece and at the other to a fixed part of the machine—as, for instance, to the inner surface of the head—and when thus organized it will be seen that although the spring *f'''* is always under tension it is not materially affected by the

vibratory movement of the thread-arm, because the point at which the spring is connected with the plate *f* is closely adjacent to the pivot of the thread-arm.

5 It is not to be understood that the use of the plate *f* necessarily involves the use of a separate spring therewith, although I prefer that arrangement. In Fig. 10 the plate *f* is shown to be provided with an integral spring, *f*⁴,
10 which is afforded by a slender extension or tail-piece, which is curved or bent so as to take bearing against one side of the usual screw which serves as the pivot for the arm.

15 All of the thread-holders thus shown and described by me obviously contain the main novel and characteristic feature of my invention—viz., a cam-slot which is provided at one or more points with a yielding face for contact with the needle-bar pin *d*—and it is equally
20 obvious that various other modifications thereof can readily be made without departure from the said main feature of my invention.

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

1. The combination, substantially as here- 25
inbefore described, of the needle-bar, provided with a projecting pin or stud, and a thread-arm having a cam-slot provided with a yielding face at one or more points therein.

2. The thread-arm provided with a cam- 30
slot, and with a spring-plate pivoted upon said arm, to serve as a yielding face for a portion of the cam-slot, substantially as described.

3. The combination of the cam-slotted thread- 35
arm, the plate serving as a portion of the cam-slot, and a spring mounted on said arm for controlling said plate, substantially as described.

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Witnesses:

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