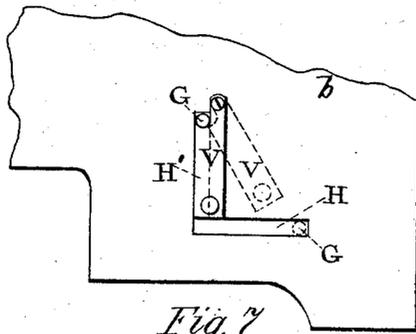
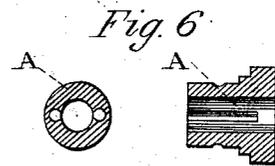
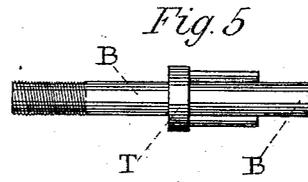
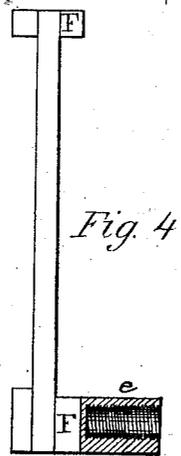
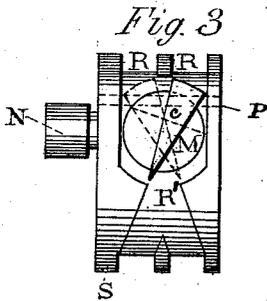
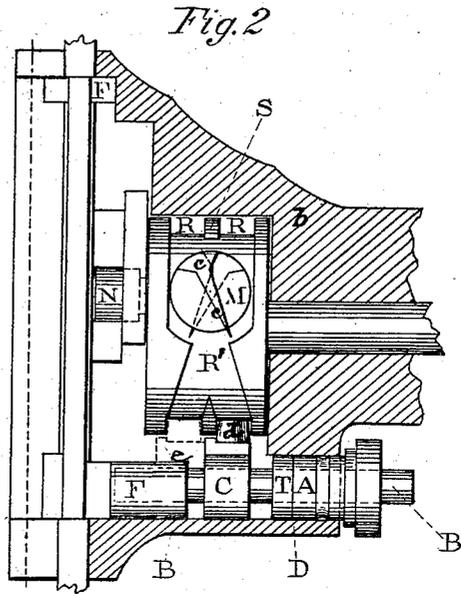
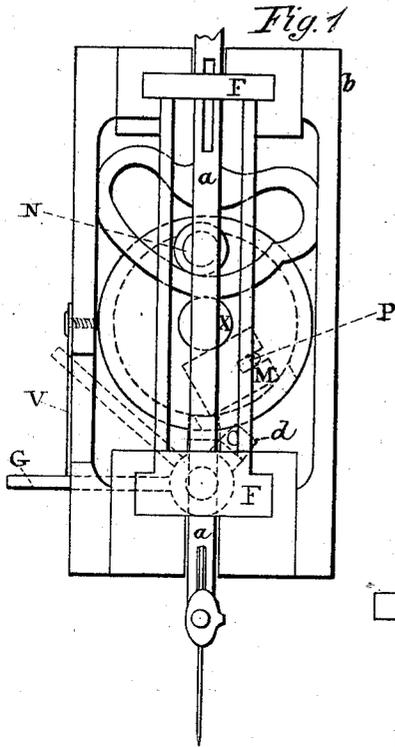


T. W. MORRISON
Sewing-Machine.

No. 216,289.

Patented June 10, 1879.



Witnesses:
William Dixon
Martha Dixon

Thomas W. Morrison,
Inventor.

UNITED STATES PATENT OFFICE

THOMAS W. MORRISON, OF NEWARK, NEW JERSEY.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **216,289**, dated June 10, 1879; application filed March 1, 1879.

To all whom it may concern:

Be it known that I, THOMAS W. MORRISON, of Newark, New Jersey, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a specification.

My invention relates to that class of sewing-machines in which the needle is caused to operate so that a zigzag seam may be formed, this result being due to lateral motion imparted to the needle in a line transverse to the line of feed.

It is my object to combine in an ordinary sewing-machine means by which a straight or zigzag seam may readily be sewed and the zigzag seam readily varied while the machine is in operation.

To attain this result I employ devices which, while simple, are yet entirely effective to impart positive lateral movement to the needle in both directions, and they are so combined and arranged that I can at will, and while the machine is in full motion, throw the needle-head—that is to say, the part which carries the needle stock or bar—into and out of engagement with its lateral reciprocating mechanism, thus instantaneously changing the seam from straight to zigzag or vice versa.

I also provide a regulator which, while attached to or engaging some moving part of the lateral-movement-transmitting mechanism for the purpose of adjusting that part so as to regulate the length of lateral reciprocation of the needle-head, is, nevertheless, stationary with respect to that part, and does not receive movement from the transmitting mechanism.

I also employ as a lateral-movement actuator a peculiar cam arrangement, the characteristic of which is a switch, which, each time it is passed by the pin or other object which it serves to guide or deflect, is set by said pin in proper position for the succeeding movement.

These and other features of my invention will be understood by reference to the accompanying drawings, in which—

Figure 1 is a front view of so much of the head or overhanging front end of the goose-neck of a sewing-machine and the parts carried therein as needed to illustrate my invention. Fig. 2 is a longitudinal vertical central section of the same. The remaining figures

represent detached parts which will be herein after referred to.

The sewing-machine is one in which the needle is carried by a vertically-reciprocating needle-bar, *a*, which has its bearings in a frame, *F*, which I term the "needle-head." (Shown detached in side elevation, partly in section, in Fig. 4.) The needle-head is supported in suitable guides or ways in the sewing-machine frame or goose-neck *b*, so as to be movable laterally—that is to say, in a horizontal plane transverse to the line of feed.

The needle-bar obtains its movement through the instrumentality of the usual slotted yoke, which is engaged by the crank-pin *N* in the customary way. The crank-pin in this instance is carried by the cam *S*, (shown detached in Fig. 3,) which serves to produce the lateral movement also, said cam being fixed on the horizontal driving-shaft, which is supported in the goose-neck, and is driven in any ordinary or suitable manner. The cam is a peripherally double-grooved cam, the two grooves *R R* passing into one at one point *R'*, where they form a single broader groove, with sides converging toward the point where the switch *c* is situated. This switch is a fin or rib, wedge shape in the present instance, which projects from a disk or cylindrical hub, *M*, seated and adapted to rotate or oscillate on its axis in the cam, being held therein by a key, *P*, which enters a cross-slot in the hub, as shown by dotted lines in Fig. 1, in such manner as to permit said hub to rotate to the requisite extent in either direction.

The cam, which I term a bi-cam, is engaged by a friction-roller stud or pin, *d*, which enters its grooved part, as shown in Fig. 2. Suppose the parts to occupy the position shown and the cam to be in revolution, with the point of the switch deflected to the right. The movement of the cam will bring the roller-stud into the grooved part *R'*, where it will travel along the right-hand inclined side of said groove, and thence will be deflected by the switch into the left-hand groove; but in passing into that groove it will abut against the enlarged rear end of the switch, which will thus be tilted over to occupy the position shown in dotted lines in Fig. 2, in which position it will act when it again comes around to

deflect the roller-stud from the left-hand groove back into the right-hand groove. Thus the switch is set each time by the object which it deflects and guides.

The roller-stud in this way has a movement of positive reciprocation, which may be transmitted to the laterally-movable needle-head through the intermediary of any suitable instrumentality. One convenient arrangement for the purpose is shown in the drawings, it being an arrangement which permits the mechanism to be brought into small compass and to be contained within the head or front end of the goose-neck.

The roller-stud is fast to and projects from a slide or sleeve, C, on the cylindrical rod B. (Shown detached in Fig. 5.) This rod screws at one end into a horizontal socket, *e*, formed in the lower part of the needle-head, and at its other end engages, by means of one or more longitudinal splines, a grooved regulating-sleeve, A, (seen in longitudinal and transverse section in Fig. 6,) which is supported so as to be capable of rotary but not of longitudinal movement in the frame or goose-neck *b*. Its outer end projects from the goose-neck, and has a milled head, by means of which it may be turned.

The rod B extends through the regulating-sleeve, and can play back and forth therein to the extent permitted by the collar T, which is fixed on the rod, and is intended to bear against the inner end of the regulating-sleeve.

By turning the regulator the rod will be rotated and will be screwed out from or into the socket *e*, more or less, according to the extent to which the regulator is turned, thus varying the distance between the collar T and the part *e* of the needle-head into which the front end of the rod screws. It is this distance which determines the length of lateral reciprocation of the needle-head.

The slide C playing back and forth on the rod between the points *e* T, as these points are brought nearer together, the lateral movement of the head increases, and as they are separated the lateral movement diminishes. Sound-deadening washers of leather, rubber, or other suitable material may be interposed between the slide and the shoulders.

In order to arrest instantaneously the lateral movement, the roller-stud can be arranged to be thrown out of engagement with the cam, thus arresting all movement of the lateral-motion-transmitting mechanism, bringing the parts to rest and preventing wear. I accomplish this result by the use of a device or mechanism which I term the "throw-off," consisting, in the present instance, of a lever or handle, G, fast to the slide or sleeve C, and projecting through the goose-neck or frame, so that its exposed end may serve as a handle. It projects through a horizontal slot, H, in the side of the goose-neck, as indicated in Fig. 7, which slot, at its rear end, connects with a vertical slot, H'. The handle moves with the sleeve, and consequently traverses the horizontal slot

when the roller-stud engages the cam. If it be desired, however, to disengage the stud and the cam, the handle, when it comes opposite the vertical slot, can be lifted, which will have the effect of rotating the slide or sleeve far enough to tilt the roller-stud out of engagement with the cam, as indicated by dotted lines in Fig. 1. When thus placed all lateral movement ceases.

A movable notched plate or guard, V, can be employed to prevent the handle from accidentally catching in or entering the vertical groove while the machine is making a zigzag seam, or to engage and uphold the handle when it is raised into the vertical groove.

I would remark that, while I have shown one form of cam arrangement, yet the principle involved therein can be applied in various ways, the characteristic being that the switch is set each time by the object which it guides and deflects. The cam-grooves may, for instance, be formed in the face, instead of the periphery, of a rotary disk, or they may be formed in a flat, instead of a curved, surface; and the device in which they are formed may, instead of rotating, reciprocate or vibrate, or, indeed, be stationary. For example, a flat double-grooved cam-plate, with switch, could be placed alongside of the laterally-movable needle-head, said plate being stationary and fixed to the machine-frame in proper position, and a pin or roller-stud from the vertically-reciprocating needle-bar could project into and engage the cam. In this way the vertical reciprocations of the needle-bar would cause the lateral reciprocatory movement necessary to make the zigzag seam.

The pin could be made movable, so as to connect and disconnect the parts at pleasure. This arrangement would not permit of varying the extent of lateral reciprocation; but by connecting the parts, not directly, as just suggested, but through the instrumentality of proper intermediaries, provision for varying the extent of lateral movement could readily be made.

While I much prefer the bi-cam or switch-cam herein described, yet it may be replaced by cams of known construction, which, while differing in detail, will yet serve the purpose of producing the reciprocatory movement desired.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination, with the laterally-movable needle-head, of mechanism for imparting lateral reciprocation to the same, arranged and adapted to be thrown into and out of engagement with the driving mechanism while the machine is in motion, substantially as and for the purposes set forth.

2. The combination, substantially as set forth, of the laterally-movable needle-head, the double-groove cam and reversible switch thereon, the pin or stud engaging said cam and operating to set the switch by which it is

guided from one groove to the other, and intermediate mechanism whereby the reciprocatory movement of the said pin or its equivalent is imparted to the needle-head.

3. The combination, substantially as set forth, of the needle-head, the cam from which lateral movement is derived, and intermediate mechanism for imparting said lateral movement to the needle-head, and a throw-off to engage or disengage said mechanism from said cam, whereby, when the machine is sewing a straight seam, the lateral-movement-transmitting mechanism will be entirely at rest.

4. The combination, substantially as set forth, of the needle-head, the regulator, the screw-rod connecting the same, and the reciprocatory slide mounted on said rod, whereby the working length of the said rod may be varied to increase or lessen the distance between the shoulders against which the slide

acts, in order to cause the lateral reciprocation of the needle-head.

5. The double-grooved driving-cam, the stud or pin engaging the same, the sliding sleeve and its supporting-rod, in combination with the throw-off lever or handle, arranged to rotate said sleeve in order to engage the pin with or disengage it from the cam.

6. In a sewing-machine adapted to sew both a straight and a zigzag seam, the combination, with the mechanism for imparting lateral reciprocation and the cam or other actuator by which said mechanism is driven, of a throw-off, arranged and operating to throw said parts into and out of engagement at will, substantially as and for the purposes set forth.

THOMAS W. MORRISON.

Witnesses:

WILLIAM DIXON,
MARTHA DIXON.