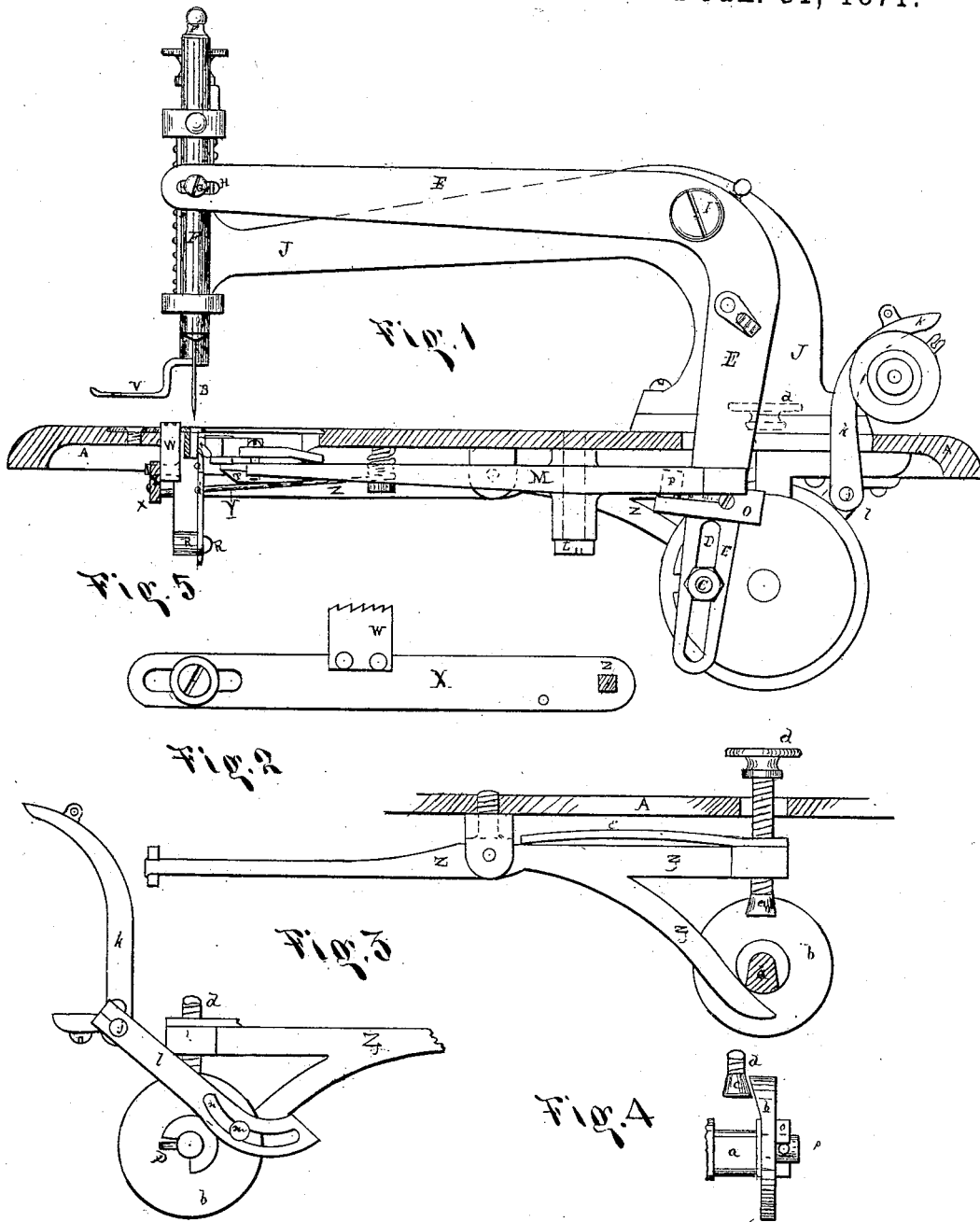


W. B. HIGGINS.

FEEDING MECHANISM FOR SEWING MACHINES.

No. 111,452.

Patented Jan. 31, 1871.



Witnesses:

David B. Smith
Geo. L. Scott

Inventor:

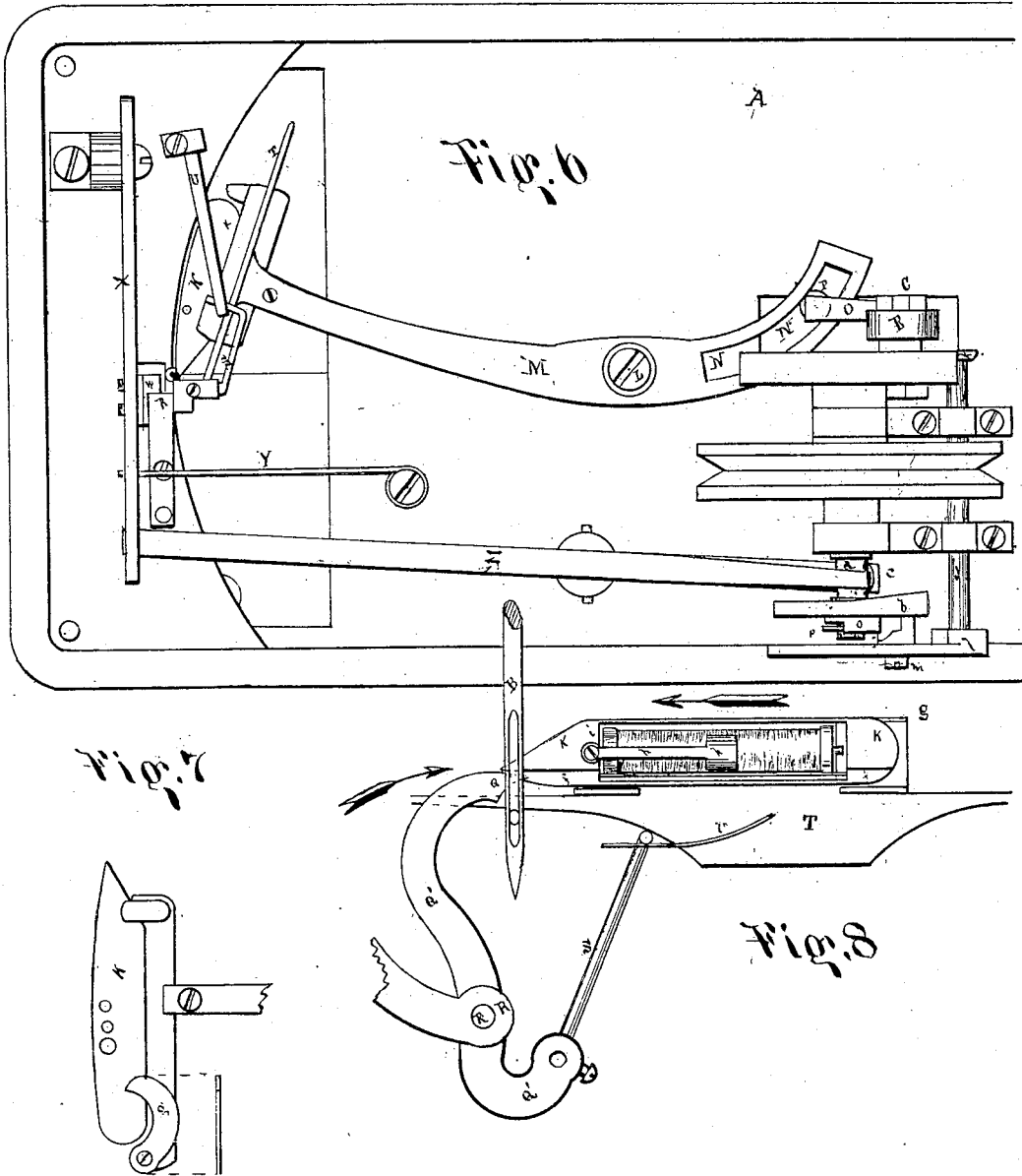
Walter B. Higgins
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UNITED STATES PATENT OFFICE.

WALTER B. HIGGINS, OF SAN FRANCISCO, CALIFORNIA.

IMPROVEMENT IN FEEDING MECHANISMS FOR SEWING-MACHINES.

Specification forming part of Letters Patent No. **111,452**, dated January 31, 1871.

To all whom it may concern:

Be it known that I, WALTER B. HIGGINS, of San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Sewing-Machines; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention consists in certain details of construction relating to the mechanism for feeding the cloth, the details of which will be fully described hereinafter.

In the annexed drawings, Figure 1, Sheet 1, is a vertical longitudinal section of a sewing-machine embodying my invention. Fig. 6, Sheet 2, is a view of under side of same. Figs. 2, 3, 4, and 5, Sheet 1, and Figs. 7 and 8, Sheet 2, are details.

Like letters refer to like parts in each of the figures.

A is the bed-plate, to which all the other parts are secured. A uniform vertical reciprocating motion is given to the needle B by means of the crank-pin C, working in slot D of the needle-lever E. The needle-lever E drives the needle-bar F by means of the pin G, working in the slot H; but the needle may be curved and secured directly to the end of the lever E, if such a construction is preferred. The lever E has its center of vibration in the axis of the pin I, projecting from the stout arm J.

The shuttle K moves in a plane parallel with the bed-plate and in an arc of a circle, the center of which is in the axis of the pin L. The shuttle is propelled by the curved lever M, in the opposite extremity of which is the curved slot N. Lever M has its fulcrum at L and receives motion from the lever E by means of the piece O, having the friction-roller P, working in the slot N.

Q is a hook formed on the end of a vibrating lever or arm, Q', hinged at R, below and nearly on a line with the needle, and receiving motion by means of the rigidly-attached adjustable arm S from the cam-plate T. The cam-plate T moves with the extremity of the lever M, and is secured to that lever immediately below or close to the shuttle. By means of the spring U the arm S is held against the working-faces of the cam-plate T; but it is obvious that instead of the spring U a slot in

the cam-plate may be formed that would give exactly the same motion to the arm S as is obtained by the arrangement shown in the drawings, and I prefer a slot for that purpose. It is also obvious that the arm S may be attached to any part of the lever or arm Q', provided it does not come in the way of the needle or other part of the machinery.

The operation of the hook will be understood by reference to Fig. 8, Sheet 2. The needle is there represented in position as having performed a part of its upward stroke. The points of the shuttle and hook, having simultaneously and in opposite directions begun their transit, are inserted between the needle and the loop formed by the slacking of the thread between the eye of the needle and the fabric. As the parts move on in the direction of the arrows the needle will proceed rapidly upward. The hook Q, moving only a little, will retain the bight or loop of the thread and serve the purpose of preventing a pull or strain sidewise to the needle or the dragging of the thread as the shuttle passes on through the loop. Without the use of this hook it is evident that the thread must be very slack or loose to prevent this side strain on the needle, and this slack or loose thread by being drawn repeatedly through the fabric, becomes worn and injured, and the shuttle, by dragging the thread, will break it or prevent obtaining an even tension, and the working of the shuttle can never be so certain or the stitches so uniform and even without the said hook Q as with it. The reverse motion of the hook takes place a very little before the shuttle has passed quite through the loop, in order that the thread may slip off the hook and around the end of the shuttle. Of course the hook Q, instead of being formed on the extremity of a vibrating arm, as represented, may have the required vibrating or reciprocating motion imparted to it in any suitable manner by guides or otherwise.

In order that the shuttle may pass over the hook without touching it, and the points of the shuttle and hook approach each other as nearly as possible when taking the loop, a longitudinal groove, f, is formed in the lower edge or corner of the shuttle.

The feed is of the well-known four-motion variety, and is obtained by means of the foot V, operated in the usual manner, the toothed piece W, secured to the sliding and vibrating

plate or feed-bar X, spring Y, forked lever Z, and cams *a* and *b*. The spring Y constantly tends to force the extremity of the plate X downward and keep the lower arm of the fork up against the cam *a*, in order that the vertical motion of the feed may be produced by said cam *a*. The spring Y also constantly acts on the plate X in such a manner as to keep the cone or friction-roller *c* against the face of the cam *b*, said cone *c* being on the end of the feed-adjusting screw *d*, passing through the upper arm of the fork in such a manner that the horizontal motions are produced by the cam *b*.

The adjusting thumb-screw *d*, passing through the bed-plate A, furnishes a ready and convenient method or device for regulating the length of the stitches without stopping the machine by causing the cone *c* to approach or recede from the center of my improved cam *b*.

It will be observed that the face of cam *b* is concave or composed of two inclined planes, as shown, in such a manner as to give more or less longitudinal movement to plate X, according to the distance of the cone *c* from the center of the driving-shaft, and in that manner determine the length of the stitch.

To prevent the shuttle from flying up out of its seat, a hook-plate, *g*, Fig. 7, Sheet 2, is provided. Said plate is hinged at *h* in such a manner that when pushed back it will release the shuttle, and when the machine is at work approach as nearly to it as to prevent the noise hitherto caused by the flying about of the shuttle in its seat or carrier. A light spring should also be provided that would have a constant tendency to force the point of the hook-plate *g* toward the shuttle and against a suitable stop provided for the purpose of preventing the hook from coming in actual contact with the shuttle.

By reference to Fig. 8, Sheet 2, it will be seen that a uniform tension on the thread as it leaves the bobbin is provided for by means of a spring, *h*, said spring being firmly secured at one end to the shuttle by means of the screw *i*, and terminating at its other end in a broad curved plate, that bears directly upon the thread, and consequently always operates upon the thread at the same distance from the axis of the bobbin as the part of the thread is being unwound.

In order to take up the slack of the thread caused by the passage of the shuttle through the loop, a device is provided consisting of the rock-shaft *j* and arms *k* and *l*, operated by means of the crank-pin *m*, attached to the back of the cam *b*. The crank-pin *m* works in a slot, *n*, in the arm *l*.

The cam *b* is loose on the driving-shaft, and has a part of its hub *o* cut away so as to form lugs or stops, against which the pin *p* bears, either against one lug or the other, according to the direction in which the shaft is turned. By this simple device the whole machine becomes reversible, and may be turned or worked in either direction without inconvenience.

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

The feeding mechanism described, consisting specifically of the cam-wheel Z, constructed, as described, with its cam-shaft *a*, lever *z*, with its arms, having the adjustable screw *d* and spring *e*, and slotted bar X, with teeth W, when combined and arranged as described.

In witness whereof I have hereunto set my hand and seal.

W. B. HIGGINS. [L. S.]

Witnesses:

C. W. M. SMITH,
H. S. TIBBEY.