J. KEATS.

SEWING-MACHINE.

No. 191,975. Patented June 12, 1877.

Fig. 1.

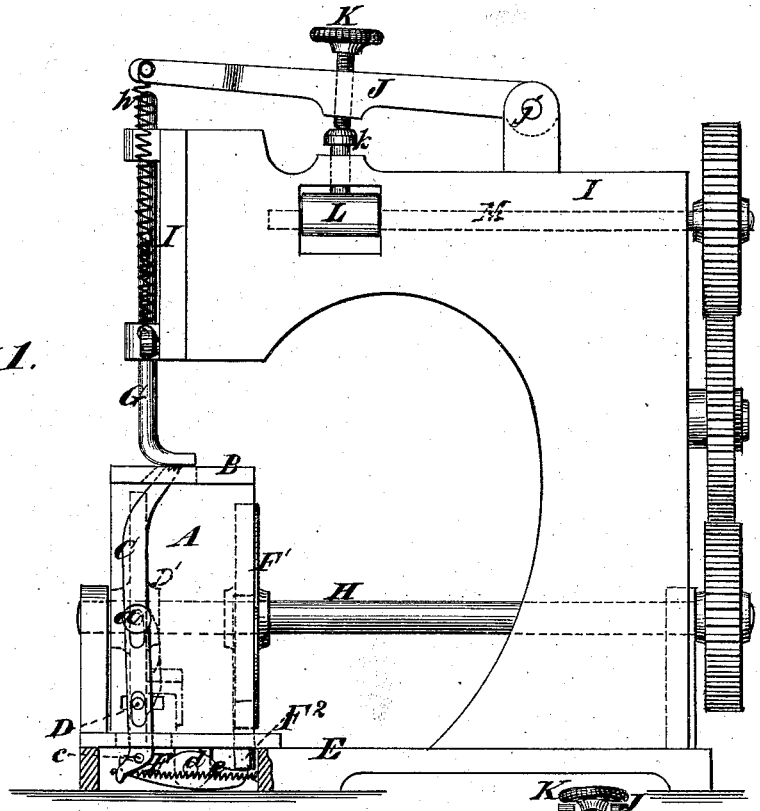

Fig. 3.

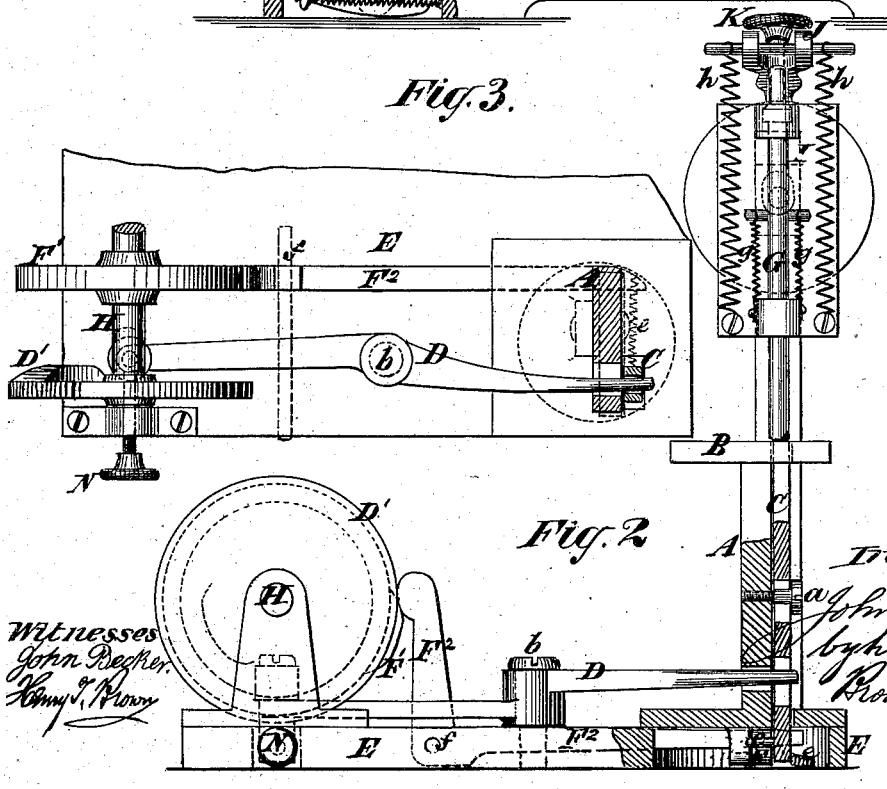

Fig. 2.

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JOHN KEATS, OF WOOD GREEN, ENGLAND.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **191,975**, dated June 12, 1877; application filed December 16, 1876.

To all whom it may concern:

Be it known that I, JOHN KEATS, of Wood Green, in the county of Middlesex, England, have invented certain new and useful Improvements in Sewing-Machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

This invention relates to the feed mechanism and to the presser.

The improvement in the feed mechanism has mainly for its object to provide a simple and effective under feed for that class of sewing-machines known as "post" machines. This improvement consists in a novel combination of levers, cams, and a spring with a vertical feed-bar.

The improvement in the presser has for its object to provide for varying the pressure upon the work during the operation of making each stitch, so that a heavy pressure may be maintained upon the work at the time of tightening the stitch, and a lighter pressure, but sufficient to steady the work, may be maintained while feeding.

This improvement consists in the combination, with the presser, of two springs or two sets of springs and an automatic lifting device, operated by the sewing-machine to take off the pressure of one of said springs or sets of springs. One of said springs or sets may remain constantly in operation, but the other, to which the lifting or relieving device is applied, is allowed to operate on the presser so long as is necessary to hold the work, being sewed against the pull of the thread in the tightening of the stitch, but has its pressure taken off at the time of feeding.

The invention further consists in novel means of applying to the presser and taking off therefrom the pressure of the last-mentioned springs.

Figure 1 of the drawing is a front view of so much of a sewing-machine as is necessary to illustrate my invention, the stitch-making devices and all parts not involved in my improvements being omitted. Fig. 2 is a side view of the same, partly in section. Fig. 3 is a plan view of the feed mechanism.

Similar letters of reference indicate corresponding parts in the several figures.

The improvement in the feed mechanism is illustrated by all the figures.

A represents the post, having a cap, B, of any suitable form on which the work is supported, and through a slot in which works the upper end of the vertical feed-bar C, which is serrated or toothed at its upper end, and which moves up and down, and also oscillates upon a pin, *a*, secured in the post. The post may be hollow, as is usual in post-machines, and the feed-bar C arranged inside of it. The feed-bar C is slotted some distance below the pin *a* to receive the front end of a horizontally-moving lever, D, which works on a fixed fulcrum-pin, *b*, secured in the post-supporting table E; and the side bar has secured in it, near its lower end, a stud, *c*, bearing upon a vertically-moving lever, F, which works on a fixed fulcrum, *d*, at the bottom of the post. The lower end of the feed-bar is connected with a spring, *e*, which always acts to draw the bar back in the opposite direction to that in which it moves in feeding. That end of the lever F which is farthest from the feed-bar is situated under the horizontal arm of a vertically-moving elbow-lever, F^2, which works on a fixed fulcrum-pin, *f*, secured in the table E. The horizontal lever D is operated upon by a side-faced feeding-cam, D′, and the elbow-lever F^2 is operated by a peripherical lifting-cam, F^1, the said cams being upon a horizontal rotating shaft, H, suitably arranged upon the machine.

The lifting-cam F^1 raises up the feed-bar by its operation on one end of the elbow-lever F^2, the other end of which depresses one end of the lever F, and so raises the other end of the latter, upon which the feed-bar C is supported by the stud *c*. The feeding-cam gives the required feeding movement to the feed-bar by means of the lever D. The two cams are, of course, properly timed, so that the lifting and feeding movements are in proper relation to each other. The feed-regulating screw N, for regulating the length of feed, is applied to operate on the lever D.

It may be observed that the stud *c* in the feed-bar has a movement toward and from the fulcrum *d* of the lever F, and the lifting movement is effected when the stud *c* is nearest the fulcrum *d*, when the leverage is greatest. In order that in the drawing back of the feed-

bar by the spring *e*, in which operation the stud *c* moves along the upper face of the lever F, the work of the spring may be easy, and a light spring may be sufficient, that part of the face of the said lever F on which the said stud *c* works is curved or inclined downward toward the fulcrum, as shown in Fig. 1, in such manner that the stud begins to ease itself as the spring begins to operate.

The improvement in the presser is illustrated in Figs. 1 and 2. The presser-rod G, which, with its presser-foot, may be of ordinary construction, is fitted in the usual or any suitable way to guides in the face-plate or head I of the machine, and it has applied to it two light spiral springs, *g g*, which connect it with the head I or face-plate in such a manner as to give it constantly a light downward pressure. Over the top of the presser-rod is situated the end of a lever, J, the opposite end of which is attached by a fulcrum-pin, *j*, to the head I of the machine. This lever is connected near the presser-rod by two powerful springs, *h h*, with the front plate or head of the machine, in such manner that when the said lever is allowed to bear on the presser-rod the said springs *h h* give a powerful pressure to the said rod and the presser, and the said lever carries an adjusting-screw, K, which bears upon a lifting-pin, *k*, which is fitted to the head of the machine directly over a cam, L, on a horizontal rotating shaft, M, which is arranged in bearings in the head of the machine.

The lever J, the cam L, and their adjuncts constitute the automatic lifting or relieving device. The cam at the time the feed takes place lifts the lever from the presser-rod, and so relieves the presser of the pressure of the springs *h h*, but leaves it subject to the pressure of the lighter springs *g g*, which is sufficient to steady the work while being fed; but, after the feeding, the cam allows the stronger springs *h h* to draw down the lever J upon the presser-rod, and so apply their pressure to the presser, and continue it during the operation of tightening the stitch by the drawing up of the needle. Both sets of springs in their normal condition operate upon the presser to make it press upon and hold the work, and it is only when the pressure of the springs *h h* is taken off by the positively-operating lifting or relieving device that they cease to operate upon the presser.

The adjusting-screw K provides for regulating the lift of the lever J to suit different thicknesses of work.

This improvement in the presser is applicable to sewing-machines of all kinds, but is especially useful for those in which heavy leather work is performed. A single spring might be substituted for the two *g g*, or one for the two *h h;* but it is more convenient to apply the springs in pairs.

The improvement in the feed is applicable also to various kinds of machines. In applying it to a post-machine with a rotary looper the lever F may be bent, forked, or formed with a yoke to pass the vertical shaft or bearing of the rotary looper.

I claim—

1. The combination of the vertical feed-bar C, the levers F, F^2, and D, the cams F^1 D′, and the spring *e*, substantially as herein described.

2. The combination, with the presser of a sewing-machine, of two springs or sets of springs, both of which, in their normal condition, act upon the presser to hold it down upon the work, and an automatic lifting or relieving device, applied to one of said springs or sets of springs to take its pressure from the presser without interfering with the pressure of the other spring or set, substantially as herein described.

3. The combination of the presser-rod G, the spring or springs *g g*, the spring or springs *h h*, the lever J, and the cam M, substantially as and for the purpose herein set forth.

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