B. C. STEVENS.

Machine for Making Latches for Knitting-Machine Needles.

No. 221,003. Patented Oct. 28, 1879.

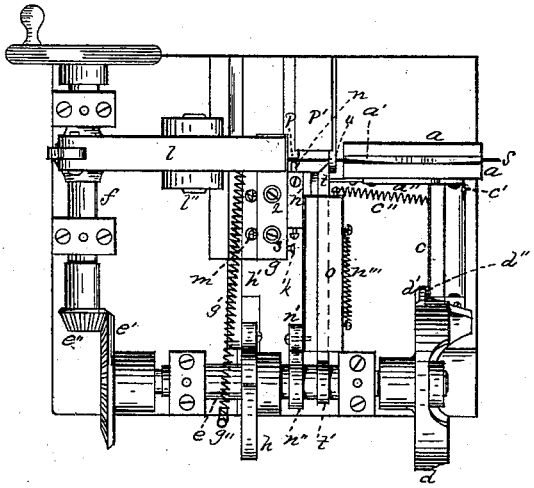

Fig. 1.

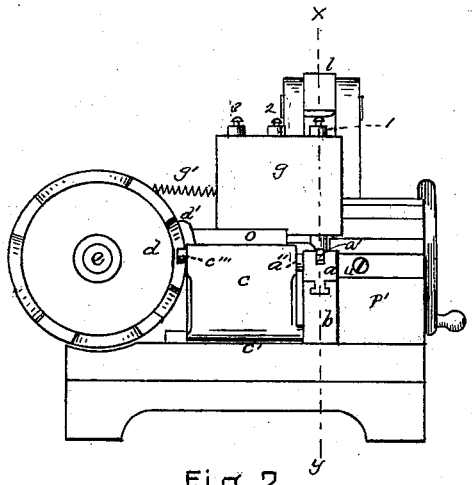

Fig. 2.

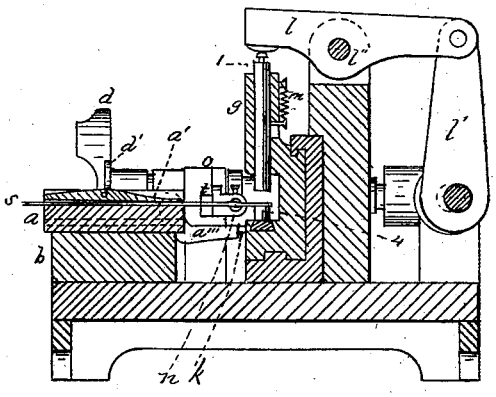

Fig 3

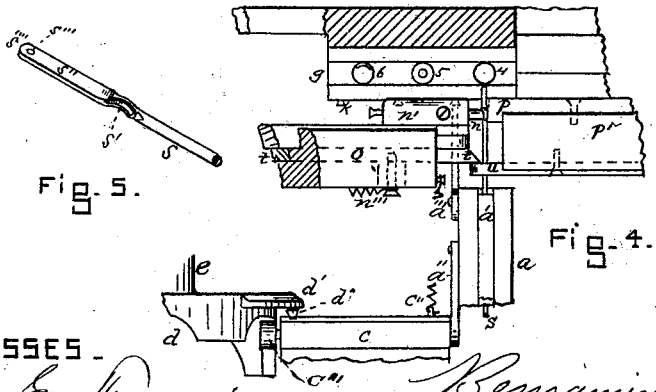

Fig. 5.

Fig. 4.

WITNESSES.

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UNITED STATES PATENT OFFICE.

BENJAMIN C. STEVENS, OF FRANKLIN, NEW HAMPSHIRE, ASSIGNOR TO JACKMAN & FLANDERS, OF SAME PLACE.

IMPROVEMENT IN MACHINES FOR MAKING LATCHES FOR KNITTING-MACHINE NEEDLES.

Specification forming part of Letters Patent No. **221,003**, dated October 28, 1879; application filed July 3, 1879.

To all whom it may concern:

Be it known that I, BENJAMIN C. STEVENS, of Franklin, in the county of Merrimack and State of New Hampshire, have invented a new and Improved Machine for Making Latches or Tongues for Knitting-Machine Needles, of which the following is a specification.

In the accompanying drawings, in which similar letters of reference indicate like parts, Figure 1 is a plan of my improved machine. Fig. 2 is a front elevation of the same. Fig. 3 is a vertical section on line *x y*, Fig. 2. Fig. 4 is a sectional plan of a portion of the machine. Fig. 5 is a perspective view of the latch as manufactured by the machine.

a is the feeder, provided with the spring *a'*, under which is placed the wire *s*, which is fed into the machine. The feeder *a* slides back and forth in the stationary grooved block *b*, and has reciprocating motion imparted to it by means of the lever *c*, hinged at *c'*, and connected by the rod *a''* with the feeder.

A spring, *c''*, secured to the block *o*, holds the wheel *c'''* against the cam-wheel *d*, which is fixed to the shaft *e*, which shaft is connected by the gear *e' e''* to the driving-shaft *f*. By means of the cam-wheel *d* the various forward and backward motions desired are imparted to the feeder.

d' is a flange, against which an adjusting or regulating screw, *d''*, secured to the lever *c*, presses. This screw, of course, regulates the length of the vibration of the lever *c* when it reaches that point on the cam. A bent rod, *a'''*, extending from the feeder *a*, regulates its stroke, as will be seen below.

g is a sliding block, held against the cam *h* upon the shaft *e* by means of the extension *h'* and spring *g'*, extending to the standard *g''*. This block supports the plungers 1 2 3 and their corresponding dies 4 5 6, as well as stops *k*, which regulate the length of the stroke of the feeder by means of the bent rod *a'''*. The block *g* can be removed to the side of the machine, if desired, in order to adjust the dies or stops. The plungers 1 2 3, which are held in raised positions by suitable springs *m*, are forced down singly upon their respective dies by the lever *l*, pivoted at *l''*, and operated by the eccentric *l'* upon the shaft *f*.

n is the punch, which forms the spoon *s'* in the latch. It is supported by the carriage *n'*, which slides in the block *o*, and is actuated by the cam *n''* upon the shaft *e*. The punch is thus forced against its die *p*, which is supported by the block *p'*, and is sprung back, when released by the actuating mechanism, by means of the spring *n'''*.

t is the wire-cutter sliding in the block *o*, and operated by the cam *t'* upon the shaft *e*. The cutter slides by a projection, *u*, provided with an opening through which the wire passes. A suitable spring retracts the wire-cutter when it is released by the actuating mechanism.

The machine having been put in operation, the wire *s* is placed under the spring *a'* in the feeder *a*, (said feeder being then at its farthest point from the machine,) and the wire having been placed so as to extend through the hole in the projection *u*, it is carried forward by the feeder *a* (which is operated by the cam *d* through the lever *c*) beyond the spoon-punch *n*, and into the position shown in Fig. 4. The punch *n* being actuated by the cam *n''* moves up to the wire, and by forcing it against the die *p* makes the spoon *s'*. The feeder recedes and the wire, being still griped by the punch *n*, remains stationary, and the spring *a'* slips back over the wire. The plunger 1 and die 4 are brought by the sliding block actuated by the cam *h*, so as to be on a line with the wire, and the feeder then moves the wire under plunger 1, which is forced down upon the die 4 by the lever *l*, and flattens the wire at *s''*. The feeder and wire then recede, and the plunger 2 and die 5 move into line with the wire, which then advances, and the hole *s'''* is made by the plunger 2, which, having moved under the lever *l*, is forced down thereby. The feeder and wire again recede, the plunger and die 3 6 move into position, the feeder and wire advance, and the wire is cut off at the rounded end *s''''*. The feeder and wire recede, and the cutter *t*, actuated by the cam *t'*, advances and cuts off the wire, leaving it as shown in Fig. 5. The block *g* now slides back to its original position, and the operation is repeated. The latch is then perfectly formed, excepting that it may need shortening. The only time that the wire is held so as to allow the feeder to slip back

over the wire is when the feeder recedes for the first time. Every subsequent motion is controlled by the feeder.

The length of the latch is regulated by the screw d'' upon the lever c and the flange d'. The length of the stroke of the feeder is determined by the bent rod a''' and adjustable stops $k\,k\,k$.

The flange d' may be placed either inside or outside the rim of the cam d, as desired.

The principal features of my improved machine are the separate plungers and corresponding dies in the sliding block g, each plunger doing its peculiar work, and being distinct from each other plunger, the reciprocating feeder having no lateral motion, but simply moving back and forth, so that instead of the wire moving laterally and following the plungers, the plungers and dies move up to the wire and the flange d' on the cam d for regulating the length of the latches.

I am aware that Letters Patent were granted to W. Aiken for a machine for making knitting-machine-needle latches, November 12, 1867, and of course claim nothing shown in that patent.

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

1. In a machine for making latches for knitting-machine needles, the combination of the lever l and eccentric l', the independent plungers 1 2 3, corresponding dies 4 5 6, the sliding block g, extension h', spring g', and cam h, substantially as and for the purpose set forth.

2. The combination of the feeder a and spring a', projection u, provided with an opening for the passage of the wire, spoon-punch n, cam n'', die p, cutter t, cam t', and the sliding block g, having the punches 1 2 3 and dies 4 5 6, substantially as and for the purpose described.

3. In combination, with the lever c, provided with the screw d'', the rod or link a'', the feeder, and the cam d, provided with the flange d', substantially as and for the purpose set forth.

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Witnesses:

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