J. H. GREENLEAF.

Needle-Loom.

No. 163,184. Patented May 11, 1875.

Fig. 1.

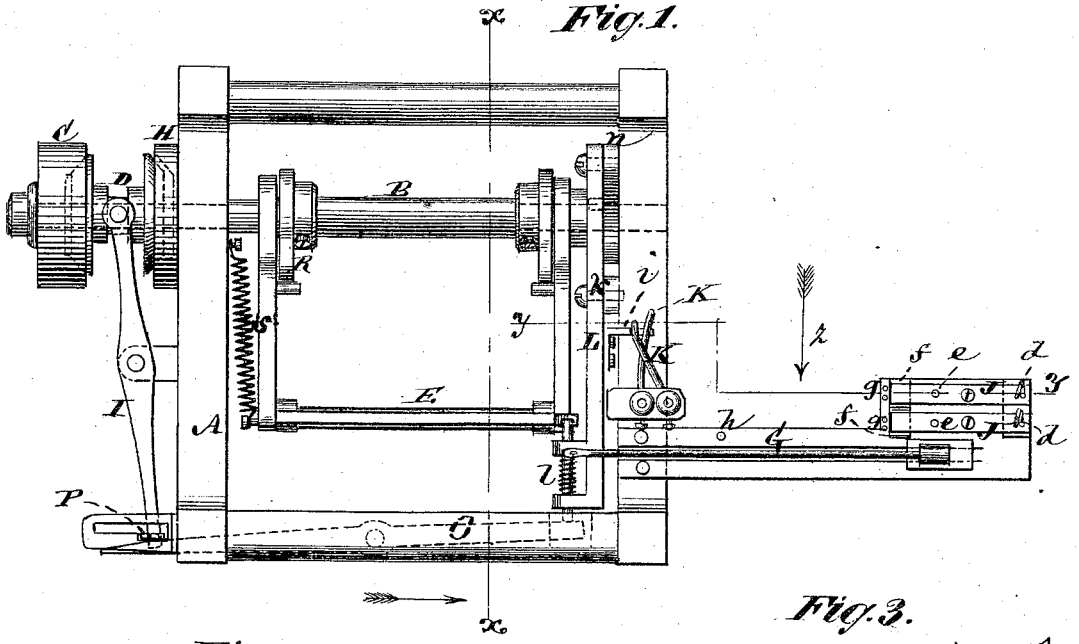



Fig. 2.

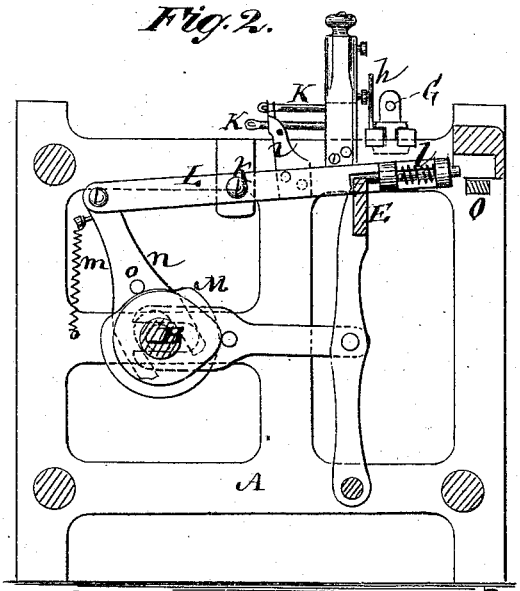



Fig. 3.

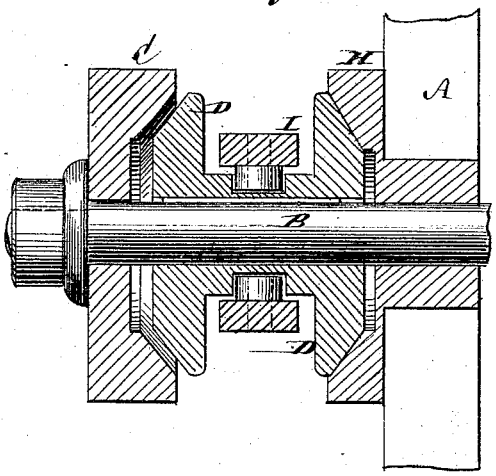
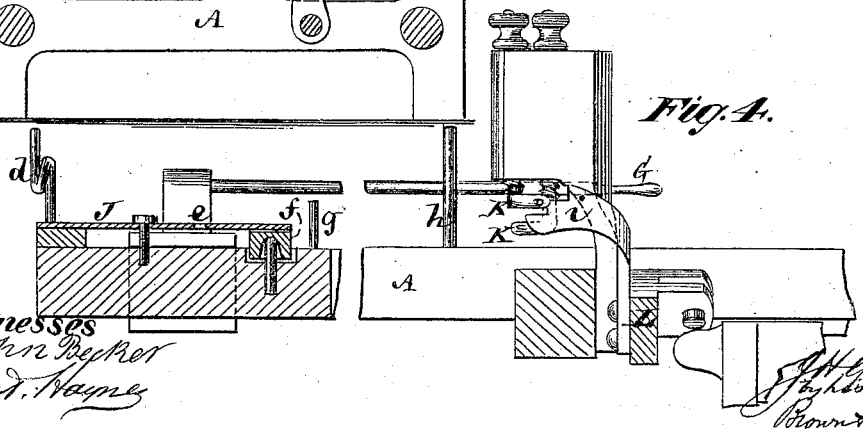



Fig. 4.




Witnesses
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# UNITED STATES PATENT OFFICE.

JOSEPH H. GREENLEAF, OF NEW HAVEN, CONNECTICUT.

## IMPROVEMENT IN NEEDLE-LOOMS.

Specification forming part of Letters Patent No. **163,184**, dated May 11, 1875; application filed October 23, 1874.

*To all whom it may concern:*

Be it known that I, JOSEPH H. GREENLEAF, of New Haven, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Looms, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing forming part of this specification, and in which—

Figure 1 is a plan in part of a loom, having my improvements applied. Fig. 2 is a transverse vertical section of the same on the line *x x;* Fig. 3, a vertical section, on a larger scale, of a friction-brake and clutch arrangement applied to the loom; and Fig. 4 a vertical longitudinal section in part on the irregular line *y y*, Fig. 1, looking in direction of the arrow *z*, but upon a larger scale.

This invention, although applicable, in part, to other classes of looms, is mainly designed to be applied to that description of looms in which the filling is carried through the shed by a reciprocating eye-pointed rod or needle, and the loop of the warp locked at the selvage by the passage through it of a shuttle and its thread upon the opposite edge, the needle, in returning, leaving in the shed a double filling, with its loop interlocked by the shuttle-thread, and such filling being beaten up by the lay. The invention consists, first, in a combination, with the needle, of one or more spring-tension friction devices, consisting of a perforated spring with rear guide, a rocking bearing, and front guide, whereby the needle-thread is subjected to a yielding but positive tension. The invention likewise consists in a combination, with one or more of said spring take-ups or vibrating fingers, of a novel stop mechanism for arresting the motion of the loom in case of the breakage of a needle-thread or of the shuttle-thread, or of the failure of the latter to interlock with the loop of the needle thread or threads. Furthermore, the invention consists in a novel construction of friction-clutch mechanism and brake, including a stationary friction disk or cup, the whole being controlled by the stop mechanism of the loom.

In the accompanying drawing neither the shuttle nor mechanism for reciprocating the eye-pointed needle, nor yet the reeds and other operating parts which form no part of this invention, are shown, and no special reference will here be made to such parts illustrated in the drawing as are common.

A is the frame; B, the driving-shaft, to which power is communicated through a loose pulley, C, when put in gear with said shaft by a double-faced friction-clutch, D. E is the lay of the loom for beating up the filling. G is the reciprocating eye-pointed needle, suitably guided on the side of the loom opposite to that on which the shuttle works, the path of the needle being at right angles to the warp, and the shuttle working in a race parallel with the warps. The friction-clutch D slides along a feather on the shaft B, and, according as it is slid to the right or to the left, is either put into frictional contact with the pulley C or with a stationary disk or cup, H, which latter causes the clutch D, by its feathered connection with the shaft B, to act as a brake, and so that, on disconnecting the clutch from contact with the pulley C, and throwing it into contact with the fixed disk or cup H, not only is motion failed to be communicated to the shaft B by the pulley C, but previous motion or impetus is at once arrested by the contact of the clutch D with the stationary disk or cup H. I is the lever by which these duplicate actions of the clutch are produced, which lever it is proposed to operate by the stop mechanism of the loom, as hereinafter described. J J are duplicate tension friction-springs for controlling duplicate needle-threads in their passage to the needle, but when only one thread is used then a single tension-spring suffices. Each of these tension-springs has arranged in rear of it a back-eye guide, *d*, through which the needle-thread passes to and through a perforation, *e*, and from thence under the front of the spring and over a rocking bearing, *f*, which insures a firm hold of the needle-thread without any tendency to cut or bind, to an extent equal to that of the pressure of the spring, and from thence through a guide, *g*, to a feeler or finger, K, or feelers or fingers K K, when two threads are used with the one needle. These feelers or fingers, from which the needle-threads pass round a fixed guide, *h*, to the eye of the needle, are of an elastic construction, and have a vibrating action to take up the slack of the needle-thread, and so long as the needle-thread

or threads keep whole, and the shuttle-thread interlocks with the loops of the latter, said fingers or feelers are kept drawn back by the needle-threads away from contact with or locking over a projection, *i*, forming part of a lever, L, which has its fulcrum at *k*, and which carries at its one end a sliding spring-stop, *l*, and is borne down at its other or back end by a spring, *m*, attached to a forked lever, *n*, made to straddle the shaft B, so that when so borne down at its back end a cam, M, on the shaft B, acts on a pin, *o*, of the forked lever to vibrate the lever L, so that when the lay beats up the spring-stop *l* is raised out of the way of contact with the lay, and no action is had upon the stop mechanism. When, however, the needle-thread breaks, or the shuttle-thread fails, either by breakage or otherwise, to interlock with the needle-thread, then the spring finger or fingers K K fly forward, and entering steps in or bearing down on the wing or projection *i* of the lever L, keep the forward end of said lever down, and so that the spring-stop *l* is struck by the lay E when beating forward, and caused to act upon a lever, O, which, acting upon a spring tripping-lever, P, operates upon the lever I to throw the catch D out of gear with the pulley C, and into gear or contact with the fixed friction cup or disk H, and so arrest the motion of the loom.

The lay E is operated by cams R on the main shaft as against springs *s*.

I claim—

1. The combination, with the eye-pointed needle G, of one or more perforated springs, J, and rocking bearings *f*, for operation in connection with suitable eyes or guides, to control the tension of the needle-thread, substantially as specified.

2. The combination of one or more fingers or feelers, K, with the lever L, the forked lever *n*, the cam M, the spring *m*, the spring-stop *l*, the lay E, and the lever O, substantially as and for the purposes specified.

3. The combination of the double-faced clutch D, adapted to slide on and to turn with the driving-shaft of the loom, the loose pulley C on the said shaft, and the stationary brake cup or disk H, secured to the loom framing, the whole constructed and operating substantially as and for the purpose herein described.

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Witnesses:

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