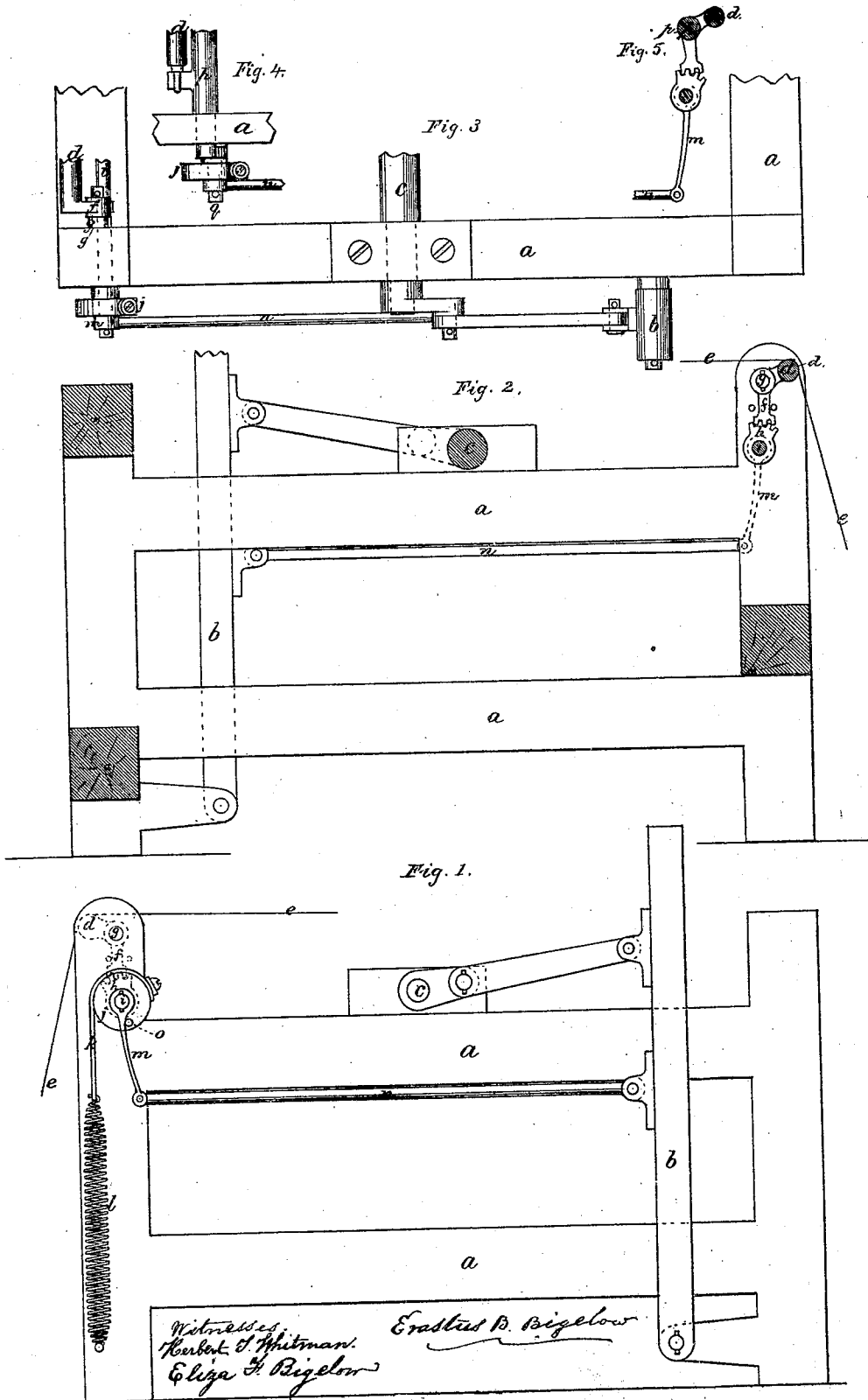


E. B. Bigelow,

Let Off for Looms.

No. 103,415.

Patented May 21, 1870.



Witnesses:
Herbert S. Whitman.
Eliza S. Bigelow

Erastus B. Bigelow

United States Patent Office.

ERASTUS BRIGHAM BIGELOW, OF BOSTON, MASSACHUSETTS.

Letters Patent No. 103,415, dated May 24, 1870.

IMPROVEMENT IN LET-OFF MECHANISM FOR LOOMS.

The Schedule referred to in these Letters Patent and making part of the same.

I, ERASTUS BRIGHAM BIGELOW, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Let-off Mechanism for Power-Looms, of which the following is a specification.

In my patent of the 9th of February, 1869, No. 86,805, I have described and claimed a spring arrangement, combined with a vibrating roller, or its equivalent, for regulating the delivery of the warps, whereby the tension of the warps is gradually diminished while the open shed is being formed, and gradually increased to an extent to resist the beat-up while the shed is being closed, a single mechanism being employed for producing tension of the warps, both in the open shed and in resisting the beat-up.

I find that a separate device for accomplishing each of these objects, though acting together, produces a good result, and is capable of more easy adjustment.

The annexed drawing represents my present invention, and such parts of a loom as are necessary to show its application.

Figure 1 is a left-hand end elevation;

Figure 2 a transverse section, looking toward the left, and

Figure 3 is a plan.

The frame of the loom is marked *a*, the lay *b*, and the lay-shaft *c*.

The vibrating roller or bar, the varying position of which regulates the delivery of the warps, is marked *d*.

The warps, which are indicated by a line, *e*, pass from the warp-beam over the vibrating roller or bar *d* to the cloth-forming line, as is usual, the cloth being taken up by a positive motion.

The mode of operating the warp-beam, and of connecting it with the vibrating roller or bar for regulating the delivery of the warps being well understood, I have not deemed it necessary to represent them in the drawings.

The vibrating roller or bar *d* is supported by bent levers, *f*, one on either end of the loom, which oscillate on axis *g*, and engage with pinions *h*, affixed to a tension-shaft, *i*.

When the tension-shaft *i* is turned in one direction it raises the vibrating roller or bar *d*, and increases the tension of the warp, and when turned in the opposite direction it depresses it, and diminishes the tension of the warp.

A pulley, *j*, is affixed to the tension-shaft *i*, and carries a strap, *k*, to which a spring, *l* (for which a weight may be substituted) is attached, the force of

the spring or weight being sufficient to give the needed tension to the warps when the shed is open.

This degree of tension, however, except in weaving very light fabrics, is not sufficient to resist the beating up of the cloth by the lay, and another device is employed to increase the tension of the warps at the time of the beat-up, which I will now describe.

A spring lever-arm, *m*, turns loosely on the tension-shaft *i*, and has its lower end connected with the lay *b*, by a connecting-rod, *n*, and vibrates in unison with it.

As the lay advances to beat up the cloth, the spring lever-arm *m* strikes against a stop, *o*, affixed to the pulley *j*, and turns the tension-shaft *i* in the direction to tighten the warps, and thus gradually increases their tension to a degree to resist the beat-up, and when the lay falls back it gradually relaxes the spring lever-arm, and diminishes the tension of the warps, until the force of the spring or weight *l* is applied to them.

It is important to note, in this connection, the relation of the spring or weight *l* and the spring lever-arm *m* to the regulation of the delivery of the warps, as only the spring or weight *l* governs the position of the vibrating roller or bar *d*, when it determines the action of the let-off mechanism, the spring lever-arm *m* at that time being thrown back far enough to clear the stop *o*, and thus have no action on the tension-shaft *i*.

The stops *o*, or the connecting-rod *n*, may be made adjustable for the convenient adaption of the force of the spring lever-arm *m* to the requirements of the cloth to be woven, heavy goods requiring more force to resist the beat-up than light goods.

The spring action of the spring lever-arm *m* is only required to adapt the strain it gives to the warps at the time of the beat-up to their varying condition, consequent upon the varying action of the delivering mechanism, and except at, or nearly at, the time of the beat-up, the spring lever-arm acts as a lever, increasing or diminishing the tension of the warps by the motion imparted to it by the lay.

A modified arrangement of the vibrating bar or roller *d*, and the devices for giving tension to the warps, is represented in figs. 4 and 5.

Instead of supporting the vibrating bar or roller *d* by oscillating lever-arms, actuated by pinions affixed to a tension-shaft, as above described, it may be supported by arms extending from an oscillating shaft, *p*, as shown in fig. 4.

In this arrangement the tension-shaft *i* may be dispensed with, and the pulley *j*, and spring devices con-

nected therewith for giving tension to the warps, may be supported by, and oscillate on a stud, *g*.

Having described my invention, and pointed out some of the modifications of which it is susceptible without departing from its distinguishing principles,

What I claim as new, and desire to secure by Letters Patent, is—

Combining a vibrator, and mechanism for operating it, controlled by a spring or equivalent, to produce the necessary tension on the warp when the shed is made,

and a spring arm, operated from the lay, and engaging a pin in the vibrator-actuating mechanism, to increase the tension on the warp when the lay beats up, all combined and operating substantially as described.

ERASTUS B. BIGELOW.

Witnesses:

HERBERT T. WHITMAN,
ELIZA F. BIGELOW.