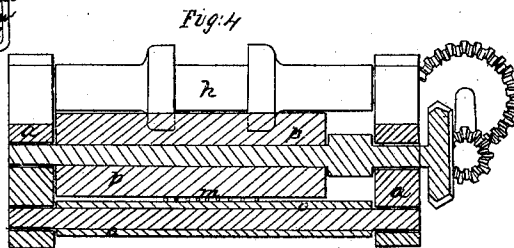
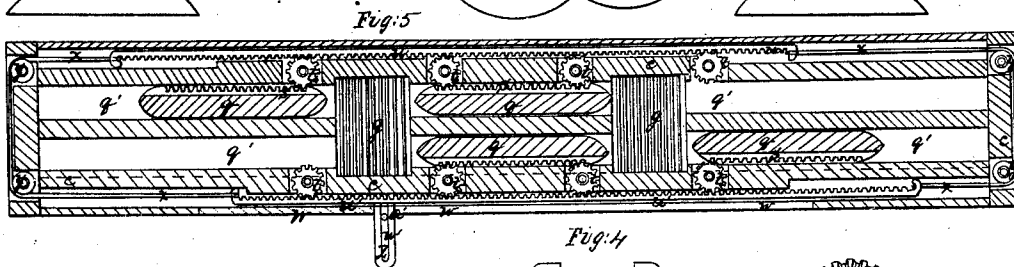
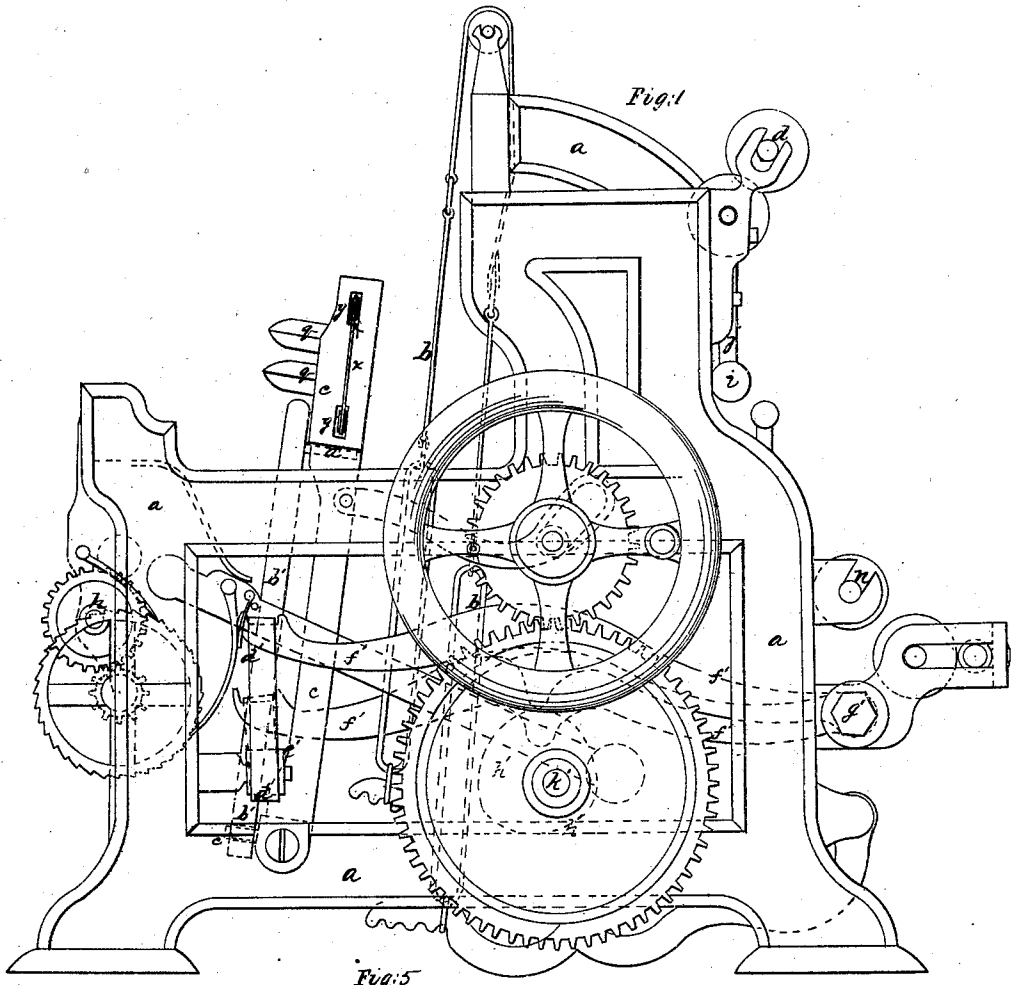


O. C. Smith.
Narrow Ware Loom.

N^o 38,265.

Patented Apr. 21, 1863.



Witnesses
Charles Taylor
W. L. Garrett

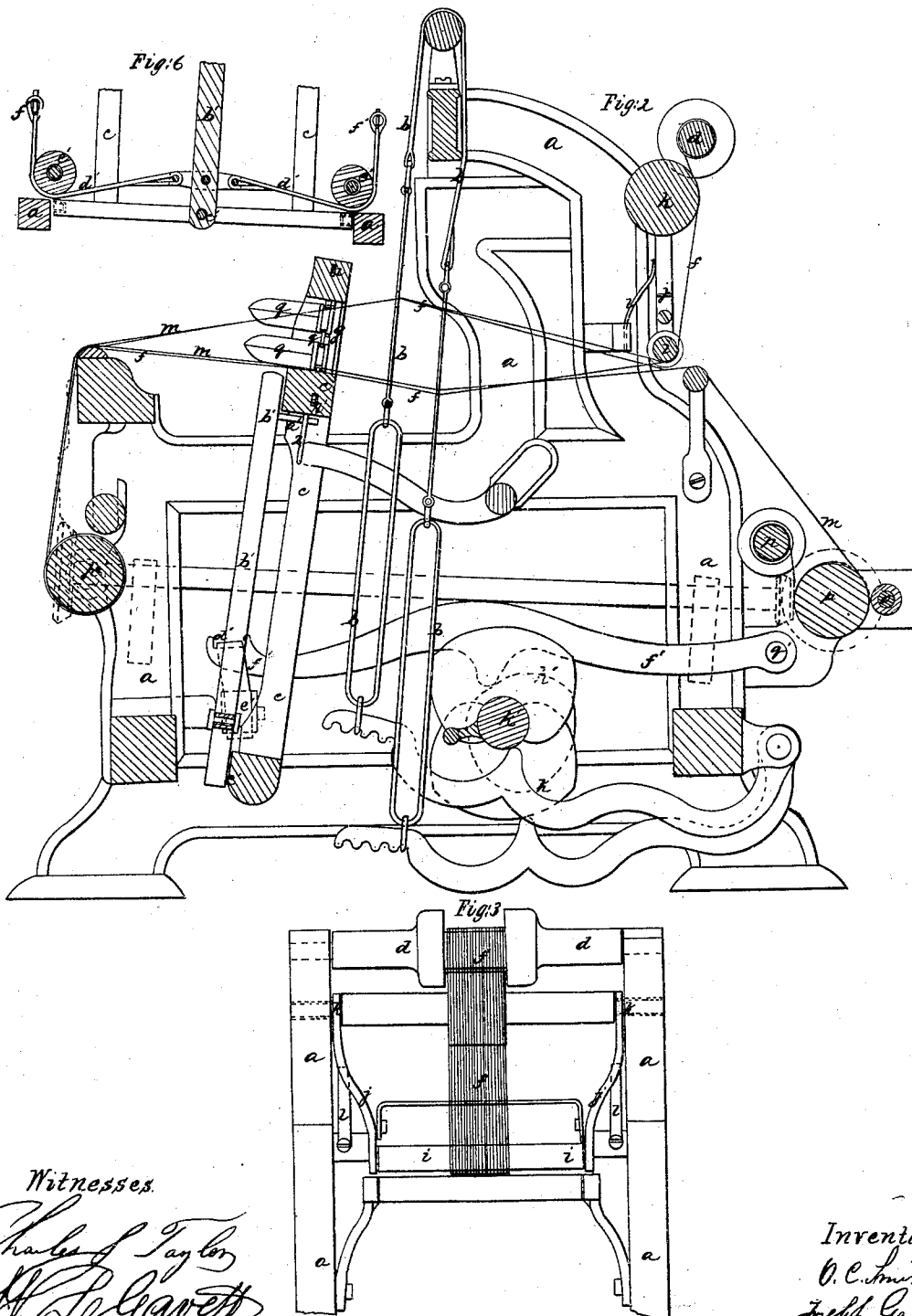
Inventor
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Sheet 2 of 2 Sheets.

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Witnesses.

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UNITED STATES PATENT OFFICE.

O. C. SMITH, OF SALEM, ASSIGNOR TO A. N. CLARK, OF BOSTON, MASS.

IMPROVEMENT IN LOOMS.

Specification forming part of Letters Patent No. 38,265, dated April 21, 1863.

To all whom it may concern:

Be it known that I, O. C. SMITH, of Salem, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Looms for Weaving Fabrics; and I do hereby declare that the following description, taken in connection with the accompanying drawings, hereinafter referred to, forms a full and exact specification of the same, wherein I have set forth the nature and principles of my said improvements by which my invention may be distinguished from others of a similar class, together with such parts as I claim and desire to have secured to me by Letters Patent.

The present invention relates to certain new and useful improvements in looms, (a part of which is especially adapted to the weaving of elastic fabrics;) and it consists, first, in a novel arrangement of devices, the purpose of which is to overcome or "take up" the slack of the warp-threads, caused by their being raised and lowered in the harness, and thus preserve a uniform tension upon the same, the advantages of which are evident and need not be herein specified; second, in a peculiar combination of rollers between which the rubber threads are passed when weaving elastic fabrics, and by means of which they are held constantly to their proper tension; and, third, in a new arrangement of mechanical devices for operating the shuttles, as will be hereinafter more particularly described.

In the accompanying drawings my improvements in looms are represented, and of which Figure 1 is a side elevation of the same; Fig. 2, a central longitudinal vertical section; Figs. 3, 4, 5, and 6 are detail views, respectively, of those parts of the looms in which my improvements are made.

As the general operation of the loom is the same as is ordinary and well known to all experienced in loom machinery, and as my improvements are limited to particular parts of the loom, I shall therefore confine my description mainly to those parts.

a a in the accompanying drawings represent the frame-work of the loom; *b b*, the harness, which is raised and lowered in the usual manner; *c c*, the shuttle-frame; *d d*, the feed-rollers for the warp-threads *f f*, and from which the threads *f f* pass, as represented by red

lines in the drawings, through the harness *b b* and reed *g* of the shuttle-frame to the cloth-beam *h*, upon which they are wound as fast as interwoven with the woof-threads.

In order to overcome the slack in the warp-threads, caused by their being raised and lowered in the harness *b b*, the said threads are passed from their feed-roller *d* around a roller, *i*, of a swinging frame, *j*, turning upon a center at *k* of the frame-work *a a*. Bearing upon the inside surface of the said frame *j* are springs *l l*, the recoil and force of which serve to always keep a uniform tension upon the said threads during the whole operation of weaving, as is apparent without further description. These springs *l l*, it is evident, may be made adjustable, and thereby any desired tension upon the warp-threads can be not only obtained but always maintained, as described.

m m are the rubber threads, (represented by blue lines in the drawings,) and *n n* the feed-roller of the same.

In the weaving of elastic fabrics—that is, those fabrics containing both rubber and cotton or other fibrous threads—it is necessary, in order to give the desired elasticity to the cloth, that the rubber threads should be continually held while being interwoven with the weft at a certain and uniform tension. To produce this tension in a uniform manner upon all the threads much difficulty has heretofore been experienced, owing to various causes, the principal one of which was that the holding or nipping devices used have not been such as could adjust themselves to the varying thicknesses of the threads, which variations, as is evident, although ever so slight, still would serve to prevent the accomplishment of the desired result.

It may be observed here that the difficulty of maintaining a uniform tension upon rubber threads by the ordinary methods is much greater than in inelastic ones, as the extreme sensitiveness of rubber threads renders them liable to be unequally stretched, whenever any disturbing cause occurs—for instance, such as the accumulation of dust between the feeding and holding rollers, in want of parallelism in their peripheries occasioned by wear, &c. In my improvements, however, this difficulty is entirely obviated, and the rubber threads are held at a uniform tension, throughout the

whole time occupied in weaving, by means of the following arrangement of nippers and holding devices, viz:

o is a rubber or elastic roller, and *p p* an inelastic roller. Between these two rollers *o* and *p* the rubber threads, before passing to the harness and cloth beam of the loom, are passed, and the said rollers are then so adjusted with regard to each, by means of set-screws or otherwise, as to cause a continual pinching or biting of the said threads as they are fed along by the revolution of the roller *p*, by any proper devices, to the shuttles of the loom, and thus produce the desired tension upon the said threads.

By the use of the elastic or rubber roller *o*, in connection with the metallic or inelastic roller *p*, it will be seen that the elastic threads while passing between the two will be embedded, as it were, to a greater or lesser degree in the rubber, thereby securing the equal holding of the threads at all times, notwithstanding any variations, however slight, in their thicknesses, or any other disturbing cause that may occur between the two rollers *o* and *p*.

qq are the shuttles, placed in ways or grooves *q' q'* of an ordinary shuttle-frame, *c*, this frame *c* being swung back and forth upon its shaft by the usual devices employed in looms. In one side of each shuttle *q* a rack-bar, *s*, is placed, engaging the toothed pinions *t t*, &c., of the shuttle-frame *r*. With these pinions *t t*, &c., sliding rack-bar *u' u'* of the frame *c* engages, the said bars being placed parallel, and respectively in the upper and lower edges, and connected together by cords *x x*, passing over pulleys *y y* in each corner of the said frame. Attached to the lower rack-bar, *u'*, upon the under side thereof, and moving in a groove, *w*, of the frame, is a projection, *z*. In the groove *w'* of the said projection *z* a stud or pin, *a'*, in the upper end of a vertical lever, *b'*, is placed, the said lever turning upon a fulcrum, *c'*, in the lower portion of the shuttle-frame. To the lower end of the lever *b'* one end of straps or cords *d' d'* is attached. The

opposite ends thereof, passing under guide-rollers *e' e'* of the frame-work *a a*, are attached to the outer ends of two horizontal levers, *f' f'*, turning on fulcrums at *g' g'* of the frame-work *a a*. These levers *f' f'*, between their fulcrums and their outer ends, respectively, bear and travel upon the edge or periphery of two cam-wheels, *h' h'*, attached to and so arranged with regard to each other upon the drawing-shaft *K'* of the loom that by the revolution thereof the two levers *f' f'* will be made to rise or lower, turning upon their fulcrums at the proper times, and thereby, through the arrangement of the connecting devices above described, cause the shuttle *q q*, at the proper time, to be moved back and forth across the warp-threads of the loom.

It will be seen by inspection of the drawings and by the description above of the arrangement of the pinions *t t*, rack-bars *u u'* in the shuttle-frame, that the shuttles in the two parallel horizontal grooves *q' q'* thereof, when made to move back and forth in their frame, as described, travel in opposite directions to each other.

What I claim as my invention, and desire to have secured to me by Letters Patent, is—

1. The swinging frame *j*, arranged and operating substantially as hereinabove described, and for the purpose of taking up the slack in the warp-threads.

2. The elastic and non-elastic nipping and feeding-rollers, operating together and upon the elastic threads passing between them, substantially as hereinabove described.

3. The peculiar arrangement of devices herein described, for operating the shuttles of the loom, the same consisting of the rack-bars *u u'*, pinions *t t*, &c., and vertical lever, *b'*, connected with and receiving motion from the driving-shaft of the loom, substantially as set forth.

O. C. SMITH.

Witnesses:

JOSEPH GAVETT,
ALBERT W. BROWN.