Nute & Hathorn.

Hand-Loom.

No. 73256 Patented Jan. 14, 1868.

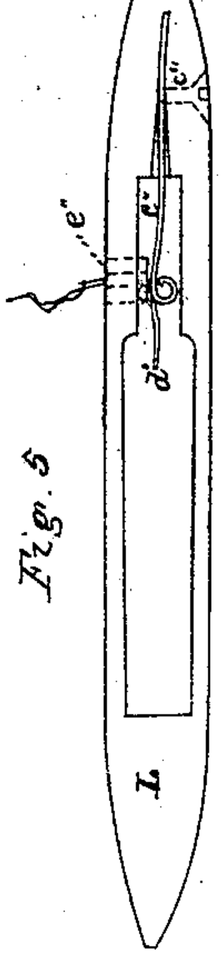

Fig. 5

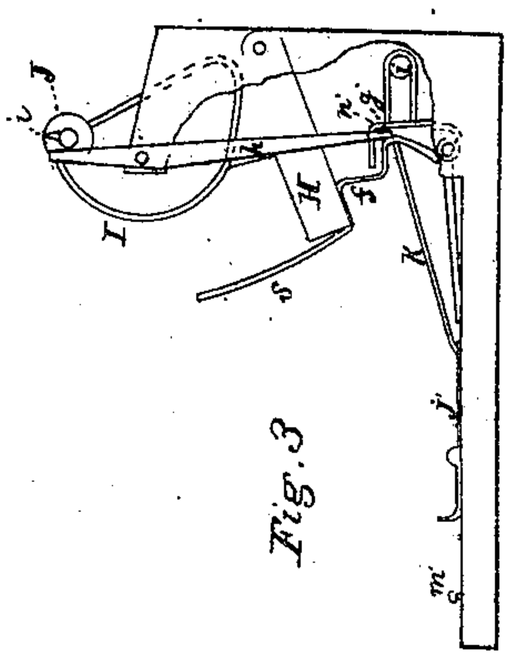

Fig. 3

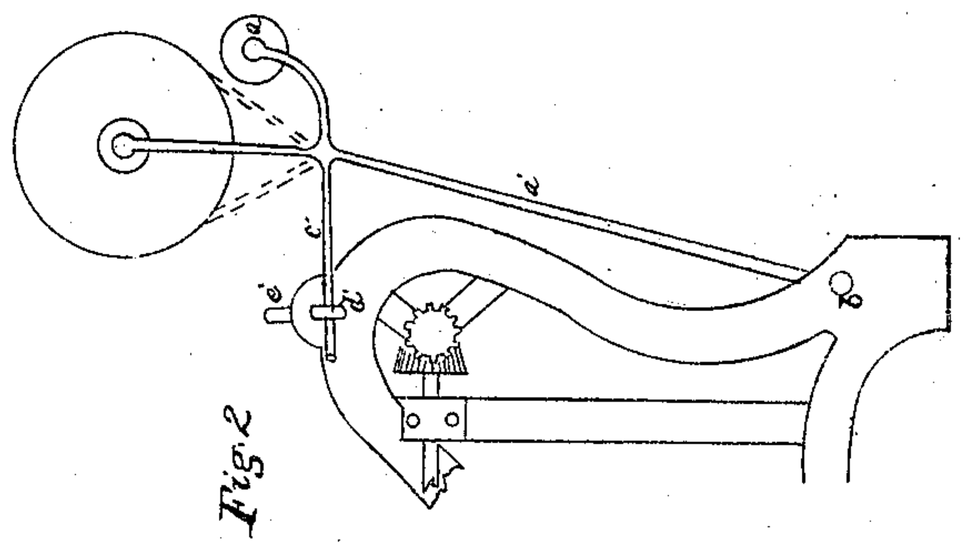

Fig. 2

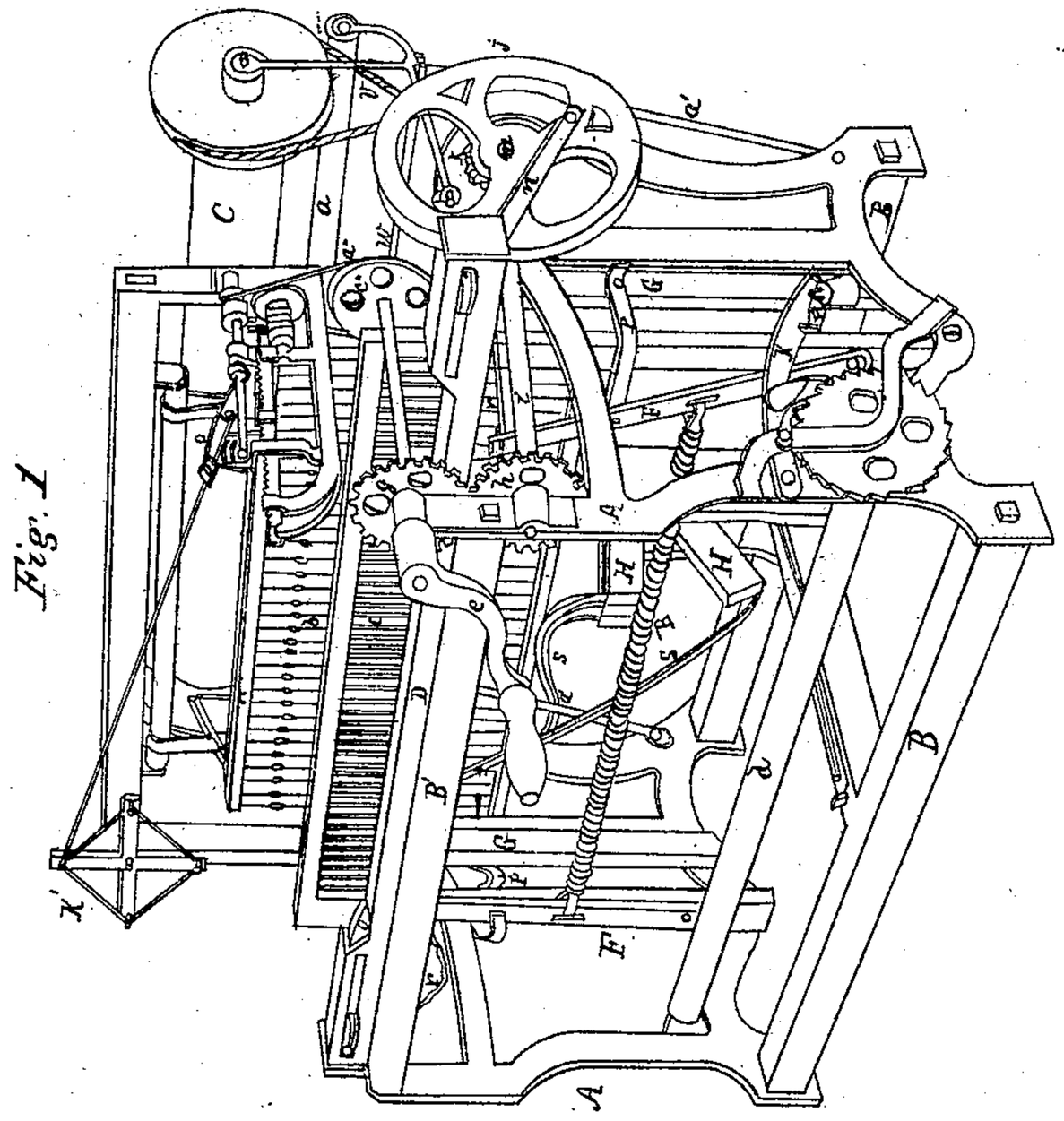

Fig. 1

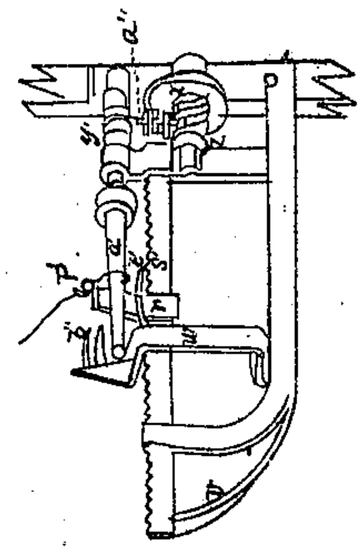

Fig. 4

Witnesses
H. K. Porter
C. H. Fenson

Inventors
James E. Nute
George H. Hathorn
By T W Porter & Co

United States Patent Office.

JAMES E. NUTE AND GEORGE H. HATHORN, OF LINCOLN, MAINE.

Letters Patent No. 73,256, *dated January* 14, 1868.

IMPROVEMENT IN HAND-LOOMS.

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

TO ALL WHOM IT MAY CONCERN:

Be it known that we JAMES E. NUTE and GEORGE H. HATHORN, of Lincoln, in the county of Penobscot, and State of Maine, have invented certain new and useful Improvements in Hand-Looms; and we do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a perspective view of the loom complete.

Figure 2 is a detached side elevation of the yarn-beam.

Figure 3 is a similar view of the treadle-attachment.

Figure 4 is a detached perspective view of the spooler or bobbin-winder, and

Figure 5 is a top or plan of the shuttle improvement.

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

The nature of our invention consists in a device for adjusting the "yarn-beam," which admits of a sufficient reduction in the size of the loom to allow it freely to pass house-doors of the usual width; also in a peculiar device connected with the treadles, by which the operator can, at will, either allow the "shed" to drop as soon as the shuttle passes, or to hold the "shed" open until the reed "beats up the filling;" also in a self-feeding and adjusting spooler, combined with the loom, by which yarn of all degrees of fineness may be wound upon the spools or bobbins by the same motor that drives the loom.

To enable others skilled in the art to make and practise our invention, we will proceed to describe its construction and operation.

In the drawings, A A represent the end-frames of the loom, which are connected by the bars B B and B′. C is the yarn-beam, upon which the yarn or warp is wound, preparatory to weaving, passing thence, in the usual manner, around the roller *a*, then through the harness *b*, reed *c*, and over bar B′, (in cloth,) and is wound upon the cloth-beam *d*.

The loom is operated by the crank *e* upon shaft *f*, and a gear-wheel, *g*, upon this shaft, meshing into a similar wheel, *h*, fixed upon the shaft *i*, imparts motion to the fly-wheels *j* by means of a bevel-pinion on the rear end of shaft *i*, which meshes into the gear-wheel *k* attached to the fly-wheel *j*. This fly-wheel is attached to shaft *m*, and a duplicate wheel, not shown, is attached to the opposite end of the shaft. Two connecting-rods, as shown at *n*, connect the fly-wheels to the lathe D, and thereby impart the required vibratory motion to the reed.

The shuttle *o* receives its motion by the contracting force of coiled spring E, connected at its ends to the upright vibrating levers F F′, these levers being pivoted at their lower ends to the upright supports of the lathe, and a strap, P, being attached to each lever, and respectively fastened to the centre uprights G G, while two self-acting latches, beneath the lathe, alternately catch and retain the upper ends of the levers, when at their full outward vibration, the straps P, as the lathe is swung forward, serving to draw the levers alternately outward, when the latches beneath the lathe catch and retain them, as before stated; and when the levers are respectively released from the latches, the spring E, by its sudden contraction, throws the levers inward, thus acting upon the cords *r r*, which connect the levers with the shuttle-drivers, and thereby impart to the shuttle its proper reciprocating movement upon the lathes.

For the purpose of releasing or unlatching the levers F and F′, to allow the spring E to act upon the shuttle, the straps *s s* connect the latches, beneath the lathe, with the treadles H H, and, as the treadles are successively depressed to the full extent, the tension of straps *s* withdraws or releases the latches from the levers, when the spring E, acting upon the released lever, draws it inward to the extent of strap P, as shown by the lever F. The treadles are depressed successively by the eccentric I, fig. 3, which is attached to and revolves with the cam J upon shaft *m*, this cam being constructed with the usual crossing-cam grooves that, by its lateral sliding motion, the eccentric I is brought to act successively upon the treadles.

The cloth-beam *d* is wound at the requisite speed by the motion of the lathe, in which is fixed the pin *t*, which, at the backward movement of the lathe, acts upon and raises the segment-lever *k*, and also the pawl *u* attached to the lever, and, as the lathe is swung forward and allows the lever to drop, the weight at its free end serves to wind the cloth upon the beam, and, by varying the amount of the weight, any desired tension may be given to the cloth.

The yarn-beam is governed, in its yielding off of the yarn or yarns, by means of the bands *v v*, which are kept at the necessary tension by means of the levers W, as shown.

As none of the foregoing devices are claimed, and as they are known and used, a more particular description or illustration is not deemed necessary, they being described for the purpose of showing their connection with the devices hereinafter described and claimed.

The uprights *a' a'*, which support the yarn-beam, are pivoted to the end-frames of the loom at *b'*, and a horizontal rod, *c'*, which projects from support *a'*, passes through an eye, *d'*, which is secured by a screw-nut, *e'*, as shown in fig. 2.

When the loom is in use, the yarn-beam is opened out from the loom, as shown, but when it is necessary to move the loom through doors or narrow passages, by releasing the nut *e'*, the yarn-beam may be closed inside the frame of the loom, so that the loom occupies a space of but twenty-six inches, which admits of its being moved throughout a dwelling-house, while those of ordinary construction can only pass through house-doors by being taken entirely apart, often a matter of great inconvenience.

When the treadle H is depressed, as shown in fig. 3, the angle-spring *f'*, attached to the treadle, catches under the horizontal part of the pivoted catch *g'*, which retains the treadle depressed until the reed beats the thread up, or, in the language of weavers, "holds the shed open till the reed beats up the thread," which is indispensable in certain cases, as when a thread is broken in the warp, and is to be mended. When the spring *f'* thus catches under the catch *g'*, it remains till the reed beats up the thread, when it is released by the action of a spur, *i'*, on shaft *m*, the spur forcing forward the upper end of the pivoted lever *h'*, thereby throwing back the lower end, which, bearing against a pin, *n'*, attached to catch *g'*, forces the catch backward and releases the treadle. But when it is desired to "hold the shed open" only till the shuttle passes, the catch *g'* is thrown backward from contact with spring *f'*, by drawing forward the plate *j'*, and hooking it to the knob *m'* by a slot in the plate, the line *k'* being secured to the rear end of plate *j'*, and passing back over a small roller, *l'*, thence forward to catch *g'*, serving to draw the catch back from contact with the spring *f'* when the plate *j'* is drawn forward.

Looms have been constructed to hold the shed open till the reed beats the thread up, and other looms have also been constructed to allow the shed to close as soon as the shuttle passes, but the peculiarity of our loom, in this respect, consists in enabling the weaver to adopt either at will, as convenience may dictate.

K' represents the reel, upon which the yarn is placed for spooling, passing thence, as shown, to an elastic arm, *o'*, shown in fig. 1, upon which arm is a slight elastic compress, through which the yarn passes, and thence through a coiled eye, P', attached to the slide *r'*, from whence it is wound upon the bobbin *w'*. To distribute the yarn upon the bobbin, in winding, the serrated bar *s'* receives a sliding end-motion from the endless grooved cam *z*, by means of the pin *a''*, which bears in the groove of the cam, and thereby slides the bar as the cam revolves, while the small spring V' serves to hold the bar steady and give a constant outward pressure upon the bar.

In use, the slide *r'* is moved in near the shoulder of the bobbin, and the pawl *t'* attached to the slide is let down in the teeth of the bar, when, the spooler being put in motion, the yarn will be distributed upon the bobbin, to the extent of the end play given to bar *s'* by the cam *z*, when, as this space of the bobbin is filled to the required size, it presses against the slide *r'*, and at the next inward movement of bar *s'* the slide, being retained by the yarn on the bobbin, does not follow the movement of the slide, while the pawl catches in a new position in the teeth, and at the succeeding movements of the bar the yarn is distributed over a new section of the bobbin, the pawl *t'* serving to prevent the slide from moving inward, while the direction of the yarn from arm *o'* to the bobbin constantly draws the slide toward the shoulder of the bobbin. When the bobbin is thus filled to the desired length, the yarn is automatically severed by the cutter *b''* attached to the bobbin-support *w*. Motion is imparted to the spooler by the band *a''*, which passes from the pulley *c''* to small pulley Y' on the pivot for the bobbin, and another band from pulley Y' passes down to pulley *x'*, thereby imparting motion to the distributor before described.

Thus, by the motor which drives the loom, the spooling is performed, with only the care required to attach the yarn to the bobbin, and by the method of filling the bobbin by sections, as described, the yarn is less liable to slide from the bobbin, when in the shuttle, than when wound continuously from end to end, in the usual manner. By this spooler, all sizes and kinds of yarn can be spooled or wound upon bobbins with equal facility and ease.

The improvement in the shuttle consists in the tension-spring *c''*, which is inserted in the shuttle L, as shown, and which bears against the thread *d''* at the mouth of the aperture *e''*, through which the thread passes when leaving the bobbin to be incorporated in the cloth. The pressure of spring *c''* upon the thread is regulated by the set-screw *f''*, which bears upon the screw, as shown.

By the use of this spring the yielding off of the thread from the bobbin may be controlled as desired, thus allowing a free and easy movement of the bobbin upon its pivot, and the liability of breaking it, by the sudden shocks caused by starting the shuttle, is entirely obviated, thus saving the loss of time required in knotting the broken thread, as well as the labor and time required to stop and start the loom.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The combination, with the loom-frame, of the pivoted arms *a'*, warp-beam C, rod *c'*, and eye *d'*, and screw-nut *e'*, or equivalent securing-devices, substantially as described.

2. Combining with the treadles H the adjustable devices, herein described, for holding the shed open till the reed beats up the thread, or which will allow the shed to close when the shuttle passes, when constructed and arranged to operate by means and in manner substantially as described and specified.

3. The combination, with the loom-frame, of the shaft *f* and spooling-mechanism, substantially as described, so that the motor which drives the loom shall simultaneously operate the spooler, substantially as described.

4. The spooler, as constructed, with the sliding serrated bar *s'*, slide *r'*, actuated by cam *z*, or its equivalent, and with the pawl *t'* and eye P', arbor Y' and support *w*, or their equivalents for suspending the bobbin, all constructed and arranged to operate in manner substantially as and for the purposes specified.

JAMES E. NUTE,
GEORGE H. HATHORN.

Witnesses:
O. H. CHESLEY,
JOHN J. ADLEY.