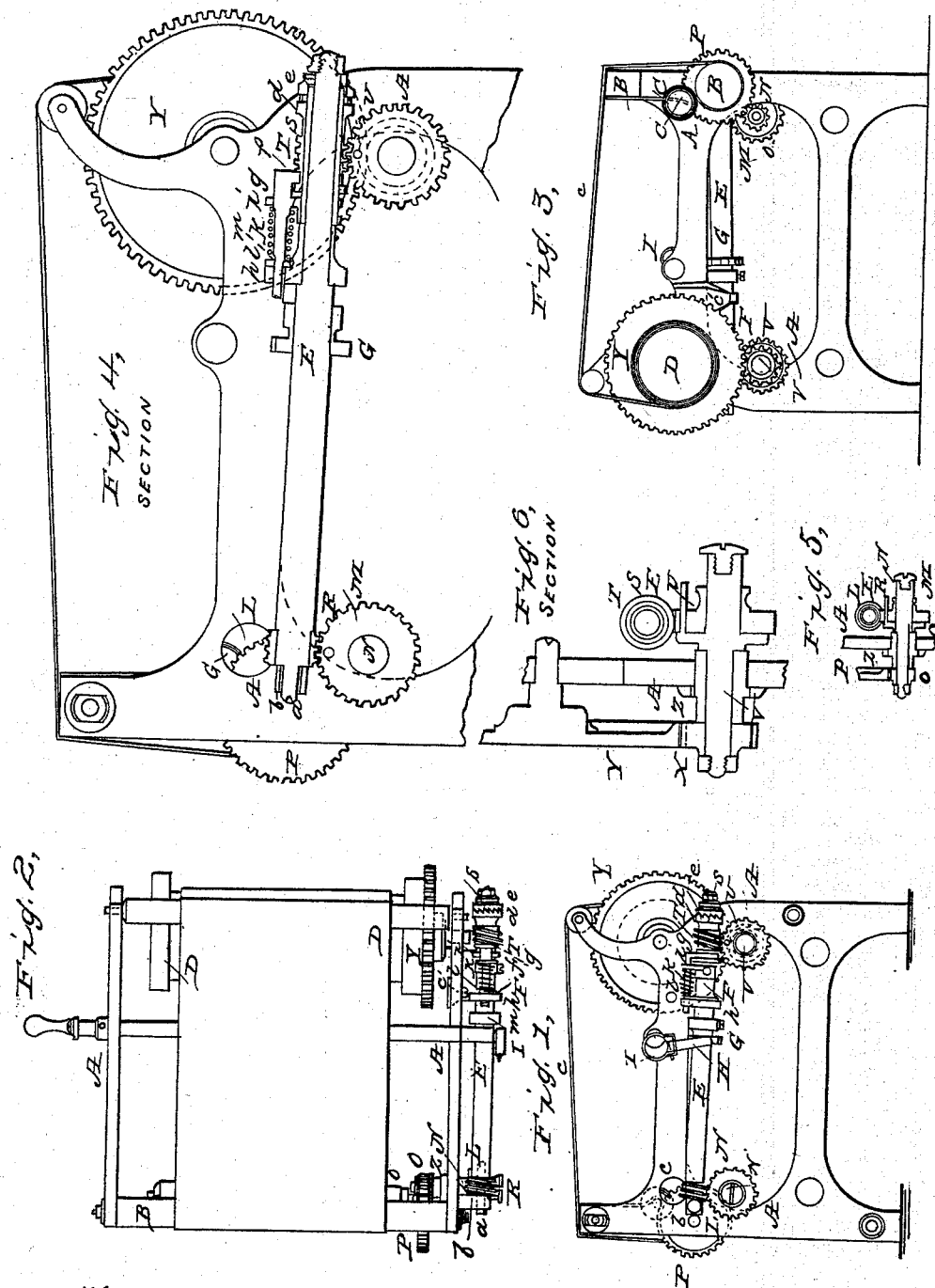


H. FISKE.  
Let-off for Looms.

No. 49,472.

Patented Aug. 15, 1865.



WITNESSES  
L. E. Fisher  
H. D. Hale Jr.

INVENTOR:  
Hiram Fiske  
by his attorney  
R. H. Hedy

# UNITED STATES PATENT OFFICE.

HORATIO FISKE, OF FARNUMSVILLE, MASSACHUSETTS, ASSIGNOR TO HIMSELF AND ALFRED MORSE, OF SAME PLACE.

## IMPROVEMENT IN LET-OFFS FOR LOOMS.

Specification forming part of Letters Patent No. **49,472**, dated August 15, 1865.

*To all whom it may concern:*

Be it known that I, HORATIO FISKE, of Farnumsville, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Looms for Weaving Cloth; and I do hereby declare the same to be fully described in the following specification and represented in the accompanying drawings, of which—

Figure 1 is a side elevation of a loom-frame and my invention connected therewith. Fig. 2 is a top view of the invention as applied to the yarn and cloth beams of the loom. Fig. 3 is a longitudinal section of the cloth and yarn beams, it being taken so as to represent the operating-gears and mechanism thereof. Fig. 4 is a longitudinal section, taken through the worm-shaft and the mechanism immediately connected therewith.

The purpose of my invention is to insure a proper delivery of the yarn from the yarn-beam during the weaving process.

In carrying out my invention I employ a positive motion, or mechanism to effect the rotary motion of the cloth-beam, and in connection therewith and the yarn-beam I use not only a mechanism to produce the rotation of the latter, in order to cause it to deliver yarn, but a mechanism by the operation of which the delivery of yarn by the yarn-beam will be arrested at such times when it may not be necessary for such delivery to take place. When, in consequence of a necessity for delivery of the yarn, the tension on it may be increased by the draft of the cloth-beam, such increase of tension, acting through and on the cloth-beam, will cause the mechanism for revolving the cloth-roller to be thrown into engagement with that for moving the yarn-beam, and in consequence thereof to give motion to the yarn-beam, so as to cause it to deliver yarn. As soon as a sufficient delivery of such yarn may have taken place the tension of the warps will have been reduced to such a degree as to enable a spring to operate and cause the disengagement of the yarn-beam rotative mechanism with the shaft for putting it in rotation, in which case the rotary motion and delivery of the yarn-beam will cease, and will not again take place until there may be another and sufficient increase of tension of the yarn.

In the drawings, A denotes the loom-frame;

B', the breast-beam. B' is the cloth-beam; C, the cloth-roller on which the cloth is wound by the cloth-beam. D is the yarn-beam, each of such beams being a cylinder, duly supported so as to be capable of being revolved within the frame.

The positive motion or mechanism for effecting an intermittent rotation of the cloth-beam (about which and the cloth-roller the cloth is to be carried in a manner well known and understood by weavers) may be thus described: Along one side of the loom-frame a shaft, E, is arranged horizontally, or thereabout, the said shaft being supported at one end by a journal, a, extending through a bearing, b, projecting from the loom-frame. The shaft is further supported by a stationary and tubular shaft, F, which projects from a bracket, c', fastened to the loom-frame, and is arranged concentrically with the shaft E. The said shaft E goes entirely through the tubular shaft F, or projects in opposite directions beyond it, in manner as shown in Fig. 4. A ratchet, G, is fixed on the shaft E. An impelling-pawl, H, carried by a crank, I, projecting from the lay crank-shaft, so engages with the ratchet as to impart to it from the lay-shaft an intermittent rotary motion, which by the ratchet will be transferred to the shaft E. The ratchet should be practically at rest while the beat of the lay takes place, motion being imparted to the ratchet and the shaft E during the throw of the shuttle. A worm or screw, L, fixed on the shaft E, engages with a worm-gear, M, carried by a shaft, N, on whose inner end there is fixed a pinion, O, which engages with a spur-gear, P, fixed on the shaft of the cloth-beam.

Fig. 5 is a section taken along and through the axis of the shaft N and the connection of the worm-gear M with such shaft. The gear M is applied to the shaft so as to be capable of being slid freely thereon, either toward or away from a disk, Q, permanently fixed on the shaft. A pin, R, extends from the disk and parallel to the axis of the shaft, and through a hole made in the gear M. By sliding the gear on the shaft such gear may be drawn out of engagement with its screw or worm, the pin and disk serving to so engage the gear with the shaft as to cause the shaft to be revolved by the gear when the latter may be in engagement with its worm.

The next part of my invention to be described is as follows: A tubular shaft, S, encompasses a portion of the stationary tubular shaft F, and slides freely thereon, and carries a worm or screw, T, and a clutch-wheel, *d*, the latter being to engage with a similar and fellow clutch-wheel, *e*, fixed on the shaft E. There is a flange, *f*, at the rear end of the shaft S, which is embraced transversely by a slider, *g*, supported within and by two standards, *h i*, erected on the stationary shaft F. Between the two standards there is a helical spring, *k*, which encompasses the slider and bears at one end against the standard *i* and at the other end against a nut, *l*, which is screwed on the slider or on a screw, *m*, made thereon. The worm T engages with a worm-gear, U, which is carried by a shaft, V, and is applied thereto in the same manner as the worm M is applied to the shaft N—that is to say, so that by drawing forward the gear U it may be moved out of engagement with its worm T. A pinion, X, fixed on the shaft V engages with a gear, Y, fixed on the shaft of the yarn-beam. Each of the shafts N and V is supported in and by a suitable bracket, Z, fixed to the loom-frame. Fig. 6 is a vertical section taken through the shaft V, the worm-gear U, the worm T, the frame X, and the gear Y.

From the above it will be seen that when it may be necessary for the yarn-beam to deliver the warp the increased tension of the warp, acting through the yarn-beam, the gears Y X, the shaft V, the worm-gear U, and the worm T, will cause the worm-gear shaft S to be moved so as to overcome the pressure of the spring *k* and effect an engagement of the clutch-wheels, and thereby cause the said shaft to be revolved by the shaft E. Such a movement of the shaft S will create a rotary motion of the yarn-beam, by which the warp will be delivered therefrom until the reacting power of the spring *k* may be relieved, so as to create a disengagement of the clutch-wheels, which having taken place, the motion of the yarn-beam will be arrested.

By means of the nut *l* and screw *m* of the slider *g* the spring *k* may be contracted so as to increase its reacting power, and as a matter of course the tension on the warp. Thus by means of the said nut and screw applied with mechanism, as described, the said tension may be either increased or diminished as circumstances may require.

By the employment of the stationary tubular shaft F, in connection with the driving-shaft E and the worm-shaft S, the latter shaft will be prevented from being revolved by the friction of the driving-shaft. Were the tubular worm-shaft placed directly on and concentrically with the said driving-shaft, without any intermediate stationary tubular shaft, the driving-shaft while revolving would be liable at times to generate friction sufficient to cause it to put the worm-shaft in revolution, and thus create an improper delivery of the yarn, all of which is prevented by the employment of the

stationary tubular shaft arranged between the shafts E and S, and concentrically with them.

In case it may be desirable to slacken the warp at any time for any purpose, we have only to draw either of the worm-gears forward on its shaft, so as to disengage such worm-gear from its screw or worm. This having been accomplished, the beam next to such worm-gear (whether it be the cloth-beam or the yarn-beam) will be free to be moved so as to slacken the warp.

Having thus described my invention, what I claim as constituting the same is as follows, viz:

1. The combination of the positive motion or mechanism for effecting the regular intermittent rotary motion of the cloth-beam, such consisting of the shaft E, machinery for rotating in manner as described, the screw L, the worm-gear M, the shaft N, the pinion O, and the gear P, or their mechanical equivalents, and the mechanism by which the yarn-beam is caused to deliver warp and to remain at rest under circumstances as set forth, such being the clutch-wheels *d e*, the shaft S, the worm T, the slider *g*, its retracting-spring and standard or their equivalents, the gear U, the shaft V, the pinion X, and the gear Y.

2. The combination of the nut *l* and the screw *m*, or their mechanical equivalent or equivalents, with the said positive motion or mechanism of the cloth-beam, and with the said mechanism by which the yarn-beam is caused to deliver warp and to remain at rest under circumstances as set forth.

3. The combination of the stationary tubular shaft F with the aforesaid positive motion or mechanism of the cloth-beam, and with the said mechanism by which the yarn-beam is caused to deliver warp and remain at rest under circumstances as set forth.

4. In connection with the said positive motion or mechanism of the cloth-beam, and with the aforesaid mechanism by which the yarn-beam is caused to deliver warp and remain at rest under circumstances as specified, the application of each or either of the worm-gears to its shaft in such manner as to enable such worm-gear not only to maintain its connection with the shaft so as to be revolved by it, but also to be moved on its shaft relatively to its screw, in manner and for the purpose of disengaging the said worm-gear and screw, as specified.

5. The combination consisting of the clutch-wheels *d e*, the shaft S, the worm T, the slider *g*, its retracting-spring *k* and standard *i*, the gear U, the shaft V, the pinion X, and the gear Y, or their equivalents, the whole being applied to the cloth-beam and operated by means and for the purpose substantially as above specified.

HORATIO FISKE.

Witnesses:

ALFRED MORSE,  
F. P. HALE, Jr.