

Cummings, Hayes & Entwistle,

Warping Mach.

No. 113028,

Patented Mar 28, 1871.

Fig. 1.

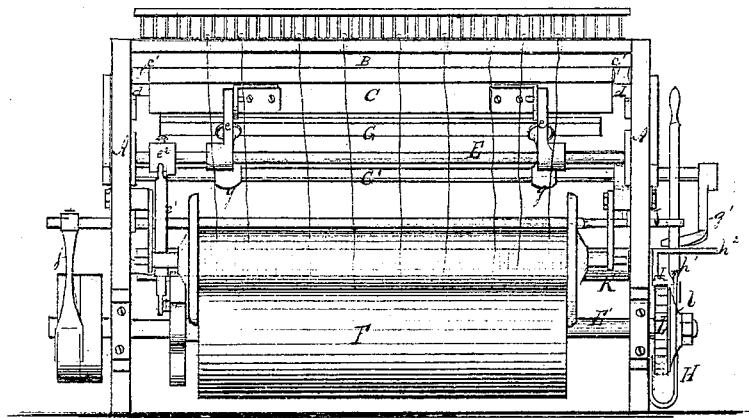


Fig. 4.

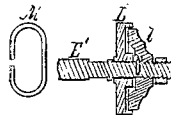


Fig. 2.

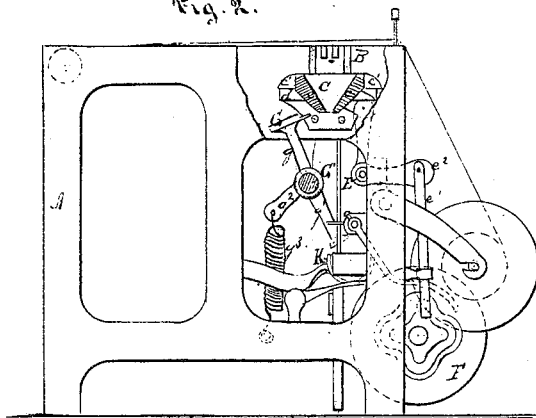
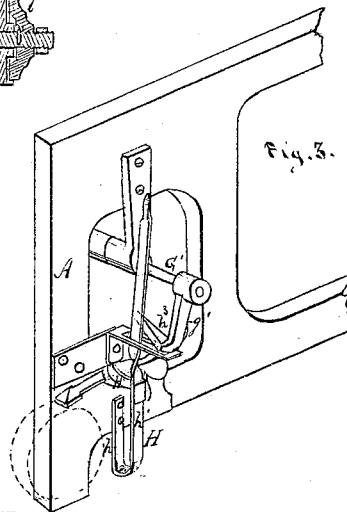


Fig. 3.



Witnesses:

L. J. Hayes
E. H. Purson

Inventors:

Cummings, Hayes & Entwistle
By N. W. Beadle & Co. attys

United States Patent Office.

EDWIN H. CUMMINGS, OF LEWISTON, MAINE, AND GRIMSHAW HEYES AND
THOMAS ENTWISTLE, OF ACCRINGTON, ENGLAND.

Letters Patent No. 113,028, dated March 28, 1871.

IMPROVEMENT IN STOP-MOTIONS FOR WARPING-MACHINES.

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, EDWIN H. CUMMINGS, of Lewiston, in the county of Androscoggin and State of Maine, and GRIMSHAW HEYES and THOMAS ENTWISTLE, of Accrington, England, have invented a new and useful Improvement in Stop-Motion for Warping-Machines; and we do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawing and to the letters of reference marked thereon.

This invention relates to that class of warping-machines which is provided with devices for stopping the motion of the machine whenever a thread breaks, and consists in certain details of construction, which will be fully described hereinafter.

In the drawing—

Figure 1 represents a front elevation;

Figure 2, an end elevation partially in section;

Figure 3, a partial view of the opposite end in perspective; and

Figure 4, the drop-wire and sectional view of the toothed wheel, with collar.

To enable others skilled in the art to make and use our invention, we will now proceed to describe fully its construction and manner of operation.

A A represent the frame-work of the machine, which may be constructed of any proper form and material. The machine is provided, of course, with the usual devices for winding the thread from the spools onto the beam, but these need not be particularly described.

B represents a beam or bar, which extends across the machine below the side frames, and is provided with longitudinal slots extending through it, as shown.

C represents a bottomless box, located beneath the beam B, and provided with inclined sides *c c*, as shown.

c c represent projecting horizontal bars at each end, which rest upon ways *d d*, suitably attached to the inner sides of the side frames A.

This box receives a reciprocating or oscillating motion from the rock-shaft E by means of arms *e e*, as shown.

The shaft E turns in suitable bearings in the side frames, and receives its motion from the drum or roller F, which is provided at one end with a cam-groove, which operates, by means of a friction-roller, the rod *e'*, attached to the arm *e*.

The cam-groove may be of any proper form to give the desired movement.

G represents a bar, having one or more ledges or rabbets upon one or both edges, which is located below the oscillating box C. It is supported upon the rock-shaft G' by means of arms *g g*.

The shaft G' hangs in suitable bearings depending from the side frames, and has attached to one end, which extends outward beyond its bearing, an arm or lever, *g'*, the lower end of which is bent inward at right angles, and formed with an inclined face, as shown. It has also attached to it an arm, *g''*, to the lower end of which latter is attached one end of a spring, *g'''*, the other being secured to the frame, as shown.

H represents a U-shaped spring-bar, the end of the short arm *h* of which is rigidly secured to one of the lower beams of the frame. Its long arm *h'* is twisted on itself at right angles at a point near its center, and it terminates above in a suitable handle.

This long arm or handle *h'* moves toward and from the frame on a slot in the angle-iron *h''*.

The outer end of the slot is provided with a recess, *h'''*, in which the arm *h'* rests when the machine is in motion.

H' represents a bar, rigidly attached to the arm *h'* at right angles thereto, which projects inward toward the frame beneath the pawl I. Its upper edge is inclined at its free end, for the purpose of lifting the pawl when the arm *h'* is drawn outward.

J represents a rod or bar, which extends across the frame, resting in suitable bearings at each end, and so arranged as to be capable of a longitudinal movement thereon. One end is connected to the arm *h'* by means of pins, which extend beyond it on each side, and the other end is provided with an arm, *j*, for slipping the belt, which is constructed in the usual well-known manner.

K represents a trough, which is supported in any proper manner in line beneath the bottomless box C, which is designed to receive the drop-wires that fall when threads are broken.

L represents a toothed wheel, loose upon the driving-shaft E', which bears against the collar I, attached to the shaft so as to revolve with it.

M represents a drop-wire, constructed of a single piece of wire bent in oval or link-shaped form, which is provided with an opening upon one side, as shown.

The operation is as follows:

The thread is wound in any proper manner from the spools onto the warper-beam. In its passage from the former to the latter it passes over the slotted beam B. At this point the drop-wires are placed upon the threads by means of the opening in the sides, and, resting in the slots of the beams, they are thereby held from moving with the thread. Whenever a thread becomes broken from any cause, its wire of course, being no longer sustained by it, falls through the slot of the beam B into the reciprocating bottomless box C, situated immediately below. Its movement is here

stopped, however, temporarily, for, although the box C has no bottom, the bar G, being located just below, catches and sustains it in the depression or ledge upon its edge until the backward movement of the box has forced the bar G backward by pressing the wire, which still rests partially within the box.

The movement of the bar G causes its arm g^1 to press against the arm h^1 and free it from the recess h^2 in the slotted bar, in which it rests when the machine is in operation.

The movement of the bar G is facilitated also by the operation of the spring g^3 . The spring of arm g^2 is to keep the inclined face of arm g^1 against arm h^1 , so that it will follow arm h^1 , thereby moving bar G back far enough to allow the wire to drop through into its receptacle. The movement of the arm h^1 is also facilitated by its own spring, which exerts its force to draw it on toward the frame.

The movement of the arm h^1 causes the operating-belt at the opposite end of the machine to be transferred from the fast to the loose-pulley through the medium of the bar J, with its arm j , and, at the same time, also permits the pawl I to fall by moving from beneath it the projecting end of the arm H^1 . When the pawl falls, it, of course, comes in contact with the toothed wheel L, and instantly stops its movement. In order to prevent the machinery from being so suddenly stopped as to cause breakage this wheel is made loose upon the shaft, and is connected to it only by the friction-collar, which revolves with it. By means of this construction all undue strain of the machinery is prevented.

It will thus be perceived that the breaking of a thread permits a wire to fall, which comes in contact with the bar G as the box C moves back and forth, and, forcing it back, thereby operates the arm h^1 , which, by means of its connections, shifts the belt and lets fall the pawl, which stops the motion of the machine.

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

1. The oscillating box C, constructed and arranged substantially as described.
2. The arm g^1 , provided with its tapering face, in combination with the arm h^1 , as described, for the purpose set forth.
3. The combination of the box C and bar G, as described.
4. The combination of the toothed wheel L, friction-collar l , and its adjusting-nut, with the pawl I and the arm h^1 , or its equivalent, for operating the latter, as described.
5. The combination of the slotted beam, oscillating box, bar G and its connections, with the arm h^1 and its connections, as described.
6. The described method of stopping the motion of a warping-machine by means of a wire held by an oscillating box coming in contact with a beam or bar which operates the shipping-arm.

This specification signed and witnessed this 17th day of January, 1871.

EDWIN H. CUMMINGS.
GRIMSHAW HEYES.
THOMAS ENTWISTLE.

Witnesses as to the signature of EDWIN H. CUMMINGS:

W. H. WHITE,
FRED. KELLEY.

Witnesses as to the signature of GRIMSHAW HEYES:

WM. P. FRYE,
FRED. KELLEY.

Witnesses as to the signature of THOMAS ENTWISTLE:

G. D. BISBEE,
FRED. KELLEY.