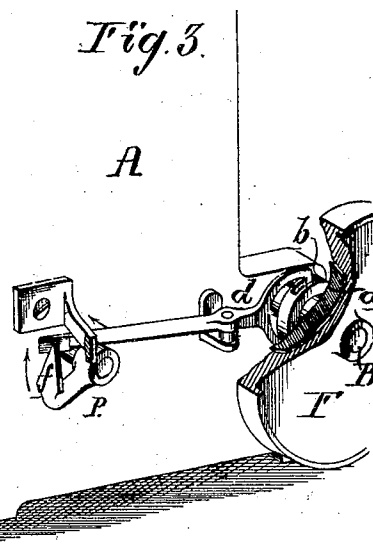
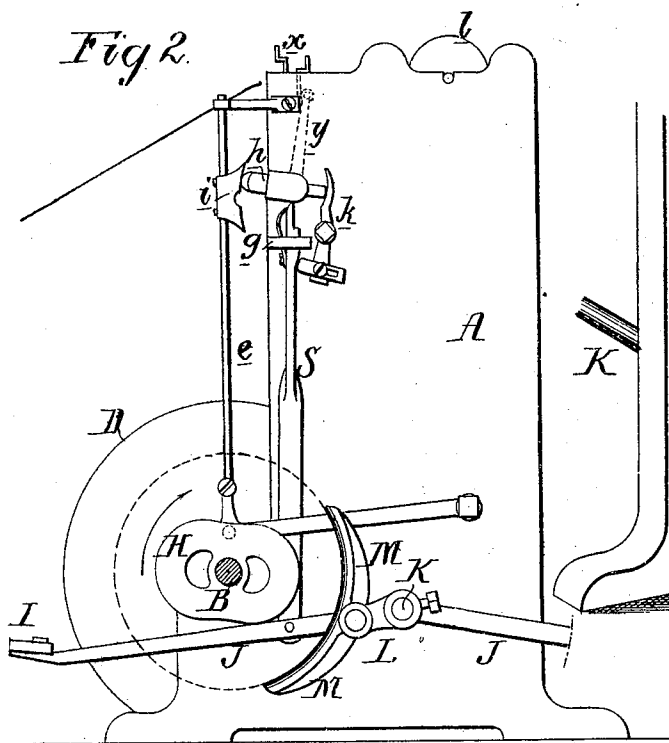
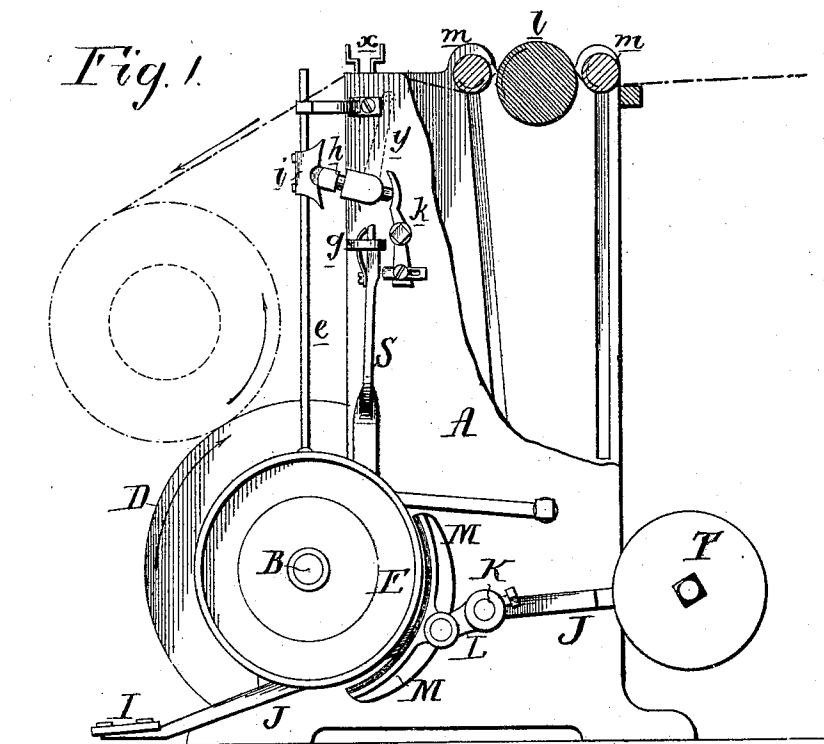


G. S. FOLLENSBEE & T. C. ENTWISTLE.

WARPING MACHINE.

No. 171,788.

Patented Jan. 4, 1876.



Witnesses, Hubert Houston
Thomas M. Devaux

Geo. S. Follensbee and
Thomas C. Entwistle
by their attorneys,
Hornum and Co.

UNITED STATES PATENT OFFICE.

GEORGE S. FOLLENSBEE AND THOMAS C. ENTWISTLE, OF LEWISTON, ME.

IMPROVEMENT IN WARPING-MACHINES.

Specification forming part of Letters Patent No. 171,788, dated January 4, 1876; application filed May 31, 1875.

To all whom it may concern:

Be it known that we, GEORGE S. FOLLENSBEE and THOMAS C. ENTWISTLE, of Lewiston, Androscoggin county, Maine, have invented certain Improvements in Warping and Beaming Machines, of which the following is a specification:

The objects of our invention are to so construct the stopping and starting appliances of a warping or beaming machine that both can be operated by one motion of a treadle, and to so arrange the rollers, between which the threads pass before reaching the drop-wires, as to insure a more even tension on the said threads.

These objects we attain in the manner which we will now proceed to describe, reference being had to the accompanying drawing, in which—

Figure 1 is a side view, partly in section, of a warping or beaming machine, with our improvements; Fig. 2, the same, with the operating parts in a different position; and Fig. 3, a view of the opposite side frame, illustrating the mechanism for throwing the driving-shaft in and out of gear.

In bearings in the opposite side frames A of the machine turns the driving-shaft B, carrying the cylinder D, which supports and imparts motion to the warp-beam, upon which the threads are to be wound, as shown in dotted lines in Fig. 1. The shaft B has at one end a fast pulley, E, Fig. 1, and at the opposite end a loose pulley, F, Fig. 3, to which the power is applied, this pulley F being thrown in and out of gear with the shaft B by means of the friction-clutch *a*, which is operated by means of the sleeve *b* and forked lever *d*, in a manner described hereafter. A treadle, I, is hung by means of arms J to a transverse shaft, K, which extends completely across the machine, and carries at one end an arm, L, to the outer end of which is attached a brake-shoe, M, adapted to the periphery of the pulley E. To the opposite end of the said shaft K is attached an arm, P, on the outer end of which is formed an inclined projection, *f*, which will, when it is moved in the direction of the arrow, Fig. 3, force back the long arm of the lever *d*, and thus throw the friction-clutch *a* against the pulley F in order to start the ma-

chine. The treadle is maintained in the depressed position shown in Fig. 1 by a bar, S, connected at its lower end to one of the arms J of the treadle, and notched at its upper end, where it is adapted to a plate, *g*, secured to the side of the machine. A weight, T, is attached to the outer end of one of the arms J, the tendency of this weight being to raise the treadle, as shown in Fig. 2, when the bar S is released.

When the treadle is depressed the brake-shoe M is maintained free from contact with the pulley E, and the clutch *a* is in gear with the pulley F; but when the treadle is elevated the clutch is out of gear, and the brake applied.

The devices for operating the brake and clutch, when a thread breaks, are shown in Figs. 1 and 2, and consist of the usual drop-wires *x*, and vibrating arm *y*, the shaft of which carries a sliding rod, *h*, the latter, when the free vibration of the arm *y* is interfered with, being acted upon by the cam-plate *i* attached to the reciprocating rod *e*, operated by a scroll-cam, H, on the driving-shaft, so as to force back the lever *k*, and free the notched bar S from the control of the plate *g*, thus allowing the treadle to be elevated, the clutch to be thrown out of gear, and the brake to be applied, as shown in Fig. 2, in order to effectually stop the machine. A simple pressure of the foot upon the treadle I is all that is necessary to throw the clutch into gear, to remove the brake, and bring the parts into the position shown in Fig. 1, when the machine is again put in operation. Before reaching the drop-wires the threads pass over a roller, *l*, turning in bearings in the frame of the machine, and beneath two drop-rolls, *m*, one of which is arranged on each side of said roller *l*, and the journals of which slide in slots formed in the side frames. By passing the threads under the drop-roll, both before and after passing over the main roller *l*, a firm bearing of the threads upon the said roller is obtained, and a more uniform tension upon the said threads insured.

We claim as our invention—

1. A warping or beaming machine, in which the brake for stopping the motion of the machine, and mechanism for operating the clutch to throw the same in and out of gear, are at-

tached to the treadle-shaft, all as and for the purpose set forth.

2. The combination of the arm L and its brake-shoe M, hung to one end of the treadle-shaft K, and adapted to the pulley E, with the arm P and its inclined projection *f*, hung to the opposite end of said shaft, and arranged to operate the clutch-lever *d*, all as set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

GEORGE S. FOLLENSBEE.
THOMAS C. ENTWISTLE.

Witnesses:

FRED. E. BICKFORD,
FRED. KELLEY.