J. B. GREENHALGH.

Stop-Motion for Warping-Machines.

No. 199,702. Patented Jan. 29, 1878.

Fig. 1.

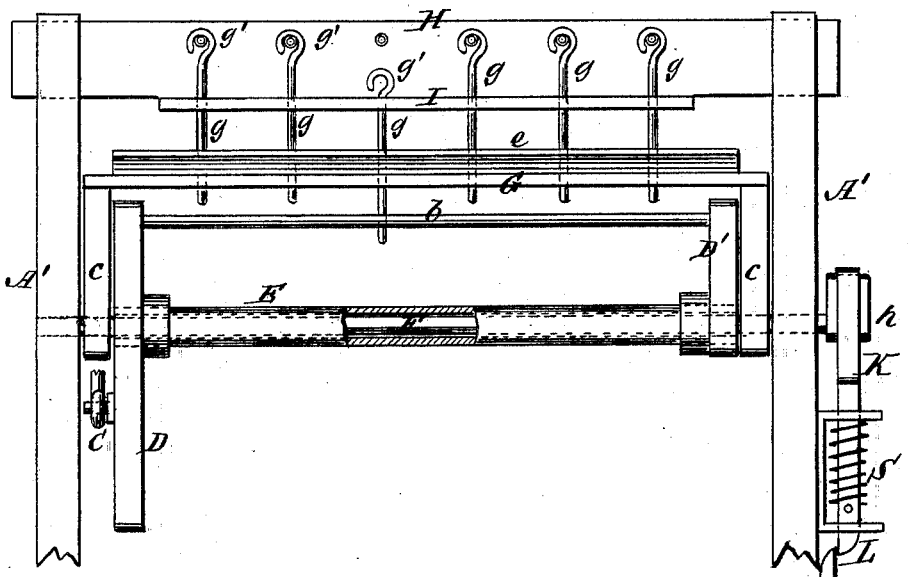
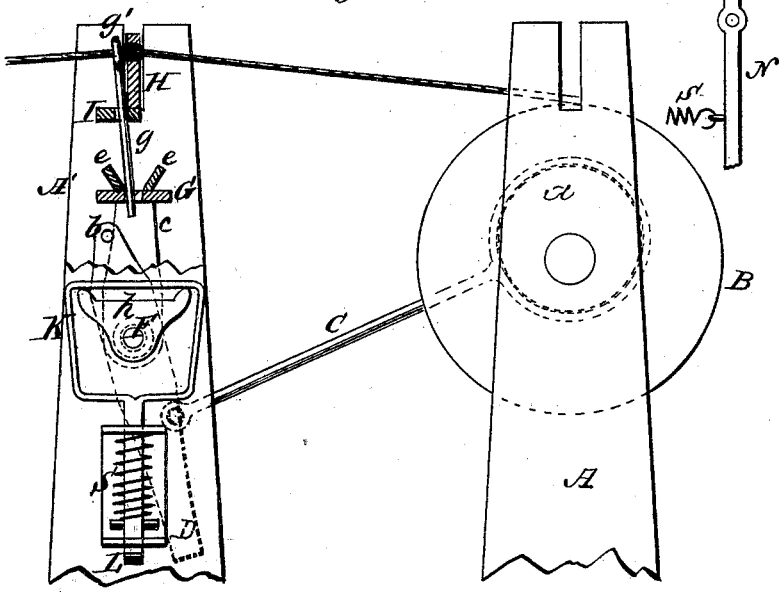


Fig. 2.



WITNESSES:

E. Wolff

J. H. Scarborough.

INVENTOR:

J. B. Greenhalgh.

BY Munn & Co

ATTORNEYS.

UNITED STATES PATENT OFFICE.

JOHN B. GREENHALGH, OF UXBRIDGE, MASSACHUSETTS.

IMPROVEMENT IN STOP-MOTIONS FOR WARPING-MACHINES.

Specification forming part of Letters Patent No. **199,702**, dated January 29, 1878; application filed July 30, 1877.

To all whom it may concern:

Be it known that I, JOHN B. GREENHALGH, of Uxbridge, county of Worcester, and State of Massachusetts, have invented a new and Improved Stop-Motion for Warping-Machines, of which the following is a specification:

This invention has relation to stop-motions for warping-machines; and the nature of my invention consists in arranging between the drum or reel and the spools a series of gravitating wires, through eyes formed on which the threads pass, in combination with a vibrating bar and tripping devices which will actuate a belt-shifter and stop the motion of the machine should a thread break, as will be understood from the following description.

In the annexed drawing, Figure 1 is a view in detail and partly in section, illustrating my improved stop-motion. Fig. 2 is an end view, partly in section.

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

The letter A designates one of the supports for the shaft of a cylinder, B, around which is wound the yarn to be spooled. On one end of the shaft of this cylinder an eccentric, *a*, is keyed, which operates through the medium of a pitman-rod, C, on an arm, D, that is keyed on a tubular shaft, E. The arm D and another arm, D′, also keyed on shaft E, have secured to their ends a rod, *b*.

Passing through the shaft E is a shaft, F, which has its bearings in two standards, A′ A′, and to which two arms, *c c*, are keyed, which have a slotted plate, G, secured to their ends. On opposite sides of the slot through said plates are arranged inclined guides *e e*. Above the slotted plate G is a perforated bar, H, which has its end bearings in the standards A′ A′, and to which a guide, I, is secured. This guide I is perforated, and receives loosely through it drop-wires *g*, the upper ends of which are constructed with hooks *g′*. The wires *g* are allowed free vertical play through the guide I. On one end of the shaft F is keyed a trip, *h*, which receives oscillating motion at certain times through the medium of said shaft F, and operates on a yoke, K, to lift a latch, L, held down by a spring, S. With the lower end of the latch L the upper end of a belt-shifter, N, engages. When the latch L is lifted the belt-shifter is released from it, and by the recoil of a spring, *s*, will throw the driving-belt from the fast to the loose pulley and stop the machine.

The threads are carried from the drum B and passed through the perforated bar H, thence through the hooks or eyes *g′* on drop-wires *g*, and thence to the spools. The rod *b* receives constant vibration from the drum B, passing forward and backward beneath the lower ends of the drop-wires *g* as long as the machine is in operation and no threads are broken. Should a thread break from any cause, the wire *g*, which is held up from it, will drop, and the end of such wire will pass through the slotted plate G and be struck by the rod *b*, causing a movement of shaft F, thereby raising latch L and throwing the belt-shifter into operation. The machine will instantly stop, and the broken thread can be mended and its drop-wire disengaged from the plate G, when the operation of winding will proceed as before.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, in a warping-machine, of the swinging slotted plate G, having arms *c* and guides *e*, the vibrating rod *b*, having arms D D′, and the solid shaft F and tubular shaft E with the drop-wires *g*, perforated guide-board H I, and mechanism, as described, for connecting the same with a belt-shifting device or stop-motion, substantially as herein set forth.

2. The combination of the yoke K, latch L, spring S, belt-shifting lever N, and spring *s* with the shaft F, having oscillating trip *h*, drop-wires *g*, slotted plate G, and rod *b*, as and for the purpose set forth.

JOHN B. GREENHALGH.

Witnesses:

JAMES H. MOORHOUSE,

THOMAS SMITH.