(No Model.)

C. H. LARNED.

STOP MOTION MECHANISM FOR SPINNING MACHINES, &c.

No. 300,616. Patented June 17, 1884.

Fig. 1.

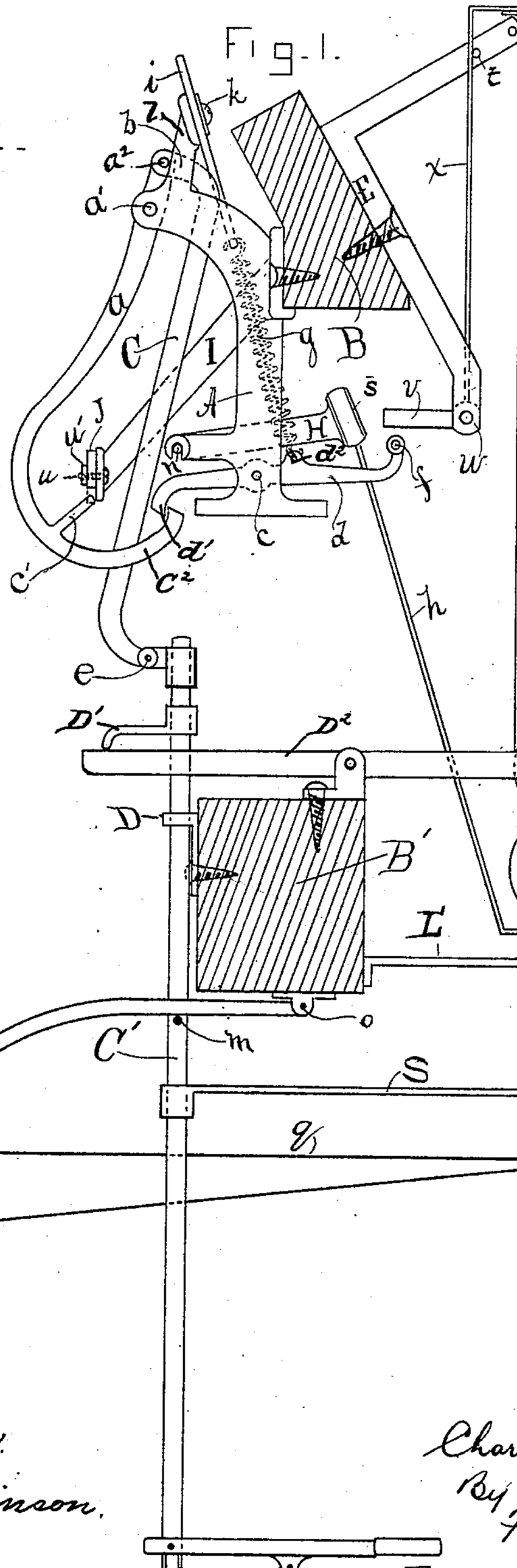


Fig. 2.

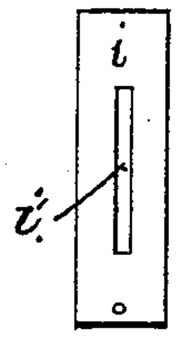


Fig. 3.

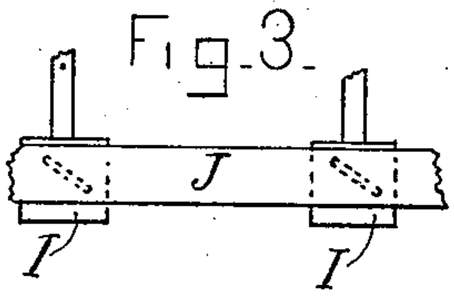
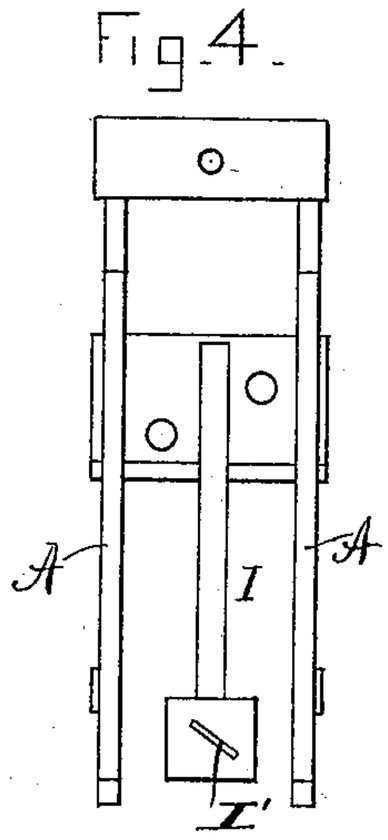


Fig. 4.



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STOP-MOTION MECHANISM FOR SPINNING-MACHINES, &c.

SPECIFICATION forming part of Letters Patent No. 300,616, dated June 17, 1884.

Application filed July 6, 1883. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. LARNED, of Willimantic, county of Windham, and State of Connecticut, have invented certain new and useful Improvements in Stop-Motions for Spinning, Twisting, Winding, and Doubling Machines, which improvements are fully set forth and described in the following specification, reference being had to the accompanying drawings.

My invention relates to spinning, twisting, winding, and doubling machines; and it consists of improvements in the part or parts of said machines known as "stop-motions," by means of which the mechanism to which they are attached automatically stops when a thread breaks. My device is particularly valuable when applied to the class of machines specified above employed in silk manufacture.

The object of my invention is to produce a machine which shall be positive in its action, and which cannot be tripped or unlocked by the ordinary jar of the machine, yet shall be capable of receiving so fine an adjustment that a very slight weight will unlock it and stop the spindle to which it is attached.

In the accompanying drawings, Figure 1 is a side elevation of my device attached to the rails of a spinning-machine, (which are shown in section,) showing the various parts in their proper position, with the latch closed and the cord or belt which revolves the spindle tightened, as in the act of winding or twisting. Fig. 2 is a front view of the adjustable device to which is attached my latch-spring. Fig. 3 is a rear view of the sliding rod which simultaneously locks all of the stop mechanism. Fig. 4 is a detached rear view of the frame and bracket which support parts of my device.

My improved device is secured to the rails of a machine, as shown at B and B′, by screws or other suitable fastening devices. These rails are supported in any suitable manner, and may be several feet in length and arranged to receive and support as many of my devices as they carry spindles or threads.

Attached to the rail B is a bracket-frame, A, made preferably of cast metal, which, by its peculiar shape, is adapted to support in proper bearings the principal parts of my device.

The letter C designates a connecting-rod, pivoted at a^2 to the short arm of the lever *a*, and at the other end at *e* to the drop-rod C′, which latter is guided by a bracket, D, secured to the rail B′. The connecting-rod C may be made of any suitable material, having at its upper end an elbow or projection, *b*, which may be made rigid with said rod, or may be separately made and attached to it by a set-screw or other suitable fastening.

Pivoted in the bracket-frame A is a lever, *a*, whose fulcrum is at *a′*, the upper or shorter arm thereof pivoted loosely to the elbow or projection *b* of the connecting-rod C. The fulcrum *a′* and the pivot a^2, which unites the elbow or projection *b* and the lever *a*, should not be in vertical alignment, although very closely approaching it.

As shown at *c*, in the bracket-frame is hung my tripping-latch *d*, which in its normal position is nearly horizontal, and said tripping-latch is provided with a transverse hub having a central opening, in which is inserted a wire, *f*.

At the upper end of the bracket-frame A, I have arranged a spring, *g*, having one end attached to the tripping-latch *d*, as shown at d^2, while its other end is attached to a plate, *i*, provided with a slot, *i′*, which is capable of longitudinal adjustment on an upward extension, *l*, of the bracket-frame A by means of a screw, *k*. The lever *a* at its lower end is provided with a hook, c^2, to engage the hook end *d′* of the tripping-latch *d*, and the edges of the ends of said hooks c^2 and *d′* should be beveled, as shown in Fig. 1, so that as the hook c^2 meets the hook end *d′* of the tripping-latch *d* said hook end will ride upward and pass the hook c^2, when the spring *g* acts on the outer end of the tripping-latch *d* with an upward tendency, causing the inner end to descend and lock the hook c^2 of the lever *a*, and hold the latch in place until again released by pressure on wire *f*.

To the lower end of the bracket E is pivoted a rocking arm, *v*, as shown at *w*, which has extending upward therefrom a wire, *x*, having

at its upper end a guide-eye or twizzle to receive and guide the thread, which is shown by the line *y*. So long as the thread remains intact it supports the wire *x* in an upright position; but should the thread break the weight of the rocking arm *v* carries it downward against the wire *f*, whereby the tripping-latch *d* is unable to resist the pressure thus given to its outer end, which is depressed, and the lever *a* is released by the weight of arm *v*, and the mechanism is stopped, as hereinafter described.

In the process of twisting several minute strands of silk into one, it becomes necessary to use a drop-wire to engage and support the thread after it has passed the rolls F and G, so that should the complete thread be broken the machine may be instantly stopped.

The letter H represents an arm which is pivoted at *n* in an extension of the bracket-frame A. This arm is provided with a weighted end, *s*, and has attached to it a drop-wire, *h*, which extends downward below the rolls F G, and connects with the thread *y* by means of a querl at its lower end. When the thread is broken below the rolls, the wire will swing inward, causing the weighted end *s* of the arm to drop down on the tripping-latch *d*, over which it overhangs, causing said tripping-latch to be released from the hook c^2 of the lever *a*, causing in turn the connecting-rod C and the drop-rod C′ to fall, thereby stopping the mechanism.

The belt-tightening device is composed of a lever, P, pivoted to the rail B′ at *o*, and having hung in its outer end a loose guide-pulley, L.

To the lower end of the outside of rail B′, I attach an arm, L′, which is intended to guide the thread between the eye of the drop-wire *h* and the spindle R.

To the drop-rod C′ is rigidly secured a pin, *m*, which forms a support for the lever P, which is fulcrumed at O.

The cord *q*, which rotates the spindle R, passes over the loose guide-pulley L after leaving the spindle. When the mechanism is latched and the drop-rod C′ raised, the loose guide-pulley L is carried upward and tightens the cord which rotates the spindle. When the mechanism is unlocked by the breaking of a thread either above or below the rolls F G, the drop-rod C′ is depressed, the inner end of the lever P, carrying the loose guide-pulley L, is lowered on account of the lowering of the pin *m*, thus loosening the cord or belt, which slips freely around the whirl of the spindle R. To insure the instant stopping of the spindle R, a brake, S, having on its outer end a piece of leather or other suitable material, is attached to and moves with the drop-rod C′, and has its outer end directly over the spindle-whirl. When the drop-rod C′ is depressed and the cord is loosened, the brake engages the whirl of said spindle, and by means of friction the spindle is stopped. When the rods C C′ are depressed, an arm, D′, on the drop-rod C′ bears down against the outer end of the pivoted lever D^2, which carries the roll F and lifts it from contact with the roll G, whereby the feed of the thread to the spindle is stopped.

At the bottom of the machine is arranged a treadle or foot-lever, T, which is pivoted to the lower end of the drop-rod C′, by means of which my device can be reset after a broken thread is reunited. This is accomplished by pressing on the said foot-lever, which forces the rods C C′ upward to their original position, whereby the hook c^2 of the lever *a* will connect again with the hook end *d′* of the tripping-latch *d*. The connecting-rod C, at its upper end, has a lateral as well as a vertical movement when the lever *a* is released, and swings outward, and to provide for such motions I have constructed the rods C C′ in two parts, as shown in Fig. 1, and jointed or hinged them at *e*, thus confining the drop-rod C′ to a vertical movement.

When a machine according to my invention is stopped at the close of a day's work, the thread is ordinarily slackened, and in such case the drop-wire *h* might sag sufficient to unlock the stop mechanisms. This would necessitate the relocking before the spindles could be started. To avoid such a result I have arranged at the rear side of my device a series of brackets or supports, I, one end being secured rigidly to the rail B, the outer end being constructed with a vertical plate provided with oblique slots I′. These brackets I, for convenience, are placed between the arms of the bracket A, (see Fig. 4,) and may, if desired, form a part of the same casting; or, if made separate from the bracket A, they may be secured to the rail B by the same screws or bolts which fasten the bracket A to the rail B.

Running the entire length of the machine is a rod, J, made of any suitable material, supported on the brackets I, and held in contact therewith by means of the bolts *u*, rigid with said rod and fitting loosely in the oblique slots I′, so that said rod may have endwise movement for the purpose of locking the machine when it is stopped. As the rod is forced endwise, the bolts *u* follow the oblique slots, and the rod is carried downward a sufficient distance to engage with the upper side of the projection *c′* on the lever *a*. This prevents the hook c^2 of the lever *a* and hook end *d′* of the tripping-latch *d* from leaving each other; and when the machine is to be started again, instead of resetting each device, a single sliding movement of the rod accomplishes the same result. As the rod J is forced back when the machine is to be started, the bolts *u* in the oblique slots I′ of the brackets I carry it upward and away from the projection *c′*, and it is locked in position by the nuts *u′* engaging with the bolts *u*.

At the upper end of the bracket-frame E, I provide lugs *t t′*, the former of which supports and holds in position the wire *x*, while the lat-

ter serves as a guide against which the thread will bear to prevent said wire *x* from falling backward.

Having described my invention and the operation thereof, what I claim is—

1. The bracket-frame A, the lever *a*, provided with hook c^2, the connecting-rod C, provided with elbow or projection *b*, the tripping-latch *d*, having hook end *d'*, and wire *f*, in combination with the bracket E, having the rocking arm *v*, and wire *x*, provided with a guide-eye at its upper end, drop-rod C', and the belt-tightening device P L, substantially as shown and described, and for the purpose set forth.

2. The combination, with the bracket-frame A, having the extension *l*, the lever *a*, the connecting-rod C, provided with elbow or projection *b*, the tripping-latch *d*, the slotted plate *i*, attached to the extension *l*, and the screw *k*, of the spring *g*, attached to the tripping-latch and to the plate *i*, as shown and described, and for the purpose set forth.

3. The combination, with the bracket-frame A, the lever *a*, slotted plate *i*, and tripping-latch *d*, having wire *f*, and the spring *g*, connected to the plate and latch, of the connecting-rod C, pivoted to the lever *a*, drop-rod C', the lever D^2, carrying the roll F, the arm D', for operating said lever, the bracket E, having rocking arm *v*, the wire *x*, and the belt-tightening device P L, substantially as shown and described.

4. The combination, with the bracket-frame A, the lever *a*, provided with the projection *c'*, and brackets I, provided with oblique slots I', of the rod J, provided with bolts *u*, adapted to move in the slots of the brackets, and arranged to slide diagonally to engage with the projection *c'* on the lever *a*, as and for the purpose specified.

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Witnesses:
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