(No Model.)

H. WYMAN.

STOPPING MECHANISM FOR LOOMS.

No. 383,163. Patented May 22, 1888.

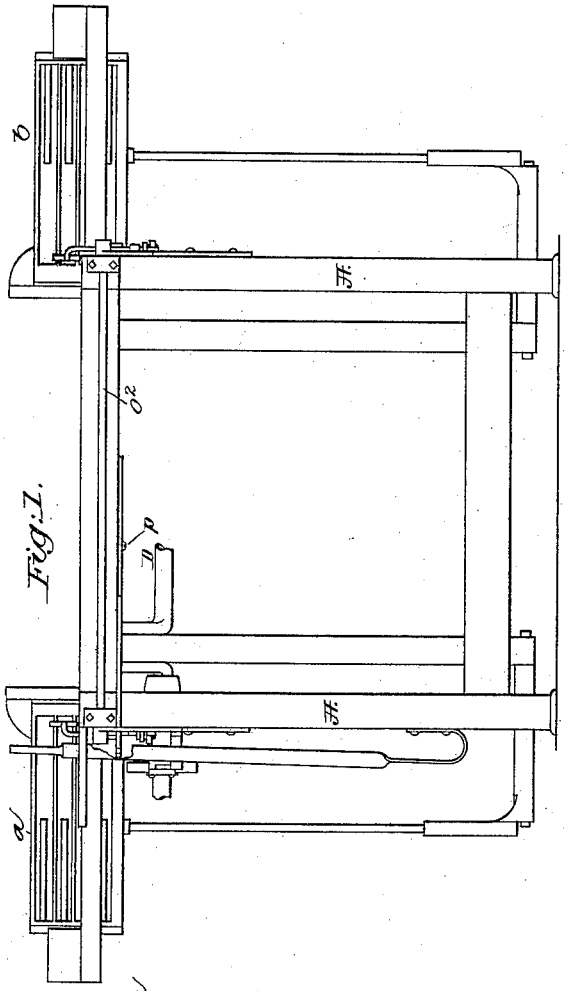

Fig. 1.

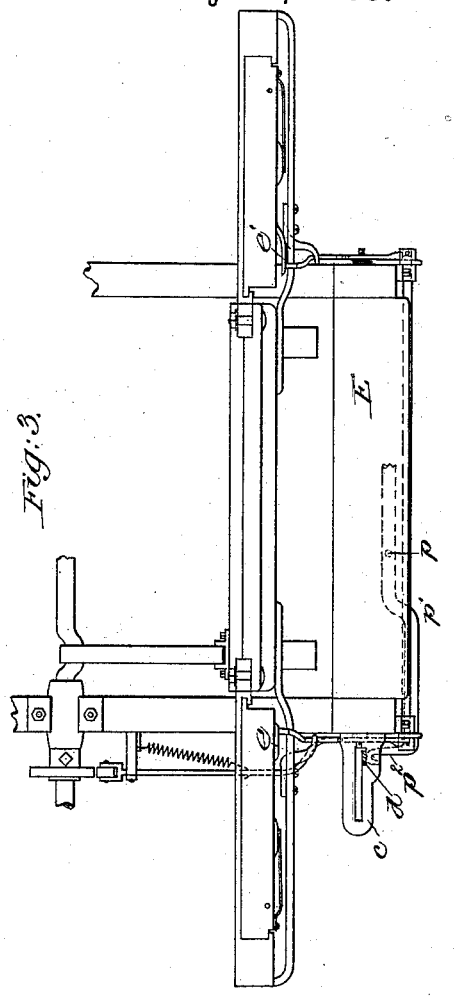

Fig. 3.

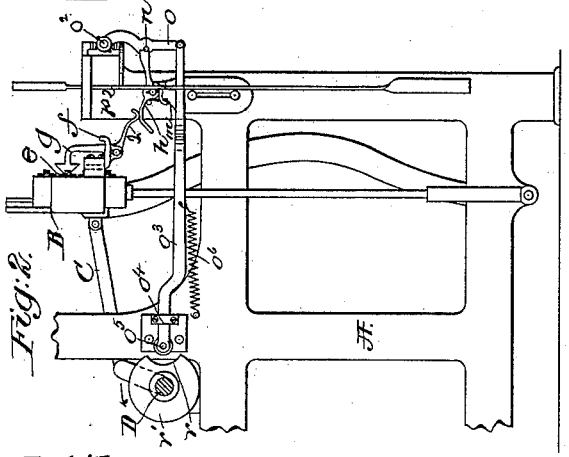

Fig. 2.

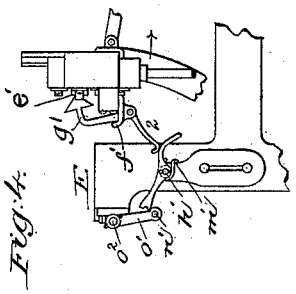

Fig. 4.

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UNITED STATES PATENT OFFICE.

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STOPPING MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 383,163, dated May 22, 1888.

Application filed April 26, 1887. Serial No. 236,137. (No model.)

To all whom it may concern:

Be it known that I, HORACE WYMAN, of Worcester, county of Worcester, and State of Massachusetts, have invented an Improvement in Stopping Mechanism for Looms, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object to provide improved mechanism whereby the loom may be stopped whenever two shuttles happen to be in two boxes opposite the level of the shuttle-raceway, for if a shuttle should be thrown under such circumstances it would be caught in the shed and be struck by the reed in the forward movement of the lay and the warp would be broken.

In accordance with my invention the lay is provided at each side the loom-frame with a binder-feeler, which, during the backward movement of the lay, is turned on its pivot so that its upper end is moved toward the binders, so that should a shuttle be present in the box opposite the binder, an arm of the binder-feeler will act against a cam-shaped releasing-lever pivoted at the loom side, and will remove the outer end of said lever from contact with a pin or projection connected to an arm of a rock-shaft extended across the loom at the breast-beam, one of the arms of the rock-shaft having attached to it a rod, herein shown as provided at its inner end with a roller or other stud which is located in line with a cam-disk on the crank-shaft, the said roll not, however, touching the said cam-disk unless the releasing-levers at both sides the loom should be simultaneously actuated by the presence of a shuttle in each box opposite the raceway while the lay retreats from the breast-beam. When both the releasing-levers are raised to release the arms of the rock-shaft extended across the loom at the breast-beam, one of the said arms acts against a lever pivoted at the under side of the breast-beam, causing it to strike the usual shipper-lever and release it to stop the loom, the roller or other stud referred to at such time entering the recess in the periphery of the cam-disk, a spring attached to the rod carrying the said roller-stud, causing the movement of the stud toward the cam-disk. The roller or other stud having entered the space in the cam-disk, the latter in its further movement acts thereon, moves the rod outward, and causes the pins on the arms of the rock-shaft to pass the holding ends of the releasing-levers, which again resume their control of the rock-shaft.

In accordance with my invention a rock-shaft supported on the frame of the loom has combined with it and a shipper-lever means whereby when the said shaft is oscillated the shipper-lever will be engaged and moved to effect the stopping of the loom. The rock-shaft is provided with arms and projections thereon, with which co-operate two releasing-levers supported on the loom-frame, and also two binder-feelers carried by the lay to feel for the binders of those boxes that are in line with the raceway. The picking takes place while the crank moves substantially from its top to its bottom center, and the shuttle-boxes are shifted while the crank-shaft moves substantially from its bottom to its top center, and it is just as the shuttle-boxes have assumed their new positions that the binder-feelers by coming in contact with the releasing-levers are made to act against or feel for the binders to detect if two shuttles are in opposite boxes at the race of the lay.

It will be noticed in this my invention that the binder-feelers retire from the binders, or their pressure toward the binders, as when feeling for them is released, and the feelers are free to retire from the binders before the picking takes place. As the binder-feelers are moved, as described, should there be a shuttle under but one binder the releasing-lever co-operating with the binder not held out by the shuttle would not be moved; but should both binders be held out by shuttles then both releasing-levers would be turned to remove their ends from the projections on the rock-shaft arm and permit the rock-shaft to oscillate and effect the disengagement of the shipper-lever to stop the loom.

Figure 1 in front elevation shows a sufficient portion of an ordinary loom having change shuttle-boxes at each end to enable this invention to be understood. Fig. 2 is a left-hand end view of Fig. 1. Fig. 3 is a top or plan view of Fig. 1; and Fig. 4 is a partial

right-hand end elevation of Figs. 1 and 3, the lay being supposed to be moving toward the crank-shaft, the crank moving from its bottom to its top center.

The loom-frame A, the lay B, the lay connecting-rod C, the crank-shaft D, to actuate the lay, the shuttle-boxes *a b*, the notched plate *c*, the shipper-lever *d* therein, and the shuttle-binders *e e'* are and may be all as usual or common in looms for weaving ginghams, and the shuttle-boxes will be moved by a shuttle-box mechanism, preferably such as shown in United States Patent, Reissue No. 10,433.

The lay at its front side, near the loom-side, is provided with brackets, as *f f'*, upon which are pivoted like binder-feelers *g g'*, the feelers being of such shape or weight or being so held as to cause their upper ends normally to stand away from the binders *e e'*, thus leaving the lower ends or tails, 2, of the binder-feelers depending in position to strike the convexed or cam-shaped faces of the releasing-levers *h h'*, pivoted upon the loom-side at a point below the level of the breast-beam, each of the said releasing-levers being acted upon by a spring, *m* or *m'*, which normally keeps the outer notched end of the said lever depressed, so as to lie immediately opposite a pin or projection, as *n* or *n'*, extended from an arm, *o* or *o'*, connected to a rock-shaft, o^2, extended, as herein shown, across the loom at the front side of the breast-beam.

The arm *o* of the rock-shaft referred to has connected to it a rod, o^3, which is extended through a guide, o^4, and provided with a roller or other stud, as o^5. (See Fig. 2.) This rod o^3 has connected to it a spiral spring, o^6, which normally acts to draw the rod, and consequently the arms *o* and *o'*, toward the releasing-levers *h h'*.

The breast-beam E has pivoted to it at its under side upon a stud, as *p*, a disengaging-lever, *p'*, one end, p^2, of which is bent or shaped as best shown in Fig. 3, to act upon the shipper-lever *d* and release it from its holding-notch. This shipper-lever in practice may operate any usual belt-shifting devices common in power-looms.

The lever *p'*, between its fulcrum *p* and the shipper-lever *d*, crosses the path of movement of the arm *o*, so that when the arm *o* is moved toward the lay by means of the spring o^6, the said arm strikes the lever *p'* and causes it to act against the shipper-lever and knock it out of the holding-notch in the slotted plate *c*; but this movement of the arm *o* cannot take place until both the releasing-levers *h* and *h'* are removed out of range of the pins or projections *n* or *n'*, and even then the arm cannot move backward under the action of the spring o^6 until in the rotation of the crank-shaft the surface *r* (see Fig. 2) in the cam-disk *r'*, attached to the crank-shaft D, comes in the rotation of the crank-shaft opposite the roll or other stud, o^5.

When the loom is operating correctly, the shuttle-box at that end of the raceway opposite from which the shuttle is next to be thrown is empty, and in such event the tail 2 of the binder-feeler during the movement of the lay, as described, immediately after the shuttle-boxes arrive in their new position, meets and rides by and over the cam-surface of the releasing-lever with which it co-operates, and does not turn the said lever upon its fulcrum to remove its notched end from contact with the pins *n n'*, with which it co-operates, and consequently the releasing-lever which is not so moved prevents the inward movement of the arm *o* and the release of the shipper-lever. On the contrary, should it happen at such time that a shuttle were in each of the two boxes opposite the level of the race of the lay, then the said shuttles, acting upon the binders *e* and *e'*, will hold them outward, so that the binder-feelers arriving against the binders will be so held that the tails 2 of the said binder-feelers, as the lay is moving backward, will act against the releasing-levers with sufficient force to turn them both on their pivots away from and so as to remove their notched or outer ends from the position immediately against the pins *n* or *n'*, thus permitting the spring o^6, acting through the rod o^3, and connected with the arm *o*, to assume control of the rock-shaft and move the arm *o* to effect the release of the shipper-lever and cause the loom to be stopped in usual manner.

After the roller or other stud o^5 has entered the recess *r* of the cam-disk *r'*, the further partial rotation of the crank-shaft D, due chiefly to the momentum of the lay, causes the notched or cam parts of the cam-disk to act upon the roller or other stud, move the bar o^3 outward, and with it the arm *o*, into such position that the springs *m m'* may act and throw the notched or front ends of the releasing-levers down behind the pins *n n'*, leaving the loom again in operative condition, ready to be started after the operator shall have placed the shuttles back in proper position in the shuttle-boxes.

I wish it to be understood that the binder-feelers and the releasing-levers moved by them may be employed to good advantage with a loom having a series of shifting shuttle-boxes at but one end of the loom.

I claim—

1. The lay, means to operate it, the shuttle-boxes, their binders, the binder-feelers, the rock-shaft, its arms *o o'*, provided with pins or projections, the shipper-lever, a notched plate to hold it, and means actuated by the rock-shaft to release the shipper-lever, combined with two releasing-levers, and with means to normally move the arms *o* toward the lay, whereby when two shuttles arrive in two boxes located at the opposite ends of the raceway of the lay the said binder-feelers are made to actuate the releasing-levers and effect the release of the shipper-lever.

2. The lay, means to operate it, the shuttle-boxes, their binders, the crank-shaft, its attached cam-disk, the rock-shaft o^2, its attached arms *o o'*, rod o^3, and spring o^6, combined with

two releasing-levers and with binder-feelers co-operating therewith, substantially as described.

3. The lay, means to operate it, the shuttle-boxes, their binders, a rock-shaft supported on the frame of the loom, the shipper-lever, and means between them adapted by the oscillation of the rock-shaft to disengage the shipper-lever and stop the loom, combined with two binder-feelers carried by the lay and two notched releasing-levers between them and the said rock-shaft, whereby when either one of the feelers is not actuated by a binder of a shuttle-box in line with the race of the lay just before the picking takes place it will not actuate its co-operating releasing-lever, and thereby will prevent the oscillation of the rock-shaft, substantially as described.

4. The lay, a crank-shaft to operate it and change shuttle-boxes at each end of the lay, and binders attached to the shuttle-boxes, combined with two binder-feelers and with means to actuate them to feel for the binders immediately after the shuttle-boxes arrive in their new position, the binder-feelers returning from the binders to release them from pressure at the time that the picking takes place, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HORACE WYMAN.

Witnesses:
G. W. GREGORY,
C. M. CONE.