(No Model.)

F. M. DAY.

LOOM.

No. 552,354. Patented Dec. 31, 1895.

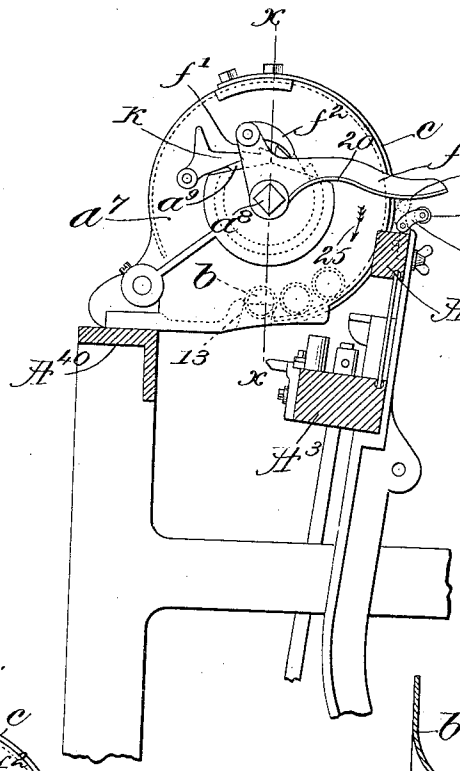

Fig. 1.

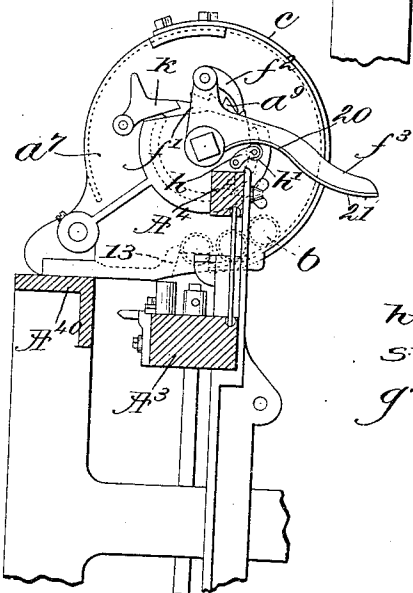

Fig. 2.

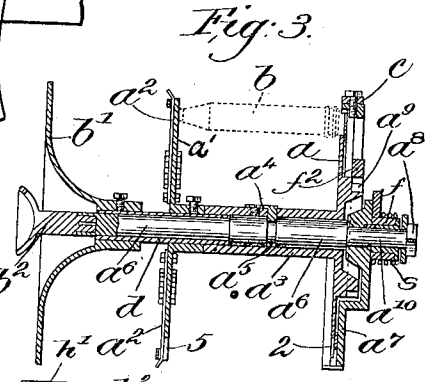

Fig. 3.

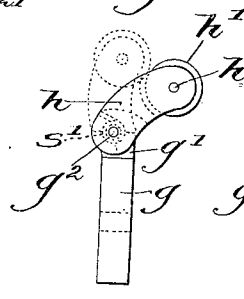

Fig. 4.

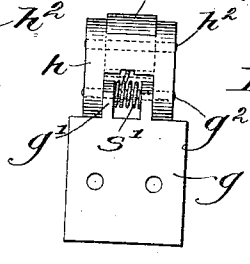

Fig. 5.

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UNITED STATES PATENT OFFICE.

FLORENCE M. DAY, OF HOPEDALE, MASSACHUSETTS, ASSIGNOR TO GEORGE DRAPER & SONS, OF SAME PLACE.

LOOM.

SPECIFICATION forming part of Letters Patent No. 552,354, dated December 31, 1895.

Application filed October 15, 1895. Serial No. 565,815. (No model.)

To all whom it may concern:

Be it known that I, FLORENCE M. DAY, of Hopedale, county of Worcester, State of Massachusetts, have invented an Improvement in Looms, of which the following description, in connection with the accompanying drawings, is a specification, like letters and numerals on the drawings representing like parts.

In United States Patent No. [illegible],940, granted to James H. Northrop, a loom is shown provided with filling changing or supplying mechanism, wherein an intermittingly-operating filling-feeder positively brings each filling-carrier, shown as a bobbin, into position under the pusher, to be inserted in the shuttle, a stop against which rests the head of the bobbin next to be acted upon by the pusher co-operating with the feeder. The filling-feeder in said patent is composed of two disks attached to a sleeve mounted on a fixed stud, a ratchet connected to the sleeve or a disk being engaged by a pawl mounted upon a spring-actuated pawl-carrier deriving its motion from a projection carried by the lay. The disks constitute a hopper for the bobbins or "filling-carriers," as they will be hereinafter termed, and the coiled spring to rotate the hopper naturally becomes weakened by such rotation, and it is necessary to provide means for restoring its energy. In the patent referred to such means are provided by the pawl-carrier having a pawl to engage the ratchet to which the spring is attached, the pawl-carrier being so positioned on the hopper that it comes into the path of a roll or projection on the lay. On the transfer of a filling-carrier to the shuttle, the lay being forward, the hopper rotates by means of the coiled spring, and the pawl-carrier controlling the spring turns with it, bringing the end of said pawl-carrier directly into the path of the roll on the lay. When the lay moves back the roll raises the pawl-carrier and turns or winds up the spring through the pawl and ratchet, a separate dog or detent preventing backward movement of the filling-feeder. Evidently, in order that the pawl-carrier shall always move its pawl back far enough to wind the spring before engaging the ratchet, it is necessary that the roll or projection on the lay control the pawl-carrier for a short time after the pawl has been moved into position to engage the ratchet, and so the pawl-carrier is moved back a little more than enough to bring its pawl into engagement with the ratchet at the proper point. The pawl-carrier is consequently touched at every sweep of the lay by the roll or projection, which sometimes takes place nearly two hundred times per minute.

This invention has for its object the production of means for overcoming this constantly-recurring engagement of the pawl-carrier and lay, and for this purpose I make use of a roll which, instead of being stationary or rigid on the lay, is attached to a short rocker-lever mounted on the lay and under the control of a suitable spring, which normally holds the roll down and out of engagement with the pawl-carrier or a part thereof when the lay moves forward, the hopper being held inoperative.

When a filling-carrier is transferred to the shuttle, however, the pawl-carrier will be moved during the partial rotation of the hopper into the path of the roll, and, engaging therewith, the friction will cause the rocker-lever to be moved against its controlling-spring when the lay moves back, thereby raising the roll into operative position to move through a higher path and act upon and lift or swing the pawl-carrier. By the time the lay has moved back the roll will have swung the pawl-carrier enough to tighten the hopper-spring and carry the pawl back into engagement with its ratchet, and when the lay comes forward again the rocking lever, under the stress of its controlling-spring, will move back into normal position, moving its roll out of the way of the pawl-carrier and remaining in such position until again brought into action by the transfer of another filling-carrier.

Figure 1 is a view, partially in section, of the inner end of the hopper or filling-feeder, with the lay back, the lay and breast-beam being shown in section on a plane at right angles to the latter, with the hopper and its operating mechanism in normal inoperative position. Fig. 2 is a similar view, the lay being shown as forward, however, and the hopper is supposed to have been rotated by its spring after a filling-carrier has been transferred to the shuttle-box, the tightening de-

vices for the hopper-actuating spring being shown as in position to be operated by the lay on its back stroke. Fig. 3 is a longitudinal sectional detail of the filling-feeder and weft-end holder, taken on the line x x, Fig. 1, and looking to the right, one filling-carrier being shown in position by dotted lines. Fig. 4 is an enlarged end elevation of the roll-carrier and its roll, its operative position being indicated by dotted lines; and Fig. 5 is a front elevation thereof in normal inoperative position.

The feeder or hopper for the filling-carriers consists essentially of a disk or plate a notched at 2 to receive the heads of the filling-carriers b, (see Fig. 3,) and a second disk or plate a' having a series of grooves 5 and provided with a series of springs a^2 serves to hold the tips of the filling-carriers, as in said patent, the hub a^3 of disk a having a dog a^4 extended through a slot in the hub and entering an annular groove a^5 in a stud a^6 fixed relatively to the stand a^7 by a nut a^8, so that the hub and disk may be rotated intermittingly on the stud a^6, and the ratchet-teeth a^9 on the disk a may be and are substantially as in the patent referred to. A weft-end support b' is fast on a sleeve d forced tightly into the open end of the hub a^3 and loose on the stud a^6, said support having a weft-end holder b^2, the support and holder rotating in unison with the filling-carrier, feeder or hopper.

The foot of the stand a^7 is attached by suitable bolts to a block or plate resting on the breast-beam A^{40}, said stand having around a portion of its periphery an attached guard or shield c overlapping the heads of the filling-carriers supplied to the feeder, the endmost filling-carrier always resting against the stop 13, (shown in dotted lines, Figs. 1 and 2,) directly over the shuttle-box of the lay A^3 when the latter is in its forward position toward the breast-beam.

The inner end of the stud a^6 projecting through the stand a^7 is reduced at a^{10} (see Fig. 3) to form the fulcrum for a pawl-carrier, (shown clearly in Figs. 1 and 2,) the hub f thereof carrying a coiled spring s, one end of which is attached to the pawl-carrier, while its other end is fixed to the stand a^7 or some other stationary part, the spring moving the pawl-carrier to effect the rotation of the filling-feeder in the direction of arrow 25, Fig. 1, or in its forward direction, the pawl-carrier and pawl being moved in the opposite direction by means to be described.

An upturned arm f' of the pawl-carrier has mounted thereon a spring-pressed pawl f^2 which engages the ratchet-teeth a^9 on the disk a, the pawl clicking over the ratchet-teeth when the pawl-carrier is raised, the said pawl-carrier having a tail f^3, (see Figs. 1 and 2,) cam-shaped on its under side to present a concavity 20 adjacent the hub f, and a convex portion 21 toward its outer end.

A stand g is attached by suitable bolts or some part thereof (herein shown as the reed-cap A^4) to the lay A^3, and provided with ears g' to form bearings for a pin or stud g^2, (see Figs. 4 and 5,) extended through the lower preferably forked or bifurcated end of a rocker-lever h', which straddles the ears g', as best shown in Fig. 5. A spring s' is coiled around the pin g^2 and held at one end to one of the ears g', or to some fixed part of the stand, the other end of the spring bearing against the rocker-lever h and tending to normally hold it in full-line position, Figs. 1, 2, and 4. The said lever is notched at its upper end to receive a roll h', mounted on a pin h^2, and preferably free to rotate, said roll being adapted, when the lay is forward, to contact with the under side of the tail f^3 of the pawl-carrier when the latter is in the position shown in Fig. 2, the filling-feeder having been moved forward by the spring s upon the transfer of a filling-carrier to the shuttle. Now as the lay moves back the friction between the roll h' and the tail f^3 will turn the rocker-lever h upon its pivot up into dotted-line position, Figs. 1 and 4, so that it will move in a higher path as the lay continues its backward movement, and when the roll h' passes along to the convex portion 21 of the tail f^3 the latter will be raised into position shown in Fig. 1. The pawl f^2 is thus carried back to engage a new portion of the ratchet a^9, winding up and restoring the power of the feeder-actuating spring s. Just as soon as the roll h' is carried out to the end of the tail f^3 its spring s' restores it to its normal inoperative position, out of range of the tail, and on subsequent strokes of the lay it will not contact therewith until the filling-feeder has again moved forward at the transfer of the next filling-carrier to the shuttle, when the foregoing operation will be repeated. A detent k pivoted on the stand a^7 engages the ratchet a^9 and prevents retrograde motion of the feeder. The spring s' is comparatively weak and is easily overcome by friction when the roll h' engages the pawl-carrier tail, as described.

By the construction hereinbefore described it will be obvious that the movement of the filling-feeder due to transfer of a filling-carrier will act through the pawl-carrier to automatically move the roll h' into operative position to reset the feeder-actuating spring, and when this has been accomplished the roll is automatically returned to inoperative position.

I claim—

1. In a loom, the lay, a rotatable filling supplying feeder; a spring to rotate it when a filling carrier is transferred to the shuttle; means, including a pawl carrier, to wind said spring, movable in one direction with the feeder, an actuator on the lay, to move the pawl carrier in the opposite direction and wind the spring after the transfer of a filling carrier, and means to return the actuator to inoperative position, substantially as described.

2. In a loom, a rotatable filling feeder hav-

ing a ratchet, a pawl, a pawl-carrier, a spring connected to the feeder and wound up by the pawl-carrier when the latter is moved in one direction, and moving said pawl-carrier in the opposite direction when the feeder is rotated, the lay, an actuator thereon to engage and move the pawl-carrier after the transfer of a filling-carrier, and a controlling spring for and to return the actuator to inoperative position after the latter has acted on the pawl carrier, substantially as described.

3. In a loom, a rotatable filling feeder; a spring to rotate it; means to wind the spring; the lay; an actuator thereon for the said winding means, to operate the latter after the transfer of a filling carrier, and a device to return the actuator to inoperative position thereafter, substantially as described.

4. In a loom, a rotatable filling feeder having a ratchet; a pawl-carrier, and a pawl to engage the ratchet; a feeder-controlling spring wound up by movement of the pawl-carrier in one direction, and moving the latter into abnormal position when the feeder is rotated; the lay; a rocker-lever thereon provided with a roll, and a spring to normally maintain said lever and roll in inoperative position, movement of the pawl-carrier into abnormal position bringing it into engagement with and to move the roll to operative position as the lay moves back, to return the pawl-carrier to normal position and wind the spring, substantially as described.

5. In a loom, a rotatable filling-feeder; a spring to rotate it; means, including a pawl-carrier having an extended tail, to wind the spring, said pawl-carrier being moved into abnormal position when the feeder is rotated; the lay; an actuator thereon, and a spring to normally maintain it inoperative, movement of the tail of the pawl-carrier to abnormal position bringing it into the path of and to engage the actuator on the backward stroke of the lay, thereby raising said actuator to operative position and lifting the tail of the pawl-carrier into normal position, substantially as described.

6. In a loom, the lay; a rocking lever thereon provided with a roll, and a spring to normally maintain the lever lowered and the roll inoperative; a rotatable filling-feeder provided with a ratchet; co-operating pawl and its pawl-carrier having an extended tail above the path of the roll and cam shaped on its under side, and a spring to rotate the filling-feeder and depress the pawl-carrier after the transfer of a filling-carrier, to bring the tail into the path of the roll, whereby the latter is raised by the cam surface into operative position and the pawl-carrier thereafter restored to normal position as the lay moves back, winding the feeder spring, the spring of the rocking lever rendering it inoperative after disengagement of the roll and pawl-carrier tail, substantially as described.

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

FLORENCE M. DAY.

Witnesses:
E. D. BANCROFT,
C. N. NICHOLS.