C. W. MEGGINSON.

SHIPPER LOCKING MEANS FOR LOOMS.

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1,042,461. Patented Oct. 29, 1912.

Fig. 1.

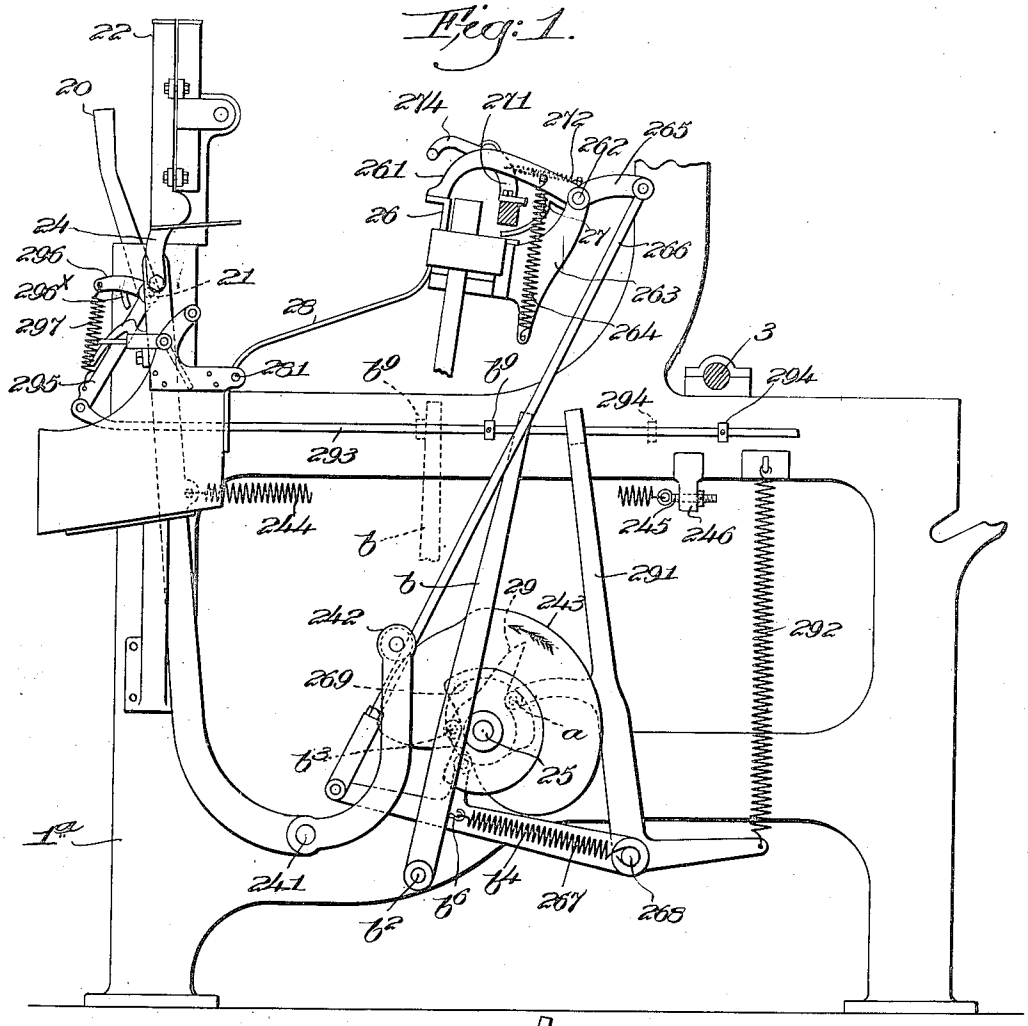
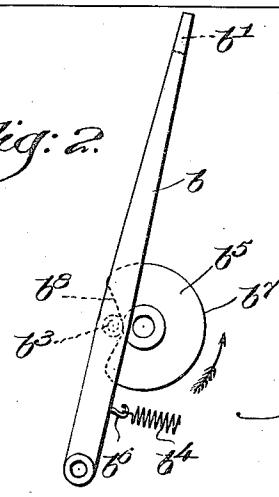


Fig. 2.



Witnesses,
Edward F. Allen.
Joseph M. Ward.

Inventor:
Isabell W. Megginson,
by Edwards, Hurd & Smith,
Attys.

UNITED STATES PATENT OFFICE.

CABELL W. MEGGINSON, OF DANVILLE, VIRGINIA, ASSIGNOR TO DRAPER COMPANY, OF HOPEDALE, MASSACHUSETTS, A CORPORATION OF MAINE.

SHIPPER-LOCKING MEANS FOR LOOMS.

1,042,461. Specification of Letters Patent. Patented Oct. 29, 1912.

Application filed March 6, 1911. Serial No. 612,446.

To all whom it may concern:

Be it known that I, CABELL W. MEGGINSON, a citizen of the United States, and resident of Danville, county of Pittsylvania, State of Virginia, have invented an Improvement in Shipper-Locking Means for Looms, of which the following description, in connection with the accompanying drawing, is a specification, like characters on the drawing representing like parts.

This invention relates more particularly to automatic filling-replenishing looms of the type wherein the replenishment of filling is effected by a change of shuttles, the weaving operations being suspended while the shuttle changing instrumentality is in operation, such action of the various mechanisms being controlled by or through filling-detecting devices when filling failure occurs. Owing to the somewhat peculiar mode of operation of such looms certain conditions arise which at times lead to objectionable and even dangerous results.

When the shuttle-changing instrumentality is in action and the weaving devices are at rest the shipper is in stopping position, and in many instances it has happened that the weaver, noticing an apparent stoppage of the loom, has thrown on the shipper and started the loom during the shuttle changing operation with the inevitable result that something was smashed.

Again, an accidental movement of the shipper to running position during shuttle changing will sometimes throw a shuttle out of the loom with great force and speed, endangering the lives of employees, or two or more shuttles may be changed, causing breakage of shuttles and adjacent mechanism. The ease with which the shipper may be thrown on at such times is due to the fact that in looms of this type the shipper is thrown on automatically to resume weaving when the cycle of operation of the shuttle changing instrumentality is completed, but said shipper is not locked during such cycle.

My present invention has for its object the production of means to obviate the objectionable features noted in looms of the specified type, and in accordance with the embodiment of my invention herein contained I provide automatic means to lock the shipper in stopping position during the operation of the shuttle changing mechanism, the locking means being rendered inoperative automatically when said mechanism has performed its function.

The novel features of my invention will be fully described in the subjoined specification and particularly pointed out in the following claims.

I have illustrated my invention in connection with a shuttle changing loom of the type referred to, such as forms the subject-matter of United States Patent No. 945,722, granted January 4, 1910, to Jackson.

Figure 1 is a partial elevation of the replenishing side of the loom shown in said patent, with one embodiment of my present invention applied thereto, the loom parts being shown in normal operation, and I have omitted certain features of construction which have no bearing on my invention; Fig. 2 is a side elevation of the shipper locking means, detached.

I will first briefly describe such portions of the loom as may be necessary to a proper understanding thereof, as found in the Jackson patent, and will then describe my novel shipper locking means and the mode of operation thereof.

In Fig. 1, 3 is the crank-shaft, and 1ª the loom frame at the replenishing side of the loom, and 20 is the shipper, fixed on one end of the horizontal stopping rock shaft 21 extended across the loom beneath the breast-beam, and 22 is the hopper for reserve or fresh shuttles.

24 is the injector, its supporting lever being mounted pivotally at 241 on the lower part of the loom side and having a short arm provided with a roll 242 held in contact with an edge-cam 243 carried by the change-shaft 25, the spring 244 (partly broken out in Fig. 1) being fixed at one end to an eye-bolt 245 and at its other end attached to the injector-lever.

Normally the change-shaft 25, and the cams fast thereon, stands motionless in the position shown in Fig. 1, and the injector occupies the position beneath the hopper 22. When the change-shaft is caused to rotate by or through detection of filling absence the bottom shuttle is caused to drop and rest upon appropriate portions of the injector, and the spring 244 then acts, under control of cam 243, to move said injector toward the lay to place the fresh shuttle in the replenishing shuttle-box, after which said cam acts

to restore the injector to its normal position shown in Fig. 1. The automatic movement of the shipper 20 to stopping position throws the weaving mechanism out of operation and the lay is stopped in replenishing position, while the change-shaft 25 is thrown into action by appropriate and well known means as described in the Jackson patent. The front-plate 26 of the replenishing shuttle-box is moved to open such box to permit discharge of the spent shuttle, and the insertion of the fresh shuttle by the injector 24, said front-plate being carried by arms 261 on a rock shaft 262 mounted in brackets 263 on and at the rear of the lay. Spring 264 normally maintains the front-plate in working position, and to raise said front-plate the rock shaft 262 has an arm 265 connected by a rod 266 with an arm 267 fulcrumed at 268, said arm having a projection which is engaged by the periphery of an edge-cam 269 fast on the change-shaft. Rotation of said change-cam acts through cam 269 and intermediate devices to raise the front-plate 26 and open the shuttle-box while spring 264 depresses said plate to close the box.

27 is the ejector, journaled in brackets 271, and held retracted normally by the spring 272, and is operatively moved by engagement of the frontwardly projecting finger 274 with one of the arms 261 of rock shaft 262 when the front-plate 26 is raised.

The ejected shuttle falls from the shuttle-box onto the flexible apron 28, connected at its upper end with the lay and passing over a transverse, fixed rod 281.

The devices for re-starting the weaving instrumentalities after replenishment has been completed comprise the cam 29 on the change-shaft 25, the lever 291 fulcrumed at 268 and having a roll a which is pressed against the periphery of said cam by the spring 292, a rod 293 having an adjustable collar 294 to be engaged by said lever 291 when the latter is moved by the action of the tappet-like projection of the cam 29, an arm 295 loose on the shipper rock-shaft 21 and with which the front end of rod 293 is connected pivotally, an arm 296 fast on said rock shaft, and a stiff spring 297 connecting said arms 295 and 296, serving to transmit motion with yielding force from arm 295 to arm 296.

The cam 29 acts through the described connections to turn the shipper rock shaft 21 in the direction to replace the shipper 20 in the position which it occupies during the regular running of the loom, and such movement of the shipper to running position also brings about the stoppage of rotation of the change-shaft 25.

All of the devices described are as shown in the Jackson patent above referred to and operate in the manner therein set forth, the same reference characters being applied to like parts herein for convenience in comparison.

When the arrest of the weaving instrumentalities is brought about the shipper 20 is moved to the right, Fig. 1, and thereby the rod 293 is moved to the left, bringing the collar 294 to dotted line position, nearer the re-starting lever 291, and as the weaving instrumentalities are arrested the change-shaft 25 and its cams are called into action, and make one complete revolution to accomplish the change of shuttles.

It will be manifest that when the shipper is in stopping position and the collar 294 is in dotted line position there is nothing, so far as described, to prevent the shipper from being moved, accidentally or with purpose, to running position, to start the weaving instrumentalities while the change-shaft and its adjuncts are in action to effect replenishment.

I will now describe the simple and efficient means which I have provided to prevent shipper movement to running position while replenishment is in process. A locking lever b, slotted at its upper end at b' to loosely embrace the starting rod 293, is pivoted at its lower end at b^2 on the loom side, Fig. 1, and said lever is provided with a roller or other stud b^3 held by a spring b^4 in engagement with the periphery of a shipper-locking arm b^5 fast on the change-shaft 25. The spring b^4 is located in any convenient situation, and herein I have shown it attached at one end to the fulcrum or pivot stud 268 and at its other end attached to an eye b^6 on the locking lever. The locking cam b^5 has a long dwell portion b^7, Fig. 2, and a reëntrant portion b^8, so shaped that a rapid forward movement is imparted to the locking lever b to dotted line position, Fig. 1, when the change-shaft is called into action, the spring b^4 returning said lever quickly to normal position as the change-shaft comes to rest. In front of the slotted end of the locking lever b I attach adjustably to the starting rod 293 a stop collar b^9, said collar assuming the dotted line position shown in Fig. 1 when, upon the movement of shipper 20 to stopping position, the rod 293 is moved to the left. When the locking lever b is moved to operative or locking position by the rotation of the change-shaft its upper end is just behind the stop collar b^9, as shown by dotted lines in Fig. 1, and the dwell portion b^7 of the locking cam maintains said lever in such operative position until its quick release. This latter is permitted when the rotation of the change-shaft again brings the reëntrant portion b^8 of the cam b^5 into coöperation with the roll b^3. The locking-cam b^5 and the re-starting cam 29 are so set upon the change-shaft that the locking-lever b is returned to inoperative

position as the cam 29 begins to act upon lever 291 to throw the shipper into running position.

From the foregoing description, and the drawing, it will be manifest that so long as the locking lever b is in locking position the engagement therewith by the stop collar b^9 will prevent any movement of the rod 293 or arm 295 to the normal position shown in Fig. 1, and movement of the shipper 20 from stopping to starting position is prevented by engagement of a lug 296^x on the arm 296 with the arm 295. Hence the shipper is locked in stopping position during the time of replenishment, or in other words, during the time the change-shaft 25 and its adjuncts are in operation, and hence the weaving devices cannot be set in motion during the period mentioned, but the shipper-locking means is rendered inoperative contemporaneously with the termination of the replenishing operation.

I have added the lug 296^x to the arm 296 because said arm is fast on the shipper rock shaft 21, while the arm 295 is loose thereupon. Were it not for such lug the only obstacle to movement of the shipper 20 to running position would be the heavy spring 297, and in ordinary circumstances this would not be sufficient. Said lug does not interfere in any way with the proper functions of said spring, and it is merely one practical means for preventing movement of the arms 295, 296 toward each other.

Various changes or modifications in details of construction and arrangement may be made by those skilled in the art without departing from the spirit and scope of my invention as set forth in the claims hereunto annexed.

Having fully described my invention what I claim as new and desire to secure by Letters Patent is:

1. In a loom provided with weaving devices, a replenishing instrumentality, including a change-shaft intermittingly rotated to effect the operation of such instrumentality, and means, including a shipper, to arrest the operation of the weaving devices when the change-shaft is called into action, in combination, automatic means governed by said change-shaft to lock the shipper in stopping position during the operation of the replenishing instrumentality.

2. In a loom provided with weaving and filling-replenishing instrumentalities either of which is inactive when the other is in action, a shipper movable to stopping position to bring said replenishing instrumentality into action, and means to move said shipper automatically to running position when replenishment is completed, in combination, means to lock said shipper automatically when moved to stopping position and to unlock the shipper when the action of the replenishing instrumentality is completed.

3. In a loom provided with weaving and filling replenishing instrumentalities either of which is inactive when the other is in action, a shipper movable to stopping position to bring said replenishing instrumentality into action, and means, including a shiftable rod, operatively connected with the shipper, to move the shipper automatically to running position when replenishment is completed, in combination, means to cooperate automatically with said rod only during the operation of the replenishing instrumentality and by such coöperation prevent starting movement of such rod and the shipper, whereby the shipper cannot be moved to running position during such period.

4. In a loom having weaving and filling-replenishing instrumentalities either of which is inactive when the other is in action, and provided with means, including a shipper, to suspend the operation of the weaving instrumentality and set up the operation of the replenishing instrumentality when the shipper is moved to stopping position, in combination, a restarting rod operatively connected with the shipper, means to move said rod to throw the shipper automatically into running position when replenishment is completed, a stop-collar on the rod, and means including a locking lever, to move said lever into operative engagement with the stop-collar when the replenishing instrumentality is in action and to maintain such engagement until replenishment is completed, to thereby prevent movement of the shipper to running position during such period.

5. In a loom provided with a filling-replenishing instrumentality, means, including a shipper, to set such instrumentality into action when the shipper is moved to stopping position, and devices to move the shipper automatically to running position when the replenishing action is completed, in combination, means to lock said shipper automatically and hold it from movement to running position during the replenishing action and to unlock the shipper and thereby permit movement thereof to running position only when replenishment is completed.

6. In a loom provided with a filling-replenishing instrumentality, means, including a shipper, to set such instrumentality into action when the shipper is moved to stopping position, and devices to move the shipper automatically to running position when the replenishing action is completed, in combination, means to lock said shipper automatically from movement to running position during the replenishing action and to unlock the shipper when replenishment

is completed, said shipper-locking means including a locking member, and an intermittingly rotated cam to control the movement of said member into and out of locking position, said cam starting and stopping with the commencement and termination, respectively, of the replenishing action.

7. In a loom having a filling-replenishing instrumentality, means, including an intermittingly rotated change-shaft, to bring about the operation of such instrumentality by or through rotation of the shaft, a shipper moved to stopping position when rotation of the change-shaft is instituted, and mechanism governed by said shaft to move the shipper automatically to running position just prior to stoppage of the shaft, said mechanism including a re-starting rod, operatively connected with the shipper, in combination, a shipper-locking lever, a controlling cam therefor on the change-shaft, and a stop-collar on the rod, rotation of the change-shaft causing the controlling cam to move the locking lever into engagement with the stop-collar and so maintain it until replenishment is completed, to thereby prevent movement of said rod and the shipper to place the latter in running position, the controlling cam permitting movement of the locking-lever to inoperative position as the change-shaft brings the restarting mechanism into action.

8. In a loom having weaving and filling-replenishing instrumentalities either of which is inactive when the other is in action, and provided with means to arrest temporarily the operation of the weaving instrumentality and set up the operation of the replenishing instrumentality, in combination, mechanism brought into temporary action automatically upon cessation of the weaving operations to prevent manual manipulation of said means to start the weaving instrumentality during the period when the replenishing instrumentality is operating.

9. In an automatic weft-replenishing loom in which the replenishment is effected during suspension of the weaving action, the combination with the loom-shipper, and with the replenishing mechanism, of a safety-device by which the weaving mechanism is prevented from being shipped into action until the replenishing action has been safely completed.

10. In an automatic weft-replenishing loom, the combination with means for shipping the weaving mechanism into and out of action, of a device in connection with the replenishing mechanism for preventing the said means from being operated to ship the weaving mechanism into action until after the replenishing action has been safely completed.

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

CABELL W. MEGGINSON.

Witnesses:
R. B. DAVIS,
W. HOWARD DODSON.