(No Model.)

J. H. NORTHROP.

LOOM.

No. 454,806. Patented June 23, 1891.

Fig. 1.

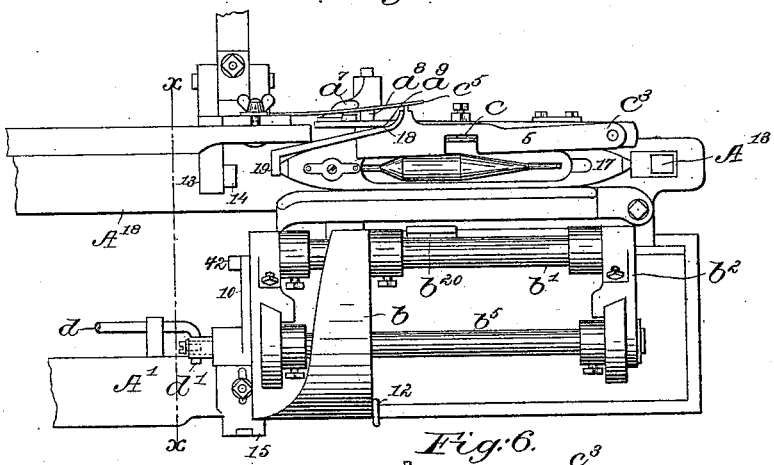


Fig. 6.

Fig. 2.

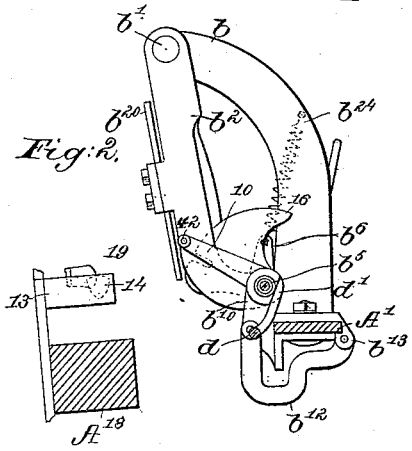


Fig. 3.

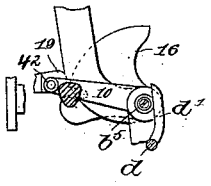


Fig. 5.

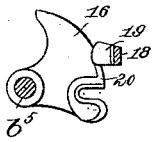
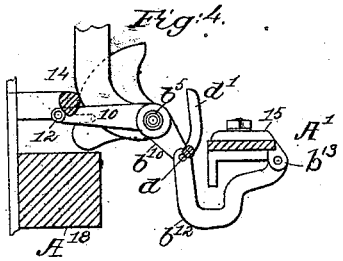


Fig. 4.



Witnesses.
Edward F. Allen.
O. F. Hill.

Inventor:
James H. Northrop
by Crosby & Gregory Attys

UNITED STATES PATENT OFFICE.

JAMES H. NORTHROP, OF HOPEDALE, MASSACHUSETTS, ASSIGNOR TO GEORGE DRAPER & SONS, OF SAME PLACE.

LOOM.

SPECIFICATION forming part of Letters Patent No. 454,806, dated June 23, 1891.

Application filed May 8, 1890. Serial No. 351,029. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. NORTHROP, a subject of the Queen of Great Britain, but at present residing at 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 figures on the drawings representing like parts.

This invention is an improvement on the class of loom described in application, Serial No. 334,873, filed on the 24th day of December, 1889. In the loom described in the said application the catch for pulling the hopper backwardly or from the breast-beam in unison with the lay during the operation of turning the transferrer to supply the loom with weft after the same has been exhausted, is shown as connected to the lay and adapted to engage a projection on the hopper, the hook slipping off from the said projection owing to motion of the hopper and lay about different centers. In the loom referred to the transferrer was elevated quickly by a spring as soon as the hook slipped from the said projection, and the transferrer, in rising, lifted the shuttle just put into the box or scraped over and frequently marred and injured the shuttle-body.

One feature of this present invention consists in connecting the hook to the transferrer rock-shaft and causing it to engage a cam-lug or lug device on the lay, so that the hook when thrown down to engage the cam projection or lug device will cause the hopper to be moved in unison with the lay for a longer period during the backward stroke of the lay and while the transferring operation is being effected, the transferrer being prevented from rising until after the engaging portion of the hook passes below the said cam projection or lug device. This change in construction affords longer time for the transfer of the shuttle and keeps the transferrer down until the shuttle in the backward movement of the lay gets so far out of the way that the transferrer in rising cannot strike and lift the shuttle or scratch or mar the same.

In the loom described in the application referred to the arm or lever carrying the lip or projection to lap over the top of the shuttle and also the lip or projection to serve as a rest for the bottom of the shuttle was pushed back by a plate on the hopper engaging a plate on the said arm, and as a result thereof the said arm was swung into the shuttle-box as soon as the hopper was released, this happening sometimes before the incoming shuttle was fully placed in position, which frequently caused trouble. To overcome this I have provided the transferrer with a cam or projection which as the transferrer commences its descent to transfer a shuttle into the shuttle-box will first push back the said arm to release the spent shuttle, and in its further descent, the shuttle being in place, or substantially so, the cam projection leaves said projection on the said arm, thus letting the latter close quickly after, but not before, the shuttle has been put correctly into the shuttle-box of the lay.

Figure 1 is a plan view showing one end of the lay, the hopper and transferrer, and part of the breast-beam and some of the co-operating parts located at that end of the lay and breast-beam, a shuttle being shown as in the shuttle-box. Fig. 2 is a partial section in the line x of Fig. 1. Figs. 3 and 4 are detail views showing different positions of the hook, and cam or lug device, and the lay with which it co-operates. Fig. 5 is a detail showing the transferrer and its cam, together with the finger extended from the arm pivoted at the side of the shuttle-box, and having the lips referred to. Fig. 6 shows the arm c^3 detached.

The frame-work A, the breast-beam A′, the stand b, erected on the loom side, the hopper b^2, pivoted at b' and having at its lower end the transferrer rock-shaft b^5, the lay A^{18}, the arm c^3, pivoted at the rear side of the shuttle-box of the lay and having a lip 5 at its upper edge and a lip 4 at its lower edge, (see Fig. 6,) both to enter the shuttle-box and embrace the upper and lower edges of the shuttle, the binder a^9, having an upward extension c to be struck by the plate b^{20}, carried by the hopper, to remove the binder from the shuttle when the said shuttle is to be ejected from the shuttle-box, the finger a^7 to press against the binder, the rearwardly-extended arm a^8 of the binder rock-shaft to which the said

finger is connected, and the rock-shaft d, having bearings in ears connected to the breast-beam, and provided with a finger d', which, when the weft fails and the weft stop-motion devices act to turn the said rock-shaft, causes the said finger to push the hopper far enough to enable it to be caught and moved backwardly with the lay for part of its stroke, are and may be all as in the said application, wherein like parts are designated by like letters and figures.

In this present instance of my invention I have provided the transferrer rock-shaft b^5 with an arm 10, having a roller or other stud 42, and I have provided the lay with a projection 13, having a cam-lug 14 or lug device. The rock-shaft b^5 has an arm b^{10}, connected by link b^{12} to a pin b^{13} in a stand 15, attached to the breast-beam, so that when the hopper is swung to the left in Fig. 2 the rock-shaft will be turned and cause the transferrer 16 thereon to be moved in the arc of a circle, and while in engagement with a shuttle 17, as provided for in said application, transfer a shuttle from the hopper into the shuttle-box e of the lay, the spent shuttle being ejected from the shuttle-box in advance of the incoming shuttle, the binder being at such time pressed back.

In this my present invention the arm c^3 has been provided with an extension 18, having a finger 19, which is extended toward the transferrer and partially across the shuttle-box raceway, but above the line of movement of the shuttle. The transferrer 16 differs from the transferrer in the said application only in that that one of the segmental disks nearest to the center of the loom is provided with the lip 20, (see Fig. 5,) which acts as a cam and strikes the said finger 19 during the first part of the descent of the transferrer to thus push back the arm c^3 and remove the lips 4 and 5 from above and below the spent shuttle, so that it may drop down through the open bottom of the shuttle-box; but as soon as this happens the projection 20 on the transferrer passes below the finger 19, as shown in Fig. 5, when the spring c^5, acting on the arm c^3, causes it to be thrown in quickly and catch the incoming shuttle. When the hopper is pushed forward by the finger d', the shaft d^5 is turned far enough to place the roller or other stud 42 at the rear side of the cam-lug 14, as shown in Fig. 3, the projection 20 of the transferrer at the same time acting on the finger 19, as described, to push back the arm c^3. This happens while the lay is being moved away from the breast-beam, and the cam-lug 14, acting on the stud 42 of arm 10, causes the hopper to be drawn back with the lay, the transferrer being turned into the position of Fig. 4, putting the shuttle into the shuttle-box e; but owing to the shape of the cam-lug acting on the stud 42 the transferrer is kept down so long as the said stud is in contact with the said cam-lug, so that the shuttle gets entirely out of the way of the transferrer before the latter is permitted to rise into its normal position, as shown in Fig. 2, under the spring b^{24}, connected to arm b^6, as in said application.

The end of the weft of each shuttle used in the hopper will be attached to the pin or catch 12 carried by the hopper-stand and common to my said application. The shape of the cam-lug 14 is such as to prevent the rock-shaft from turning back under the action of the spring b^{24} to raise the transferrer until after the shuttle in the backward movement of the lug has been moved far enough to remove the shuttle out of the way of the transferrer, so that the latter cannot strike and lift the shuttle or scratch or mar it.

The arm connected to the rock-shaft and the lug device are alike operative in the loom described in application Serial No. 351,228, filed May 10, 1890, wherein I have shown the hopper provided with a series of bobbins or spindles to be pushed automatically, as desired, into one and the same shuttle-body, the said loom having a so-called "pusher" on the rock-shaft instead of a transferrer, as herein shown.

I claim—

1. The hopper, the rock-shaft, and its attached arm, combined with the cam-lug or device connected to the lay, to operate substantially as described.

2. The lay having the shuttle-box, and the arm having a lip to aid in holding the shuttle in the shuttle-box, and provided with an extension, combined with the transferrer having a cam projection to act upon the said extension, substantially as described.

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

JAMES H. NORTHROP.

Witnesses:
E. D. BANCROFT,
C. E. LONGFELLOW.