

(No Model.)

J. H. NORTHRUP.
LOOM.

No. 529,942.

Patented Nov. 27, 1894.

Fig. 1.

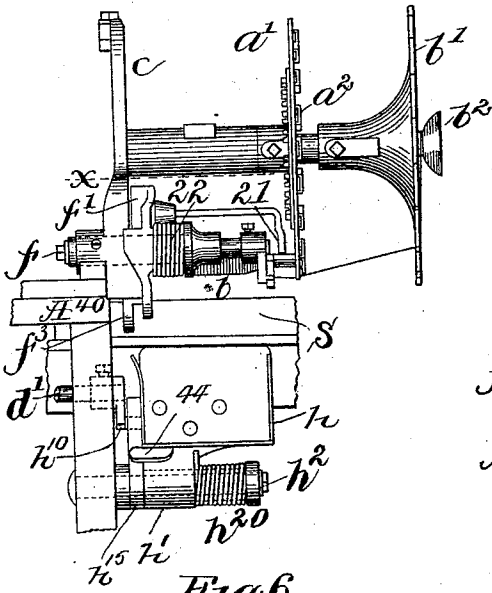


Fig. 2.

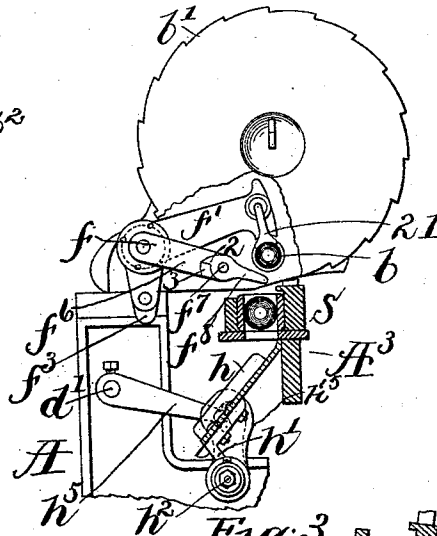


Fig. 6.



Fig. 3.

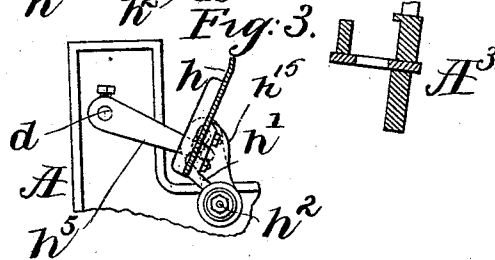


Fig. 5.

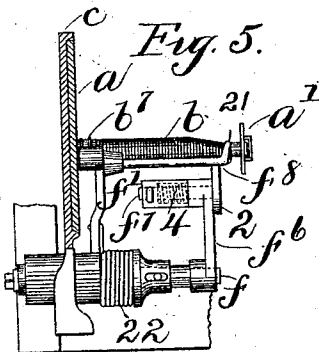


Fig. 4.

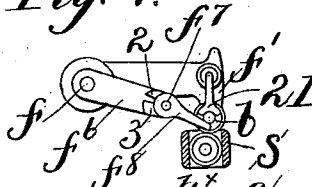
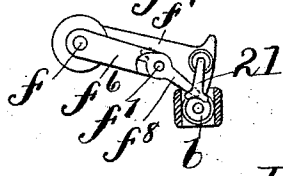


Fig. 4a.



Witnesses:

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UNITED STATES PATENT OFFICE.

JAMES H. NORTHROP, OF HOPEDALE, MASSACHUSETTS, ASSIGNOR TO THE
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LOOM.

SPECIFICATION forming part of Letters Patent No. 529,942, dated November 27, 1894.

Application filed October 24, 1893. Serial No. 489,009. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. NORTHROP, a subject of the Queen of Great Britain, 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 has for its object to improve that class of loom wherein a shuttle is supplied automatically with a bobbin when the weft fails or becomes exhausted, United States Patent No. 454,810, dated June 23, 1891, showing a loom of this type. My invention, however, to be herein described is illustrated in connection with a loom of the type referred to, but somewhat changed, as fully represented in my application, Serial No. 414,831, filed December 12, 1891, wherein the bobbins are taken from a rotating feeder rather than from a hopper.

In the class of loom referred to, the time occupied in moving the bobbin from the hopper or feeder containing the extra filled bobbins, into the shuttle while the loom is in motion, is but a small fraction of a second, and sometimes the quick moving pusher or device which acts upon the bobbin to put it into the shuttle, fails to push the bobbin correctly into the shuttle chamber.

One part of this my present invention has for its object to better insure the entrance of the bobbin into the shuttle chamber. To effect this desired result I have combined with the pusher a tip-supporting and directing device, it normally occupying a position directly under the tip end of the bobbin while the pusher acts on the upper side of the bobbin at its tip and also at its base to push the same toward and into the shuttle chamber. The supporting and directing device, while the tip of the bobbin yet rests on it, is made to enter the shuttle chamber, it co-operating with the pusher in such manner as to hold onto the tip of the bobbin above and below until the bobbin has entered the shuttle chamber, and is put substantially in working position, and until the lay commences to retire from the fell of the cloth.

In the loom to be herein described, as is also the case in the loom referred to, the front side of the lay under the shuttle box is cut away to leave an open space down through which the bobbin may be discharged. In this my present invention this open space is adapted to receive at proper times the upper end of a chute made preferably of metal, said chute being mounted on a stud located at the loom side, a portion of the lay at a point below the bottom of the shuttle-box striking the said chute during the forward motion of the lay toward the breast beam, provided, however, a bobbin is to be ejected from the shuttle, but preferably not otherwise. In this way, whenever a bobbin is ejected from the shuttle through the bottom of the shuttle-box, said bobbin enters the chute unerringly and is by it guided, without any possibility of getting out of place, preferably directly into a suitable receptacle located at the loom side and adapted to receive the ejected bobbin.

Figure 1, in front elevation, represents a sufficient portion of a loom with my improvements added to enable my invention to be understood. Fig. 2 is a right-hand end elevation of the parts shown in Fig. 1. Fig. 3, shows the chute or apron and part of the lay in another position. Figs. 4 and 4^a show two views different from Fig. 2, of the tip support and pusher co-operating with the shuttle. Fig. 5 is a plan view below the dotted line *x*, Fig. 1; and Fig. 6 is detail of cam arm *h'*.

The loom frame *A*; the breast-beam *A'*; the lay *A*³ having the bottom of its shuttle box cut away below the self-threading shuttle *S*; the bobbin feeder comprising the connected rotatable plates *a*, *a'*, suitably shaped to receive the opposite ends of the bobbin *b*; the weft-thread supporting plate *b'* rotatable with the bobbin-feeder; the weft end holder *b*², with which the weft on each bobbin *b* is connected; the stud *f*; the pusher *f'* mounted thereon and having the forked end *f*³ and a projection 21; the spring 22 to raise the pusher; and the shaft *d'* adapted to be rotated by the movement of the weft fork in the absence of the filling, are and may be all as represented in said application wherein like letters are used to designate like parts, the parts hereinbefore referred to by letter being op-

erated in practice all as therein provided for, with the exception that the trip or dog carried by the end f^3 of the pusher will be put into operative position preferably by devices fully described in my application, Serial No. 414,831, filed December 12, 1891.

Having briefly referred to and pointed out the class of loom with which my present improvements are to be embodied, I will now describe my invention.

The stud f is prolonged and has attached to it an arm f^6 upon which at or near one end, as at f^7 , I have pivotally mounted a tip-supporting or directing device f^8 , said device being shown as having a lug 2 which is normally kept in contact with a stop 3 projecting from said arm, by a coiled spring 4 fastened at one end to said arm and at its other end to, as herein shown, the pivotal point f^7 of the device f^8 , said pivotal point in this instance consisting of a rod attached to said device and having bearings in the arm.

When the rod d' is turned by the weft fork, the weft being absent in the shed, all as provided for in said application, Serial No. 414,831, and the pusher is moved toward the shuttle to be replenished by a full bobbin, then the pusher acts first on a bobbin b and removes it from the feeder, but as the bobbin is started out of the feeder, it meets the tip-supporting device f^8 , and the latter descends, it yielding to the bobbin, as represented in the upper diagram Fig. 4, the said supporting device continuing to descend under the action of the pusher or bobbin against it, until the supporting device enters the shuttle chamber, as shown in Fig. 4^a, at which time it directs the tip of the bobbin into the shuttle chamber.

The tip-supporting device, as illustrated, gets into the shuttle chamber into about the position indicated by dotted lines in Fig. 4^a, just about as the lay reaches its forward position toward the breast-beam A^{40} , and the tip-supporting device will remain in such position until the tip of the bobbin gets started into the shuttle chamber, and thereafter the pusher, in its further descent, crowds the tip of the bobbin beyond and below the free end of the tip-supporting device, the base of the bobbin at the same time being pushed into the usual holder in the shuttle S , said shuttle in practice being substantially such as represented in United States Patent No. 454,810, it having a holder adapted to receive the rings b^7 about the base of the bobbin, as provided for in said patent, the rings being therein designated by the same letter.

As the bobbin b is put into the shuttle chamber, it, as described in the said patent, acts against the spent bobbin marked b^x , and ejects it from the shuttle, as provided for in Patent No. 454,810, and also as provided for in said application, Serial No. 414,831.

As the bobbin b gets into the shuttle cavity, the pusher begins to rise and the lay begins to retire from the breast-beam, and the

shuttle is moved backwardly in unison with the retreating lay, so that it will be understood that the shuttle will be carried away bodily from the end of the tip-supporting device, letting the latter rise under the action of spring 4 into its normal position, shown in Fig. 2, where it will stand below the tip of the next bobbin to be taken from the feeder and put into the shuttle.

It is preferred that the bobbins ejected from the shuttle and through the bottom of the shuttle box, be deposited in a receptacle provided for that purpose.

In Patent No. 454,810 the spent bobbin receptacle is connected with the loom side, and herein said receptacle, not shown, may be so located.

In this present invention I have provided a chute h , made preferably of sheet metal, said chute being represented as bolted to an arm h' pivoted on a stud h^2 , suitably supported at the loom side, said arm having co-operating with it a spiral spring h^{20} , which acts normally to turn the upper end of said chute toward the lay, the extent of movement of said chute by said spring being, however, controlled by a finger 44 which contacts with one edge of an arm h^{15} , also mounted loosely on said stud and having a cam slot h^3 , see Fig. 6, which receives a pin h^{10} carried by an arm h^5 connected to the rock-shaft d , common to said patent, said pin determining the extent of movement of said arm h^{15} toward the lay. Normally when the pin h^{10} is in the lower end of the slot h^3 , the upper end of the chute, through the action of spring h^{20} , stands so far in front of the lay as not to be struck thereby when the reed of the lay beats in the filling, but as soon as the weft fails and the shaft d' is rocked, then the arm h^5 is raised slightly and the pin h^{10} at its end and within said slot h^3 moves the chute, so that its upper end is borne sufficiently toward the lay to be met and struck by the lay at a point below the slot in the bottom of the shuttle box, so that said lay, see Fig. 3, as it completes its forward movement toward the breast beam, will move the chute in unison with it for some distance, the chute turning at such time about the pivot h^2 , the spring h^{20} connected at one end to the stud h^2 and at its other end to the arm h' , permitting the chute to yield and move with the lay. In this way it will be understood that whenever a bobbin is to be ejected from the shuttle through the slot in the bottom of the shuttle box, the chute, preparatory to the ejection of the bobbin, will contact with the lay, and will form a bridge below the lay upon which the bobbin will be unerringly deposited, and by which it will be unerringly conducted away from the lay, or at least so that the bobbin cannot drop down and get into the way of the picker stick or underneath the loom and get into the working parts.

This my present invention is not directed especially toward devices for moving or de-

termining the time of movement of the pusher, and preferably in connection with the chute or apron herein described I shall provide the end f^3 of the pusher with a trip or dog and actuating devices of the kind specifically described and claimed in my application, Serial No. 490,078, filed on the 6th day of November, 1893.

For the best results I prefer that the chute or apron be controlled by a spring, so that the chute may be moved forward for some distance with the forwardly moving lay.

Believing myself to be the first to employ a chute supported independently of the lay, this invention is not limited to the exact manners shown of supporting the chute, or of moving the same in order that it may co-operate with the lay and act as a bridge under the space in the shuttle-box through which the bobbin is discharged.

The hopper or feeder referred to constitutes what in this instance of my invention I shall denominate a "bobbin-holder."

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

1. The combination with a lay, of a yielding chute, and a support therefor entirely independent of said lay, and devices to put said chute in position with relation to the lay to conduct a bobbin away from the shuttle-box, substantially as described.

2. The combination with a lay having an open shuttle-box for the discharge through it of a bobbin, of a rod under the control of a weft fork, a chute, and connecting devices between it and said rod, whereby when the

weft fails the said chute will be put into position to conduct a bobbin away from the said shuttle-box, substantially as described. 40

3. The combination with the lay having an open shuttle-box for the discharge of a bobbin, and mechanism under the control of a weft fork, of a movable chute supported independently of the lay, and devices between said chute and said mechanism to automatically put the said chute into position to conduct a bobbin away from the lay, substantially as described. 15

4. The lay having an open shuttle-box for the discharge of a bobbin, combined with a pivoted chute, a cam slotted arm, and devices co-operating with said arm to turn said chute about its pivot, substantially as described. 50

5. The combination with a lay having a shuttle-box open for the discharge of a bobbin, of a yielding chute supported independently of the lay and adapted to be moved by the lay for a part only of its forward stroke, substantially as described. 55

6. The combination with a bobbin-holder, and a co-operating pusher to transfer a bobbin from the holder into a shuttle, of a yielding support or finger adapted to enter the shuttle chamber and lie under and guide the tip end of the bobbin into position in the said shuttle chamber, substantially as described. 60 65

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

JAMES H. NORTHROP.

Witnesses:

GEORGE OTIS DRAPER,
S. F. SMITH.