

J. NORTHROP.
SHUTTLE BOX.

APPLICATION FILED OCT. 1, 1908.

973,130.

Patented Oct. 18, 1910.

2 SHEETS—SHEET 1.

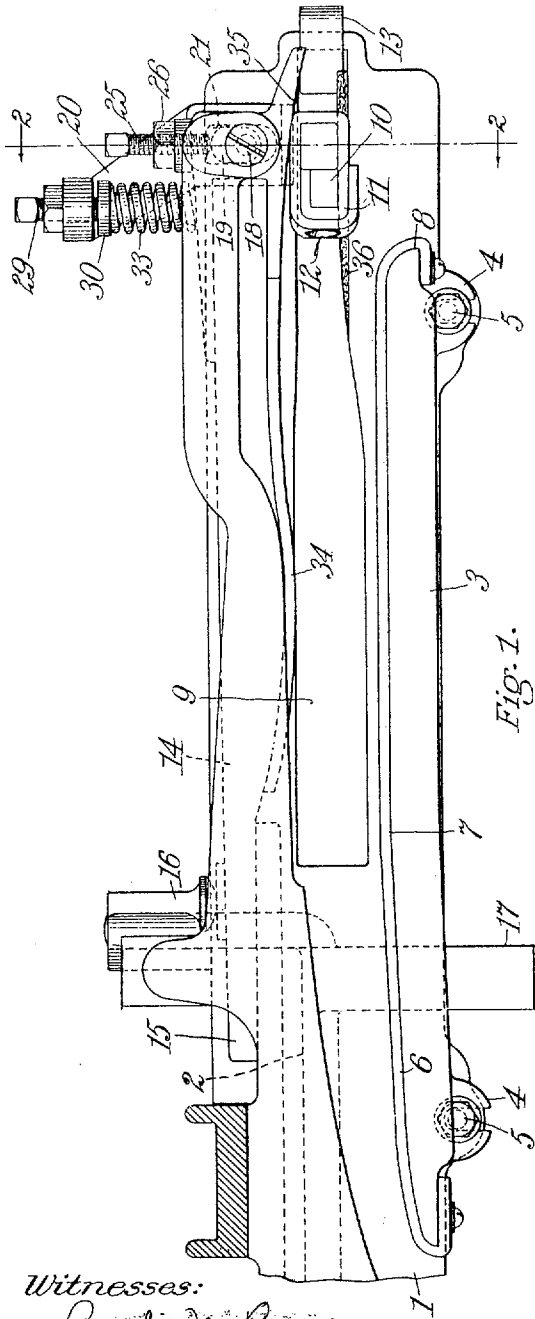


Fig. 1.

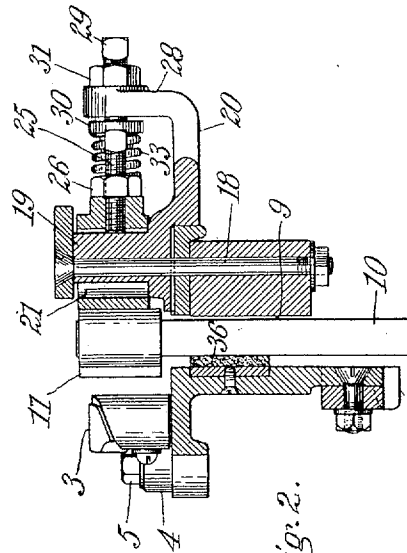


Fig. 2.

Witnesses:

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Marion F. Kimball

Inventor:
Jonas Northrop
by Robt. P. Harris
Atty.

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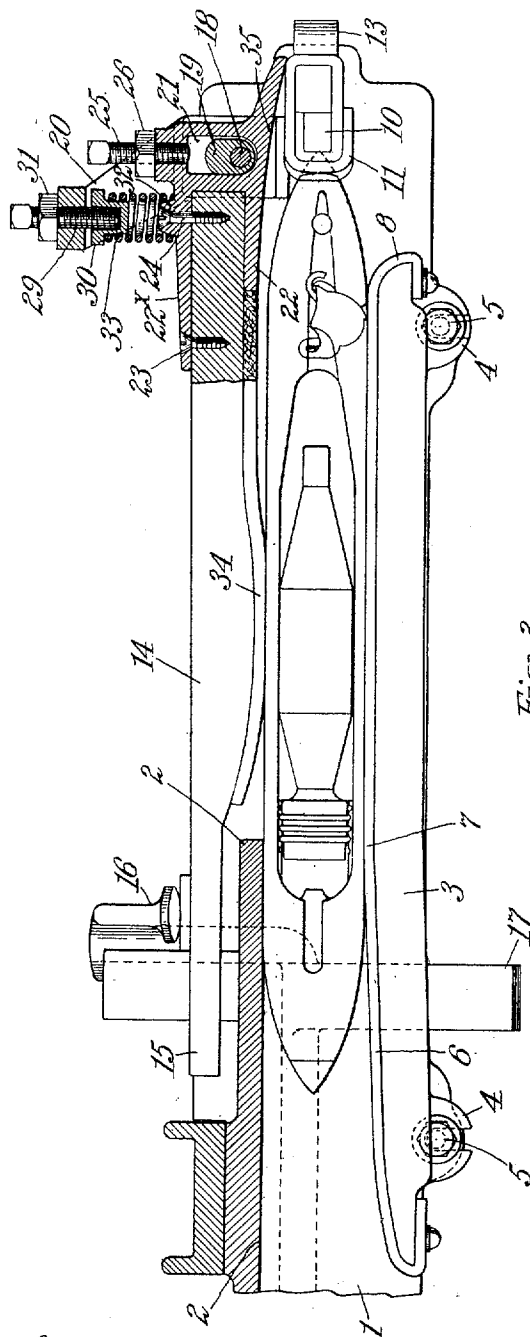


Fig. 3.

Witnesses:

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UNITED STATES PATENT OFFICE.

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SHUTTLE-BOX.

973,130.

Specification of Letters Patent.

Patented Oct. 18, 1910.

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To all whom it may concern:

Be it known that I, JONAS NORTHROP, a citizen of the United States, residing at Hopedale, in the county of Worcester and State of Massachusetts, have invented an Improvement in Shuttle-Boxes, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

The invention to be hereinafter described relates to looms, and more particularly to the means employed for bringing the shuttle to rest in the shuttle box at the end of its picking movement.

As well understood by those skilled in the art, the shuttle is picked or thrown from one side of the lay to the other in laying the filling in the shed, and, as it passes into the shuttle box, it is not only desirable that it be gradually brought to rest in proper position in the box, but that it be not deflected from its straight course as it passes into the box under the control of the checking means.

With these facts in mind, the aims and purposes of the present invention will best be understood and made clear from the following description and accompanying drawings of one form or embodiment of means for carrying the invention into effect and securing the objects above stated, it being understood that the invention is not restricted to the details shown, but is definitely set forth in its true scope by the claims.

In the drawings:—Figure 1 is a plan or top view of a shuttle box embodying the present invention, only so much of the adjacent loom parts being shown as are necessary to make clear the association and action of the invention therewith; Fig. 2 is a section on the line 2—2, Fig. 1; and Fig. 3 is a view similar to that of Fig. 1, some of the parts being in section or broken away, and the shuttle being indicated as having fully entered the box.

Mounted on the lay beam 1 is the fixed wall 2 extending in prolongation or in the plane of the reed and forming a part of the back wall of the shuttle box. Adjustably secured to the lay beam is the front wall 3 of the shuttle box, said front wall being preferably provided with the slotted lugs 4 which are engaged by bolts 5, whereby said front wall is secured in position. It will

be noted that the front wall 3 has its inner or shuttle engaging surface formed slightly flaring at the entrance to the shuttle box, said flaring portion 6 extending from a point 7, between which and the surface of the back wall 2 the dimension of the shuttle box is substantially the same as the exterior dimension of the shuttle. From the point 7 to the terminal portion 8, the shuttle engaging surface of the front wall of the shuttle box is parallel to the inner surface of the back wall 2, the construction being such that as the side of the shuttle rides along the inner surface of the back wall 2 of the shuttle box and contacts with the inner surface of the front wall at the point 7, the shuttle continues to travel in a straight course and glides straight into the shuttle box, avoiding any side deviation or blow by the rear end of the shuttle against the rear wall of the shuttle box even after the shuttle comes under the influence of its checking means, as will presently appear.

Movable longitudinally in the bottom slot 9 of the shuttle box is the picker stick 10, of any usual character, the end portion only of said stick being shown, and on or connected to the picker stick is the picker 11 having a shuttle engaging seat 12, Fig. 1, and by which the shuttle is given its picking movement, as well understood. If desired, a cushion or buffer 13 may be connected to the outer portion of the shuttle box against which the picker stick may rest prior to its picking movement.

The shuttle binder comprises the body portion 14, preferably formed of wood or other desired material, terminating at its inner end portion in a tongue 15, against the exterior surface of which bears the binder finger 16 for controlling the dagger 17 in a manner well understood by those skilled in the art, the construction and relation of parts being such that when the shuttle binder is forced back by the entering shuttle, it will move the binder finger 16 and raise the dagger 17 so that in the beat-up movement of the lay the dagger will not engage the trip member of the knock-off mechanism, as usual; but should the shuttle fail to enter the shuttle box sufficiently far to thus move the binder, or if it should unduly rebound, then the binder will fail to be held in back position as the lay

beats up, with the result that the binder finger will not lift the dagger, and the latter will "knock-off" the loom, in the well understood manner.

5 Passing through the outer end portion of the lay beam or shuttle box is a bolt 18 preferably passing also through a lug 19 of a bracket 20 and the top plate of the shuttle box, substantially as indicated by Fig. 2, 10 whereby the top plate and bracket 20 may be conveniently secured in place, it being understood that while this assemblage of parts is a good practical form of means, yet the invention is not restricted thereto.

15 In the presented form of the invention the outer end portion of the binder is preferably made of metal, cast or otherwise formed, with the elongated slot 21 which loosely embraces the lug 19 of the bracket 20, Figs. 1 and 3, and having the front and back walls 22 and 22', respectively, between 20 which the body portion of the binder 14 projects, and to which it may be secured by suitable fasteners or screws 23 and 24 or 25 otherwise, as will be clear from Fig. 3. For purposes of identification, this end of the binder, which is connected to the lay beam or shuttle box, may be called the binder head, it being understood that the term is 30 used in its broad sense for purposes of designation only.

Screw-threaded into the back portion of the binder head is an adjusting screw 25, the end of which may be positioned in the 35 elongated slot 21, to vary the amount of back and forth movement of the binder head for a purpose that will presently appear, a lock nut 26 being preferably employed to hold the adjusting screw 25 in 40 adjusted position.

Projecting rearward from the end of the lay beam or shuttle box is the bracket arm 20, having the post 28 through which extends the screw 29, the inner end thereof 45 being received by a cap piece 30, and a lock nut 31 being preferably employed to maintain the screw 29 in adjusted position. Disposed between the cap piece 30 and the seat 32 on the binder head is the tension spring 50 33, the construction being such that while the binder head is movable toward and from the plane of the front wall of the shuttle box by reason of the elongated slot 21, it is normally resisted in such movement by 55 the spring 33, as will be evident.

The binder has a swell or inwardly extending portion 34, which, when the shuttle is not in its box, projects into the shuttle box, Fig. 3, under the action of the spring 60 33 and binder finger, and the end of the adjusting screw 25 bears upon the adjacent portion of the bearing lug 19, said screw and the tongue 15 thus determining the normal position of the binder when the shuttle is 65 not in its box.

As well understood by those familiar with the art, it is desirable to bring the shuttle gradually to rest in proper position in the shuttle box without shock or injury thereto, and while the ordinary swell contributes to 70 this end it is not always satisfactory for well known reasons. In the present invention the outer end portion or head of the binder is connected to the lay by the shifting fulcrum and is provided with the cam surface 35 75 adapted to act upon the side of the picker 11, as the latter is moved to the end of its outer position by the incoming shuttle, and, as the picker is confined to travel in a straight line, the binder head is moved back against the 80 direct action of the spring 33, imparting to the picker a progressively increasing retardation as the picker moves along the cam surface 35 to the end of its travel. It will be evident, of course, that the retarding 85 effect of the binder head upon the picker may be varied by adjusting the tension of the spring 33, and that the amplitude of outward movement, and perforce the retarding effect of the binder head, may be further ad- 90 justed by means of the screw 25.

The present invention is not intended to be confined to the details illustrated and described as one form of means for carrying 95 it into practical effect, as it may be modified in various ways by those skilled in the art.

From the characteristics of the invention as hereinbefore announced, it will be noted that as the shuttle enters the box it will 100 move in a straight course into position between the back wall and the point 7 of the front wall, and as it meets the swell 34 of the binder its straight course will not be altered, but the binder will move pivotally 105 about the lug 19 as a center, thus acting through the binder finger 16 to raise the dagger. As the shuttle meets the picker, which is at the time located approximately as indicated in Fig. 1, it will cause the 110 picker to move to the right, Fig. 3, with the result that, as the picker moves along the cam surface 35 of the binder head, the latter will be moved outward against the tension of the spring 33, imparting through the 115 picker a progressively increasing retardation to the shuttle movement as the picker approaches the end of its outward travel. During this outward movement of the binder head, the binder will turn about a point on the swell in contact with the shuttle, but, as 120 the binder swell has its shuttle contacting portion relatively near the inner end part of the binder, such action will not interfere unfavorably with the proper action of the binder finger, and the parts will come to 125 rest in substantially the relative position indicated by Fig. 2. It will also be noted that the shuttle contacts with the binder at the binder swell only and that the final checking action of the binder operates through 130

the picker and not directly on the shuttle except in so far as outward movement of the binder head may increase the action of the binder swell.

5 The action of the cam 35 on the picker is liable to cause the picker stick to be deflected sidewise toward the opposite wall of the slot 9. As one means of counteracting this tendency, the wall of the slot 9 opposite
10 the cam 35 is faced with a suitable material, such as leather 36, Figs. 1 and 2, which may be preferably thinned toward the inner end of the shuttle box, as indicated in Fig. 1, to properly resist the side thrust of the cam
15 35 on the picker stick. Obviously also the binder and front wall of the shuttle box may be faced with any desired material, such as leather.

From the described embodiment of the invention it will be seen that the binder is
20 mounted on a shifting fulcrum; that the slot 21 in the binder head is made of suitable dimension to permit the binder head not only to move directly outward against the
25 action of the spring 33 in the manner stated, but also to swing the necessary amount about the lug 19. It will also be noted that as the picker stick moves to the outer portion of its stroke the guiding slot 9 narrows
30 to maintain the picker stick in proper position and to enable the cam 35 to act effectively upon the picker in checking the shuttle.

What is claimed is:

35 1. In a loom, the combination of a lay having a shuttle box, a shuttle binder having a shifting fulcrum connection with the lay, said binder being provided with a swell to engage the shuttle as it enters the box and
40 a cam portion extending into the path of the picker to be engaged thereby and projecting toward the outer end of the binder from the shifting fulcrum, and means to positively limit the amplitude of shifting fulcrum
45 movement under the action of the picker.

2. In a loom, the combination of a lay having a shuttle box, a picker, a shuttle binder having a swell to engage the shuttle
50 and a cam portion to engage the picker, and a pin and slot connection between the lay and binder constituting a shifting fulcrum, the inner wall of the said slot acting to determine the amount of outward movement of
55 the binder on its fulcrum as the picker acts upon said cam portion of the binder.

3. In a loom, the combination of a lay having a shuttle box, a picker, a shuttle binder having a swell to engage the shuttle
60 and a cam portion to engage the picker, a pin and slot connection between the lay and binder constituting a shifting fulcrum, the inner wall of the said slot acting to determine the amount of outward movement of
65 the binder on its fulcrum as the picker acts

upon said cam portion of the binder, and means for adjusting the inward movement of the binder on its fulcrum.

4. In a loom, the combination of a lay having a shuttle box, means for throwing
70 the shuttle, a binder having a single shifting fulcrum at its outer end, a spring acting on the binder, a swell on said binder to engage the shuttle and turn the binder about its fulcrum, a cam on the outer end of the
75 binder extending into the path of the shuttle throwing means to be engaged thereby and shift the binder fulcrum in opposition to said spring, and means limiting the outward movement of the binder fulcrum under the
80 action of the cam and picker.

5. In a loom, the combination of a lay having a shuttle box, a picker for throwing the shuttle, a binder having a swell and a
85 slotted end, a fixed pivotal support for the binder, a cam on the binder adjacent the head portion thereof, a spring acting on the binder, said cam projecting into the path of the picker to be engaged thereby to move the slotted end of the binder with relation
90 to its fixed support and in opposition to said spring as the picker moves to the outer portion of the shuttle box, and means for limiting the shifting movement of the binder with relation to its fixed pivotal support.
95

6. In a loom, the combination of a lay having a shuttle box, a picker, a binder having a slotted head portion, a single fixed fulcrum support for the binder engaging said
100 slotted portion to permit the binder to turn and move bodily with respect thereto, and a spring acting on said binder, said binder having a swell and a cam portion, the former to be engaged by the shuttle as it enters the shuttle box and turn the binder about its
105 support, and the latter to be engaged by the picker and moved bodily by it in opposition to the said spring as the picker moves to the outer portion of the shuttle box.

7. In a loom, the combination of a lay
110 having a shuttle box, a picker, a binder having a swell to engage the shuttle and a cam portion to engage the picker, connection between the binder and lay to permit the cam carrying portion of the binder to move the
115 binder bodily outward as the picker travels toward the outer end of the shuttle box, and means for adjusting the amplitude of said movement of the cam carrying portion of the binder.
120

8. In a loom, a lay having a shuttle box, the back wall of which is in the plane or prolongation of the reed, and a binder pivotally connected to the outer end of the lay and
125 having a swell to engage the shuttle, said shuttle box having a front wall provided with an incline, the smallest dimension between which and the back wall is at the base of the incline.

9. In a loom, a lay having a shuttle box, 130

the back wall of which is in the plane or prolongation of the reed, a binder pivotally connected to the outer end of the lay and having a swell to engage the shuttle, said shuttle
5 box having a front wall provided with an incline, the smallest dimension between which and the back wall is at the base of the incline, a picker for throwing the shuttle, and a cam on the binder head to be engaged
10 and moved by the picker as it moves to the outer end of the shuttle box.

10. In a loom, the combination of a lay having a shuttle box provided with a bottom slot, a picker stick movable in said slot and
15 carrying a picker, a shuttle binder having

a single shifting fulcrum and a cam portion for engaging the picker, and a facing of yielding material on the inner surface of said slot to prevent side deflection of the picker stick as the picker acting on the cam
20 portion of the binder moves the binder outward.

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

JONAS NORTHROP.

Witnesses:

EVERETT S. WOOD,

WENDELL WILLIAMS.