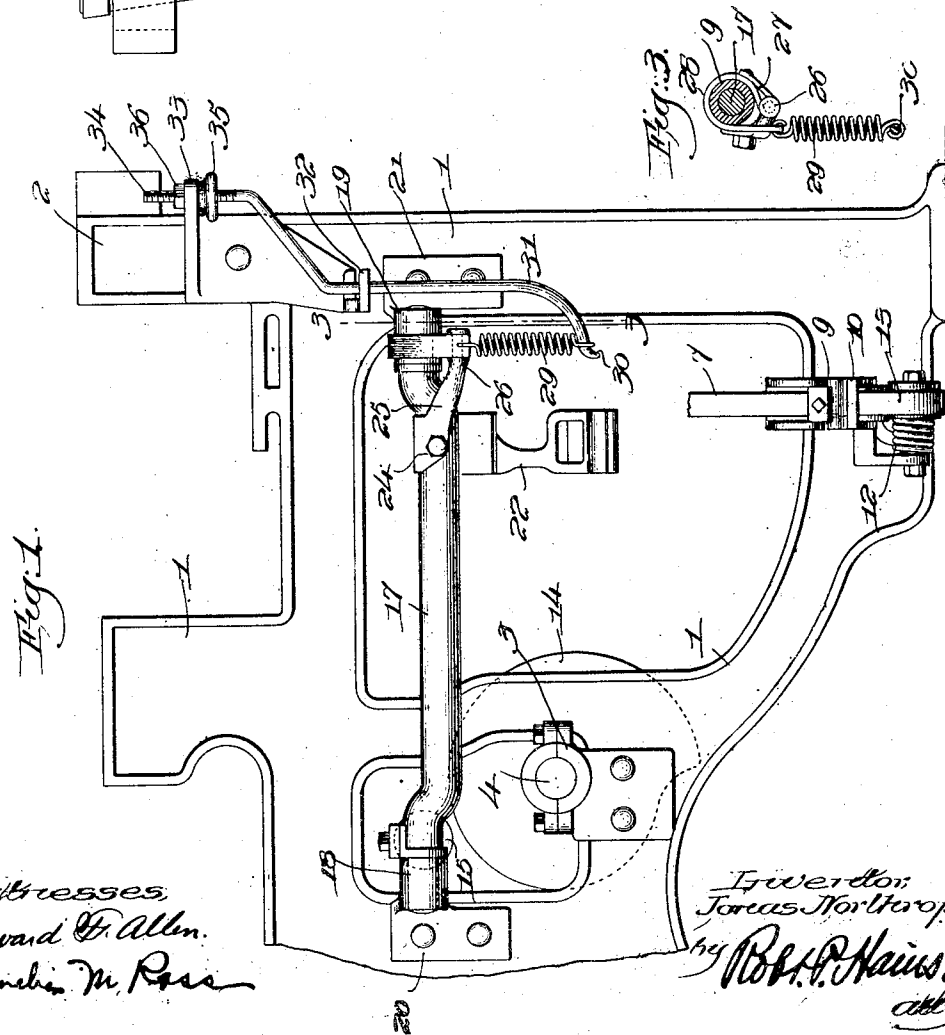
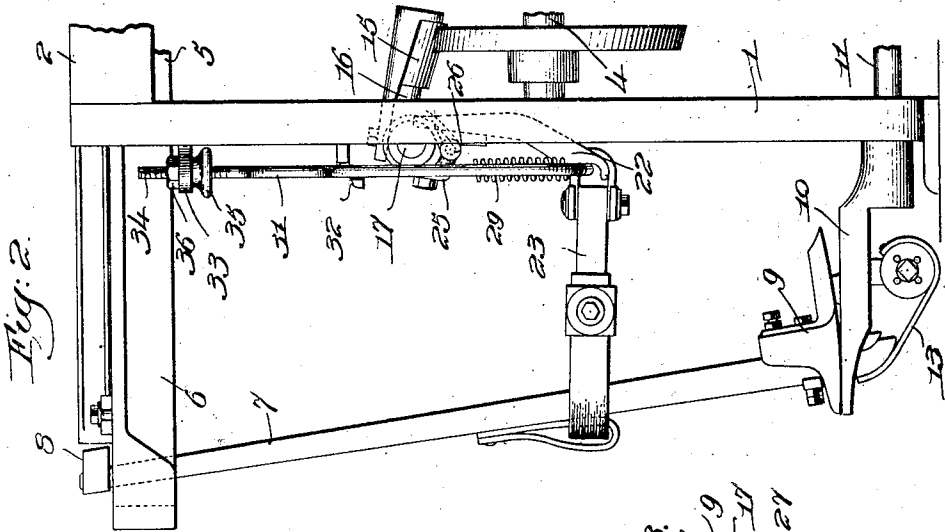


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SHUTTLE CHECK FOR LOOMS.
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UNITED STATES PATENT OFFICE.

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SHUTTLE-CHECK FOR LOOMS.

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To all whom it may concern:

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

The invention herein to be described relates to looms for weaving and more particularly to the means for arresting or checking the shuttle as it passes into the shuttle box at the terminal portion of its picking motion. As the shuttle makes its picking excursion from one to the opposite side of the loom and enters the receiving shuttle box, it is desirable that it be gradually, yet effectively, brought to rest in proper position and without rebound. To those skilled in the art the importance of these desirable characteristics in the checking action of the shuttle is well understood, especially in high speed looms and the so called automatic looms, wherein the supply of filling is renewed at intervals without stopping the machine.

With these well understood desirable characteristics of shuttle checking motions in view the aims and purposes of the present invention will best be made clear from the following description and accompanying drawings of one form of means for carrying the invention into practical effect, it being understood that the invention is not circumscribed by the details thereof, but in its true scope is definitely set forth by the claims.

In the drawing:—Figure 1 is a side view of sufficient of a loom to make clear the character and operation of the present invention, and its association with other parts; Fig. 2 is a front elevation of the parts shown by Fig. 1; and Fig. 3 is a section on the line 3—3, Fig. 1.

The loom frame may be of any desired form and character to properly support the operating parts, and as shown, it comprises the cast metal side frames 1, joined by a breast beam 2, and having suitable bearings 3, Fig. 1, for the cam or under shaft 4, driven from any usual or desired source of power.

The lay 5 has the usual shuttle boxes 6,

one at each end, lengthwise of which works the usual picker stick 7 carrying a picker 8 for acting upon the shuttle. The picker stick may be mounted in any suitable manner, and as shown, has the usual rocker 9 secured to its lower end portion which rocks upon the usual seat 10 of the usual rocker shaft 11, the picker stick being normally under the influence of the spring 12 connected to it by the strap 13 to move the upper end of the picker stick and perforce the picker outward or toward the outer end of the shuttle box after each picking action.

The parts so far described may be all as usual and may operate as heretofore, except as modified in the manner presently to be explained.

Mounted on the cam shaft 4 is the picking cam 14, adapted to act upon the roll 15 carried by the arm 16 projecting from the picking shaft 17. The shaft 17 is supported to rock under the action of the picking cam, and as shown, is supported in suitable bearings 18 and 19 carried by suitable sustaining brackets 20 and 21. Projecting from the picking shaft is the picking arm 22 which is itself connected to the picker stick 7, as by means of the strap 23, the construction being such that upon rocking movement of the picking shaft under the action of the picking cam, the picker stick and perforce the picker will be actuated to impart to the shuttle its picking movement; and upon the completion of the picking movement the return spring 12 may return the picker stick and picker toward the outer end of the shuttle box.

Except in so far as the structure or operation of the parts thus far described may be changed to suit their association with features of the present invention, they may be as heretofore common in the art or of other approved type.

As hereinbefore noted it is desirable that the shuttle shall be brought to rest in proper position in the shuttle box at the completion of its picking movement. Failure in properly positioning the shuttle in the shuttle box may arise from various causes. For instance the shuttle may have greater momentum at one time than another owing to its changing load of yarn or filling, or the loom may vary in speed, in either of which cases if the shuttle checking force remains the same, obviously the position at which the

shuttle will be brought to rest will vary. In another case the force of the picking motion may be lighter sometimes than at others whereupon, under shuttle checking action of substantially constant amount, the shuttle may not sufficiently enter the shuttle box or it may enter and then rebound. Regardless of cause, the objections to improper positioning of the shuttle in the shuttle box are well understood, and the present invention has in view means of simple and efficient character for bringing the shuttle to rest properly positioned in its box, and also in simple devices for enabling the loom tender to readily adjust the checking action of said means without in any way interfering with the loom operation.

In the form of the invention illustrated, movement of the picker and picker stick by the shuttle after it has entered the box is utilized to create frictional resistance to such movement of increasing amount dependent upon the momentum of the shuttle, and devices are provided to vary the degree of increase to suit conditions of use, all of which will appear from the following form of means shown as an embodiment of the invention.

Secured to the picker shaft 17, as by the bolt 24 is an arm 25, the free end 26 whereof has secured thereto one end 27 of a friction band 28 passing around a fixed friction seat. The friction seat is preferably secured to the loom frame, and in the form of such seat illustrated, it is produced by a part of the bearing 19 for the end of the picker shaft, but obviously the friction seat with which the friction band coöperates may be variously formed within the essentials of the present invention. After passing about the friction seat the band 28 has its other end secured to or connected with a tension spring 29, the construction being such that after the picking action and when the picker stick has been moved outward of the shuttle box by its return spring 12, the friction band 28 will modify further action of the return spring 12 and cause the picker stick and picker to come to rest substantially as indicated by Fig. 2, with the picker and picker stick in a position between the inner and outer ends of the shuttle box. In this position it will be noted the return spring 12 holds the picker stick to the left, Fig. 2, but owing to the frictional retardation of the band 28 on its seat, the picker shaft is prevented from responding to the demands of the spring 12, the picking roll 15 is held clear of the picking cam 14 and the picker is in a position between the ends of the shuttle box ready to receive the impact of the incoming shuttle. When the incoming shuttle strikes the picker 8, it moves the picker and perforce the picker stick farther outward toward the end of the shuttle box,

whereupon the picker shaft is turned through its connections with the picker stick, and the arm 25 is caused to bind the friction band 28 with greater and greater force about the friction seat dependent upon the momentum of the shuttle as it acts to move the picker stick toward the outer end of the shuttle box. In order that the shuttle checking action may be readily adjusted to suit the shuttle momentum while the loom is running and thus cause the shuttle to be finally stopped in proper position in the shuttle box, the retarding effect of the friction band is made variable by adjusting means accessible to the loom tender while the loom is running. As one form of means for securing this variation in retarding effect of the friction band, one end of the tension spring 29 is secured to the hooked end 30 of the adjusting rod 31, which preferably passes upward at the loom side through guides 32 and 33, its upper end being provided with screw threads 34 and suitable adjusting and lock nuts 35 and 36; the construction being such that by manipulating the said nuts the rod 31 and perforce the tension of the spring 29 may readily be varied to suit conditions of use. Thus without stopping the loom the loom tender can adjust the checking action of the shuttle checking means and can at once observe the effect of the adjustment so that the shuttle may be unerringly brought to rest in proper position in the shuttle box.

Obviously, changes may be made in details of the described means without departing from the true scope of the present invention which is definitely stated by the claims.

What is claimed is;—

1. In a loom, the combination of the shuttle box, the picker stick and picker adapted to be moved by the shuttle as it moves in the shuttle box, means actuated by the shuttle movement and including the picker and picker stick to create frictional resistance to such movement of increasing amount dependent upon the momentum of the shuttle, and means secured to a fixed part of the loom for varying the degree of increase during the running of the loom.

2. In a loom, the combination of the shuttle box, a picker rock shaft, the picker and picker stick, a friction device for retarding outward movement of the picker under the action of the shuttle, and means actuated by the picker rock shaft for causing said friction device to act progressively with increasing energy as the shuttle moves toward the outer end of the shuttle box.

3. In a loom, the combination of the shuttle box, a picker rock shaft, the picker and picker stick, a friction device for retarding outward movement of the picker under the action of the shuttle, means actuated by the

picker rock shaft for causing said friction device to act progressively with increasing energy as the shuttle moves toward the outer end of the shuttle box, and means secured 5 to the loom frame for adjusting the action of the friction device while the loom is in operation.

4. In a loom, the combination of the lay and shuttle box, the picker stick and 10 picker, the picking shaft for actuating the picker stick and picker, and frictional retarding means acting through the picking shaft to retard movement of the picker toward the outer end of the shuttle box under 15 the action of the shuttle.

5. In a loom, the combination of the lay and shuttle box, the picker stick and picker, the picking shaft for actuating the picker stick and picker, means comprising a friction band and operating arm therefor connected to the picking shaft to retard movement of the picker toward the outer end of the shuttle box under the action of the shuttle, and devices for regulating the action of 25 said means while the loom is in operation.

6. In a loom, the combination of the lay and shuttle box, the picker stick and picker, the picking shaft for acting upon the picker stick, and means acting frictionally on the 30 picker shaft to retard rotative movement of the picking shaft in one direction to check the shuttle in the shuttle box.

7. In a loom, the combination of the lay and shuttle box, the picker stick and picker, the picking shaft for acting upon the picker stick, means acting frictionally on the picker shaft to retard rotative movement of the picking shaft in one direction to check the shuttle in the shuttle box, and 40 means for adjusting the first mentioned means while the loom is running.

8. In a loom, the combination of a picking shaft, a picker, devices between the picking shaft and picker for moving each by the 45 other, and means permitting free movement of the picking shaft in one direction for imparting picking action to the picker and for exerting a frictional retarding force to movement of the picking shaft by the picker 50 in the reverse direction.

9. In a loom, the combination of a picking

shaft, a picker, devices between the picking shaft and picker for moving each by the other, means permitting free movement of the picking shaft in one direction for imparting picking action to the picker and for exerting a frictional retarding force upon the picking shaft to movement in the reverse direction, and devices for regulating the retarding action of said means while the 60 loom is running.

10. In a loom, the combination of the picking shaft, a picker, devices between the picker and picking shaft for moving each by the other, a friction band and its seat, 65 and connections with the picking shaft to cause the latter to bind the friction band upon its seat when the picking shaft is moved in one direction.

11. In a loom, the combination of the 70 picking shaft, a picker, devices between the picker and picking shaft for moving each by the other, a friction band and its seat, connections with the picking shaft to cause the latter to bind the friction band upon its seat when the picking shaft is moved in one 75 direction, and a device for regulating the action of the friction band and seat during the operation of the loom.

12. In a loom, the combination of the 80 picking shaft, a picker, means for operatively connecting the said shaft and picker, a friction band and seat, one end of said friction band being connected to the picking shaft, and means for holding the other 85 end of the band.

13. In a loom, the combination of the picking shaft, a picker, means for operatively connecting the said shaft and picker, a friction band and seat, one end of said friction band being connected to the picking shaft, means for holding the other end of the band, and devices for adjusting said holding means while the loom is running.

In testimony whereof, I have signed my 95 name to this specification, in the presence of two subscribing witnesses.

JONAS NORTHROP.

Witnesses:

WM. O. PERKINS,
E. D. OSGOOD.