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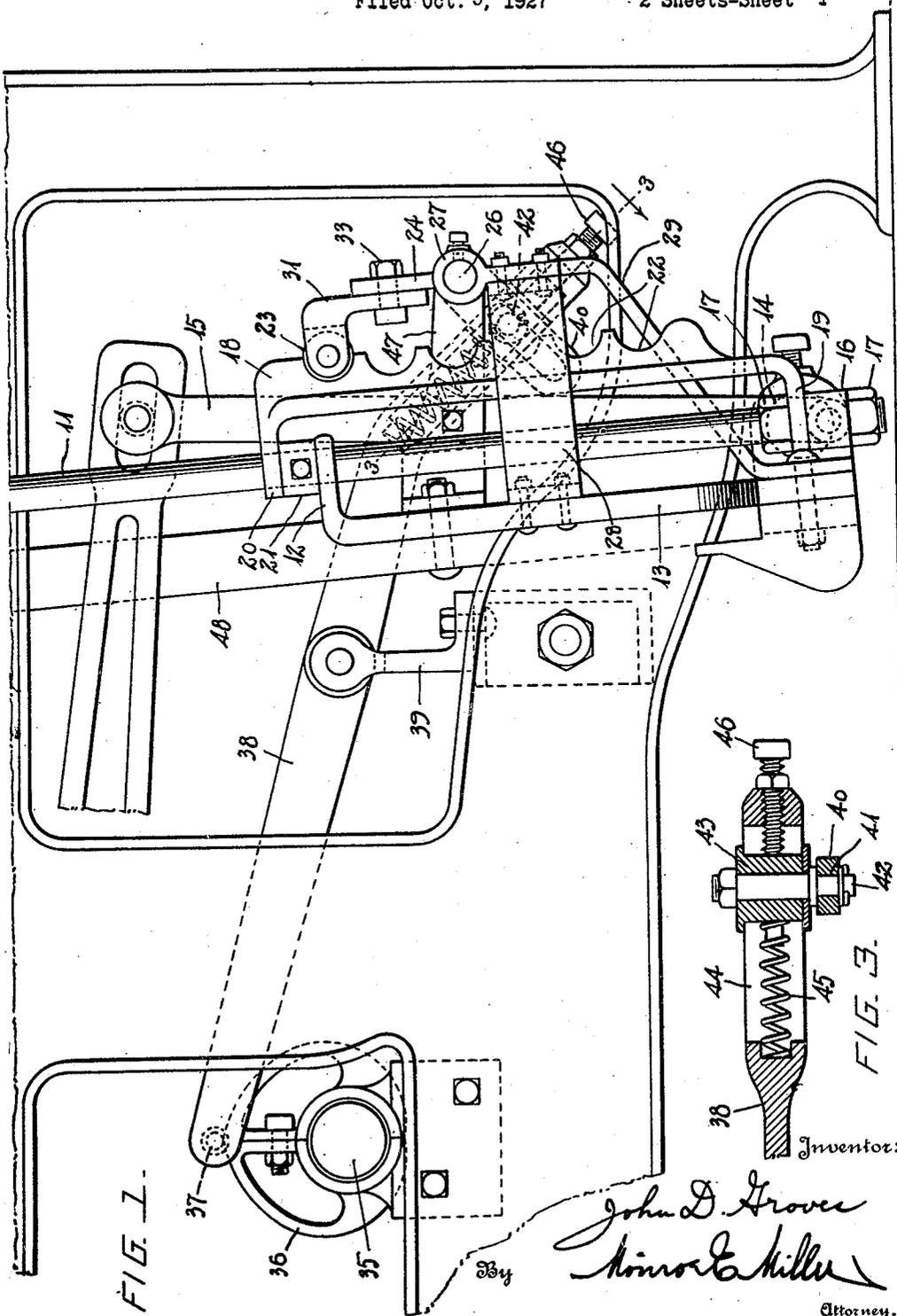
1,683,543

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AUTOMATIC BOX LOCK FOR DROP BOX LOOMS

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2 Sheets-Sheet 1



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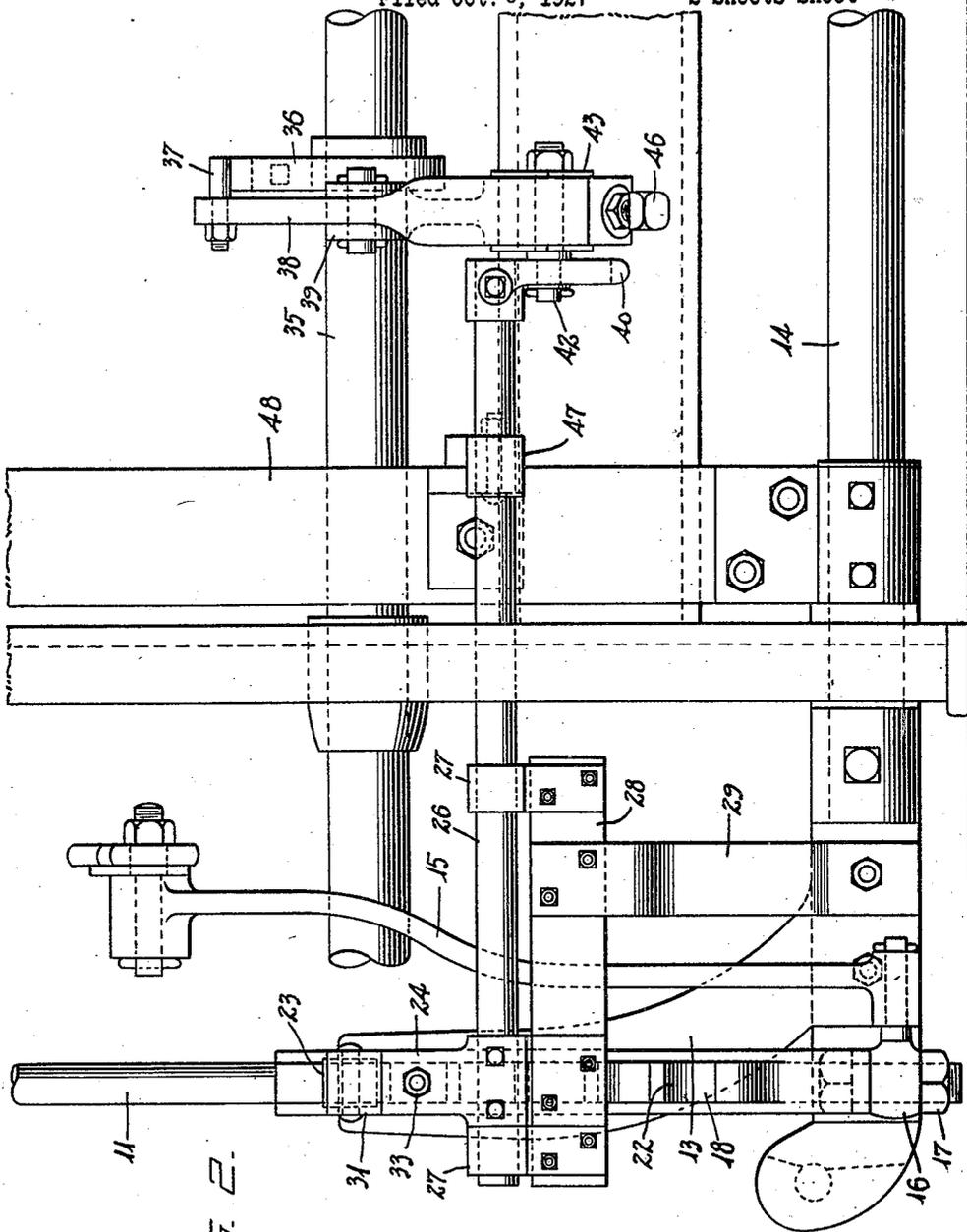


FIG. 2.

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AUTOMATIC BOX LOCK FOR DROP-BOX LOOMS.

Application filed October 3, 1927. Serial No. 223,819.

The present invention relates to automatic box locks for drop box looms, and is an improvement over the device disclosed in my Patent No. 1,549,717, granted August 11, 1925.

It is the object of the invention to provide an automatic shuttle box lock controlled from a shaft of the loom in a novel manner, in order to hold the shuttle boxes in proper place on a level with the race plate during the time that the shuttle starts on its flight through the warp from the corresponding shuttle box, and also during the return of the shuttle into the box.

With the foregoing and other objects in view, which will be apparent as the description proceeds, the invention resides in the construction and arrangement of parts, as hereinafter described and claimed, it being understood that changes can be made within the scope of what is claimed, without departing from the spirit of the invention.

The invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a fragmentary side elevation of a drop box loom showing the improved box lock.

Fig. 2 is an end view of the loom illustrating the parts shown in Fig. 1.

Fig. 3 is a sectional detail taken on the line 3—3 of Fig. 1.

Drop box looms are equipped with a set of superposed shuttle boxes (not shown), as well known, carried by a box rod 11 which is raised and lowered for bringing the several boxes or cells on a level with the race plate, as well understood in the art. The rod 11 passes slidably through an apertured angularly extending terminal 12 of an arm 13 secured to a rock shaft 14, which is oscillated in the usual manner to swing the shuttle boxes and lay back and forth. The shuttle boxes are raised and lowered by means of a link 15 actuated by a suitable mechanism, said link being pivotally connected with a collar 16 fitted on the lower terminal of the rod 11 between a pair of nuts 17 which are screw-threaded on the rod for purpose of adjustment so as to raise and lower the shuttle boxes with reference to the link 15. The parts described up to this point are used in

drop box looms, and may be regarded as typical.

The lock includes a bar 18 disposed at one side of and parallel with the rod 11, and attached to said rod. The lower end of the bar 18 embraces the rod 11, as at 19, and is clamped between the collar 16 and upper nut 17, and the upper end 20 of the bar 18 also embraces the rod 11 above a collar 21 secured on the rod 11 by means of a set screw, the collar 21 being seatable on the terminal 12 of the arm 13 to limit the downward movement of the rod. The bar 18 has a series of spaced notches 22, there being one notch for each shuttle box, and said notches are spaced apart according to the spacing of the shuttle boxes. Said notches are for the engagement of a roller 23 of a locking member or latch, so as to hold the rod 11 and shuttle boxes in their proper vertical position when the shuttle boxes have been positioned for the movement of the shuttle through the warp either away from or toward the shuttle boxes.

The locking member or latch comprises an arm 24 secured by a set screw or otherwise on a rock shaft 26 parallel with the shaft 14 and mounted for rotation in bearings 27 secured to a bracket 28 which is fastened to the arm 13, and a brace 29 connects said bracket and arm. The roller 23 is mounted in an adjustable member 31 clamped to the arm 24 by a bolt 33.

The latch is operated automatically during the forward and backward movement of the shuttle boxes, from a rotating shaft 35 of the loom. For this purpose, a cam 36 is secured on the shaft 35 and contacts with a roller 37 of a lever 38 fulcrumed on a pedestal 39 secured on a cross member of the frame of the loom. An arm 40 is secured to the rock shaft 26 of the latch and extends downwardly at an angle across the arm of the lever 38 opposite to the cam 36 which extends downwardly at an angle in the opposite direction, said arm of the lever 38 and arm 40 crossing one another at an angle as seen in Fig. 1.

The arm 40 has a longitudinal slot 41 in which a pin 42 works, and said pin is secured or clamped through a slide 43 movable

in a longitudinal slot 44 in the corresponding arm of the lever 38. A coiled spring 45 is confined between the slide 43 and upper or inner end of the slot 44 to yieldingly move the slide 43 downwardly, and the downward movement of the slide 43 is limited by means of an adjustable stop screw 46 threaded within the end of the lever 38 and projecting into the slot 44.

In the operation of the loom, with the rod 11 and shuttle boxes moved to their extreme left hand position, as seen in Fig. 1, the cam 36 is in its uppermost position, and when the rod 11 and shuttle boxes are swung to their extreme right hand position the cam 36 is in its lowermost position, the shaft 35 turning in synchronism with the oscillatory movement of the shuttle boxes and lay.

In operation, when the shuttle boxes are swung toward the left, as seen in Fig. 1, and the cam 36 is moved upwardly, the roller 37 is raised so as to swing the slotted arm of the lever 38 downwardly, and the spring 45 presses the slide 43 and pin 42 downwardly. The shaft 26 moving with the arm 13 and rod 11 toward the left will result in the shaft 26 moving toward the left with reference to the pin 42, thereby turning the arm 40 downwardly and swinging the arm 24 or latch toward the left, so as to move the roller 23 into the registering notch 22. This will lock the rod 11 and shuttle boxes in the corresponding vertical position.

When the shuttle boxes move toward the right, the cam 36 moves downwardly, thereby permitting the slotted arm of the lever 38 to move upwardly, and swinging the arm 40 upwardly. Furthermore, the shaft 26 moving toward the right with the rod 11, will move away from the pin 42, which is permitted by the slot 41, and as a result the shaft 26 is turned so as to swing the latch away from the bar 18, thereby releasing the rod 11 so that it may be moved vertically.

It will be noted that with the parts as seen in Fig. 1, when the roller 23 engages in the corresponding notch 22 before the left hand limit of movement of the shuttle boxes is reached, the slide 43 may be moved toward the left in the slot 44 so as to compress the spring 45. This provides for yielding action in order to hold the latch in place under spring compression.

The device will lock the rod 11 in any of its vertical positions, with the rod swung to the position shown in Fig. 1, in which position the shuttle travels through the warp either out of or into the shuttle box which is on a level with the race plate of the loom. The latch being held under spring pressure in engagement with the bar 18 will prevent vertical vibration of the shuttle boxes and accomplish other advantages.

As shown, the lever 38 and arm 40 are located at a distance from the rod 11 and bear-

ings 27, so that the shaft 26 is journaled in a bracket 47 secured to an oscillating member or bar 48 of the loom which is secured on the rock shaft 14.

Having thus described the invention, what is claimed as new is:—

1. In a loom, an oscillatory lay member, a slidable shuttle box lifting member movable therewith and slidable relatively thereto, a latch carried by the oscillatory member for locking the slidable member in different positions, a mechanically operable member movable in synchronism with said oscillatory member, and a connection between the mechanically operable member and latch including a spring and so arranged that the movement of the oscillatory member in one direction and the movement of the mechanically operable member in the corresponding direction will jointly move the latch to unlocking position and that the joint movements of the oscillatory and mechanically operable members in the opposite directions will move the latch to locking position under spring pressure.

2. In a loom, an oscillatory lay member, a slidable shuttle box lifting member movable therewith and slidable relatively thereto, a latch carried by the oscillatory member for locking the slidable member in different positions, an oscillatory arm connected with said latch for moving it to locking and unlocking positions, a mechanically operable member operable in synchronism with said oscillatory member, a slidable pivot connection between said arm and mechanically operable member, said arm and mechanically operable member being so arranged that the movement of the oscillatory member in one direction and the movement of the mechanically operable member in the corresponding direction will jointly move the latch to unlocking position and that the joint movements of the oscillatory and mechanically operable members in the opposite direction will move the latch to locking position, and spring means associated with said connection to exert pressure on the latch when it is moved to locking position.

3. In a loom, an oscillatory lay member, a slidable shuttle box lifting member movable therewith and slidable relatively thereto, a latch carried by the oscillatory member for locking the slidable member in different positions, a mechanically operable lever operable in synchronism with said oscillatory member, an oscillatory arm connected with the latch for moving it to locking and unlocking positions, and a sliding pivot connection between said lever and arm, said lever and arm being so arranged that the movement of the oscillatory member in one direction and movement of the lever in the corresponding direction will jointly move the latch to unlocking position and that the

joint movements of the oscillatory member and lever in the opposite directions will move the latch to locking position.

4. In a loom, an oscillatory lay member, a slidable shuttle box lifting member movable therewith and slidable relatively thereto, a latch carried by the oscillatory member for locking the slidable member in different positions, a mechanically operable lever operable in synchronism with said oscillatory member, an oscillatory arm connected with the latch for moving it to locking and unlocking positions, a sliding pivot connection between said lever and arm, said lever and arm being so arranged that the movement of the oscillatory member in one direction and movement of the lever in the corresponding direction will jointly move the latch to unlocking position and that the joint movements of the oscillatory member and lever in the opposite directions will move the latch to locking position, and spring means associated with said connection to provide for yielding action and to move the latch to locking position under spring pressure.

5. In a loom, an oscillatory lay member, a slidable shuttle box lifting member movable therewith and slidable relatively thereto, a latch carried by the oscillatory member for locking the slidable member in different positions, a mechanically operable lever operable in synchronism with said oscillatory member and having a slot, an oscillatory arm connected with the latch for moving it to locking and unlocking positions and having a slot, a pivot element working in said slots of the lever and arm, said lever and arm being so arranged that the movement of the oscillatory member in one direction and movement of the lever in the corresponding direction will jointly move the latch to unlocking position and that the joint movements of the oscillatory member and lever in the opposite directions will move the latch to locking position, and spring means associated with the lever and

pivot element arranged to permit of yielding action and to move the latch to locking position under spring pressure.

6. In a loom, an oscillatory lay member, a slidable shuttle box lifting member movable therewith and slidable relatively thereto, a latch carried by the oscillatory member for locking the slidable member in different positions, a mechanically operable lever operable in synchronism with said oscillatory member and having a slot, an oscillatory arm connected with said latch for moving it to locking and unlocking positions and having a slot, said arm and lever crossing one another at an angle, a pivot element working in said slots of the arm and lever, said arm and lever being so arranged that the movement of the oscillatory member in one direction and movement of the lever in the corresponding direction will jointly move the latch to unlocking position and that the joint movements of the oscillatory member and lever in the opposite directions will move the latch to locking position, and spring means carried by said lever to permit of yielding action of said pivot element in the movement of the latch to locking position.

7. In a loom, an oscillatory lay member, a slidable shuttle box lifting member movable therewith and slidable relatively thereto, a latch carried by the oscillatory member for locking the slidable member in different positions, and mechanically operable means connected with said latch and operable in synchronism with said oscillatory member for moving the latch to unlocking position when said oscillatory member is moved in one direction and for moving the latch to locking position when the oscillatory member is moved in the opposite direction, said means including a spring to exert pressure on the latch when it is moved to locking position.

In testimony whereof I hereunto affix my signature.

JOHN D. GROVES.