

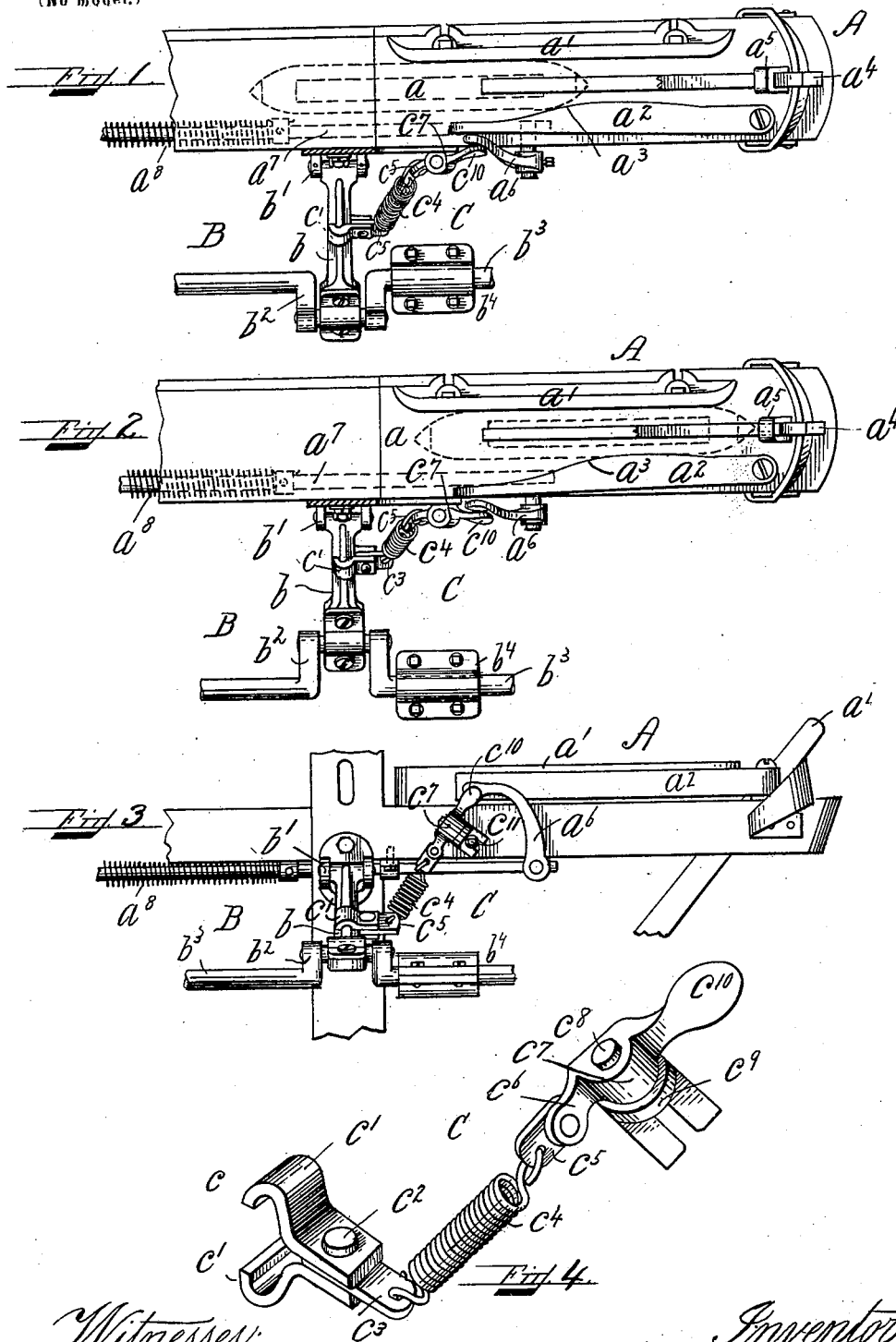
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Patented June 18, 1901.

W. T. FAIRBURN & J. HARGREAVES.
SHUTTLE CHECKING AND RELEASING MECHANISM FOR LOOMS.

(Application filed Mar. 15, 1901.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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SHUTTLE CHECKING AND RELEASING MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 676,491, dated June 18, 1901.

Application filed March 15, 1901. Serial No. 51,807. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM THOMAS FAIRBURN, a citizen of the United States, and JOHN HARGREAVES, a subject of the King of Great Britain, both residing at Fall River, in the county of Bristol and State of Massachusetts, have invented certain new and useful Improvements in Shuttle Checking and Releasing Mechanism for Looms, of which the following is a specification, reference being had therein to the accompanying drawings.

Figure 1 is a plan showing new elements and such parts of the ordinary loom as will clearly illustrate the application of the principle of our invention, all the elements co-acting. Fig. 2 is a plan of our invention, some of the elements being out of action. Fig. 3 is an elevation of Fig. 2 from the rear of the loom, and Fig. 4 is an enlarged detail showing the new elements of our invention.

The means at present employed to push the swell of a shuttle-box toward the front thereof and into the path of the incoming and outgoing shuttle consist of a finger and sometimes a strong spiral spring on a protecting-rod, said means acting at all times. The shuttle therefore, after having been driven between said front and the inclined face of the swell and there stopped, is until ejected by the picker-stick bound by the spring operating thereon through the swell; but plainly this operation of the spring on the shuttle, after the latter has been brought to a state of rest in the box, is not only useless, but decidedly injurious, in that there results the loss of the additional power essential to overcome the resistance of the spring offered to the outgoing of the shuttle; the greater liability to breakage not only of the teeth of the gearing through which power is transmitted to the picker-stick, but also the picker-stick while transmitting said additional power, and, further, the picker on the picker-stick requires more frequent renewal. Another objection resides in the fact that this strong spiral spring is always acting with practically uniform pressure on the swell, so that as far as the spring is concerned the shuttle, while in moving or stationary contact with the swell, is subjected to the same pressure, and on entering the box strikes "hard" on the in-

clined face of the swell, the shock tending to throw off and break the filling. A further objection is that, as the front of the shuttle-box is often inclined to the plane of the picker-stick and as the swell holds the shuttle parallel with said front, the shuttle when it leaves the box is inclined to the longitudinal axis of the lay—i. e., the shuttle goes out of the box slightly sidewise and zigzags its way across the loom, wears away its edges by coming into contact with the reed, and often jumps out of its course. Now our invention overcomes these objections, and consists in supplying means whereby pressure exerted on the swell is intermittent and variable instead of constant and uniform, not acting on the shuttle after it is brought to a state of rest, and increasing the strength during the entrance of the shuttle into the box, the shuttle thus being not only free from pressure of said spring and swell while being ejected from the box by the picker-stick, but on entering the box subjected to a pressure slight on striking the inclined face of the swell, but rapidly increasing until the shuttle is brought to a stop, the striking hard and the objections resulting being thus avoided. Further, as the swell does not act on the shuttle during the operation of picking the axis of the shuttle becomes not inclined to but is parallel with the longitudinal axis of the lay.

In the drawings illustrating the principle of our invention and the best mode now known to us of applying that principle, A is the shuttle-box of a loom, B means for operating the lay, and C the new elements of our invention.

The shuttle-box A consists of the usual race-plate a , the box-back, (not shown in the drawings for the sake of clearness,) the box-front a' , and the swell a^2 , having an inclined face a^3 , the picker-stick a^4 being provided with a picker a^5 and operated in the usual manner. The free end of the swell a^2 is engaged by the finger a^6 , fixed to the protecting-rod a^7 , upon which is coiled a spiral spring a^8 , very much weaker than that usually used, but strong enough to prevent said finger and swell from moving farther away from the front a' of the box than is shown in Fig. 2 and without being of any material assistance

in stopping the incoming shuttle. Motion is imparted to the lay in the ordinary manner by the link *b*, pivotally connected to the lay at *b'* and to the crank *b*² of the power-shaft *b*³, having bearings, as *b*⁴. Excepting the weak spring *a*⁸ on the protecting-rod *a*⁷ the elements above described are those commonly found in a loom. To these old elements we add those, C, shown in Fig. 4. *c* is a clip made up of two hooked members *c'* *c'*, that engage the link *b* and are fixed thereto by a threaded bolt *c*² passing through the shanks of said members and a piece of leather *c*³, located between said shanks. To this leather piece *c*³ is secured a stiff spiral spring *c*⁴, whose other end is secured to a second piece of leather *c*⁵, fast to one arm *c*⁶ of a lever *c*⁷, having a fulcrum *c*⁸ on a slotted bracket *c*⁹. This bracket is located on the lay above the pivot *b'* of the link *b* and between said pivot *b'* and the finger *a*⁶, the other arm *c*¹⁰ of the lever *c*⁷ capable of engaging the finger *a*⁶, as shown in Figs. 1, 2, and 3, said bracket being secured to the lay by a screw *c*¹¹. The length of the combined elements C (shown in Fig. 4) is a little greater than the distance between the fulcrum *c*⁸ on the bracket *c*⁹ and the middle of the link *b* when said link is in its high position, as shown in Figs. 2 and 3, so that when the clip is secured at about said middle the mechanism C is not quite taut and the lever *c*⁷ for a short space of time is not in engagement with the finger *a*⁶, and the shuttle X, in free sliding contact with the swell *a*², can, unhampered by the latter, be driven out of the shuttle-box by the picker-stick *a*⁴, which operates when the mechanism C is not acting on the shuttle through the swell. As the crank *b*², its link *b*, and clip *c* begin to descend to the low position, as shown in Fig. 1, the distance between the clip and the fulcrum begins to increase, and consequently the spring *c*⁴ is brought under tension, which increases until the lowest position of clip is reached, after which the distance between said points and the tension of said spring begin to decrease until they return to the original position, (shown in Figs. 2 and 3,) where the swell is not acted on by the lever *c*⁷. It is during the period of time that spring *c*⁴ is

increasing its tension that the shuttle on every other revolution of the crank enters the shuttle-box by being driven between the front *a'* and the swell *a*², and it will be plain that during said period the shuttle is subjected to a pressure which increases as the shuttle goes farther into the box. In brief, by this construction the pressure exerted through the swell on the shuttle is intermittent and frees the shuttle in season for it unimpeded to be driven out of the box by the picker-stick, and the incoming shuttle is subjected to an increasing pressure as distinguished from a constant pressure, which tends to obviate the objections arising from the shuttle striking the swell hard.

It will be plain to all those skilled in the art to which this invention appertains that our invention can be embodied in different forms without departing from the spirit thereof, and in view of United States Letters Patent to Perham, No. 562,653, and British Letters Patent to Pilling and Booth, No. 753, dated February 23, 1878, we desire to be understood as claiming our invention in the broadest manner legally permissible.

What we claim is—

In a loom, the combination of a shuttle-box provided with a swell; a protecting-rod and finger engaging said swell; a link pivotally connected both to a crank on power-shaft, and to the lay of the loom; a lever whose fulcrum is above the link's pivot to the lay, and between said pivot and the end portion of the finger engaging the swell, said lever having two arms; a spiral spring, one end of which is fixed to said link, the other end to an arm of said lever, the other arm of said lever being free to engage said finger, all designed to subject the shuttle, during its incoming, to an increasing side pressure, and, during its outgoing, to no side pressure.

In testimony whereof we affix our signatures in presence of two witnesses.

WILLIAM THOMAS FAIRBURN.
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