(No Model.)

C. F. PERHAM.

SHUTTLE CHECKING AND RELEASING MECHANISM FOR LOOMS.

No. 562,653. Patented June 23, 1896.

Fig. 1.

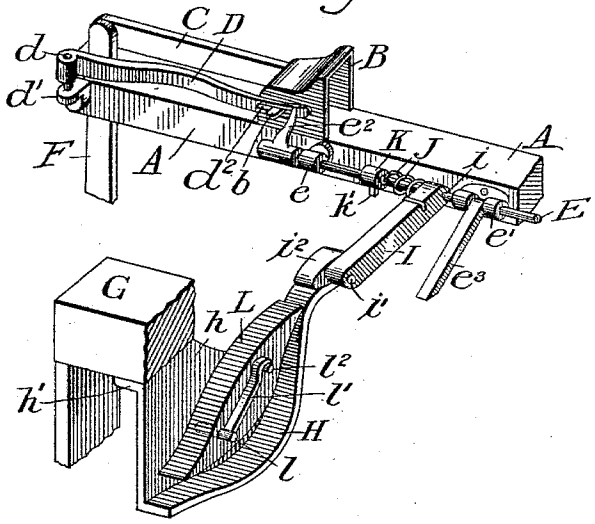
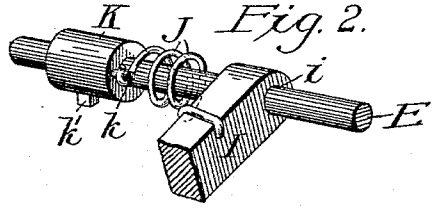


Fig. 2.



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SHUTTLE CHECKING AND RELEASING MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 562,653, dated June 23, 1896.

Application filed May 15, 1893. Serial No. 474,207. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. PERHAM, a citizen of the United States, residing at Lowell, in the county of Middlesex and Commonwealth of Massachusetts, have invented a certain new and useful Improvement in Shuttle Checking and Releasing Mechanism for Looms, of which the following is a specification.

My invention relates to shuttle checking and releasing mechanism for looms; and it consists in the devices and combinations hereinafter described and claimed, one object of said invention being to diminish the pressure of the binder upon the shuttle gradually while the shuttle is entering the box and thereafter to substantially release the shuttle of pressure until the binder serves only to guide the shuttle when the latter leaves the shuttle-box, thereby effecting a saving of the power required to throw the shuttle and saving wear of the shuttle and picking devices.

Another object of said invention is to vary the pressure upon the binder, at the time the shuttle is entering the box, to the varying speed of the shuttle, and thereby stopping the shuttle in the proper place for the next pick and lessening the liability of breaking the warps and the frequency of stoppages caused by the failure of the shuttle to complete a pick in the allowed time.

In the accompanying drawings, Figure 1 is a perspective view of my invention complete, together with parts of the loom immediately coöperating therewith. Fig. 2 is a detail view in perspective of a part, drawn to an enlarged scale and hereinafter more particularly referred to.

The lay-beam A, throat-piece B, back piece C, binder D, its pivot d, and supporting-bracket d', the guide-lug b, which projects through a slot d^2 in the binder, near the free end of said binder, the dagger-rod E, supported in bearings or sleeves e e' and having a finger e^2, arranged to press against the front or outer face of the binder D, near the free end of the same, the dagger e^3, the picker-stick F, and breast-beam G, are all of the usual construction and operation, except as hereinafter stated, it being understood that the lay-beam vibrates through an arc of a circle and that the picker-stick not only moves with the lay-beam, but also moves in a longitudinal slot in said lay-beam, to throw the shuttle out of the shuttle-box, in a well-known manner.

I secure to the breast-beam a stationary cam H, preferably formed in one piece with a bracket h, having a flange h', by means of which it is secured by bolts or screws, the curvature of said cam H being substantially as shown. A tension-lever I is hinged at one end to the lay-beam, preferably by passing the dagger-rod E loosely through a hole i in said tension-lever, near the rear end thereof, and the front end portion of said lever is provided with a lateral projection i', which extends over the stationary cam H, and which may be in direct contact with the upper surface of said stationary cam; but, to lessen the friction, it is preferred to pivot on said projection i' an antifriction-roll or the oblong antifriction-piece i^2, said antifriction-piece i^2 being free to rock on said projection, to accommodate its under surface to the upper surface of the cam H, as the lay vibrates. The projection i' or antifriction-piece i^2 is held in contact with the cam H by a spring, which bears upon the top of the tension-lever I, in front of the dagger-rod and is connected to said dagger-rod, said spring being represented as a spiral spring J, surrounding the dagger-rod, one end of said spring resting upon the tension-lever and the other end of said spring being bent around a pin k, which projects laterally from a collar K, said collar surrounding the dagger-rod and being prevented from turning thereon by a set-screw k', which turns in said collar radially and thrusts against said dagger-rod. By loosening the set-screw k' said collar K may be turned to increase or diminish the tension of the spring J. The spring J serves also the usual purpose of the dagger-rod spring, that is, it holds up the dagger, except when the dagger-rod is turned by the outward pressure of the binder D against the dagger-rod finger e^2.

The tilting block or pivoted cam L is substantially of the shape shown and turns upon a stud l, which projects from the bracket h of the stationary cam H, and the upper end of said tilting block is held against the stationary cam H by a spring l', secured to the stud l,

and pressing upon a pin l^2, which projects from the side of said tilting block.

The ends of the tilting block are thinned down to a wedge shape, to allow the antifriction-piece to run off from the cam H and on to the upper end of said block and off from the lower end of said block on to the cam H without sudden jar, the surfaces of said block and cam being substantially continuous at either end of said block, when that end of the block is in contact with said cam H. When the lay-beam is farthest from the breast-beam, the front end of the tension-lever is at its greatest height and the pressure upon the binder is the greatest, and as the lay-beam approaches the breast-beam the antifriction-piece descends along the upper surface of the block L, and after passing the stud l tilts the front lower end of said block down against the cam H, slides off from the block on to said cam H, allowing the front end of said block to rise, and as the lay-beam again recedes from the breast-beam passes under said block and to the rear end of said block in so doing.

The spring l' may be omitted and the weight of the tilting block L (which is mostly in front of the stud or pivot l) be relied upon to return the upper end of said block to position. It will appear obvious to those skilled in the art that the form of the stationary cam H may be varied to suit varying circumstances, and that if the tilting block or switch L were removed the spring-pressed finger e^2 would still be operated by the action of the tension-lever I on the said cam, though by taking off the tilting block the spring-pressed finger might not be capable of being controlled to the same degree of nicety as with its use.

In operation, the greatest pressure upon the binder takes place when the tension-lever is in the position shown in Fig. 1, and said pressure upon the binder constantly diminishes as the lay-beam approaches the breast-beam and allows the front end of the tension-lever to descend on its cam-support, and the picking devices are adjusted with reference to the position of the tension-lever, so that the shuttle is thrown when the projection i' or the antifriction-piece i^2 is on the lowest part of the cam H and just before said projection or antifriction-piece begins to rise, that is, when the pressure of the binder upon the shuttle is least, and the shuttle enters the box when said projection or antifriction-piece has very slightly descended on its cam-support, for instance, to about the place where the upper end of the said tilting block is represented in Fig. 1.

From this construction it follows that the pressure of the binder upon the shuttle constantly diminishes while the shuttle is entering the box, and that if the shuttle is traveling at a rate of speed less than the normal rate it will encounter a less resistance in entering the shuttle-box, and that if the speed of the shuttle is greater than normal it will encounter a greater resistance in entering the shuttle-box, so that whatever be the speed of the shuttle it will be stopped at substantially the same place in the shuttle-box. The speed with which the shuttle travels depends upon a variety of circumstances, among which are the force of the blow struck by the picker, the amount of filling carried by the shuttle, the ease with which the filling is delivered by the shuttle, and the condition of the warps, and all these circumstances are variable in effect; but, in any case, the longer the time consumed by the shuttle in passing from one box to the other, the less will be the resistance to its entering the latter shuttle-box, because the lower the projection l' or the antifriction-piece i^2 will have descended, or, in other words, the lower will be the front end of the tension-lever and the less will be the tension of the tension-spring.

I claim as my invention—

1. A shuttle checking and releasing mechanism for looms comprising in its construction a lay and shuttle-box connected therewith, a shuttle-binder, a spring-pressed finger for bearing upon the shuttle-binder, a tension-lever operatively connected with the spring-pressed finger to control the stress with which it bears upon the shuttle-binder, and a cam-support for the free end of the tension-lever, whereby the action of the said tension-lever may be controlled, as set forth.

2. The combination of the lay-beam, the shuttle-box, the binder, the dagger-rod, having a finger arranged against the outer surface of said binder, the tension-lever, having at its free end a lateral projection, a stationary cam, and a tension-spring, connecting said dagger-rod and said tension-lever, and adapted to hold said projection against said cam and to have its tension varied by the position of said projection on said cam, to vary the pressure of said finger on said binder, as and for the purpose specified.

3. The combination of the lay-beam, the shuttle-box, the binder, the dagger-rod, having a finger arranged against the outer surface of said binder, the tension-lever, having at its free end a lateral projection, an antifriction-piece loose thereon, a stationary cam, and a tension-spring, connecting said dagger-rod and said tension-lever and adapted to hold said antifriction-piece against said cam and to have its tension varied by the position of said antifriction-piece on said cam, to vary the pressure of said finger on said binder, as and for the purpose specified.

4. The combination of the lay-beam, the shuttle-box, the binder, the dagger-rod, having a finger arranged against the outer surface of said binder, the tension-lever, having at its free end a lateral projection, a stationary cam, a tilting block, arranged above said stationary cam and having thin upper and lower edges and normally in contact with said stationary cam at the upper end of said tilting block, and a tension-spring, connecting said dagger-rod and said tension-lever, and

adapted to hold said projection against said cam and to have its tension varied by the position of said projection on said cam and tilting block, to vary the pressure of said finger on said binder, as and for the purpose specified.

5. The combination of the lay-beam, the shuttle-box, the binder, the dagger-rod, having a finger arranged against the outer surface of said binder, the tension-lever, having at its free end a lateral projection, a stationary cam, a tilting block, arranged above said stationary cam and having thin upper and lower edges, a spring, to hold the upper end of said block against said stationary cam, and a tension-spring connecting said dagger-rod and said tension-lever and adapted to hold said projection against said cam and to have its tension varied by the position of said projection on said cam and tilting block, to vary the pressure of said finger on said binder, as and for the purpose specified.

In witness whereof I have signed this specification, in the presence of two attesting witnesses, this 10th day of May, A. D. 1893.

CHARLES F. PERHAM.

Witnesses:

ALBERT M. MOORE,

JAMES SYKES.