

(No Model.)

H. E. HAMILTON & N. BOISVERT.
SHUTTLE GUARD FOR LOOMS.

No. 487,183.

Patented Nov. 29, 1892.

Fig. I.

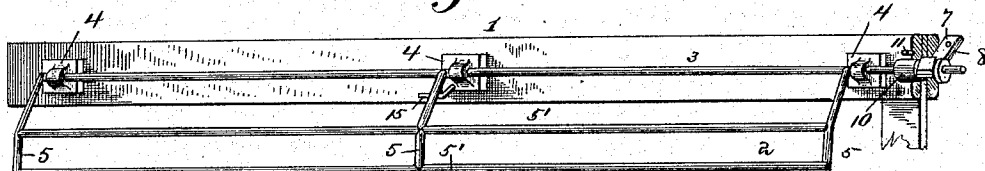


Fig. II.

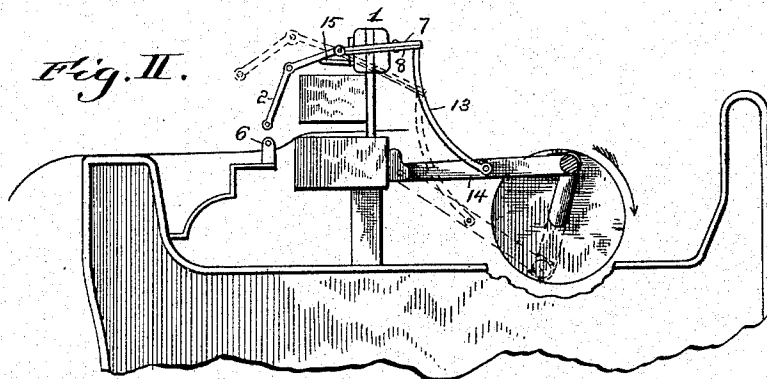


Fig. III.

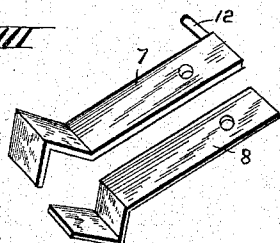


Fig. IV.

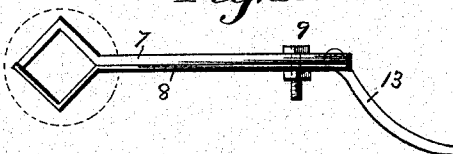


Fig. V.

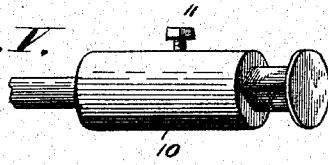
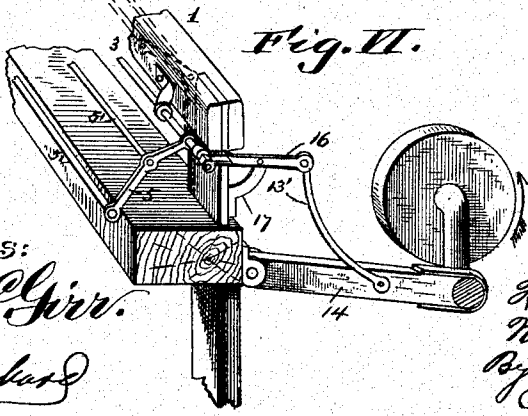


Fig. VI.



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UNITED STATES PATENT OFFICE.

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SHUTTLE-GUARD FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 487,183, dated November 29, 1892.

Application filed March 4, 1891. Serial No. 384,048. (No model.)

To all whom it may concern:

Be it known that we, HERBERT E. HAMILTON and NAPOLEON BOISVERT, citizens of the United States, residing at Salmon Falls, in the county of Strafford and State of New Hampshire, have invented certain new and useful Improvements in Shuttle-Guards for Looms; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to improvements in automatic safety devices or guards for loom-shuttles; and it has for its object to provide an attachment for looms arranged to operate automatically to effectually prevent the shuttle from flying out while in motion through the shed and which is capable of being lifted by hand to permit the warp ends to be adjusted without interfering with the proper operation of the guard.

With these ends in view our invention consists of a suitable frame pivoted on the front of the reed-cap of a loom and extending down in close proximity to the lay-beam. The pivot-rod of the frame or guard projects slightly to receive a rigid arm and a spring-arm suitably clasped together and fitting closely on a polygonal end of said pivot-rod. The end of this rigid arm is connected by a spring-rod to one of the pitmen operating the lay from the main crank-shaft of the loom, and the rigid and spring arms are held in position by a suitable guard secured on the pivot-rod, which prevents lateral displacement of these parts.

Our invention consists, further, of certain details of construction and arrangement of parts, as will more fully appear hereinafter.

To enable others to more readily understand our invention, we have illustrated the same in the accompanying drawings, in which—

Figure I is a perspective view of our invention. Fig. II is a side elevation showing so much of a loom as is necessary to understand our invention. Figs. III, IV, and V are detail views of the rigid and spring arms and their connections, and Fig. VI is a modified form of our invention. Fig. VII is a detail view of the modified construction, showing

particularly the intermediate piece and bracket attached to the ordinary construction, by means of which the device is adapted to looms having their crank-shaft running from left to right.

Referring to the drawings, in which like numerals of reference denote corresponding parts in all the figures, 1 is the rail or reed-cap of the ordinary loom, and to the same is secured the improved safety device of our invention. This device consists, essentially, of the guard or shield 2, which has its main rod 3 secured by brackets or bearings 4 4 to the reed-cap, said rod 3 projecting slightly beyond the end of the hand-rail 1.

Secured rigidly on the hand-rail 1, at or near the brackets, are curved or bent ribs 5, which extend down almost to the temples 6 of the loom. Extending across the front of the loom and secured in the ribs 5 are transverse rods 5', thus completing the guard, which serves to prevent the shuttle from flying outward or upward when it is in rapid motion through the warp. These ribs may be made of malleable iron, and the center and lower rods may be milled up on the ends and riveted in the ribs; but we do not confine ourselves to any particular style or manner of fastening the ribs and rods together. The bearings in the brackets 4 4 are provided with a suitable lubricant, and they are preferably packed with green hide soaked in oil to prevent the parts from wearing out and to give them a free and easy movement.

The main rod 3 may be angular or circular in cross-section, as desired; but the projecting end thereof is preferably polygonal, and secured to said end are the rigid arm 7 and the spring-arm 8. This rigid arm 7 has one end bent to conform to the shape of two sides of the polygonal end of main rod 3, and the spring-arm 8, which may be made of any suitable spring metal, is tightly clasped to the rigid arm on the under side thereof by a bolt 9, one end of said spring-arm being bent to conform to two sides of the end of main rod 3 similar to the rigid arm. The two arms 7 8 are clasped so tightly on the polygonal end of the pivot-rod that said rod cannot turn in the sockets in the arms 7 and 8, and hence the rod 3 and the guard will oscillate, which

is due to the movement imparted thereto by the arms 7 8. The bolt is screwed very tightly through the arms and it serves to hold them so rigid and close to each other and to the polygonal pivot-rod that the guard will raise or lower as these arms are lowered or raised. To prevent the arms from getting out of proper working position or from becoming displaced laterally in the pivot-rod, we provide a collar or guard 10, which is fitted in the pivot-rod and secured rigidly in position thereon by a set-screw 11, whereby said collar is made to hold the arms 7 8 from moving laterally on the pivot-rod 3 of the guard.

The rear end of the rigid arm 7 has a short projecting lug 12, and to this lug is secured one end of a rod 13, which has its other end attached to the pitman 14, which is operated by the crank on the crank-shaft of the loom, and by this connection the guard is lowered and raised at every revolution of the crank-shaft.

By the construction and arrangement of parts herein set forth we provide a guard which is automatically lowered at the time the shuttle is picked in each direction and raised on the forward movement of the lay, and it positively covers the shuttle when the crank is on top center and the shuttle starts across, and it remains in a position to prevent the shuttle from flying outward or upward until it gets so nearly across to the other side that there is no danger of the shuttle flying out.

In order to make the operation of the guard more effective and certain, we sometimes connect the guard with the pitman on either side of the loom, and this arrangement is especially desirable when the loom is wide, so that the guard will operate evenly and not be strained at points throughout its length. To prevent the guard from falling down on the temples or the warp if it should happen to become loose or disconnected, we provide a bracket or rest 15, secured to the hand-rail or reed-cap 1, which projects downwardly and outwardly, and when the guard is in its lowest position it rests upon this bracket and limits its downward movement.

The ordinary shuttle-guards in common use generally project so much beyond the reed-cap that the hand-rail is often taken off to permit the weaver to "pick out" without striking the fingers against the guard, and the guard only extends down to the top of the shuttle-box, because they are fastened to the hand-rail and their position is rigid and stationary, and if they extended downward any farther the weaver would not get at the shuttle or warp ends. This arrangement is very unsatisfactory and disadvantageous, and to overcome these objections we have arranged and constructed our device so that the guard may be thrown back out of the way by hand without any trouble whatever.

As heretofore mentioned, we make the pivot-rod rectangular in cross-section at its end, and the rigid and spring arms 7 8 are securely

clamped on the end thereof, and by this construction it will be readily seen that in order to throw the guard back out of its normal position it is only necessary to overcome the tension of the spring-arm 8. When the crank is on the bottom center and turning from left to right, the guard is raised sufficiently to permit the weaver to change the shuttles and mend in the warp-threads. Hence it is not necessary to turn the guard by hand above its normal position; but if it is necessary or desirable at any time to turn back the guard it can be easily and quickly accomplished without disarranging in any manner the apparatus.

The operation of our device is obvious from the foregoing description, and it will be readily seen that the guard is elevated when the pitman is in its lowest position and lowered when the pitman is elevated.

We have described our invention as applied to a loom which has its crank-shaft running from left to right; but we do not confine ourselves to this construction, but also contemplate its use on a loom which has its crank-shaft running from right to left, and when so applied the connections are slightly different from that previously described, as shown in Fig. VI. In this case the rod 13 is shortened, as at 13', and connected to the lug on the rigid arm 7 by means of an intermediate piece 16, (shown in Fig. VII,) which is rigidly secured at its ends to the rigid arm 7 and the rod 13, and said piece 16 is pivoted on a fixed support 17, which projects outwardly from a convenient part of the lay. By this arrangement the guard is depressed when the crank is on the bottom center, when the crank rotates from right to left, and the loom is picking from bottom center.

We are aware that changes in the form and proportion of parts and details of construction can be made without departing from the spirit or sacrificing the advantages of our invention, and we therefore reserve the right to make such changes as fall within the scope of our invention.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In an automatic safety device for looms, the combination, with a hand-rail, a lay-beam, a crank-shaft in rear of said beam, and a pitman pivoted at one end to the lay-beam and connected to said shaft at its other end, of the depending guard pivoted on the hand-rail and arranged over and at one side of the lay-beam and the yielding connection between the pitman and pivot of the guard, substantially as and for the purpose shown and described.

2. In an automatic safety device for loom-shuttles, the combination of a pivoted guard, the rigid arm, the spring-arm secured to said rigid arm and forming therewith a bearing for the guard, the lay-pitman, and connections intermediate of the pitman and said

arms to operate the guard, substantially as described.

3. In an automatic safety device for loom-shuttles, the combination of a pivoted guard
5 having the transverse rods, the rigid and the spring arms having their ends shaped to conform to one of the transverse guard-rods, the main crank-shaft of the loom, the pitman, and a rigid connection between the arms and the
10 pitman, substantially as described.

4. In an automatic safety device for loom-shuttles, the oscillating guard having the polygonal stud, combined with the rigid and the spring arms having their ends shaped to
15 conform to the contour of said stud and clamped tightly thereon, the pitman, and the link connecting the arms with the pitman, substantially as described.

5. In a safety device for loom-shuttles, the
20 combination, with a crank-shaft and a pitman, of a lay-beam, the hand-rail, the guard

pivoted on said hand-rail and having the transverse rods and the polygonal stud projecting on one end of the guard, and rigid and spring connections intermediate of the pitman and
25 the guard to automatically operate the latter, substantially as described.

6. In a safety device for loom-shuttles, the combination, with a crank-shaft and a pitman, of a pivoted guard and connections yield-
30 ingly secured to the guard and connected to the pitman to adapt the guard to be lifted by hand above its normal operative position, as and for the purpose described.

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

HERBERT E. HAMILTON.
NAPOLEON BOISVERT.

Witnesses:

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