(No Model.)

Z. T. McKINNEY.

LOOM SHUTTLE RELIEF MECHANISM.

No. 382,995. Patented May 15, 1888.

Fig. 2.

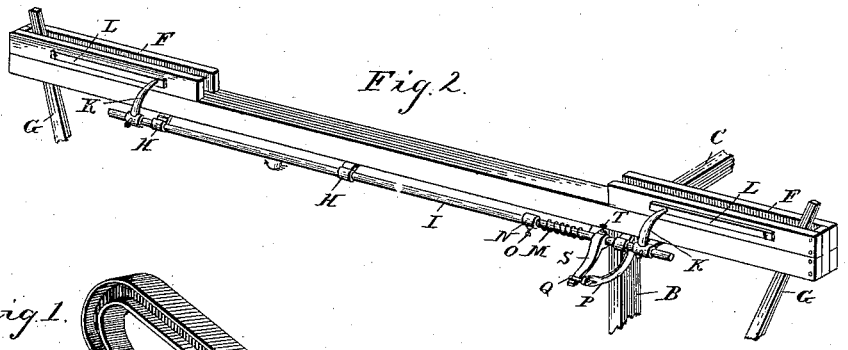


Fig. 1.

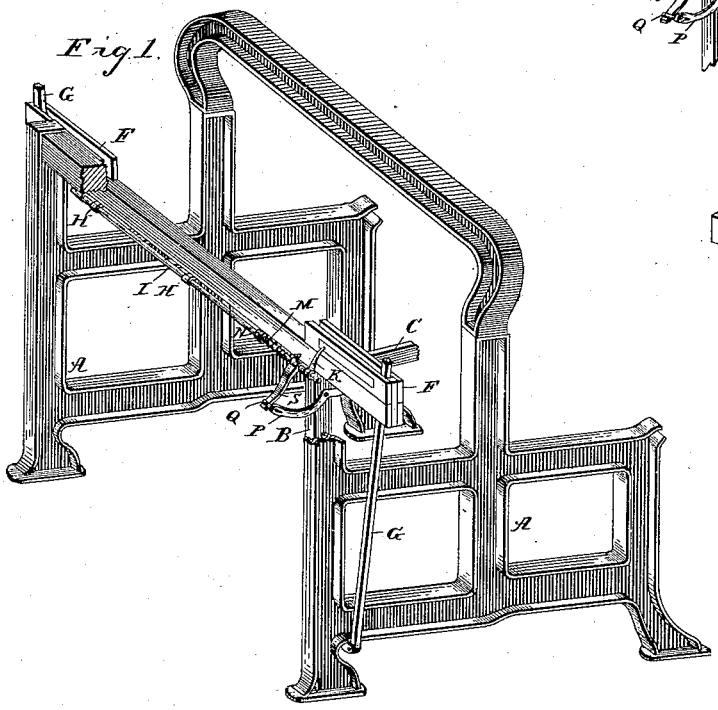


Fig. 5.

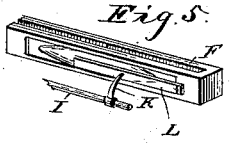


Fig. 4.

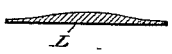
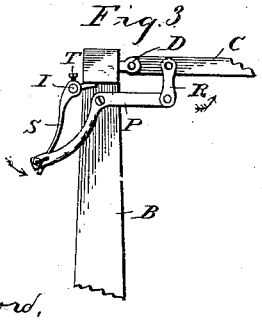


Fig. 3.



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UNITED STATES PATENT OFFICE.

Z. TAYLOR McKINNEY, OF PIEDMONT, SOUTH CAROLINA.

LOOM-SHUTTLE RELIEF MECHANISM.

SPECIFICATION forming part of Letters Patent No. 382,995, dated May 15, 1888.

Application filed November 10, 1887. Serial No. 254,781. (No model.)

To all whom it may concern:

Be it known that I, Z. TAYLOR McKINNEY, a citizen of the United States, residing at Piedmont, in the county of Greenville and State of South Carolina, have invented certain new and useful Improvements in Loom-Shuttle Relief Mechanisms, of which the following is a specification so clear and full as will enable others skilled in the art to which this invention appertains to make and use the same, reference being had to the appended drawings, forming a part hereof.

My invention relates to certain new and useful improvements in looms, the peculiarities of which will be hereinafter more fully set forth in the specification and pointed out in the claims.

As heretofore constructed, a check or guard has been provided for the shuttles used in looms, whereby when the picker-staff strikes the shuttle and sends it from one side to the other of the lay it will be received at the other end in such a manner that it will not strike against the picker-staff at that end and rebound, but its motion will be gradually retarded and it will come to rest without any rebound.

The object of my invention is to construct improved means to release the said checks or guards at a moment just previous to the striking of the shuttle by the picker-staff, whereby the said checks or guards are entirely withdrawn from contact with the shuttles and the latter allowed to be entirely free to be operated upon by the picker-staff, thus avoiding the constant wear and tear upon the shuttle and the shuttle check or guard, and, furthermore, and at the same time, allowing a very much more rapid operation of the machine than has heretofore been permitted, and as a consequence thereof largely increasing the capacity of the machine for work.

In the accompanying drawings, forming a part of this specification, and on which similar letters of reference indicate the same or corresponding features, Figure 1 represents a perspective view of a portion of the general frame of a loom, showing my invention applied thereto and the parts with which it cooperates. Fig. 2 is a detail perspective view of the lay, the shuttle-boxes thereon, and portions of adjacent parts, and showing also my invention in connection therewith. Fig. 3 is a detail end view of a portion of a loom, showing my invention applied thereto. Fig. 4 is a longitudinal sectional view showing more clearly the contour of the inner surface of the spring check or guard; and Fig. 5 is a detail enlarged view of one of the shuttle-boxes, showing the check or guard and its operating-finger, and also a portion of the shaft to which it is connected.

The letter A designates the frame of a loom, the same being of the ordinary or any approved construction, all of the operating parts in the present instance, save those which are necessary to show my invention, being removed.

The letter B refers to the sword, and the letter C to the pitman, the same being pivotally connected to the sword, as shown at D.

To the top of the lay, as more clearly seen in Fig. 2, at each end, I provide shuttle boxes F, and I show the picker staffs G extending therethrough. Extending from the lay in a forward direction, and attached thereto, are the bearings H, one of which is near each shuttle-box and one near the center of the said lay, the purpose of which is to hold the rocking bar or shaft I. Each end of this rock-shaft is provided with a curved finger, K, the same being attached thereto by a set-screw, or otherwise, as may be desired, and extending upwardly and coming in contact at its other end with the check or guard L, as more clearly seen in Fig. 4, and pressing the said check or guard against the shuttle in the shuttle-box. This guard or check is composed, preferably, of spring metal attached at one end to the shuttle-box, its other end remaining free, and, as seen in Fig. 4, it is bulged or enlarged on its inner face, so that the shuttle as it comes in contact with it is impeded more and more the farther it endeavors to force itself into the box.

As seen in Figs. 1 and 2, the rocking bar or shaft is provided with a coiled or other spring, M, one end of which is rigidly secured to the shaft by means of a clamp, N, having a set-screw, O, and the other end of said spring is extended under and abuts against the lower surface of the lay, so that the normal tendency of the bar is to turn in the direction indicated by the arrow in Fig. 2, or, in other words, to

force the operating-fingers K against the checks L. From this it will be seen that the guards or checks are normally forced inwardly or against the sides of the shuttles, so that when the picker-staff strikes the shuttles it must strike with sufficient force not only to send the shuttle to the other side of the lay, but to at the same time overcome the frictional contact of the check with the shuttle, so that the shuttle must be given a blow much more violent than would be necessary were it not held so tightly in place by the check, and still a strong pressure of the check is necessary in order to keep the shuttle when it enters the box from rebounding.

Thus far I have described looms as ordinarily constructed, and it is at this point that my invention comes into play, the object of it being to release the shuttle from the pressure of the spring-guard just a moment previous to the picker's striking it, and at the same time to have the guard at the other end of the lay in such a position when the shuttle reaches that point that the said shuttle will be retarded in its progress and will not rebound. This is accomplished as follows: Pivotally mounted on the sword B is a bell-crank lever, P, carrying at one end a laterally-extending roller, Q, and pivotally connected at its other end to the pitman C by means of the connecting link or rod R. Mounted on the rock-shaft I is what I term a "relief-bar," S, the same being the bar by means of which the pressure of the check upon the shuttle is relieved. This bar is slightly curved, and its lower end is evenly planed, so as to allow the roller R to travel smoothly over it, and is fastened to the rock-shaft I by means of a set-screw, T.

The operation of my invention is as follows: When in the course of the operation of the machine the pitman C receives a forward upward movement, (indicated by the arrow in Fig. 3,) the farther end of the bell-crank lever is thrust downward, (as indicated by the arrow at that point,) and the roller Q moves downward upon the planed surface of the relief-bar, and in this manner gives to the bar I a tilting or rocking motion in a direction reverse to that in which (by the action of the spring M) it normally tends, so that the curved finger K is thrown backward or withdrawn from the spring-guard L and the shuttle is freed from the impingement of the said guard. All this takes place a second or two before it is time for the picker-staff to strike the shuttle, so that when said picker-staff is operated it finds the shuttle free to leave the box. The moment the shuttle leaves the box the pitman C begins to descend and, through the bell-crank lever, the roller travels upwardly upon the relief-bar, and the rock-shaft returns to normal position, and by the time the shuttle has reached the other end of the lay it finds the spring guard or check there pressed inwardly and ready to retard it in its progress.

I have placed this invention on quite a number of looms and I find by actual trial the machines are rendered capable of doing from ten to thirteen per cent. more work in a given time, to say nothing of the saving on the wear and tear on the shuttle, the shuttle-box, and the guard.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a loom, the combination, with the lay, the shuttle check or guard, a shaft having a finger, and a spring in proximity to the shaft which normally presses the finger against the guard, the pitman, and the bell-crank lever connected thereto, of a relief-bar connected to the rock-shaft and constructed to be actuated by the bell-crank lever.

2. In a loom, the combination, with the lay, the shuttle check or guard, a rock-shaft having a finger, and a spring in proximity to the shaft which normally presses the finger against the guard, the pitman, and the bell-crank lever connected thereto and provided at one end with a roller, of a relief-bar connected to the rock-shaft and constructed to be actuated by the bell-crank lever.

3. In a loom, the combination, with the lay, the shuttle check or guard, a rock-shaft having a rod or finger, and a spring mounted in proximity to the shaft to normally press the finger against the guard or check, of a pitman, a bell-crank lever connected thereto and provided at one end with a roller, and a relief-bar connected to the rock-shaft and constructed to be actuated by the bell-crank lever.

In testimony whereof I affix my signature in the presence of two witnesses.

Z. TAYLOR McKINNEY.

Witnesses:
E. J. McCALL,
JAS. F. ILET.