

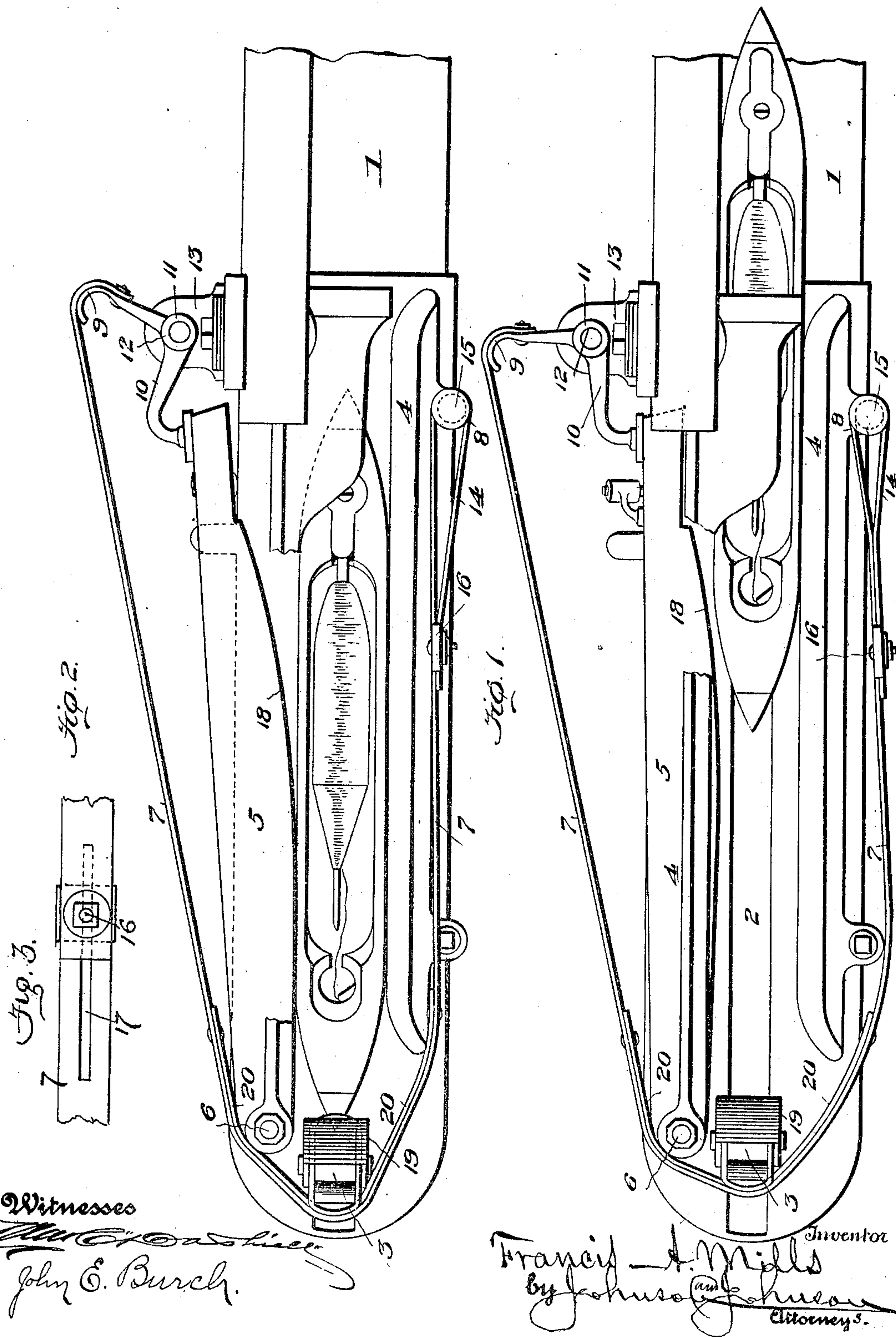
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Patented Aug. 5, 1902.

F. A. MILLS.
SHUTTLE LOCK FOR LOOMS.

(Application filed Feb. 27, 1902.)

(No Model.)



UNITED STATES PATENT OFFICE.

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SHUTTLE-LOCK FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 706,190, dated August 5, 1902.

Application filed February 27, 1902. Serial No. 95,978. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS ARTHUR MILLS, a citizen of the United States, residing at Methuen, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Shuttle-Locks for Looms, of which the following is a specification.

I have produced a shuttle-lock which may be applied to any of the looms in use having a shuttle-binder; and my invention is directed to provision whereby the force of the impact of the shuttle against the picker is caused to actuate the binder, through the instrumentality of a lever device independent of the binder and a strap connecting said lever device and shuttle-box, to lock the shuttle simultaneously with such impact. Referring to the provision for effecting such results, so far as I know and can find I am the first to design an independent lever device adapted to act by impact upon the free inner end of the binder and actuated by a strap connecting one end of said independent lever device with the race-lay, whereby to obtain an effective and instantaneous impact on the free inner end of the binder to lock the shuttle by its impact on said strap at the moment of such impact and allow the release of the binder at the moment succeeding such impact of the shuttle on the strap.

Referring to the drawings, Figure 1 shows in top view the left end of the race-lay of a loom, the shuttle-box thereon, the shuttle-binder, and means embodying one form of my shuttle-lock, the shuttle in the position just entering the shuttle-box. Fig. 2 is an identical view, the shuttle being at the limit of its throw into the box and in contact with the picker, the blow from said contact having actuated means at the same instant to lock the shuttle at the time of such contact. Fig. 3 shows in detail the provision for adjusting the length of the strap for actuating the binder.

In the drawings I have shown so much of a loom as illustrates one way of applying my invention thereto and wherein the shuttle-race lay 1 has the usual slot 2 for the picker-

stick 3, the shuttle-box 4, and the binder 5, pivotally mounted at 6 in the shuttle-box in the well-known way.

In the drawings is shown one means of carrying out my invention, and the following description, read in connection with the accompanying drawings, will enable any one skilled in the art to which my invention relates to understand its nature and to practice it in the form in which I prefer to employ it; but it will be understood that my invention is not limited to the precise form, construction, and arrangement of the parts herein illustrated and described, as various modifications and changes may be made without exceeding the scope of the claims in which my invention is set out.

The invention which constitutes the subject of this patent is carried out by means which I will now state.

A strap 7, arranged around the end of the shuttle-box, is connected at one end 8 to the side wall of the box or lay at or near the inner end of the box and at its other end to a pivotally-mounted device on the other side of the box or lay. This device is an independent impact-pressure bell-crank lever, to one of the arms 9 of which the strap is fastened. The other arm 10 is in free contact with the free end of the shuttle-binder, the hub 11 of the device being loosely seated on a vertical stud 12 in a bracket 13, fixed on the lay. This causes the lever device to act by impact against the free end of the binder by means of the strap. That end of the strap which is connected to the lay I prefer to make of loop form 14 and seat it on a stud 15, extending from the box, the end of the loop being adjustably fastened to the strap to lengthen or to shorten the strap to stop the shuttle at any desired point in the shuttle-box. This is effected by tightening the strap more or less, and for this purpose a simple provision is the screw-clamp 16, the screw passing through a slit 17 in the strap, which operates the pressure-lever. The end 9 of the lever device to which the strap is fastened forms a convex bearing to prevent the wear of the strap. It is the adjustment of the strap that gives the

important advantage of stopping the shuttle at any desired point in the box.

It will be understood that the tighter the strap the tighter will be the pressure of the binder upon the shuttle. This advantage is especially important in what is known as the "magazine" loom in the patent to Northrop, No. 529,940, dated November 27, 1894, in which it is necessary that the shuttle be stopped at a given point for the purpose of transferring a bobbin from the magazine. I have described the strap as being short, and I mean by this that there is a separate strap for actuating each binder, and this and the independent lever devices are the elements that give the quick-locking action to the binder.

Looking at Fig. 1 it will be seen that the shoulder of the shuttle entering the box is about to strike the swell 18 of the binder and in doing so will force it out, and thereby push the pressure-arm 10 out from its normal position (seen in Fig. 1) to the position seen in Fig. 2, and thereby pull upon the strap in a direction opposite to that caused by the impact of the shuttle against the picker. In these movements it will be understood that the bell-crank lever is pulling upon the strap while the shuttle is going into the box and will continue to pull upon the strap until the shuttle strikes the picker, and on such impact the strap will then pull the lever suddenly in the opposite direction, thereby causing the bell-crank-lever device to press with an impact blow upon the binder and the binder upon the shuttle, thereby locking the shuttle by its impact against the picker 19. As a result of this simultaneous impact of the shuttle upon the picker and the binder upon the shuttle there can be no rebound of the shuttle. As a further result of this shuttle-lock after the impact has been delivered and the shuttle at rest and about to be thrown to the other side of the loom the shuttle is free from pressure of the binder after its impact upon the picker, because at the precise time of the impact the locking of the shuttle is effective, and it is at this instant that the strap is pulled taut by the impact of the shuttle against the picker. The strap after the impact of the shuttle against the picker becomes free from tension, and therefore allows the binder to release its tension upon the shuttle, and the latter is therefore free of pressure and can be thrown with much less power than with shuttles held by frictional contact.

To prevent the wear and chafing of the strap at the points of contact and impact, it

is reinforced by a wear-strap 20, which can easily be replaced.

Referring to Fig. 1, it will be noted that the strap is loose, and the binder is therefore loose and the picker-stick sustained in its normal position by the strap ready to receive the impact of the shuttle and to yield with the strap under such impact, while in Fig. 2 the strap is seen under tension by the shuttle's impact driving the picker backward with the strap.

The essential feature of my invention resides in the provision by which a lever device independent of the binder is caused by the impact of the shuttle on a short strap to exert a direct or impact pressure on the inner free end of the binder to throw it inward against the shuttle to lock it.

I claim—

1. A shuttle-box, a picker, a pivoted binder, a lever device pivoted on the box independent of the binder and a strap passing around the shuttle-box and having its ends connecting the lever device and the box in the manner for the purpose stated.

2. In a loom and in combination the shuttle-box, the picker, a pivoted binder for the box, a strap passing around the shuttle-box and fixed at one end to the box, and a lever device pivoted to the box at the free end of the binder, said lever device having an arm connected to the other end of the strap and an arm having a free bearing upon the free end of the binder, for the purpose stated.

3. A shuttle-box, a picker, a binder, a strap passing around and connected at one end to the lay, a device pivotally mounted on the lay connected to the other end of the strap and having an arm adapted to be forced with an impact pressure against the inner free end of the binder, whereby the strap receives and imparts the force of the impact of the shuttle to the said pivoted device and thence against the free end of the binder.

4. A shuttle-box, a picker, a binder, a strap connected at one end to the lay, a bell-crank lever mounted upon the lay having one arm connected to the other end of said strap, the other arm of said lever bearing on the free end of the binder and means for adjusting the length of the strap whereby to render effective the lock of the binder upon the shuttle at any point of its throw into the box.

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

FRANCIS ARTHUR MILLS.

Witnesses:

A. E. H. JOHNSON,
T. H. YEAGER.