

G. W. & J. C. Duckworth, 2 Sheets, Sheet 1.

Loom.

No. 97,175.

Patented Nov 23 1869.

Fig. 1

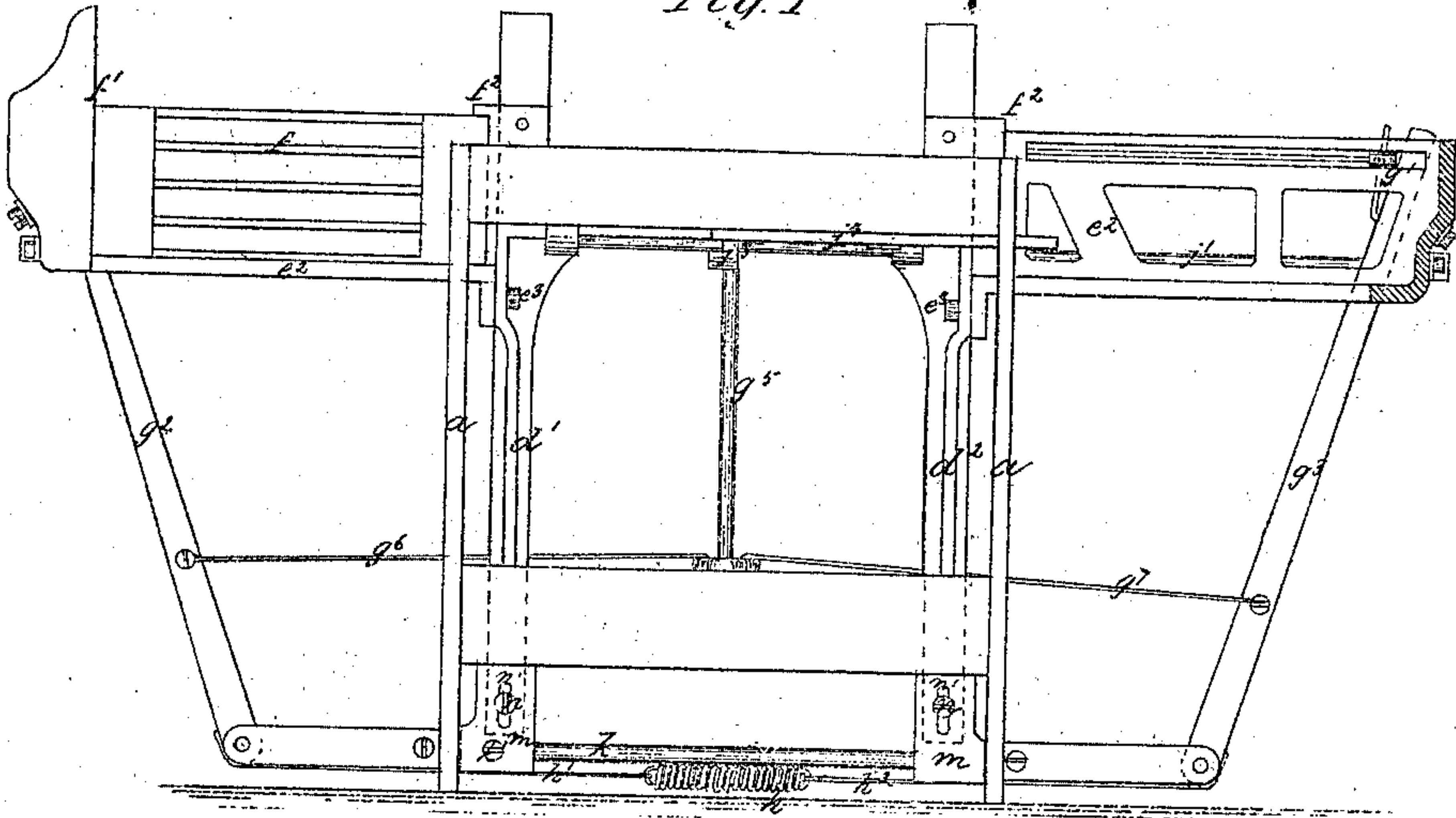
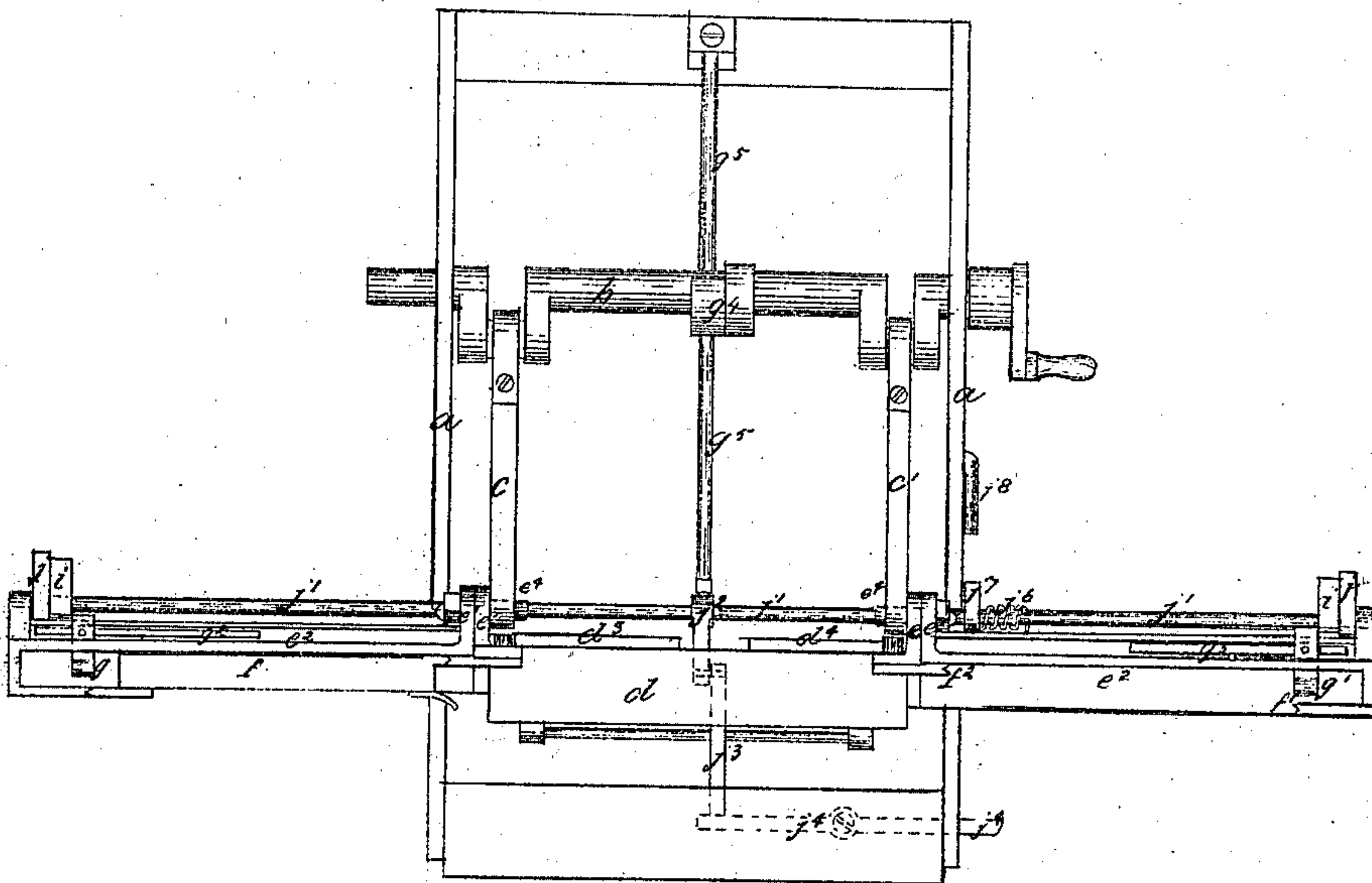


Fig. 2



Witnesses.

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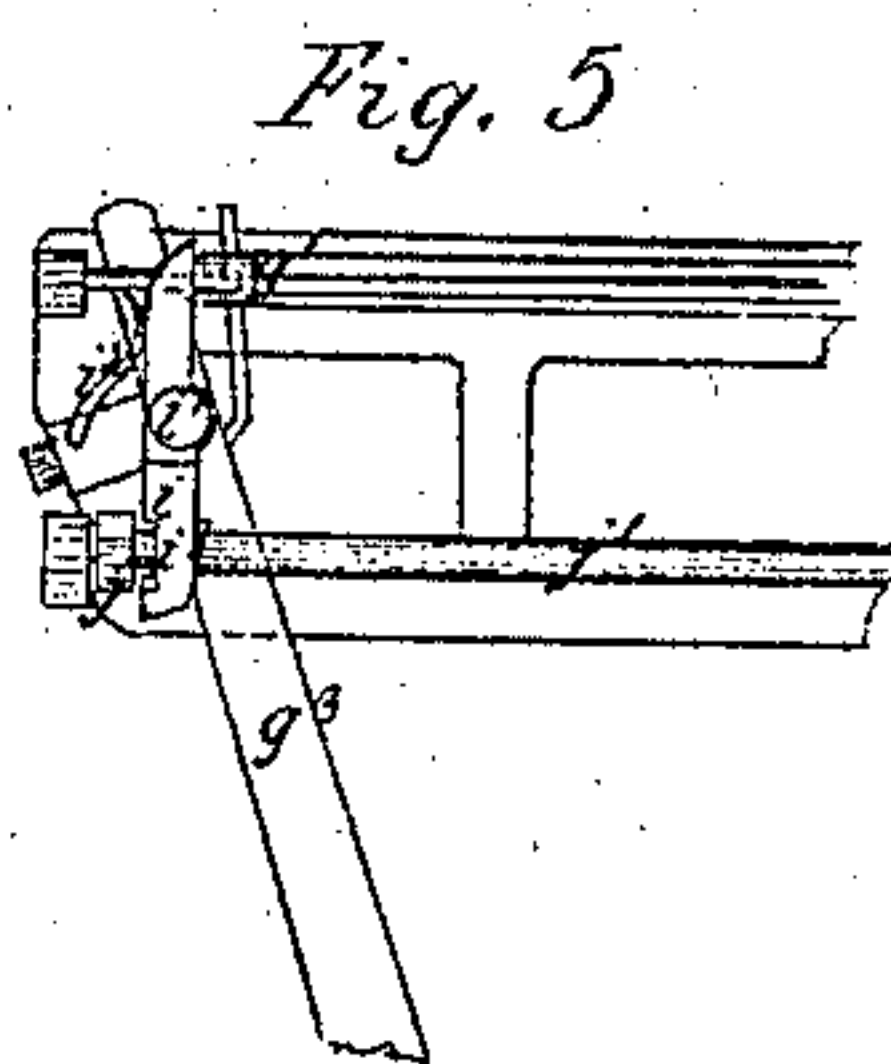
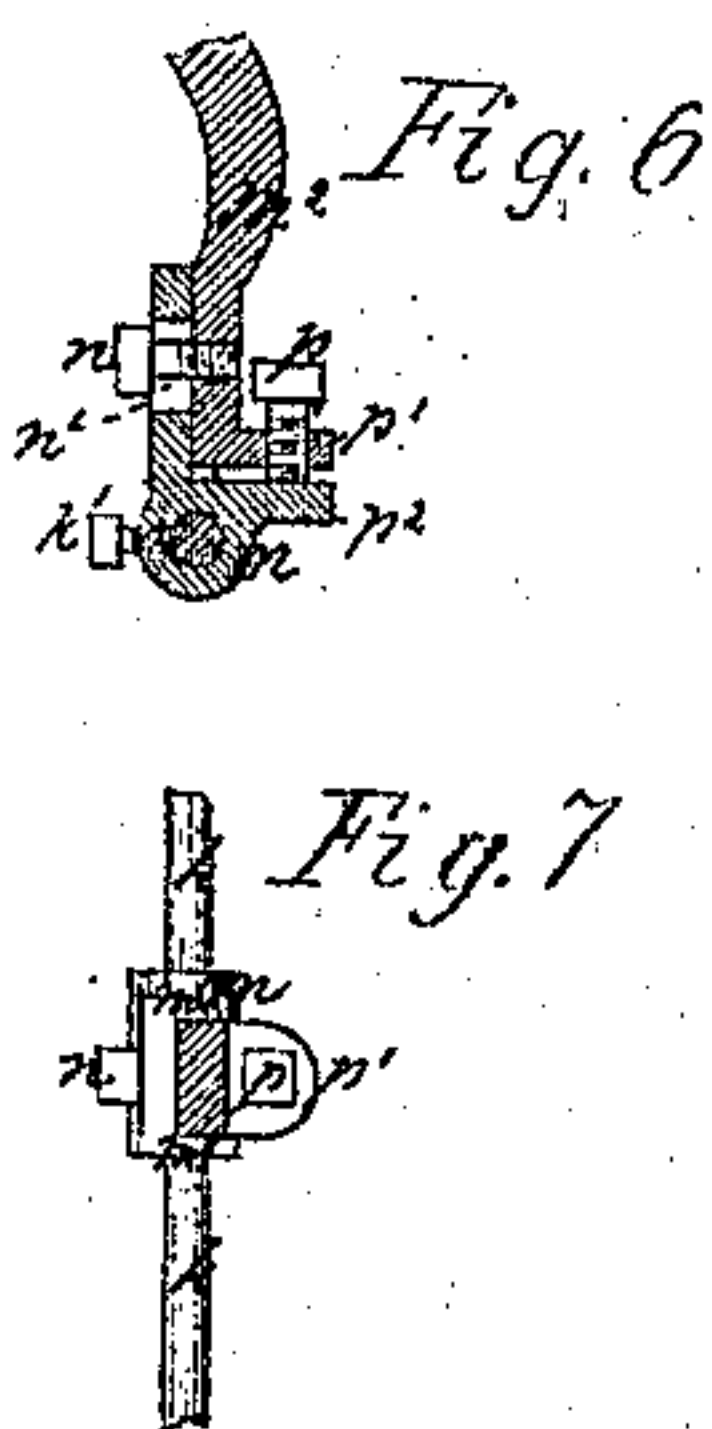
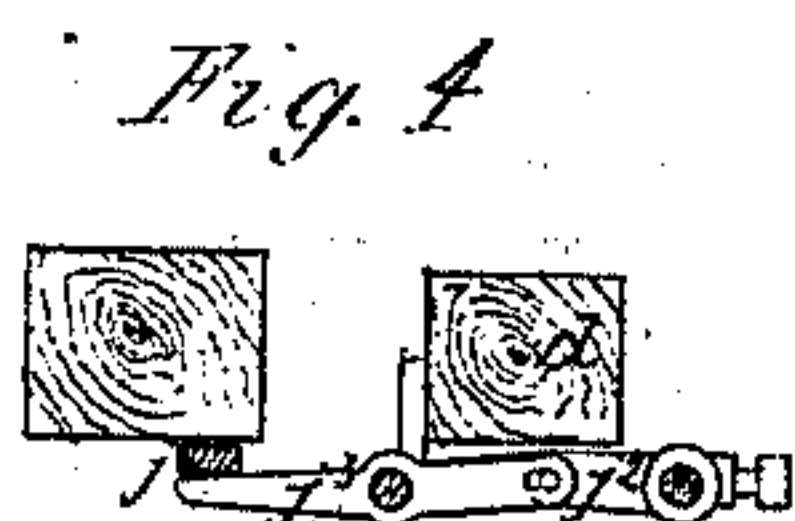
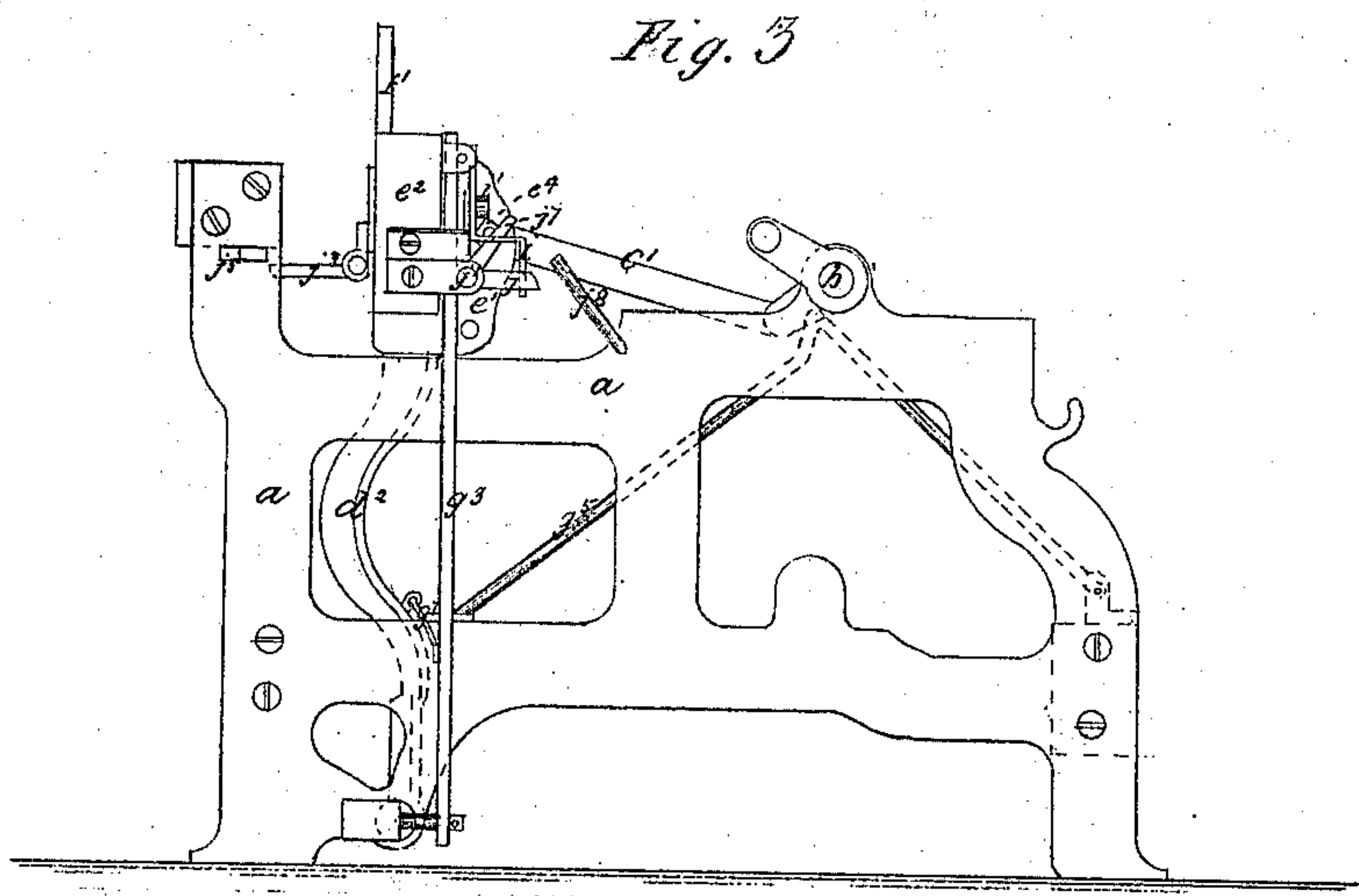
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GEORGE DUCKWORTH, WILLIAM DUCKWORTH, JAMES DUCKWORTH, AND
JOHN C. DUCKWORTH, OF PITTSFIELD, MASSACHUSETTS.

Letters Patent No. 97,175, dated November 23, 1869.

IMPROVEMENT IN LOOMS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that we, GEORGE DUCKWORTH, WILLIAM DUCKWORTH, JAMES DUCKWORTH, and JOHN C. DUCKWORTH, of Pittsfield, in the county of Berkshire, and State of Massachusetts, have invented certain new and useful Improvements in Power-Looms; and we do hereby declare that the following is a full and correct description thereof, reference being had to the accompanying drawings, and to the letters of reference thereon.

Our invention relates to looms which have shifting shuttle-boxes that move up and down at the ends of the lay, to shift the shuttles.

The first part of our invention consists in combining with a picker or pickers used with shifting shuttle-boxes that move up and down at the ends of the lay, a protecting-mechanism, which operates to stop the loom whenever the picker fails to withdraw from the shifting shuttle-box after it has thrown the shuttle, so that the shuttle-boxes cannot be moved when obstructed by the picker, and breakage of parts of the loom is thereby prevented.

Our invention also consists of a means of adjusting the lay-swords, substantially as hereinafter described.

But more particularly to describe our invention, we will refer to the annexed drawings, which represent a frame and portions of the mechanism of a loom embodying our invention.

Figure 1, of the drawings, represents a front elevation of the loom;

Figure 2, a plan view, and

Figure 3, a side elevation of the same.

Figure 4 is a detached cross-section, through the lay and breast-beam, showing a portion of the picker-protector.

Figure 5, a detached rear view of one of the ends of the lay, showing a portion of the picker-protector.

Figures 6 and 7, vertical and cross-sections of the adjustable connection of the lay-swords.

Letter *a* represents the frame; *b*, the crank-shaft; *c c'*, connecting-links; *d*, the lay.

The lay-swords *d¹ d²* are of cast-iron, the heads projecting upward above the lay, and have brackets *d³ d⁴*, projecting inward, to which the lay is secured by screws, or in any suitable manner.

On the outside of each of the lay-swords is cast a flange or seat, *e*, to which is fitted a corresponding flange or seat, *e¹*, upon the inner end of each of the cast-iron frames *e² e³*, which receive and hold the shuttle-boxes, and are secured to the lay-swords, by suitable bolts and nuts, through the said flanges.

One of the screw-bolts used to fasten the end frames to the swords may be placed as shown at *e⁴*, fig. 1; and

another may be a shoulder-bolt, *e⁴*, fig. 2, with a projecting pin to connect with the lay-connecting rods.

The end frames are both attached, in the same manner, to the lay-swords at the end of the lay.

The shifting shuttle-boxes *f* are cast in one piece, and move up and down, when required to shift the shuttles, in slides *f¹ f²*.

In figs. 1 and 2, the shifting shuttle-boxes are only shown on one side of the loom, being omitted from the other side to show more clearly the construction of the end frames and the operation of the picker.

The pickers *g g¹*, one for each end of the lay, are driven, as usual, by picker-staves *g² g³*, which receive motion in one direction, to throw the shuttle, from a cam, *g⁴*, upon the crank-shaft *b*, through a lever, *g⁵*, and picker-straps *g⁶ g⁷*.

The spring *h* and straps *h¹ h²* throw back the picker-staves, to withdraw the pickers from the shifting shuttle-boxes after the shuttle is thrown, so as to permit the shuttle-boxes to move up or down, as required, which they could not do if the pickers were not withdrawn, because the pickers work in stationary horizontal guide-slots, through the end frames of the lay, which hold the shifting shuttle-boxes.

To prevent breakage, in case the picker fails to withdraw, which frequently happens, we have contrived and applied to the picker a protecting-mechanism, as follows, viz:

Upon the back of each of the end frames of the lay, a spring-catch is placed, composed of a vibrating bent lever, *i*, pivoted at *i¹*, and actuated in one direction, by a spring, *i²*, and in the other by the picker, when it is withdrawn from the shuttle-box.

The lower arm of each of the spring-catch levers *i* is bent backward and downward, and notched, at *i³*, to receive, respectively, the ends of two short arms *j*, one at each end of the lay, attached to a horizontal shaft, *j¹*, supported in bearings at the back of the lay, and extending the whole length of the lay.

An arm, *j²*, attached to the middle of the shaft *j¹*, operates a vibrating lever, *j³*, which extends forward from the lay, in such position as to pass just under the breast-beam when the lay beats up, and either strike the vibrating lever *j⁴*, pivoted to the under side of the breast-beam, or clear it, as it happens in the working of the protector.

The vibrating lever *j⁴* extends outside of the loom, through a slot, *j⁵*, in the frame, where the spring-handle of the belt-shipper of a loom is usually placed, and if this lever is struck by the lever *j³*, carried by the lay, it will, of course, throw off the belt-shipper and stop the loom, as in like mechanism used for filling thread-protectors in looms.

A helical spring, j^6 , upon the shaft j^1 , keeps down the point of the lever j^3 , so as to clear the lever j^4 , when the protector is not required to operate.

When the pickers are thrown back out of the shifting shuttle-boxes, as they should be, they press against the spring-lever catches i , and prevent them from engaging with the short arms j , attached to the horizontal shaft, but should either of the pickers fail to be withdrawn at the proper time from the shifting shuttle-boxes, its protecting spring-catch will engage with the short arm next to it, and thereby hold up the point of the lever j^3 , so as to cause it to strike the lever j^4 and throw off the belt-shipper, or, at all events, to stop the loom before the shuttle-boxes commence to move up or down.

The horizontal shaft and its arms and levers are brought into position to engage with the spring-catches to stop the loom, at every back-beat of the lay, after the shuttle has been thrown and sufficient time has elapsed for the withdrawal of the picker, by an arm, j^7 , attached to the horizontal shaft j^1 , coming in contact with a stop, j^8 , projecting from the lower frame.

It will be observed that the protecting-mechanism herein described is similar in construction and mode of operation to that used for thread-protectors and shuttle-protectors in looms, the novelty of our invention consisting in combining a protecting-mechanism with a picker.

The advantage gained by our picker-protection is not confined to saving breakage, but it enables looms having shifting shuttle-boxes to be safely run at a higher rate of speed.

Figs. 6 and 7 show the adjustable connection of the lay-swords with their rock-shaft.

Each of the lay-swords is connected with its rock-shaft k by means of a casting, m , secured to the rock-shaft k by a pinching-screw, k' .

The casting m is formed with lips m^1 at each side, to receive the ends m^2 of the lay-sword, the lay-sword being secured to the casting by a screw-bolt, n , a slot, n' , in the casting, permitting of vertical adjustment of the lay-sword. So far this construction is well known.

In order to conveniently adjust the lay-swords, and to keep them up in case the screw-bolt should slip in the slot, we have improved this connection by the introduction of the adjusting-screw p , held by a flange, p^1 , at the lower end of the lay-sword, and acting against a flange, p^2 , upon the casting k .

By the use of this adjustment, one man can readily adjust the lay, and breakage or injury is saved if the screw-bolts, which secure the lay-swords to their connecting-seats, should slip.

We claim—

1. In combination with the pickers of a loom having shifting shuttle-boxes, a protecting-mechanism, substantially as described, whereby the loom is stopped when a picker fails to withdraw from a shifting shuttle-box at the proper time to permit it to be shifted.

2. In combination with the lay-swords, the adjustable connections and adjusting-screws, substantially as described.

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Witnesses:

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