R. B. GOODYEAR.

Shuttle-Box Operating Mechanisms

No. 144,089. Patented Oct. 28, 1873.

FIG. 1.

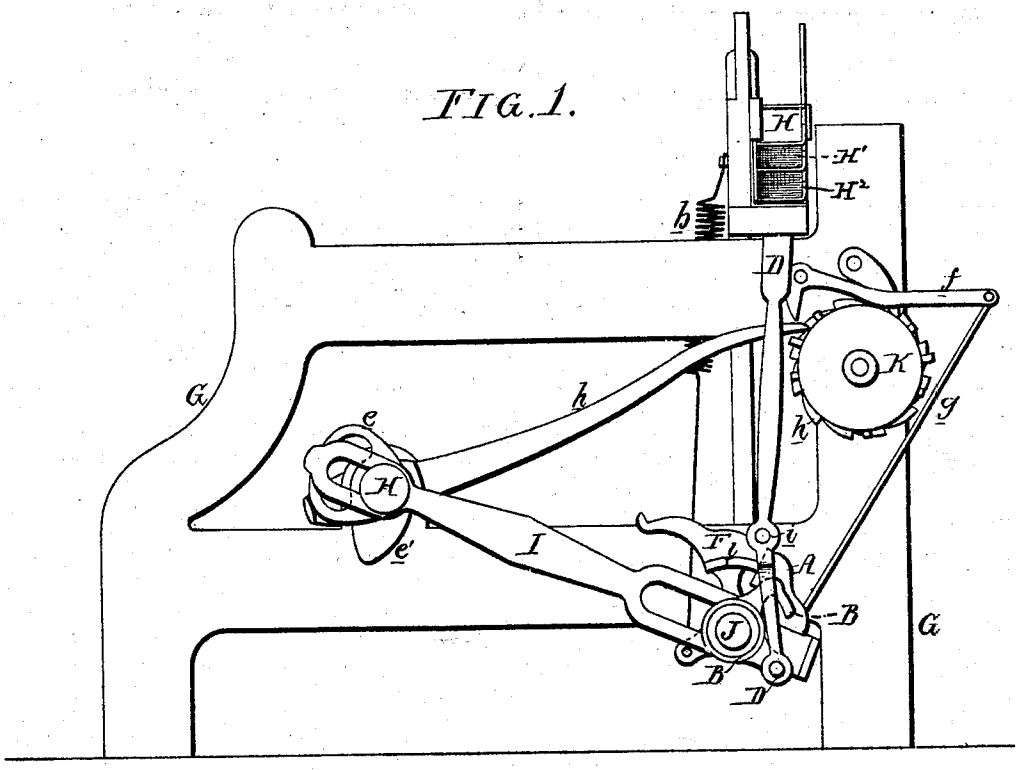


FIG. 2.

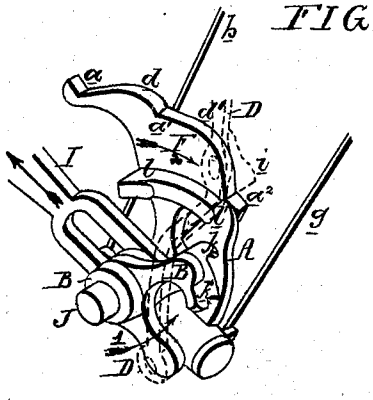
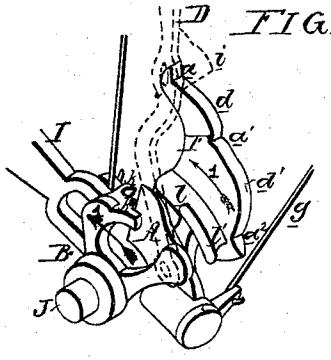


FIG. 3.



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by his Attys.
Howson and Son.

UNITED STATES PATENT OFFICE.

ROBERT B. GOODYEAR, OF WILMINGTON, DELAWARE, ASSIGNOR TO HIMSELF AND JOHN GREENHALGH, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN SHUTTLE-BOX-OPERATING MECHANISMS.

Specification forming part of Letters Patent No. **144,089**, dated October 28, 1873; application filed August 29, 1873.

To all whom it may concern:

Be it known that I, ROBERT B. GOODYEAR, of Wilmington, New Castle county, State of Delaware, have invented an Improvement in Drop-Box Looms, of which the following is a specification:

The object of my invention is to effect the various adjustments of the drop-boxes of looms through the medium of simple mechanism, and without the usual jerking and rattling movement of the parts. I attain this object by the combination of a pawl, A, operated from the cam-shaft of the loom, and controlled in its movements by a pattern wheel or chain, with two stepped levers, B and F, to the former of which is hung a rod, D, for sustaining the drop-boxes, the said rod being elevated by the lever B, and sustained, after each adjustment, by one of the shoulders *a* of the lever F, which is acted on by a spring, *b*, or its equivalent, and being eased in its descent by the cam-like inclines *d* of the said lever F, when the latter is pushed back by the pawl A, all as plainly shown in the side elevation, Figure 1, and perspective views, Figs. 2 and 3, of the accompanying drawing.

My invention will be fully understood from the following detailed description of its construction and operation.

G represents one of the side frames of the loom, and H the cam-shaft, on which are two cams, *e* and *e'*, the former of which imparts a reciprocating movement to a rod, I, guided at its outer slotted end by the same fixed pin J to which the stepped levers B and F are hung, the said rod extending between the two levers, and sustaining at its extreme outer end the pawl A, which is vibrated in either direction, according as it is required to act upon one or the other of the stepped levers, by a pattern-wheel, K, through the medium of a lever, *f*, and connecting-rod *g*, the said pattern-wheel deriving its movement, through a pawl and ratchet, *h*, from the cam *e'* on the cam-shaft. The drop-boxes H, of which there are three in the present instance, (see Fig. 1,) act upon the upper enlarged end of a rod, D, which is connected, at its lower end, to one arm of the bell-crank lever B, and has a projection, *i*, overhanging the cam-like portion of the lever F. (See Figs. 2 and 3.) Upon the other arm of the bell-crank lever B are formed two steps, *k* and *k'*, similar steps *l* and *l'* being formed upon a projection of the lever F; and the portion of the latter overhung by the projection *i* of the drop-box rod is so shaped as to form three abrupt shoulders, *a*, a^1, and a^2, between which are two cam-like inclines, *d* and *d'*. Both of the levers B and F are hung loosely to their fulcrum-pin J, and both are turned in the direction indicated by the arrows 1, Fig. 3, although not simultaneously, by the pawl A, which is directed toward one or other of the steps *k* or *l*, according to the movement required. The lever B is turned in a direction the reverse of that indicated by the arrows 1 by the weight of the drop-boxes through the medium of the rod D, while the lever F has a constant tendency to turn in the same reverse direction, owing to the action of its spring *b*.

In Figs. 1 and 2 the highest box, H, is opposite the shuttle-race, to obtain which adjustment the pawl A has been turned to such a position by the pattern-wheel and its connections as to be directly opposite the step *l'* of the lever F, so that when the said pawl and its rod I were moved in the direction of the arrow 3 the said lever F should be turned in a corresponding direction to the extremity of its movement, the projection *i* of the rod D slipping gradually over the cam-like incline *d'*, and permitting a correspondingly gradual descent of the boxes by their own weight, until the said projection rested upon the shoulder a^2, as shown; and during this same movement the lever B was, owing to the descent of the shuttle-boxes, turned in a direction the reverse of that of the lever F, to the extremity of its movement, or to the position shown in Fig. 2.

If, after this, it were required to bring the lowest shuttle-box, H^2, opposite the race, the pawl A, when drawn back, would, by means of the pattern-wheel, be turned to such a position as to strike the shoulder *k'* of the lever B when moved forward; and in such case the said lever B would be turned to the extremity of its movement in the direction of the arrow 1, lifting the rod D and the shuttle-boxes, and permitting the lever F, owing to the action of its spring, to turn in the reverse direction, as

indicated by the arrow 2, until the projection *i* of the box-rod rested upon the shoulder *a*, by which the said rod and boxes would be sustained, as shown in Fig. 3, during the movement of the parts to effect the next adjustment.

When the second box, H^1, is opposite the shuttle-race, the weight of the whole number of boxes, and of the rod, is sustained by the shoulder a^1 of the lever F, the latter, whenever the boxes are raised, slipping under the projection *i* of the box-rod, and facilitating the adjustment of and sustaining the same after adjustment, while, when the lever F is pushed back by the pawl, its inclines *d*, over which the projection *i* slides, ease the descent of the boxes, and prevent the usual sudden jerking and jarring of the parts caused by the dropping of the boxes.

If, at any time, the pawl A, owing to imperfect adjustment, were to engage with and push back both levers at once, neither could be injured, as the boxes would be simply raised by the lever B, and the lever F, acted on by its spring or weight, would yield until the pawl was retracted.

In applying my invention to a loom having more than three boxes, the number of steps, and of inclines and shoulders, on the levers B and F would have to be correspondingly increased.

I claim as my invention—

1. In a drop-box loom, the combination, substantially as described, of a pawl, A, controlled by a pattern wheel or chain, the stepped lever B, and the rod D, supporting the drop-boxes, and hung to and deriving its upward movement from the said lever B.

2. The combination, substantially as described, with the drop-box rod D, of the lever F, acted on by a spring or weight, and formed with a series of cam-like inclines and shoulders for facilitating the proper adjustment of the said rod, and for sustaining the same after adjustment.

3. In a drop-box loom, the combination, substantially as described, of the stepped lever B, the stepped cam-lever F, the pawl A, controlled by a pattern wheel or chain, and the drop-box rod D, hung to the said lever B.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ROBT. B. GOODYEAR.

Witnesses:

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