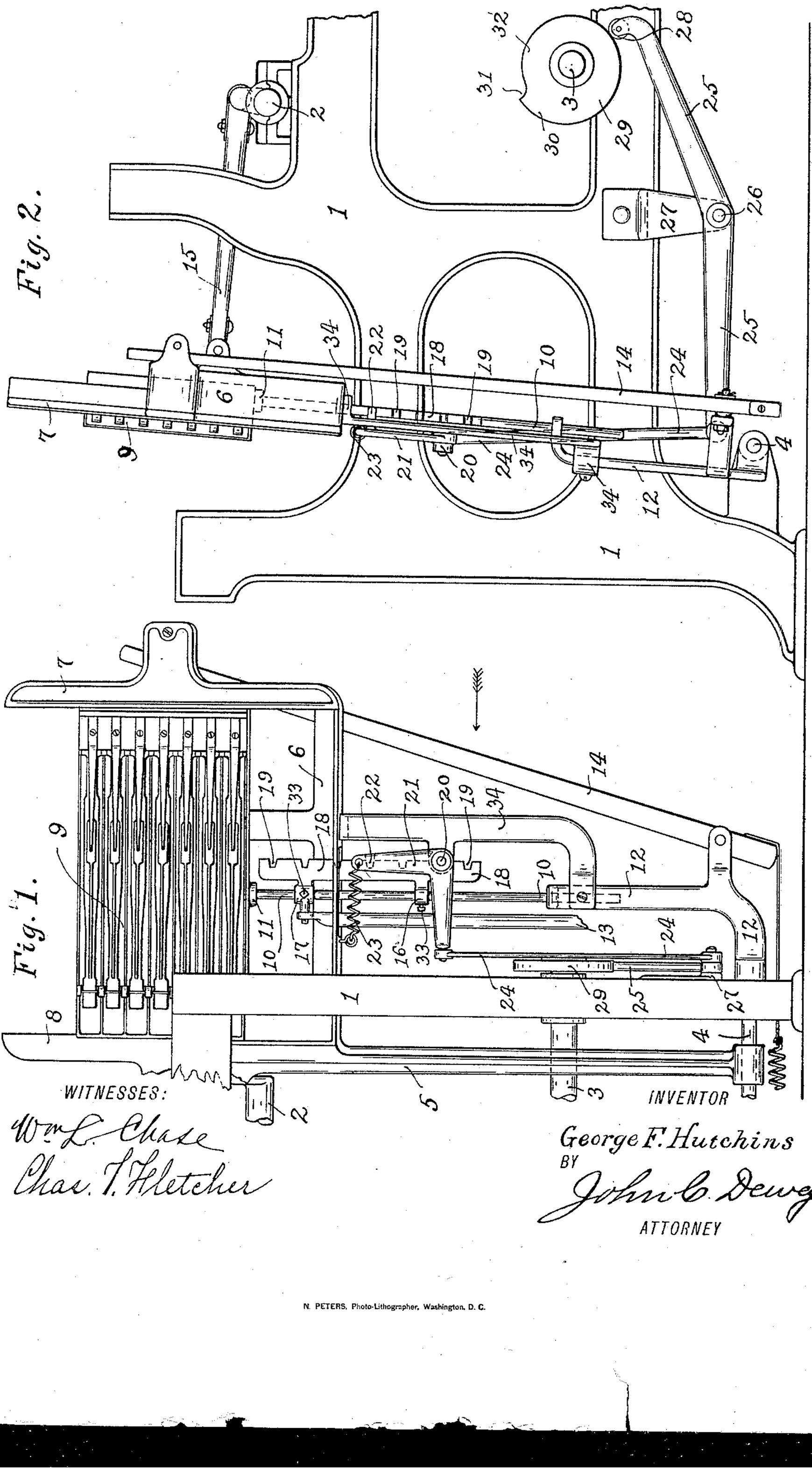
(No Model.)

G. F. HUTCHINS.

SHUTTLE BOX LOCKING DEVICE FOR LOOMS.

No. 411,197. Patented Sept. 17, 1889.



UNITED STATES PATENT OFFICE.

GEORGE F. HUTCHINS, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO THE KNOWLES LOOM WORKS, OF SAME PLACE.

SHUTTLE-BOX-LOCKING DEVICE FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 411,197, dated September 17, 1889.

Application filed April 6, 1889. Serial No. 306,204. (No model.)

To all whom it may concern:

Be it known that I, GEORGE F. HUTCHINS, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Shuttle-Box-Locking Devices for Looms; and I do hereby declare that the following is a full, clear, and exact description thereof, which, in connection with the drawings making a part of this specification, will enable others skilled in the art to which my invention belongs to make and use the same.

My invention relates to looms, and more particularly to the drop-box mechanism of looms.

The object of my invention is to stop the vibration in the shuttle-box caused by the shifting of the boxes, and to correct any error in the alignment of the shuttle-box shelves with the race-plate of the lay, which exists to a greater or less extent in all box-shifting mechanisms, and also at the proper time to lock the box-shelf rigidly at the level of the race-plate.

My invention consists in a supplementary attachment adapted to be applied to drop-box mechanisms of looms of ordinary construction, by means of which the drop-boxes are locked in position at the proper time after they are shifted and released preparatory to their shifting in the manner to be hereinafter fully described.

Referring to the drawings, Figure 1 represents in side elevation a portion of a loom with my invention applied thereto; and Fig. 2 represents some of the parts shown in Fig. 1, looking in the direction of the arrow, same figure.

In the accompanying drawings, 1 is the loom side; 2, the crank-shaft; 3, the bottom shaft, and 4 the lay-pivot shaft.

5 is the lay-sword, omitted for sake of clearness in Fig. 2.

6 is the projecting lay end, fitted with slides 7 and 8, in which moves freely the tier of shuttle-boxes 9.

10 is the shuttle-box lifter and guide-rod, attached rigidly to the boxes at 11, and sliding freely in a hole in the top of the rocker-arm 12.

13 is the lifter-connector through which motion is communicated to the lifter-rod and shuttle-boxes from the box-shifting mechanism. (Not shown, but which may be of any common and well-known construction and operation.)

14 is the picker-stick.

15 is the crank-connector through which the lay is oscillated on its pivot by the crank-shaft.

All the parts above mentioned are constructed, arranged, and operated in the usual manner.

Fastened upon the lifter-rod 10, by means of set-screws 33 in hubs 16 and 17, is a plate 18, which has in its outer edge a series of slightly-beveled notches 19, equal in number to the cells in the tier of shuttle-boxes 9, in this instance seven.

Pivoted at 20 upon an arm 34, which is secured to the projecting lay end 6 and also to the rocker-iron 12, is a bell-crank lever 21, the upright arm of which carries a projection 22 (see Fig. 2) to engage and enter the notches 19 in the plate 18. Said projection 22 is forced into the notches 19 when one is presented opposite to it by means of a coil-spring 23, attached at its inner end to the upright arm of the bell-crank lever 21 and fastened at its outer end to the lay end 6. Connector 24 joins the horizontal arm of the bell-crank lever 21 to a lever 25, pivoted at 26 on a stand 27, bolted to the loom side. (See Fig. 2.) The opposite end of the lever 25 from the connector 24 carries a roll 28, which bears upon a cam 29, fast upon the bottom shaft 3. The cam 29 is so shaped and so timed with reference to the box-shifting mechanism and other parts of the loom that when the shifting mechanism operates the roll 28 is on the high part 30 of the cam 29, which, through lever 25 and connector 24, raises the horizontal arm of the crank-lever 21 and disengages the projection 22 from the notches 19 and allows the boxes to be shifted. Just at the point of completion of the action of the shifting mechanism the drop 31 in the cam 29 allows the spring 23 to operate to draw over the upright arm of the bell-crank lever 21 and cause the projection 22 to enter into a notch 19 in the locking-plate 18. The low part 32 of the cam 29 allows the spring 23 to hold the projection

22 in its notch until the loom has picked and the shuttle is settled in the opposite box, when the cam 29 gradually operates crank-lever 21 and lifts the projection 22 out of its notch 19 in time for the locking-plate 18 to be free for the next box-shift.

In quick-running looms, and particularly with heavy boxes necessary to secure a large number of cells, considerable difficulty is experienced in getting the box properly seated in time for the pick. This difficulty is augmented in boxes containing a large number of cells by making long skips in shifting the boxes, owing to the momentum acquired during the motion of the box.

My locking device effectually overcomes all tendency of the box to throw beyond its proper place or to rebound, thus keeping the box steady and rigid for the pick and reducing the chances of the shuttle flying out of the shed or of failing to promptly and smoothly enter its opposite box.

My device also serves to correct any error in the throw of the box-shifting mechanism, from which, owing to imperfection in the fitting and wear and the rock of the lay, no box mechanism is practically free, and which is greatly increased with a large number of cells to be operated.

It frequently happens that the distances between the shelves in shuttle-boxes are not exactly alike, owing to imperfections in the pattern or in molding and to unequal contraction of the metal in cooling; but by making the notches 19 in the locking-plate 18 the same distance apart as the shuttle-box shelves I am enabled to correct this inaccuracy also.

I do not limit myself to the special construction of the locking device shown and described, the details of construction of which may be varied somewhat if desired.

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

In a loom, the combination, with a tier of shuttle-boxes, a lifter, and guide-rod, of a locking-plate, a locking-arm, an operating-spring and operating-cam, and connections intervening between said cam and locking-arm, substantially as set forth.

GEORGE F. HUTCHINS.

Witnesses:
JOHN C. DEWEY,
HENRY H. YOUNG.