(No Model.) 2 Sheets—Sheet 1.

A. SINCLAIR.

SHUTTLE CHANGING MECHANISM FOR LOOMS.

No. 428,322. Patented May 20, 1890.

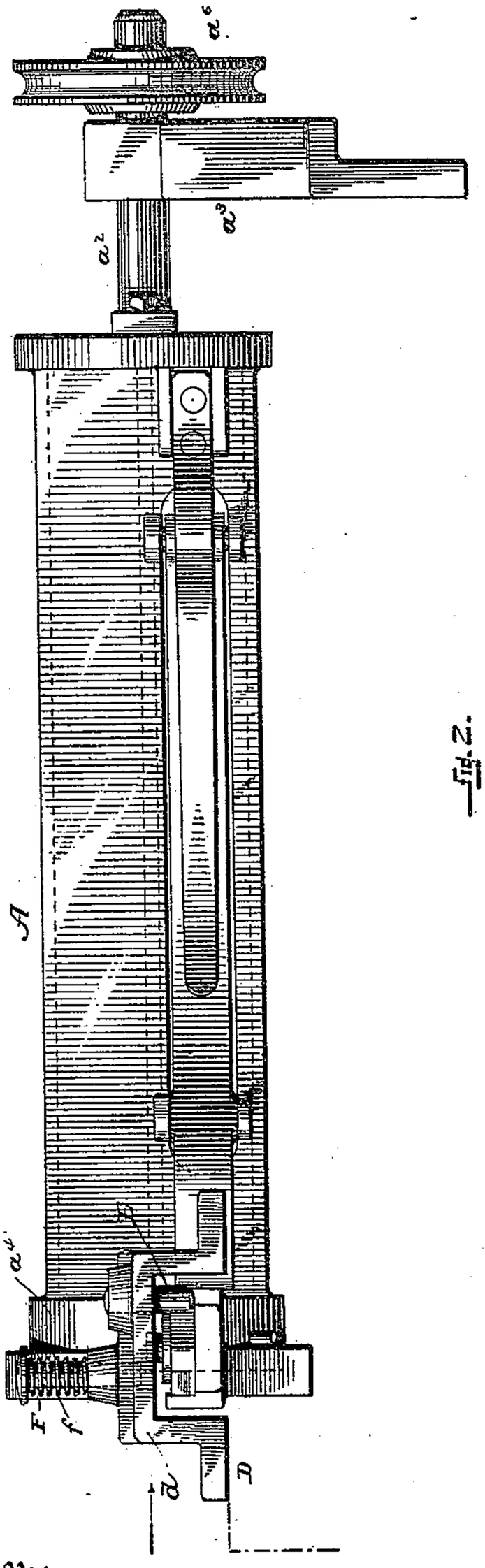

Fig. 1.

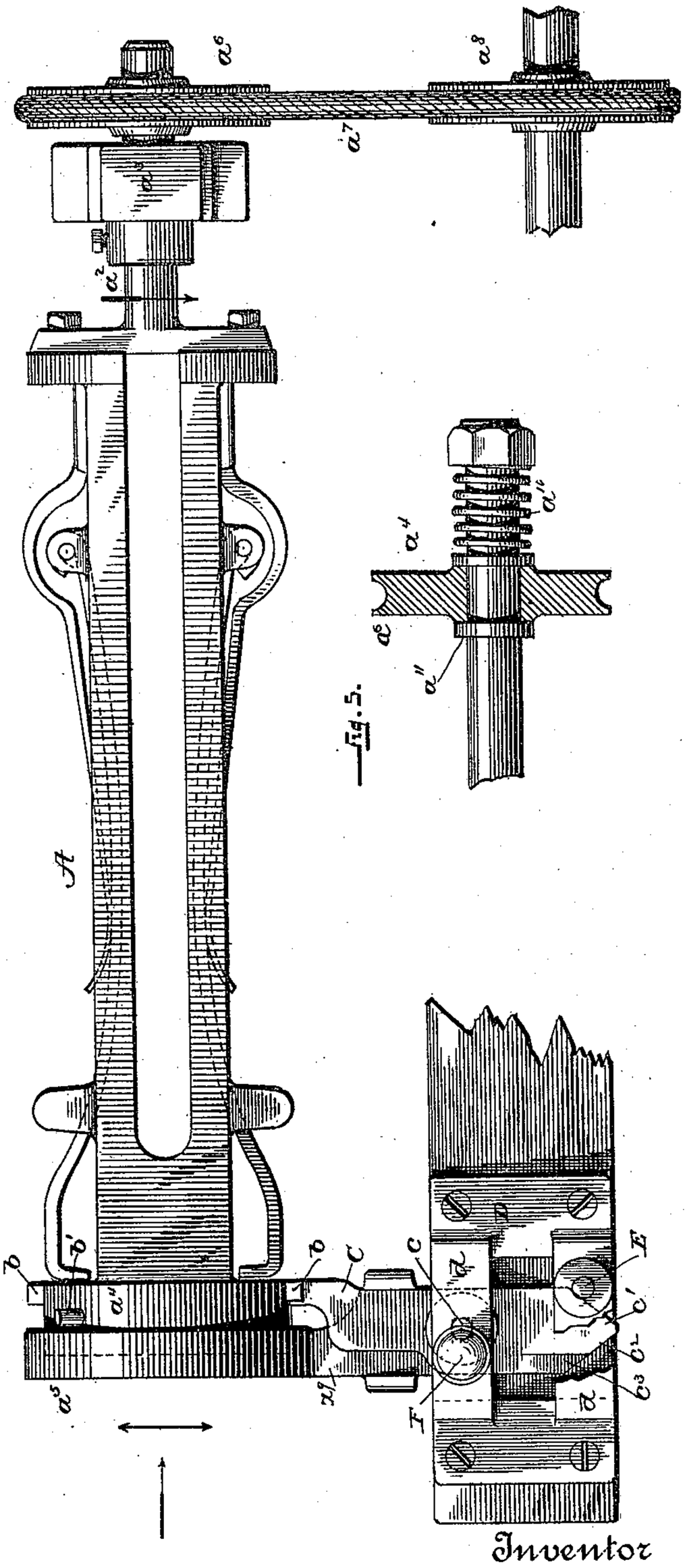

Fig. 2.

Fig. 5.

Witnesses
W. W. Mortimer.
H. A. Kennedy.

Inventor
Alexander Sinclair
By his Attorney
Phil. T. Dodge.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

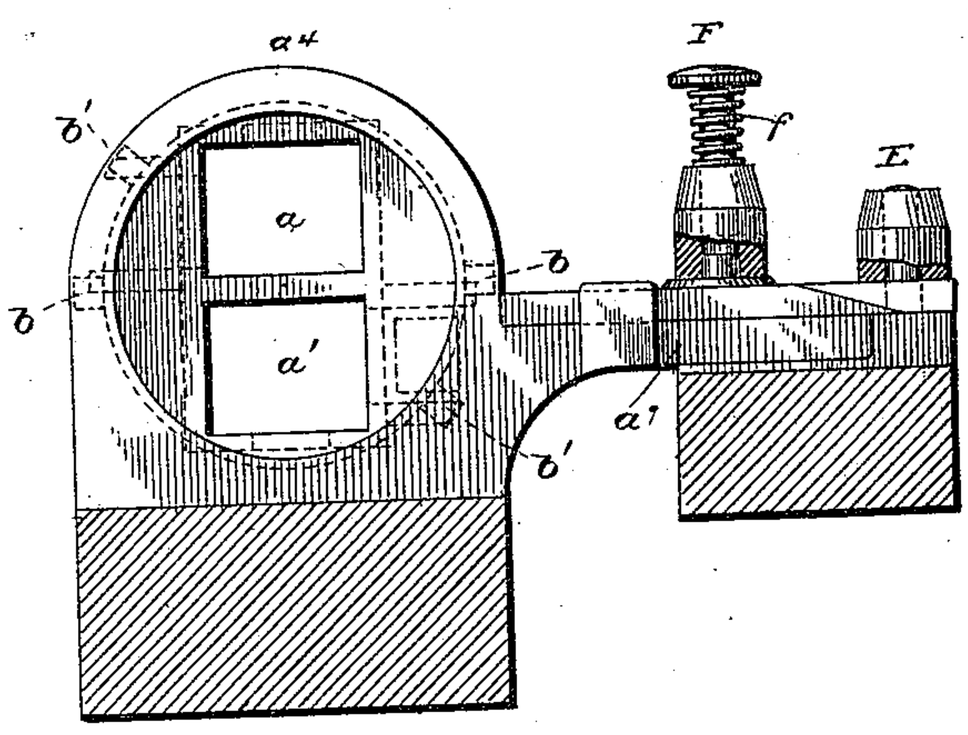
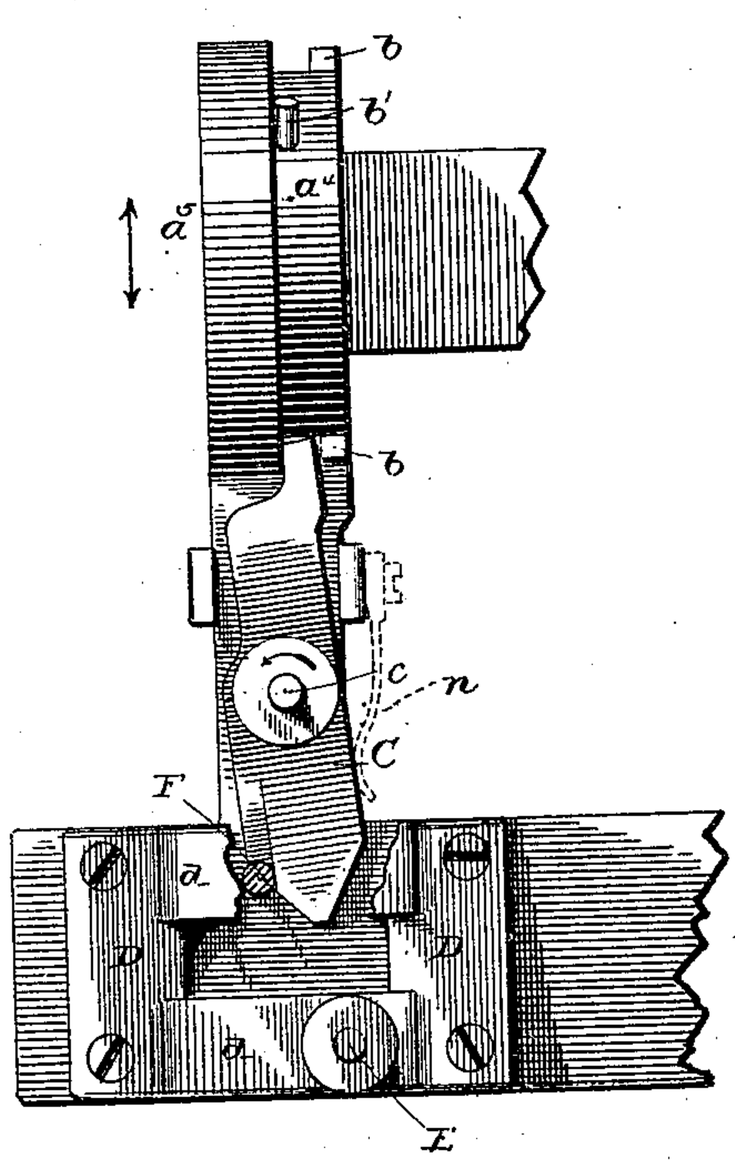


Fig 4.



Witnesses

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H. A. Kennedy.

Inventor

Alexander Sinclair

By his Attorney

Phil. T. Dodge.

UNITED STATES PATENT OFFICE.

ALEXANDER SINCLAIR, OF SMITHVILLE, NEW JERSEY, ASSIGNOR, BY MESNE ASSIGNMENTS, OF ONE-HALF TO ROBERT W. MARTIN, OF PHILADELPHIA, PENNSYLVANIA.

SHUTTLE-CHANGING MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 428,322, dated May 20, 1890.

Application filed June 8, 1888. Renewed April 17, 1890. Serial No. 348,314. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER SINCLAIR, of Smithville, in the county of Burlington and State of New Jersey, have invented certain Improvements in Shuttle-Changing Mechanism for Looms, of which the following is a specification.

This improvement is intended more particularly for application to looms employed for plain weaving, and its object is to enable the operator to bring a second shuttle quickly into operative position after the thread of the first is exhausted and without stopping the loom.

To this end it consists, essentially, of a revolving shuttle-box adapted to receive two or more shuttles, a frictional driving mechanism which tends constantly to revolve the box, and stop devices to be operated by hand, whereby the attendant may at will release the box and permit it to turn a sufficient distance to bring the full shuttle into operative position.

As my device is adapted for application to ordinary looms without change therein in other respects, and as its operation is not dependent upon the other parts of the loom, I have represented in the drawings only such features as are immediately associated with my invention.

In the accompanying drawings, Figure 1 represents a front elevation of my shuttle-box and its operating devices. Fig. 2 is a top plan view of the same. Fig. 3 is an end elevation of the same, looking in the direction indicated by the arrows in Figs. 1 and 2. Fig. 4 is a plan view illustrating the manner in which the stop devices are disengaged to permit the rotation of the shuttle-box. Fig. 5 is a sectional view illustrating a modified form of the frictional driving devices.

Referring to the drawings, A represents the tubular shuttle-box constructed, as shown, with two longitudinal cells or chambers a and a', each adapted to receive a shuttle. At its outer or rear end the shuttle-box is provided with and sustained by a horizontal shaft or journal a^2, mounted in a bearing-plate a^3, secured rigidly to the lay of the loom. At its opposite or forward end the box is formed with and sustained by a circular flange a^4, seated and arranged to revolve in an annular plate a^5, which is also bolted or otherwise secured rigidly to the lay. Thus sustained the box is free to revolve around a horizontal axis, so that its chambers $a\,a'$ will be brought alternately in position to present their respective shuttles to the picker or other propelling device. The journal a^2 is provided with a pulley a^6, which is connected by a driving-belt a^7 with a continuously-revolving driving-pulley a^8, which may be operated in any suitable manner, either by connection with the loom or with independent driving mechanism, the manner of mounting and driving this pulley forming no part of my invention. The belt is adjusted to act upon the pulley a^6 with such degree of friction as to insure instantaneous rotation of the shuttle-box when it is released, but to permit it to slip upon the pulley whenever the shuttle-box is held at rest by the stop devices hereinafter described. Instead of having the belt slip upon the pulley, the latter may be connected to its shaft by means of a friction-coupling of any ordinary character. Various friction devices suitable for the purpose are already known in the art. One simple device is that shown in Fig. 5, in which the pulley a^6, acted upon on one side by a spiral spring a^{10}, is forced thereby against a collar a^{11}, formed on the shaft at the opposite side of the pulley. It is to be understood that the essence of the invention in this regard lies in combining with the rotary shuttle-box frictional driving devices which tend constantly to effect its rotation, so that when released its movement will occur without delay.

For the purpose of arresting and releasing the box and properly limiting each movement to a half-revolution, I provide its flange a^4 at diametrically-opposite points with two studs b, and also in advance of each stud b and in a different vertical plane with studs b'. From the plate a^5, in which the end of the box revolves, I extend a horizontal rigid arm a^9, and on

this arm I mount a stop lever or detent C, adapted to turn horizontally around a vertical pivot *c*, by which it is connected to the sustaining-arm. At the outer or forward end this stop-lever is beveled sidewise or pointed, as shown at *c'* and c^2. It is also provided with an inclined portion c^3, extending from its upper surface downward to the lower face, where it intercepts the beveled edge c^2. It is to be observed that all the foregoing parts are carried by and moved forward and backward with the lay.

To effect the engagement and disengagement of the stop-lever, I mount on the frame of the loom or in any other rigid support a plate D, having raised or arched portions *d*, in such position that the stop-lever C will be carried endwise beneath them as the lay swings forward. In one of these raised portions I secure a pin E, the lower end of which stands in position to encounter the beveled edge *c'* of the stop-lever as the lay completes its forward motion. Between this stud E and the shuttle-box I mount in the plate D a vertically-movable tripping-pin F, acted upon by a spring *f*, which holds it normally in an elevated position with its lower end above the level of the stop-lever C. This pin stands, however, in such position that if depressed before the end of the trip-lever reaches it it will act on the beveled face c^2 of the lever.

The operation of the device is as follows: The parts stand normally in the position shown in Figs. 1, 2, and 3, the lever C lying beneath one of the studs *b*, thereby holding the shuttle-box so that it cannot be revolved by the frictional driving devices. The trip-pin F being at this time in its elevated position is inactive, and the trip-lever is permitted to pass freely to and fro thereunder as it is carried back and forth with the lay without being effected thereby. During this operation the thread or filling is lead from the shuttle in the lower chamber into the fabric. The operator without stopping the motion of the loom at his leisure inserts a filled shuttle into the upper chamber of the box. When the thread of the lower bobbin is exhausted, the operator merely depresses the trip-pin F at or about the time that the lay begins to swing forward. As the lever C is carried forward by the lay its face c^2 encounters the trip-pin, whereby it is caused to turn to the position shown in Fig. 4, thereby disengaging the stud *b* and passing into the path of the succeeding stud *b'*, whereupon the friction devices instantly revolve the shuttle-box until the stud *b'* encounters the lever, as shown in Fig. 4, the box making somewhat less than half a revolution. As the lever is moved by the trip-pin F its inclined surface c^3 is brought in line with the pin, and, riding thereunder, lifts the pin out of engagement and to its original position. Immediately thereafter the beveled face *c'* of the lever encounters the stud E, which acts to turn the lever horizontally to its original position out of engagement with the stud *b'* and into engagement with the succeeding stud *b*, whereby the shuttle-box is permitted to turn slightly forward and complete its half-revolution, thereby bringing the full shuttle into operative position. The parts having now assumed their original positions remain unchanged until the operator again depresses the trip-pin to bring another shuttle, inserted in the meantime into the box, into operative position. The lever, in connection with the two pairs of studs, serves as an escapement by which more than a half-revolution of the box is prevented.

When preferred, a spring may be employed in any suitable manner as a substitute for or in addition to the stud E as a means of returning the stop-lever or latch to its normal position. One application of a spring for this purpose is indicated by dotted lines at *n*, Fig. 4, the spring being made of flat form, fastened at one end to the arm which supports the stop-lever and arranged to act at its free end against the edge of said lever.

While I prefer to retain the details of construction herein shown, it is manifest that they may be modified within the range of mechanical skill provided substantially the same mode of action is retained.

I am aware that in looms intended for weaving figured fabrics it is old to employ rotary shuttle-boxes combined with automatic mechanism for effecting their rotation at predetermined times, and this I do not claim. I believe myself to be the first, however, to combine with a rotary shuttle-box a driving mechanism and manual stop devices by which the operator may at will release the box and permit its rotation.

Having thus described my invention, what I claim is—

1. In a loom, the combination of the rotary shuttle-box having a series of shuttle chambers or pockets, with the frictional driving devices tending constantly to turn the same, the stop device to prevent its rotation, and the manual trip to release the stop device at the will of the attendant.

2. In a loom, the combination, substantially as described, of the lay, the rotary shuttle-box thereon, the frictional driving devices for the box, the stop devices to hold the box against rotation, a stationary support, and a movable trip on said support to actuate the stop, whereby the attendant is enabled to cause the rotation of the box at will during the forward movement of the lay.

3. The lay, the rotary shuttle-box thereon, the stop-lever to prevent the rotation of the box, and driving devices to turn the box, in combination with a stationary support and a movable trip mounted thereon to engage the stop-lever as the latter is carried forward with the lay.

4. In combination with the lay and rotatable shuttle-box thereon, and mechanism to rotate the box, a stop mechanism to control

the rotation of said box, consisting of the studs *b b'* on the shuttle-box, the lever C, having the rear end provided with the inclines c^2 and c^3, a stationary support, a stud E or its described equivalent, for returning the stop-lever to its normal position, and a movable trip-pin F to throw the stop-lever out of engagement.

5. In a loom, a rotary shuttle-box having two or more shuttle-receiving pockets or chambers, in combination with a frictional driving device tending constantly to turn the same, and a movable stop to prevent its rotation.

In testimony whereof I hereunto set my hand, this 30th day of April, 1888, in the presence of two attesting witnesses.

ALEXANDER SINCLAIR.

Witnesses:
C. C. STUART,
WM. S. KELLEY.