No. 619,017. Patented Feb. 7, 1899.

J. H. FERGUSON.

BELT SHIFTER.

(Application filed July 15, 1898.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

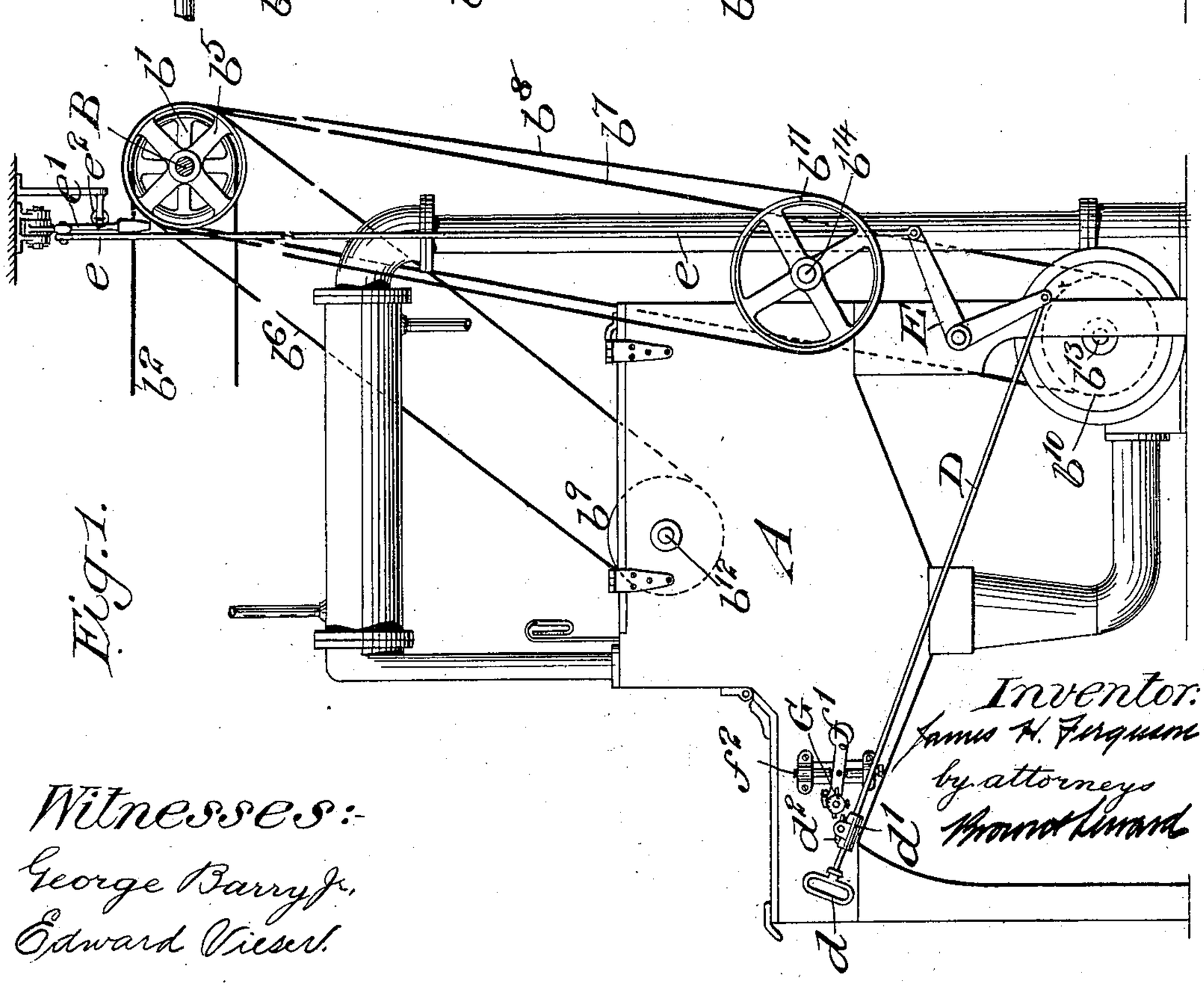

Fig. 2.

Witnesses:-
George Barry Jr.
Edward Viesel.

Inventor:
James H. Ferguson
by attorneys
Brown & Linard

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Fig. 4.

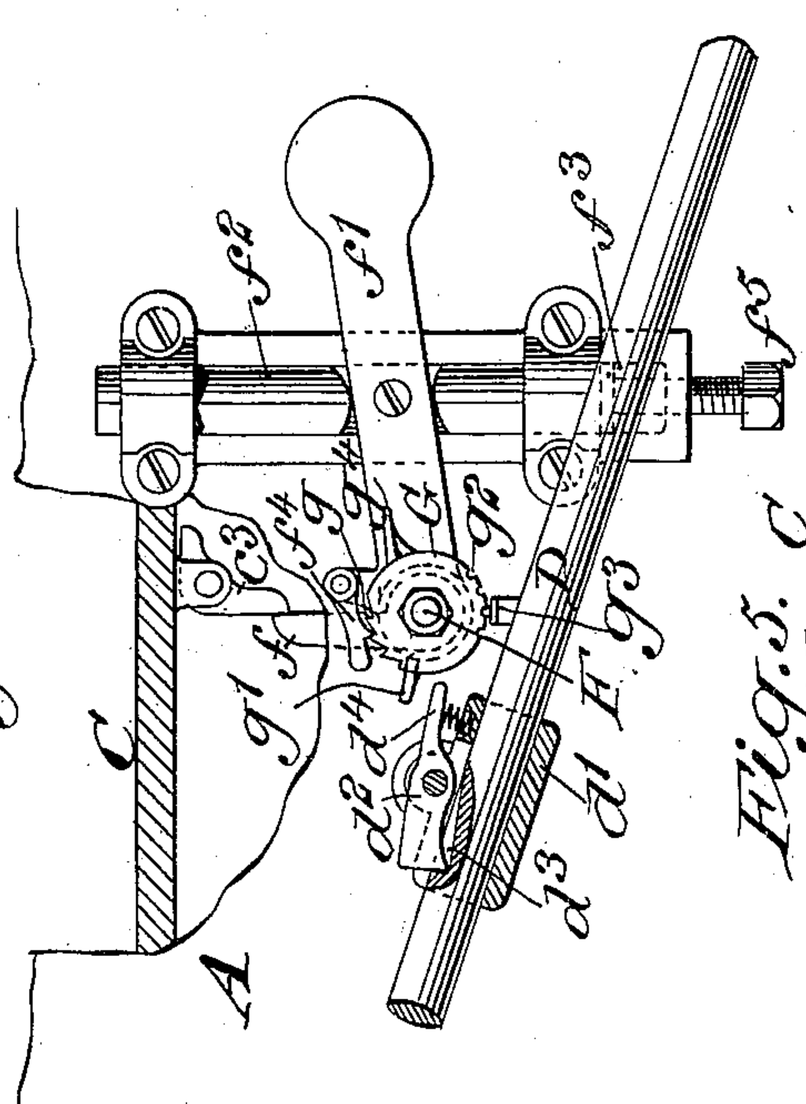

Fig. 5.

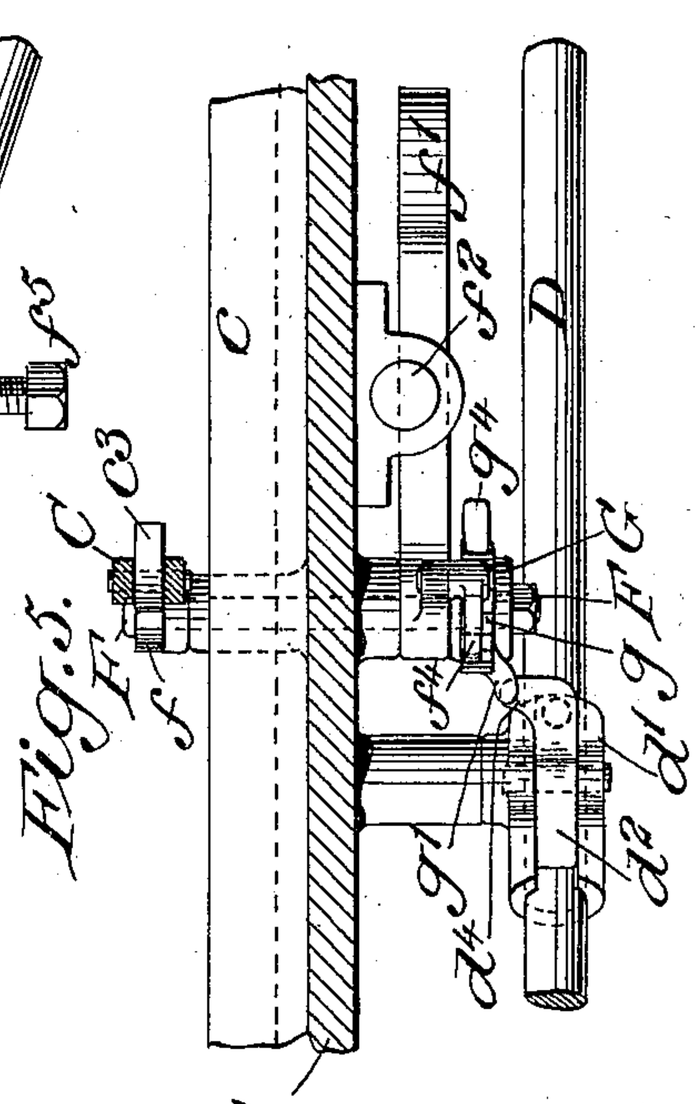

Fig. 3.

Witnesses:
George Barry Jr.
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Inventor:
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UNITED STATES PATENT OFFICE.

JAMES H. FERGUSON, OF NEW YORK, N. Y., ASSIGNOR TO THE LOVEJOY COMPANY, OF SAME PLACE.

BELT-SHIFTER.

SPECIFICATION forming part of Letters Patent No. 619,017, dated February 7, 1899.

Application filed July 15, 1898. Serial No. 686,022. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. FERGUSON, a citizen of the United States, and a resident of New York, in the county of Kings and State of New York, have invented a new and useful Improvement in Belt-Shifters, of which the following is a specification.

The object of my invention is to provide a belt-shifter which is under the control of a tripping mechanism, whereby the main driving-belt of any machine may be shifted from the fast pulley onto the loose pulley at a predetermined time during the operation of the machine.

A practical embodiment of my invention is represented in the accompanying drawings, in which—

Figure 1 represents a side view of a leading-machine with my improved belt-shifter applied thereto. Fig. 2 is a front view of the same. Fig. 3 is a horizontal section through the machine, parts of the same being broken away to more clearly show the reciprocating carriage and its operating mechanism. Fig. 4 is an enlarged side view, partially in section, of a portion of the belt-shifter and its operating mechanism; and Fig. 5 is a top plan view of the same.

A designates the casing of a leading-machine, and B represents the main drive-shaft. Fast and loose pulleys b b' are mounted on the shaft B and a main driving-belt b^2 leads to a suitable source of power. (Not shown.) Upon this main drive-shaft B are mounted pulleys b^3 b^4 b^5, which pulleys are engaged by belts b^6 b^7 b^8, leading to pulleys b^9 b^{10} b^{11}, mounted on the different shafts of the machine. The pulley b^9 is mounted on the brush-operating shaft b^{12} of the machine. The pulley b^{10} is mounted on the blower-operating shaft b^{13} of the machine, and the pulley b^{11} is mounted on the cross-shaft b^{14}, which drives the carriage-reciprocating shaft b^{15}.

The carrier for supporting the molds is denoted by C, which carrier is adapted to travel backward and forward on suitable side rails or tracks c within the casing A. This carrier is provided with a traveling switch-nut c', which engages the right and left screw-threaded portion c^2 of the shaft b^{15}, so that as the shaft is rotated the carrier will be reciprocated.

The mechanism which I have shown for shifting the main driving-belt for stopping the rotation of the shaft B, and thereby stop the operation of the machine, is as follows: A belt-shifter rod D is located upon one side of the casing A, exterior thereto, and is connected at its rear end to an angle-lever E, from which a rod e leads to a belt-shifting lever e', engaged with the driving-belt b^2. The rod D is provided with a suitable handle d at its forward end and near its forward end is mounted to slide in a suitable bearing d'. A spring e^2 engages one arm of the shifting-lever e' and exerts its force in a direction tending to shift the driving-belt b^2 from the fast pulley b onto the loose pulley b' for stopping the machine when the belt-shifter rod D is released. The rod D is held at the limit of its forward movement by means of a suitable spring-actuated pawl d^2, which is adapted to engage a notch d^3 in the rod D. The pawl d^2 is provided with a tailpiece d^4, which is adapted to be engaged by the tripping mechanism for releasing the pawl from the notch d^3.

The tripping mechanism above referred to consists of the following parts: A short shaft F is mounted to rock in suitable bearings in the side of the casing A, a portion of the said shaft extending into the interior of the casing and the other portion of the shaft extended exterior thereto. This shaft is provided with an arm f within the casing, which arm extends upwardly to within a short distance of the bottom of the carrier C. The said carrier is provided with a rock-dog c^3, which is adapted to engage the arm f and rock the shaft F forwardly as the carrier is moved forward, the said dog being so pivoted as to travel freely over the arm as the carrier travels rearwardly. After the arm f has been rocked forwardly and the shaft F thereby rocked the said shaft is returned to its normal position by means of a weighted arm f', which is secured to the shaft exterior to the casing. This weighted arm is connected to an air-cushioning device for preventing the too rapid return of the shaft, which cushioning device consists of a plunger-rod f^2, piv-

oted to the arm f' and having its lower end located within an air-cushion chamber f^3. The arm f' is provided with a pawl f^4, which is in position to engage teeth g upon the periphery of a disk G, which is mounted on the shaft F so as to rotate independently thereof. There are a number of these teeth g, (in the present instance four are shown,) and each forward movement of the carrier C causes the said disk G to rotate the distance of one tooth because of the engagement of the pawl f^4 therewith. As the shaft F returns to its normal position the pawl f^4 will slip into the next succeeding tooth g to the rear. The disk G is also provided with a tripping abutment or lug g', which is caused to engage the tail-piece d^4 of the pawl d^2 as the disk is rotated, thereby releasing the pawl from the notch d^3 in the rod D, whereby the rod is permitted to slide rearwardly and shift the main driving-belt and stop the machine.

The disk G is provided with a number of depressions g^2 upon its periphery opposite the teeth g, which depressions are engaged by a spring-latch g^3, extended outwardly from the casing A, which spring-latch yieldingly holds the disk against movement until positively rotated by the forward rocking movement of the shaft F.

A thumb-piece g^4 projects from the disk G, so that the disk may be rotated and the pawl f^4 caused to engage a predetermined tooth g, so that the rod D will be released by the first, second, third, or fourth forward movement of the carrier C. The movement of the shaft F in one direction is limited by means of a set-screw f^5, which enters the bottom of the air-chamber f^3 and engages the bottom of the rod f^2 for limiting its downward movement. This set-screw also accurately adjusts the throw of the pawl f^4, so as to permit it to rotate the disk G the distance of a single tooth each time the shaft F is rocked forwardly.

What I claim is—

1. In combination, a belt-shifter bar mounted to slide in suitable bearings, a spring-actuated pawl engaging the said bar for holding it at the limit of its upward movement, tripping mechanism for tripping the pawl comprising a rock-shaft, a disk mounted to rotate thereon, having a pawl-and-ratchet engagement with the rock-shaft, the said disk having a projection adapted to release the bar-holding pawl after a predetermined number of rocking movements of the said shaft, substantially as set forth.

2. A belt-shifter bar mounted to slide in suitable bearings, a pawl for holding the bar at the limit of its movement in one direction and means for releasing the said bar comprising a rock-shaft, a weighted lever carried thereby an arm carried by the shaft in position to be engaged for rocking the shaft forwardly, a tripping-disk mounted to rotate on the shaft having a pawl-and-ratchet engagement therewith, the said tripping-disk being in position to release the shifter-bar pawl after a predetermined number of rocking movements of the shaft and a cushioning device engaged with the weighted arm for yieldingly cushioning the return movements of the rock-shaft, substantially as set forth.

3. A shifter-bar mounted to slide in suitable bearings, a pawl adapted to hold the bar at the limit of its movement in one direction and means for releasing the pawl comprising a rock-shaft, a tripping-disk mounted to rotate on the rock-shaft having a pawl-and-ratchet engagement with the said shaft, a spring for yieldingly holding the disk against movement except when the shaft is rocked in one direction, the said disk being adapted to engage the shifter-bar pawl to release it after a predetermined number of forward movements of the rock-shaft, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 15th day of June, 1898.

JAMES H. FERGUSON.

Witnesses:
FREDK. HAYNES,
C. S. SUNDGREN.