

N. BABCOCK.  
 Griper-Motion for Printing-Machines.

No. 208,359.

Patented Sept. 24, 1878.

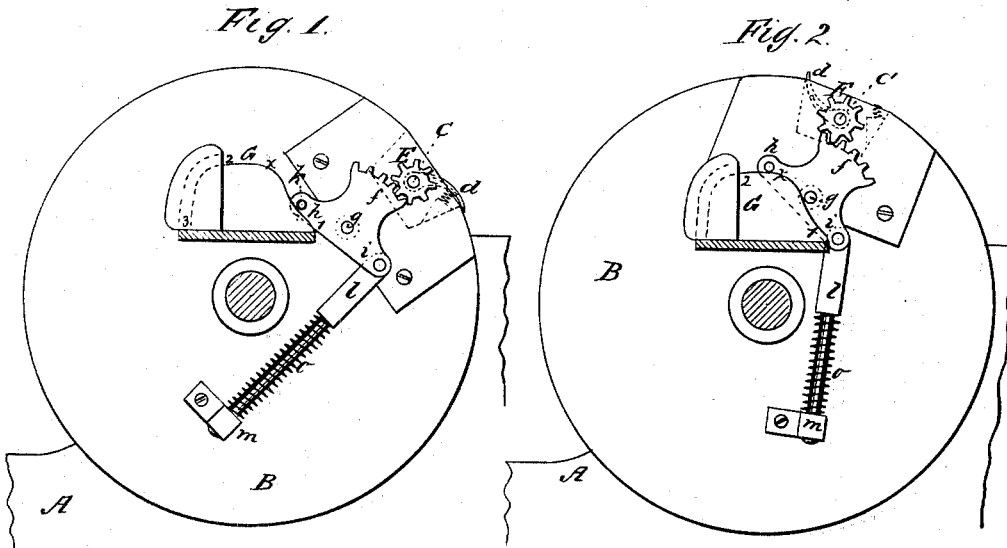
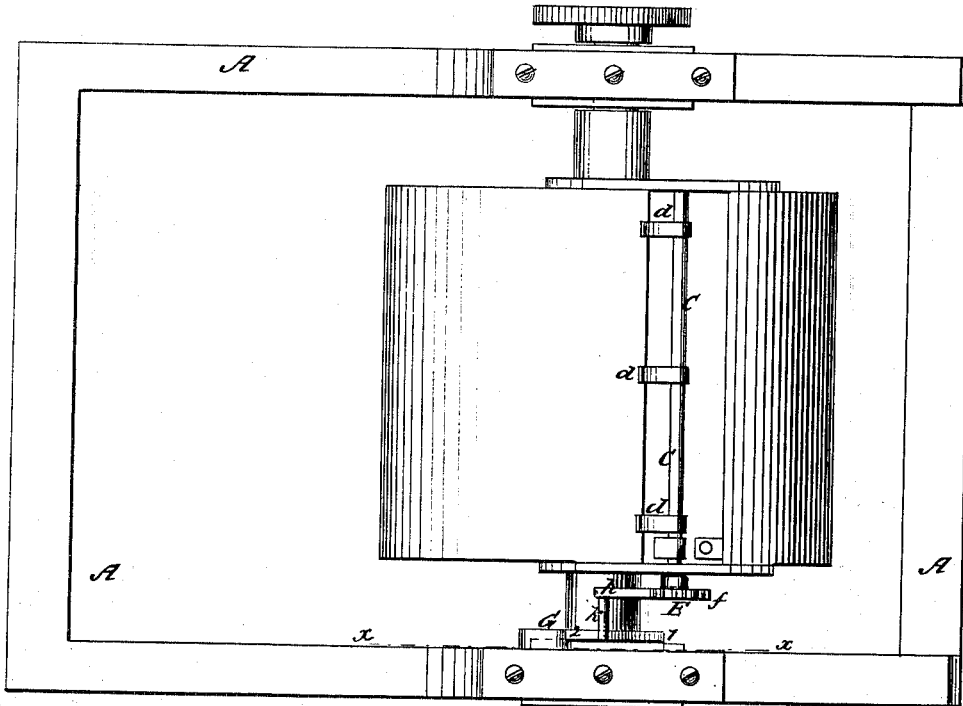


Fig. 3.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

NATHAN BABCOCK, OF WESTERLY, RHODE ISLAND.

## IMPROVEMENT IN GRIPER MOTIONS FOR PRINTING-MACHINES.

Specification forming part of Letters Patent No. 208,359, dated September 24, 1878; application filed May 17, 1876.

*To all whom it may concern:*

Be it known that I, NATHAN BABCOCK, of Westerly, in the county of Washington and State of Rhode Island, have invented certain new and useful Improvements in Griper Motions for Printing-Machines; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

Previous to my invention various means have been devised for operating the gripers of the impression-cylinder in different kinds of presses; but in all the contrivances with which I am familiar the mechanism for opening and closing the grippers has either been complex and uncertain in its operation, or such as to permit the grippers, in closing, or some other part in coming to a state of rest, to cause a slam and noise, or embodied both of these objectionable features.

As is well known, it is most desirable to have the griper-fingers open clear back, remain open long enough to permit the perfect placement of the sheet to be griped, and then close rapidly, but at the same time without any slam of any of the parts; and it has been attempted to attain these ends by contrivances embracing cams for throwing open and closing the fingers, and by others in which gear-teeth and cams have been so combined as to effect the opening and closing of the fingers. But in those contrivances in which the griper-shaft and its fingers are flipped over first in one and then the other direction, there is considerable slam and jar, and consequent wear and tear of the parts, while in those mechanisms in which the griper-shaft is provided with a pinion or toothed sector engaging with a toothed wheel or arm operated by cam motion, the wear which soon occurs in the geared parts permits a backlash, which is noisy and leads to rapid wear and tear of the mechanism.

I propose to overcome these objections to the griper opening and closing mechanism, and provide means for operating the fingers with the most desirable kinds of movements, (as to the time of opening, remaining open, and closing rapidly,) while at the same time the mechanism shall be noiseless, and work the griper-shaft with positiveness and uniformity.

To these ends and objects my invention consists in providing the griper-shaft with a toothed wheel, and combining therewith a double cam and toothed arm or sector plate mounted on the cylinder, and which is moved in one direction (to open the griper-fingers) by a stationary cam, and in another direction (to close the fingers) by a motive-spring, exerting a constant pressure, and connected by the double cam, all as will be hereinafter more fully explained.

To enable those skilled in the art to make and use my invention, I will proceed to describe its construction and operation, referring by letters to the accompanying drawings, in which—

Figure 1 is a side elevation of so much of a press as is necessary to be shown to illustrate my invention. Fig. 2 is a similar view, with the impression-cylinder turned to exhibit a different condition of the part; and Fig. 3 is a top view.

In the several figures the same part will be found designated by the same letter of reference.

A is the usual frame of the press, and B the ordinary impression-cylinder, having mounted in its periphery, in about the usual manner, the griper-shaft C, carrying the fingers *d*. The end of shaft C is provided with a spur-pinion, E, which meshes into or engages with the teeth of a sector-plate, *f*, that is mounted so as to turn freely on a short stud or center at *g*, projecting from the cylinder-head. This sector-plate has two projecting arms or extensions at *h* and *i*, from the former of which projects a pin, *k*, which works against the cam-motor, as will be presently explained, and to the other of which is pivoted one end of a rod or bar, *l*, the other end of which is guided in a box, *m*, fastened, as shown, to the cylinder-head. The rod or bar *l* is made with a shoulder, between which and the box *m* is arranged, encircling said rod, a spiral spring, *o*, which operates as will be presently described.

G is a fixed double cam or cam-plate, secured to the frame A of the machine, as shown, and the office of which is to act in a certain manner upon the stud or pin *k* of the sector-plate *f*, that travels around with the cylinder,

to the head of which it is pivoted, as already explained. This double cam or plate *G* is compound in its formation—that is, one portion of it, from 1 to 2, acts as a mere surface-cam to control the pin *k* of the sector-plate in one direction only, as it rides in contact with it, while the other portion, from 2 to 3, operates as a groove-cam to regulate the path of motion of pin *k* in both directions.

The general mode of operation may be thus explained: During the rotation of the impression-cylinder *B*, and at the proper time for the printed sheet to be released from the cylinder, the pin *k* of the sector-plate comes in contact with and rides up on the portion 1 of the double cam or plate *G*, and is forced by the latter to follow a path of travel which turns the sector-plate *f* on its axis or pivot into the position seen at Fig. 2, or so as to open wide the griper-fingers for the releasement of the printed sheet and the reception of a new sheet from the feeder. This complete opening of the gripers is effected by the time the pin *k* has reached the point *x* on the double cam *G*, and while traveling from this point to the point 2 the pin *k* moves in a line about concentric to the circle of motion of the cylinder-head, and the gripers are, consequently during this time simply held wide open. During the passage of pin *k* from 2 to 3 the sector-plate *f* is so turned on its axis as to completely close the gripers, and during this time the pin *k* is controlled positively by the groove portion of said double cam *G*. The fingers being closed, they are held fast in this closed condition or position by the action of the spring *o*, which, being slightly compressed between the box *m* and the shoulder or rod *l*, exerts a constant pressure against the rod *l* endwise, and in that direction which makes the rod tend to force the sector-plate *f* in the proper direction to close the fingers.

It will be understood that as the pinion on

the end of the griper-shaft is started very gradually by the action of the cam on the pin *k*, and the resistance to the opening of the fingers is in spring-pressed sector-plate *f*, and not in the pinion or griper-shaft, there will be no sudden or injurious taking up of the backlash in the gear-teeth; and it will be seen that since the closing of the fingers, or the action of the sector-plate *f* for closing the fingers, is effected, first, by the conjoint operation of the cam and the spring *o*, and, finally, by the positive action of the groove of said cam *G*, not only is the closing of the gripers made positive, but all injurious backlash in or sudden shock on either the gear-teeth or other parts is avoided, while the retentive action of the holder-spring *o* prevents any rebound of the fingers.

By the combination, as described, of the motive sector-plate, operated upon by both the double cam and the spring, with the pinion and griper-shaft, a griper mechanism is produced which, while it is positive and reliable in its motions, and gives to the fingers the most desirable sort of action, is noiseless in its operation, simple in construction, and not liable to much wear and tear or early derangement.

Having so fully explained my improved contrivance for operating the griper-fingers of a press that any skilled person can make and use the same,

What I claim as new, and desire to secure by Letters Patent, is—

In combination with the griper-shaft of the cylinder and its pinion, a sector-plate, an actuating-spring, and the double cam, the whole constructed to operate substantially as and for the purpose described.

NATHAN BABCOCK. [L. S.]

In presence of—

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