

(No Model.)

J. R. McDONALD.

STOP CYLINDER PRINTING MACHINE.

No. 358,051.

Patented Feb. 22, 1887.

Fig. 1

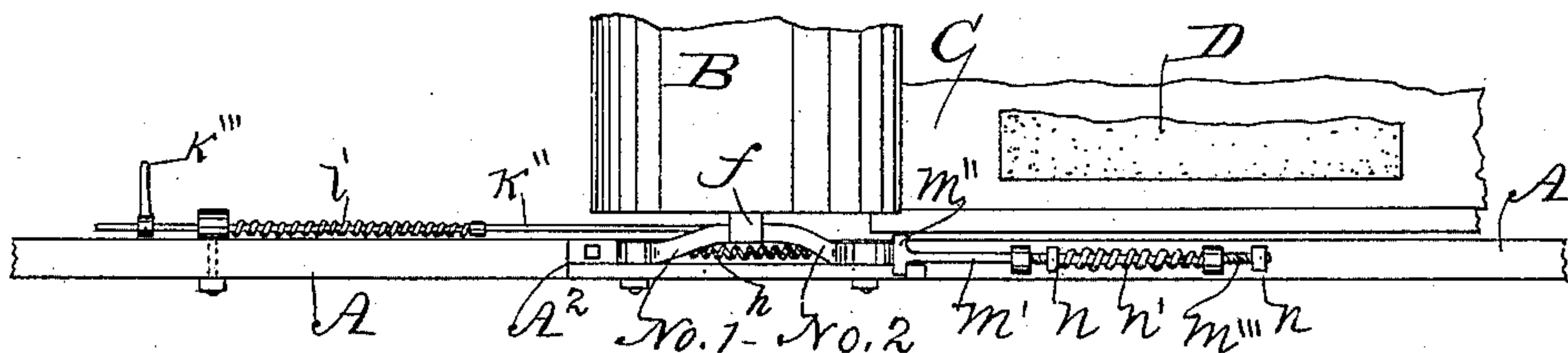


Fig. 2

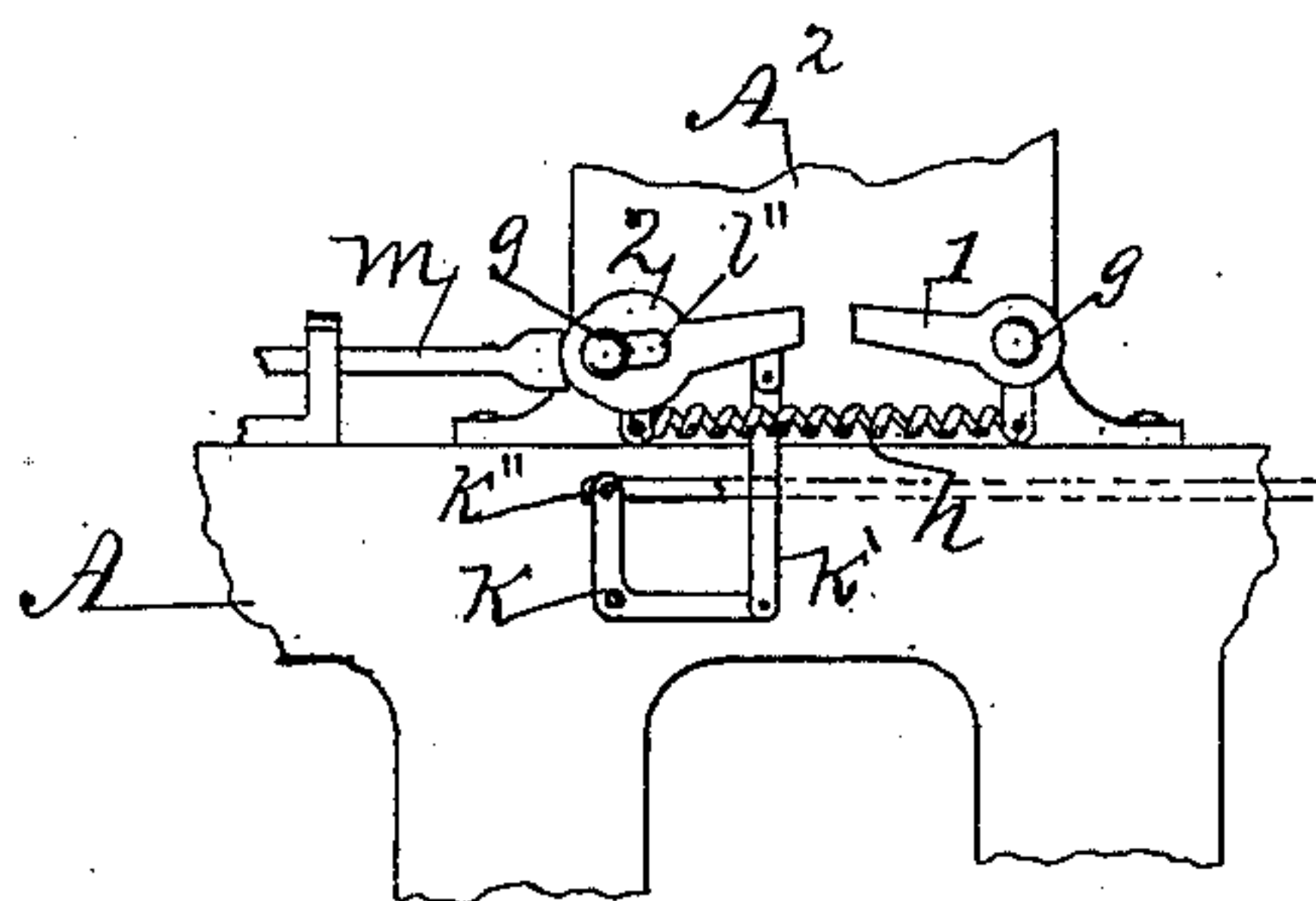
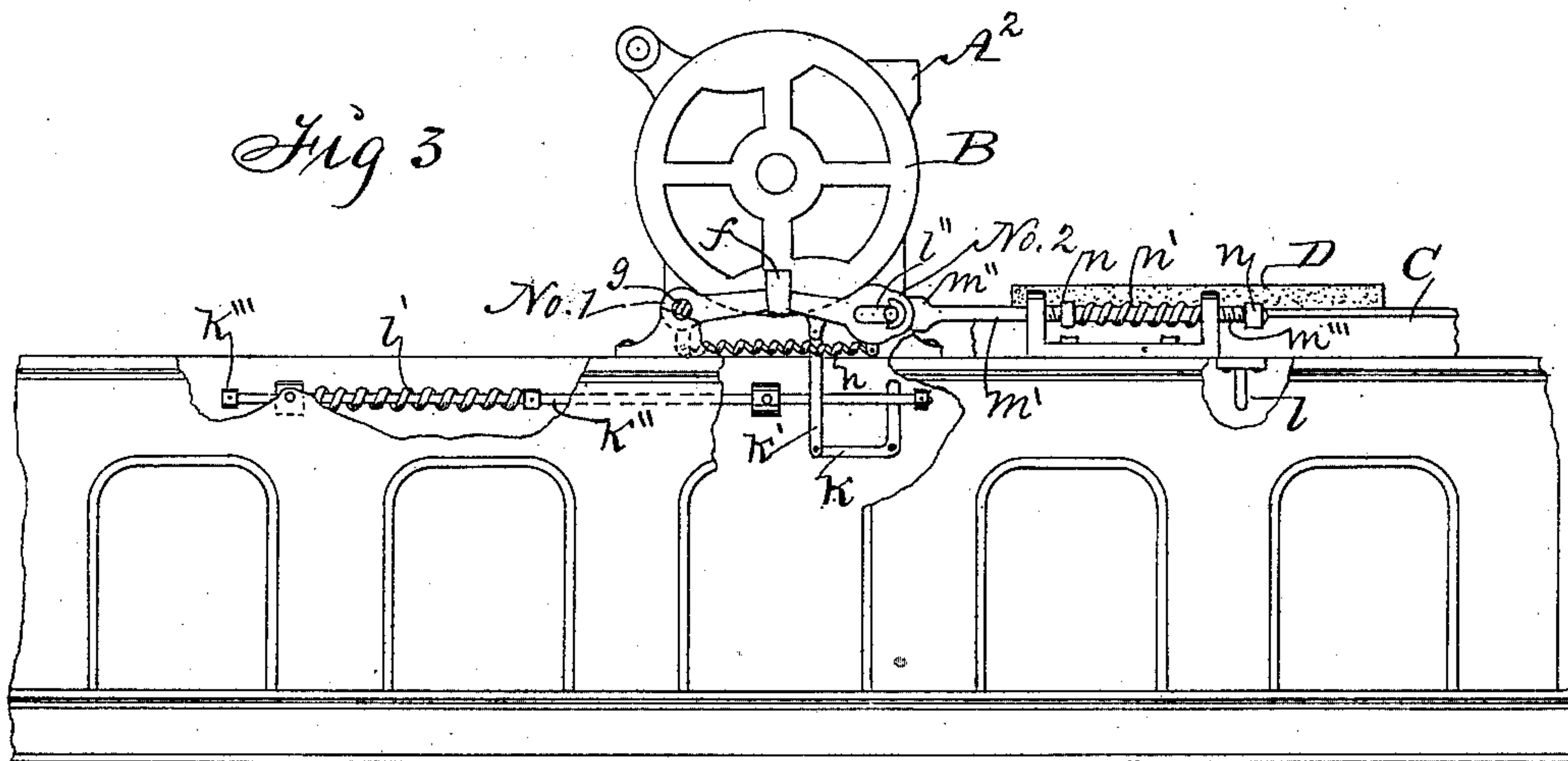


Fig. 3



Witnesses:

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# UNITED STATES PATENT OFFICE.

JAMES R. McDONALD, OF DES MOINES, IOWA.

## STOP-CYLINDER PRINTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 358,051, dated February 22, 1887.

Application filed May 18, 1886. Serial No. 202,574. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES R. McDONALD, a citizen of the United States of America, and a resident of Des Moines, in the county of Polk and State of Iowa, have invented an Improvement in Stop-Cylinder Printing Machines, of which the following is a specification.

My object is to increase the speed of printing upon a lithographic press, to diminish noise, concussion, and wear, and to preserve accurate registry and clearness in the impressions made upon sheets of paper in rapid succession.

Heretofore the speed of the intermittent rotary motions of the press-cylinder operated in concert with the reciprocating rectilinear motions of a form or stone upon a bed as required to make impressions upon sheets of paper successively attached to the cylinder has been restricted on account of the jarring and concussion and wear occasioned in arresting the motion of the cylinder at the end of each revolution and retaining it stationary while the form on the carriage was moved backward under the cylinder. As the speed of the cylinder and the printing is increased the momentum of the cylinder is increased accordingly, and, by force of inertia, will strike the stop mechanism so hard as to produce concussion and vibration that will prevent correct registry and fine and clear prints on the paper and, if continued, a wreck of the press. To overcome such difficulty a series of springs has been combined with the cylinder by means of a crank having a bridle to engage a pin fixed to the end of the cylinder. A non-elastic stop device that can be adjusted to compensate for wear has also been combined with a cylinder by means of a wheel fixed to the end of the cylinder-axle.

My invention consists in the construction and combination of an automatic device with the frame and carriage and cylinder of a press, as hereinafter set forth, in such a manner that concussion will be prevented and wear readily compensated by adjustment, so that the speed of the press can be increased without impairing the quality of the work.

Figure 1 of the accompanying drawings is a top view, Fig. 2 is an inside view, and Fig.

3 a side view, of a section of a press having my adjustable and automatic stop mechanism attached as required for practical use.

A represents the frame of a press, B a rotating cylinder, and C a reciprocating carriage, such as are in common use.

D represents a form or stone upon the bed of the carriage.

*f* is a projection formed on or fixed to the end of the cylinder B.

Nos. 1 and 2 are detents, in the form of elbow-shaped levers, pivoted against the inside face of the auxiliary frame  $A^2$ , that supports the cylinder, and on the opposite sides of the axis of the cylinder, by means of bearers or fulcrums *g*, in such a manner that they will jointly engage the projection *f* and hold the cylinder stationary at the end of each revolution and during the backward motion of the carriage that carries the stone. The short arms of the levers or detents are connected by means of a coiled spring, *h*, that in its normal condition retains the short arms perpendicular and parallel and the long arms inclined upward and in contact with the projection *f* on the end of the cylinder.

*k* is an elbow-shaped lever pivoted on the inside face of the frame and immediately below the detent No. 2.

*k'* is a bar pivoted to the detent No. 2 and the lever *k* in such a manner that when the lever is vibrated the detent will be pulled down and disengaged from the projection *f* on the end of the cylinder, as required, to free the cylinder.

*k''* is a sliding rod in bearings attached to the frame. It has a lateral projection at one end adapted to engage the free end of the lever *k*, as required, to vibrate the lever and thereby pull down the detent No. 2.

*k'''* is a short bar adjustably fixed to the rod to project horizontally inward in such a manner that a cam, *l*, fixed to the under side of the carriage C, will come in contact therewith, as required, to slide the rod in its bearings and to vibrate the lever *k*.

*l'* is a spring fixed to the rod *k''* in such a manner that it will reverse the motion of the rod, the lever, and the detent No. 2 as soon as the motion of the carriage is reversed.

*l''* is a slot in the detent No. 2 that allows



the detent to move bodily and horizontally when it is struck by the projection *f* on the cylinder.

*m* represents a buffer device attached to the frame to receive the impact of the projection on the cylinder for the purpose of arresting the motion of the cylinder without causing concussion.

*m'* is a sliding bar in bearings fixed to the frame. It has a head, *m''*, adapted to engage the detent No. 2, and a screw-threaded shank, *m'''*, upon which adjustable nuts *n* and a spring, *n'*, are placed in such a manner that the tension of the spring can be readily regulated, as required, to meet the force of the blows struck upon the detent.

In the practical use of my invention the sheets of paper that are to receive impressions from the form or engraved stone are attached to the cylinder while the cylinder is held stationary by the detents Nos. 1 and 2, and the carriage and form or stone thereon is moving backward under the stationary cylinder, and when the cam *l* comes in contact with the lateral projection *k'''* it actuates the rod *k''* and lever *k*, as required, to pull down the detent No. 2 to release the cylinder. Then, as the carriage makes a reverse motion, the cylinder revolves in the same direction, and thus by the joint movements of the carriage and the cylinder the paper is pressed upon the form or engraved stone carried by the carriage and an impression made upon the paper. The projection *f* on the end of the cylinder depresses the detent No. 1 at the end of the revolution of the cylinder, and as quick as the projection has passed over the end of the detent the force stored in the spring *h*, by the vibration of the detent, will move the detent in a reverse way and into contact with the projection *f*, again to co-operate with the detent No. 2 and the buffer mechanism in arresting and holding the cylinder stationary. It is therefore obvious that a print or impression from a form or an engraving on a stone on the reciprocating carriage can be made at each revolution of the cylinder, and that the speed of the work will depend upon the speed of the successive revolutions of the cylinder and the accuracy of registry upon starting the cylinder from precisely

the same point at each revolution; hence the importance of the means described for arresting the motion of the cylinder and holding it stationary at precisely the same point at the end of every successive revolution. Without a cushioning or buffer device the wear of positive stop devices is so rapid that absolute perfect registry cannot be long maintained even at a slow rate of speed.

By the use of my invention the wear is so greatly diminished that thousands of revolutions and impressions can be made and absolute registry obtained on the press while the press is operated at greatly increased speed.

To increase the tension of the spring, I simply adjust the nuts *n* on the buffer-bar *m'*, as required, to advance the said bar toward the slotted and sliding detent No. 2.

I claim as my invention—

1. The detent No. 1, the detent No. 2, having a horizontal slot, a spring, *h*, fixed fulcrums *g*, and the cylinder having a projection on its end, a buffer device for restricting the sliding motion of the slotted detent, and mechanism for vibrating the sliding detent, all constructed, arranged, and combined substantially as described, for the purposes stated.

2. The lever *k* and the spring-actuated sliding rod *k''*, having a lateral projection, *k'''*, in combination with the detent No. 2 and a reciprocating carriage having a cam, *l*, to operate in the manner set forth, substantially as described, for the purposes stated.

3. The automatic stop mechanism for a printing-press, composed of the following elements, to wit: the elbow-shaped lever or detent No. 1, the detent No. 2, having a slot, the spring *h*, the fixed fulcrums *g*, the buffer device consisting of the bar *m'* *m''* *m'''*, the nuts *n*, and the spring *n'*, the lever *k*, connecting-bar *k'*, and sliding rod *k''* *k'''*, actuated by a spring, in combination with a reciprocating carriage having a cam, *l*, and a rotating cylinder having a projection, *f*, on its end, to operate in the manner set forth, substantially as described, for the purposes specified.

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Witnesses:

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