

(No Model.)

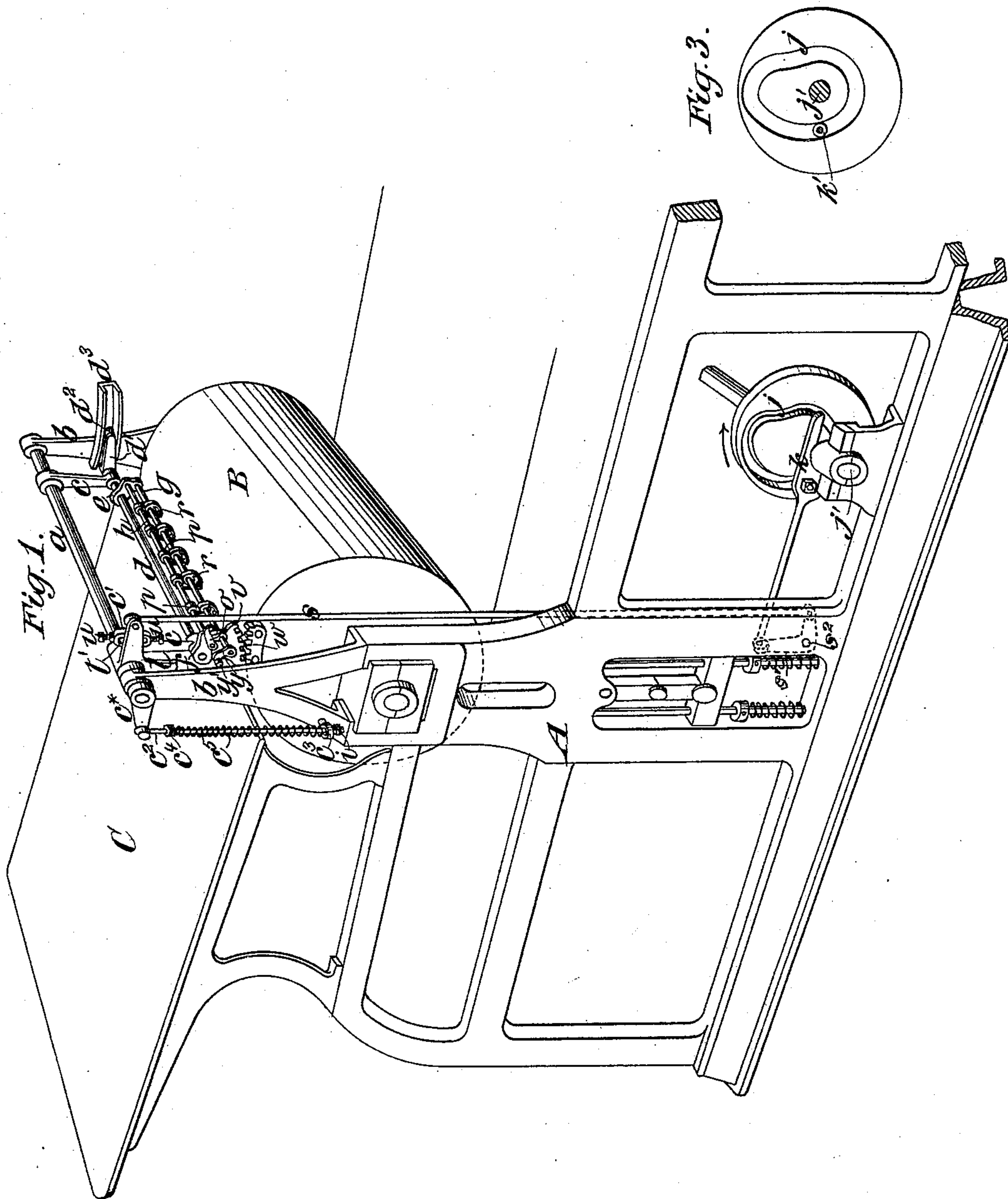
2 Sheets—Sheet 1.

C. B. COTTRELL.

FEEDING MECHANISM FOR CYLINDER PRINTING MACHINES.

No. 420,621.

Patented Feb. 4, 1890.



Witnesses:

Olundgren  
D. H. Hayward

Inventor:

Calvert B. Cottrell  
By attorney  
Frown & Griswold

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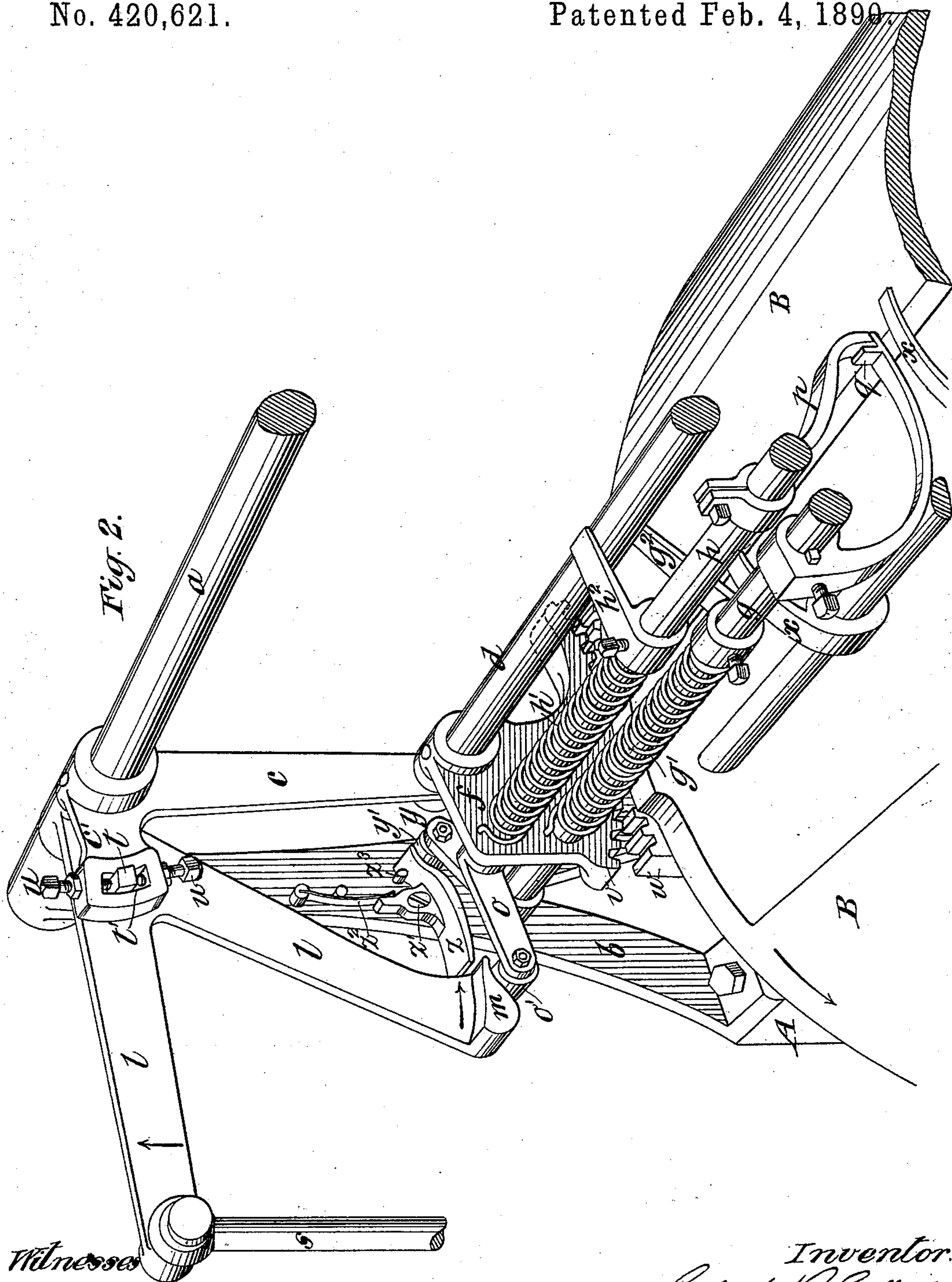
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# UNITED STATES PATENT OFFICE.

CALVERT B. COTTRELL, OF WESTERLY, RHODE ISLAND.

## FEEDING MECHANISM FOR CYLINDER PRINTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 420,621, dated February 4, 1890.

Application filed June 14, 1889. Serial No. 314,217. (No model.)

*To all whom it may concern:*

Be it known that I, CALVERT B. COTTRELL, of Westerly, in the county of Washington and State of Rhode Island, have invented a new and useful Improvement in Feeding Mechanism for Cylinder Printing-Machines, of which the following is a specification, reference being had to the accompanying drawings.

The object of this invention is to provide in continuously-revolving cylinder printing-machines for the same accuracy of register that is provided for in stop-cylinder machines.

In carrying out my invention I employ a pair of feeding-grippers and a carrier therefor outside of and detached from the cylinder, and give to said grippers a backward and forward movement relatively to the cylinder, and a period of rest between said backward and forward movements, that the sheets may be placed in the said grippers while they are open during said period of rest between the backward and forward movements, and I give the said grippers, during their subsequent forward movement in the same direction with the cylinder, the speed corresponding with that of the cylinder, so that the sheet may be taken by the grippers provided on the cylinder while it is in motion at the same speed in which the cylinder itself is moved.

I will now proceed to describe my invention with reference to the accompanying drawings, and afterward point out its novelty in claims.

Figure 1 represents a perspective view of the cylinder, feed-board, and the feeding apparatus of a two-revolution printing-machine illustrating my invention. Fig. 2 represents a perspective view, on a larger scale, of part of the cylinder and the feeding apparatus. Fig. 3 is a face view of a cam by which the operation of the swinging gripper-carrier is produced.

Similar letters of reference designate corresponding parts in the several figures.

A designates the main framing of the machine, B the cylinder, and C the feed-board.

b b designate two standards erected on the framing over the cylinder-boxes and containing the bearings for the rock-shaft a, which with its arms c constitute parts of the carrier for the feeding-grippers. In the lower ends

of the arms c are bearings for a rock-shaft d, to which are firmly secured two plates e f, which contain bearings for the rods g h, the former of which rods carries the lower grippers r and the latter of which rods carries the upper grippers p. The said rods g h have respectively applied to them coil-springs g' h', one end of each of which is secured in the plate f for the purpose of closing the said grippers, and they are also furnished with stops g<sup>2</sup> h<sup>2</sup>, which regulate their position in closing by coming in contact with the shaft d.

The rod g has fastened upon it an arm y, which carries a roller y', which works in contact with a trip-cam z, secured to one of the standards b for the purpose of depressing the points of the lower grippers r, and the rod h has fast upon it an arm o, which carries a roller o', which is operated upon by a cam m, carried by an elbow-lever l, which has its fulcrum on the shaft a for the purpose of raising the points of the upper grippers p.

The trip-cam z above mentioned is pivoted by a pin z' to the standard b, and has applied to it a spring z<sup>2</sup>, which tends to hold it against a fixed stop z<sup>3</sup>, secured in the standard b. The lever l is connected by a rod s with one of the arms of the elbow-lever s', (see Fig. 1,) which is fulcrumed at s<sup>2</sup> on the framing A, and the other arm of which is connected with the yoke k of the cam j on the cam-shaft j', which is or may be the same cam-shaft commonly employed in two-revolution cylinder printing-machines to operate the lift motion of the cylinder. The cam-yoke is, as is common, provided with a truck-roll k', which works in a groove in the said cam and being slotted to run on the shaft. The lever l is loose on the rock-shaft a. A connection is made between said elbow-lever and one of the arms c of the rock-shaft which carries the gripper-shaft d, for the purpose of giving motion to the said rock-shaft and arms c by means of a lug t, which engages with lost motion in a slot t' in a projection c' on one of the said arms c c, the said lug t having a certain amount of lost motion in the said slot, which is regulated by stop-screws u, which screw into the said projection c' above and below the said slot t'. On the other end of the rock-shaft a there is fast an arm c\*, with which is connected a rod c<sup>2</sup>, which passes



through a guide  $c^3$  (see Fig. 1) on one of the standards  $b$ , and upon this rod, between the said guide  $c^3$  and the stop  $c^4$  in the said rod, is a spiral spring  $c^5$ , which acts between the said guide  $c^3$  and the said stop  $c^4$  to raise the arm  $c^*$  and throw the carrier-arms and the feeding-grippers toward the feed-board as far as permitted by stop-nuts  $i$ , provided on the said rod  $c^2$  under the guide  $c^3$ .

The plate  $f$  contains the bearings for one end of each of the gripper-rods  $g$   $h$ , and has upon it a toothed sector  $v$ , which is concentric with the rock-shaft  $a$  when the grippers  $p$   $r$  are closed and their stops  $g^2$   $h^2$  are in contact with the gripper-shaft  $d$ , and upon one side of the cylinder is a short toothed sector  $w$ , which is concentric with the cylinder, and which is capable of gearing with the said toothed sector  $v$ , as shown in Figs. 1 and 2. Fast on the other end of the gripper-shaft  $d$  is an arm  $d'$ , on the end of which is a roller  $d^2$ , which enters the groove of a stationary cam  $d^3$ , secured to the adjacent standard  $b$ .

The cylinder-grippers  $x$ , one of which is represented in Fig. 2, may be of the kind commonly used on impression-cylinders of printing-machines and operated in the usual manner, and therefore need no description here.

Attached to and moving with the carrier of the feeding-grippers are gage-stops  $q$ , against which the edge of the sheet is presented to be taken by the said grippers. These stops  $q$  in the example represented consist of upward projections provided on the lower grippers  $r$  at a little distance in rear of their points.

The operation of the apparatus is as follows: The spring  $c^5$  on the rod  $c^2$  tends to keep the gripper-carrier, which consists of the shaft  $a$ , the arms  $c$ , the shaft  $d$ , plates  $f$ , and the feeding-grippers in said carrier, swung back toward the feed-table when allowed to do so by the cam  $j$  on the cam-shaft  $j'$ . The nuts  $i$  on the rod  $c^2$  serve as stops to regulate the position to which the said parts are thus brought, which is that in which the grippers  $p$   $r$  receive the sheet from the feed-board. I will now suppose the truck-roll  $k'$  of the cam  $j$  to be nearly on the lowest part of the cam or the part nearest the center, as shown in Figs. 1 and 3. This will allow the shaft  $d$  and the grippers to come back as near the feed-board as permitted by the stop-nuts  $i$  on the rod  $c^2$ . Then as the cam continues to rotate and draw the truck-roll toward its center it causes the yoke-rod, the elbow-lever  $s'$ , and the rod  $s$  to pull down the lever  $l$ , which is loose on the shaft  $a$ , and so produce the movement of the cam  $m$  on the said lever in the direction of the arrow shown near the said cam in Fig. 2, and by this movement of the said cam  $m$  and its consequent action on the roll  $o'$  on the arm  $o$  of the upper gripper-rod  $h$  the upper grippers  $p$  will be raised ready for the deposit of the sheet on the ends

of the lower grippers  $r$ . The cam  $j$  now holds all the parts of the swinging gripper-carrier and its grippers stationary long enough for a sheet to be placed with its edge on the ends of the lower grippers  $r$  and against the gage-stops  $q$ , after which the cam  $j$  will throw the lever  $l$  in the direction of the arrow marked on its upper arm in Fig. 2. This will throw the cam-shaped end  $m$  away from the roll  $o'$  and allow the grippers  $p$  to close on the sheet. When the grippers have closed, the lug  $t$  on the lever  $l$  comes in contact with the upper stop-screw  $u$  in the adjacent arm  $c$  of the swinging gripper-carrier, and the said carrier with the grippers  $p$   $r$  will swing away from the feed-board with the sheet. The cam  $j$  is so shaped that it makes the points of the grippers  $p$   $r$  travel at the same speed as the cylinder-surface, and so that the toothed segments  $v$  and  $w$  may come into gear and continue the movement of the grippers at the same speed with the cylinder. While the said segments are thus in gear, the cylinder-grippers  $x$  close on the sheet, and the feeding-grippers  $r$  are opened by the truck-roll  $y'$  on the arm  $y$  of the gripper-rod  $h$ , running under the trip-cam  $z$ , which is then held by the spring  $z^2$  against the stop  $z^3$ . The sheet having now been transferred to the cylinder, the swinging gripper-carrier keeps on moving with the cylinder until the segments  $v$  and  $w$  become disengaged. The grippers close after the roll  $y'$  passes the pivot  $z'$  of the cam, as the gripper-spring  $g'$  overcomes the pressure of the cam-spring  $z^2$  and raises the forward part of the cam  $z$ . When the truck-roll  $y'$  runs beyond the forward end of the cam  $z$ , the latter is depressed by the spring  $z^2$ , so that when the gripper-carrier swings back toward the feed-board the roll  $y'$  will pass over the said cam, and thus leave the grippers  $r$  closed, so that they will not strike the cylinder. When the segments  $v$  and  $w$  are engaged, they may tend to make the swinging gripper-carrier move a little faster than the cam  $j$  is driving it through the lever  $l$ ; but the play between the lug  $t$  on the lever  $l$  allows this before the truck-roll  $o'$  comes in contact with the cam-shaped end  $m$  of the lever  $l$ .

The purpose of the arm  $d'$  on the gripper-shaft and the stationary cam  $d^3$  (shown in Fig. 1) is to keep the points of the feeding-grippers  $p$   $r$  moving in a direction substantially parallel with the feed-board, and thus prevent the bending of the edge of the sheet as the said grippers move with the cylinder away from the feed-board.

In a two-revolution press the cylinder is in its lower position in gear with the bed when the feeding-grippers are returning to the feed-board for another sheet, and the cylinder is in its upper position when the sheet is transferred from the feeding-grippers to the cylinder. On a drum-cylinder press the feeding-grippers swing back when the low part of the cylinder is toward them.



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

1. The combination, with the continuously-revolving cylinder of a printing-machine and grippers thereon, of a carrier outside of the cylinder having a backward and forward movement, grippers in said carrier for receiving a sheet and transferring it to the cylinder-grippers, and stops, also in said carrier, for gaging the front edge of the sheet when deposited in the grippers in the carrier, substantially as herein set forth.

2. The combination, with the continuously-revolving cylinder of a printing-machine and grippers thereon, of a carrier outside of said cylinder having a backward and forward movement, feeding-grippers in said carrier for receiving a sheet and feeding the same to the cylinder-grippers, and gage-stops on the said feeding-grippers, substantially as herein set forth.

3. The combination, with the cylinder of a printing-machine, a gripper-carrier and grippers therein, and a rock-shaft for said carrier, of a lever loose upon the said rock-shaft and engaging with the said carrier with a lost motion, a cam-shaft and cam, and connections with the said lever for producing the swinging movement of the carrier and toothed segments on the cylinder and carrier, substantially as and for the purpose herein set forth.

4. The combination, with the cylinder, the swinging gripper-carrier and the gripper-rods and grippers therein, and a rock-shaft for the said carrier, of a lever on said rock-shaft engaging with said carrier with a lost motion, and means, substantially as herein

described, for operating said lever to produce the swinging movement of the carrier, a stop to stop the gripper-carrier in its backward swinging movement, a cam on said lever, and an arm on one of the gripper-rods, upon which the said cam acts to open the grippers after the carriage is arrested by said stop, substantially as herein described.

5. The combination, with the feed-board, the impression-cylinder and its grippers, the swinging gripper-carrier, and the feeding-grippers and their rock-shaft journaled in said carrier, of an arm on said rock-shaft, and a fixed cam by which said arm is guided for the purpose of directing the movement of the grippers in substantially parallel relation to the feed-board as they move with the cylinder away from the feed-board, substantially as herein described.

6. The combination, with the swinging gripper-carrier and the grippers in pairs, of which one of each pair is carried by a spring-actuated rod journaled in said carrier, of a tripping-cam and a fixed pivot for carrying the same, a stop for said cam, and a spring for holding said cam to said stop, and an arm on said spring-actuated rod passing under said cam for opening the grippers while the carrier and grippers swing in one direction, and passing over said cam to allow the grippers to remain closed while the carrier swings in the opposite direction, substantially as herein described.

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