

(No Model.)

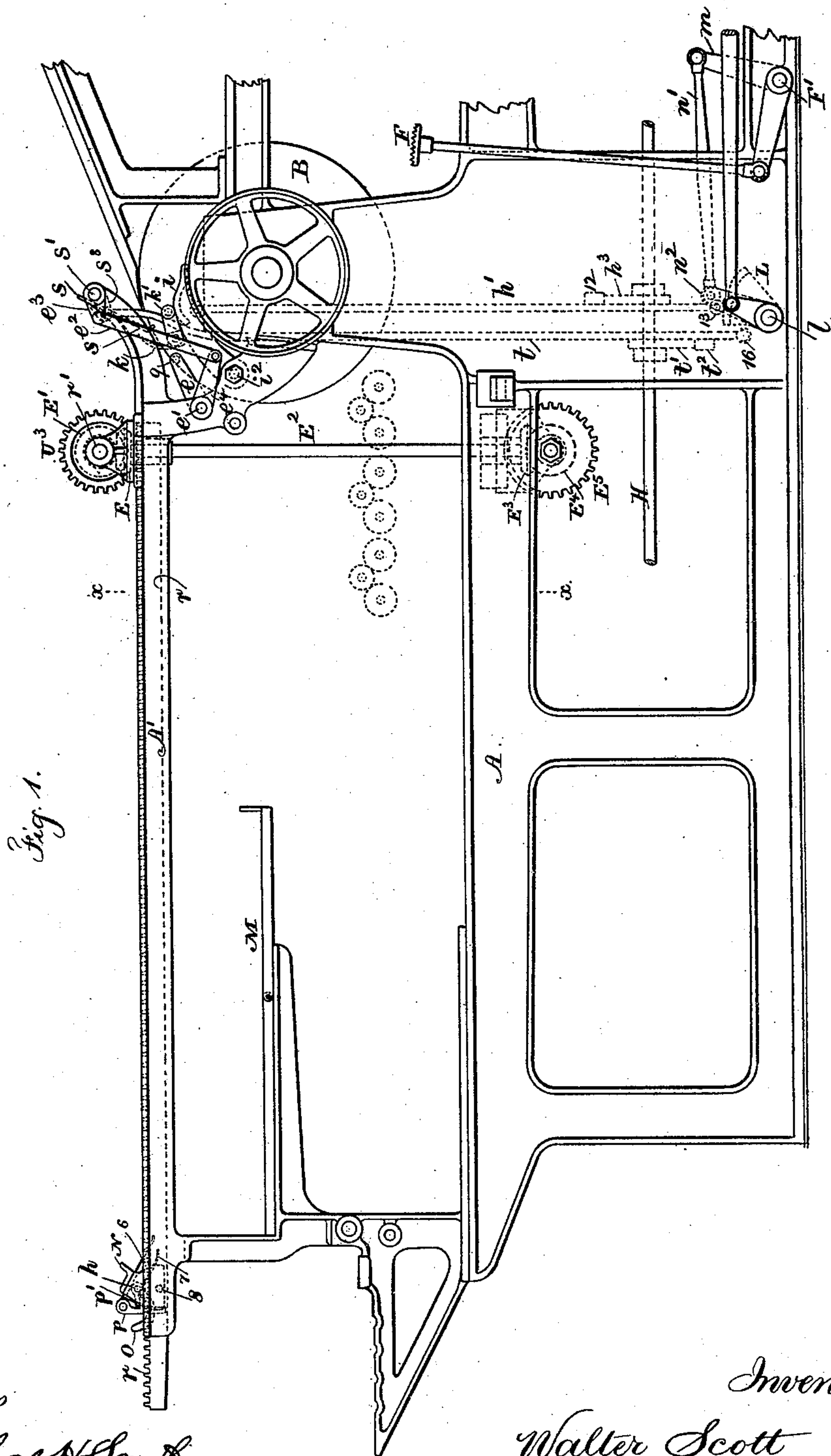
2 Sheets—Sheet 1.

W. SCOTT.

SHEET DELIVERY APPARATUS FOR PRINTING MACHINES.

No. 351,471.

Patented Oct. 26, 1886.



Witnesses

Chas. H. Smith  
J. Stait

Inventor

Walter Scott  
per Lemuel W. Perrett

attys

(No Model.)

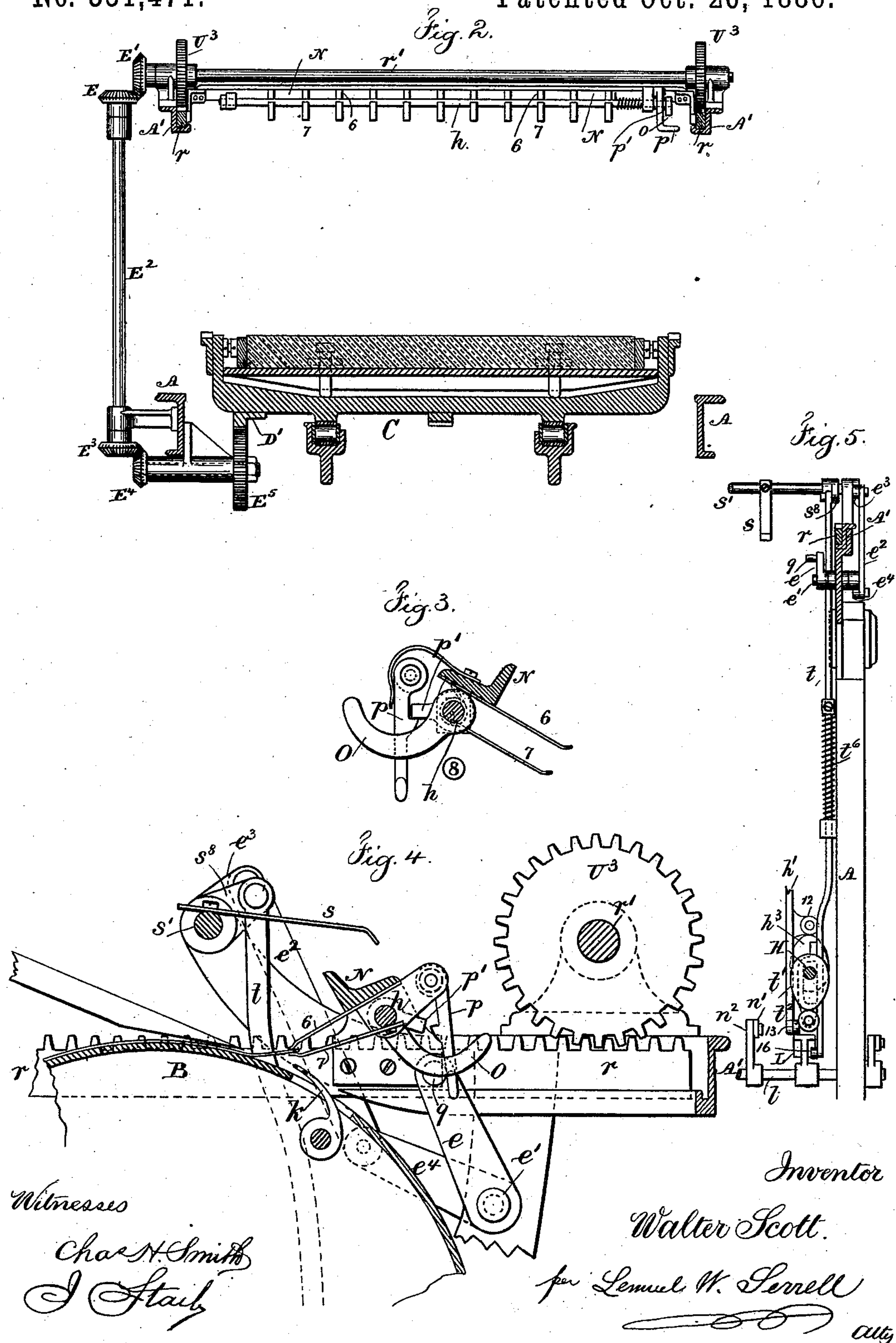
2 Sheets—Sheet 2

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SHEET DELIVERY APPARATUS FOR PRINTING MACHINES.

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# UNITED STATES PATENT OFFICE.

WALTER SCOTT, OF PLAINFIELD, NEW JERSEY.

## SHEET-DELIVERY APPARATUS FOR PRINTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 351,471, dated October 26, 1886.

Application filed October 28, 1885. Serial No. 181,147. (No model.)

*To all whom it may concern:*

Be it known that I, WALTER SCOTT, of Plainfield, in the county of Union and State of New Jersey, have invented an Improvement in Sheet-Delivery Apparatus for Printing-Machines, of which the following is a specification.

This improvement is especially available with stop-cylinder presses in which the impression-cylinder remains stationary during the return movement of the bed, and this press may be used for lithographic printing, but it is not limited in this particular. In my improvement the sheet is fed down against gage-fingers, the grippers close upon the sheet as the cylinder commences to revolve, the gage-fingers are swung away, the sheet is carried around and printed, and the cylinder again stops, with the fingers open, the sheet having been taken by a range of traveling grippers, and it is drawn off horizontally. At this time the gage-fingers are raised, but they are swung down in position for the next sheet after the printed one has been drawn away. If, now, the stop-motion that prevents the impression-cylinder revolving is brought into action by the attendant, the parts are so locked that the gage-fingers will not be swung up, and the grippers for conveying away a printed sheet will remain open as they travel back and forth, and the sheet will not be grasped by them until the proper time after being printed.

In the drawings, Figure 1 is a diagrammatic view showing portions of the printing-press in elevation, and my improved parts applied to the same. Fig. 2 is a partial cross-section at the line  $x x$ , showing the bed, the sheet-delivery grippers, and the connecting-gearing. Fig. 3 is a section representing the latch delivery-grippers and bar to which they are attached. Fig. 4 shows the delivery-grippers as closed to grasp the advancing end of the sheet; and Fig. 5 is an elevation, partly in section, of the devices for actuating the gage-fingers and the stop of the sheet-delivery grippers.

The frame A, impression-cylinder B, and bed C are of any desired or known form, and adapted to work in the ordinary manner. The devices for giving motion to the bed and for moving the impression-cylinder B, and for starting and stopping the same, do not form

any especial feature of the present invention. As these parts are well known, they may be of any desired character, it being understood that the press is constructed so as to form what is known as a "stop-cylinder" press, in which the bed may be reciprocated to any desired extent, and in which the impression-cylinder may be stopped for a longer or shorter period while the bed is being reciprocated for inking up the form or lithographic stone or other surface employed in printing. My improvements, however, are available with presses in which the impression-cylinder turns first one way and then the other as the bed reciprocates, and in which the impression is thrown off by raising the cylinder or lowering the bed.

The sheet-delivery grippers 6 and 7 are upon a cross-bar, N, between two racks,  $r$ , supported in the auxiliary frames A', similar to those shown in my application No. 178,991, filed October 5, 1885, to which a reference is made for a more full description of the construction of the cross-bar N and parts connected therewith. I however remark that the racks  $r$ , that support the end of the cross-bar N, are in ways upon the auxiliary frame A', and receive motion back and forth by the shaft  $r'$  and wheels U<sup>3</sup>, as shown in said application, and the pin 8, over which the cam-lever O slides, serves to swing the fingers 7, opening the grippers and delivering the sheet upon the table M, and the latch  $p$  holds the heel or arm  $p'$ , that projects from the shaft  $h$ , so that the latter cannot rotate and allow the fingers to close and grasp the sheet until the latch  $p$  is withdrawn from the heel  $p'$ . These parts operate the same as in the aforesaid application; but I arrange the parts in such a manner that the delivery-grippers 6 and 7 are moved entirely up to the impression-cylinder B and take the sheet off directly from the same, in the manner hereinafter described.

It is preferable to drive the shaft  $r'$  and gear-wheels U<sup>3</sup> by the beveled gears E E', shaft E<sup>2</sup>, beveled gears E<sup>3</sup> E<sup>4</sup>, and gear-wheels E<sup>5</sup>, that receive motion from a rack, D', upon the under side of the bed C, as seen in Fig. 2, in order that the gearing may be moved first one way and then another as the bed reciprocates, and in like manner the racks  $r$ , cross-bar N, and delivery-grippers will be moved back and forth as the bed C is reciprocated.



The devices which are made use of for throwing off the impression and stopping the revolution of the impression-cylinder B, but allowing the bed C to reciprocate, are of any desired character, and as they do not form any part of this invention are not shown herein, except that the foot-piece F, which is usually employed in presses of this character to move the shaft F', and the devices therewith connected that throw off the impression, are also used in connection with the present improvements to act upon the sheet-gage, the gripper-cam, and the stop for the sheet-delivery fingers, as hereinafter described. The foot-piece F is raised and returned to a normal position by a spring in any well-known manner.

The shaft H is to be connected with the other parts of the press, so that it revolves once to each complete reciprocation of the bed C. This shaft is usually found in presses of this character. Upon the said shaft H, I place a cam,  $h^3$ , that acts upon a roller, 12, upon a vertical rod,  $h'$ , and this rod  $h'$  is pivoted at its upper end to the gripper-cam  $i$ , which cam is connected to the frame of the machine by a pivot-bolt,  $i^2$ .

$k$  are the grippers and gripper-shaft upon the impression-cylinder B, and  $k'$  is an arm at the end of the gripper-shaft against which the cam  $i$  acts to open the grippers as the impression-cylinder revolves. These grippers are closed by a spring, as usual, and I remark that in presses of this character the grippers  $k$  are opened by the cam  $i$  and closed by the action of the spring to grasp the sheet as the arm  $k'$  passes off the cam  $i$ , and the parts are timed so that this operation takes place when the sheet is to be grasped and carried around with and by the impression-cylinder B for receiving the impression from the lithograph-stone or other surface, but when the sheet is to be delivered the grippers are opened to liberate the sheet, and the sheet-delivery fingers grasp and carry away the sheet before the grippers  $k$  close by the movement of the impression-cylinder.

At the lower end of the rod  $h'$  is a roller or pin, 13, and there is a locking-sector, L, upon a shaft,  $l$ , that receives motion from the cross-shaft F', arm  $m$ , link  $n'$ , to the crank  $n^2$ , upon the shaft  $l$ ; hence, when the foot-piece F is depressed to bring into action the devices that stop the impression-cylinder B, as usual, the arm  $m$ , link  $n'$ , and crank  $n^2$  turn the shaft  $l$  and locking-sector L, so that the locking-sector passes beneath the pin or roller 13 and causes the said locking-sector to hold up the rod  $h'$ , gripper-cam  $i$ , and the gripper-arm  $k'$ , so that the gripper  $k$  remains open, and this position continues as long as the foot-piece F is depressed.

I make use of gage-fingers  $s$  upon a shaft,  $s'$ , the bearings for which are at the ends of the auxiliary frame A', and upon the shaft  $s'$  is an arm,  $s^8$ , to which the vertical rod  $t$  is hinged, and upon the aforesaid shaft H is a second cam,  $t'$ , acting against the roller  $t^2$  upon the

vertical rod  $t$ . The shape and position of the cam  $t'$  are such that the gage-fingers  $s$  are allowed to remain in their normal position for the lower edge of the sheet to stop against as it is fed to the press; but just before the cylinder B commences to move, the cam  $t^2$  raises the gage-fingers  $s$  out of the way of the advancing end of the sheet of paper. At the same moment the gripper-fingers  $k$  hold the sheet to the impression-cylinder while the same is conveyed away and printed. If the impression-cylinder B is stopped, the gage-fingers  $s$  remain in position, because the locking-sector L, as it is swung in the manner before described, passes over a pin, 16, on the vertical rod  $t$ , holding said rod  $t$  down, and preventing it being raised by the spring  $t^6$ , that lifts the same and swings the gage-fingers. This spring may be applied in any desired manner. Usually it will be helical and surround the rod  $t$ , so as to act upon the said rod and the parts connected therewith.

I provide a pin, 9, the object of which is to swing the latch  $p$  and disconnect it from the arm  $p'$  of the shaft  $h$  and allow the delivery-gripper 7 to close and grasp the sheet, as in the aforesaid application; but if this pin or stop 9 were stationary, the delivery-grippers would be closed each time such grippers were brought up to the impression-cylinder B, and the sheet would be grasped and torn if this occurred while the impression-cylinder B, grippers  $k$ , and gage-fingers  $s$  remained stationary, or an unprinted sheet might be taken away by the delivery-fingers. I therefore place the stop-finger 9 upon an arm,  $e$ , pivoted at  $e'$  upon the frame of the machine, and there is a link,  $e^2$ , to an arm,  $e^3$ , at the end of the shaft  $s'$ , so that when the gage-fingers  $s$  and shaft  $s'$  occupy a normal position, the stop pin 9 and arm  $e$  are swung down out of the way of the lever  $p$ , and the delivery-grippers 6 and 7 and the parts carrying the same are free to be reciprocated without the delivery-grippers closing; but so soon as the impression-cylinder B is released and free to rotate, the locking-sector L is simultaneously swung back as the foot-piece F is raised, and the rollers or pins 13 and 16 are liberated from such locking-sector, and the cams  $h^3$  and  $t'$ , acting in connection with the rods  $t$  and  $h'$ , swing the gage-fingers  $s$  up out of the way, and in so doing move the arm  $e$  and stop 9, so that the latter unlatches the latch  $p$  and allows the gripper 7 to close and grasp the sheet, and these fingers 7 having run in beneath the lower edge of the sheet lift such sheet in the act of closing and raise the same above the grippers  $k$ , and the movement of the racks  $r$ , cross-bar N, and delivery-grippers now take place and the sheet is drawn off the impression-cylinder B and carried along horizontally over the table M, and the sheet is dropped upon the same by the cam-lever O, running over the pin 8 and opening the delivery-grippers. The parts are timed so that this motion takes place during the time that the bed C moves back beneath the



impression-cylinder B and receives the ink upon the printing-surface, and immediately after the printed sheet has been drawn off the cam  $t'$  swings the gage-fingers  $s$  down into place, and the next sheet is moved down the feeding-table until its lower edge rests against such gage-fingers  $s$ , and upon the return movement of the bed C the impression-cylinder B commences its rotation, the grippers  $k$  close and grasp the sheet, and the printing operation is performed as usual, the edge of the printed sheet being brought around to the same place where it was taken by the grippers, the mechanism arrests the movement of the stop impression-cylinder, and the grippers being opened by the cam  $i$  the sheet is liberated and the end thereof is taken by the delivery-grippers 6 and 7 and drawn off, as before described.

I do not limit myself to the latch for holding open the delivery-grippers, or the arm and cam for opening the same, as delivery-grippers with other opening and closing devices are known and are available with the movable stop 9.

It will be borne in mind that in stop-cylinder presses and in presses in which the impression-cylinder turns first one way and then the other the stopping of the impression-cylinder and of the type-bed are simultaneous, and in my present improvement I have shown the gearing that connects the type-bed to the slides carrying the grippers, and hence the delivery-grippers stop and start with the type-bed, and they also move in the same direction. In all instances the advancing end of the printed sheet comes up over the impression-cylinder as the delivery-grippers come up in the other direction, and all these parts momentarily stop as the grippers close. I do not, therefore, limit myself to the particular gearing shown for connecting the grippers with the type-bed, so that the movements correspond, as any suitable connection may be employed between the type-bed and grippers, and this improvement is equally available in presses where the impression-cylinder oscillates and turns first one way and then the other.

I claim as my invention—

1. The combination, with the impression-cylinder and its grippers, of delivery-grippers, shaft for the same, a cross-bar and a rack for communicating motion to the delivery-grippers longitudinally of the press, a stop for opening the grippers, and a stop to cause the grippers to close, substantially as set forth.

2. In a cylinder printing-press, the combination, with the impression-cylinder and its grippers, of a swinging gripper-cam, a rod and cam for moving the same, a shaft and gage-fingers, a rod and cam for moving the same, a locking-sector for holding the respective rods, the foot-piece F, and the connections for moving the locking-sector, substantially as specified.

3. The combination, with the gage-fingers  $s$  and their shaft  $s'$ , of the impression-cylinder B and grippers, the delivery-grippers 6 and 7, and means for moving the same, and a latch for holding the grippers open, a movable stop, 9, and a connection from the said stop to the shaft of the gage-fingers, whereby the delivery-grippers are caused to remain open while the gage-fingers are in their normal position, substantially as set forth.

4. The combination, with the type-bed and stop-motion impression-cylinder, of delivery-grippers, a cross-bar and slides for the same, connecting-gearing from the type-bed to the slides, and mechanism, substantially as specified, for causing the delivery-grippers to close and draw the sheet over the impression-cylinder with the printed side upmost, and a sheet-delivery table over the type-bed, and means for opening the delivery-grippers, substantially as specified.

5. The combination, with the impression-cylinder and its grippers, of delivery-grippers and mechanism for moving the delivery-grippers horizontally, a pin, 9, and arms  $e$   $e^4$   $e^3$ , link  $e^2$ , shaft  $e'$ , and mechanism, substantially as specified, for connecting the arm  $e^3$  with the foot-treadle F, so that the delivery-grippers are caused to remain open and inoperative until the impression-cylinder is brought into action, substantially as set forth.

6. The combination, with the impression-cylinder and a reciprocating type-bed, of delivery-grippers, the cross-bar, shaft, and toothed slides for supporting the same, and gearing, substantially as specified, and the toothed wheel E<sup>5</sup>, for connecting the slides to the reciprocating bed, so that the delivery-grippers receive a positive motion from the reciprocating bed, substantially as set forth.

Signed by me this 22d day of October, 1885.

WALTER SCOTT.

Witnesses:

GEO. T. PINCKNEY,

WALLACE L. SERRELL.