

C. POTTER, JR., & A. JUDSON.  
PRINTING-PRESS.

No. 178,326.

Patented June 6, 1876.

Fig:1.

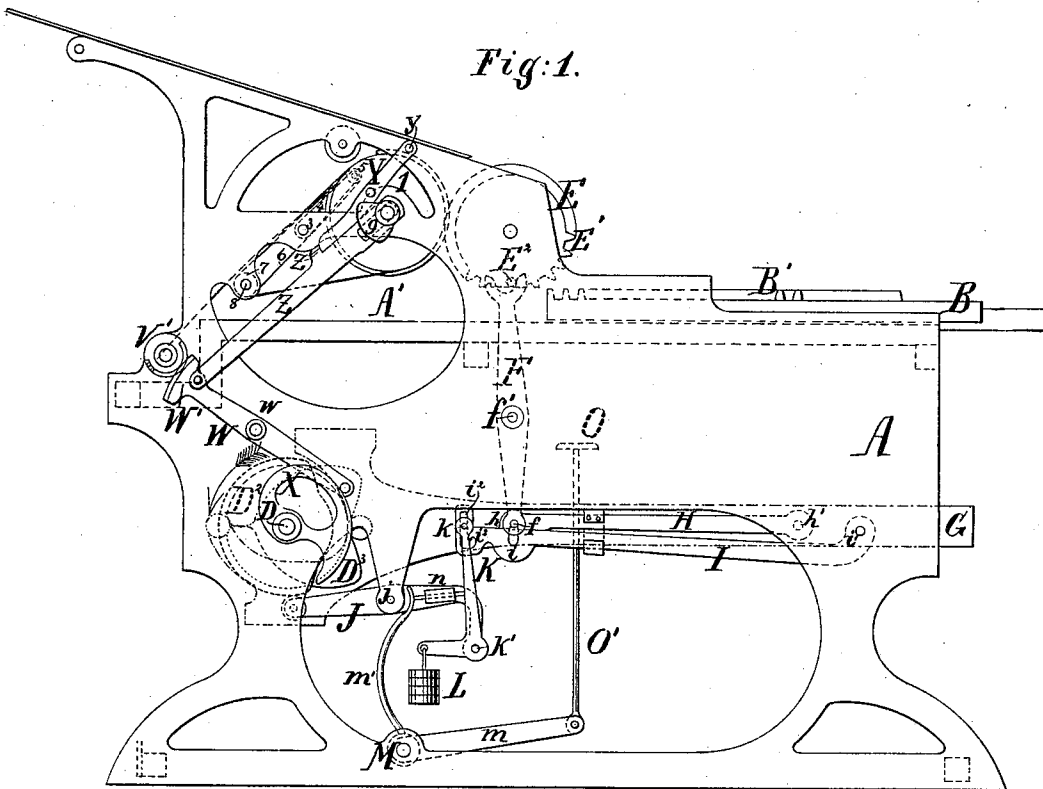
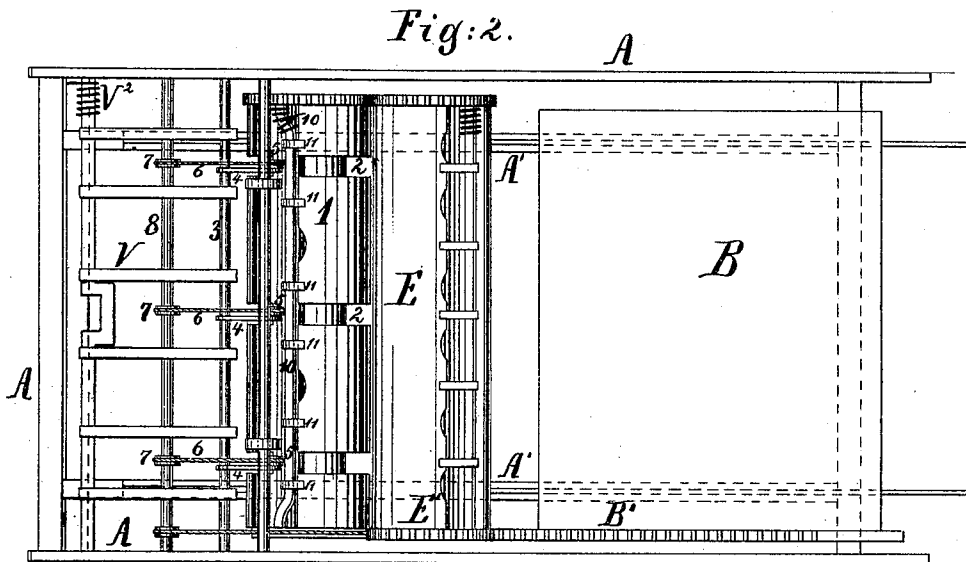


Fig:2.



Witnesses:

Henry G. Gentry

Chas. C. Stetson

Inventors:

C. Potter, Jr.

Amson Judson

by their attorney Thomas D. Stetson

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Fig: 3.

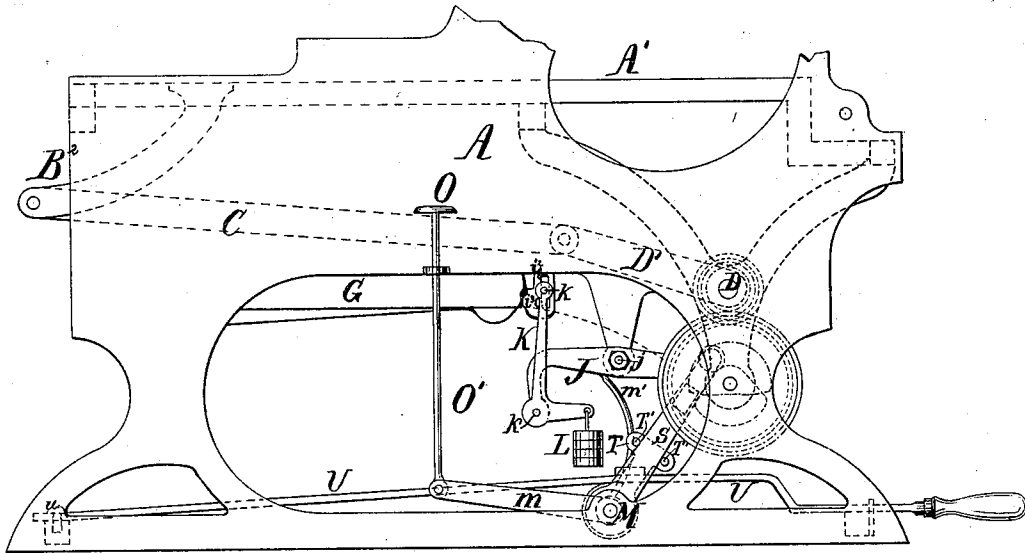
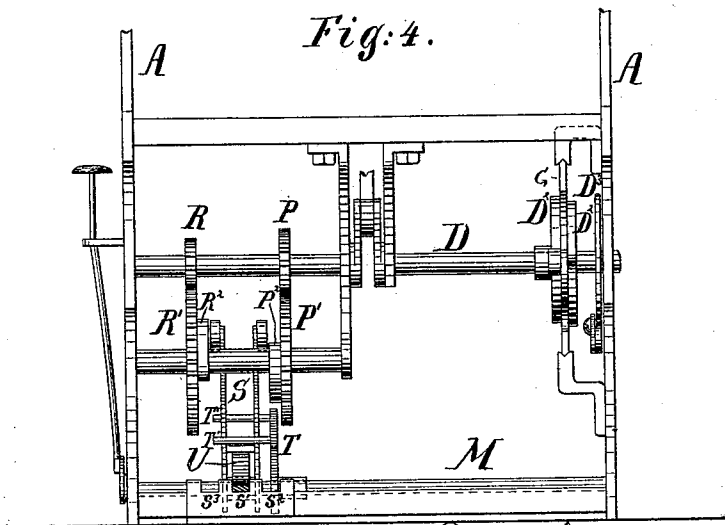


Fig: 4.



Witnesses:

Henry G. Stetson

C. G. Stetson

Inventors:

C. Potter, Jr.  
A. Judson  
by their attorney

Thomas L. Stetson

# UNITED STATES PATENT OFFICE.

CHARLES POTTER, JR., OF PLAINFIELD, NEW JERSEY, AND ANSON JUDSON, OF BROOKLYN, NEW YORK, ASSIGNORS TO CHARLES POTTER, JR., AND J. F. HUBBARD, OF PLAINFIELD, NEW JERSEY.

## IMPROVEMENT IN PRINTING-PRESSES.

Specification forming part of Letters Patent No. **178,326**, dated June 6, 1876; application filed October 25, 1875.

### *To all whom it may concern:*

Be it known that we, CHARLES POTTER, JR., of Plainfield, New Jersey, and ANSON JUDSON, of Brooklyn, Kings county, New York, have invented certain Improvements relating to Printing-Presses, of which the following is a specification:

A large class of printing-presses have a flat "form" of types carried on a flat bed, and reciprocated in contact with a revolving cylinder, which presents the paper to the types and gives the impression. The cylinder is geared to the bed, which carries the form, and their movements coincide for a certain period—*i. e.*, that during which the printing is being effected or impression taken from the types. Then they go out of gear, and the bed returns with its form, without inducing any corresponding back motion of the cylinder. There is a subdivision of this class, known as "stop-cylinder" presses, in which a relatively small cylinder is employed, and the cylinder stands still during the travel of the bed one way. Our improvements relate mainly to this class of presses.

For the accomplishment of the finest class of illustrated printing several things are essential. First, a very thorough distribution of the ink upon the inking-rollers. To accomplish this our improvements provide convenient means for distributing the ink at pleasure, before the form is put on, and without working the entire press. Second, a large amount of rolling of the form before an impression is taken. To accomplish this it is desirable to roll the form by running it more than once back and forth under the inking-rollers before taking an impression, and to effect the same at any period at will, and to prevent injury to the press by any mistaken or unskillful effort to do it at the wrong time. Our improvements provide efficient means for attaining these ends. Third, as taking an impression without a sheet being on the cylinder is injurious, and especially so in printing finely-illustrated sheets, it is highly desirable to be able to prevent an impression being taken whenever in the working of the press it is found that a sheet cannot be got upon the cylinder in time.

Our improvements afford means for accomplishing this latter object; fourth, while stopping the cylinder, on taking an impression, until two or more rollings are accomplished, it is desirable that the fly-frame, which is used to lay out the printed sheets in piles, shall be prevented from acting, as, in acting without a sheet before it, it goes down with violence, to the injury of the freshly-printed sheets already in pile. Our improvement provides for accomplishing this object by very simple means.

The following is a description of what we consider the best means of carrying out the invention.

The accompanying drawings form a part of this specification.

Figure 1 is an elevation of one side of the press. Fig. 2 is a plan view with the table removed. Fig. 3 is a partial view of the side opposite to that shown in Fig. 1, and Fig. 4 is an end view of a portion of the works.

Similar letters of reference indicate like parts in all the figures.

A is the fixed frame-work of the press, and A' the ways which support the reciprocating bed B. There may be rollers to serve as a support for the bed upon the ways, and it will be understood that all the ordinary and usual appliances may be provided for reducing friction, and insuring the strength and perfection of working of the several details. On one side of the bed B is a rack, B<sup>1</sup>. Under the bed is an arm, B<sup>2</sup>, (see Fig. 3,) which receives a connecting-rod, C, leading from a crank, D<sup>1</sup>, on the main or crank shaft D, turned either directly or through the medium of gearing or belts, or both, by a steam-engine, or other suitable power, the direction of rotation being indicated by a curved arrow. E is the impression-cylinder. E<sup>1</sup> is a nearly continuous gear-wheel. E<sup>2</sup> is a pin on the cylinder end, against the point where the gear-teeth are omitted. F is a lever turning on a fixed center, *f*, and forked at its upper end. The lower end of the lever F carries a pin, *f*.

The mechanism which seizes and acts on the pin *f* is peculiar. A sliding bar, G, guided between supports on the framing A, is moved a little, at the right period, by cams D<sup>2</sup> on the

main shaft D. To it is pivoted, at the point  $h'$ , a bar, H, having a hook,  $h$ , adapted to seize the pin  $f$ . So long as this hook and pin remain engaged the impression-cylinder E will, by the action of the cams  $D^2$ , be caused to engage with the bed and produce one impression at each reciprocation. I is a bar, provided on its upper side with a hook,  $i$ , and pivoted to the fixed frame-work at the point  $i'$ . The hook  $h$  being traversed backward and forward over the hook  $i$ , if the bar I is raised at the right moment, it will also raise the bar H, and the pin  $f$  will become disengaged from the hook  $h$ , and become engaged in the hook  $i$ , and thus the impression-cylinder will remain stationary, allowing the bed with the form to reciprocate under it without engagement therewith; but the bar I should be raised only at the moment when the hook  $h$  is still and directly over the hook  $i$ . J is a lever, pivoted at the point  $j$ , and subject to the action of a cam,  $D^3$ , causing it to elevate its opposite end at just the proper moment to effect the elevation of the bar H by the bar I. Its opposite end is bent downward, and carries an L-shaped link, K, pivoted thereto at the point  $k'$ , and having a pin,  $k$ , at its upper end, which is thus raised once to each reciprocation of the bed back and forth. The end of the bar I is widened, and has an L-shaped slot. The pin  $k$  works in this L-shaped slot.

When the pin  $k$  is in the upright part of this slot it traverses idly up and down; but when it is moved into the horizontal part its next elevation raises the levers I and H, and thenceforward holds the pin  $f$  in the hook  $i$ .

The surfaces on one side of this L-shaped slot are those which are mainly important. I will designate the upright surface on one side of the upright part—the right-hand side in Fig. 1—by the mark  $i^2$ , and the horizontal surface or shoulder, which forms the upper side of the horizontal part, by the mark  $i^3$ . We may, when necessary, refer to the corresponding parts of the slot by the same letter, but it is those surfaces which are mainly important. The surface on the other side of the slot only keeps the link K from getting too far away from the principal surfaces. L is a weight, tending to hold the pin  $k$  out of the horizontal arm of the L-shaped slot.

We provide two sets of means for turning the link K in opposition to this weight. Both act through the medium of a slide,  $n$ , which latter is mounted on the side of the lever J, in position to act against the upright part of the link K.

The spring-arm  $m'$ , acting on this slide, is fixed on a shaft, M, which extends across the framing. This shaft M has an arm,  $m$ , acted on by a rod, O', on a handle or treadle, O, placed in a convenient position; and when it is desired to reciprocate the bed idly at will, the operator presses down the handle O. On the main shaft D are fixed two gear-wheels, P R, (see Figs. 3 and 4,) of different sizes, which engage, severally, with the gear-wheels

$P^1 R^1$ , also of different sizes, supported on suitable bearings below. On the side of each is a cam. The cam  $P^2$  is revolved once for each two complete reciprocations of the bed, and the cam  $R^2$  for each three reciprocations. A frame, carrying rollers, as shown, is mounted on the shaft M, with freedom to be moved endwise, and held between the parallel bars  $T' T'$  of an arm, T, keyed firmly on the shaft M. U is a long bar, pivoted at the point  $u$ , and extending through the frame S, so as to control the position thereof.

When the lever U is left in the middle notch  $s^1$  the frame S is kept out of contact with the cams; but when the bar U is lifted out of the notch  $s^1$  and moved into the notch  $s^2$  it correspondingly moves the frame S endwise, and presents it to the cam  $P^2$ . In this condition of the apparatus the frame S will be lifted for each two reciprocations of the bed B, and the cylinder E will only give its impression after two rollings of the form, and on the second reciprocation of the bed. When the bar U is lifted out of the notch  $s^2$  and dropped into the notch  $s^3$  it presents the frame S to the action of the cam  $R^2$ , and now the bars I H will be held up longer, and the impression-cylinder E will remain stationary during two out of every three reciprocations of the bed B, and the form will be inked three times before the cylinder gives its impression.

The fly-frame V, (see Fig. 1,) subject to the action of the spring  $V^2$ , carries the segment  $V^1$ , which is engaged with the segment  $W'$  on the end of the lever W, which turns on the fixed center  $w$ , and is actuated by a cam, X, carried on the main shaft, as usual. The spring  $V^2$  tends always to throw the fly, and the cam X lifts it once for each reciprocation of the bed.

When no printing is effected it is well to prevent the fly from working idly. We attain this by means of a stop-lever, Y, turning on a fixed center,  $y$ , and engaging with a shoulder,  $Z'$ , on the slotted rod Z, which is connected to the lever W. A cam, 9, on the end of the delivering-cylinder 1, raises the stop lever Y, and allows the fly to move from its position only when the sheet is fed onto it by a revolution of the delivery-cylinder. Whenever the bed B is reciprocated idly, and therefore the cylinders are not revolving, the fly is held up by the engagement of the stop-lever Y with the shoulder  $Z'$ .

The delivery-cylinder is marked 1. It is geared to the impression-cylinder, and revolves in unison therewith, and is provided with nippers 11, mounted on a shaft, 10. These nippers seize the front edge of the sheet as the nippers of the impression-cylinder relax their hold, all in a manner which has been long approved.

The nipper-shaft 10 in our press is so bent at each end that it extends along at a considerable depth within the cylinder. Deep grooves 2 extend around the cylinder at short intervals. 3 is a shaft, mounted in bearings

in the framing A. 4 4 are arms held by said shaft, and carrying wheels 5, over which the bands or tapes 6 pass from the ordinary tape-wheels 7 on the shaft 8. The wheels 5 stand in the grooves 2, and should be held at such depth therein as to be mainly within the periphery of the cylinder, but without striking the nipper-shaft.

Mechanism may be attached, if preferred, by which these wheels shall sink deeper during some portion of the revolution than at others.

Whether stationary or movable, the rollers 5 serve to hold the carrying bands or tapes 6 just within the surface of the cylinder, so that as the front edge of the sheet is brought over and subjected to their influence, and released from the nippers 11, it is carried smoothly down on the fly-frame.

Many of the details of the machine may be varied within wide limits. Thus, instead of two cams to control the movements of the bar G, one cam of the proper form, acting against a strong spring or weight, may serve. Instead of a weight on the horizontal arm of the L-shaped link K, a spring may be employed. The link K we prefer to make double, with the parts or halves mounted on opposite sides of the lever J. We have so represented this. The action is better guided and the parts better supported by this construction; but most of the advantages of the invention may be realized without such peculiarity.

Having now described the various parts of our press, the manner in which we accomplish our first object—viz., that of thoroughly distributing the ink before an impression is taken—and also in which we accomplish our second object—that of thoroughly rolling the form—can readily be understood by the following description of the operation:

By pressing down on the rod or handle O, the spring  $m'$  is pressed against the rod  $n$  in the lever J, which presses the pin  $k$  on the link K into the horizontal part of the L-shaped slot in the end of the lever I, and at the proper time the lever J, operated by the cam  $D^3$ , lifts, through the lever I, by its connections, the traveling lever H from the pin  $f$  in the catch-lever F, and its place is taken by the stationary or holding lever I, which thus holds the catch-lever F from moving the cylinder into connection with the rack  $B^1$  on the bed B, and, therefore, holding the impression-cylinder E still while the bed reciprocates, as usual. It will be seen that so long as the rod  $O'$  is held down, the delivery-cylinder 1 being geared to the impression-cylinder, its connections, including the fly, will be prevented from working. If this is done before putting the form on the bed, the ink will be distributed only. If it is done after the form is on the bed, the ink will be distributed and the form will also be rolled. Such distribution and rolling may be worked as long as desired before an impression is taken, and at the will of the operator.

By adjusting the lever or long bar U in the notch  $s^2$ , the intermission of the action of printing during each alternate reciprocation of the bed is made automatic. By adjusting the lever V in the notch  $s^3$ , the action is intermitted during two out of every three reciprocations. By putting the lever V in the notch  $s^1$ , the press prints at each reciprocation. The action under all these conditions is ready to be further intermitted at will on the depression of the handle O. The means by which we omit an impression whenever, through any inadvertence, the sheet is not placed upon the cylinder in time, are precisely similar. The foot or hand of the operator presses down the handle or treadle O, and the action of all, beyond the bed motion and inking distribution and rolling, is interrupted until the sheet is placed. The stopping of the action of the fly-frame during every period while the printing is intermitted is automatic, and requires no attention. To obtain access to the form when near its rear position, we reach under the elevated tapes from one side, or both sides.

We claim as our invention—

1. The mechanism for stopping, holding, and starting the impression-cylinder E, consisting of cams  $D^2$ , sliding bar G, hook H  $h$ , and catch-lever F, combined and arranged substantially as herein described and specified.
2. In combination with the impression-cylinder E, catch-lever F, and engaging-hook H  $h$ , and its operating means, the cam  $D^3$ , vibrating lever J, and the link K  $k$ , capable of a lateral movement at its upper end, the slide  $n$ , arm  $m$ , the bar I  $i$ , having the guiding-surface  $i^2$ , and a shoulder,  $i^3$ , adapted to operate therewith, as and for the purposes specified.
3. The combination of the movable piece  $n$ , carried on the vibrating lever J, with the arm  $m'$ , to transmit the proper lateral movement to the link K, as and for the purposes specified.
4. The lever V, in combination with the cams  $R^2$   $P^2$  and frame S, and lock-plate having notches  $s^1$   $s^2$   $s^3$ , operating as described.
5. The pawl Y and trip-cam 9, in combination with the sliding bar Z, having a catch-notch, Z', and the bar W W', and fly-segment V', as and for the purposes specified.
6. The nipper-shaft 10, with its nippers 11, in combination with the grooved delivery-cylinder 1, and with the arms 4, supporting the pulleys 5, carrying the delivery-tapes 6 to the fly V, as and for the purposes herein specified.

In testimony whereof we have hereunto set our hands this 21st day of October, 1875, in the presence of two subscribing witnesses.

CHARLES POTTER, JR.  
ANSON JUDSON.

Witnesses:

PHILLIPS ABBOTT,  
CHAS. C. STETSON.