

(No Model.)

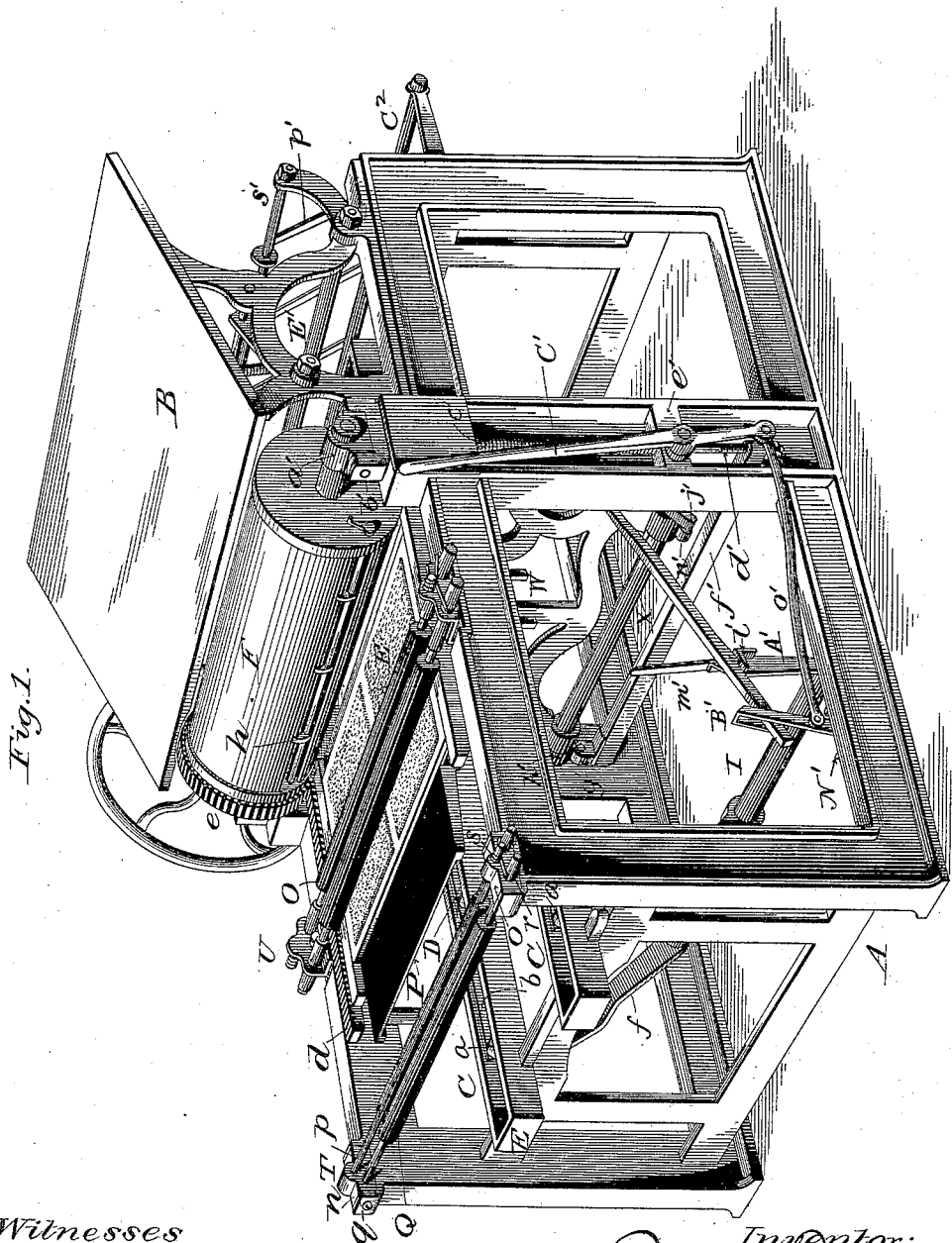
4 Sheets—Sheet 1.

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CYLINDER PRINTING MACHINE.

No. 344,111.

Patented June 22, 1886.



Witnesses

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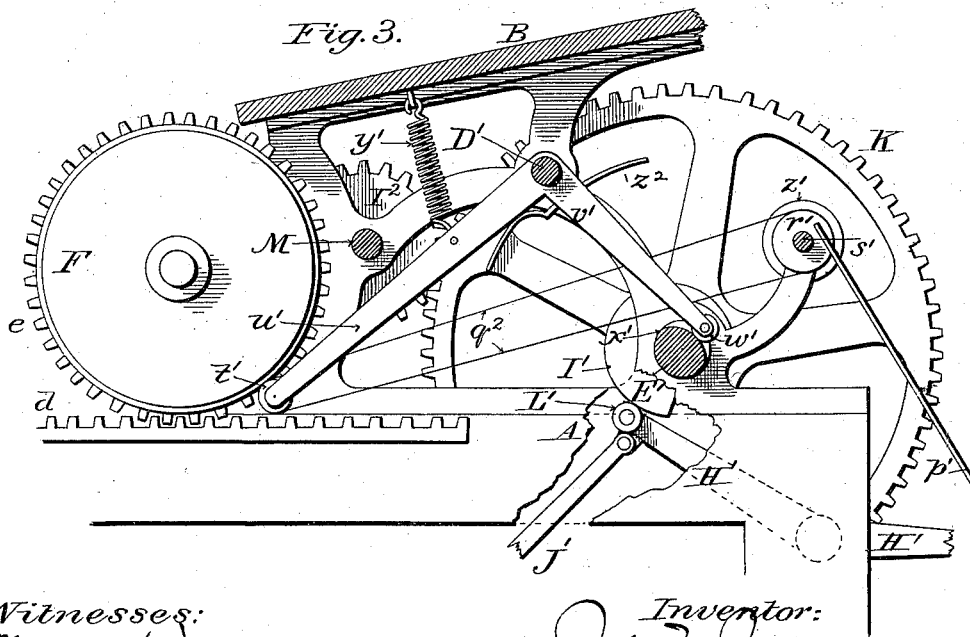
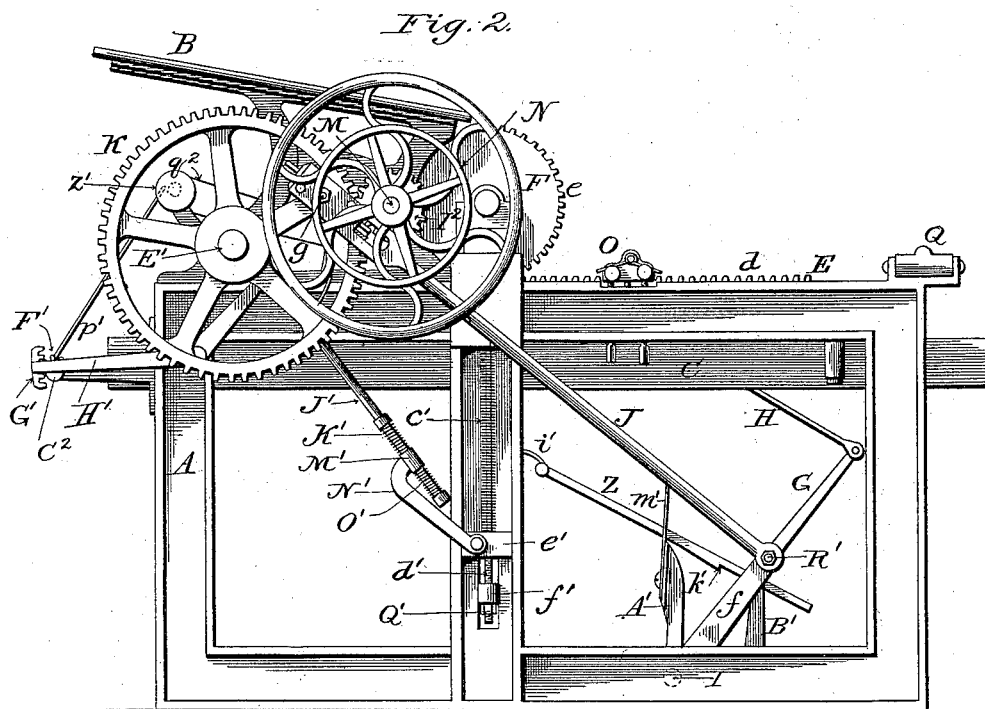
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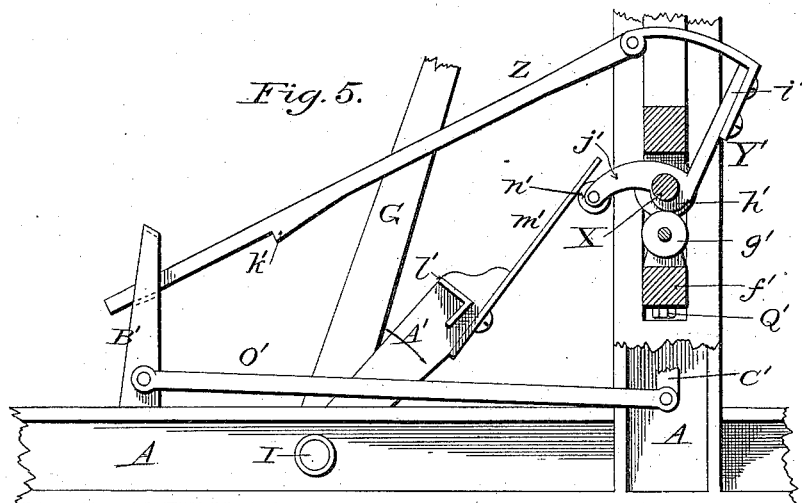
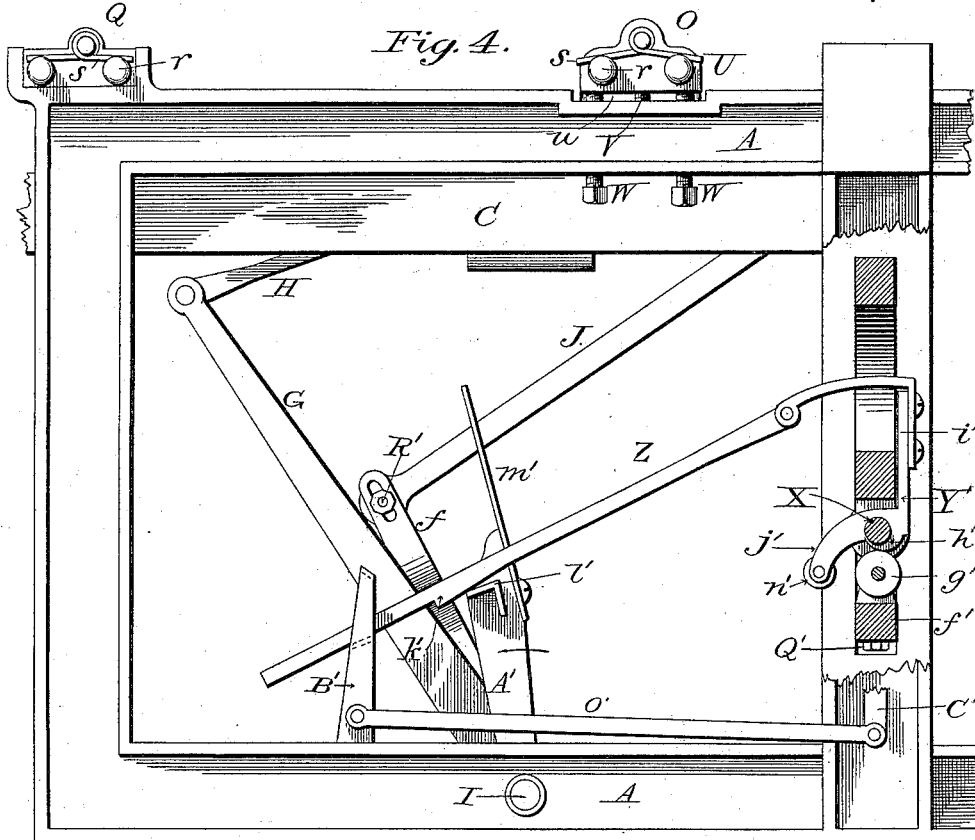
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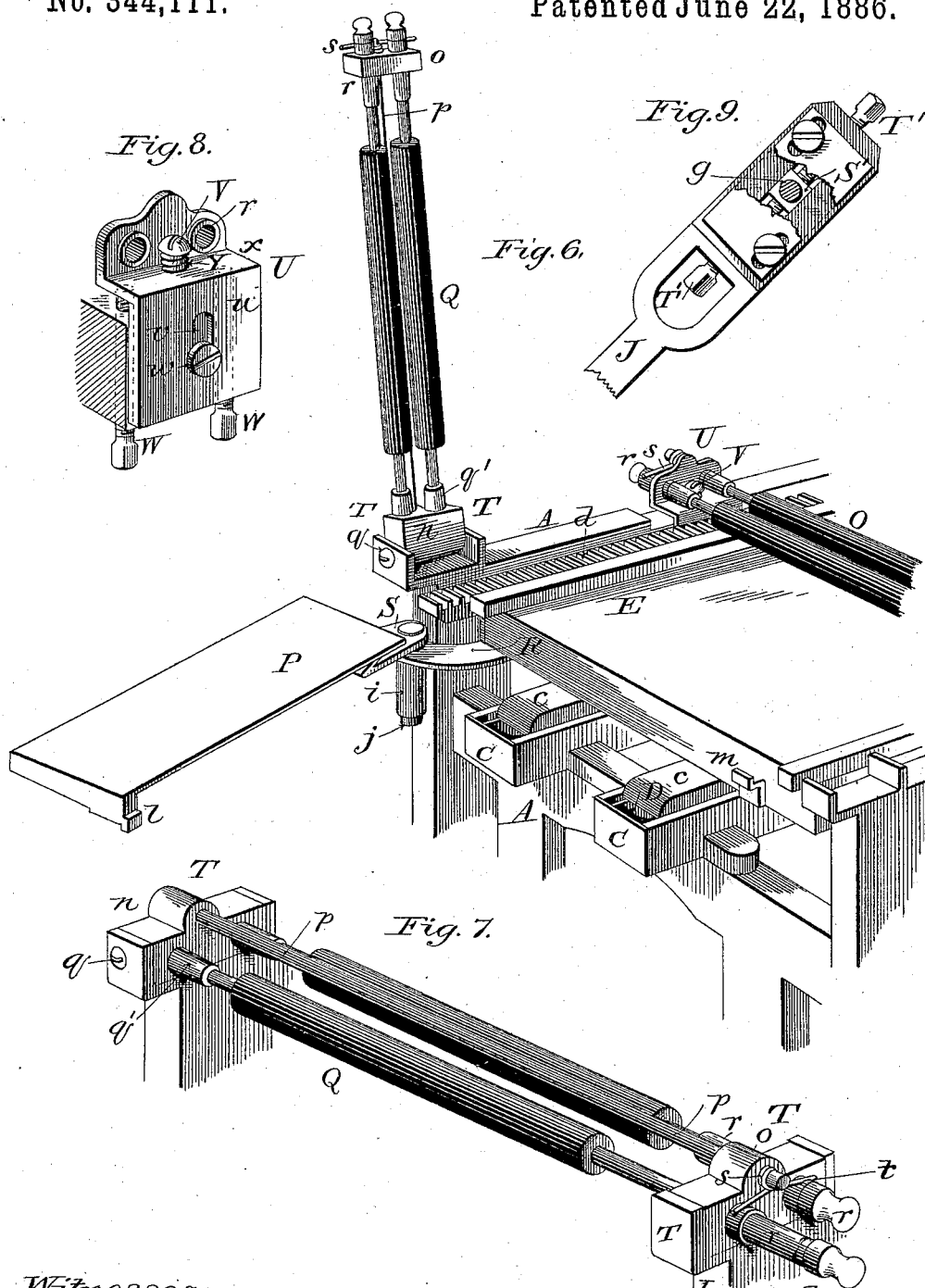
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# UNITED STATES PATENT OFFICE.

JOHN M. JONES, OF PALMYRA, NEW YORK.

## CYLINDER PRINTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 344,111, dated June 22, 1886.

Application filed June 4, 1884. Serial No. 133,817. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN M. JONES, of Palmyra, in the county of Wayne and State of New York, have invented certain new and useful Improvements in Cylinder Printing-Machines, of which the following is a specification.

This invention relates to that class of printing-presses in which a horizontal reciprocating type-bed travels beneath an impression-cylinder, said cylinder being geared to rotate first in one direction and then in the other, according to the direction in which the type-bed moves, and furnished with mechanism for raising it clear of the type on the return movement of the bed.

The improvement consists in various features and details of construction hereinafter fully set forth and claimed.

In the accompanying drawings, Figure 1 is a perspective view of the press; Fig. 2, a side elevation of the driven side; Fig. 3, a detached view of the tape and finger mechanism for discharging and piling up the printed sheets; Figs. 4 and 5, detached views of the mechanism for elevating and lowering the impression-cylinder; Fig. 6, a perspective view illustrating the construction and arrangement of the distributing-rollers and ink table or plate to permit ready access to the type-bed and type; Fig. 7, a detail view of the clip or fastening for holding the rollers in their frames; Fig. 8, a detail view of the ink-roller supports and adjusting devices; Fig. 9, a detail view of the adjustable crank-pin.

The purpose of this invention is to simplify and improve the construction of this class of presses, to facilitate the placing, removal, and correction of the form, and to avoid undue jar and concussion in the operation of the parts.

With these objects in view I construct the press in the following manner, reference being had to the annexed drawings, illustrating the various features described. A strong frame, A, of metal or other suitable material and of substantially common form, is constructed to receive and support the various parts, and upon said frame is placed the usual inclined feeding-table, B. Below the top of the frame are secured horizontally troughs or box-

girders C, in which are placed carriers D, each consisting of a series of rollers, *a*, connected by side bars or strips, *b*, and arranged to roll or travel back and forth in the longitudinal troughs or guides, as usual.

E indicates the type-bed, provided on its under side with runners *c*, which rest upon the rollers of the carriers D, and are thus enabled to move back and forth with very little friction. The type-bed E is furnished at one side (or at both, if preferred) with a toothed rack, *d*, which meshes with and imparts rotary motion to a gear-wheel, *e*, on the end of an impression-cylinder, F, beneath which the bed reciprocates, thus causing the cylinder to rotate first in one and then in the other direction as the type-bed reciprocates. The type-bed is reciprocated through the medium of a vibrating or oscillating arm, G, with which it is connected by a link or pitman, H, said arm projecting radially from a rock-shaft, I, extending transversely across the lower part of the frame A, and rocked through the medium of a pitman, J, connected at one end to a crank-arm, *f*, of the rock-shaft I, and at its opposite end to a crank-pin, *g*, of a driven gear-wheel, K, at the side of the main frame. Motion is imparted to wheel K through a pinion, *I*, on the driving-shaft M, which receives motion through a band-wheel, N. The type-bed carries the form to be printed from, and the impression-cylinder is provided with clamping-fingers *h*, which open when close to the lower edge of the feed-table B, and receives between them and the cylinder the edge of the sheet to be printed, drawing said sheet from the pile and winding it upon the cylinder as the latter changes its direction, which change occurs simultaneously with a change in the direction of travel of the type-bed, the two being geared together, as mentioned.

Thus far the machine is quite similar to others already patented or in use; but new features and improvements will now be pointed out, which distinguish this press from others.

Referring now to Figs. 1 and 2, in which it will be seen that the type-bed E travels beneath a pair of inking-rollers, O, and that an ink bed or table, P, is attached to the other side of the type-bed and passes beneath the ink-rollers, and also beneath a pair of distrib-

uting-rollers, Q, at the outer or forward end of the press-frame A, the ink-table being charged with a proper quantity of ink, which is evenly distributed over its surfaces by the rollers Q, then transferred to the rollers O, and by them evenly applied to the type in the usual manner. Owing to the presence of the distributing-rollers Q and the ink-table P at the point mentioned, it is difficult to get at the type-bed to correct the form or to apply or remove the same to or from the bed, while the time and labor required to remove these parts if attached in the ordinary way would be so great as to seriously impair the value of the press. To avoid such difficulty, I form or attach to the type-bed E a strong arm or bracket, R, having a sleeve, *i*, to receive a pintle or journal, *j*, formed upon an arm, S, at one end of the ink-table P, the pintle being inserted into the sleeve to form a hinge joint or connection between the type-bed and ink-table, upon which the latter may be swung outward, as in Fig. 6, to give access to the former. The free or swinging end of table P is provided with a lip or catch, *l*, which drops into a keeper, *m*, on the type-bed when the ink-table is in its working position, and retains it in such position until the catch is lifted from the keeper preparatory to swinging the table outward. Before thus swinging the ink-table outward, however, it is necessary to remove the distributing-rollers Q from their normal position, and to permit such removal to be made quickly and easily I construct a frame, T, as shown in Figs. 1, 6, and 7. By examining said figures this frame will be seen to consist of two end blocks or heads, *n o*, connected by a rod, *p*—one of the blocks pivoted in an arm or bracket, *q*, at one side of the press-frame A, and the other seated loosely in a similar bracket at the other side of said frame, so that the frame and its rollers may be swung upward to and a little beyond a vertical position at one side of frame A, as shown in Fig. 6, giving free access to the type-bed after the ink-table is swung out, as explained, and as shown in the same figures. Block *n* is provided with two sockets, *q'*, to receive the journals of the rollers Q at one end, and block *o* is provided with loose sleeves *r*, to receive the journals at the opposite ends of said roller, the sleeves *r* being arranged to slide through openings in block *o*, and held in position by spring arms or catches, which enter the notches *t* in the sleeves, as shown in Fig. 7. By lifting the spring arms or catches *s* the sleeves *r* are released and made free to be drawn outward off the journals of the distributing-rollers, which may then be removed from plate T. The inking-rollers are similarly held in vertically-adjustable carriers or supports U, which are more fully illustrated in Fig. 8. Each support or carrier U consists of a vertical slide, *u*, having a slot, *v*, through which passes a guide screw or pin, *w*, which enters frame A, and serves to retain the slide in proper relation to frame A, while permitting it to rise

and fall or to tip or to be tipped, to bring one or the other roll closer down to the type-bed. The upper end of each slide *u* is formed with a horizontal offset, *x*, through which passes a vertical screw, V, encircled by a pressure-spring, Y, and beneath which bear two vertical elevating or adjusting screws, W, by which both the elevation and the inclination of the slide may be regulated and adjusted. As the impression-cylinder rotates both on the inward and on the outward movement of the type-bed E, it is necessary to raise it clear of the type on the return movement of the bed, as otherwise it would receive ink from the type and impart the same to the surface of the next sheet printed. For the purpose of thus elevating the impression-cylinder and again lowering it when an impression is required, I provide the mechanism shown more plainly in Figs. 1, 4, and 5. As shown in Fig. 1, the journals at each end of the cylinder F are carried in long bearing sleeves or boxes *a'*, pivotally supported in vertical slides *b'*, which are raised and held up by springs *c'*, encircling draw-rods *d'*, which pass from the slides *b'* downward through fixed blocks or ledges *e'*, on which the springs *c'* rest, to a cross-bar, *f'*, extending from one side of the frame A to the other. Pressure applied in a downward direction to cross-bar *f'* causes it to descend, overcoming the upward action of springs *c'*, and drawing down the slides *b'* with the cylinder-bearings and cylinder; but upon the removal of such pressure the springs again raise the slides and the cylinder, which latter in its elevated position is high enough to clear the type. Upon the upper side of cross-bar *f'* are anti-friction rollers *g'*, upon which bear depressing cams or eccentrics *h'*, carried by a rock-shaft, X, journaled in the main frame A. The rock-shaft X carries a yoke or lever, Y', having two arms, *i'* and *j'*. To the upper arm, *i'*, is attached a rod or bar, Z, having a shoulder, *k'*, as shown in Figs. 1 and 4, which rod takes the position shown in said figures immediately after the impression is completed.

A' indicates an upright arm rigidly secured to rock-shaft I, and provided with a shoulder, *l'*, to engage with shoulder *k'* of rod or bar Z, and also furnished with a spring end piece or leaf, *m'*, which on the forward movement of the arm strikes a lateral stud or roller, *n'*, of the lower arm, *j'*, of lever Y' and rocks the shaft X forward, so as to permit the rise of the cylinder F. As the bed moves outward, the arm A' swings backward and its shoulders *l'*, riding beneath the gravitating bar or rod Z, lifts said bar until the shoulder *k'* passes beyond shoulder *l'* and the two enter into engagement. The motion of rock-shaft I is then reversed and the arm A' swings forward, carrying before it the rod or bar Z and the yoke or lever Y', to which it is attached, causing shaft X to rock in its bearings, and to swing the eccentrics or cams *h'* downward upon the anti-friction rollers *g'*, thereby depressing

cross-bar  $f'$ , and, through the intermediate connections already explained, drawing down the impression-cylinder to the required position to act upon or in connection with the type.

5 The eccentrics or cams reach their lowest point or have their points of greatest eccentricity carried slightly beyond a line passing through the axis of rock-shaft X and rollers  $g'$  shortly before the inner side of the type-bed reaches the impression-cylinder, and they remain in  
10 such position during the impression. Just as the impression is completed, however, the spring leaf or arm  $m'$  comes into contact with arm  $j'$  or with its stud or roller and moves said  
15 arm far enough to carry the point of greatest eccentricity of cams or eccentrics  $h'$  back of a line passing through their axes and that of the rock-shaft, whereupon the upward pressure of  
20 springs  $c'$  and the weight of bar Z carry the rock-shaft X and said bar Z back to the position shown in Figs. 1 and 4. By providing the spring leaf or extension  $m'$  to start the rock-shaft back I effectually prevent any jar or concussion which might otherwise occur.

25 It often happens that for one reason or another it becomes desirable to stop the press so far as the printing operation is concerned without shifting its driving-belt or stopping the prime motor, and for this purpose I provide  
30 a swinging upright, B', which has a limited movement between fixed stops N', and through which the free end of bar Z plays as the bar is raised, lowered, and moved back and forth longitudinally. When the upright B' is raised  
35 to a vertical position, it lifts the bar Z above its normal position and to such height that shoulder  $l'$  of arm A' will pass beneath and clear of shoulder  $k'$  of bar Z, and as a consequence the bar and the eccentrics remain in  
40 such position as will permit the springs  $c'$  to elevate the impression-cylinder. When it is desired to again bring the cylinder into action, the upright B' is thrown forward into an inclined position by means of a hand-lever, C',  
45 connected with the upright by a link or rod,  $o'$ , the shoulders  $k'$   $l'$  being thus caused to engage again as explained. It will be observed that as the arm A' swings inward the shoulder  $l'$  is caused to rock, so that its rear edge lifts  
50 the bar Z up and disengages the shoulders  $k'$   $l'$  as soon as the bar moves the required distance.

C' indicates a rock-shaft, carrying fingers  $p'$ , which receive the printed sheets from tapes  
55  $q'$  and lay them upon a table, as usual. The tapes pass about pulleys  $r'$ , fixed rigidly upon a shaft,  $s'$ , journaled in the press-frame, and also about a shaft or roller,  $t'$ , the ends of which are faced with leather, rubber, or other  
60 flexible or elastic material, and bear against and receive motion by frictional contact from the ends of the pressure-cylinder as the type-bed returns after an impression is given and preparatory to another. The tapes serve to  
65 receive the printed sheet from the impression-cylinder, and to convey it to the fingers  $p'$ , as is customary in this class of presses.

The roll or shaft  $t'$  is carried by arms or hangers  $u'$ , projecting from a rock-shaft, D', which  
70 arms are normally drawn upward to hold the friction-faces of the roll or shaft  $t'$  against the ends of impression-cylinder F. As there is no occasion for the tapes to move while the impression is being given, and as it is  
75 undesirable that they should travel backward, as they would do at such time, a rearwardly-projecting tail or extension,  $v'$ , is formed upon one of the arms  $u'$ , and is furnished at its end with an anti-friction roller,  $w'$ , which  
80 rests upon shaft E', which carries the wheel K. This shaft E' is cut away to an eccentric form, or may be furnished with an eccentric hub or boss at  $x'$  directly beneath the roller  $w'$ , so that at the proper instant and for a suitable  
85 length of time the roller may fall and permit the spring  $y'$  to raise the arm  $u'$ , and to hold the ends of roll  $t'$  in contact with the impression-cylinder F.

In most presses of this character it is found  
90 that the movement of the tapes received from the cylinder is insufficient to properly deliver the sheet to the fingers or fliers, and as a consequence the papers are liable to be delivered  
95 unevenly or to fall in behind the fliers, and to remedy this difficulty I provide shaft  $s'$  with a friction wheel or pulley,  $z'$ , and provide wheel K with an elastic friction-arm,  $z''$ , of any desired  
100 length, which just as the roll  $t'$  is moved from contact with cylinder F comes into contact with and rotates wheel  $z'$ , and gives the tapes the desired additional movement. Rock-shaft C', which carries the fingers  $p'$ , is furnished at one  
105 end with a pinion, F', which is rotated first in one direction and then in the reverse direction by a curved rack, G', carried by a rocking arm, H', pivoted to the side of frame A, thrown upward  
110 by a cam, I', on the shaft E', and is thrown downward when the action of the cam ceases by a rod, J', actuated by a spring, K', encircling said rod and bearing at its ends against  
115 a collar, L', on the rod and the end of a guiding-sleeve, M', through which the rod moves, said sleeve being formed upon an arm, N', pivoted to the side of frame A.

In order to prevent the fingers from being  
120 thrown down with too great force, a second and shorter spring, O', is interposed between sleeve M' and a head or collar, P', upon the end of rod J'.

In order to adjust the pressure of the cylinder F upon the type, it is only necessary to  
125 turn the nuts Q' upon the ends of the draw-rods  $d'$ . Provision is likewise made for adjusting and regulating the movement of the bed and taking up wear of the parts, first by  
130 slotting arm  $f'$  and securing the crank pin or stud R' therein by a clamping-nut, and by passing crank-pin  $g'$  of wheel K through a sliding block, S', mounted in the slotted end of pitman J, and moving said block longitudinally by set-screws T', as shown in Fig. 9.

I am aware that ink-rolls have before been arranged to swing horizontally away from the bed; but the vertical arrangement is better,

for the reason that it requires less room, and it is important in this structure because it does not in any way interfere with the ink-table, which swings horizontally.

5 Having thus described my invention, what I claim is—

1. In combination with the reciprocating type-bed of a printing-press, a rock-shaft connected with the bed by an arm and a pitman, 10 and provided with an arm having a slotted end, a stud or pin adjustably secured in said slot, a driving-wheel, and a pitman connected with a crank-pin of the driving-wheel, and with the adjustable stud or pin, substantially 15 as and for the purpose set forth.

2. In combination with a reciprocating type-bed and a crank-wheel for reciprocating the bed, an intermediate pitman having its end slotted and provided with a movable block 20 to receive the crank-pin, and with set-screws to adjust and hold said block, substantially as described and shown.

3. In combination with a press-frame and a reciprocating bed, an ink-roller frame pivoted 25 to the main frame and adapted to swing vertically away from the type-bed to a plane outside of its pivot, whereby it is adapted to maintain such position.

4. In combination with frame A, a reciprocating bed, E, distributing-roll frame T, pivoted to the main frame at one end and adapted to swing vertically away from the bed, substantially 30 as and for the purpose set forth.

5. In combination with main frame A, reciprocating bed E, and ink-roller frame T, attached to said main frame by a horizontal pivot, a bracket or guide secured to the main frame and adapted to receive and hold the 35 free end of frame T.

6. In combination with an ink-roll, a longitudinally-movable sleeve or tubular bearing to receive the end of the roll-shaft, a block or support for said sleeve, and a detent or catch 40 to retain the sleeve in place, substantially as shown and described.

7. In combination with an ink-roll, a block, o, provided with a longitudinally-movable sleeve, r, having notches t, and spring arm or catch s, adapted to enter said notch and 45 retain the sleeve in place.

8. In a printing-press, the combination, with a reciprocating type-bed, of an ink-table pivoted to said bed and adapted to be swung into a position parallel with or at right angles 50 to the side thereof, substantially as set forth, whereby access to the form is permitted.

9. In a printing-press, the combination of a reciprocating bed, an ink-table hinged or pivoted to said bed, and an ink-roller frame 55 overhanging the ink-table and pivoted or hinged to the frame of the press, substantially as shown and described, whereby both the ink-table and the ink-roll frame, with its rollers, may be swung away from the front of the 60 type-bed to give access thereto.

10. In a printing-press, the combination, with a tape-pulley shaft, and a wheel or pulley

at one end, of a wheel provided with a spring-arm to engage with and rotate the wheel or pulley of said shaft, substantially as and for 70 the purpose explained.

11. The combination, substantially as described and shown, of cylinder F, shaft t', bearing at its ends against said cylinder, shaft s', provided with pulley z', tapes q', passing 75 about said shafts, a movable frame carrying shaft t', means, substantially as shown and described, for throwing shaft t' alternately into and out of contact with cylinder F, and wheel K, provided with a friction-arm to engage and 80 rotate pulley z', all substantially as set forth and shown.

12. In combination with cylinder F and shaft E', having eccentric portion x', shaft s', shaft t', carried by arms u', tail v', connected 85 with said arms u', and tapes or carrying-bands q', passing about shafts s' t', substantially as shown.

13. In a printing-press, an ink-roller support consisting of a vertical slide having a 90 horizontal ledge, a spring above said ledge and bearing thereon, a regulating-screw bearing upon said spring, and a screw or screws bearing against the under side of the slide and serving to raise the same, substantially as 95 described and shown.

14. In combination with an ink-roller, a centrally-slotted supporting-slide, u, guide-screw w, spring Y above the slide, spring-adjusting screw V, and adjusting-screws W beneath the 100 slide, on opposite sides of the slot, substantially as and for the purpose explained.

15. In a printing-press, the combination of a reciprocating type-bed, an impression-cylinder, bearings for said cylinder, springs beneath said bearings, to elevate the same, a 105 cross-bar beneath the cylinder, connected therewith by rods, a rock-shaft above said cross-bar, provided with cams or eccentrics to bear upon said cross-bar, and means, substantially as described and shown, for imparting a rocking motion to said rock-shaft.

16. In combination with impression-cylinder F and cross-bar f', connected therewith, rock-shaft X, provided with eccentric h', reciprocating bed E, and intermediate connections, substantially such as shown and described, between the rock-shaft and the bed, 115 whereby the impression-cylinder is raised and lowered, as explained.

17. In combination with impression-cylinder F and cross-bar f', connected therewith, elevating-spring c', rock-shaft X, provided with eccentrics h', and with yoke Y, having 120 arms i' and j', rod Z, connected with arm i' and provided with shoulder k', reciprocating bed E, rock-shaft I, provided with arms G and A', the latter having spring-leaf m', and pitman H, connecting arms G and bed E, said parts being constructed and arranged to operate 125 substantially as set forth.

18. In combination with impression-cylinder F, cross-bar f', connected with said cylinder, and elevating-springs c', rock-shaft X,



provided with eccentrics  $h'$ , and yoke Y, having arms  $i'$   $j'$ , vibrating arm A', with latch-bar Z, all constructed and combined substantially as set forth.

- 5 19. In combination with vertically-movable impression-cylinder F and its cross-bar  $f'$ , rock-shaft X, provided with cams or eccentrics  $h'$ , and yoke Y, latch-bar Z, provided with shoulder  $h'$ , and connected with said  
10 yoke, and arm A', connected with the reciprocating bed E, and arranged, as shown, to alternately engage, move, and release the latch-bar Z, as set forth.

- 15 20. In a printing-press, the combination, with an impression-cylinder and reciprocating bed, of a rock-shaft having cams to draw down the impression-cylinder and projecting arm,

and a vibrating arm connected with the reciprocating bed, and arranged, as shown, to strike the projecting arm of the rock-shaft to rock 20 the same.

21. In combination with impression-cylinder F, cross-bar  $f'$ , and spring  $c'$ , rock-shaft X, provided with cams  $h'$  and arm  $i'$ , latch-bar Z, provided with shoulder  $h'$ , vibrating 25 arm A', provided with shoulder  $h'$ , upright guide B', and a hand-lever for moving said guide to elevate or lower the latch-bar and permit or prevent engagement of shoulders  $h'$   $h'$ , as and for the purpose set forth.

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