

(No Model.)

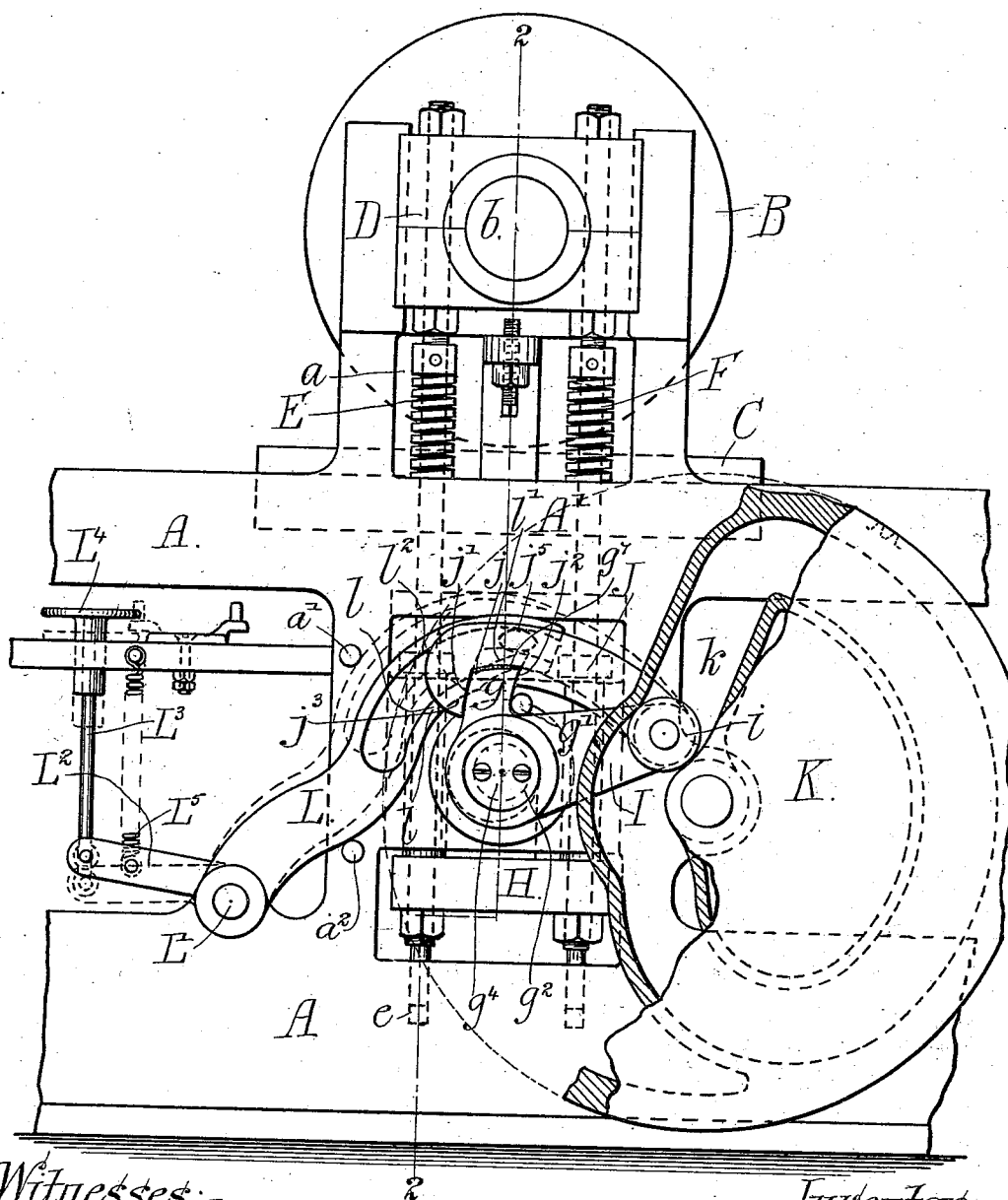
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R. MIEHLE.
PRINTING PRESS.

No. 550,992.

Patented Dec. 10, 1895.

Fig. 1.



Witnesses:-
Irene Miller.
Louis M. F. Whitehead.

Inventor:-
Robert Miehle.
By:- Clayton, Poole & Brown.
His Attorneys

(No Model.)

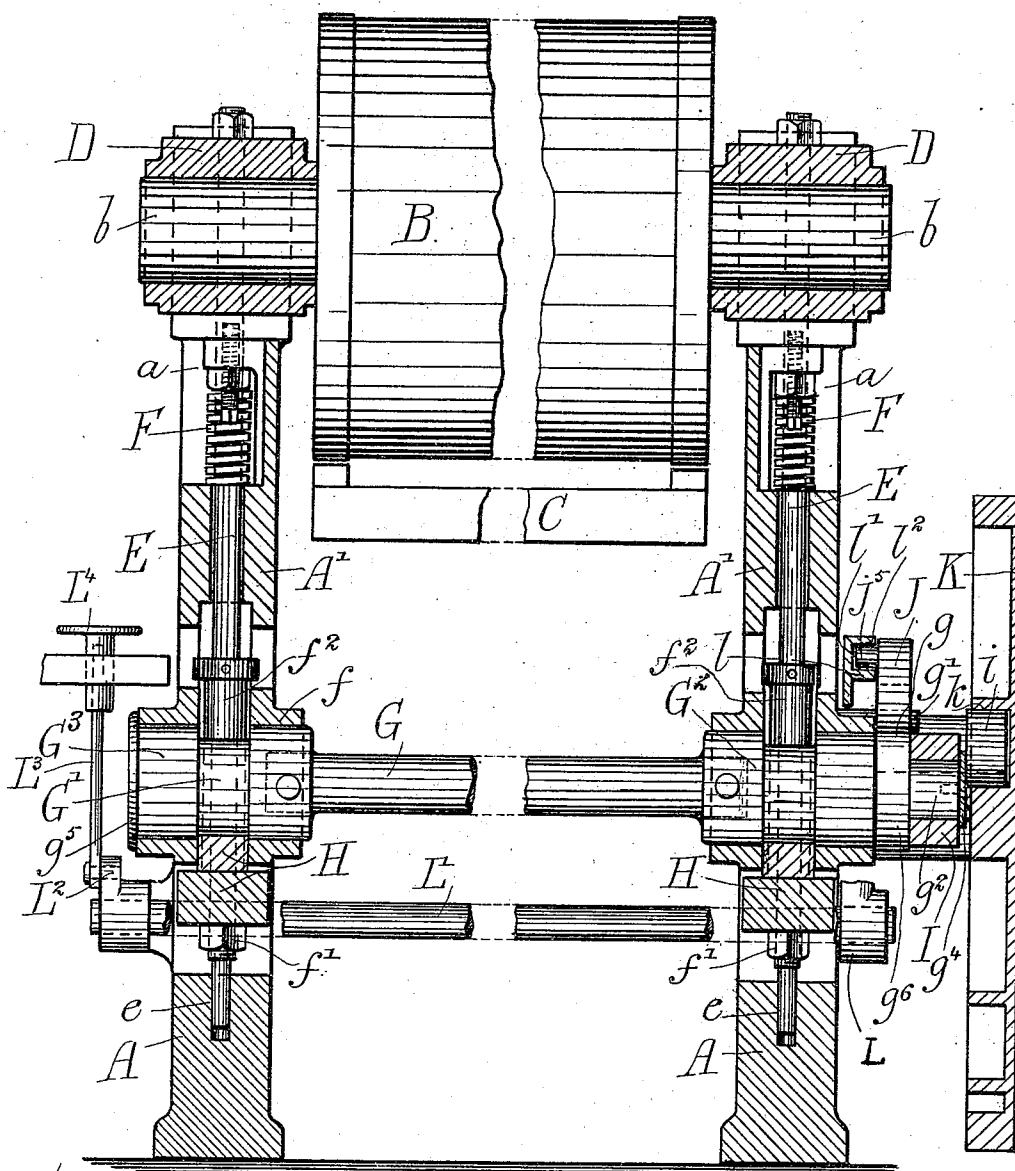
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PRINTING PRESS.

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Patented Dec. 10, 1895.

Fig. 2.



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(No Model.)

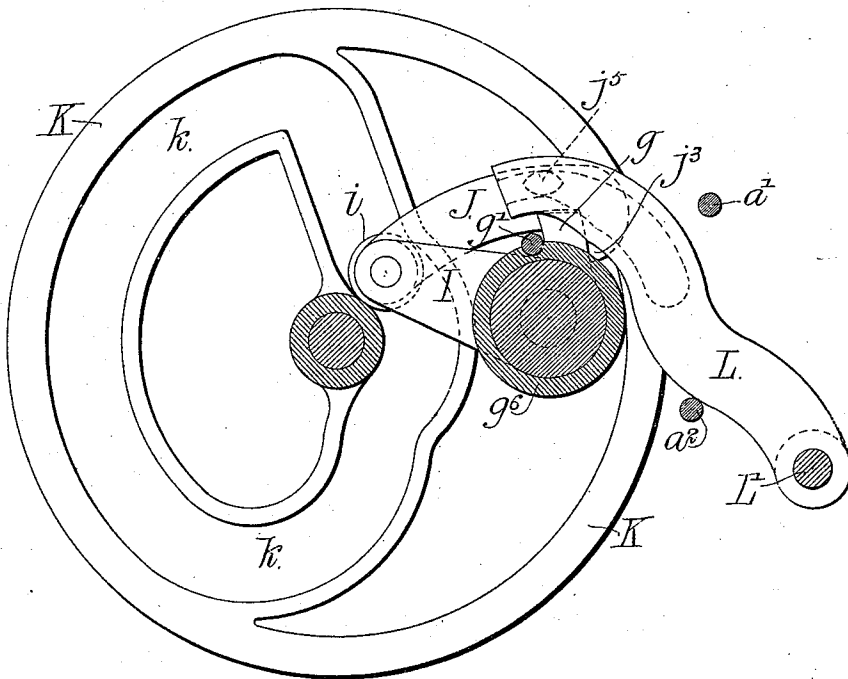
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Fig. 3.



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UNITED STATES PATENT OFFICE.

ROBERT MIEHLE, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE MIEHLE PRINTING PRESS AND MANUFACTURING COMPANY, OF SAME PLACE.

PRINTING-PRESS.

SPECIFICATION forming part of Letters Patent No. 550,992, dated December 10, 1895.

Application filed June 19, 1891. Serial No. 396,828. (No model.)

To all whom it may concern:

Be it known that I, ROBERT MIEHLE, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful
5 Improvements in Printing-Presses; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon,
10 which form a part of this specification.

This invention relates to that class of printing-presses having an impression-cylinder which makes two or more revolutions for each impression and in which the impression-cylinder is moved bodily toward and from the
15 type-bed or printing-surface, so that the latter may at times pass freely beneath the impression-cylinder without contact with the latter, and more especially to means by which
20 the operator is enabled to prevent the movement of the impression-cylinder toward the type at any time desired—as, for instance, when no sheet is fed to the machine or brought
into position for printing.

25 The invention consists in the matters hereinafter described, and pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a side elevation of the parts of a printing-press adjacent to the impression-cylinder, showing devices for giving bodily movement to the impression-cylinder and means for controlling such bodily movement embodying my
30 invention. Fig. 2 is a cross-section through the machine-frame upon line 2 2 of Fig. 1. Fig. 3 is a vertical sectional view of the machine, taken on a line drawn between the machine-frame and the cam-plate and looking toward the cam.

40 As shown in said drawings, A A designate the main side pieces of the machine-frame, which are arranged vertically and parallel with each other in the usual manner, B the impression-cylinder supported between said
45 frame-pieces at the upper part of the machine, and C the reciprocating type-bed located below said cylinder.

50 D D are journal-boxes, in which the journals *b b* of the impression-cylinder are mounted. Said journal-boxes are constructed to slide or

move vertically in vertical slots *a a* in the frame-plates A.

E E are vertical rods secured in said journal-boxes and extending downwardly to points near the bottom of the frame-plates. As a preferable and convenient construction
55 the rods E E are held in place and guided at their lower ends by being inserted in guide-passages *e e*, formed in the frame-plates in the manner illustrated.

60 F F are coiled springs located beneath the said journal-boxes and between the same and stationary cross-pieces A' A' of the frame-plates and operating to lift said boxes, and thereby tending to hold the impression-cylinder in an elevated position. Said springs
65 F F are herein shown as placed around the rods E E; but they may be otherwise located or arranged, as found desirable or convenient, or counterbalance-weights may obviously be used in place of said springs.

70 G is a rock-shaft extending horizontally across the machine-frame and resting at its ends in bearings *f f* in the lower parts of the frame-plates A A. Said rock-shaft is provided near its ends and at a point vertically
75 beneath the bearing-boxes E E of the impression-cylinder with eccentrics or eccentric parts G' G', which engage yokes H H, connected with the rods E E. To afford adjustable
80 connection of the yokes H H with the said rods, the latter pass through vertical holes in the ends of the yokes, and nuts *f' f' f' f'* are placed upon threaded parts of the rods above
85 and below the yokes and bear against the latter, so as to adjustably hold the same in place on the rods. It follows from this construction that when the rock-shaft G is turned or
oscillated in its bearings the impression-cylinder will be moved bodily in a vertical direction,
90 the same being drawn downwardly against the action of the lifting-springs when the rock-shaft is turned in one direction and allowed to rise when the rock-shaft is turned
95 in the opposite direction. The adjusting-nuts *f' f' f' f'* enable the vertical position of the impression-cylinder to be changed for the purpose of accurately adjusting the
said cylinder relatively to the type-bed, or, in other words, for determining the press-
100

ure of the type against the cylinder in printing. Upon one end of the rock-shaft is rigidly secured a radial arm g , through the medium of which a rocking or oscillatory movement is transmitted to said rock-shaft. The movement of this arm in one direction is limited by a pin g' , secured in the frame-plate A, said arm and pin being so arranged that the arm will strike the pin and limit the further rotation of the rock-shaft when the impression-cylinder is at the upward limit of its movement, the arm being thrown in a direction toward the pin by the action of the lifting-springs hereinbefore described. The contact of said arm g with the pin therefore serves both to limit the upward movement of the impression-cylinder and to determine the position of the arm g when the impression-cylinder is lifted.

I is a swinging arm pivoted on the end of the rock-shaft G which extends outside of or beyond the arm g . Pivoted to the outer or free end of the arm I is a dog J, which is provided near its free end, or that remote from the arm I, with a notch j , adapted to receive the end of the arm g of the rock-shaft. The side j' of said notch nearest the free end of the dog is made considerably longer than the opposite side j'' of said notch to form a tooth or projection j^3 , which when the dog is lifted or moved outwardly away from the arm g will stand in position to engage the end of the arm while the arm is disengaged from the said notch.

In the particular construction of the parts herein illustrated the rock-shaft G is provided at its ends with separate cast sections G^2 G^3 , in which the eccentric parts G' G' are formed, the said sections G^2 G^3 being made larger in diameter than the main part of the rock-shaft and having sockets at their inner ends to receive the end portions of the shaft, to which the sections are secured by set-screws, as shown, or otherwise. The said sections G^2 G^3 , furthermore, are fitted to the bearings in the frame-plates in their parts at either side of the eccentrics G' G' , which latter are made smaller in diameter than the said sections. By this construction the said sections are obviously afforded bearings in the frame at each side of the eccentrics. The section G^2 at the end of the shaft at which the arm g is located is preferably cast integral with said arm and is provided outside of the arm with a prolongation or stud g^2 , on which the swinging arm I is mounted, said arm being held thereon by a plate or washer g^4 , secured to the end of the stud in the manner illustrated. The other section G^3 at the opposite end of the rock-shaft is provided at its outer end with a flange g^5 , which overlaps the bearing-aperture in the frame-plate at the outer face of the latter, and thus holds the rock-shaft from endwise movement. The rock-shaft is held from endwise movement in the opposite direction by a flange or collar g^6 , of which the arm g forms a continuation or extension. It follows from

this construction that when the dog is moved or swung outwardly on its pivot far enough to release the arm g from the inner wall of the notch the dog may be moved endwise by the turning of the arm I without moving the arm g ; but the dog cannot at such time pass away from or become detached from the arm g by reason of the presence of the projection j^3 at the end of the dog, which projection insures the return of the arm g to its position in contact with the stop g' and the lifting of the impression-cylinder away from the type.

Oscillatory movement is given to the arm I and the dog connected therewith by means of a cam-wheel K, provided with a cam-groove k , in which is inserted a pin or roller i upon the free end of the arm I. The cam-wheel K may be actuated from any suitable part of the machine, the particular devices employed for driving it having no relation to this invention. The movement of said wheel is, however, so timed with relation to the movement of the impression-cylinder and the cam-groove in said wheel is so shaped that the arm I and dog J will be oscillated to turn the rock-shaft G and depress the impression-cylinder at the proper times for printing.

For preventing the descent of the impression-cylinder when such descent is not desired—as, for instance, in case of failure to feed a sheet of paper to the machine at the proper time—a tripping device for disengaging the dog J from the arm g is provided, as follows: L is a cam-arm mounted on a rock-shaft L', arranged parallel with the shaft G. Attached to said rock-shaft is a foot-lever L², which in the case of a large machine will have attached to it an operating-rod L³, provided with a foot-piece L⁴. A spring L⁵ serves to lift the foot-lever, and stops a' a^2 on the frame limit the movement of the cam-arm L and rock-shaft in both directions. The cam-arm L is provided with a flange l and with a cam-surface l' , which is located opposite the stud j^3 on the dog J at the time the dog is at the rearward limit of its movement and the arm g is in contact with the pin g' , or, in other words, when the dog is in the position (shown in Fig. 1) that it occupies when the impression-cylinder is elevated. Said outwardly-deflected part of the cam-surface is, moreover, so arranged that when the rock-shaft L' is turned by pressure of the foot upon the foot-lever and the cam-arm thereby moved said surface will be thrown outwardly in such position that when the stud j^3 rests on or rides over the same the dog J will be thrown outwardly or swung away from the arm g a distance sufficient to disengage the notch in the dog from the said arm. This position of the parts is shown in dotted lines in Fig. 1. When, however, pressure on the foot-lever is released and the cam-arm returns to its normal or usual position, the said cam projection or outwardly-deflected part l' will rest inside of or out of the path of said stud j^3 , so that it will have no effect on the movement of the dog

and the latter will remain engaged with the arm *g*. The position last described is the usual one in the operation of the machine, the dog remaining engaged with the arm, so as to give continuous oscillatory movement to the rock-shaft, as hereinbefore stated. When, however, it is desired to prevent the type from coming in contact with the impression-cylinder, the cam-arm is actuated through the medium of the foot-lever and the dog *J* thereby lifted, so as to free it from the arm *g*, and thus allow the dog to complete its oscillation without giving movement to the rock-shaft, it being of course understood that the dog slides freely over the end of the said arm *g* during this movement of the parts. The cam-arm *L* is also provided with an outer flange *l'*, arranged opposite and approximately parallel with the flange *l*, and which is adapted for contact with the stud *j*⁵ of the dog *J*, so as to limit the outward movement of the free end of the dog and prevent the same from being thrown by accident or otherwise out of its operative position or so far away as to allow the projection *j*³ to pass said arm. The stud *j*⁵ may travel on the flange *l* below the outwardly-deflected part *l'* thereof during the motion or throw of the dog at the time the latter is disengaged from the arm *g*. The presence of said flange is not essential, however, inasmuch as the dog may be otherwise guided, or it may be allowed to slide upon or ride over the end of the arm *g* after it is released from the same, as in the construction illustrated. Preferably a cushion or block *g'*, of leather or other suitable material, is inserted and held in the bottom of the notch *j* to prevent noise when the dog is thrown into engagement with the arm.

It will be obvious from the above description of the parts that the arm *g*, arranged to oscillate in the manner described, and the dog *J*, having a bodily oscillation in a curved path and adapted for engagement with said arm, constitute, in effect, the members of a clutch, which clutch as a whole operates as a means or medium of transmitting motion from the other operating parts of the machine to the impression-cylinder for moving the latter bodily, and the members of which clutch can be separated or disengaged at will, so as to prevent the transmission of such motion and to arrest the bodily movement of the impression-cylinder when desired.

An important advantage is gained by mounting the arm which carries the clutch-dog directly on the rock-shaft, for the reason that in this construction the said arm normally or commonly, in the usual operation of the machine, turns or oscillates with said rock-shaft. The said clutch-arm thus turns on its pivot only when the parts of the clutch are disengaged and the impression-cylinder is out of operation. As a consequence the friction which would result from the continuous oscillation of said arm on its pivot is avoided, and the parts are made more dura-

ble by avoidance of the friction and consequent wear which would result if said arm were independently pivoted on the frame. 70

An important feature of my invention is that embraced in the construction by which the cam-plate or the cam-surface thereof acts to disengage the members of the clutch or to hold the same in position to prevent engagement thereof when the impression-cylinder is in a position remote from the type-bed and at such time only, so that when the cam-plate is actuated it will have no effect upon the clutch and will fail to disengage the parts thereof during the movement of the impression-cylinder, but will act upon the clutch at the time the impression-cylinder is returning to its normal position after having been depressed or having been brought into position for printing. This may be more readily understood by observation of the fact that the outwardly-deflected part *l'* of the cam-plate herein shown is arranged to act upon the stud *j*⁵ of the dog *J* when said dog reaches the backward limit of its throw, or, in other words, when the notch of the dog is engaged with the arm *g* and the latter is in contact with the pin or stop *g'*. If the cam-plate is moved or shifted by the operator at any point during the forward or backward movement of the dog, it will have no effect until the dog nearly reaches the rearward limit of its stroke, when the stud will ride upwardly on the said cam-surface *l'* and will be thereby lifted or thrown outwardly free from the arm *g* at the time the said arm is restored to its normal position in contact with the pin *g'*, it being of course understood that the springs which act to lift the impression-cylinder will hold the said arm positively against the pin when the dog is thus released from the said arm. It follows that the operator may move or actuate the cam-plate at any time after the dog begins its forward movement, and the depression of the cylinder and the printing of the sheet will take place without interruption by reason of such movement of the cam-plate, but that, if the operator's foot remains on the foot-lever and the cam-plate is held in its shifted position, the impression-cylinder will remain elevated during the next or succeeding movement of the type-bed. It will also be understood that in case the cam-plate is moved while the dog *J* and arm *G* are at rest and at the backward limit of their movement, or, in other words, during the time the stud *i* is in the concentric portion of the cam-groove *k* nearest the center of the wheel, the dog will be thrown outward and released from the arm *g*, so that when the dog begins its forward movement it will remain disengaged from the arm *g* and complete its full stroke without moving said arm or shifting the impression-roller. Among other disadvantages which would result from the release of the dog from the arm *g* during the downward or upward movement of the impression-cylinder would be that the cyl-

inder would in such case, on the release of the parts of the clutch, be thrown forcibly upward by the lifting-springs, and thereby objectionably jar the machine.

5 I claim as my invention—

1. The combination with an impression cylinder, of means for giving bodily movement to the cylinder comprising a rock-shaft, which is connected with and actuates the cylinder, 10 an oscillating clutch-arm attached to said shaft, a clutch-dog, an arm for supporting the clutch-dog pivoted on said rock-shaft, means for actuating the said pivoted arm, and a tripping device for disengaging the clutch-dog from the clutch-arm, substantially as described. 15

2. The combination with an impression cylinder, of a rock-shaft connected with and giving bodily movement to the same, a clutch consisting of a clutch-arm rigidly attached to said rock-shaft, a supporting arm pivoted upon the rock-shaft, means for actuating said supporting arm a clutch-dog pivoted to said supporting arm and adapted to engage the 25 clutch-arm, and a movable cam-plate adapted to engage and move the clutch-dog for releasing it from the clutch-arm, substantially as described.

3. The combination with an impression cylinder, of a rock-shaft connected with and giving movement to the cylinder, a clutch-arm rigidly attached to the rock-shaft, an oscillating arm mounted on said rock-shaft, a clutch-dog pivoted to said arm, a cam-wheel engaged 35 with and giving motion to said arm, and a tripping device for disconnecting the dog from the clutch-arm, substantially as described.

4. The combination with an impression cylinder, of means for moving the same bodily, embracing a rock-shaft, which is connected with and moves the impression cylinder, a clutch-arm attached to the rock-shaft, a supporting arm mounted on the rock-shaft, an oscillating dog pivoted on the said supporting arm and provided with a notch to engage 45 the clutch-arm, and also with a laterally projecting stud, and a movable cam plate located at one side of the dog and provided with an outwardly deflected part acting on the said 50 stud to disengage the dog from the clutch-arm, substantially as described.

5. The combination with an impression cylinder, of means for bodily moving the same comprising a separable clutch consisting of 55 two detachable parts, to wit, a pivotally supported clutch-arm intermediately connected with and giving movement to the cylinder, and a bodily oscillating clutch dog which is actuated from or by one of the operative parts 60 of the machine and is provided with a later-

ally projecting stud, and means for moving the clutch-dog, comprising a cam-plate provided with a flange to arrest the outward movement of the dog, and a cam surface for moving the clutch-dog to disengage it from 65 the clutch-arm, substantially as described.

6. The combination with an impression cylinder, of means for giving bodily movement to the cylinder, comprising a rock-shaft which is connected with and moves the cylinder, a 70 clutch-arm rigidly attached thereto, a clutch-dog, an oscillating arm mounted on the rock-shaft, to which said dog is pivoted, a cam for actuating the said oscillating arm, and means limiting the movement of the dog in a direction 75 away from the clutch arm, said dog being provided with a projection adapted to engage the clutch-arm when the dog is swung away from said arm, substantially, as described. 80

7. The combination with an impression cylinder, of means for bodily moving the same, comprising a rock-shaft connected with and moving said cylinder, a clutch-arm rigidly attached to said rock-shaft, a supporting arm 85 mounted on the rock-shaft, a clutch-dog mounted on the said supporting arm, provided with a laterally projecting stud, means for moving the clutch-dog, comprising a cam-plate having a surface to engage the said stud, 90 a rock-shaft supporting said cam-plate, and a foot-lever attached to the rock-shaft, substantially as described.

8. The combination with an impression cylinder and movable bearings supporting the 95 same, of springs applied to said bearings for moving the cylinder, means for bodily moving the impression cylinder against the action of the springs, comprising a clutch device consisting of two parts, to wit, a pivotally 100 supported clutch-arm which is connected with the cylinder bearings, a stop limiting the movement of said clutch arm under the action of said springs, a bodily oscillating clutch-dog which is actuated from or by one of the 105 operative parts of the machine, and means for moving the clutch-dog to disengage the parts of the clutch comprising a cam-plate having a cam surface located in position to engage the dog and hold the same free from 110 the clutch-arm when the latter is held in contact with the said stop, substantially as described.

In testimony that I claim the foregoing as my invention I affix my signature in presence 115 of two witnesses.

ROBERT MIEHLE.

Witnesses:

C. CLARENCE POOLE,
GEORGE W. HIGGINS, Jr.