Nov. 1, 1932. C. L. LOW 1,886,281

AUTOMATIC TRIP MECHANISM FOR PRINTING PRESSES

Filed Nov. 22, 1929 4 Sheets-Sheet 1

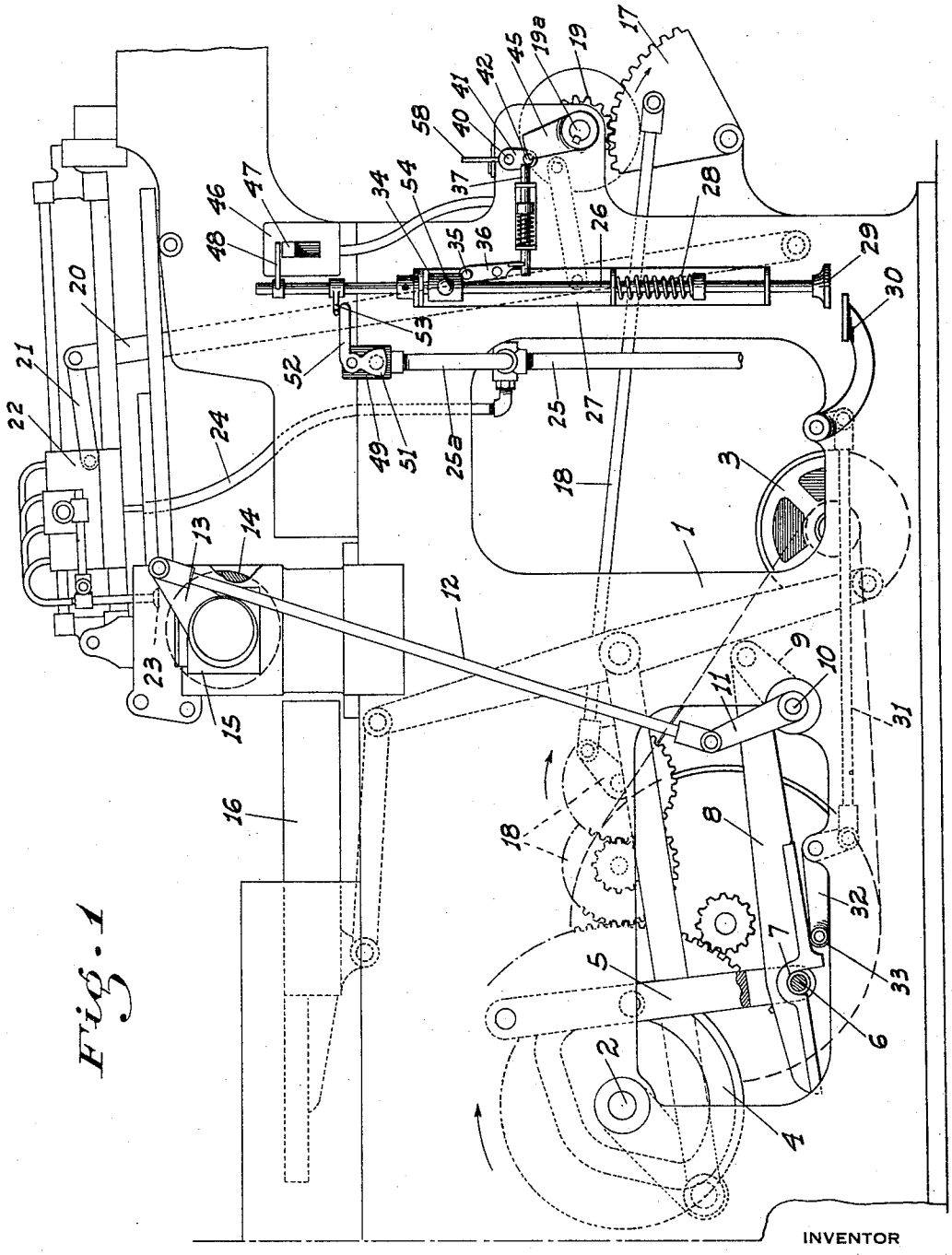


Fig. 1

INVENTOR

Chas L. Low

BY

ATTORNEY

Nov. 1, 1932. C. L. LOW 1,886,281

AUTOMATIC TRIP MECHANISM FOR PRINTING PRESSES

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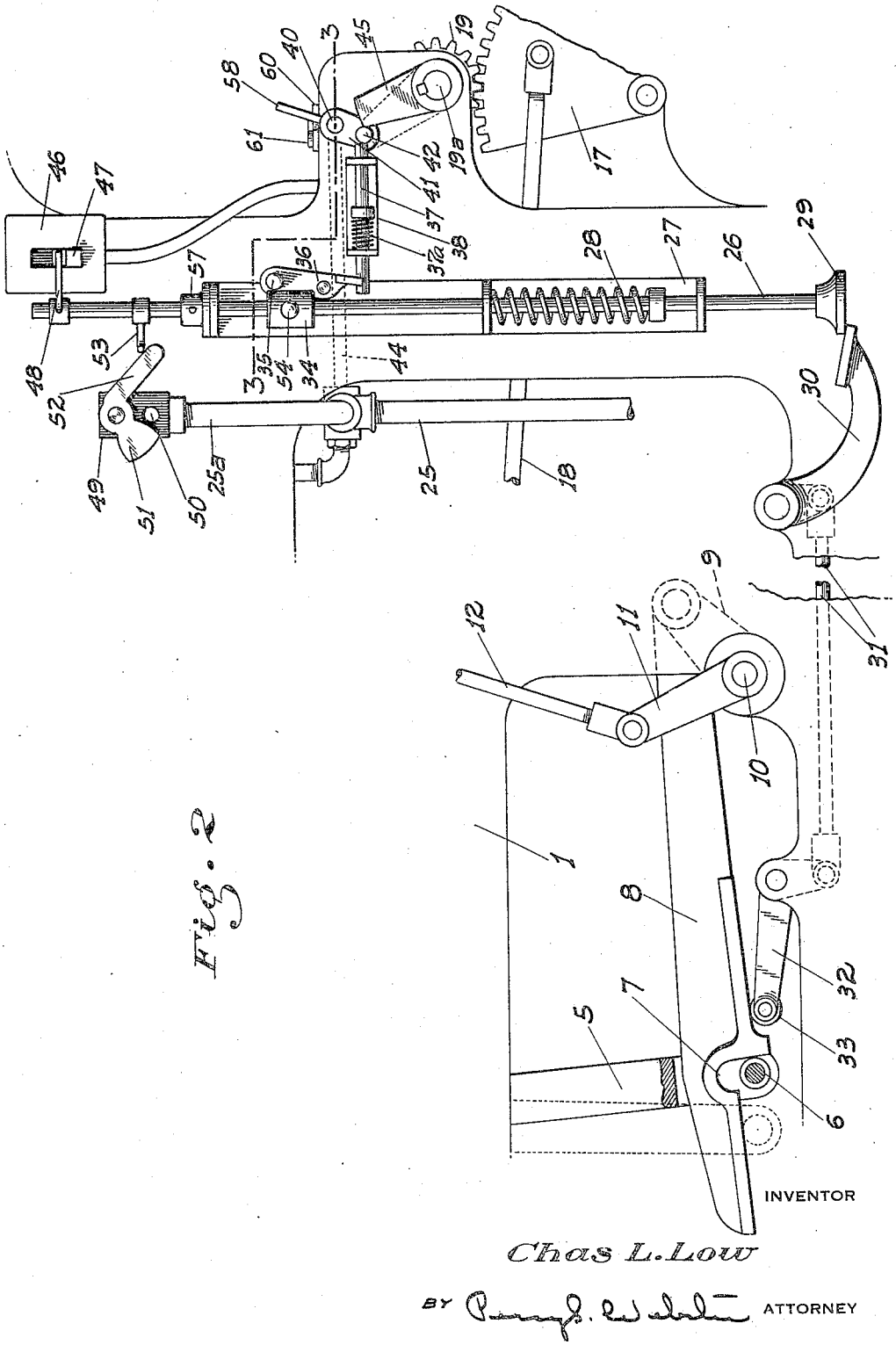


Fig. 2

INVENTOR

Chas L. Low

BY ATTORNEY

Nov. 1, 1932. C. L. LOW 1,886,281

AUTOMATIC TRIP MECHANISM FOR PRINTING PRESSES

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Fig. 3

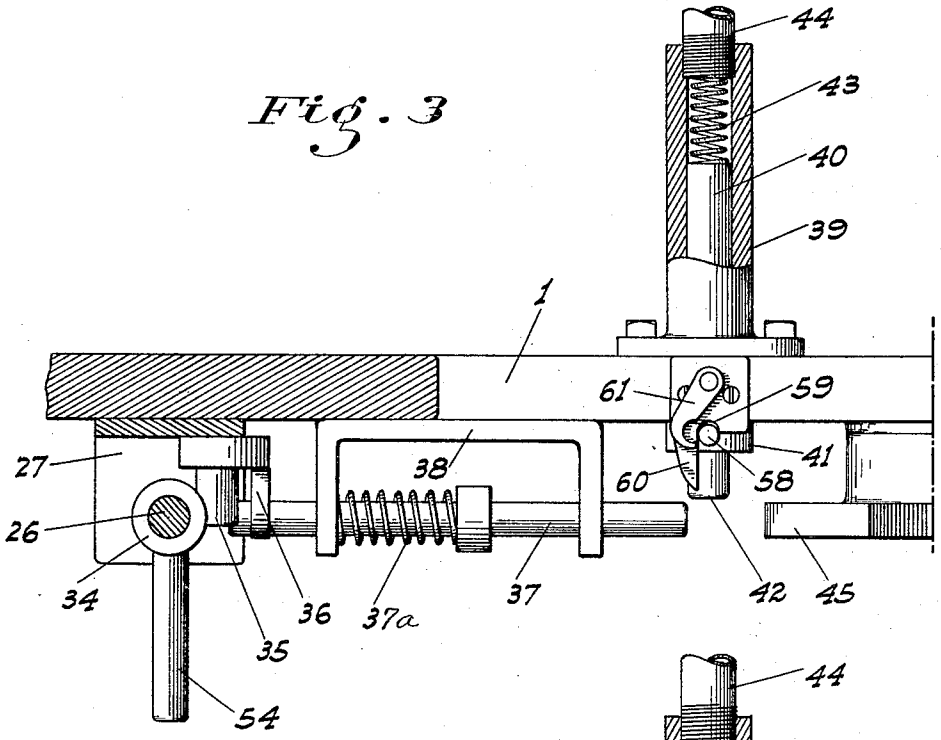
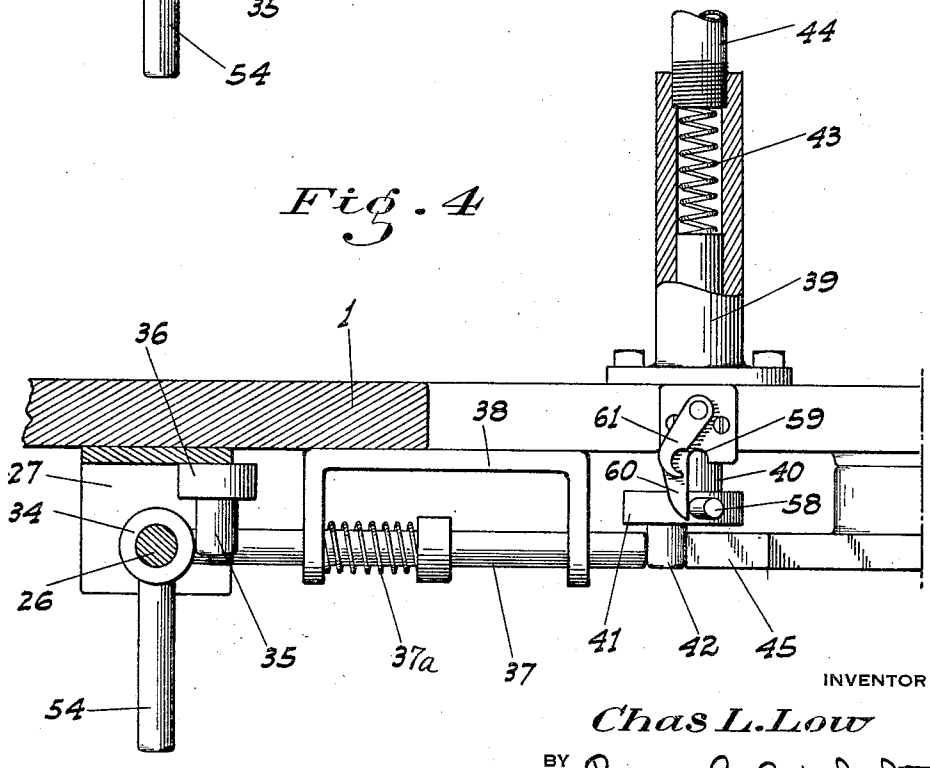


Fig. 4



INVENTOR

Chas L. Low

BY

ATTORNEY

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AUTOMATIC TRIP MECHANISM FOR PRINTING PRESSES

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Fig. 5

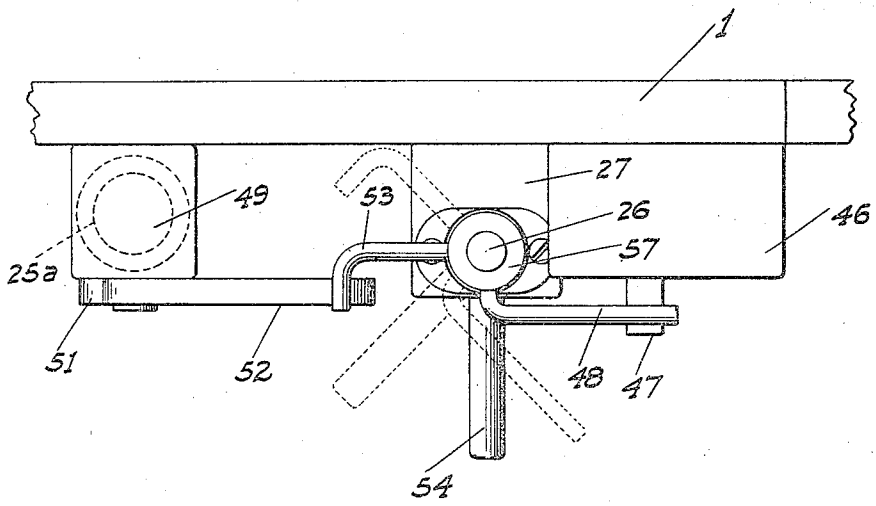


Fig. 6

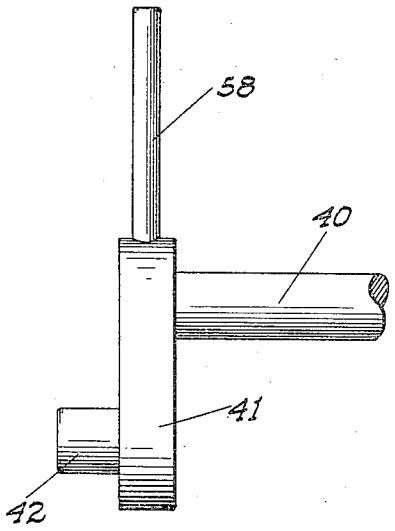
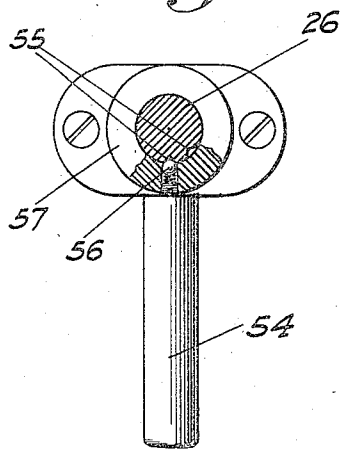


Fig. 7



INVENTOR

Chas L. Low

BY

ATTORNEY

Patented Nov. 1, 1932 1,886,281

UNITED STATES PATENT OFFICE

CHARLES L. LOW, OF FRESNO, CALIFORNIA, ASSIGNOR TO LISENBY MANUFACTURING COMPANY, OF FRESNO, CALIFORNIA, A CORPORATION

AUTOMATIC TRIP MECHANISM FOR PRINTING PRESSES

Application filed November 22, 1929. Serial No. 408,936.

This invention relates to printing presses, and particularly to a press of the cylinder type in which the sheets to be printed are fed from a stack to the printing cylinder by a suction nozzle, such as the construction shown in my copending application for patent, Serial No. 391,606, filed September 10, 1929.

In a press of this character the cylinder is arranged to be pressed as the sheet is fed under the same, by a mechanism operated in conjunction with the operation of the press as a whole, and if no sheet is thus fed due to the failure of the suction nozzle to engage and feed the sheet for any reason, the cylinder when depressed will contact directly with the inked type on the moving bed and must be wiped off before operations can be resumed.

The principal object of my invention is to provide a means, functioning upon the failure of the suction nozzle to engage a sheet, or upon the failure of the suction itself for causing the driving connection between the cylinder and its depressing means and the driving mechanism of the press to be instantly broken at such time.

A further object of the invention is to provide in connection with such means a selectively controlled mechanism for enabling the switch of the press driving motor to be also opened and the main suction line opened so that the suctional force at the nozzle is positively destroyed for the time being.

A further object of the invention is to produce a simple and inexpensive device and yet one which will be exceedingly effective for the purpose for which it is designed.

These objects I accomplished by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings similar characters of reference indicate corresponding parts in the several views:

Fig. 1 is a fragmentary side elevation of a press showing the major features thereof in connection with my improved trip mechanism, the latter being shown in its normal or non-functioning position.

Fig. 2 is an enlarged side elevation of the trip mechanism as functioning to trip the operation of the machine.

Fig. 3 is an enlarged sectional plan on the line 3—3 of Fig. 2 showing the trip mechanism in its normal non-functioning position.

Fig. 4 is a similar view showing the trip mechanism functioning.

Fig. 5 is a top plan view showing the switch and the suction valve operating members of the trip mechanism.

Fig. 6 is a fragmentary side elevation of the suction actuated plunger and trip pin unit.

Fig. 7 is a fragmentary plan section showing the position holding means of the main rotatable trip rod.

Referring now more particularly to the characters of reference on the drawings, the numeral 1 denotes the main side frames of the press in which are mounted the main drive shaft 2 which is constantly driven from an electric motor 3 by suitable operating connections. A cam 4 is mounted in fixed connection with the shaft 2, which causes a vertical lever 5 to be intermittently oscillated. On its lower end this lever carries a cross pin 6 normally engaging a deep notch 7 cut in the lower face of a beam 8. This beam is free at its end adjacent the pin and is supported thereby, but at its other end it is connected to an arm 9 projecting radially from a shaft 10. Another arm 11 also projects radially from said shaft and is connected to the lower end of a link 12, which at its upper end is connected to an arm 13 projecting radially from one end of the printing cylinder 14. This cylinder is eccentrically mounted as usual in its bearing blocks 15 so that when said arm 13 is depressed the cylinder will be lowered into engagement with the moving bed 16 of the press.

Supported from the frame is a segmental gear 17 which is oscillated through a certain arc with every revolution of the shaft 2 by suitable driving connections therebetween, as indicated generally at 18. This gear meshes with a pinion 19 which is oscillated through a half revolution with each stroke of the segmental gear. The oscillation of the pinion also reciprocates a vertical lever 20 through

suitable connections with said lever; said lever being pivoted at its lower end on the frame. At its upper end this lever is connected by a link 21 to a slide block 22 which supports the suction nozzles 23 which are adapted to engage the individual sheets from the stack (not shown) and feed the same toward the cylinder. A flexible conduit 24 is connected with the nozzles and leads thence to a rigid pipe 25 connected to a suitable source of negative or suctional pressure (not shown). All the parts so far described, with the exception of the special form of the beam 8, and the particular connection of the lever 5 therewith, are standard parts of the press shown in the copending application aforementioned, and are described merely to show their connection with the trip mechanism.

These parts are so arranged relative to each other that the cylinder is depressed as the nozzles are moving away from the same or are returning to their retracted and sheet engaging positions.

The trip mechanism associated with these parts is constructed as follows:

A vertical rod 26 is turnably and slidably mounted in a suitable bracket 27 secured to the frame 1 preferably near the shaft 19a of the pinion 19. A compression spring 28 acts to push the rod down. The lower end of this rod carries a head 29 adapted to engage one end of a horizontal pedal 30 which is pivoted at its opposite end on the frame 1. This pedal is connected by a link 31 with a horizontal arm 32 which is pivoted on the frame at one end and at its other end carries a roller 33 adapted to bear against the under face of the beam 8 between the notch thereof and the arm 9. These parts are so arranged that when the pedal is depressed the arm is raised, which causes the beam 8 to be raised also, turning about its connection with the arm 9 as an axis. This withdraws the notch 7 from about the pin 6 and allows the lever 5 to oscillate without moving the beam. The cylinder therefore will not be depressed as long as the pedal is depressed. This pedal is so arranged relative to the head 29 that it has no direct connection therewith, and may also be manually depressed by a foot of the operator, so as to disengage the cylinder depressing mechanism, without affecting the operation or position of the rod 26.

This rod is normally held raised but is allowed to be pulled down by the spring 28 when the suctional pressure in the pipe 25 is temporarily lowered or destroyed for any reason, and at a predetermined time relative to the movement of the nozzle supporting slide by the following means.

Fixed on the rod 26 intermediate its ends is a block 34 normally engaged on its under side by a suitable pin 35 which projects from a vertical arm 36 pivoted intermediate its ends on the bracket 27. The lower end of this arm is engaged by a horizontal rod 37 slidable in a bracket 38 and engaged by a spring 37a which acts to hold the arm in position so that the pin 35 will engage the block.

Slidable and turnable in a cylinder 39 fixed on the inside of the frame and extending transversely relative to the rod 37 is a plunger 40. This plunger on its outer end carries a depending crank arm 41 having a stub pin 42 projecting from the outer face of the same at its lower end, and which is in substantial horizontal alinement with the rod 37, and is also normally disposed so as to lie immediately in front of said rod.

A spring 43 acts on the plunger to force the same outwardly of the cylinder, the inner end of which is connected by a pipe 44 to the pipe 25. These parts are so arranged that when the proper working suction is present in the pipe 25 the plunger will be drawn inwardly of the cylinder and the fin 42 will be drawn transversely to a point so that it is clear of the rod 37, as shown in Fig. 3. When the suction is not present in the suction line, however, the spring 43 acts to force the plunger out of the cylinder, with the result that the pin 42 is in direct transverse alinement with the rod 37 and is immediately in front of the same, as shown in Fig. 4.

Fixed on the shaft 19a is an arm 45 transversely alined with the rod 37 and so positioned that it will oscillate past the horizontal plane of said rod with the oscillation of the pinion. The length of the arm is less than the normal distance from the shaft 19a to the adjacent end of the rod 37, but is greater than the distance from said shaft to the adjacent face of the pin 42. Therefore if the pin is retracted from the plane of the rod (as in the normal operation of the machine) the oscillating arm will not affect said rod. If, however, the pin is transversely alined with the rod, as when the functional pressure is lessened or destroyed, said pin will be engaged by the arm 45, and the pin being turnable about the plunger 40 as an axis, said pin and the rod 37 will both be moved horizontally. The holding pin 35 will therefore be moved clear of the block 34, and the rod 27 being thus released will be pulled down by the spring 28, causing the pedal 30 to be depressed with the results as previously stated. The arm 45 is positioned on the shaft 19a in such relation to the position of the nozzle supporting slide whose movement is controlled by the oscillation of said pinion, that said arm will thus actuate the trip rod 37 just before the nozzles reach a position nearest the cylinder, or shortly before the cylinder would otherwise be depressed.

In addition to thus disconnecting the cylinder depressing mechanism I have also provided means, operated by the downward

movement of the rod 26 for enabling the switch 46 (which controls the motor circuit) to be opened and the suction line 25 to be also opened to the atmosphere. The switch is of that type having a vertically movable swivel operating button 47, the switch being placed so that the switch will be closed and the motor in operation when the button is uppermost. To enable said button to be depressed to open the switch when the rod 26 moves down, the switch is positioned alongside said rod adjacent its upper end and the latter has a button engaging finger 48 projecting therefrom in front of the switch and over the button.

The pipe 25 is provided with an extension 25*a* which also extends alongside the rod 26, but on the opposite side of the same from the switch. Said extension on its upper end is capped by a flat faced boss 49 having an opening 50 in its vertical face which is normally covered by a swivel flap 51 mounted on the boss. These parts constitute a normally closed suction relief valve, as will be evident. The flap has a radial extension 52 projecting toward the rod 26 and adapted to be engaged on its upper surface by a finger 53 projecting horizontally from the rod 26.

The fingers 48 and 53 are disposed so that when said rod is turned a certain distance the fingers will clear the switch button and flap extension, as shown in Fig. 5, so that the downward movement of the rod will not affect these parts, as for instance when it is only desired to disengage the cylinder depressing mechanism.

To enable the rod to be easily turned a handle 54 projects outwardly from the block 34, and to hold the rod in one position or the other it is provided with circumferentially spaced notches 55 adapted to be yieldably engaged by a spring pressed ball 56 or the like which is mounted in a boss 57 fixed on the bracket at a convenient point.

To enable the trip mechanism to be placed out of action entirely should this be desired, I mount an upstanding pin 58 on the top of the crank arm 41. This pin, when the plunger 40 is in its innermost position in the cylinder and the pin 42 is clear of the rod 37, is adapted to seat in a notch 59 formed in a fixed guide plate 60. A notched catch member 61, to cooperate with the plate notch, is swivelly mounted on the plate so as to engage and hold the pin 58 when in place in the notch, and thus hold the same against outward movement regardless of the tendency of the spring 43 to thus move the same. In this case the presence or absence of suction in the cylinder 39 will not cause any movement of the plunger or its stop pin and no part of the press mechanism will be tripped.

From the foregoing description it will be readily seen that I have produced such a device as substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described my invention what I claim as new and useful and desire to secure by Letters Patent is:

1. In a printing press having a printing cylinder, means for depressing the cylinder, an electric motor for driving said means, a switch for the motor, a suction nozzle for feeding sheets to the cylinder and a suction line leading to the nozzle; a means functioning automatically with a reduction of negative pressure in the suction line for opening the motor switch.

2. In a printing press having a printing cylinder, driven means for alternately depressing the cylinder, which includes disengageable but normally engaged members, an electric motor for constantly driving one of said members, a switch for the motor, a suction nozzle for feeding sheets to the cylinder, and a suction line leading to the nozzle; a means functioning automatically with a reduction of negative pressure in the line for disengaging said members and for simultaneously opening the switch.

3. A structure as in claim 2, in which said automatic means includes a switch-actuating finger, and means associated with said automatic means for enabling the finger to be moved clear of the switch without interfering with the functioning of the automatic means to disengage the members.

4. In a printing press having a printing cylinder, driven means for alternately depressing the cylinder, which includes disengageable but normally engaged members, a suction nozzle for feeding sheets to the cylinder, and a suction line leading to the nozzle; a movable arm adapted to engage and move one of said members out of engagement with the other member, a pedal connected to the arm for thus moving the same, a longitudinally movable rod positioned over the pedal, means tending to move the rod into engagement with the pedal, holding means normally preventing such movement of the rod, and means adapted to function at a predetermined period in the cycle of operation of the press when a reduction of negative pressure is had in the suction line for releasing the holding means.

5. In a printing press having a printing cylinder, driven means for alternately depressing the cylinder, which includes disengageable but normally engaged members, a suction nozzle for feeding sheets to the cylinder, and a suction line leading to the nozzle; a longitudinally movable rod, means tending

to move the rod, releasable holding means normally preventing such movement, means functioning automatically when a reduction of negative pressure is had in the suction line for releasing the holding means, and means actuated by the movement of the rod for moving one of said disengageable members out of engagement with the other.

6. In a printing press having a printing cylinder, driven means for alternately depressing the cylinder, which includes disengageable but normally engaged members, a suction nozzle for feeding sheets to the cylinder, and a suction line leading to the nozzle; a longitudinally movable rod, means tending to move the rod, means actuated by the movement of the rod for moving one of said disengageable members out of engagement with the other, a releasable holding pin normally preventing movement of the rod, a longitudinally movable rod connected to said pin to cause the same to be released with such movement of the last named rod, an arm beyond and transversely alined with the last named rod, means for oscillating said arm through a certain arc with the operation of the press, and means functioning automatically and only with a reduction of negative pressure in the suction line for causing said arm, during its oscillation in one direction, to move said last named rod to release the holding means.

7. A structure as in claim 2, in which said last named means comprises a cylinder fixed in a plane at right angles to the second named rod, a plunger slidable and turnable in the cylinder, a pipe between the cylinder and the suction line whereby when suction is present in the line the plunger will be moved along the cylinder in one direction, a spring acting to move the plunger in the opposite direction, a crank arm depending from the outer end of the plunger, and a pin projecting from the outer end of the arm; the pin being arranged, when the spring is free to move the plunger to extend immediately in front of the second named rod and to also lie in the path of movement of the oscillating arm.

In testimony whereof I affix my signature.

CHARLES L. LOW.