April 15, 1958 F. R. JACOBY ET AL 2,830,537

AUTOMATIC CONTROL RELEASE AND CONTACT MECHANISM FOR PRINTING PRESSES

Filed April 19, 1954 2 Sheets-Sheet 1

Fig. 1.

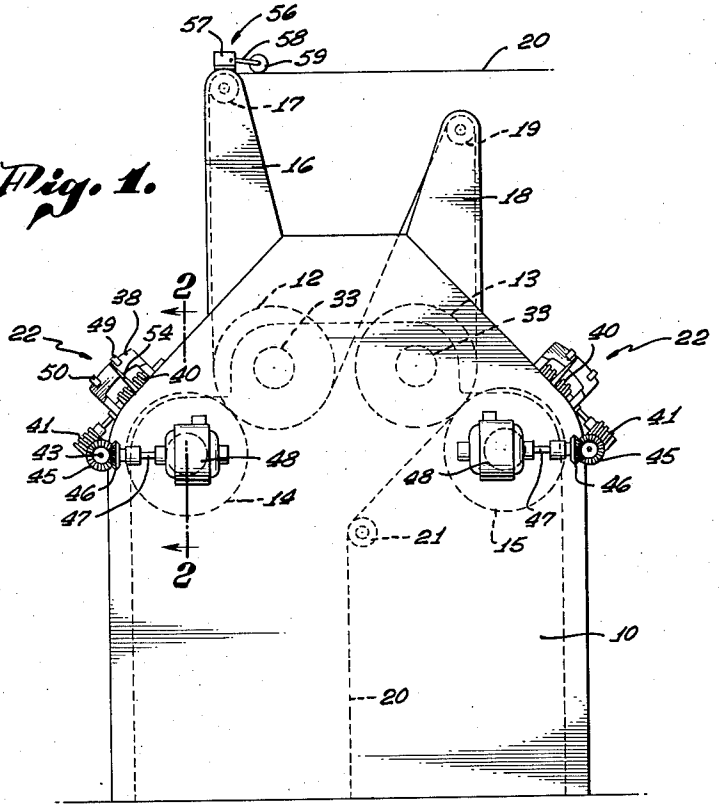

Fig. 2.

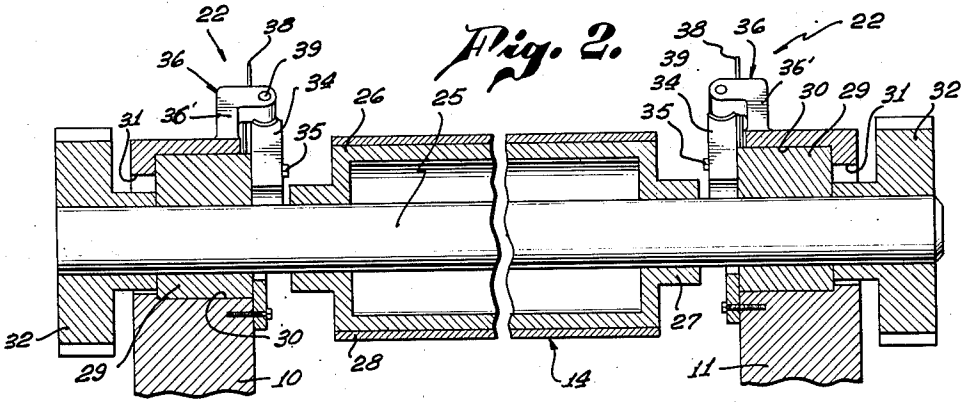

Fig. 3.

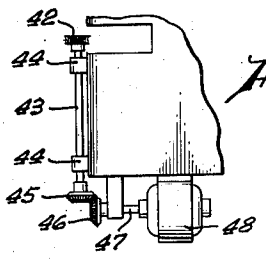

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Fig. 4.

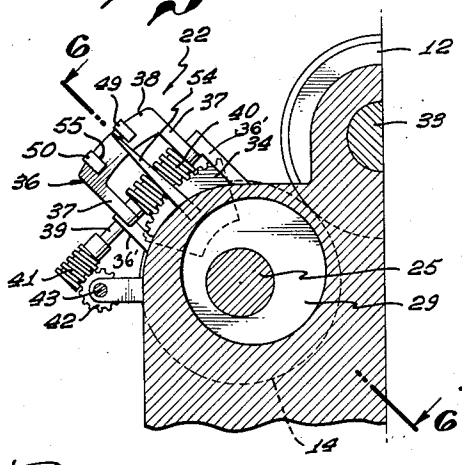


Fig. 6.

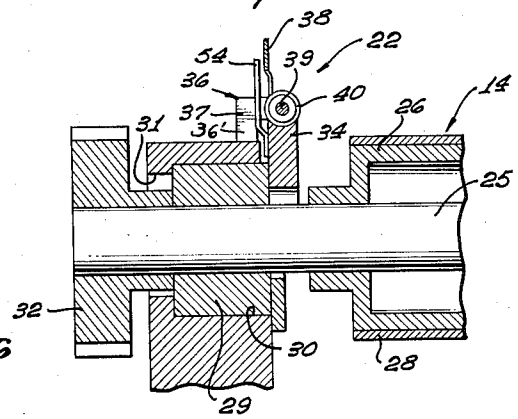


Fig. 5.

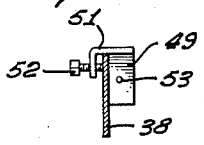


Fig. 7.

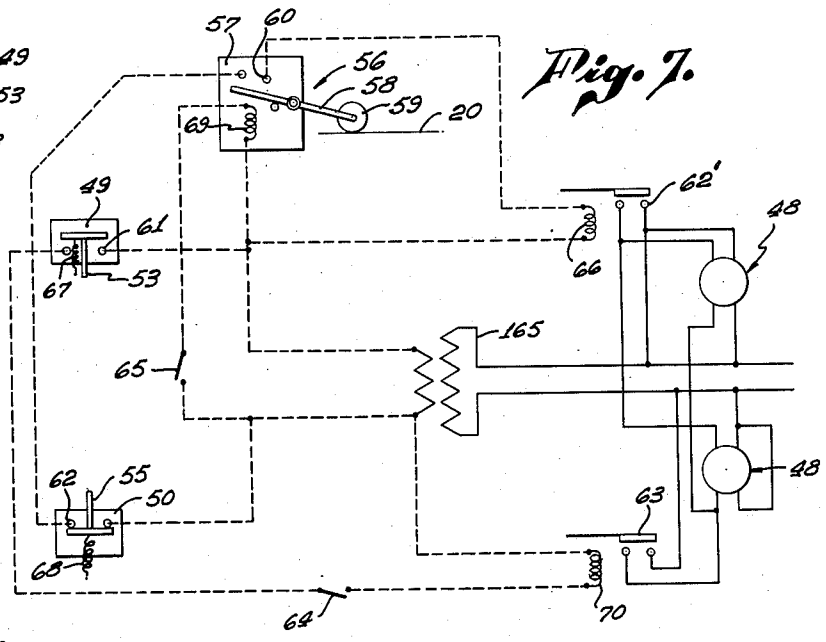
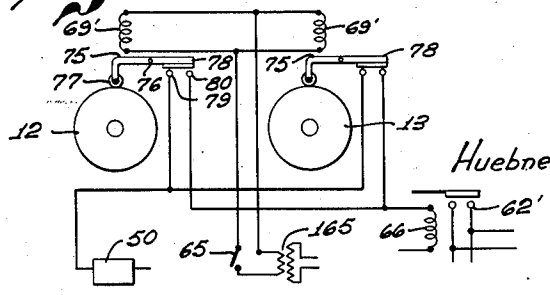


Fig. 8.



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AUTOMATIC CONTROL RELEASE AND CONTACT MECHANISM FOR PRINTING PRESSES

Fred R. Jacoby and Lonnie E. Duncan, Los Angeles, Calif.

Application April 19, 1954, Serial No. 424,123

6 Claims. (Cl. 101—221)

The invention relates to printing machinery and adjustments therefor and has particular reference to a rotary type newspaper press wherein the paper web is run between what is commonly termed a blanket cylinder and a plate cylinder wherein the pressure of the plate cylinder is adapted to be adjusted relative to the blanket cylinder.

The construction and operation of rotary type newspaper presses has been well established to the point where presses of this kind operate with extreme rapidity and are adapted to run for a great many hours and days without the necessity for any substantial amount of servicing. Such performance is a necessity in the printing trade and in particular the printing of newspapers. To assure continued operation of the presses a rather large crew of operators is kept in constant attendance. The chief interruption to the steady flow of newspaper printing occurs because of breaks in the web of paper which happens from time to time as weak spots in the web pass through the press or for some one or another of other reasons, the causes of which cannot be completely eliminated.

Once the web of paper breaks, the presses ordinarily cannot be immediately shut down. In consequence, many yards of the web are wound around the numerous rolls in the press and these must be torn out before the press can again be started. Considerable waste of newsprint is thus experienced. Further still, after a break in the web, the web must again be threaded through the cylinders of the press and this in turn takes a considerable amount of time and necessitates the employment of substantially large numbers of personnel. Further still, once the adjustment in pressure of the plate roll or cylinder against the blanket cylinder has been established, it becomes necessary to maintain those cylinders in engagement while the rethreading takes place. Consequently the newsprint or web must be fed slowly and the presses turned over slowly while this rethreading is taking place.

Normally the plate cylinder must be adjusted from time to time with respect to its pressure against the blanket roll or cylinder. The blanket surfacing wears in the course of time, becoming thinner, and to maintain proper pressure of the plate against the blanket cylinder the adjustment must be made periodically. Both ends of the blanket cylinder must be capable of adjustment so that the adjustment will be regular across the entire plate roll.

It is therefore among the objects of the invention to provide a new and improved adjustment for rotary type printing presses which is capable of automatically releasing the pressure of the plate cylinder against the blanket cylinder as promptly as a break takes place in the web so that even though the press continues to turn, the web will not be wound around the rollers necessitating subsequent removal.

Another object of the invention is to provide a new and improved auxiliary attachment for rotary type printing presses which, in addition to releasing the pressure of the plate cylinder against the blanket roll in case of a break, is capable of effecting return of the plate cylinder to its position of impression against the blanket cylinder at precisely the same adjustment it had before the break took place and pressure was released.

Still another object of the invention is to provide a new and improved attachment for rotary type printing presses which employs electrically actuated means for releasing the pressure of the print cylinder against the blanket cylinder in the event of a break in the web which is equipped with switches so mounted that the position of make and break of the circuit can be adjusted even while the press is in operation and which continue to be effective for releasing the pressure of plate cylinder against blanket cylinder at whatever the new position of adjustment may be without further readjustment of the system being necessary.

Still further among the objects of the invention is to provide a new and improved attachment for rotary type printing presses which is simple in its structure and which is so designed that it can be readily installed upon rotary type printing presses already in operation without any substantial change being necessary in the conventional operation of the presses.

With these and other objects in view, the invention consists in the construction, arrangement and combination of the various parts of the device whereby the objects contemplated are attained, as hereinafter set forth, pointed out in the appended claims and illustrated in the accompanying drawings.

In the drawings:

Figure 1 is an end elevational view of one unit of a rotary type press showing the relative location of the adjusting attachment of the invention.

Figure 2 is a cross-sectional view taken on the line 2—2 of Figure 1 foreshortened in view of the normal breadth of the press.

Figure 3 is a fragmentary plan view of that portion of the rotary press wherein the attachment is installed.

Figure 4 is a fragmentary vertical sectional view of a portion of the press wherein the adjustable attachment is installed shown on a larger scale.

Figure 5 is a fragmentary cross-sectional view of the attachment showing the manner in which switches are adjustable thereon.

Figure 6 is a fragmentary sectional view taken on the line 6—6 of Figure 4.

Figure 7 is a wiring diagram illustrating an electric hook-up by means of which the novel attachment can be operated.

Figure 8 is a portion of a wiring diagram showing a modified type of trip.

In the construction of rotary type presses there is ordinarily provided a frame having side elements 10 and 11 mounted upon a suitable base, not shown. The presses are customarily in units so that in the printing of a newspaper of appreciable size a relatively large number of press units will be mounted side by side for as many units as needed, depending on the size of the newspaper, all operating simultaneously. Each unit is set up for the printing of different portions of the paper and the printing of opposite sides of the web of each portion. The auxiliary attachment comprising the subject matter of the invention is one adapted to be applied without alteration or change to plate cylinders of any number of batteries of presses, the attachment being one ordinarily applied to both ends of a given plate cylinder.

The side elements of the frame are shown as providing a mounting for blanket cylinders 12 and 13 which in each case have mounted adjacent thereto respective plate

cylinders 14 and 15. A frame extension 16 extends upwardly above the blanket cylinder 12 and mounts an idler roller 17 while a frame extension 18 extends above the blanket cylinder 13 and carries an idler roller 19. A web 20 of newsprint is threaded into the press unit traveling in the direction of the arrows being passed first over an idler roller 21, thence between the blanket cylinder 13 and plate cylinder 15, following a path over idler roller 19, then between blanket cylinder 12 and plate cylinder 14, after which it passes over idler roller 17 and thence on to another unit of the press (not shown). Release attachments 22 are shown in Figure 1 for adjacent ends of both the plate cylinder 15 and the plate cylinder 14. A similar attachment 22 is shown in Figure 2 for the opposite end of the plate cylinder 14.

The plate cylinder in each case is carried by a shaft 25, there being a plate cylinder member 26 having hubs 27 immediately in engagement with the shaft. The curved printing plates 28 are mounted on the exterior of the plate cylinder element 26.

At the outer ends of the shaft 25 where the shaft is supported on the respective side elements of the frame there is provided an eccentric bearing block 29 which is received in a suitable cylindrical recess 30. The shaft 25 is eccentrically mounted relative to the bearing block. An enlarged aperture 31 in the respective side element admits shifting of the location of the shaft 25 in response to rotation of the eccentric bearing block 29. Drive gears 32 at the outside ends of the shaft 25 furnish means for the application of power for rotation of the plate cylinder, the power application being conventional and not shown. The blanket cylinders are carried by appropriate shafts 33 for rotation on a fixed axis relative to the frame.

For rotation of the eccentric bearing box thereby to change the location of the shaft 25 relative to the corresponding shaft 33 of the blanket cylinder, there is provided for each bearing block a gear segment 34 secured to the bearing block by suitable bolts 35 at the inner face. Upon the frame of the press are supports 36' and a bracket 36 is mounted by means of legs 37 upon the supports, the legs in turn supporting an arcuate beam or gage 38 between their outer ends. Also mounted upon supports 36' is a worm wheel shaft 39 which in turn carries a worm wheel 40. The worm wheel meshes with gears on the outside edge of the gear segment 34. For driving the worm wheel there is provided a second worm wheel 41. The worm wheel 41 mounted as it is on the outer end of the shaft 39 meshes with and is driven by a worm gear 42 on a shaft 43, this shaft being rotatably mounted upon suitable brackets 44 on the frame. At the opposite end of the shaft 43 is a bevel gear 45 meshing with a similar bevel gear 46 on a motor shaft 47 which is driven by a reversible motor 48. The reversible motor 48 is carried on the respective side element of the frame as illustrated for example in Figure 1.

Upon the arcuate beam 38 is mounted a switch block 49 housing a suitable switch and a second switch block 50 likewise housing a suitable switch. As illustrated in Figure 5 the switch block 49 is secured to the beam 38 by a bracket 51 through which a set screw 52 is passed by means of which the switch block can be mounted in any position along the arcuate beam. A switch arm 53 protrudes from one side of the switch block and is adapted to be engaged by a switch actuating arm 54 which in turn is mounted upon and moves with the gear segment 34. A similar switch arm 55 extends from the switch block 50 and is in a position adapted to be engaged by the switch actuating arm at the end of its movement opposite from that shown in Figure 4.

A trip device 56 is shown mounted at the upper end of the frame extension 16. The trip device includes a switch block 57 from one side of which extends a detector arm 58 at the outer end of which is a roller 59 adapted to roll upon the web 20 and to be supported thereby when the web is in operating condition in the press.

As illustrated in the wiring diagram of Figure 7, the trip device 56 has the detector arm 58 lifted by the web 20 so that switch 60 is open. This is operating condition of the press. At the same time switch 61 in the switch block 49 is open and switch 62 in switch block 50 is closed. Further still, when the circuit is in this condition, switch 62' in the circuit for forward operation of the motor 48 is open as is also switch 63 in the circuit for reverse operation of the motor 48. A manually actuated switch 64 is open as is also a manually actuated switch 65. The switch 64 is in the hold circuit for reverse operation of the motor whereas the switch 65 is in the hold circuit for forward operation of the motor.

Let it be assumed that the press is in operation. As running, the eccentric bearing blocks 29 are rotated to their maximum position of displacement so that the plate cylinder is pressed at the desired amount of pressure against the blanket cylinder. This condition is illustrated in Figure 4. In that position the relative positions of the switches in the electric circuit are as illustrated in Figure 7. As there shown both switches 62 and 63 are open so that the motor 48 is not operating. Power, however, is present in the transformer 165.

Let is now be assumed that the web 20 breaks. When the web breaks, the detector arm 58 will drop so that the end of the arm opposite the roller 59 will raise and close the switch 60. Switch 60, being in the hold circuit for forward operation of the motor 48, and inasmuch as switch 50 is closed, solenoids 66 will be energized causing switch 62' to close and the motor 48 to be actuated in a forward operating direction. This will start rotation of the motor shaft 47, bevel gears 46 and 45, the shaft 43, worm gear 42, worm 41, and ultimately worm wheel 40 which in turn rotates the gear segment 34 in a direction counter-clockwise as viewed in Figure 4. As promptly as the gear segment begins rotation, the eccentric bearing block 29 will rotate counter-clockwise causing release of pressure of the plate cylinder 14 against the blanket cylinder 12.

At the same time the switch actuating arm 54 will travel away from the switch arm 53 and a spring 67 will cause the switch 61 to close. The switch actuating arm 54 will continue to travel toward the switch block 50 and switch 62 as long as the motor continues in forward operation. When the switch actuating arm 54 finally engages switch arm 55, the switch 62 will be opened and this switch, being in the hold circuit for forward operation of the motor, will break that circuit, de-energizing solenoid 66 which will effect opening of the switch 62' by means of the spring 68. Operation of the motor then ceases with the plate cylinder completely released from pressure against the blanket cylinder. The amount of movement between the cylinders may be in the neighborhood of ⅛ inch or whatever distance suits the particular construction of the rolls of a given press. Because of this separation even though the press continues to run, the web will not continue to be fed and motion of the web will cease, thereby eliminating the winding of web about the rolls or cylinders.

Inasmuch as the web has broken and may fall from its proper position between the plate cylinder and blanket cylinder, it will need to be rethreaded. Rethreading can readily be accomplished without starting the presses because of the separation between the plate cylinder 14 and the corresponding blanket cylinder 12, and this can be done quickly and effectively without any of the presses being started in motion.

For rethreading it is desirable to have the arm 58 raised. This may be accomplished by closing the switch 65, thereby energizing solenoid 69 causing the detector arm 58 to be pulled upwardly out of the way of the web.

After the rethreading operation is complete for whatever reason it may have been performed, it is necessary to reset the apparatus to the position of Figure 4 and to reset the circuit to the position of Figure 7. To accom-

plish this the manual switch 64 is depressed to a closed position. This closes a hold circuit for the reverse operation circuit of the motor 48 by energization of solenoid 70 which closes the switch 63, inasmuch as switch 61 is closed at this stage. As soon as the motor 48 begins operation in a reverse direction, the worm wheel 40 is rotated in an opposite direction to that rotation first described and the gear segment 34 will be moved in a clockwise direction as viewed in Figure 4. The switch 62 will close as the switch actuating arm 54 disengages from the switch arm 55. The motor 48 will continue to operate in a reverse direction until the switch actuating arm 54 moves against the switch arm 53 opening the switch 61. Switch 61, being also in the hold circuit for the reverse operation of the motor, will cause the motor to stop. Inasmuch as the web 20 has previously been threaded into position, the detector arm 58 will already be raised, opening the switch 60, and the initial condition of the electric circuit switches and adjusting apparatus will prevail.

In the event that it may be desirable to change the pressure at the operating cycle of the plate cylinder against the blanket cylinder, it is accomplished by loosening the set screw 52 whereupon the switch block 49 may be moved in one direction or another depending upon whether the pressure is to be increased or decreased and the set screw tightened for holding the switch block in its new position. If need be the switch block 50 may be adjusted by similar means. The adjustment described can be accomplished if necessary while the presses are in motion inasmuch as movement need be but slight and inasmuch as the resistance of the drive chain to the motor 48 is not sufficient to prevent such adjustment.

It will further be apparent that the pressure setting of the cylinders is positive and that even though in the event of a break the cylinders are completely separated one from another and pressure is relieved, nevertheless as promptly as the motor 48 operates in a reverse direction the position of the cylinders will be returned to precisely the adjustment enjoyed at the beginning of the cycle.

In place of the trip device 56 already described in detail there may be employed a different type of trip mechanism built on the principle illustrated in Figure 8. The device there shown may be used in the same electrical system shown in Figure 7. A detector arm 75 is pivoted at 76 and has a shoe 77 adapted to lie a few thousandths of an inch clear of the surface of the adjacent cylinder 12. In the position shown an armature 78 on the detector arm is in a position of potential engagement with points 79 and 80.

Should the web 20 break for any reason, the usual occurrence is for the paper of the web to roll up on the cylinder 12 to a depth of many thicknesses before the press can be slowed down. In the modified form, as a few additional thicknesses of the web build up on the cylinder, they press against the shoe 77 raising the shoe until the armature 78 moves down to close contact between the switch points 79 and 80. Current then flows to the solenoid 66 to close the switch 62' to effect forward operation of the motor 48 with the result already described. A solenoid 69' may be energized by closing the switch 65 as previously described to hold the shoe out of engagement with the cylinder for a rethreading operation. The trip operates the same way for the cylinder 13 and a corresponding set of trips will be employed for each unit of a battery of presses.

There has accordingly been described a relatively simple and positive-acting accessory adjustment for a rotary type press of such character that it can be readily mounted as an attachment to presses already in existence as well as being one such that it can be initially built into new presses.

While we have herein shown and described our invention in what we have conceived to be the most practical

and preferred embodiment, it is recognized that departures may be made therefrom within the scope of our invention, which is not to be limited to the details disclosed herein but is to be accorded the full scope of the claims so as to embrace any and all equivalent devices.

Having described our invention, what we claim as new and desire to secure by Letters Patent is:

1. In a rotary type press for printing on a web of print paper comprising a frame, a blanket cylinder rotatable thereon, a plate cylinder rotatable thereon in printing relation and an adjustable eccentric mounting on the frame for the plate cylinder adapted to shift the plate cylinder laterally between printing and release positions relative to the blanket cylinder, the combination of a gear segment on said eccentric, a bracket on the frame, a rotating drive means on the bracket engaging said gear segment, a motor on the frame having forward and reverse operating circuits and having operative and inoperative positions when said circuits are alternatively closed and opened, a drive train from the motor to the rotating drive means, an electric switch device on the frame in the forward operating circuit of the motor, a trip movably mounted on the frame and having one element thereof adapted to engage the web and another element adapted to engage the switch, said trip when engageable with the web being adapted to hold the switch device in a position rendering said motor inoperative, said switch being in one position when said trip is engaged with the web and being in another position effecting forward operation of the motor when said trip is disengaged from the web, two switches on the bracket spaced from one another, one of said switches being operatively connected with the forward operating circuit and the other being operatively connected with the reverse operating circuit, a switch actuating arm on said eccentric movable upon forward operation of the motor from an operative position relative to one of said switches on the bracket to an operative position relative to the other of said switches whereby to stop forward operation of the motor in released position of the plate cylinder relative to the blanket.

2. In a rotary type press for printing on a web of print paper and comprising a frame, a blanket cylinder and a plate cylinder rotatable thereon and adapted to contain the web therebetween, an adjustable eccentric mounting on the frame for the plate cylinder adapted to shift the plate cylinder laterally between printing and release positions relative to the blanket cylinder, the combination of a gear segment on said eccentric, a bracket on the frame, a rotating drive means on the bracket engaging said gear segment, a motor on the frame having forward and reverse operating circuits and having operative and inoperative positions when said circuits are alternatively closed and opened, a drive train from the motor to the rotating drive means, an electric switch device on the frame in the forward operating circuit of the motor, a trip movably mounted on the frame having one element engageable with the web and another element engageable with the switch, said trip when engageable with the web being adapted to hold the switch device in position rendering said motor inoperative, said switch being in one position when said trip is engaged with the web and being in another position when disengaged from the web, two switches spaced from one another on the bracket, one of said switches being operatively connected with the forward operating circuit and the other being operatively connected with the reverse operating circuit, a switch actuating arm on said eccentric movable upon forward operation of the motor from an inoperative position relative to one of said switches on the bracket to an operative position relative to the other of said switches whereby to stop forward operation of the motor in released position of the plate cylinder relative to the blanket cylinder, and an adjustable mounting for at least one of

the switches on the bracket whereby to vary the setting of said plate cylinder relative to the blanket roll.

3. In a rotary type press for printing on a web of print paper and comprising a frame, a blanket cylinder and a plate cylinder rotatable thereon and adapted to contain the web therebetween, an adjustable eccentric mounting on the frame for the plate cylinder adapted to shift the plate cylinder laterally between printing and release positions relative to the blanket cylinder, the combination of a gear segment on said eccentric, a bracket on the frame, a rotatable drive means on the bracket engaging said gear segment, a motor on the frame having forward and reverse operating circuits and having operative and inoperative positions when said circuits are alternatively closed and opened, a drive train from the motor to the rotating drive means, an electric switch device on the frame in the forward operating circuit of the motor, a trip movably mounted on the frame having one element engageable with the web and another element engageable with the switch, said trip when engageable with the web being adapted to hold the switch device in position rendering the motor inoperative with the web, said switch being in one position when said trip is engaged with the web and being in another position when disengaged from the web, two switches on the bracket spaced from one another, one of said switches being operatively connected to the forward operating circuit and the other being operatively connected to the reverse operating circuit, a switch actuating arm on said eccentric movable upon forward operation of the motor from an inoperative position relative to one of said switches on the bracket to an operative position relative to the other of said switches whereby to stop forward operation of the motor in released position of the plate cylinder relative to the blanket cylinder, and a normally open manually actuable switch in the reverse operating motor circuit adapted when closed to effect return of the plate cylinder and switch actuator arm to the first defined positions.

4. In a rotary type press for printing on a web of print paper and comprising a frame, a blanket cylinder and a plate cylinder rotatable thereon and adapted to contain the web therebetween in printing relationship and a rotatable laterally adjustable mounting on the frame for the plate cylinder adapted to effect shifting of the plate cylinder toward and away from the blanket cylinder, the combination of a member secured to the adjustable mounting and movable in an arcuate direction in response to rotation of said mounting, a bracket on the frame, a rotatable drive means on the bracket engaging said movable member, a reversible motor on the frame, circuit means for the motor enabling alternatively forward and reverse operation of the motor, a drive train from the motor to the worm wheel, motor switch means on the frame and connected in said circuit means, a trip movably mounted on the frame having one element thereof engageable with the web in operating position of said web and another element thereof in operating relation to the motor switch, said switch being in one position when said trip is engaged with the web and being in another position when disengaged from the web, two switches on the bracket spaced one from the other, said two switches being in said circuit means for the motor, a switch actuating arm on said gear segment movable upon operation of the motor from a position enabling operation of one of said switches to start the motor to a position enabling operation of the other of said switches to stop the motor, and a manually actuable switch in said circuit means operable to effect operation of the motor to return said plate cylinder to the printing position relative to the blanket cylinder.

5. In a rotary type press for printing on a web of print paper comprising a frame, a blanket cylinder rotatable thereon, a plate cylinder rotatable thereon in printing relation to the web and an adjustable eccentric mounting on the frame for the plate cylinder adapted to shift the plate cylinder laterally between printing and release positions relative to the blanket cylinder, the combination of a gear segment on said eccentric, a bracket on the frame, a worm wheel on the bracket engaging said gear segment, a motor on the frame having forward and reverse operating circuits, a drive train from the motor to the worm wheel, a normally open electric switch device on the frame in the forward operating circuit of the motor having a circuit closing trip engageable with the web in operating position of said web, said switch device being closed when said trip is disengaged from the web, a first normally open switch mounted on the bracket and in the forward operating motor circuit, a second normally closed switch on the bracket spaced from said normally open switch and in the forward operating motor circuit, said normally closed switch being in the reverse operating motor circuit, a switch actuating arm on said gear segment normally holding said first switch open and movable upon forward operation of the motor from a position enabling opening of said first switch to a position opening said second switch, a normally open manually actuable switch in the reverse operating motor circuit, and a normally open reset switch in the forward operating motor circuit adapted to maintain the plate cylinder in a position released from the blanket cylinder for rethreading the web, and an adjustable mounting for each of said first and second switches on the bracket whereby to vary the setting of said plate cylinder relative to the blanket roll at both printing and release adjustment.

6. In a rotary type press for printing on a web of print paper and comprising a frame, a blanket cylinder and a plate cylinder rotatable thereon and adapted to contain the web therebetween in printing relationship and a rotatable laterally adjustable mounting on the frame for the plate cylinder adapted to effect shifting of the plate cylinder toward and away from the blanket cylinder, the combination of a member secured to and movable in an arcuate direction in response to rotation of the adjustable mounting, a bracket on the frame, a rotatable drive means on the bracket engaging said movable member, a reversible motor on the frame, circuit means for the motor alternatively enabling forward and reverse operation of the motor, a drive train from the motor to the worm wheel, motor switch means on the frame and being normally open, a trip comprising an arm pivoted on the frame having one end in sliding contact with the cylinder and having an armature at the other end cooperable with said motor switch means, said motor switch means being closed by pressure of accumulating layers of a broken web of print paper at said one end of the arm, two switches on the bracket spaced one from the other, said two switches being in said circuit means for the motor, a switch actuating arm on said gear segment movable upon operation of the motor from a position enabling operation of one of said switches to start the motor to a position enabling operation of the other of said switches to stop the motor, and a manually actuable switch in said circuit means operable to effect operation of the motor to return said plate cylinder to the printing position relative to the blanket cylinder.

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