J. WHITE AND W. K. ECKHARD.

PRINTING PRESS.

APPLICATION FILED APR. 6, 1920.

1,364,598.

Patented Jan. 4, 1921.

2 SHEETS—SHEET 1.

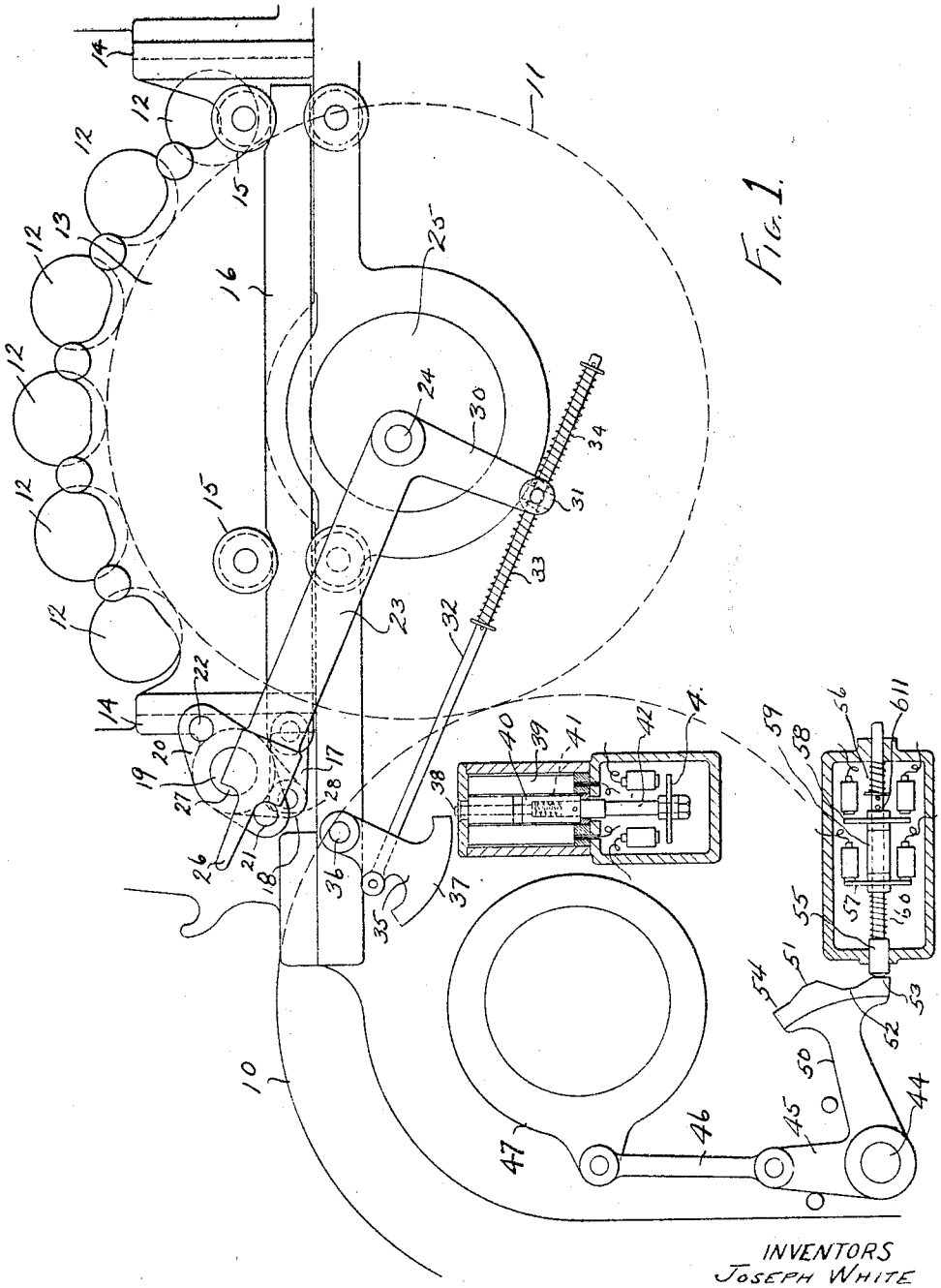


FIG. 1.

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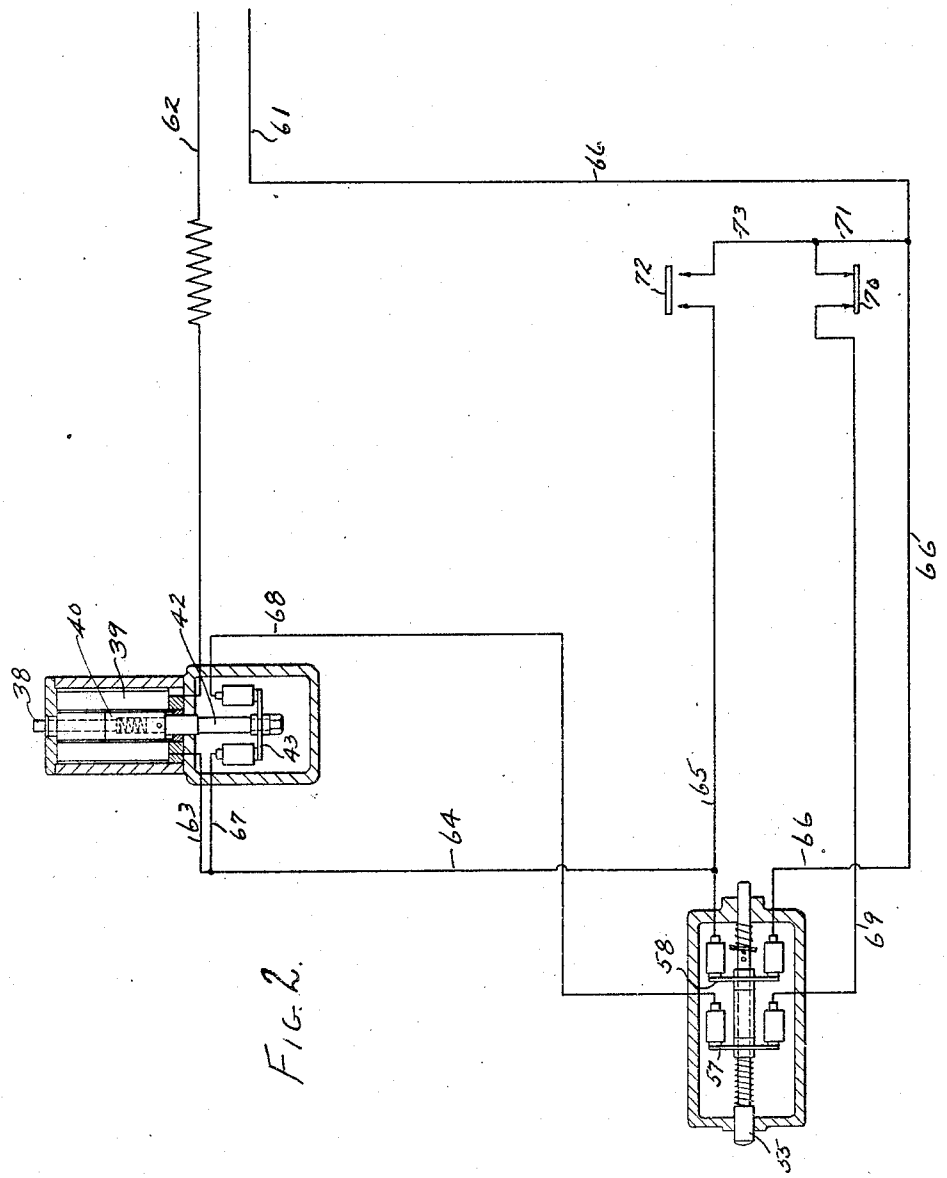


FIG. 2.

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UNITED STATES PATENT OFFICE.

JOSEPH WHITE, OF MIDDLESEX, AND WILLIAM K. ECKHARD, OF PLAINFIELD, NEW JERSEY.

PRINTING-PRESS.

1,364,598. Specification of Letters Patent. Patented Jan. 4, 1921.

Application filed April 6, 1920. Serial No. 371,686.

To all whom it may concern:

Be it known that we, JOSEPH WHITE, a citizen of the United States, residing at Middlesex, in the county of Middlesex and State of New Jersey, and WILLIAM K. ECKHARD, a citizen of the United States, residing at Plainfield, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Printing-Presses, of which the following is a specification.

Our present arrangement relates to printing presses in which the form inking rollers are arranged to be raised and lowered from contacting position with the form.

One of the objects of our invention is to provide an electrically operated roller lifting and lowering device controlled by the tripping and untripping of the printing couple.

Another object of our invention is to provide such a device in which the rollers will be raised automatically when the press is tripped, and lowered automatically when the printing couple is in printing relation, and which also is sufficiently under the control of the operator so that he may reverse the normal position of the rollers at will.

Another object of our invention is to provide such a machine so that no matter whether the operator reverses the normal position of the rollers or not, such rollers will be caused to synchronize in their raising and lowering with the tripping and untripping of the printing couple.

With these and other objects in view our invention consists of the combinations and structures hereinafter described and more specifically pointed out in the appended claims.

In the drawings, Figure 1 is a more or less diagrammatic side elevation of one type of printing press which we have chosen for purpose of illustration, and to which an illustrative form of our invention is shown applied; Fig. 2 is a more or less diagrammatic view of the wiring used in the arrangement shown in Fig. 1. Like parts have like reference numerals in the several figures.

In the drawings, 10 is an impression cylinder and 11 a form cylinder mounted to turn together in suitable bearings in the well-known manner, these two cylinders constituting, in the press illustrated, a printing couple. 12, 12 represent the series of inking rollers adapted normally to contact with the form carried by the form cylinder 11. As is well understood by those skilled in the art, these rollers are carried in suitable sockets which are adjustably attached to a bracket 13 adapted to slide in the guideways 14, 14. To the bracket 13 is attached a pair of rollers 15, 15 which engage with the top of a bar 16, such bar having a pair of depressions with which the rollers 15, in the position of the part shown in Fig. 1, are engaged. To the left hand end of the bar 16 is attached a link 17 which in turn is connected to a lever 18 attached to a shaft 19 extending across the press. It will be understood that the parts so far described are duplicated on either side of the press and, as is well understood, when the bar 16 is in the position shown in Fig. 1 the bracket 13, and therefore the rollers 12, are in their lowermost positions, and the rollers contact with the form. If, on the other hand, the shaft 19 is turned anti-clockwise so as to move the bar 16 to the right of Fig. 1, the rollers 15 will rest on the high part of the top of the bar 16 and will cause the brackets 13 to move upwardly to lift the rollers 12 above the form.

As a means for moving the shaft 19, we attach to the shaft a double ended arm 20 having pins 21 and 22. A member 23 pivotally connected at 24 to the end of the shaft 25 of the form cylinder 11 has its outer end formed with a projection 26 and a pair of notches 27, 28.

The pivot 24 is eccentric to the shaft 25 so that when the form roller 11 rotates, the member 23 is reciprocated back and forth. If the member 23 is held in the position shown in Fig. 1, it will contact with the pin 21 and move it to the position shown in Fig. 1. Since this position is the extreme of the stroke of the member 23, the shaft 19 will remain in this position until the member 23 is raised, so that notch 27 will contact with the pin 22 on the next forward stroke of the member 23. The shaft 19 will then be rotated anti-clockwise to move the bar 16. So long as the member 23 is held in this upward position, the rollers 12 will be held off the form. As soon as the member 23 is permitted to drop to the position shown in Fig. 1, the notch 28 will contact with the pin 21 on the next forward movement of the mem-

ber 23, and restore the parts to the position shown in Fig. 1.

The arrangement so far described is substantially the same as that shown for lifting inking rollers in the prior patent to Joseph White, No. 1,214,485, granted January 30, 1917, and no further description thereof would be necessary. It will be understood, however, that we have adopted this particular arrangement for lifting the inking rollers merely for illustrative purposes.

In order to shift the member 23 from one position to the other so as to trip or untrip, or raise or lower, the inking rollers, we provide an arm 30, forming part of the member 23, which carries a puppet 31, through which passes a spring rod 32 having a pair of springs 33, 34 on either side of the puppet, the opposite ends of the springs abutting against suitable washers fixed on the rod 32. The opposite end of the rod 32 is connected to a member 35 pivoted at 36 and having a guard section 37 which is adapted to swing across a pin 38, which pin is adapted to be moved into and out of the path of the section 37 by devices to be hereinafter described. With the parts in the position shown in Fig. 1 the member 30 as it is carried around by the pin 24 swings the member 35 back and forth, so that the vertical position of the member 23 is not affected. If, however, when the parts are in the position shown in Fig. 1 the pin 38 is thrown upward, then the member 35 cannot swing to the right of Fig. 1, and this will turn the members 23 and 30 around the pivot 24 as that pivot is carried around by the shaft 25 to swing the member 23 upward, so that the notch 27 will be in operative relation to the pin 22. In other words, while the pin 38 is in the position shown in Fig. 1, the rollers 12 will be in inking relation with the form. When the pin 38 is moved upwardly, as shown in Fig. 2, the parts will be held so that the rollers 12 will be raised and held away from the form.

Preferably, we move the pin 38 by electrical means which, in the form illustrated, consists of a solenoid 39 having a movable core 40 with which the pin 38 is yieldingly connected by means of the spring 41. To the lower end of the movable core 40 is attached a rod 42 having a contact plate 43 adapted to contact with a pair of switch members when the rod 42 is moved upwardly.

In the form illustrated, the printing couple is separated by moving eccentric bearings which carry the cylinder 10, this moving being accomplished by any of the well-known tripping mechanisms. We have shown one part of such a mechanism consisting of a shaft 44 extending across the press, to either end of which is fastened a lever 45 connected by a link 46 with the eccentric bushing 47. In the position shown in Fig. 1, the bushings are turned so that the printing couple is in printing position. When the shaft 44 is turned clockwise, the bushings 47 will be turned to move the cylinder 10 away from the cylinder 11. On the shaft 44 we provide a cam lever 50 having a cam face with a high portion 51, a low portion 52 and neutral portions 53, 54. This cam is arranged to contact with the end of a pin 55 supported slidingly in a suitable support, and normally moved to the left of Fig. 1 by a spring 56. On the rod 55 is mounted a blade 57, a blade 58, a distance piece 59 and a spring 60, there being a limiting pin 611 against which the hub of the blade 58 may contact. All of these parts, except the pin 611 are loosely mounted on the pin 55. The blades 57 and 58 are adapted to contact with switch members, as shown.

Referring now to Fig. 2, which shows the circuit connections between the parts heretofore described, 61, 62 are the mains connected to any suitable source of power. The main 62 connects directly with one side of the solenoid 39, the other wire of which, 63, connects to a wire 64, connected to a wire 65, one end of which is attached to one of the switch points with which the blade 58 is adapted to contact, the other switch point being connected through a wire 66 with the main 61. One of the switch points of the switch 43 is connected by the wire 67 to the wire 64, and the other point is connected by the wire 68 with one of the switch points with which the switch blade 57 is adapted to contact, the other switch point of this switch being connected by a wire 69 through a normally closed switch 70 with a wire 71 connected to the wire 66. The wire 65 leads to a normally open switch 72, the other switch point of which is connected through the wire 73 with the wire 71. Preferably, the switches 70 and 72 are of the push button type, since, as will be explained hereinafter, it is contemplated that they shall be moved from their normal position by hand and only momentarily.

With the construction described, if the printing couple is to be tripped, the shaft 44 will be rotated clockwise so that the pin 55 will first move to the low part 52, then to the high part 51 and finally to the neutral part 54 of the cam on the arm 50, and will remain in this position so long as the couple is tripped. In passing from the neutral position 53 to the low position 52, switch 57 will be opened by reason of the motion of the pin 55 to the left of Fig. 1, by reason of the expansion of the spring 56. The pin 611 will then contact with blade 58 and through the distance piece 59, will move the blade 57 away from its contact points. This will have, however, no effect in the operation of the device. As the pin 55 moves from the

low part 52 to the high part 51, the switches 57 and 58 will be closed. The closing of the switch 57 will produce no effect, but as soon as switch 58 is closed, the current will pass from the main 61 through wire 66, to switch 58, the wires 64, 63 and the solenoid 39 to the main 62. The solenoid will then be energized and the pin 38 moved to the position shown in Fig. 2. This, as has been previously explained, will stop the oscillation of the member 37 and will raise the inking rollers. As soon as the pin 38 moves upward, the switch plate 43, which is connected to the core 40, will be carried into contact with its switch points and will close a circuit through the solenoid which will be independent of the switch 58, this circuit being from the main 62 through the solenoid, the wires 63, 67, the switch 43, the wire 68, the switch 57, the wire 69, the switch 70 and the wires 71 and 66. When, therefore, the pin 55 moves from the high part 51 to the neutral position 54, so as to open the switch 58, but not the switch 57, the solenoid 39 will be continuously energized to hold the pin 38 upward, and to maintain the inking rollers raised.

When, in turn, the printing couple is untripped and brought into printing relation, the shaft 44 will turn anti-clockwise and the pin 55 will first move to the right as it passes to the high part 51. This will cause no change in the operation, but as soon as the pin 55 reaches the low part 52, the switches 58 and 57 will both be opened so that both circuits through the solenoid 39 will be broken. This will cause the pin 38 to drop and the rollers to be restored to inking position. As the pin 55 reaches the neutral part 53, the switch 57 will again be closed, but this will not energize the solenoid 39 because, when the solenoid 39 was deënergized, the rod 42 dropped to open the switch 43.

From the foregoing, it will be seen that the momentary closing of the switch 58 will energize the solenoid 39, and that this will result in the closing of the switch 43 so that the subsequent opening of the switch 58 will not deënergize the solenoid. Similarly, the momentary opening of the switch 57 will deenergize the solenoid and cause the pin 38 to remain permanently down.

When the operator of the press is preparing it for printing, he sometimes wishes to run the inking rollers in contact with the form while the printing couple is separated, and we have provided devices by which this may be accomplished. With the solenoid energized and the pin 38 projecting upward, a momentary opening of the switch 70 will cause the inking rollers to be lowered into contact with the form, because this switch is in the circuit which passes through the switch 57 and the switch 43, as well as the solenoid 39. The instant the current ceases flowing in this circuit, therefore, the solenoid is deënergized and the switch 43 opened, so that the subsequent closing of the switch 70 will not reënergize the solenoid.

Similarly, while the couple is in printing position, it is sometimes desired to raise the inking rollers and this may be accomplished by momentarily closing the switch 72. This permits a current to pass directly through the solenoid from the mains, and when so energized, the switch 43 is also closed, which completes a circuit through the switch 57, which is always closed when the cylinders are either in tripped or untripped positions.

It will be seen that, by the arrangement which we have described, the operator may raise or lower the rollers as he desires so that temporarily the raising and lowering of the rollers is out of step with the automatic raising and lowering, and that, when the press is started up again in normal operation the automatic arrangement will be thrown into action, so as to raise the rollers when the couple is tripped, and to lower them when it is untripped, regardless of the position in which the rollers may have been left by the operator before resuming the normal operations of the press.

It will be understood that, while we have shown the inking rollers as above the form cylinder, they may in some cases be below that cylinder, and that when we have used the terms "raised" and "lowered," we mean the moving of the rollers out of and into printing relation with the form.

It will be also understood that the printing couple may consist of a cylinder and a flat form as well as of two cylinders and that such couple may be the form and blanket cylinders of an offset press.

While we have illustrated our invention in connection with solenoids as the electrically operated devices for actuating the roller moving mechanism, it will be understood that any other electrically operated device may be used.

As a matter of simplicity, we prefer to use the solenoid which raises the pin 38 as the means for closing the switch 43, but it will be understood that, if desired, a separate solenoid or other electrically operated device could be used to close this switch when the circuit through the solenoid is energized.

While we have illustrated a roller-raising device in which the rollers are raised when the circuit through the solenoid is energized, it will be obvious that the reverse of this arrangement may be used. If, for instance, the link 17 and its lever 18 were on the opposite side of the shaft 29, then the rollers would be lowered when the solenoid 39 is energized, and raised when it is deënergized. We prefer the arrangement shown, however,

because normally the rollers are in contact with the printing form for a greater time while the press is in operation than they are off the form, and the arrangement which we have shown results in a saving of electrical energy.

We claim:

1. In a printing press having a trip, form inking rollers adapted to move into inking and non-inking positions, means, including an electrically operable device, adapted, when said device is energized, to move said rollers from one position to the other and maintain said rollers in the latter position, and when deënergized, to reverse such motion and position, and automatic means connected to the printing couple to control said device to cause said rollers to be raised when the couple is tripped and to be lowered when the couple is untripped.

2. In a printing press having a trip, form inking rollers adapted to move into inking and non-inking positions, means, including an electrically operable device, adapted when said device is energized, to move said rollers from one position to the other and maintain said rollers in the latter position, and when deënergized, to reverse such motion and position, and automatic means connected to the printing couple to control said device to cause said rollers to be raised when the couple is tripped and to be lowered when the couple is untripped, and hand operated means to control said device whereby said rollers may be lowered while the couple is tripped.

3. In a printing press having a trip, form inking rollers adapted to move into inking and non-inking positions, means, including an electrically operable device, adapted, when said device is energized, to move said rollers from one position to the other and maintain said rollers in the latter position, and when deënergized, to reverse such motion and position, and automatic means connected to the printing couple to control said device to cause said rollers to be raised when the couple is tripped and to be lowered when the couple is untripped, and hand operated means to control said device whereby said rollers may be raised while the couple is untripped.

4. In a printing press having a trip, form inking rollers adapted to move into inking and non-inking positions, means, including an electrically operable device, adapted, when said device is energized, to move said rollers from one position to the other and maintain said rollers in the latter position, and when deënergized, to reverse such motion and position, and automatic means connected to the printing couple to control said device to cause said rollers to be raised when the couple is tripped and to be lowered when the couple is untripped, and means, including a normally open, hand operable switch, constructed and arranged to control said device to cause said rollers to be raised and held in non-inking position when said switch is closed momentarily while the couple is untripped.

5. In a printing press having a trip, form inking rollers adapted to move into inking and non-inking positions, means, including an electrically operable device, adapted, when said device is energized, to move said rollers from one position to the other and maintain said rollers in the latter position, and when deënergized, to reverse such motion and position, and automatic means connected to the printing couple to control said device to cause said rollers to be raised when the couple is tripped and to be lowered when the couple is untripped, and means, including a normally closed, hand operable switch, constructed and arranged to control said device to cause said rollers to be lowered and held in inking position when said switch is opened momentarily while the couple is tripped.

6. In a printing press having a trip, form inking rollers adapted to move into inking and non-inking positions, means, including an electrically operable device, adapted, when said device is energized, to move said rollers from one position to the other and maintain said rollers in the latter position, and when deënergized, to reverse such motion and position, and automatic means connected to the printing couple to control said device to cause said rollers to be raised when the couple is tripped and to be lowered when the couple is untripped, and hand operable means whereby said device may be controlled to cause said rollers to be raised and held in non-inking position while the couple is untripped and to cause said rollers to be lowered and held in inking position while the couple is tripped.

7. In a printing press having a trip, form inking rollers adapted to move into inking and non-inking positions, means, including an electrically operable device, adapted, when said device is energized, to move said rollers from one position to the other and maintain said rollers in the latter position, and when deënergized, to reverse such motion and position, and automotic means connected to the printing couple to control said device to cause said rollers to be raised when the couple is tripped and to be lowered when the couple is untripped, and hand operable means whereby said device may be controlled to cause said rollers to be raised and held in non-inking position while the couple is untripped and to cause said rollers to be lowered and held in inking position while the couple is tripped, said automatic means being constructed and arranged to cause the raising and lowering of said rollers to syn-

chronize with the tripping and untripping of the couple after said hand operated means have been operated.

8. In a printing press having a trip, form inking rollers adapted to move into inking and non-inking positions, means, including an electrically operable device, adapted, when said device is energized, to move said rollers from one position to the other and maintain said rollers in the latter position, and when deënergized, to reverse such motion and position, a first circuit including said electrically operable device and a first switch, a second circuit including said electrically operable device, a second switch and a third switch, means controlled by the printing couple and adapted to close said first switch momentarily to energize said electrically operable device when the printing couple is moving in one direction between tripped and untripped position, and to cause both said first and said second switches to be open momentarily when the printing couple is moving in the opposite direction between tripped and untripped position, and to hold said second switch closed and said first switch open when the printing couple is in tripped or in untripped position, and means to close said third switch when said electrically operable device is energized.

9. In a printing press having a trip, form inking rollers adapted to move into inking and non-inking positions, means, including an electrically operable device, adapted, when said device is energized, to move said rollers from one position to the other and maintain said rollers in the latter position, and when deënergized, to reverse such motion and position, a first circuit including said electrically operable device and a first switch, a second circuit including said electrically operable device, a second switch and a third switch, means controlled by the printing couple and adapted to close said first switch momentarily to energize said electrically operable device when the printing couple is moving in one direction between tripped and untripped position, and to cause both said first and said second switches to be open momentarily when the printing couple is moving in the opposite direction between tripped and untripped position, and to hold said second switch closed and said first switch open when the printing couple is in tripped or in untripped position, means to close said third switch when said electrically operable device is energized, and a shunt circuit around said first switch and a normally open hand operable switch in said shunt circuit.

10. In a printing press having a trip, form inking rollers adapted to move into inking and non-inking positions, means, including an electrically operable device, adapted, when said device is energized, to move said rollers from one position to the other and maintain said rollers in the latter position, and when deënergized, to reverse such motion and position, a first circuit including said electrically operable device and a first switch, a second circuit including said electrically operable device, a second switch and a third switch, means controlled by the printing couple and adapted to close said first switch momentarily to energize said electrically operable device when the printing couple is moving in one direction between tripped and untripped position, and to cause both said first and said second switches to be open momentarily when the printing couple is moving in the opposite direction between tripped and untripped position, and to hold said second switch closed and said first switch open when the printing couple is in tripped or in untripped position, and means to close said third switch when said electrically operable device is energized, and a normally closed hand operable switch in said second circuit.

11. In a printing press having a trip, form inking rollers adapted to move into inking and non-inking positions, means, including an electrically operable device, adapted, when said device is energized to move said rollers from one position to the other and maintain said rollers in the latter position, and when deënergized, to reverse such motion and position, hand operable means whereby said device may be energized or deënergized at the will of the operator to cause said rollers to be moved and maintained in inking or non-inking position, and automatic means, controlled by the printing couple, to control said device to raise said rollers when the printing couple is tripped and to lower said rollers when the couple is untripped, said hand operable means and said automatic means being each operable irrespective of the operation or non-operation of the other.

12. In a printing press having a trip, form inking rollers adapted to move into inking and non-inking positions, means, including an electrically operable device, adapted, when said device is energized, to move said rollers from one position to the other and maintain said rollers in the latter position, and when deënergized, to reverse such motion and position, a first circuit including said electrically operable device and a first switch, a second circuit including said electrically operable device, a second switch and a third switch, means in the first circuit adapted to close said third switch when said first circuit is energized, means controlled by the printing couple and adapted to close said first switch to energize said first circuit when the printing couple is moving in one direction between tripped

and untripped position, and to open both said first switch and said second switch simultaneously when the printing couple is moving in the opposite direction.

13. In a printing press having a trip, form inking rollers adapted to move into inking and non-inking positions, means, including an electrically operable device, adapted, when said device is energized, to move said rollers from one position to the other and maintain said rollers in the latter position, and when deënergized, to reverse such motion and position, a first circuit including said electrically operable device and a first switch, a second circuit including said electrically operable device, a second switch and a third switch, means in the first circuit adapted to close said third switch when said first circuit is energized, means controlled by the printing couple and adapted to close said first switch to energize said first circuit when the printing couple is moving in one direction between tripped and untripped position, and to open both said first switch and said second switch simultaneously when the printing couple is moving in the opposite direction, and a hand operable means whereby said first circuit may be energized when said first switch is open.

14. In a printing press having a trip, form inking rollers adapted to move into inking and non-inking positions, means, including an electrically operable device, adapted, when said device is energized, to move said rollers from one position to the other and maintain said rollers in the latter position, and when deënergized, to reverse such motion and position, a first circuit including said electrically operable device and a first switch, a second circuit including said electrically operable device, a second switch and a third switch, means in the first circuit adapted to close said third switch when said first circuit is energized, means controlled by the printing couple and adapted to close said first switch to energize said first circuit when the printing couple is moving in one direction between tripped and untripped position, and to open both said first switch and said second switch simultaneously when the printing couple is moving in the opposite direction, and a hand operable means whereby said second circuit may be opened when said second switch is closed.

15. In a printing press having a trip, form inking rollers adapted to move into inking and non-inking positions, means, including an electrically operable device, adapted, when said device is energized, to move said rollers from one position to the other and maintain said rollers in the latter position, and when deënergized, to reverse such motion and position, a first circuit including said electrically operable device and a first switch, a second circuit including said electrically operable device, a second switch and a third switch, means in the first circuit adapted to close said third switch when said first circuit is energized, means controlled by the printing couple and adapted to close said first switch to energize said first circuit when the printing couple is moving in one direction between tripped and untripped position, and to open both said first switch and said second switch simultaneously when the printing couple is moving in the opposite direction, said last mentioned means including a cam adapted to be oscillated when said couple moves between tripped and untripped position and a member adapted to be moved by said cam.

16. In a printing press having a trip, form inking rollers adapted to move into inking and non-inking positions, means, including an electrically operable device, adapted, when said device is energized, to move said rollers from one position to the other and maintain said rollers in the latter position, and when deënergized, to reverse such motion and position, a first circuit including said electrically operable device and a first switch, a second circuit including said electrically operable device, a second switch and a third switch, means in the first circuit adapted to close said third switch when said first circuit is energized, means controlled by the printing couple and adapted to close said first switch to energize said first circuit when the printing couple is moving in one direction between tripped and untripped position, and to open both said first switch and said second switch simultaneously when the printing couple is moving in the opposite direction, the blades of said first and second switch being adapted to be moved in the same direction to close said switches and said last mentioned means including a cam adapted to be oscillated when said couple moves between tripped and untripped position and having central adjacent high portion and low portions, a neutral portion at either end, and a member adapted to be moved by said portions and to transmit motion to said blades.

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