To all whom it may concern:

Be it known that I, Joseph R. Blaine, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Cylinder-Trip Mechanism, of which the following is a specification.

This invention relates to cylinder trip mechanism for printing presses.

One of the objects of this invention is to improve means whereby the blanket cylinder may be tripped away from the plate and impression cylinders and maintained in such tripped position throughout successive revolutions, as, for instance, when preliminarily inking the plate cylinder, thereby overcoming wear of the parts incident to the bounding of the cylinder in and out.

Another object is to provide novel trip control mechanism whereby the blanket cylinder may be moved into and out of engagement with the plate and impression cylinders in a manner adapted to meet the various requirements for successful commercial operation.

These and other objects are accomplished by means of the arrangement disclosed on the accompanying sheets of drawings, in which—

Figure 1 is a fragmentary side elevation of a printing press embodying my invention;

Figure 2 is a detail front elevation of my trip control mechanism; and,

Figure 3 is a side elevation, parts being in section, of the arrangement shown in Figure 2.

The various novel features of my invention will be apparent from the following description and drawings and will be particularly pointed out in the appended claims.

This invention is an improvement upon part of the control mechanism disclosed in my co-pending application, Serial No. 92,819, filed April 22, 1919.

In the type of printing press which I have herein disclosed, there are a plate cylinder 10, blanket cylinder 11 and impression cylinder 12. As is well understood in the art, it is desirable at times to move the blanket cylinder 11 out of engagement with the plate and impression cylinders; for instance, when preliminarily inking the plate cylinder. To move said blanket cylinder out of engagement with the plate and impression cylinders, or, in other words, to trip the blanket cylinder, the latter has its bearings in bearing blocks eccentrically mounted. One of the eccentric bearings 13 is operatively connected to a cross rocker shaft 15 through a rod 14 and an arm 16 fast on the shaft 15, so that when the rocker shaft 15 is rocked in a counter-clockwise direction, as viewed in Figure 1, the blanket cylinder 11 will be tripped or moved out of engagement with the plate and impression cylinders; and when the rocker shaft 15 is moved in a clockwise direction from its tripped position the blanket cylinder will be moved back into operative engagement with the plate and impression cylinders 10 and 12, respectively. Also secured to the shaft 15 is a lever 17 having a latch-engaging portion 18 adapted to be engaged by a latch 19 which is pivotally connected at 20 to a lever 21 loosely mounted upon the shaft 15 adjacent the lever 17. This lever 21 loosely mounted upon the shaft 15 is rocked back and forth by a link 22 pivotally connected at one end to the lever 21 and at the other end to a bell crank lever 23 pivotally supported at 24, and having at one end a roller 25 which transverses a cam 26 formed in the blanket cylinder.

Unless some provision is made normally to retain the latch 19 out of engagement with the latch plate 18, a continuous back and forth movement will be given to the blanket cylinder 13 toward and away from the plate and impression cylinders. Normally to retain the latch 19 in inoperative position, an arm 27 is provided which is engaged by a roller 28 carried by the latch 19. This arm 27 supports the latch 19 and is spring-pressed to permit lowering of the latch into inoperative position. The arm 27 is pivotally mounted upon a pin 29, and is provided with a plurality of apertured ears 30 receiving a pin 31 forming a pivotal connection between a control lever 32 and the arm 27, so that while the arm may oscillate in one direction the lever 32 may oscillate in a plane at right angles to the plane of oscillation of the arm 27.

Cooperatively associated with the control lever 32 are two levers 33 and 34 pivotally mounted on pin 29 and having ears 35 and 36, respectively, which limit the rocking movement of the lever 32 in a clockwise di...
rection as viewed in Figure 3, and, therefore, limit the rocking movement of the arm 27 in the same sense. Normally the levers 33 and 34, and accordingly the lever 32, are prevented from rocking in a clockwise direction, as shown in Figure 3, by a latch 37 pivotally mounted at 38 and having two shouldered arms 39 and 40 which engage the ears 35 and 36, respectively, of levers 33 and 34, said latch 37 being yieldably held in such locking or holding position by a spring 41 connected to the latch and anchored to any suitable point, such as 42. It will be understood that whenever the levers 33 and 34 are hooked up by latch 27, it will be impossible for the arm 27 to lower to permit latch 19 to move into operative position; that it, to engage the associated latch member 18 for causing movement of the blanketing cylinder in one direction or the other. Therefore, when it is desired to cause the blanket cylinder to be tripped away from the plate and impression cylinders 10 and 12, or to be moved back into operative engagement therewith, it will be necessary to release the latch 37. To accomplish this, the lever 32 is provided with a cam portion 43 which cooperates with a cam portion 44 carried by the latch 37, so that when the lever 32 is oscillated from one of its extreme positions to its other extreme position, the latch 37 will be raised, thereby liberating the levers 33 and 34 and accordingly liberating the lever 32, which in turn permits arm 27 to lower, whereupon the latch 19 engages the latch portion 18, causing the blanket cylinder to be moved into or out of engagement with its associated cylinders.

As shown in Figure 1, the blanket cylinder 11 is in operative engagement with the plate cylinder 10 and impression cylinder 12, the control parts being in a corresponding position, as shown in Figure 2. If, under these conditions, it is desired to trip the blanket cylinder, the same will be accomplished by depressing a pedal 45 which is connected to a bell crank lever 46, one arm of which is connected to a link 47 which in turn is connected to an arm 48 on the control lever 32, causing the arm 48 to rise and accordingly to move the lever 32 into its right-hand position, as shown in Figure 2, which represents the trip position. It will be understood that as the lever 32 is moved from its left-hand position, representing the printing position, toward its right-hand or trip position, the cam 43 is moved from one side of the cam 44 to the other side, causing the latch 37 to be raised, thereby liberating levers 33 and 34 and accordingly lever 32, permitting arm 27 to lower and the latch 19 to transmit motion to the shaft 15 for tripping the blanket cylinder or moving the latter out of operative engagement with its associated cylinders. When the latch 37 is raised into inoperative position, a secondary latch 39 rocks upwardly behind a leg of latch 37, causing the latter temporarily to be held in inoperative position; whereupon a roller 50 carried by lever 34 is free to follow the contour of a rotating cam 51. Accordingly, as the cam presents a depressed portion to the roller 50, the roller being pressed into engagement with the cam by a spring 52, the levers 34 and 32 will be caused to move to the right, as viewed in Figures 1 and 3, whereupon a pin 53, carried by the lever 32, will move into engagement with a depending finger of secondary latch 49 for tripping the latter. Accordingly, the holding latch 37, when the roller 50 engages a high part of the cam 51, snaps back into position to retain the levers 33 and 34 in a position to prevent their rollers from engaging the low parts of the associated cams; and, accordingly, through the lever 32, holding the arm 27 in an elevated position to prevent operative engagement between the latch 19 and latch portion 18 of lever 17 mounted upon rock shaft 15. The pedal 45 being retained in its depressed position, it will be understood that any number of revolutions may be made by the various other cylinders without causing the blanket cylinder to be moved back and forth. Whenever it is desired to permit the blanket cylinder to move back into operative engagement with its associated plate and impression cylinders 10 and 12, respectively, the same may be done by releasing the pedal 45, whereupon under the stored tension in a spring 54 operatively associated with the bell crank lever 46, the lever 32 will be caused to move from its right-hand position, as shown in Figure 2, to its left-hand position. During this movement the latch 37, through the cooperative action of cams 43 and 44, again will be raised, permitting levers 33, 34 and 32 to move in a manner to permit arm 27 to lower, whereupon the lever 19 will cause the lever 17 and shaft 15 to be rocked from their left-hand positions to the positions shown in Figure 3. Here again, when the lever 37 is raised, the secondary latch 49 will temporarily hold the latch 37 in a raised position, permitting the roller 55 carried by lever 33 to move into engagement with the low part of the associated cam 56. During such movement, however, the pin 53 will again actuate the secondary latch 49 to release latch 37, whereupon when the roller 55 reaches a high point on cam 56, the latch 37 again will lock the levers 33, 34 and 32 in the position shown in Figure 3, and accordingly hold the arm 27 in a position to hold the latch 19 in an inoperative position to prevent tripping of the cylinder. The cams 51 and 56 are mounted upon a shaft 57, which in this particular case revolves once to two revolutions of the cylinders. The two levers 33 and 34 are
used to cooperate with the two cams 56 and 51 because of the necessary timing element; that is to say, the blanket is tripped at one portion of its gap and is placed back into cooperative association with the other cylinders at another point in its gap. These cams and levers time the movements of the blanket cylinder while the associated lever 32 controls the latch 19 and accordingly the tripping of the cylinder.

It is my intention to cover all modifications of the invention falling within the spirit and scope of the following claims.

I claim:

1. The combination with the plate, blanket and impression cylinders of a printing press, of control means for tripping the blanket cylinder, including a latch for optionally tripping or not disturbing the position of the blanket cylinder, an arm normally holding said latch in inoperative position, and a lever carried by said arm for moving the latter whereby said latch moves into operative position to trip said blanket cylinder.

2. The combination with the plate, blanket and impression cylinders of a printing press, of control means for tripping the blanket cylinder, including a latch for optionally tripping or not disturbing the position of the blanket cylinder, an arm normally holding said latch in inoperative position, a lever carried by said arm for moving the latter whereby said latch moves into operative position to trip said blanket cylinder, and means for controlling the time at which said lever may operate to cause tripping of said cylinder.

3. In a printing press, the combination of a cylinder movable between operative and tripped positions, means for optionally tripping or not disturbing the position of said cylinder, an arm normally holding said means in inoperative position, a lever carried by said arm for moving the latter to permit said means to move into operative position to trip said cylinder.

4. In a printing press, the combination of a cylinder movable between operative and tripped positions, means for optionally tripping or not disturbing the position of said cylinder, an arm normally holding said means in inoperative position, a lever carried by said arm for moving the latter to permit said means to move into operative position and tripped positions of said cylinder.

5. In a printing press, the combination of a cylinder movable between operative and tripped positions, means for optionally moving said cylinder into one position or the other, an arm normally holding said means in inoperative position, and a lever pivotally connected to said arm for moving the latter to permit said means to move into operative position to cause a movement of said cylinder.

6. In a printing press, the combination of a cylinder movable between operative and tripped positions, means for optionally moving said cylinder into one position or the other, an arm normally holding said means in inoperative position, a lever pivotally connected to said arm for moving the latter to permit said means to move into operative position to cause a movement of said cylinder, and means for controlling the time at which said lever may operate to cause movement of said cylinder.

7. In a printing press, the combination of a cylinder movable between operative and tripped positions, two levers, one timing the movement of the cylinder into operative position and the other timing the movement of the cylinder into tripped position, and a lever oscillating between said two levers for controlling said cylinder movements.

8. In a printing press, the combination of a cylinder movable between operative and tripped positions, two levers, one timing the movement of the cylinder into operative position and the other timing the movement of the cylinder into tripped position, and a lever associated with said two other levers for controlling said cylinder movements.

9. In a printing press, the combination of a cylinder movable between operative and tripped positions, two levers, one operating in connection with the operative position and the other operating in connection with the tripped position of said cylinder, and a lever associated with said two other levers controlling said cylinder movements.

10. In a printing press, the combination of a cylinder movable between operative and tripped positions, two levers, one timing the movement of the cylinder into operative position and the other timing the movement of a cylinder into tripped position, means normally holding said levers in inoperative position, and a lever associated with said other two levers for releasing the latter from said holding means to permit a movement of said cylinder.

11. In a printing press, the combination of a cylinder movable between operative and tripped positions, two levers, one timing the movement of the cylinder into operative position and the other timing the movement of a cylinder into tripped position, means normally holding said levers in inoperative position, and control means associated with said two levers for releasing the latter means to permit a movement of said cylinder.

12. In a printing press, the combination of a cylinder movable between operative
and tripped positions, means for timing the movement of said cylinder between said positions, means normally holding said timing means in inoperative position, and a control lever associated with said timing means for releasing the latter from said holding means for causing movement of said cylinder.

13. In a printing press, the combination of a cylinder movable between operative and tripped positions, means for timing the movement of said cylinder from one of said positions to another, means normally holding said timing means in an inoperative position and having a cam portion, and a lever operatively associated with said timing means having a cam portion operatively associated with the cam portion of said holding means for moving the latter into an inoperative position to permit movement of said cylinder.

14. In a printing press, the combination of a cylinder movable between operative and tripped positions, means for timing the movement of said cylinder from one position to another, means normally holding said timing means in inoperative position, a lever associated with said timing means for releasing the latter from said holding means for causing movement of said cylinder, and a latch for temporarily retaining said holding means in inoperative position, said latch being controlled by the means for operating said holding means.

Signed at Chicago, Illinois, this 25th day of March, 1921.  
JOSEPH R. BLAINE.