May 28, 1940. W. E. HAMLIN 2,202,420

DELIVERY CONTROL

Filed Nov. 12, 1936 2 Sheets-Sheet 1

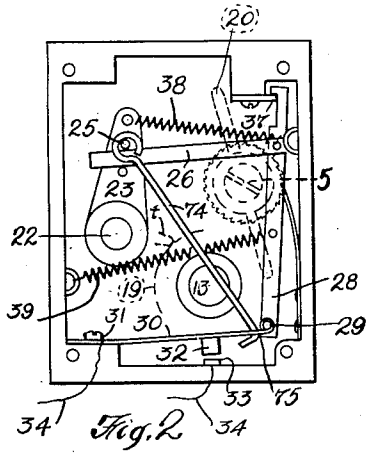


Fig. 2

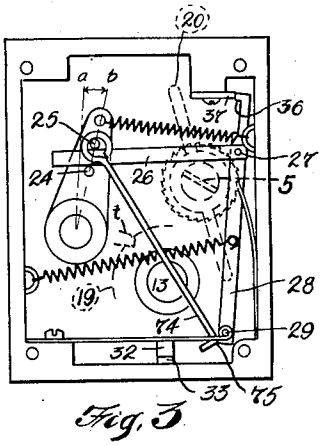


Fig. 3

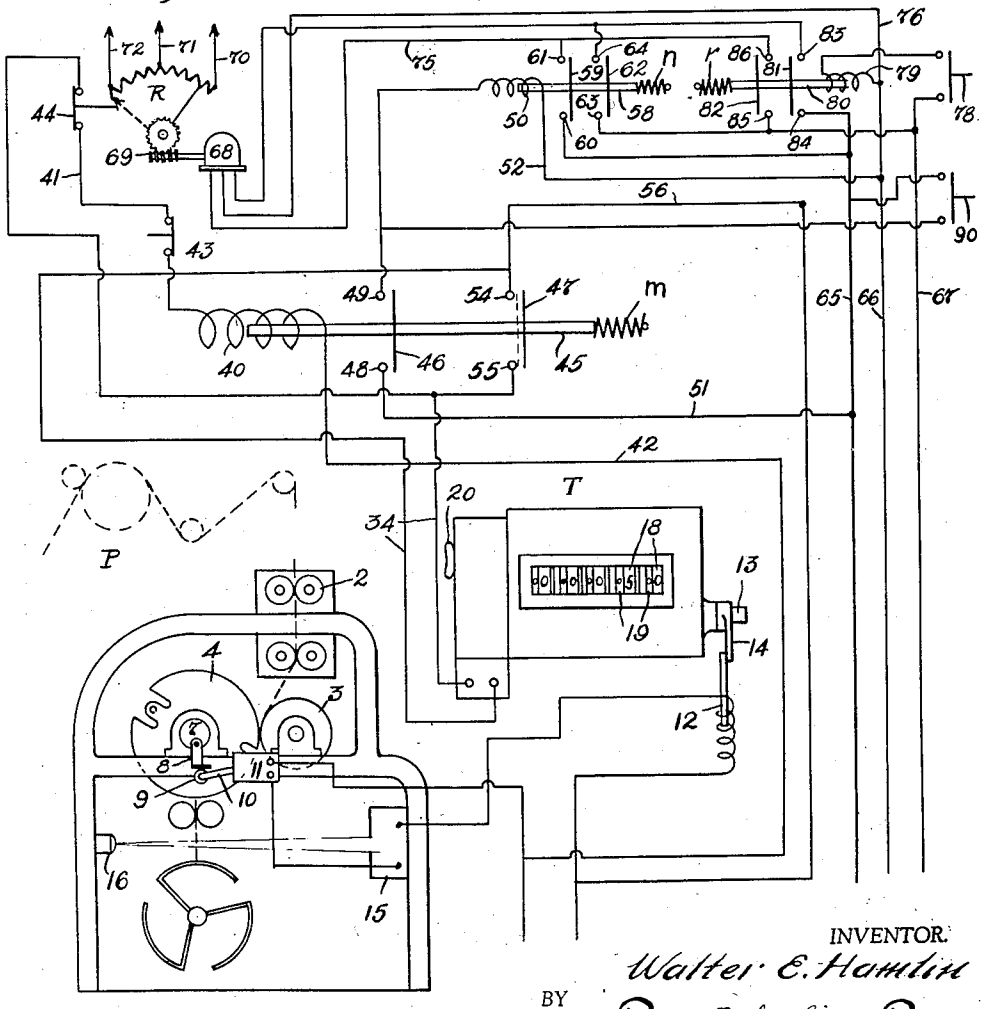


Fig. 1

INVENTOR.
Walter E. Hamlin
BY
Ray, Oberlin & Ray
ATTORNEYS.

May 28, 1940. W. E. HAMLIN 2,202,420

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Filed Nov. 12, 1936 2 Sheets-Sheet 2

Fig. 4.

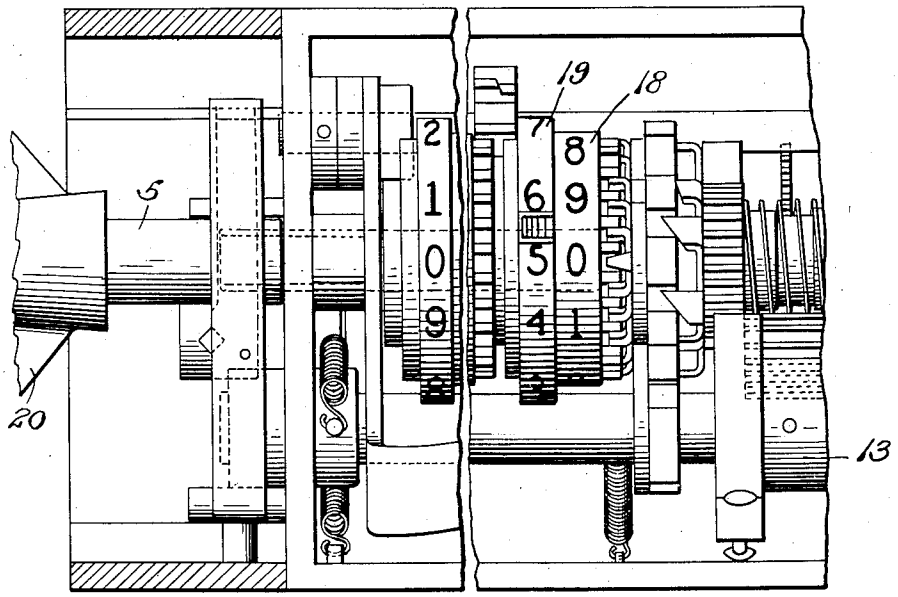
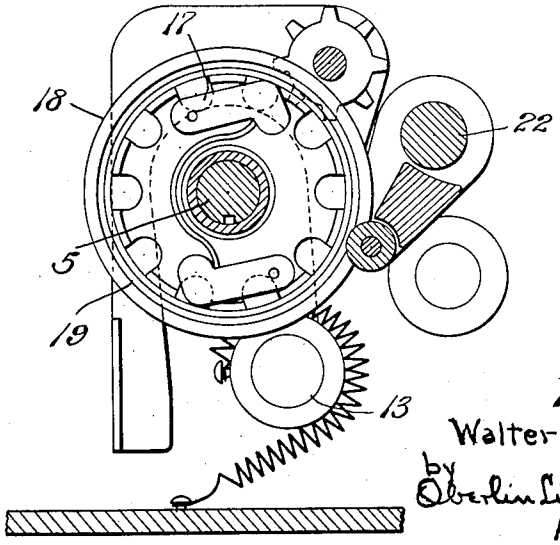


Fig. 5.



Inventor.
Walter E. Hamlin
by Oberlin Limbach & Day
Attorneys

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DELIVERY CONTROL

Walter E. Hamlin, Cleveland, Ohio, assignor to The Cleveland Shopping News Company, Cleveland, Ohio, a corporation of Ohio

Application November 12, 1936, Serial No. 110,483

4 Claims. (Cl. 172—239)

In the operation of printing presses if it is desired to have the press put out a certain definite number of printed copies, it is customary for a pressman to watch a counter attached to the press and at the correct juncture manually operate a switch to stop the press drive motors. There has been no way of accomplishing this automatically; and in cases where it be desired to include specified numbers of extra copies for instance, there has been no means for attaining this without trouble and labor out of all proportion to the results. In accordance with the present invention however, it now becomes possible to automatically control the operation of printing presses and the like, to run out any predetermined set number. Furthermore, if extra copies should be wanted, these may then be had very easily to the extent of whatever number of such extra copies as may be desired.

To the accomplishment of the foregoing and related ends, the invention, then, comprises the features hereinafter fully described, and particularly pointed out in the claims, the following description and the annexed drawings setting forth in detail certain illustrative embodiments of the invention, these being indicative however, of but a few of the various ways in which the principle of the invention may be employed.

In said annexed drawings:

Fig. 1 is a semi-schematic showing of the delivery end of a printing press, with control wiring diagram; and Figs. 2 and 3 are end elevational views, on a large scale, of a portion of the control mechanism, in respectively different position. Fig. 4 is a longitudinal vertical sectional view of the tallying mechanism T, on enlarged scale and portions being broken away at the ends and middle; and Fig. 5 is a transverse sectional detail thereof, looking toward the left.

As indicated in the drawings, the printing press P or the like having paper feed and folding rolls 2, has further a cutter cylinder 3 and final fold means 4 feeding to discharge mechanism all of which may be of any usual or desired detail. Arranged to be operated by a suitable shaft in such associated mechanism, for example conveniently on the shaft 7 of the folder finger carrier means is a projecting arm 8 which in its revolution about the shaft center actuates the lever 10 of an electric switch 11. Desirably, an antifriction roller 9 is carried on one of the operating elements, for instance, the lever 10. With this then, on each revolution of the shaft 7, the circuit is made through the switch 11 and a solenoid 12, thereby actuating the solenoid at each such contact and operating the shaft 13 of tallying mechanism, for instance by a rocker arm 14. A control means is also included in this circuit such that if the paper has broken or fails, the tallying mechanism will not operate. This may involve a photo-electric cell 15 in the circuit and a source of light 16 opposite, so that normally the paper will shield the photo-electric cell, but on failure of the paper the light beam will actuate the photo-electric cell and cause the circuit to open. The tallying mechanism T may be of any known or preferred detail construction, different forms being known commercially and further description thereof being unnecessary here, it sufficing to say that it may involve a series of units, tens, hundreds, etc., step-up gear wheels with visible indicia 18 at the dial and adjacent optionally settable wheels 19 accessible for adjusting to a desired number by opening the housing, and one illustrative construction for example may be on the lines of U. S. Patent No. 2,040,026, and may have the counting wheels 18 and the setting wheels 19 on the shaft 5, which is turned up one "unit" by suitable one-way drive gearing by the rock-shaft 13 as it is actuated; it being understood also that the wheels 18 for the tens, hundreds, thousands, etc., are loose-mounted to the extent of having appropriate side gearing to ratio, there being ratchet means permitting return movement, and the shaft 5 having a control handle 20 whereby the dial 18 may be returned to zero, and there being also means for setting the predetermining wheels 19 by hand to a desired number which may be run off, whereupon a trip engages and the press drive is automatically taken into control. Such trip operated by the tally wheels may be of a well known form for instance, in which a locking bar or trip bar *t* carried by an arm or arms projecting from a rock shaft, is so arranged as to fall into notches on the periphery on the tally wheels 19, as in Fig. 3, when the notches in the units and tens and hundreds etc, wheels come to alignment across for the predetermined total number which was set. The detail of this being well known in the art, further description is unnecessary, except to note that such trip rock shaft is shown on the drawings, Figs. 2 and 3, at 22, and at its end outside the series of tally wheels, such rock shaft carries fixedly an arm 23, and with the slight movement permitted the rock shaft as the tripper bar aforementioned falls into the finally aligned series of notches when the set number has been run off, the arm 23 has

a range of movement from the arc point *a* to the arc point *b*. Frictionally riding between pins 24 and 25 on the arm 23 is a link 26 which is connected at 27 to another link 28 whose lower end is connected at 29 to an arm 30 of resilient character, fastened to the housing at 31 and carrying electric contactor 32 which is capable of coacting with the contactor 33, and completing the electric circuit 34. The upper end of the link 28 is provided with a hook 36 which, when the link is drawn over to its left hand position, as viewed in Fig. 2, engages on a ledge 37, thereby holding the contactor arm 30 up positively against possibility of making circuit through points 32, 33. Only when the rock shaft arm 23 is in its right hand position, as viewed in Fig. 3, will the link 28 permit the contactor arm 30 to drop the contactor 32 against the contact point 33. A spring 38 extending from the end of the arm 23 to the housing tends to urge the rock shaft 22 such that the locking bar carried by it internally will promptly find the notches in the tally wheels when they come into alignment. A spring 39 extending from the housing to the link 28 tends to normally urge it to its left hand position, as shown in Fig. 2. With the structure so far described, it is seen that with each revolution of the shaft 7 in the printing press, as the papers are cut, folded and passed out, the make-arm 10 of the switch 11 is actuated, and, if the paper is passing, the circuit is closed through electro-magnet or solenoid 12 thereby pulling the arm 14 of the rock shaft 13 down and ratcheting "one" on the cumulating gearing. Spring means, whose detail is immaterial, returns the solenoid when the impulse of the current has ceased. When finally the predetermined number which has been set for has been run out, the locking bar afore-mentioned finds the aligned notches in the tally wheels, and the spring 38 pulls the arm 23 of the rock shaft 22 correspondingly into the position shown in Fig. 3, and the contactor 32 drops against the contact point 33 and closes the electric circuit 34. Thereupon, current flows through the electro-magnet or solenoid 40, and circuit 41, 42, the switches 43 and 44 normally being closed, and the magnet 40 pulls the switch bar 45 carrying, insulatingly, the switch arms 46, 47, in movement toward the left, as viewed in Fig. 1. The arm 46 bridges the contact points 48, 49, establishing a flow of line current through the electro-magnet 50 and its circuit 51, 52; and the arm 47 makes a continuing circuit through the contact points 54, 55 for the magnet 40 through 56, 41 and 42. The action of the electro-magnet 50 is to pull the switch-bar 58 to the left, as viewed in Fig. 1, and its arm 59 then bridges the contacts 60, 61, and arm 62 bridges the contacts 63, 64, to complete the circuits from the line to the small motor 68 which through gearing 69 serves to operate the rheostat R which controls the general motor press drive through the leads 70, 71, 72, the operation now initiated being to move the rheostat arm to throw in increasing resistance in the press drive circuit 70, 71, 72 and decrease the drive to final stoppage. However, in accordance with the invention, the rock shaft arm 23 of the automatic control is provided further with a link 74 extending from pin 25 on the arm 23 to connect at 75 to the contactor arm 30. Thereby while the afore-described initiated movement of the arm of the rheostat R set in motion by the closing of the decrease circuit 75, 76, etc., is under way, the immediately succeeding movement of the printing press mechanism shaft 7 operates the switch 11 and actuates the electro-magnet 12 and rock shaft 13 once more, which now, with the step-up of the first tally wheel raises the locking bar out of the aligned set of grooves and the rock shaft arm 23 immediately returns to the position shown in Fig. 2, with the link 74 pulling the contactor 32 away from the contact point 33 and opening the electric circuit 34.

If no more papers are desired, the stop switch 44 which is in circuit 41 and arranged such that the arm of the rheostat R will strike it, is operated as the arm comes to its extreme position, and this circuit is opened and the general control is restored ready so that the press can be re-started after being thus stopped.

But, if before this occurs the hand switch 43 is opened the circuit to electro-magnet 40 is broken and the switch bar 45 is thrown by return spring *r* to a position such that the switch arm 46 is pulled away from the contact points 48, 49, and the current to the electro-magnet 50 being interrupted, the switch bar 58 is retracted by its return spring *n* and the decrease circuit 75, 76, to the rheostat motor 68 is opened. Then however, on hand-closing of a step-up switch 78, an electro-magnet 79 is energized. This magnet controls the switch bar 80, carrying switch arms 81, 82, to bridge contactors 83, 84, and 85, 86, thereby allowing flow of current to the rheostat motor 68, and the press motor drive is correspondingly operated to throw out further papers to the number as desired, whereupon the switch 78 is opened.

To start the press then for another set of papers, all that is necessary is for the pressman to close the starter switch 78, which, actuating the electro-magnet 79 and its switch bar 80 establishes current flow to the rheostat motor 68 in the direction of throwing out resistance and increasing the press motor drive circuit 70, 71, 72, up to normal operating speed. This continues until the automatic control having run out its predetermined number again, actuates the switch to operate the rheostat motor to slow down and stop the press drive, and so on. It is thus seen that where desired, full automatic run for a repeated predetermined number of delivery copies may be had, and if at any time extra copies are wanted, a master-control by the pressman is permitted, whereby he may provide such extra copies as he may desire, and without interfering with the further full automatic control operation. The hand-controlled switch 90, normally opened, when closed, allows hand-control to be interposed for stoppage at any time desired, irrespective of the automatic control.

Other modes of applying the principle of the invention may be employed, change being made as regards the details described, provided the features stated in any of the following claims, or the equivalent of such, be employed.

I therefore particularly point out and distinctly claim as my invention:

1. In apparatus of the character described, means for tallying articles discharged, means for interrupting the operation of the tallying means on failure of such articles, a trip in association with said tallying means, and means to operate the trip settable for operation at a desired number, a rock shaft actuated by said trip, an arm on said rock shaft, another electric contactor and a circuit controlled thereby, a link for releasing said contactor, a link connected to said link and fric-

tionally riding between two pins on said rock shaft arm whereby on movement of the rock shaft by its said trip said contactor is set down, the rock shaft arm returning to original position on the next impulse of said electro-magnet, a link extending from one of said pins on the rock shaft arm to raise said contactor on such return movement of said arm, and an electro-magnetic switch controlled by said other electric contactor.

2. In apparatus of the character described, means for tallying articles discharge, a trip in association with said tallying means, and means to operate the trip settable for operation at a desired number, a rock shaft actuated by said trip, an arm on said rock shaft, another electric contactor and a circuit controlled thereby, a link for releasing said contactor, a link connected to said link and frictionally riding between two pins on said rock shaft arm whereby on movement of the rock shaft by its said trip said contactor is set down, the rock shaft arm returning to original position on the next impulse of said electro-magnet, a link extending from one of said pins on the rock shaft arm to raise said contactor on such return movement of said arm, and an electro-magnetic switch controlled by said other electric contactor.

3. In apparatus of the character described, means for tallying articles discharged, a trip in association with said tallying means, and means to operate the trip settable for operation at a desired number, a rock shaft actuated by said trip, an arm on said rock shaft, another electric contactor and a circuit controlled thereby, means whereby on movement of the rock shaft by its said trip said contactor is set down, the rock shaft arm returning to original position on the next impulse of said electro-magnet, and means in connection with said rock shaft arm to raise said contactor on such return movement of said arm.

4. In apparatus of the character described, means for tallying articles discharged, a trip in association with said tallying means, and means to operate the trip settable for operation at a desired number, means actuated by said trip for closing an electric circuit, and means whereby on the next operation of the tallying means such circuit is broken.

WALTER E. HAMLIN.