

June 5, 1962

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3,037,447

PRINTING APPARATUS

Filed Jan. 10, 1961

3 Sheets-Sheet 1

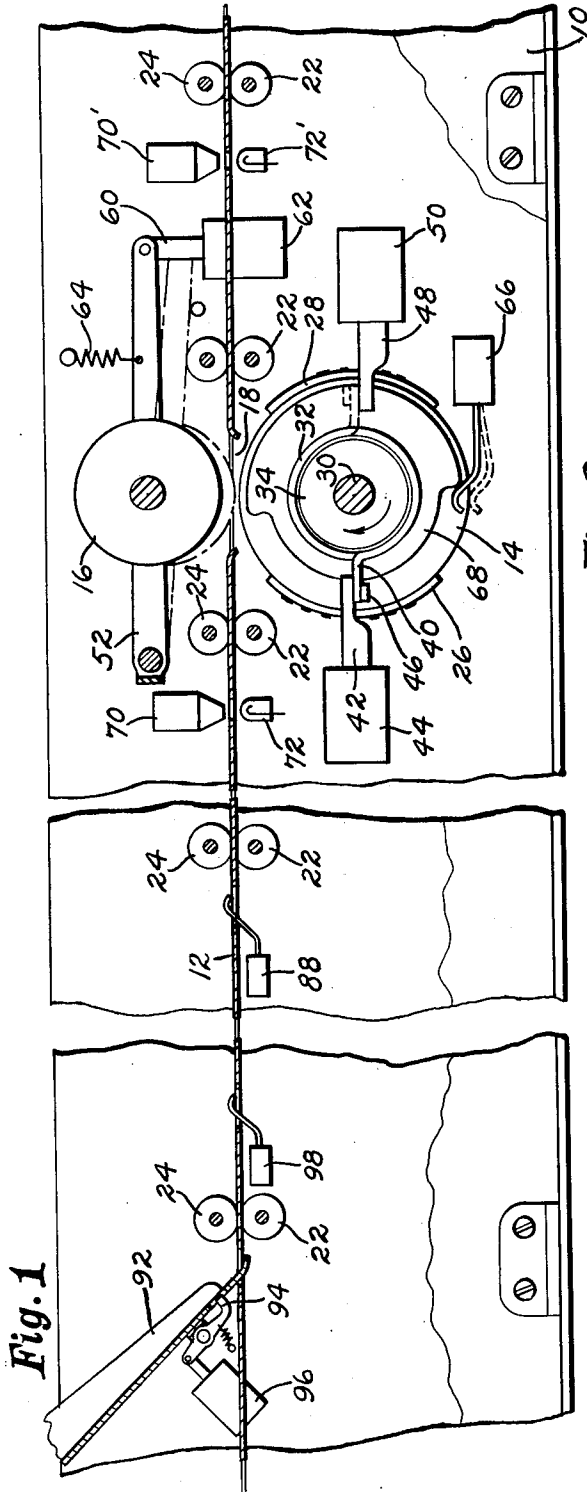


Fig. 3.

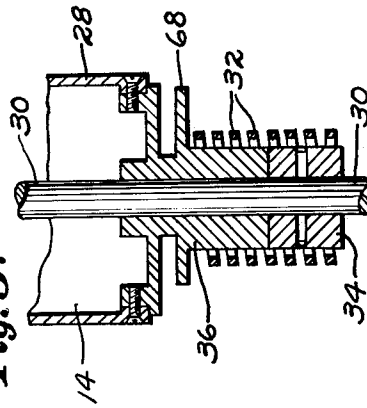
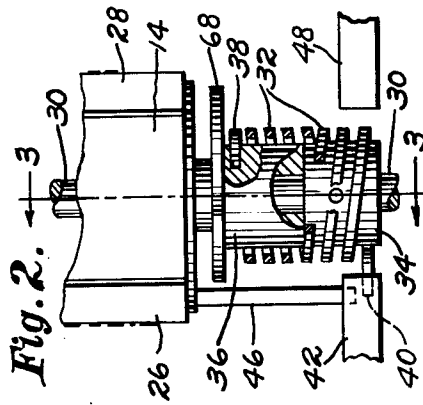


Fig. 2.



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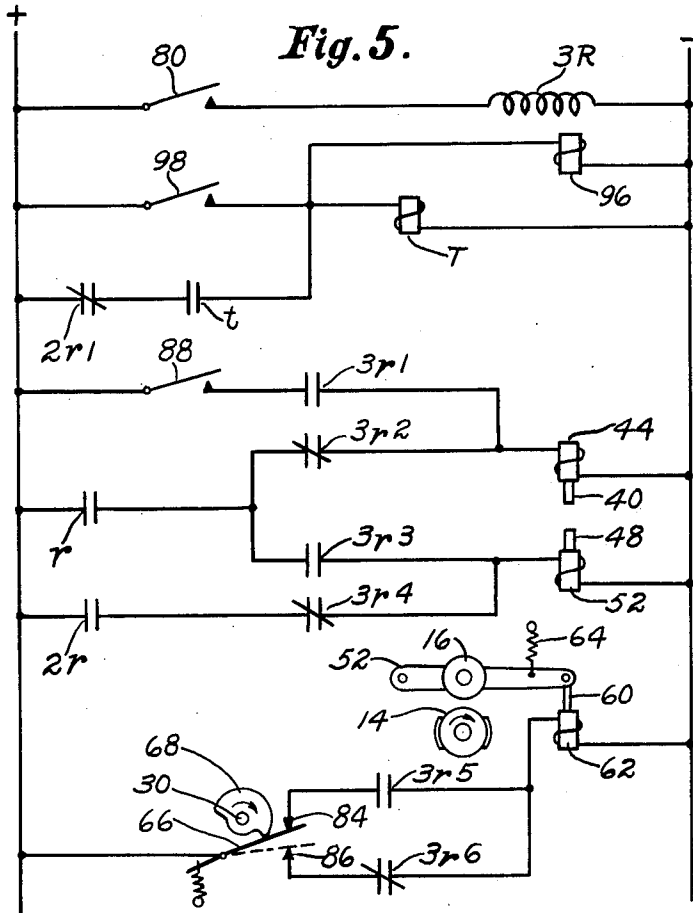
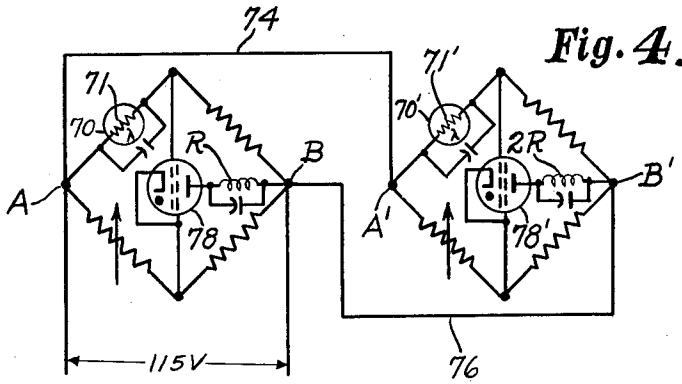
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3 Sheets-Sheet 2



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3 Sheets-Sheet 3

Fig. 6.

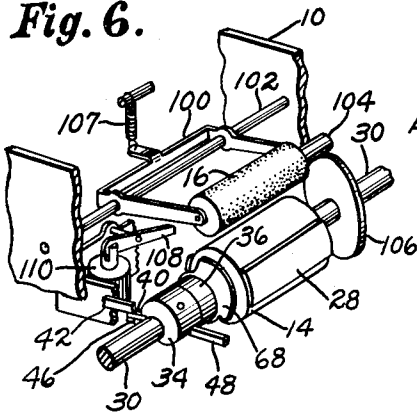


Fig. 7.

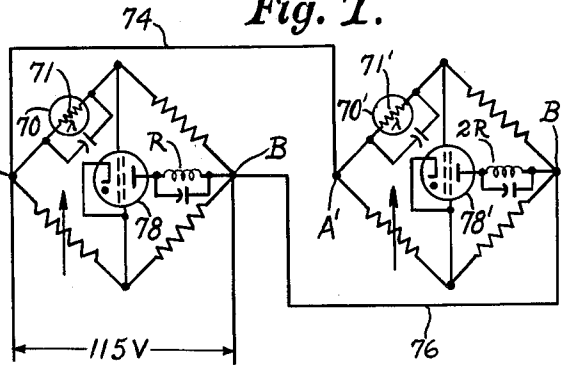
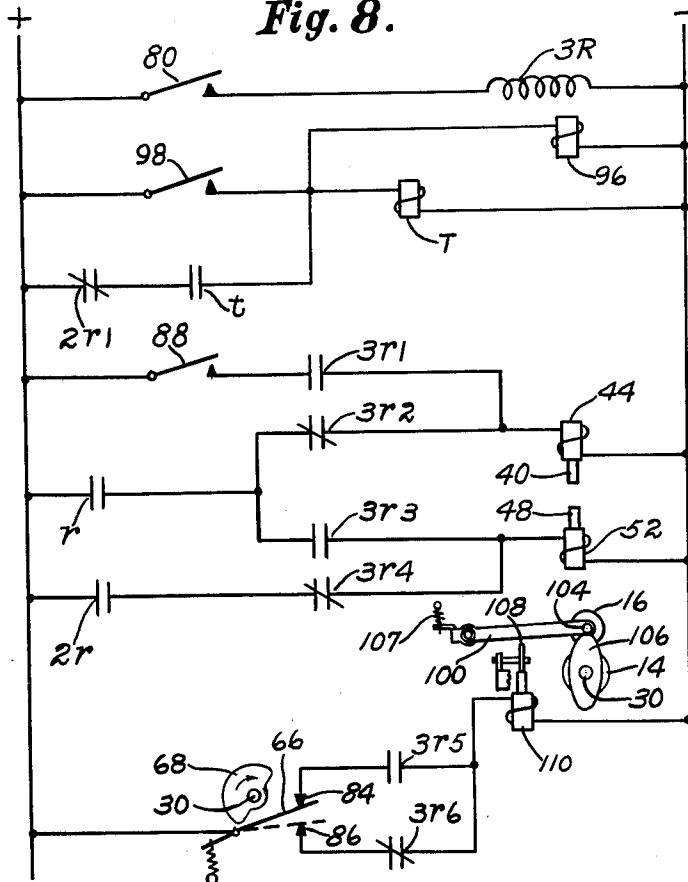


Fig. 8.



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3,037,447

PRINTING APPARATUS

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 Filed Jan. 10, 1961, Ser. No. 81,758
 13 Claims. (Cl. 101-91)

This invention relates generally to printing apparatus and particularly to a printing apparatus for endorsing checks.

It is an object of the invention to provide an improved check endorsing printing apparatus of the type in which the endorsing operation is effected by passing a check between a print wheel and pressure roller to in effect roll the endorsing imprint onto the check.

Another object of the invention is to provide a check endorsing printing apparatus of the above mentioned character in which the print wheel has a plurality of different types of endorsing print elements spaced apart on the periphery thereof and selectively operable for positioning by an indexing operation to a preprinting position.

Another object of the invention is to provide a check endorsing printing apparatus in which the print wheel indexing operation initiated to position a selected one of the print elements at the preprinting position, is effected without printing on the pressure roller of the printing apparatus.

In connection with the next preceding object, it is a more specific object of the invention to provide for an automatic movement of the pressure roller away from the periphery of the print wheel to avoid inking the print roller surface when the print wheel is being rotatively indexed to position a selected one of its print elements at the preprinting position.

A further object of the invention resides in the provision of a check endorsing apparatus of the above mentioned type in which the printing and indexing operations of the print wheel are initiated by the presence of a check in relation to the print wheel.

A still further object of the invention is to provide for a printing apparatus having a pressure roller movable toward and away from the periphery of a rotatable print wheel in timed relation to radially spaced print elements thereon, an improved control system for the roller to eliminate bouncing of the roller on the print wheel.

Other objects of the invention will become apparent from the following detail description taken in connection with the accompanying drawings in which:

FIG. 1 is a fragmentary side view partly broken away and in section of a check endorsing printing apparatus embodying features of our invention;

FIG. 2 is a fragmentary plan view of the apparatus; FIG. 3 is a sectional view, taken along the line 3-3 of FIG. 2;

FIG. 4 is a diagrammatic illustration of a part of a control system for the printing apparatus;

FIG. 5 is a diagrammatic illustration of another part of the control system;

FIG. 6 is a fragmentary perspective view of a modification of the printing apparatus; and

FIGS. 7 and 8 are diagrammatical illustrations of the control system for the modification of FIG. 6.

Referring to the drawings by characters of reference, the check endorsing apparatus shown comprises in general a support or pair of rigidly connected together side plates 10, a horizontal check conveyor 12, a print wheel 14, and a rotatable platen, or pressure roller 16. The conveyor 12, print wheel 14, and the pressure roller 16 are mounted on and between the side plates 10, the print wheel and the pressure roller being located at an

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interruption 18 in the conveyor with the pressure roller preferably positioned directly above the print wheel, as shown. The peripheries of the print wheel 14 and the pressure roller 16 are cooperatively related to form a bight and are arranged such that the bight is substantially in the path of travel of the checks along the conveyor 12.

Any suitable type of check conveyor may be employed, the present conveyor 12 comprising a plurality of horizontally spaced pairs of feed rollers, each pair of which includes a lower driving roller 22 and an upper pressure roller 24. The driving rollers 22 may be belt connected and be driven from a suitable power source, such as an electric motor (not shown).

In connection with the present invention, our printing apparatus is particularly suitable for use by banks and similar institutions which handle large batches of checks and other documents, some of which require one type of endorsement and others of which require a different type of endorsement. For example, the recording of checks is facilitated if the endorsement thereof designates whether a check is drawn on the home bank or on some other bank. To this end, the print wheel 14 has attached to the periphery thereof, a plurality of circumferentially equally spaced printing plates of which there are two in the present apparatus, designated by the reference characters 26 and 28. Of these, the print elements of plate 26 may be selected to symbolize the endorsement of the home bank and the print elements of plate 28, the endorsement to be used on the checks of all other banks.

A print wheel driving shaft 30 extends between and is journaled in the side plates 10, and this shaft may be continuously driven by the same aforementioned electric motor that drives the conveyor feed rollers 22. The print wheel 14 is freely mounted on its driving shaft 30 and is operatively connected thereto by a clutch member or radially expansible-contractable coil spring 32. Affixed onto the shaft 30 there is a tubular sleeve 34 in axial abutting relation with the end of an integral hub 36 of the print wheel 14, and the clutch spring 32 surrounds both the sleeve 34 and the print wheel hub 36. One end, as at 38, of the clutch spring 32 is anchored to the print wheel 14 and the other end, as at 40, is free and projects laterally from the sleeve for engagement by an electrically operated clutch control, or retractable stop member 42. The stop member 42 may be the armature of a normally de-energized solenoid 44, projecting into the path of rotation of the free end of the clutch spring 32 to stop the same and cause the spring to expand radially to disengage from the driving shaft 30. To activate the stop member 42, the solenoid 44 is pulsed, which retracts the stop member to release the clutch spring 32, which then contracts to couple the print wheel 14 to the continuously rotating driving shaft 30. Normally, the stop member 42 is in the path of a stop lug 46 on the print wheel 14 and disengages from the lug to release the print wheel at the same time that the clutch spring 32 is released by the activated stop member 42. When the stop member 42 is in its normal position shown, it is engaged by the lug 46 to stop the print wheel 14 in the position shown in FIG. 1, with the printing plate 26 in the preprinting position. In this preprinting position of the print wheel 14, the radial center of the printing plate 26 is less than 180° and preferably 90° from the bight of the print wheel and pressure roller 16, with respect to the direction of rotation of the print wheel.

A second electrically operated clutch control or retractable stop member 48 is provided for the print wheel 14 and is located on the other side thereof or approximately 180° from the stop member 42. Like the first stop member 42, the second stop member 48 may be the armature of a normally de-energized solenoid 50. Normally, the stop member 48 is in the position shown, extending into

the path of rotation of the free end 40 of the spring to effect disengagement of the clutch spring 32 and engagement by lug 46 thereby to limit rotation of print wheel 14 to a one-half revolution, or 180° of a complete cycle of rotation.

It will now be understood that when solenoid 44 is pulsed, the print wheel 16, limited by the stop member 43 rotates through 180° of a complete cycle of rotation and when the solenoid 50 is pulsed, the print wheel, limited by stop member 42, rotates through the second one-half cycle of rotation. The first one-half cycle of rotation of the print wheel 14 is employed to endorse a check when printing plate 26 is selected for the endorsing operation, and the second one-half cycle of rotation of the print wheel is normally a non-printing, or print wheel indexing operation for returning the print plate 26 to the preprinting position. As will be more fully understood from the description of operation, the indexing operation of the print wheel 14 is effected at intervals between the feeding of successive checks to the print wheel.

In order to prevent the printing plate 28 from printing on the pressure roller 16 during the print wheel indexing operation, the pressure roller is mounted for movement bodily toward and away from the print wheel on a bail 52, the pressure roller normally being in its retracted position, as shown, spaced from the print wheel. The bail 52 is pivotally mounted on a shaft 54 and has an extended arm 58, which is pivotally connected to an electrically operated member, or armature 60 of a solenoid 62. The solenoid 62 is normally de-energized, and a coil spring 64, attached to the bail arm 58, normally holds the pressure roller in its "up," or retracted position, out of cooperative relationship with the print wheel. A switch 66 controls the solenoid 62 and is actuated by a cam 68, which is secured to and rotates with the print wheel 14.

Referring now more particularly to FIGS. 4 and 5, the solenoid 44 is controlled by a relay switch member *r* which is responsive to the presence of a check enroute to the print wheel 14. The switch member *r* is in series with the solenoid 44 and has a sensing element or photo-electric cell 70 in circuit with the coil R of the relay switch member *r*. The photo-electric cell 70 may be of the type having a cadmium selenide conductive element 71, the resistance of which increases under the influence of light. As shown in FIG. 1, the photo-electric cell 70 is positioned above the check conveyor 12, anterior to the print wheel 14, and below the conveyor there is a light source or electric lamp 72 arranged to direct a light beam onto the conductive element 71 of the photo-electric cell to increase and maintain the resistance thereof above a predetermined resistance so long as the light beam is not interrupted by a check enroute to the print wheel 14.

The circuitry of the relay coil R and the photo-electric cell 70 may be of any of the well-known types, the present circuit being of a bridge type having terminals A and B for connection by leads 74 and 76 respectively to an electric power source, such as a 115 v., 60 cycle A.C. source. A rectifying thyatron 78 has its two grids respectively connected to the junctions of the bridge and its plate connected in series with relay coil R and terminal B. By means of the potentiometer, the potential on the control grid is adjusted such that the thyatron will not fire until such time as a check interrupts the light beam of lamp 72 whereupon the resistance of the photo-electric cell conductive element 71 decreases with resultant flow of current that fires the thyatron 78 and causes relay R to close its switch member or contacts *r*.

A second switch member 2*r* controls solenoid 52 in response to the presence of the check just after the check leaves the print wheel 14, and the switch member 2*r* is in series with the solenoid, as shown in the circuit of FIG. 4. With reference to FIG. 4, it will be noted that the circuit of the relay coil 2R is the same as the circuit of relay coil R and, therefore, like circuit components have been given primed reference characters to avoid unnecessary repetitious description. As shown in FIG. 1, the photo-electric

cell 70' and its lamp 72' are located along the conveyor 12 posterior to the print wheel 14 with respect to the direction of travel of the checks.

In accordance with the invention, there is provided a manually operable switch member 80, which is operable to select one or the other of the printing plates 26 and 28 for endorsing a check or a run of successive checks. In the present illustration, the switch member 80 is shown in its open circuit position, the switch being in series circuit with the coil 3R of a relay which has six pair of contacts, respectively designated 3*r*1, 3*r*2, 3*r*3, 3*r*4, 3*r*5, and 3*r*6. Contacts 3*r*1 are open and are in series with solenoid 44, and contacts 3*r*2 are closed and in series with switch member *r* and solenoid 44. Similarly, the open relay contacts 3*r*3 are in series with switch member *r* and with relay 52, and the closed relay contacts 3*r*4 are in series with switch member 2*r* and with the solenoid 52. The cam operated switch member 66 has two spaced apart fixed contacts, 84 and 86, the former being engaged by the switch member 66 and in series circuit with the open relay contacts 3*r*5 and the solenoid 62. The closed relay contacts 3*r*6 are in series circuit with switch contact 86 and the solenoid 62. In series with the open relay contacts 3*r*1 and solenoid 44 there is an open switch member 88, which is located in the path of check travel anterior to the photo-electric cell 70, and this switch 88 functions to effect a print wheel indexing operation when relay contacts 3*r*1 are closed.

At the feed end of the conveyor 12 there is preferably provided for the convenience of the attendant of the apparatus, a check hopper and chute 92 for guiding the check down onto the conveyor 12. The checks are to be fed, one at a time, into the hopper and not until the preceding check has been endorsed. In order to insure that a check is not fed onto the conveyor 12 before the preceding check has passed the photo-electric cell 70', a normally open gate 94 is provided for closing the lower end of the chute 92 and is actuated by a solenoid 96 under the mutual control of a check actuated switch member 98 and the switch member or contacts 2*r*1 of relay coil 2R. The switch 98 is located in the path of travel of the checks anterior to the switch 88 and controls a relay T, which has a pair of holding circuit contacts *t*, so as to provide for holding solenoid 96 energized after switch 98 is released by a check. The contacts 2*r*1 of relay coil 2R are normally closed and are in the holding circuit of relay contacts *t*. Thus, when contacts 2*r*1 open in response to the presence of a check passing beneath the photo-electric cell 70', the holding circuit of relay T is broken, and, as a consequence, solenoid 96 is de-energized to allow the gate 94 to open so that the next check may proceed to the print wheel 14.

Operations

Assuming that the conveyor 12 and the print wheel driving shaft 30 are in operation and that use of the print plate 26 is desired, the operating parts and controls therefor will be in the positions shown, and the print plate selector switch 80 will be open. The attendant now drops the first check into the chute 92 and the check proceeds past the open gate 94 to the conveyor rollers 22, 24, which feed the check toward the print wheel 14. When the check is clear of the chute 92, the check strikes and closes the switch 98, which energizes the solenoid 96 to close the gate 94 so that another check cannot immediately be fed to the conveyor. Also, the closing of switch 98 by the check causes the holding relay coil T to be energized to hold solenoid 96 energized after the switch 98 is released by the check. At a point anterior to the photo-electric cell 70, the check closes switch 88, but since contacts 3*r*1 are open, the solenoid 44 remains de-energized and operation of the print wheel is prevented, i.e., switch 88 is ineffective when selector switch 80 is in its open position selecting the use of print plate 26. When the check intercepts the light beam of lamp 72, the

resultant decrease in the resistance of the conductive element 71 of photo-electric cell 70 causes the thyatron 78 to fire and as a consequence the relay coil R is energized and closes its contacts *r*. Closing of the relay contacts *r* completes a circuit through the closed contacts 3r2 and solenoid 44 to pulse the latter whereupon the solenoid retracts its armature or stop member 42 for an interval sufficient to release the spring end 40 and clear the print wheel lug 46. Upon being released, the clutch spring 32 contracts and couples the print wheel 14 to the driving shaft 30, which rotates the print wheel in the direction of the arrow, FIG. 1, until the clutch spring is disengaged by the armature 48 of the solenoid 50 which limits rotation of the print wheel 14 to a one-half cycle of operation. Rotating with the print wheel 14, the cam 68 moves the switch member 66 from contact 84 to contact 86, completing a circuit through the closed relay contacts 3r6 and the solenoid 62 to energize the latter to pivot the pressure roller 16 down into engagement with the printing plate 26 of the rotating print wheel 14. The speed of travel of the check in relation to the position of the photo-electric cell 70 from the print wheel bight are related to the surface speed of the print wheel 14 and movement of roller 16 to insure that printing plate 26 will roll an imprint of its printing elements onto the check as the check passes between the print wheel and pressure roller. Continuing along the conveyor, the check intercepts the light beam of the lamp 72' and as a consequence, the resistance of the conductive element 71' of the photoelectric cell 70' decreases with resultant flow of current to fire the thyatron 78' and energize the relay coil 2R which then closes its contacts 2r and opens its contacts 2r1. The opening of the contacts 2r1 breaks the holding circuit of relay T causing solenoid 96 to be de-energized so as to allow gate 94 to open. The closing of contacts 2r completes a circuit through the closed relay contacts 3r4 and the solenoid 52 whereupon the solenoid retracts its armature 48 to effect engagement of the clutch spring 32 and resultant rotation of the print wheel through the second one-half cycle of its operation. This is a non-printing indexing operation for returning the printing plates 26 to the preprinting position shown in FIG. 1, the print wheel 14 being stopped in this position by the inactivated solenoid armature 42. When the print wheel indexing operation is initiated, the cam 68 rotating therewith disengages switch member 66 from contact 86 and moves the switch member back to the position shown in engagement with contact 84 so as to prevent energization of solenoid 62. As a consequence, the pressure roller 16 remains in its "up" or retracted position to avoid contact between printing plate 28 and the roller 16 which otherwise would apply ink to the roller and smear the faces of the checks. The above operation is repeated and checks are endorsed by the printing plate 26 so long as the selector switch 80 remains in its open circuit position.

When it is desired to apply the endorsing plate 28 to a check or checks, the attendant closes the selector switch 80, energizing the relay coil 3R, which then reverses the positions of its contacts 3r1, 3r2, 3r3, 3r4, 3r5, and 3r6. This renders switch 88 effective to control solenoid 44, and *r* to control solenoid 52, and renders 2r ineffective. A check is now fed into the chute 92 and as before, the check on clearing the gate 94 engages and closes switch 98 to effect the closing of the gate. Thereafter, the check engages and closes switch 88, completing a circuit through the now closed relay contacts 3r1 and solenoid 44 to effect engagement of the clutch spring 32 and resultant rotation of the print wheel 14. The print wheel is stopped by the solenoid armature 48, limiting rotation to a one-half cycle to bring the print wheel plate 28 around to the preprinting position. This is a change-over, non-printing indexing operation. During the indexing operation, the cam 68 rotated with the print wheel 14 and moved switch member 66 into engagement with contact 86, but since

relay contacts 3r6 are now open, the solenoid 62 remained deenergized and, therefore, the pressure roller 16 remained in its retracted position so as to avoid engagement with printing plate 26 during the indexing operation. Soon after the completion of the change-over indexing operation, initiated by switch 88, the check intercepts the light beam 72, which as before causes the thyatron 78 to fire and energizes relay coil R, which then closes its contacts *r*. The closing of contacts *r* completes the circuit through the now closed relay contacts 3r3 and solenoid 52, which pulses the solenoid to release the clutch spring 32 thereby to effect a one-half printing cycle of operation which applies print plate 28 to the check. It will be remembered that when the print wheel 14 was indexed to bring plate 28 to the preprinting position, the cam 68 moved and held switch member 66 in engagement with contact 86. As a result, on the following printing operation, switch member 66 again engages contact 84, which completes a circuit through the now closed contacts 3r5 and energizes solenoid 62 to move pressure roller 16 into cooperative printing relation with printing plate 28. The endorsed check proceeds along the conveyor 12 and interrupts the light beam of the photo-electric cell 70' which, as before, causes the thyatron 78' to fire and energize relay coil 2R, which closes its contacts 2r, but relay contacts 3r4 are now open so as to prevent energization of solenoid 52 which otherwise would cause the print wheel 14 to be indexed and bring the printing plate 28 prematurely to the preprinting position. Thus, it will be understood that the starting position of the print wheel 14 is the same irrespective of which of the endorsing plates 26 and 28 is selected for use; that is, the operation begins in either case with printing plate 26 at the preprinting position. If the endorsement plate 26 is selected by the selector switch 80, then switch members *r* and 2r respectively control the printing and indexing operations, whereas, if endorsement plate 28 is selected, the switch members 88 and *r* respectively control the indexing and printing operations.

Referring now to FIGS. 6, 7, and 8, the modification shown is similar to the above described printing apparatus and, therefore, like parts are designated by like reference characters. The pressure roller 16 is carried by and between the free ends of a bail 100, which is pivoted on a suitable shaft 102, and at one end of the pressure roller 16 there is a cam follower 104 to ride on a cam 106 which rotates with the print wheel 14. A coil spring 107 yieldingly acts to hold the follower 104 in engagement with the cam 106. The cam 106 is designed to allow the pressure roller 16 under the influence of spring 107 to move toward and away from the print wheel 14 to engage one or the other of the printing plates 26, 28 depending, of course, upon the setting of the selector switch 80.

A stop 108 in the form of a lever is provided to restrain downward movement of roller 16 and extends under one arm of the bail 100. Pivotaly connected to the lever 108 is the armature of a solenoid 110, which when energized, holds the lever 108 in its "up" position to overcome the spring 107 to prevent the pressure roller 16 from following the cam 106. This blocking of the pressure roller 16 occurs during the indexing operations to prevent printing of the non-selected one of the printing plates 26 or 28, as the case may be, on the pressure roller. This arrangement eliminates the tendency of the pressure roller 16 to bounce on the print wheel. In this modification, when the selector switch 80 is open, the relay contacts 3r5 are open and the contacts 3r6 are closed. Thus, when cam 68 rotates with the print wheel 14 to effect a check endorsement by the printing plate 26, the switch member 66 will not be moved into engagement with contact 86, and as a consequence, the pressure roller 16 will be free under the influence of spring 106 to move into cooperating bight forming relationship with the print wheel 14. On the next or indexing one-half cycle of the print wheel 14, the switch member 66 will engage contact 86 and

cause solenoid 110 to be energized, which through the lever 108 restrains the pressure roller 16 from moving down into engagement with the printing plate 28. The same result occurs when the contacts 3r5 are closed and the contacts 3r6 are open.

Although we have shown and described our document endorsing apparatus in considerable detail, it will be understood that many changes and variations may be made therein without departing from the spirit and scope of the invention.

What is claimed is:

1. In printing apparatus for endorsing documents, a rotatable pressure roller, a rotatable print wheel associated with said pressure roller to form a bight to which the documents are fed singly along a path of travel, a plurality of radially and equally spaced printing elements on the periphery of said print wheel, a normally disengaged clutch member operatively connecting said print wheel to a rotating driving member, a first electrically operated member operable to hold said clutch member disengaged and said print wheel with one of said printing elements in a preprinting position with relation to the bight, said first electrically operated member operable when activated to effect engagement of said clutch member, a second electrically operated member angularly displaced from the first and with the displacement substantially equal to the radial spacing between adjacent ones of said printing elements, said second electrically operated member normally operable to disengage said clutch member and on being activated to effect engagement of said clutch member, a first switch member electrically connected to activate said first electrically operated member and responsive in timed relation to the presence of a document enroute to and at a predetermined distance from the bight, a second switch member electrically connected to activate said second electrically operated member, said second switch member responsive in timed relation to the presence of the document at a second predetermined distance from the bight, and settable switch means electrically connected to and for selectively rendering one of said switch members ineffective.

2. In printing apparatus for endorsing documents fed singly along a path of travel, a rotatable pressure roller, a rotatable print wheel associated with said pressure roller to form a bight therewith, a plurality of radially and equally spaced print elements on the periphery of said print wheel, a normally disengaged clutch member operatively connecting said print wheel to a rotating driving member, an electrically operated member controlling said clutch member and holding said print wheel with one of said print elements in a preprinting position with respect to said pressure roller, said electrically operated member operable when activated to effect rotation of said print wheel, a second electrically operated means to limit rotation of said print wheel to an angular displacement substantially equal to the radial spacing between adjacent ones of said print elements, a first switch member electrically connected to said first electrically operated member and responsive to the presence of a document enroute to the bight to effect activation of said clutch member, a second switch member electrically connected to control said second electrically operated member, said second switch member responsive to the presence of the document posteriorly to said bight with respect to the direction of travel of the document to effect rotation of said print wheel, and a settable switch member electrically connected to and for rendering said second switch member ineffective.

3. In printing apparatus for endorsing documents fed singly along a path of travel, a rotatable pressure roller member, a rotatable print wheel member associated with said pressure roller member and normally spaced therefrom, one of said members being bodily movable toward and away from the other, electrically operated means operable to move said one member, a plurality of radially and equally spaced print elements on the periphery of said

print wheel member, a normally disengaged clutch member operatively connecting said print wheel member to a rotating driving member, a plurality of electrically operated members operatively connected to individually control said clutch member, said electrically operated members activatable successively to limit rotation of said print wheel member to partial cycles of rotation substantially equal to the angular displacement between adjacent ones of said print elements and one of said electrically operated members normally holding said print wheel with one of said print elements in a pre-printing position with respect to said pressure roller member, said partial cycles of rotation of said print wheel effecting alternate printing and indexing operations of said print wheel, a switch member operatively connected to activate said electrically operated means and operated in timed relation to rotation of said print wheel to effect movement of said one member into and out of engagement with the other of said associated members respectively for said printing and indexing operations, a second switch member responsive to the presence of a document at a predetermined point along the path of travel to the bight and operatively connected to activate said one electrically operated member, and a third switch member operable in response to the presence of the document posteriorly to said print wheel and operatively connected to activate another of said electrically operated members.

4. In printing apparatus for endorsing documents fed singly along a path of travel, a rotatable pressure roller member, a rotatable print wheel member associated with said pressure roller member to form a bight therewith, a plurality of radially and equally spaced print elements on the periphery of said print wheel member, one of said members movable away from and out of printing cooperation with the other of said members, a normally disengaged clutch member operatively connecting said print wheel to a rotating driving member, electrically operated means controlling said clutch member and normally holding said print wheel with one of said print elements in a predetermined preprinting position, said electrically operated means operable when activated to effect rotation of said print wheel through an angular displacement substantially equal to the radial spacing between adjacent ones of said print elements, a first switch member electrically connected to activate said electrically operated means and responsive to the presence of a document at a predetermined point enroute to said bight, electrically operated means operable to move said one member away from the other, a second switch member responsive to the position of a document at a second predetermined point electrically connected to activate both of the said electrically operated means, and a manually operable switch member electrically connected to render said second switch member ineffective.

5. In printing apparatus for the endorsing of documents, a rotatable pressure roller, a rotatable print wheel associated with said pressure roller to form a bight to which the documents are fed singly and having two different types of endorsing print elements spaced substantially 180° apart on the periphery of said print wheel, a normally disengaged clutch member operatively connecting said print wheel to a continuously operating drive shaft, a first electrically operated means controlling actuation of said clutch member and operable when activated to effect engagement of said clutch member, said electrically operated means normally holding said clutch member disengaged and said print wheel with one of said print elements in a predetermined pre-printing position less than 180° from the bight in the direction of rotation of said print wheel, a second electrically operated means controlling actuation of said clutch member, said second electrically operated means operable to disengage said clutch member and limit rotation of said print wheel to a displacement of 180° from said pre-printing position, a first switch member positioned for actuation by a document enroute to the bight and operable to activate said first elec-

trically operated means to effect endorsement of the document by said one print element, a second switch member electrically connected to activate said second electrically operated means in timed relation to said first switch member to effect rotation of said print wheel to return said one print element to the pre-printing position, and a third switch member electrically connected to said second switch member and settable to render said second switch member ineffective to activate said second electrically operated means so as to retain the other of said print elements at the pre-printing position for the next printing cycle of said print wheel.

6. In printing apparatus for the endorsing of documents, a rotatable pressure roller, a rotatable print wheel associated with said pressure roller to form a bight to which the documents are fed singly and having two different types of endorsing print elements spaced substantially 180° apart on the periphery of said print wheel, a normally disengaged clutch member operatively connecting said print wheel to a rotating drive shaft, a first electrically operated means operable when activated to effect engagement of said clutch member and release of said print wheel, said first electrically operated means normally holding said clutch member disengaged and said print wheel with one of said print elements in a preprinting position, a second electrically operated means operable to disengage said clutch member and limit said print wheel to a one-half revolution, a first switch member positioned for actuation by a document enroute to the bight and electrically connected to activate said first electrically operated means, a second switch member positioned posteriorly to the bight for actuation by the document and electrically connected to activate said second electrically operated means to effect another one-half revolution of said print wheel to return said one print element to the preprinting position, and a third and settable switch member electrically connected to said second switch member and operable to render said second switch member ineffective to activate said second electrically operated means.

7. In printing apparatus for the endorsing of documents, a rotatable pressure roller, a rotatable print wheel associated with said pressure roller to form a bight to which documents are fed singly and having two different types of endorsing print elements spaced substantially 180° apart on the periphery of said print wheel, a clutch member operatively connecting said print wheel to a rotating drive shaft, a first electrically operated means normally holding said clutch member disengaged and the print wheel with one of the print elements at a preprinting position less than 180° from the bight in the direction of rotation of said print wheel, said first electrically operated means operable on activation thereof to release said clutch member, a second electrically operable means operable to disengage said clutch member and stop said print wheel to limit said print wheel to a 180° displacement from said preprinting position, a first switch member positioned for actuation by a document enroute to the bight and operable to activate said first electrically operated means to effect endorsement of the document by said one print element, a second switch member electrically connected to activate said second electrically operated means in timed relation to said first switch member to return said one print element to the preprinting position, a third switch member electrically connected to said first switch member to effect rotation of said print wheel to return said one print element to the preprinting position, a fourth switch member electrically connected to said second switch member and settable to render said second switch member ineffective to activate said electrically operated means so as to retain the other of said print elements at the preprinting position, said pressure roller having a position ineffective to form a bight with said print wheel, means to move said pressure roller to said position, and means operable to maintain said pressure roller in said position and controlled by said second switch

member to prevent printing on said pressure roller by said other print element during return of said one print element to said preprinting position.

8. In printing apparatus for use in endorsing documents, a rotatable pressure roller, a rotatable print wheel associated with said pressure roller and having two different types of endorsing print elements spaced apart substantially 180° on the periphery of said print wheel, said pressure roller mounted for movement toward said print wheel to form a bight therewith to receive documents fed singly thereto and movable away from said print wheel, a clutch member operatively connecting said print wheel to a rotating drive shaft, a first electrically operated means operatively connected to said clutch member, a second electrically operated means operatively connected to said clutch member, said first and second electrically operated means cooperable when successively activated to effect successive one-half revolutions of said print wheel to present one and then the other of said print elements to a preprinting position less than 180° from said bight with respect to the direction of rotation of said print wheel, a first switch member positioned for actuation by a document enroute to said bight and operable to activate said first electrically operated means, a second switch member positioned for actuation by the document posteriorly to said bight and operable to activate said second electrically operated means, a third electrically operated means operable when activated to move said pressure roller toward and away from the bight, a third switch member controlling said third electrically operated means and actuated in timed relation to the rotation of said print wheel, and a settable switch member operatively connected to said second and third electrically operated means and operable to render said second and third switch members ineffective to activate said second and third electrically operated means.

9. In printing apparatus for endorsing documents, a rotatable print wheel associated with said pressure roller to form a bight to which the documents are fed singly along a path of travel, a plurality of radially and equally spaced print elements on the periphery of said print wheel, a clutch member operatively connecting said print wheel to a rotating drive shaft, a first electrically operated member normally holding said clutch member disengaged and said print wheel with a selected one of said print elements in a preprinting position with respect to said pressure roller, a second electrically operated member operable to hold said clutch member disengaged and said print wheel with another of the print elements in the preprinting position, said first and second electrically operated members being activatable alternately to effect partial cycles of rotation of said print wheel with each partial cycle substantially equal to the radial spacing between adjacent ones of the print elements, a first switch member operatively connected to activate said first electrically operated member and said second electrically operated member, said first switch member responsive to the presence of a document enroute to and at a predetermined distance from the bight, a second switch member operatively connected to activate said second electrically operated member and responsive to the presence of the document posteriorly of the bight, a third switch member operatively connected to activate said first electrically operated member and operable in timed relation to the operation of said first switch member for each document fed, and a selector switch member operatively connected to render either said first and second switch members operative to effect a printing operation and an indexing operation respectively or to render said third and first switch members operative to effect an indexing operation and a printing operation respectively.

10. In a printing apparatus for endorsing documents, a pressure roller, a print wheel associated with said pressure roller to form a bight to which the documents are fed singly along a path of travel, a plurality of radially

and equally spaced print elements attached to the periphery of said wheel, said print elements being adapted to imprint relatively different information, a normally disengaged clutch member operatively connecting said print wheel to a rotating drive shaft, a first electrically operated member controlling said clutch member, a second electrically operated member controlling said clutch member, said first electrically operated member normally holding said print wheel with one of said print elements at a preprinting position angularly displaced less than 180° from the bight with respect to the direction of rotation of said print wheel, said electrically operated members cooperable on being activated alternately to effect engagement and disengagement of said clutch member and resultant angular displacement of said print wheel with the displacement substantially equal to the radial spacing of adjacent ones of said print elements, a switch member operatively connected to activate either of said electrically operated members and responsive to the presence of a document at a predetermined point enroute to the bight, a second switch member operatively connected to activate said second electrically operated member and responsive to the presence of a document at a different point along the path of travel than said predetermined point, a third switch member responsive to the presence of a document anteriorly to said predetermined point and operatively connected to activate said first electrically operated member, and a settable selector switch member operable to render said first and second switch members effective to control respectively said first and second electrically operated members or to render said first and third switch members effective to control respectively said second and first electrically operated members.

11. In printing apparatus for use in endorsing documents, a rotatable pressure roller, a rotatable print wheel associated with said pressure roller and having two different types of endorsing print elements spaced apart substantially 180° on the periphery of said print wheel, said pressure roller mounted for movement toward said print wheel to form a bight therewith to receive documents fed singly thereto and movable away from said print wheel, a continuously operating drive shaft, a clutch member operatively connecting said print wheel to said drive shaft, a first electrically operated means operatively connected to said clutch member, a second electrically operated means operatively connected to said clutch member, said first and second electrically operated means cooperable when successively activated to effect successive one-half revolutions of said print wheel to present one and then the other of said print elements to a preprinting position less than 180° from said bight with respect to the direction of rotation of said print wheel, a first switch member positioned for actuation by a document enroute to said bight and operable to activate said first electrically operated means, a second switch member positioned for actuation by the document posteriorly to said bight and operable to activate said second electrically operated means, a third electrically operated means operable when activated to move said pressure roller toward and from the bight with said print wheel, a third switch member controlling said third electrically operated means, a cam rotatable with said print wheel and operable to actuate said third switch member to move said pressure roller into bight relation with said print elements each 180° of rotation of said print wheel, and a manually operable switch member operatively connected to said second and third electrically operated means and settable to render said second and third switch members ineffective to activate said second and third electrically operated means.

12. In printing apparatus for endorsing documents, a rotatable pressure roller, a rotatable print wheel associated with said pressure roller to form a bight to which the documents are fed singly and having two different types of endorsing print elements spaced substantially 180° apart on the periphery of said print wheel, a clutch member operatively connecting said print wheel to a rotating drive shaft, a first electrically operated member controlling said clutch member, a second electrically operated member controlling said clutch member, one of said electrically operated members normally holding said print wheel with one of said print elements in a preprinting position less than 180° from the bight in the direction of rotation of said print wheel, said electrically operated members alternately activatable to effect one-half revolutions respectively of said print wheel, a first switch member responsive to the presence of a document enroute to and at a predetermined distance from the bight and operable to activate one or the other of said electrically operated members, a second switch member responsive to the presence of the document posteriorly to the print wheel to activate said second electrically operated member, a third switch member operable in response to the presence of the document anteriorly to said first switch member to activate said first electrically operated member, and a settable selector switch operatively connected to render either said first and second switch members or said first and third switch members effective.

13. In a printing apparatus for endorsing documents, a rotatable print wheel having a pair of relatively different types of print elements substantially diametrically oppositely disposed on the periphery of the wheel, a drive shaft, a normally disengaged clutch member operatively connecting said print wheel to said drive shaft, electrically operated means controlling said clutch member and normally holding said print wheel at rest with one of the print elements at a preprinting position, a second electrically operated means controlling said clutch member, said first and second electrically operated means activatable alternately and arranged to effect successive one-half revolutions of said print wheel, a pressure roller associated with said print wheel and normally overlying one or the other of the print wheel peripheral areas between the print elements when the print wheel is at rest, said pressure roller mounted for bodily movement toward and away from the periphery of said print wheel, a cam rotatable with said print wheel and operable to move said pressure roller in timed relation to rotation of said print wheel to form bights alternately with the pair of print elements, a switch member responsive to the presence of a document enroute to the print wheel and operatively connected to actuate said first electrically operated means, a second switch member operated in timed relation to and intermediate activations of said first switch member, said second switch member operatively connected to activate said second electrically operated means, a third electrically operated means operatively connected to restrain movement of said pressure roller toward said print wheel, a third switch member movable by rotation of said print wheel between effective and ineffective positions representative of the positions of said print elements relative to said preprinting position, said third switch member operatively connected to control said third electrically operated means, and a settable switch member operable to reverse said effective and ineffective positions of said third switch member.

No references cited.