

Sept. 16, 1930.

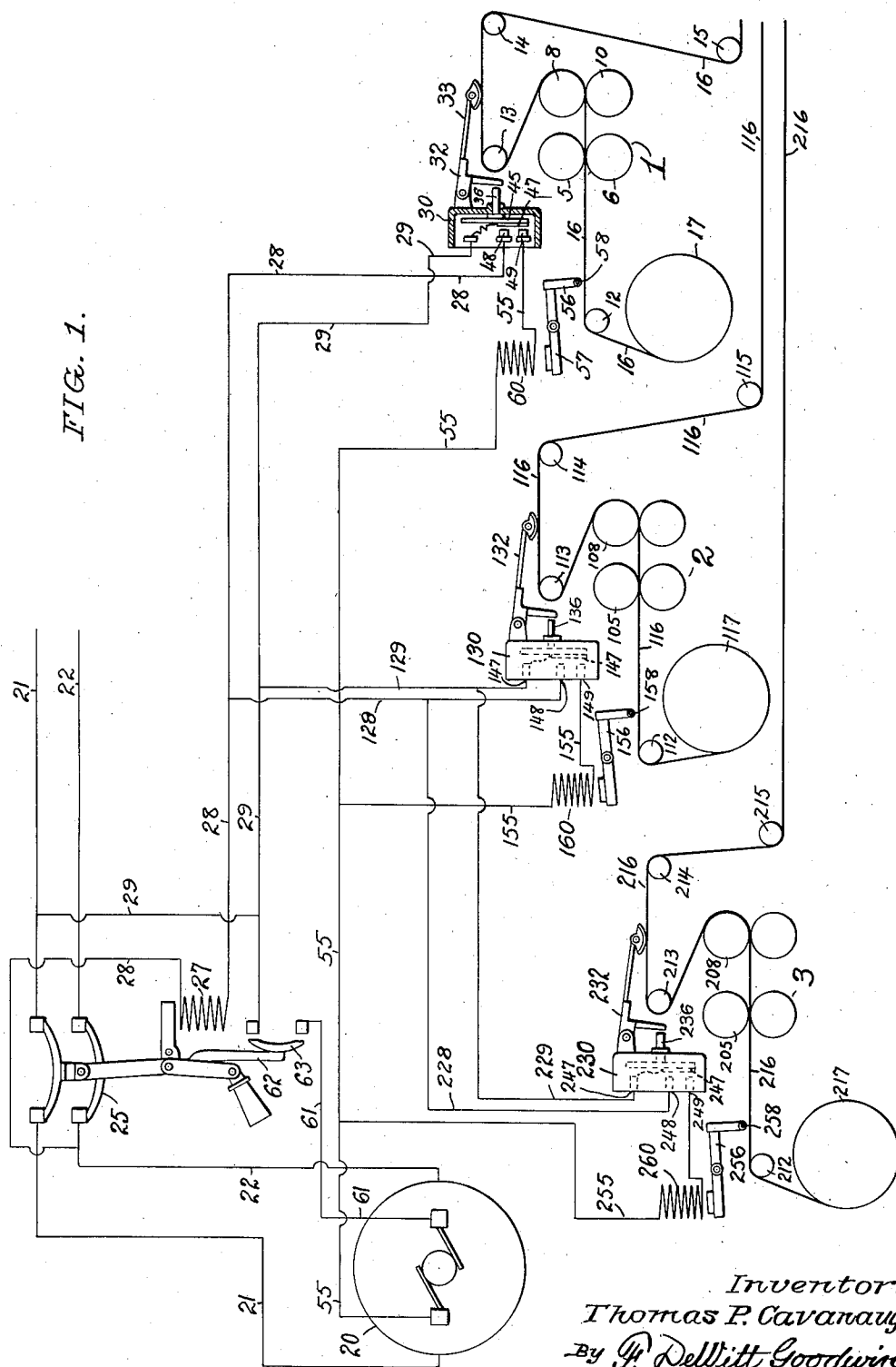
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1,776,104

WEB CONTROLLING DEVICE FOR PRINTING PRESSES

Filed July 12, 1929

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

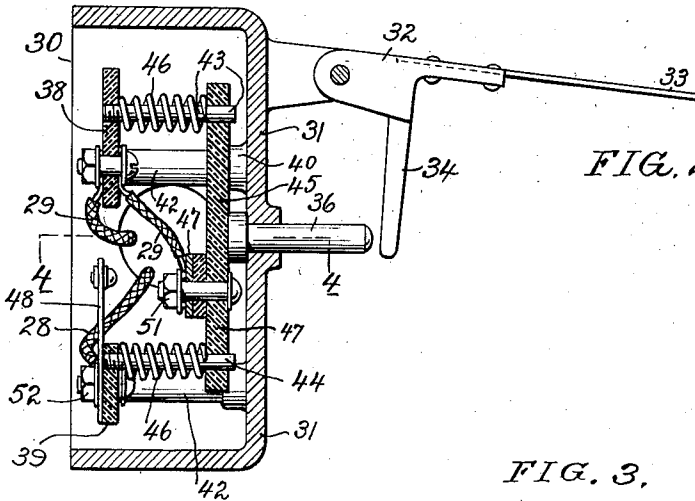


FIG. 2.

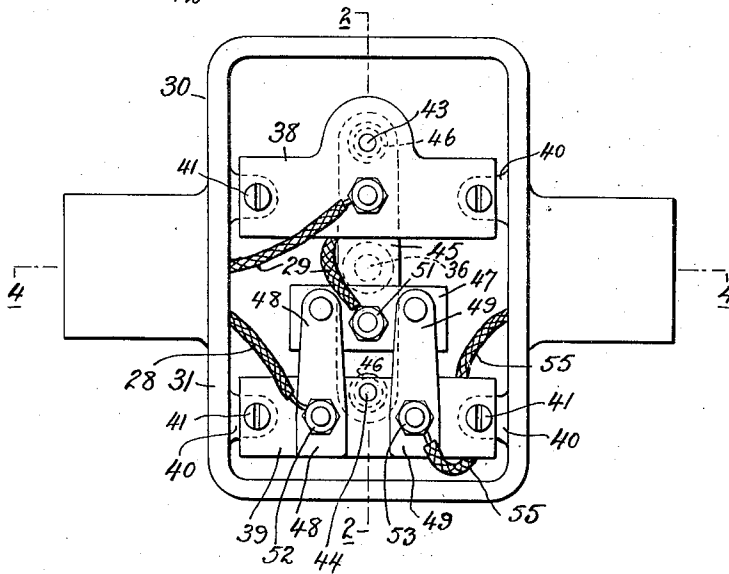
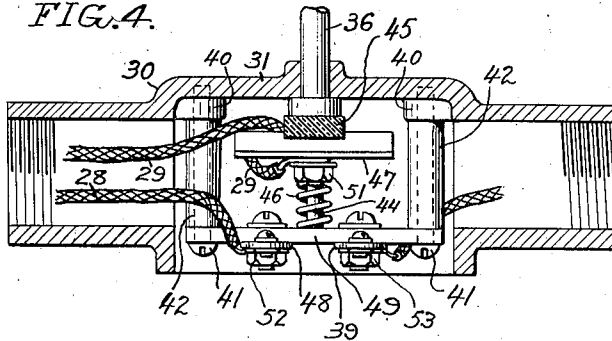


FIG. 3.

FIG. 4.



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WEB-CONTROLLING DEVICE FOR PRINTING PRESSES

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My invention relates to a paper web controlling device for printing presses, and particularly for high speed printing presses.

The object of my invention is to provide means for controlling the electrical circuits of a printing press for quickly stopping the press and for cutting off the web; a further object is to provide a web cutting device for each web, of a press operating upon a number of webs, whereby only the individual web will be cut when it is broken, thus avoiding the cutting of all the webs; a still further object is to provide a circuit including the web cutting device which is energized by the counter electromotive force of the motor used for driving the press, which force continues after the motor is disconnected from the source of power as long as the armature of the motor continues to rotate due to its inertia and the inertia of the machinery driven by the motor; a still further object is to provide separate electric circuits for operating the cutting device and for stopping the press; and a still further object is to provide a novel form of switch for controlling the circuits including the web cutting unit and the press stopping unit. These together with various novel features and arrangement of the parts, which will be more fully hereinafter described and claimed, constitute my invention.

Referring to the accompanying drawings, Fig. 1 is a diagram illustrating a plurality of printing presses and the electrical circuits for stopping the presses embodying my invention; Fig. 2 is an enlarged vertical central sectional view of the switch shown in Fig. 1; Fig. 3 is a rear view of the switch shown in Fig. 2; and Fig. 4 is a horizontal section on lines 4-4, Figs. 2 and 3.

In the accompanying drawings in which like reference characters refer to like parts, 1, 2 and 3 represent different presses operating upon webs which are carried to a common folding machine, not shown in the drawings. The press 1 comprises rolls 5, 6, 8 and 10 and guide rolls 12, 13, 14, and 15 around which passes the paper web 16 from the supply roll or reel 17. The web 16 is printed by the rolls 5 to 10 and passes from the roll 15 to a folding machine. The presses 2 and 3 are

similar to the press 1 and operate upon webs 116 and 216.

The presses are driven by a direct current motor 20, through an electrical circuit formed by the conductors 21 and 22 from any source of supply. A circuit breaker 25 of any standard type is provided for completing the circuit, as shown in Fig. 1 of the drawings, and adapted to be moved into the open position for opening the circuit for disconnecting the motor from its source of power. The circuit breaker 25 is opened by a magnet 27, connected in a second circuit formed by the conductors 28 and 29 from any source of supply, such as the conductors 21 and 22. A switch 30 is connected in said second circuit by the conductors 28 and 29 including the magnet 27. When the switch 30 is closed the magnet 27 will be energized and open the circuit breaker 25 and allow the motor 20 to stop, thus stopping the presses.

The switch 30, shown enlarged in Fig. 2, comprises a casing 31, having an arm 32 pivotally mounted thereon. The outer end 33 of said arm is adapted to be supported upon the web 16, between the supporting rolls 13 and 14, of the press 1, as shown in Fig. 1.

A finger 34 is also provided upon the arm 32, which is adapted to engage a push rod 36 slidably mounted in the casing 31. Bearing plates 38 and 39 are rigidly mounted upon lugs 40 forming part of the casing 31. Said bearing plates are held in spaced relation with the lugs 40 by means of bolts 41 and spacing sleeves 42. Upon the bearing plates 38 and 39 are guide rods 43 and 44 on which is mounted a member 45, which is adapted to be held by springs 46, in the position shown in Fig. 2. Said member 45 is movable in the opposite direction against the action of said springs by the push rod 36. The movable member 45 is provided with a cross bar or terminal 47. The bearing plate 39 is provided with two contact plates or terminals 48 and 49, which are adapted to be engaged by the cross bar or terminal 47 when the movable member 45 is actuated by the arm 32, caused by the falling of the outer portion 33 of the arm, when the paper web 16 is broken. The movable member 45 is provided with a

binding screw 51 for the attachment of the conductor 29 upon the terminal 47; and the contact plates 48 and 49 are provided with binding screws 52 and 53 for the attachment of the conductor 28 to the plate 48 and the conductor 55 to the contact plate 49.

A cutting device 56 is provided for cutting the web 16 adjacent to the supply roll or reel 17. The cutting device 56 includes a pivoted arm 57 carrying at one end a wire 58, which is stretched across the web 16 and adapted for cutting the latter when the arm is moved toward the web. The arm 57 is operated by a magnet 60, which is connected with the motor 20 in a circuit comprising the conductors 29 and 55 and 61.

The conductors 55 and 61 are operatively connected with the direct current motor 20 in such a manner that when the motor is disconnected from its source of power the counter electromotive force which is created as long as the motor armature continues to rotate, which will energize the magnets 60 and operate the cutting device 56 for cutting the web 16. The circuit breaker 25 is provided with an arm 62 having a contact plate 63, which is normally held in a position to open the circuit including the conductors 29 and 61, and which is adapted to complete the circuit between the conductors 29 and 61 when the circuit breaker 25 is moved into the open position, so as to open the circuit between the line conductors 21 and 22 for disconnecting the motor from its source of power. The counter electromotive force from the motor will cause a current to flow through the plate 63, conductors 61, 29, 55, and the switch terminals 47 and 49. Said terminals 47 and 49 are connected by the movable member 45 of the switch, which member 45 was moved by the arm 32 into the operative position by the breaking of the web 16 between the guide rolls 13 and 14, first causing the circuit breaker 25 to be opened by the circuit including the magnet 27 and also completing the circuit for conducting the current due to the counter electromotive force from the motor 20 to the magnet 60 for operating the cutting device 56.

The presses 2 and 3 are provided for operating upon a number of different webs, shown at 116 and 216 which are similar to the web 16 and also operated upon in a similar manner. Associated with the web 116 is a switch 130, which actuates the arm 132, when the web 116 is broken. The web 216 has associated therewith a switch 230 and a cutting device 256. An arm 232 is movable for operating the switch 230 due to the breaking of the web 216.

The closing of the switch 30 due to the breaking of the web 16 will not actuate magnets 160 and 260 nor cutting devices 156 and 256 due to the fact that the circuits are open or broken by the switches 130 and 230 as the

switch arms 132 and 232 are supported by the unbroken webs 116 and 216. By this arrangement the several cutting devices will not be actuated except by the switch associated and controlled by the same web, on which the cutting device is located.

The operation of my invention is as follows: When any of the different webs are broken the switch arm, previously supported by the web, will fall and a circuit will be completed by a switch which will energize the magnet 27 for opening the circuit breaker 25, thus stopping the motor 20. The plate 63 on the circuit breaker completes the circuit through the conductors 29 and 61 so that the current due to the counter electromotive force from the motor 20 may pass through the switch, which has been closed by the breaking of the web and the falling of the switch arm, so that the current due to the counter electromotive force will actuate the cutting device associated with the web which is broken and cut the web adjacent to the reel carrying the web.

The breaking of any one of the webs will cause the motor 20 to stop, but it will only actuate one cutting device as the circuits for the other cutting devices are opened due to the fact that the switch arms are held in the open position by the webs which are unbroken.

My invention provides means for quickly stopping the motor and the cutting of any web which is broken; and the use of the counter electromotive force for operating the magnets of the cutting devices forms a source of current supply which will not burn the coils of the magnets.

The counter electromotive force rapidly diminishes as the motor reduces in speed. Thus when the motor is stopped there is no current in the magnets of the cutting devices which would cause the burning of the same.

Various changes in the construction and arrangements of the parts may be made, without departing from my invention.

I claim:—

1. A printing press having a paper web passing therethrough, an electric motor for operating the press, means actuated by the breaking of the web for disconnecting the motor from its source of power, a web cutting device, and a circuit including said device and said motor energized by a counter electromotive force created after the motor is disconnected from its source of power by the continued rotation of the motor.

2. A printing press having a paper web passing therethrough, an electric motor for operating the press, a circuit including the motor and a circuit breaker, a switch, an arm upon said switch supported upon said web adapted for closing the switch by the breaking of the web, a second circuit including said switch for actuating the circuit breaker

for disconnecting the motor from its source of power when the web is broken, a web cutting device, a third circuit including said cutting device and said switch, said last mentioned circuit adapted to be closed by the switch when the web is broken, and a connection between said motor and said last mentioned circuit for actuating said cutting device by a counter electromotive force created after the motor is disconnected from its source of power by the continued rotation of the motor.

3. A printing press having a paper web passing therethrough, an electric motor for operating the press, a circuit including the motor and a circuit breaker, a switch, an arm supported upon said web adapted for closing the switch by the breaking of the web, contact terminals in said switch, a circuit including said terminals for actuating the circuit breaker for disconnecting the motor from its source of power when the web is broken, a web cutting device, a circuit including said device, a second set of contact terminals in said switch for closing the last mentioned circuit when the web is broken, and a connection between the motor and said last mentioned circuit whereby the circuit will be energized by a counter electromotive force created after the motor is disconnected from its source of power by the continued rotation of the motor.

4. An electrically operated printing press having a paper web passing therethrough, a switch, an arm operatively mounted upon said switch and supported upon said web, two independent electric circuits adapted to be closed by said switch when the arm is moved by the breaking of the web, one of said circuits adapted for disconnecting the press from its source of power, and a cutting device included in the other one of the circuits controlled by the switch adapted for cutting the web when the switch is closed by the breaking of the web.

5. An electrically operated printing press having a plurality of paper webs passing therethrough, an electric circuit including means for disconnecting the press from its source of power, a cutting device associated with each web adapted for cutting the same, a switch located adjacent to each web, an arm mounted upon each switch and held by the web in a position to open the switch, contact terminals in said switch adapted to be connected by the arm when the web is broken for completing said circuit for actuating said means for disconnecting the press from its source of power, a second set of contact terminals in said switch, a second circuit including the last mentioned terminals of the switch, a web cutting device associated with the web and connected in the last mentioned circuit whereby the movement of the arm due to the breaking of the web will close the

last mentioned circuit and actuate the web cutting device.

6. An electrically operated printing press, a web passing through the press, a web cutting device associated with the web, a switch comprising two sets of contact terminals, a movable member in said switch for controlling two separate circuits including said contact terminals of the switch, one of said circuits adapted for disconnecting the press from its source of power, the other one of said circuits adapted for operating the web cutting device, and means upon the switch for actuating said movable member into the operative position relatively to the contact terminals when the web is broken.

In testimony whereof I affix my signature.
THOMAS P. CAVANAUGH.