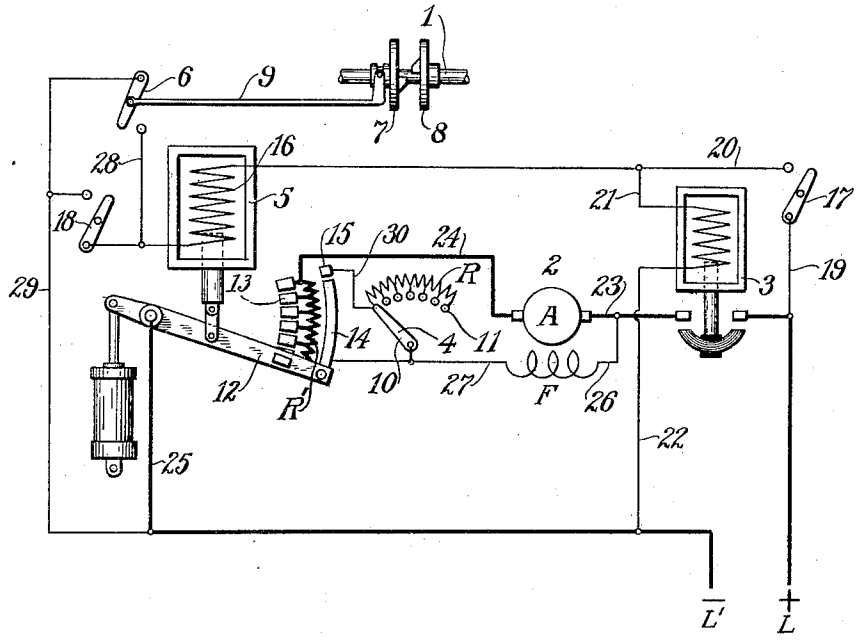
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PRINTING PRESS CONTROLLER.

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1,143,686. Patented June 22, 1915.



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PRINTING-PRESS CONTROLLER.

1,143,686. Specification of Letters Patent. **Patented June 22, 1915.**

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To all whom it may concern:

Be it known that I, CHARLES E. CARPENTER, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented new and useful Improvements in Printing-Press Controllers, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

My invention relates to improvements in controllers for motor operated printing presses.

More particularly my invention relates to controllers for presses provided with automatic feeding devices in which a feeder clutch is provided for automatically stopping the feeding device under certain conditions. Such clutches are commonly arranged to be tripped or thrown out automatically to stop the feeding mechanism under various conditions, as, for instance, where a sheet feeds crooked or two or more sheets feed simultaneously or the sheets fail to feed. When the clutch is tripped the press may be left in operation but before the clutch is again thrown in or reset the press must be slowed down in order to prevent breaking of gears and injury to the clutch which is commonly of the jaw-type. Accordingly, it has heretofore been the custom for the attendant upon tripping of the feeder clutch to first slow down the motor, then, upon rectifying the feed, to throw in or reset the clutch and thereafter manually restore the motor to its running speed. This practice, however, has been found to have numerous disadvantages, notably in the loss of time required to perform the several operations mentioned, and the increased attention required of the attendant. Further, in multicolor printing, it is necessary to feed the sheets at a substantially fixed speed in order to insure registration of the different colors. Accordingly, after the feeder clutch is thrown in, the press must be quickly restored to normal speed in order to take the sheets at the proper time and where manual restoration is relied upon it commonly occurs that the press is not accelerated within the proper time. This obviously causes a loss of the sheets which are fed into the press at an abnormally low speed and also the loss of additional time and labor where the sheets have been previously run through the press for other colors.

My invention has among its objects to provide means for automatically controlling the press upon operation of the feeder clutch to overcome the aforesaid and other disadvantages of the manual control.

A further object is to provide a controller by means of which the press may be set for operation at any one of a number of different speeds and which will upon tripping of the clutch slow down the press to a definite speed and upon the resetting of the clutch again accelerate the press to the previously established speed automatically.

Other objects and advantages of my invention will hereinafter appear.

For the purpose of more fully and clearly disclosing the nature and advantages of my invention I shall describe the embodiment thereof diagrammatically illustrated in the accompanying drawing, it being understood that my invention is susceptible of embodiment in other forms.

In the drawing, I have shown a feeder clutch 1 for the press to be controlled, a motor 2 for driving the press, controlling devices 3, 4 and 5 for said motor, and a switch 6 connected to the movable member of the feeder clutch to govern certain of said motor controlling devices, as hereinafter set forth.

The feeder clutch 1 is illustrated as of a conventional form, it being understood that in practice the same may assume any preferred form and be associated with the press and its feeding mechanism in any preferred manner, whereby when the two members 7 and 8 thereof are out of engagement, as illustrated, the feeder mechanism will be disconnected from the press. It should be also understood that whereas I have shown the switch 6 connected to the member 7 of the feeder clutch by a simple connecting rod 9 for simplicity of illustration, said switch may be connected to said clutch in any preferred manner. As illustrated, the arrangement is such that when the clutch is thrown out the switch 6 is opened and when the clutch is thrown in said switch is closed.

The motor is illustrated as of the shunt field type, being provided with an armature A and a shunt field winding F, but it should, of course, be understood that the motor may be of any other preferred type.

The controlling devices 3, 4 and 5 comprise respectively an electro-responsive switch for controlling the continuity of the motor circuit, a manual field rheostat and an electro-responsive armature rheostat. In practice, these devices may be of any preferred type. As illustrated the field rheostat comprises an arm 10, movable over a series of contacts 11, to control the field resistance R. The rheostat 5, as illustrated, comprises a pivoted arm 12 movable over a series of contacts 13 to control an armature resistance R′ and also movable over a segment 14 and into engagement with a contact 15. The arm 12 is adapted to be drawn upwardly by an operating solenoid 16 to gradually exclude the resistance R′ from circuit. During its upward movement it also travels over the segment 14, and, upon reaching final position disengages said segment and engages contact 15. The purpose of the segment 14 and contact 15, as will hereinafter appear, is to exclude the field rheostat 4 from circuit until all of the armature resistance R′ is removed from circuit and then include said field rheostat. Also, as will be hereinafter explained, the rheostat 5 is employed for speed regulation and accordingly its resistance R′ should be designed accordingly.

In addition to the foregoing elements I have illustrated a switch 17 for initially starting and accelerating the motor through certain of the aforesaid controlling devices. For simplicity of illustration this switch has been shown as a single pole switch, but it should be understood that in practice it may be of any preferred form and constitute one of a number of switches forming a control station. Further, I have shown another single pole switch 18, adapted, as will be hereinafter set forth, to short-circuit the feeder clutch switch 6 and thereby enable manual acceleration of the press when the feeder clutch is tripped or thrown out.

The operation of the controller is as follows: Assuming the feeder clutch to be thrown in or set, thereby closing the switch 6, the motor may be started and accelerated by closure of the control switch 17. This completes a circuit from supply line L by conductor 19 through said switch 17, by conductors 20 and 21 through the operating winding of switch 3, by conductor 22 to line L′. The switch 3 thereupon closes and completes the motor circuit. The motor armature circuit may be traced from line L through switch 3, by conductor 23 through the armature A, by conductor 24 through all of the resistance R′, and rheostat arm 12, by conductor 25 to line L′. The field circuit may be traced from conductor 23 by conductor 26 through the field winding F, by conductor 27 to segment 14 of rheostat 5, thence through rheostat arm 12 to line L′, as already traced. The motor is thereby set in operation and thereafter is automatically accelerated by the rheostat 5, the solenoid 16 of said rheostat being energized by closure of switch 17. The circuit of the solenoid 16 may be traced from switch 17, by conductor 20 through said solenoid, by conductor 28 through feeder clutch switch 6, by conductor 29 to line L′. The rheostat 5, upon energization, gradually removes the resistance R′ from circuit, thereby automatically bringing the motor up to a certain speed. Also, upon excluding the resistance R′ from circuit the arm 12 of rheostat 5 engages contact 15, thereby connecting the field rheostat 4 in circuit. This circuit extends from conductor 27 through arm 4 to the first of the series of contacts 11, by conductor 30 to contact 15 and rheostat arm 12. Accordingly, if the arm 4 now be moved to the right it will include resistance R in the field circuit and thereby further accelerate the motor. Of course, the rheostat 4 may be adjusted to include any desired amount of the resistance R in accordance with the speed desired, and in practice may be adjusted prior to the operation of the armature rheostat 5, in which event the desired amount of field resistance would be automatically inserted by the armature rheostat at the end of its movement.

Assuming now that the motor has been accelerated to operate the press at the desired speed, the tripping of the clutch will result in the following operation: The switch 6 will first be opened, and, inasmuch as this switch is included in the circuit of the solenoid 16, it will cause deënergization of the rheostat 5. The rheostat 5 upon deenergization operates to first exclude the field rheostat 4 from circuit and thereafter reinsert the resistance R′ in the armature circuit. The switch 3 is unaffected by the switch 6 and accordingly the foregoing operation reduces the motor speed to a definite value, but allows the motor to continue to operate at its reduced speed. The speed reduction may, of course, be changed as desired, but should be so calculated as to enable the clutch to be thrown in or reset without danger of injuring the same or breaking the gears.

Assume now that it is desired to throw in the clutch and again accelerate the motor. A single operation suffices for both. The throwing in of the clutch closes the switch 6, which thereupon energizes the rheostat 5. The rheostat 5 then operates automatically to first exclude the resistance R′ from the armature circuit of the motor and thereafter include the field rheostat in circuit, as heretofore set forth. Thus the motor is automatically restored to the same speed at which it was operating upon tripping of the feeder clutch, and furthermore, its ac-

celeration is started immediately upon the resetting of the clutch. Accordingly the motor is insured restoration to its previously established speed within a fixed period after resetting of the clutch according to the time adjustment of the rheostat.

It will thus be apparent that the controller illustrated automatically controls the operation of the press as desired without any attention whatsoever from the attendant except the resetting or throwing in of the clutch; that upon tripping of the clutch it slows down the press automatically to a definite speed and that upon the resetting or throwing in of the clutch restores the press automatically to its previously established running speed without delay.

Under some conditions it might be desirable to temporarily accelerate the press while the clutch 1 is out and the switch 18 is provided for this purpose. It is in shunt to the feeder clutch switch 6 and accordingly its closure results in energizing the rheostat 5 independently of said feeder clutch switch.

What I claim as new and desire to secure by Letters Patent is:

1. The combination with the feeder clutch of a printing press, of speed governing means for the press controlled by said clutch to slow down and again accelerate the press automatically upon certain operations of said clutch.

2. The combination with the feeder clutch of a printing press, of means accelerating the press, said means being controlled by said clutch to automatically slow down the press when said clutch is tripped and automatically accelerate the press when said clutch is reset.

3. The combination with the feeder clutch of a printing press, of means for starting the press and establishing any one of a number of predetermined running speeds therefor, said means including decelerating and accelerating means controlled by said clutch to slow down the press when said clutch is thrown out and to again accelerate the press to the established speed when said clutch is subsequently thrown in.

4. The combination with the feeder clutch of a printing press, of means for effecting operation of the press at any one of a plurality of speeds including electro-responsive means controlled by said clutch switch to slow down the press to a definite speed when the clutch is thrown out and to subsequently accelerate the press to the previously established running speed when the clutch is again thrown in.

5. The combination with the feeder clutch of a printing press, of a motor for operating the press, means for controlling the continuity of the motor circuit, and means for accelerating the motor and establishing any one of a number of predetermined running speeds therefor, said latter means including means controlled by said clutch to slow down said motor upon one operation of said clutch and to accelerate said motor to its previously established speed upon another operation of said clutch.

6. The combination with the feeder clutch of a printing press, of means controlled thereby for slowing down and subsequently accelerating the press, and means governing said former means to accelerate the press independently of said feeder clutch.

7. The combination with the feeder clutch of a printing press, of means controlled by said clutch to slow down and subsequently accelerate the press upon certain operations of said clutch, and manual means controlling said former means to accelerate the press independently of said clutch.

8. The combination with the feeder clutch of a printing press, of a switch governed by the position of said clutch, a motor for operating the press, an electro-responsive speed controller for said motor governed by said switch, and means independent of said switch for controlling the continuity of the circuit of said motor.

9. In a printing press controller, the combination with a driving motor, an electro-responsive speed controller for said motor, a feeder clutch switch governing said controller, means independent of said switch for controlling the continuity of the circuit of said motor and manual means for governing said electro-responsive speed controller independently of said feeder clutch switch.

10. In a controller for printing presses, in combination, a motor for operating the press, speed controlled means for said motor including an electro-responsive rheostat and a manually operable rheostat adapted to be excluded from circuit by said former rheostat and a feeder clutch switch governing said electro-responsive rheostat to automatically slow down the motor upon one operation of the clutch and thereafter automatically accelerate said motor to the speed determined by said manual rheostat upon another operation of the clutch.

In witness whereof, I have hereunto subscribed my name in the presence of two witnesses.

CHARLES E. CARPENTER.

Witnesses:
CHAS. F. ADAMS,
CHAS. CHANDLER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."