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 AUTOMATIC SWITCH.  
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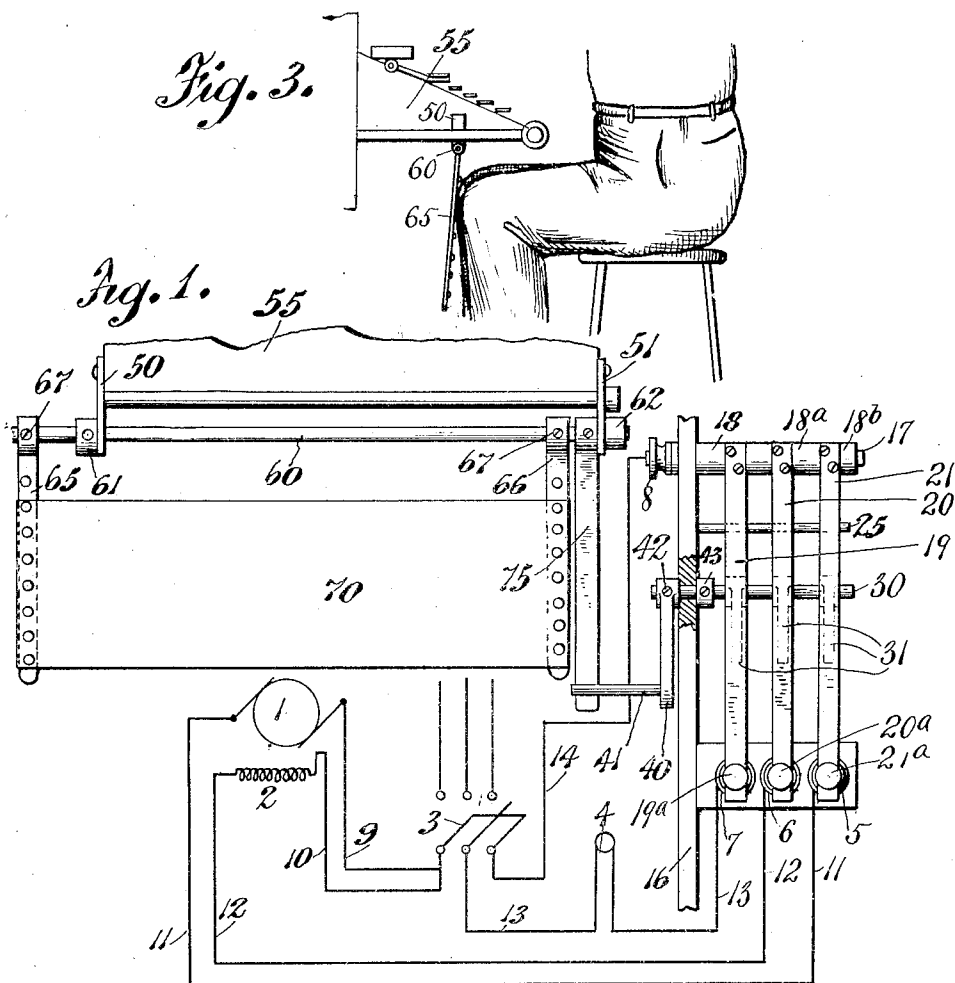
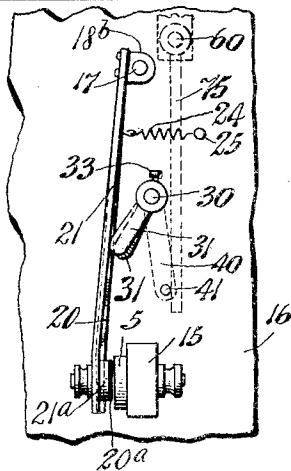


Fig. 3.

Fig. 1.

Fig. 2.



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# UNITED STATES PATENT OFFICE.

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## AUTOMATIC SWITCH.

1,045,394.

Specification of Letters Patent.

Patented Nov. 26, 1912.

Application filed November 18, 1911. Serial No. 661,113.

*To all whom it may concern:*

Be it known that we, WILLIAM GRIEBE and DAVID C. RUTH, both citizens of the United States, and both residing in Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Automatic Switches, of which the following is a full and clear specification.

In the operation of motor driven machinery, such for instance as a linotype machine, the current for the motor is usually switched on and off at the will of the operator, so that there are great losses of current due to the failure of the operator to throw out the controlling switch when he leaves his machine.

The object of the present invention is to provide an automatic switch for such machines which will be operated without thought on the part of the operator, turning on the current when he takes his position at his machine, and cutting off the current when he moves away from his machine, thus avoiding the waste of current when the machine is not in operation. While this is the main purpose of the present invention, it will be clear from the following explanation that other adaptations of the automatic switch can be made without departure from the invention.

In the specific embodiment of the automatic switch to the control of the motor current in machines such as linotype machines, the switch comprises automatically closing switch terminals properly included in the motor circuit and a swinging switch operating apron suspended beneath the keyboard of the machine in position to be engaged by the knee of the operator when he takes his operative position in front of the machine, and devices controlled by said swinging apron for normally holding the switch terminals in open position and for causing them to be closed when the swinging apron is engaged and moved by the knee of the operator in the act of seating. The swinging apron is mounted upon a rock shaft held preferably by gravity in its normal position for holding the switch terminals open. The gravitating apron frame

carries an arm which normally engages a projection from a switch operating arm which holds the movable switch terminals out of contact with the fixed terminals so that the act of disengaging the arm of the apron frame from the switch operating arm, permits the movable switch terminals to move into engagement with the fixed terminals.

In order that our invention may be fully understood we will first describe the same with reference to the accompanying drawings and afterward point out the novelty more particularly in the annexed claims.

In said drawings Figure 1 is a diagrammatic elevation of the improved automatic switch. Fig. 2 is a side elevation of the main parts of the switch. Fig. 3 is a detail view illustrating the automatic operation of the switch.

1 and 2 are respectively diagrammatic representations of the armature and field of a motor for operating the machine, the current of which is to be controlled by the automatic switch.

3 is the main line switch, 4 the lamp which is usually employed for supplying light for the machine, 5, 6 and 7 fixed terminals of the automatic switch and 8 the common terminal for the movable switch members, hereinafter referred to. From one terminal of the main line switch 3, the shunt circuits 9 and 10 lead respectively to the armature 1 and field 2 of the motor, while the circuit wires 11 and 12 lead from the armature 1 and field 2 to the fixed terminals 5 and 6, respectively of the automatic switch. From the second main line terminal, a circuit wire 13 leads through the lamp 4 to the fixed switch terminal 7 and from the third terminal of the main line switch the circuit wire 14 leads to the common terminal 8 of the automatic switch.

The fixed switch terminals 5, 6 and 7 are mounted in a suitable bar 15 secured to a supporting plate 16. Bar 15 may be of insulating material or the terminals 5, 6 and 7 may be otherwise insulated from each other. The common terminal 8 is electrically connected with a conducting pin 17 projecting from the plate 16 and support-

ing the spaced collars 18, 18<sup>a</sup> and 18<sup>b</sup> which are independently journaled upon the pin 17. These collars 18, 18<sup>a</sup> and 18<sup>b</sup> have secured to them the depending contact arms 19 20 and 21 respectively, in the lower end of which are the movable contacts 19<sup>a</sup>, 20<sup>a</sup> and 21<sup>a</sup>, of the automatic switch. Arms 21, 20 and 19 are so mounted that they will normally gravitate toward the fixed switch terminals 5, 6 and 7 respectively. A spring 24 connects each arm 19, 20 and 21 with a stationary pin 25, projecting from plate 16 to give the switch arms a more positive circuit closing action.

Between the bar 15 and pin 17, a short rock shaft 30 is journaled in the plate 16 so as to be supported directly in rear of the contact arms 19, 20 and 21. This rock shaft 30 carries the independently adjustable fingers 31 secured in the desired adjusted position upon the shaft 30 by the set screws as indicated at 33. These fingers 31 project from shaft 30 toward the contact arms 19, 20 and 21 in position to engage said arms and move them upon the pin 17 to separate the movable contacts 21<sup>a</sup>, 20<sup>a</sup> and 19<sup>a</sup> from the fixed contacts 5, 6 and 7 respectively. The adjustment of fingers 31 upon the shaft 30 enables the operator to time the opening and closing of the circuits through the switch terminals to suit the requirement of the case. The shaft 30 carries a depending rock arm 40 having a laterally projecting pin 41. The arm 40 is adjustably secured to the shaft 30 by means of set screw 42 and the shaft is preferably held in place in the bearing plate 16 by the hub of arm 40 engaging one face of the plate, and a collar 43 upon shaft 30 engaging the other face of the plate. 50 and 51 are bearing plates secured to the side frames of the key-board of a linotype machine, the key-board of such machine being indicated diagrammatically at 55. These plates 50 and 51 project downwardly from said key-board and support in their lower ends a transverse rock shaft 60 which is adjustably held against longitudinal displacement in the bearing plates by means of collars 61 and 62 secured upon the shaft.

65 and 66 are arms mounted upon and depending from the rock shaft 60. These arms are secured in the desired adjusted position upon the shaft by means of set screws 67. Secured to and stretched between the depending rock arms 65 and 66 is a flexible band or apron 70 which may be made of any suitable material such for instance as canvas. The band or apron 70 may be secured to the arms 65 and 66 in any suitable manner. Adjacent to one end of the rock shaft 60, a depending rock arm 75 is adjustably secured and presented in a position to rest behind the pin 41 of the rock arm 40 above referred to.

The frame comprising rock shaft 60, arms 65 and 66 and the band or apron 70 stretched between the arms, comprises a gravity frame which rests normally in vertical position beneath the key-board of the linotype machine. When said gravity controlling frame is in its normal position, the rock arm 75 is in engagement with pin 41 to hold the shaft 30 in position to retain the fingers 31 in engagement with the contact arms 19, 20 and 21 so as to break the circuits through contacts 5—21<sup>a</sup>, 6—20<sup>a</sup> and 7—19<sup>a</sup>. This normal or circuit-broken position of the parts is due to the preponderance in weight of the gravity controlling frame over the normal closing tendency of the movable contact arms 21, 20 and 19 respectively and their actuating devices.

When the operator takes his position in front of the key-board as indicated in Fig. 2 of the drawings, his knee will naturally come in contact with some portion of the band or apron 70 and rock the gravitating frame upon its shaft 60, thereby moving the arm 75 away from pin 41 and permitting the arms 21, 20 and 19 respectively to move into the circuit closing position. As the band or apron 70 is of flexible material it will readily be understood that the operator will not be annoyed or inconvenienced by the engagement of his knee with the apron and that there will be no tendency to irritate the operator's knee as would be the case with the use of wood or metal for the engaging part of the gravity controlling frame. The band or apron 70 extends the whole width of the linotype key-board, in fact may be projected to any desired distance at one side of the key-board to effect the automatic operation of the switch by the operator no matter what position he naturally takes at the key-board. This provision is of considerable importance in view of the fact that operators of such machines have widely varying positions when operating the machine, some sitting directly in front of the key-board, while others prefer to sit to one side of the key-board and face the key-board at an angle. The provision of the flexible band or apron for the automatically operating switch thus produces the desired result without interfering with the peculiarities of the particular operator.

It is well known to be preferable in motor practice to throw the current on the field ahead of the armature and to throw the current off the armature ahead of the field. This is provided for by the adjustability of fingers 31 upon shaft 30. As represented in the drawing these fingers 31 are in different angular relation upon the shaft 30 so that the contact arms 19 and 20 controlling the light and field respectively will move into circuit closing position slightly ahead of the contact arm 21 which controls the armature, 130

whereas in the reverse the contact arm 21 will be moved into open position ahead of the contact arms 20 and 19.

5 While we have described the improved automatic switch with particular reference to the control of the motor circuit for motor operated machines, we would have it understood that we do not intend to limit our invention to this application, since it will be clear to those skilled in the art that such automatic switches can be applied to many other uses, where the circuit to be controlled is made and broken by an automatic device such as the gravitating frame which normally maintains the circuit in broken position. Such switches are useful for burglar alarms, sign lighting, door switches, etc.

What we claim is:

20 1. In an automobile switch, the combination of an electric switch, having a normal closing tendency with gravity actuated controlling means consisting of a suspended swinging apron frame normally holding said switch open.

25 2. In an automatic switch, the combination of fixed switch terminals, and movable cooperating switch terminals having a normal circuit-closing tendency, with manually operated controlling means consisting of a suspended gravitating swinging apron frame normally holding said movable switch terminals in open position.

30 3. In an automatic switch, the combination of the fixed switch terminal, the movable contact arm supported in operative relation to said fixed terminal, a rock shaft supported adjacent to said contact arm, a finger mounted upon said rock shaft in position to engage said contact arm, a rock arm projecting from said rock shaft, and a controlling device consisting of a suspended gravitating swinging apron frame normally engaging said rock arm for holding said contact arm in open position.

35 4. In an automatic switch, the combination of the fixed switch terminals, the movable contact arms supported in operative relation to said fixed terminals, circuits including said terminals and contact arms, a rock shaft supported adjacent to said contact arms, fingers mounted upon said rock shaft in position to engage said contact arms, a rock arm projecting from said rock shaft, and a rocking controlling frame normally engaging said rock arm for holding said contact arms in open position, and a flexible apron carried by said controlling frame.

40 5. In an automatic switch, the combination of the fixed switch terminals, the movable contact arms supported in operative relation to said fixed terminals, circuits including said terminals and contact arms, a rock shaft supported adjacent to said contact arms, fingers adjustably mounted upon

said rock shaft in position to engage said contact arms, a rock arm projecting from said rock shaft and an automatic controlling device normally engaging said rock arm for holding said contact arms in circuit broken position. 70

6. In an automatic switch, the combination of a circuit controlling switch having a normal closing tendency, with a suspended controlling frame normally engaging said switch and holding it in circuit broken position, and a flexible band or apron mounted upon said suspended frame for the purpose set forth. 75

7. In an automatic switch, the combination of a circuit controlling switch having a normal closing tendency, with a suspended manually operated controlling frame, a rock arm carried by said frame normally engaging said switch and holding it in circuit broken position, and a flexible band or apron mounted upon said suspended frame for the purpose set forth. 80 85

8. In an automatic switch, the combination of a normally open circuit controlling switch, with a rocking gravity frame suspended from a machine to be controlled in position to engage and hold said switch in circuit broken position, and a flexible band or apron carried by said gravity frame and supported in position to be engaged by the knee of the operator for moving said frame and allowing said switch to close. 90 95

9. In an automatic switch, the combination with a normally open circuit controlling switch, a rock shaft adapted to be supported beneath the key-board of and across the machine to be operated, a rocking gravity frame mounted upon and suspended from said rock shaft, means of engagement between said rocking gravity frame and said switch for holding the switch normally in circuit broken position, and a flexible band or apron mounted upon said rocking gravity frame in position crosswise of the machine to be engaged by the knee of the operator seated in front of said key-board. 100 105 110

10. In an automatic switch attachment for the key-board of a motor driven machine, the combination of a normally open switch controlling the motor circuit of said machine, a rock shaft adapted to be supported beneath said key-board of and across the machine, a rocking gravity frame mounted upon said rock shaft and projecting beneath said key-board, means of engagement between said gravity frame and said switch for holding the switch normally in circuit broken position, and a flexible band or apron mounted upon said gravity frame in position crosswise of the machine to be engaged by the knee of the operator seated in front of said key-board to permit said switch to close. 115 120 125

11. In an automatic switch, the combination of a fixed terminal, a movable terminal, 130

a rock-shaft having a finger bearing against the movable terminal, and provided with a switch operating arm having a projection and a suspended gravitating swinging apron frame having an arm engaging the projection on the switch operating arm so as to cause the finger of the latter to hold the movable terminal out of contact with the fixed terminal until the apron frame is swung and carries its arm away from the projection on the switch operating arm.

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

Correction in Letters Patent No. 1,045,394.

It is hereby certified that in Letters Patent No. 1,045,394, granted November 26, 1912, upon the application of William Griebe and David C. Ruth, of Brooklyn, New York, for an improvement in "Automatic Switches," an error appears in the printed specification requiring correction as follows: Page 3, line 19, for the word "automobile" read *automatic*; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 31st day of December, A. D., 1912.

[SEAL.]

C. C. BILLINGS,

*Acting Commissioner of Patents.*