Feb. 6, 1934. J. KRELL 1,945,644

ELECTRIC CONTROL FOR THE PRINTING MECHANISM OF ADDRESS PRINTING MACHINES

Filed Nov. 25, 1932 2 Sheets-Sheet 1

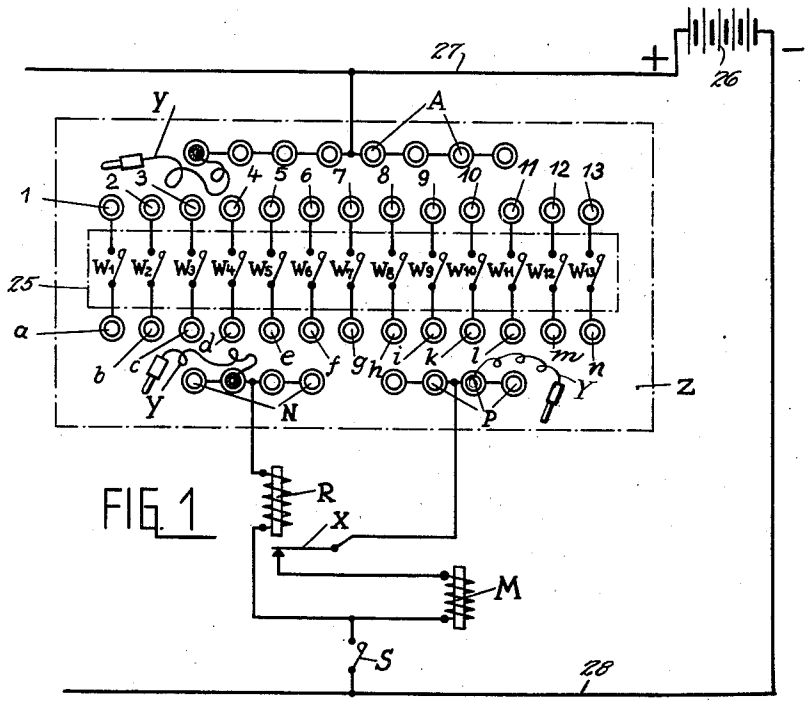


FIG. 1

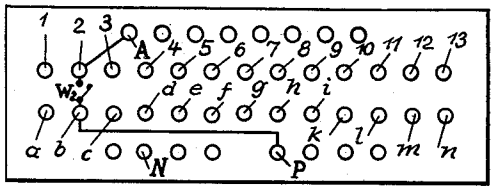


FIG. 2

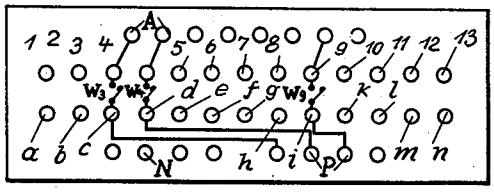


FIG. 3

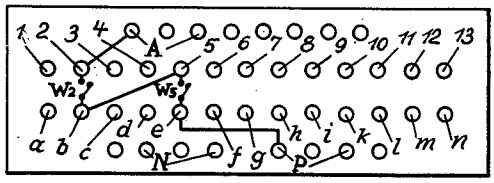


FIG. 4

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FIG. 5

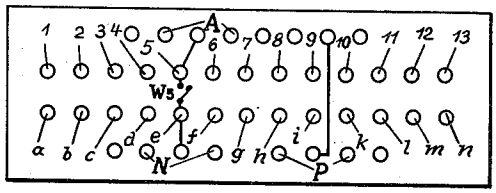


FIG. 6

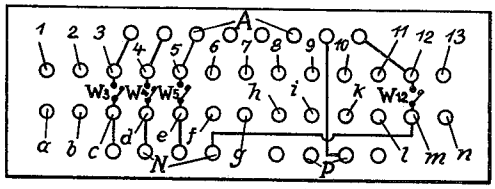


FIG. 7

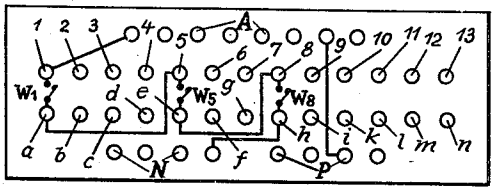


FIG. 8

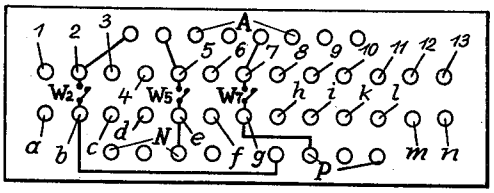


FIG. 10

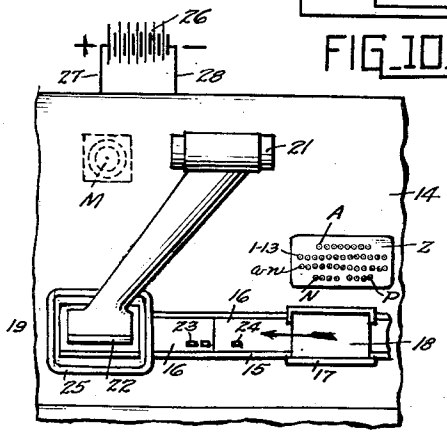
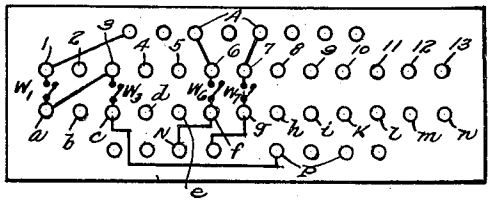


FIG. 9



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UNITED STATES PATENT OFFICE

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ELECTRIC CONTROL FOR THE PRINTING MECHANISM OF ADDRESS-PRINTING MACHINES

Joseph Krell, Berlin-Zehlendorf, Germany

Application November 25, 1932, Serial No. 644,372, and in Germany December 1, 1931

1 Claim. (Cl. 101—58)

My invention relates to address-printing machines and more particularly to an electric control for the printing mechanism of a machine which is equipped with a set of selective switches adapted to be operated by the printing members, such as printing plates or stencils, as they move through the machine.

It is an object of my invention to provide an improved control of the type referred to which combines extreme simplicity with the possibility of establishing all practicable combinations of selective switches in a convenient and readily surveyed manner.

To this end, in combination with the aforesaid selective switches, and two sets of contacts, with a contact per switch in each set, I provide a circuit connected to means for controlling the printing mechanism of the machine. Such means may be the electromagnet described in my prior patent of the United States, 1,816,733, July 28, 1931, for "Printing machine" which also shows selective switches, or in my other prior patent of the United States, 1,700,803, February 5, 1929, for "Addressing machine and similar printing machine". The electromagnet, under the control of the cooperating printing members and selective switches, regulates the position of a printing platen so that certain plates are skipped, and others printed. With these parts, I combine a source of electric energy to one terminal of which the circuit of the electromagnet is connected, an actuating contact connected to the circuit, means such as a plug contact and a cable for connecting the actuating contact to any contact in one of the sets, a selector contact which is connected to the other terminal of the source of electric energy, and means for connecting the selector contact to any contact in the other set of contacts for the selective switches. With the aforesaid means, I combine a cutting-out contact which is connected to one of the terminals of the source, a relay in the connection of the contact and the terminal, means such as a switch which is under the control of the relay for breaking the circuit connecting the actuating contact to one terminal of the source when the relay is excited, and means such as a wire with plug contacts at opposite ends, for connecting the cutting-out contact to any switch contact in one of the two sets.

It is another object of my invention to still further increase the adaptability of my control.

To this end, in addition to the two sets of switch contacts and to the actuating contact, I provide a cutting-out contact for breaking the circuits, with means such as referred to for connecting the cutting-out contact to any contact in one of the two sets.

The arrangement of selective switches and two sets of switch contacts as described, has already been proposed in address-printing machines, in combination with various means for establishing combinations of selective switches. However, such apparatus as designed heretofore are rather complicated and the number of combinations to be established is limited.

My novel control, on the other hand, possesses ideal simplicity, and in particular does not require any change-over or back contacts, while its adaptability is far superior to that of the old controls.

The operation of my novel control is facilitated by providing a plurality of actuator and/or cutting-out contacts, preferably sockets, and cables with plugs for connecting the individual contacts to the switch contacts. Similarly, a plurality of selector contacts may be provided.

The means for breaking the circuit under the control of the cutting-out contact may be a relay in a conduit which is permanently connected to one terminal of the source of electric energy, and to the cutting-out contact, or contacts, and, when excited by the connection of the contact, or a contact, to the other terminal, operates a switch and breaks the circuit.

Preferably, hand switches which usually have been arranged in the circuits including the selective switches, are dispensed with in my novel controls, as they limit the combination possibilities.

In my novel control, the selective switches which are involved in a given selecting operation, may be connected in parallel, or in series, or partly in parallel and partly in series, as desired, without any change-over means. The connections may also be established in such manner that all switches involved and connected in parallel, or in series, or partly in parallel and partly in series, prevent the printing of corresponding printing members.

In the accompanying drawings, a control embodying my invention, and diagrams illustrating some of its combinations, are shown by way of example.

In the drawings:

Fig. 1 is a diagrammatic plan view of the control,

Figs. 2 to 9 are the diagrams referred to and

Fig. 10 is a diagrammatic plan view of an address-printing machine equipped with my control.

Referring now to the drawings, and first to Fig. 1, W_1 to W_{13} are the selective switches for a machine whose printing plates or stencils are equipped with lugs, riders, recesses or the like for operating the selective switches, in thirteen distinct positions. Obviously, I am not limited to this, or any other, number of selective switches and parts on the printing members for controlling the switches.

Referring now to Fig. 10, this shows a portion of the table of a printing machine as described in my said prior Patent 1,816,733, with the switchboard *z*, the control magnet M and the battery 26 of my control. The several connections have not been shown in Fig. 10, as they clearly appear from Fig. 1.

14 is the table of the machine, 15 is a guide or track in the table, and 16 are printing plates which are stored in a supply hopper 17, and fed toward the printing station 19 by a feed slide 18 in line with the track. The printing arm 20 is mounted to rock about a pivot 21 on the table 14 and is equipped with a printing platen 22 at its free end which cooperates with the plates 16 at the printing station 19. The means for imparting rocking movement to the printing arm 20 have not been illustrated as they form no part of the present invention. Means which have not been illustrated for the same reason, are connected to the printing arm for reciprocating the feed slide 18 so that it will push the printing plates 16 from the hopper 17 and toward the printing station 19 when moving in the direction of the arrow, and perform its retrieving stroke in the opposite direction, for engaging the next printing plate from the hopper.

The control magnet M, by mechanism which has been fully described in my other prior patent referred to, 1,700,803, and not been illustrated here, regulates the printing and the skipping of the plates 16 at the printing station 19. When the control magnet M is not excited, the printing platen 22 is inactive and a plate which arrives at the printing station 19 during this condition of the control magnet, is skipped.

A multiple switch of which the selective switches W_1 to W_{13} form part, is provided at the printing station 19 at 25. Such switches are fully described in the two prior patents referred to above, and will not be described here. For the sake of more convenient illustration, the selective switches of the multiple switch 25 have been shown below the switchboard *z* in Fig. 1.

The lugs, riders or the like on the printing plates or stencils 16 are indicated at 23 and 24 in Fig. 10. When one of the selective switches W_1 to W_{13} in the multiple switch 25 is closed by the lugs or the like 23 and 24, the control magnet M, as described in prior Patent 1,700,803, attracts its armature which, through the medium of suitable mechanism, moves the printing platen 22 into active position, causing the plate which is now at the printing station 19, to be printed.

The switchboard *z* is equipped with two rows or sets of switch contacts 1—13 and *a*—*n*, selector contacts A, cutting-out contacts N, and actuating contacts P.

The selector contacts A are permanently connected to the positive terminal of battery 26 by a wire 27. The negative terminal of the battery is connected to a principal or machine switch S by a wire 28. The principal or machine switch S is connected to the coil of the control electromagnet M and, through the coil of a relay R, to the cutting-out contacts N.

There is a switch contact 1—13 and *a*—*n* per selective switch W_1 to W_{13}, or, in other words, each switch is between two contacts to which it is connected. Thus, the selective switch W_1 is connected to the contact 1 in one set, and to the contact *a* in the other set. Preferably, the switch contacts 1—13 and *a*—*n* are arranged in two parallel rows on the switchboard *z*, and designed as sockets for the reception of a plug at one end of a cable Y.

One selector contact A is required but for the reason stated it is preferred to provide several, in the present instance, eight, selector contacts. The selector contacts A are permanently connected to the "plus" terminal of the battery 26 by the wire 27, as described. They may also be connected to each other, if desired. Four cutting-out contacts N and four actuating contacts P are shown by way of example. All actuating contacts P are connected to a switch X which is under the control of the relay R and are in circuit with the controlling electromagnet M through the switch X which is normally closed. The switch X is opened and the electromagnet M cut out when the relay R is excited. Obviously, the electromagnet M might be arranged in the manner of a relay with respect to the control magnet so as to open and close the circuit of the last-mentioned electromagnet. Such an arrangement may be preferable if the selective switches are remote from the printing station.

The cutting-out and actuating contacts N and P, like the contacts A, 1—13 and *a*—*n*, are shown as sockets to be connected by plugs on the cables Y. By means of the five sets of contacts and the plugs and cables Y, or any other suitable means, such as short-circuit plugs, any desired combination may be established. Under certain conditions, and particularly if it is desired to operate the control with short-circuit plugs, as many selector, cutting-out and actuating contacts A, N and P may be provided as there are switch contacts 1 to 13 and *a* to *n*. This has no influence on the operation.

Various combinations will now be described with reference to the diagrams Figs. 2 to 9.

If it is desired to print all those printing members which have a definite part for operating a corresponding selective switch, and if W_2 is this corresponding switch, one of the selector contacts A is connected to the switch contact 2, and one of the actuating contacts P is connected to the allotted contact *b*. When a printing plate or member closes the switch W_2 by its lug or the like, the electromagnet M is excited and causes the printing platen on the printing arm to move into active position, as described in my said prior Patent 1,700,803. The operator may select that selector or operating contact A or P which is in the most convenient position, and connect it to the contact 2 or the contact *b*.

Referring now to Fig. 3, this shows the connections to be established if those plates are to be printed which close the switches W_3, W_4 and W_9. The switch contacts 3, 4 and 9 are connected to any three contacts A in parallel to each other, and the switch contacts *c*, *d* and *i* are similarly connected to any three contacts P. If there is but one selector contact A, and but one actuating contact P, three cables or other connecting means must be combined at the contacts from 3, 4 and 9, and *c*, *d* and *i*, respectively.

Referring now to Fig. 4, this shows a connection for printing plates having a given group of lugs or the like for operating certain switches,

for instance, the switches W_2 and W_5. The switch contact 2 of selective switch W_2 is connected to any selector contact A, and the switch contact *e* of selective switch W_5 is connected to any actuating contact P. The switch contact *b* of selective switch W_2 is connected to the switch contact *e* of selective switch W_5. The circuit of the electromagnet M is only established if the two selective switches W_2 and W_5 are closed by the lugs or the like on the printing members.

In a similar manner, those plates are printed which have three or more groups of lugs or the like, by connecting the corresponding switch contacts to the selector contacts A, to the actuating contacts P, and to each other, as required for the given combination of lugs.

With the connections which have been described, certain plates are printed, and all other plates are skipped. In these connections, only the selector contacts A and the actuating contacts P were used. By means of the cutting-out contacts N, certain plates may be skipped, and all other plates printed, as will now be described.

Referring to Fig. 5, in this connection all printing plates are printed with the exception of those which operate the selective switch W_5. Any one of the selector contacts A is connected to any one of the actuating contacts P, another selector contact A is connected to the contact 5 of the selective switch W_5 while the contact *e* of this switch is connected to any one of the cutting-out contacts N. All printing plates are printed until a plate arrives which operates the selective switch W_5. Current now flows from the "plus" to the "minus" terminal, the relay R is excited, attracts its armature and opens the switch X, breaking the circuit of electromagnet M and causing skipping of the printing plate.

Fig. 6 shows a similar connection in which all printing plates are printed with the exception of those which operate the selective switches W_3 or W_4 or W_5 or W_{12}. The contacts 3, 4, 5 and 12 are connected to the selector contacts A, one of which is connected to an actuating contact P, and the contacts *c*, *d*, *e* and *m* are connected to the cutting-out contacts N. The operation is the same as described with reference to Fig. 5, the relay *r* being excited and breaking the circuit as often as one of the connected selective switches is operated.

Fig. 7 shows a connection corresponding to that illustrated in Fig. 4, for printing all plates, except those having the groups of lugs or the like required for operating the selective switches W_1, W_5 and W_8. One of the selector contacts A is connected to one of the actuating contacts P, as in Figs. 5 and 6. The switch contact 1 is connected to another selector contact A. Switch contact *a* of selective switch W_1 is connected to contact 5 of switch W_5 whose other contact *e* is connected to contact 8 of switch W_8. Contact *h* of this switch is connected to a cutting-out contact N. In this connection, the plates operating all three selective switches W_1, W_5 and W_8 are skipped, and all others are printed.

Fig. 8 shows a connection for printing all plates having means for operating the selective switches W_2 or W_7, unless such plates also have means for operating the selective switch W_5. Switch contacts 2 and 5 are connected to selector contacts A, and the corresponding switch contacts *b* and *e* are connected, respectively, to an actuating contact P and to a cutting-out contact N. The switch contacts 7 and *g* of selective switch W_7 are connected, respectively, to a contact A and to a contact P. Printing plates having means for operating the selective switches W_2 and W_7 are printed but plates having, in addition, means for operating the selective switch W_5 are skipped, as the relay R is excited in the manner described when one of these plates operates the selective switch W_5, and breaks the circuit of electromagnet M.

The connection may also be modified so that only the plates having the means for operating selective switches W_2 or W_7 only are printed, by establishing all connections in the manner shown for the selective switch W_5 in Fig. 8. In other words, all circuits except the two which are connected to the positive terminal, must be connected to the negative terminal.

Fig. 9 shows a connection for printing all plates having means for operating selective switches W_1 and W_3 but not means for operating W_6 and W_7. In this connection, switch contacts *a* and 3 are connected, contact *c* of selective switch W_3 is connected to an actuating contact P, contacts 1, 6 and 7 are connected to selector contacts A, and contacts *f* and *g* are connected to cutting-out contacts N.

Obviously, connections may be established in which only those printing plates are printed which are equipped with definite groups of means for operating definite selective switches, unless the plates possess other groups of means.

It will appear from the examples shown and described, that any desired selective combination may be established without difficulty.

I claim:

In an electric control for the printing mechanism of address-printing machines, a set of selective switches adapted to be operated by the printing members moving through the machine, two sets of switch contacts, with a contact per selective switch in each set, a source of electric energy, an actuating contact, a circuit connecting said actuating contact to one terminal of said source, means under the control of said circuit for operating the printing mechanism of the machine, means for connecting said actuating contact to any switch contact in one of said sets, a selector contact connected to the other terminal, means for connecting said selector contact to any switch contact in the other set, a cutting-out contact connected to one of said terminals, a relay in its connection to said terminal, means under the control of said relay for breaking said circuit when said relay is excited, and means for connecting said cutting-out contact to any switch contact in one of said sets.

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