

March 15, 1938.

W. E. NAYLOR

2,111,124

PRINTING DEVICE

Filed Dec. 16, 1936

2 Sheets-Sheet 1

FIG.1.

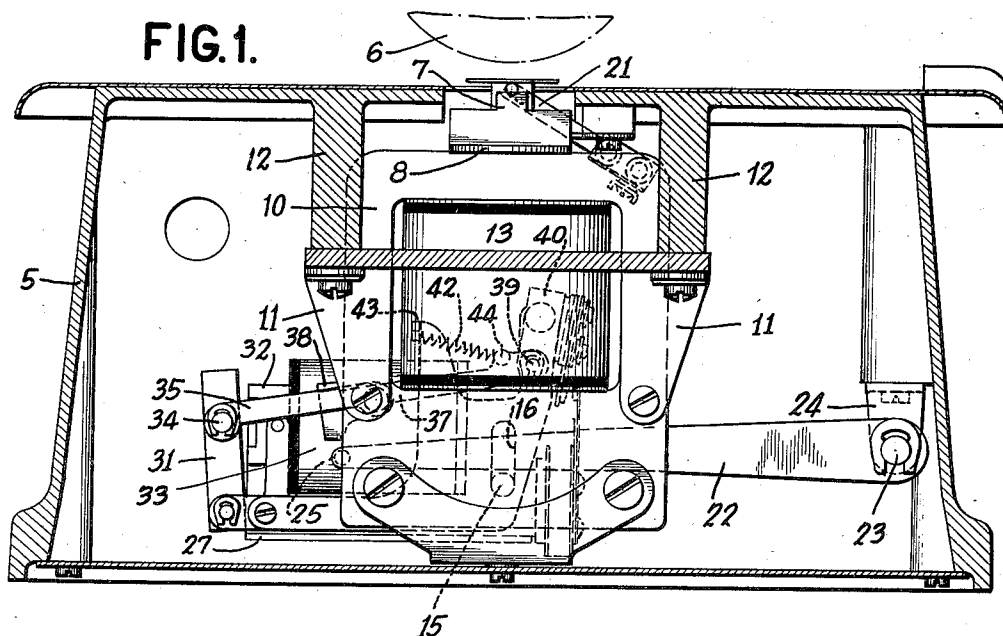
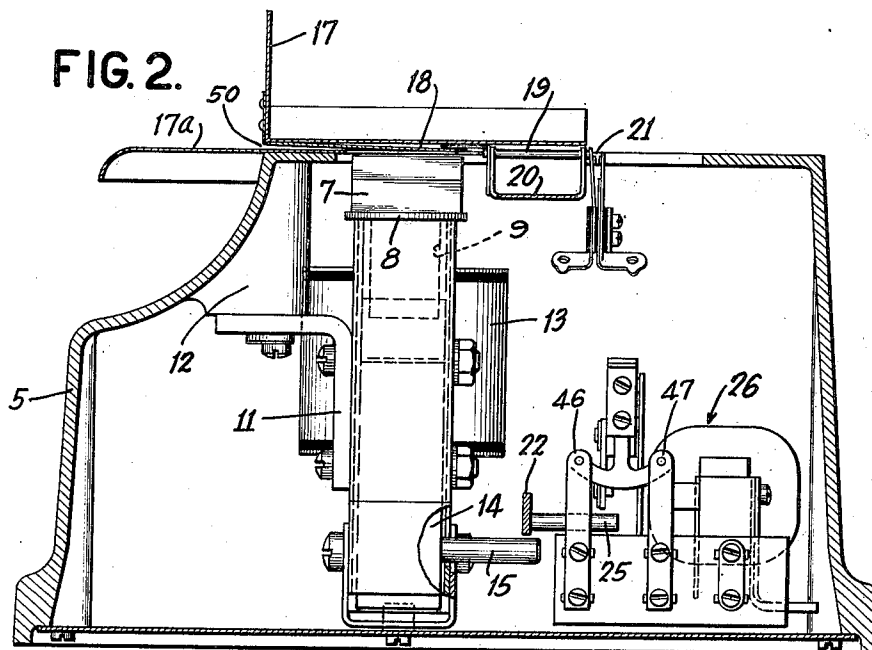


FIG. 2.



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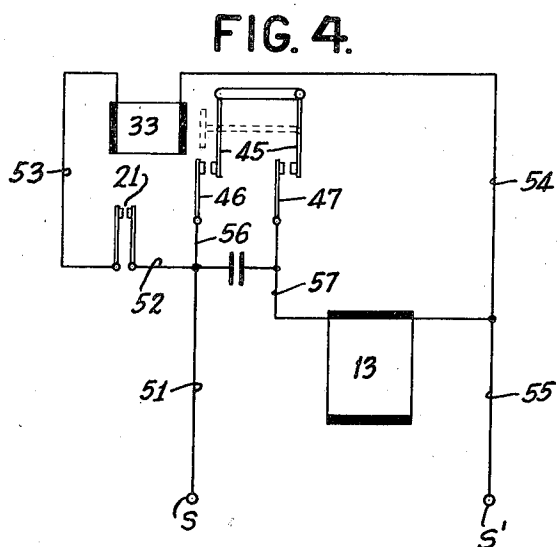
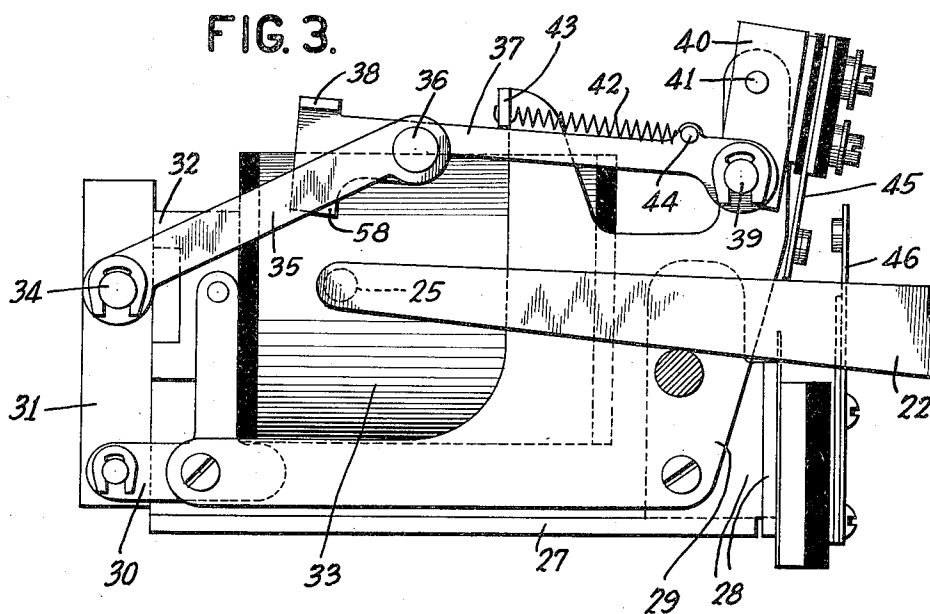
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2 Sheets-Sheet 2



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PRINTING DEVICE

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Application December 16, 1936, Serial No. 116,063

5 Claims. (Cl. 101—316)

This invention relates to printing mechanisms and more particularly to new and useful improvements in the type of printing mechanism wherein printing is automatically effected by the insertion of an article to be printed on in printing position.

An object of the invention is to provide a printing mechanism which automatically effects printing by the insertion in printing position of an article to be printed on.

Another object is to provide a printing mechanism having a movable platen projected against type wheels by electromagnetic means and in which a normally open contact in the circuit of the electromagnet is controlled by the article to be printed on.

Still another object is to provide a printing mechanism having an electromagnet to project the platen against the type wheels, a normally open contact in the circuit of the electromagnet, a second electromagnet for closing the contact in the circuit of the first electromagnet, and a second pair of normally open contacts in the circuit of the second electromagnet which is closed by an article to be printed on to effect a printing operation and further provided with a toggle link mechanism normally held in straight line position and connected with the first contact and in which said toggle link is broken from the straight line position by movement of the platen mechanism when printing is effected, to cause the first contact to be open to permit the platen to return to normal position.

Other objects and advantages of this invention will be apparent from the specification and accompanying drawings which show one embodiment of this invention and wherein similar reference numerals indicate similar parts and wherein, in the drawings:

Fig. 1 shows a front elevation of the printing mechanism.

Fig. 2 shows an end view of the printing mechanism.

Fig. 3 shows a detail view of part of the printing mechanism control.

Fig. 4 shows a wiring diagram of the printing mechanism circuits.

Referring now to Fig. 1, a base casing 5 for housing and mounting a movable platen, magnets, and contacts for operating the platen is provided. Mounted above the base may be any suitable type elements, such as date type wheels or type wheels for printing hours and minutes, suitably propelled by springs or electric motors as in time stamps or recorders. As the operat-

ing mechanism or supporting structure plays no part in the present invention and in order to simplify the illustration and description of the invention which resides in the printing mechanism, such type operating and supporting structure has been omitted and a diagrammatic showing of the type wheels is shown at 6, positioned over a platen 7, which is mounted on a plate 8 fixed to a plunger 9, the plate 8 resting on a yoke 10 which is mounted on a bracket 11 fastened to posts 12 integral with the base casing. A magnet 13 is mounted inside of the yoke 10 and is provided with a hollow core within which a movable plunger 14 is mounted, said plunger being projectable upon energization of said magnet upwardly to strike the plunger 9 and propel a platen against the type wheels adjacent thereto. A pin 15 is fixed to the lower end of the plunger 14 and projects outwardly through an aperture 16 in the yoke 10. A shield 17 is suitably mounted on whatever supporting structure may be used for carrying the necessary type wheel mechanism and a table 17a is mounted on the base casing below the shield, leaving sufficient room for a card or other article to be printed upon to be inserted between the shield and table to extend over the platen. A spring member 18 is fastened to the shield and normally holds the article to be printed upon down in the plane of a plunger 19 which is slidably mounted in a bracket 20 and abuts one blade of a normally open contact 21. The entire bracket 20 is not illustrated in order to simplify the understanding of the necessary parts of the invention, but any suitable bracket can be used for mounting the plunger 19 and the contacts 21 and mounted to the base casing 5. The plunger 19 is slidable in the bracket 20 so that when an article to be printed upon is inserted in the front of the machine, which is from the left as viewed in Fig. 2, the edge of the inserted article will strike the plunger 19, moving it to the right and causing it to close contacts 21.

A lever 22 pivoted at 23 to a bracket 24 which is mounted on a post of the casing extends and traverses the path of movement of the pin 15 and said lever is provided at its opposite end with a pin 25. A magnet and contact assembly, generally indicated at 26, is mounted on a suitable bracket (not shown) fixed to the base casing and includes a base frame 27 having formed portions 28 integral therewith and having a bracket 29 mounted thereon. An extending arm 30 is mounted to the bracket and has pivotally mounted thereto an armature 31 which cooperates with a

pole face 32 of an electromagnet 33. The armature has pivoted thereto at 34 a link 35 which is pivotally connected at 36 to a T-shaped link 37. One leg of the cross member of the T 38 is formed-over to lie in the plane of the link 35 to maintain it in straight line position as shown in Fig. 1 so that the weight of the link does not allow it to drop below this straight line position. The other end of the link 37 is pivoted at 39 to a block 40 which is in turn pivotally mounted at 41 to the bracket 29. A spring 42 is attached to a projection 43 of the bracket 29 at one end and to a stud 44 of the link 37 at the other end and biases the block 40 in a clockwise direction. Mounted on the block 40 and insulated therefrom is a T-shaped contact blade 45. Mounted to the bracket 28 and insulated therefrom are two contact blades 46 and 47 in such a position adjacent to the contact blade 45 that they are in the orbit of swing of these contacts about their pivotal mounting 41. Pin 25 on the end of the lever 22 extends into the plane of the T-shaped lever 37 and as the lever 37 and link 34 are normally in the straight line position, as shown in Fig. 1, the armature 31 will be normally biased in a counterclockwise direction about its pivot by means of spring 42. When the magnet 33 is energized, the armature 31 is moved in a clockwise direction and through the straight line linkages 35 and 37 moves the contact block 40 in a counterclockwise direction to close the contact blades 45 and 46, which in turn energize the magnet 13 through a circuit to be explained later, and causes the solenoid plunger 14 to move upwardly to effect the printing operation and at the same time carrying the pin 15 upwardly to bear against the under surface of the lever 22 and rotate it in a clockwise direction about its pivot 23. The rotation of this lever 22 moves the pin 25 against the lower projecting leg of the T-shaped member 37 moving it clockwise about its pivot 39 and thus breaking the straight line formation of the two levers 35 and 37 so that a toggle action is effected, whereby the biasing action of the spring 42 moves the contact block 40 in a clockwise direction, permitting the lever 37 now to move to the left while the lever 35 pivots counterclockwise about its pivot 34. The breaking of the contacts 45 and 46 causes the magnet 13 to become deenergized and allows the solenoid plunger 14 and therefore the platen 7 to return to the normal position so that after a printing operation has been effected, the article to be printed on will not be held between the type wheel and the platen even though the contact 21 is held closed.

Turning now to the wiring diagram shown in Fig. 4, terminals SS' represent a suitable source of electrical supply either from D. C. or A. C. commercial power lines or from a battery supply. The magnets 33 and 13 may be wound to operate on either. An article to be printed on is inserted in the throat 50 (Fig. 2) formed by the table 17a and shield 17. The leading edge of the article is held down against the table and is thus guided so that the edge meets the left hand end (Fig. 2) of the plunger 19 sliding it to the right in its bracket 20 and causing the contacts 21 to close. These contacts are normally biased in an open position by the spring action of the blade adjacent the plunger. When contact 21 closes a circuit is completed from one side of the supply terminal S (Fig. 4) through wires 51 and 52, contact 21, now closed, wire 53, magnet 33, wires 54 and 55 to the other supply terminal S'. The energization of magnet 33 causes the armature 31 to be moved

against the pole piece 32. The linkages 35 and 37 being in a straight line position as shown in Fig. 1 are normally held in this position by the bias of the spring 44 which also exerts a straight line pull from its anchor members 43 and 44 through the pivot 39. The movement of armature 31 clockwise causes the linkages 35 and 37 to exert a thrust to the right as viewed in Fig. 1 and thereby rocks the block 40 counterclockwise causing the contacts on the T shape blade to impinge upon the contacts on the contact blades 46 and 47 thus providing a conducting path between the two blades and completing a circuit as follows: from supply terminal S, through wires 51 and 56, contacts on blades 46, 45, and 47, now closed, wire 57, magnet 13, wire 55 to the other supply terminal S'. Magnet 13 is thus energized and causes its solenoid plunger 14 to be projected upwards striking the plunger 9 and thereby propelling the platen 7 upwards against the underside of the article to be printed upon and striking it against the type wheels 6.

When the plunger 14 is projected upward the pin 15 fixed thereto is lifted upward beneath the arm 22 raising the end of said arm opposite its pivot 23. The pin 25 fixed to the end of said arm is raised and engages the lower extension 58 (Fig. 3) of the T-shaped member 37, "breaking" the straight line alignment position as shown in Fig. 1 to cause the member 37 to pivot clockwise about its pivot 39. This permits the spring 42 to move member 37 to the left as viewed in Fig. 3 causing the link 35 to move counterclockwise about its pivot 34 and the block 40 to rock clockwise about its pivot 41 to take the position as shown in Fig. 3 with the armature 31 still held against the pole piece 32. The rocking of the block 40 causes the contact between contact blade 45 and the contact blades 46 and 47 to become broken to open the circuit through the magnet 13 so that it becomes deenergized and allows the plunger 14 to drop and with it the platen 7 and the arm 22. Thus only a single blow is made by the platen upon a single insertion into printing position of an article to be printed upon even though it may be held in position to continue to hold the contact 21 closed.

When the article to be printed upon is withdrawn from printing position contact 21 is opened and magnet 33 is deenergized so that its armature 31 returns to normal position by virtue of the link 35 and member 37 resuming their straight line position as shown in Fig. 1 through both the effect of gravity on the ends pivoted at 36 and the pull of the spring 42 of which the anchor pin 44 is aside from the straight line running from the anchor post 43 to the pivot 39 as shown in Fig. 3.

While there has been shown and described and pointed out the fundamental novel features of the invention as applied to a single modification it will be understood that various omissions and substitutions and changes in the form and details of the device illustrated and in its operation may be made by those skilled in the art without departing from the spirit of the invention. It is the intention, therefore, to be limited only as indicated by the scope of the following claims.

What is claimed is:

1. A printing device for printing on an article including a printing element, an impression device, electromagnetic means for moving said impression device relative to said printing element to effect a printing operation, means movable upon the insertion of said article to be printed

upon into printing position, electromagnetic means controlled by said movable means, a normally opened circuit closing element operable by said last named electromagnetic means, a circuit
5 extending from said circuit closing element to said first named electromagnetic means whereby the operation of said circuit closing means to closed position causes said first named electromagnetic means to become energized to effect
10 a printing operation.

2. The invention as set forth in claim 1 characterized by the provision of means operable upon the operation of said first named electromagnetic means to cause said circuit closing
15 means to return to its normally open position whereby deenergization of said first named electromagnetic means is effected.

3. A printing device including a printing element, an impression device, electromagnetic means for moving said impression device relative to said printing element to effect a printing operation, other electromagnetic means for controlling the operation of said first named electromagnetic means including an electromagnet, a
20 normally opened circuit closer, and means movable upon energization of said electromagnet for closing said circuit closer whereby an operation of said first named electromagnetic means is effected to cause a printing operation.

4. A printing device including a printing element and platen therefor, an electromagnet for moving said platen and element relative to each other to effect a printing operation, a normally open contact device for controlling the operation
25 of said electromagnet and circuits extending from said contacts to said electromagnet, a second electromagnet for effecting a closing operation

tion of said contacts upon energization of said magnet to cause the energization of said first named magnet whereby a printing operation is effected, and means operable by said printing operation for causing said contacts to open whereby said first named electromagnet may become
5 deenergized.

5. A printing device for printing on an article including a printing element and platen therefor, an electromagnet for causing operation of
10 said element and platen relative to each other upon energization of said electromagnet whereby a printing operation is effected, normally open contacts and circuits extending from said contacts to said electromagnet whereby energiza-
15 tion of said electromagnet is effected upon closure of said contacts, a second electromagnet and an armature therefor, a toggle mechanism normally in straight line position and connected to said armature for controlling the position of
20 said contacts, a second normally open contact movable to closed position by the insertion of an article to be printed upon into printing position, circuits connecting said second named contacts with said second named electromagnet to
25 effect energization of said magnet upon closure of said second named contacts whereby said first named contacts are closed to effect a printing operation by energization of said first named electromagnet, and means operable upon energiza-
30 tion of said first named electromagnet for causing said toggle mechanism to break from its straight line position to another position to cause the first named contacts to resume their normal open position to cause the deenergization of said
35 first named magnet.

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