

1,386,977.

Inventor:
Edward F. Watson.
by *JEH* Att'y.

UNITED STATES PATENT OFFICE.

EDWARD F. WATSON, OF YONKERS, NEW YORK, ASSIGNOR TO AMERICAN TELEPHONE AND TELEGRAPH COMPANY, A CORPORATION OF NEW YORK.

INDICATING MECHANISM.

1,386,977.

Specification of Letters Patent.

Patented Aug. 9, 1921.

Application filed August 17, 1920. Serial No. 404,210.

To all whom it may concern:

Be it known that I, EDWARD F. WATSON, residing at Yonkers, in the county of Westchester and State of New York, have invented certain Improvements in Indicating Mechanism, of which the following is a specification.

This invention relates to indicators and particularly to indicating mechanism for use with key-controlling apparatus.

The principal object of this invention is to provide an indicator of the above type that is positive in action and one that will show the exact position and number of the characters as they are produced.

Such mechanism has been found desirable in connection with perforators in preparing tapes adapted for use with printing telegraph systems wherein the characters are printed by receiving instruments in page form. The indicators are so arranged that the number and relative horizontal positions of the last character produced may be determined at a glance. This relieves the operator of counting the characters and spaces in order to ascertain when to actuate a key to produce the combination of perforations necessary to effect the return of the printer carriage.

Certain key-controlled indicators have been found objectionable because they do not indicate accurately, that is, the indicating mechanism is actuated in response to the depression of each key of the keyboard, whereas a number of the functions, such as line feed, shift, unshift, etc., for which keys are provided, do not cause a spacing operation in the printer. Therefore, the purpose of this invention is to provide an indicating mechanism that will not give false indications. This is accomplished by providing a cut-out arrangement to prevent operation of the indicator when keys, which will not cause a spacing operation in the printer, are depressed.

The above and other objects of this invention will be fully set forth in the following description and claims, and will be more readily understood by reference to the accompanying drawing, in which Figure 1 is a plan of the mechanism assembled in connection with a keyboard perforator, sections of the mechanism and the inclosing casing being broken away to more clearly show the

operating parts; Fig. 2 is a detail of part of the actuating mechanism; Fig. 3 is a detail of part of the reset controlling mechanism; Fig. 4 is a partial plan showing some of the parts in resetting position; and Fig. 5 is a detail of the indicator cut-out mechanism controlled by certain keys.

The preferred embodiment of this invention is shown associated with a keyboard tape perforator of well-known construction, and is an improvement on the mechanism disclosed and claimed in U. S. Patent 1,201,810, dated October 17, 1916.

The details of the perforator are not shown but it will be understood that the depression of any of the character keys causes the selection of combinations of punches which are forced through the paper tape into a punch block by means of a magnet. The punches and the armature of magnet are joined by a suitable shaft and coupling arrangement and are normally held in an inoperative position by means of a suitable spring (not shown).

On the front frame of the perforator or on a suitable plate attached thereto is an indicating scale which is divided into sections proportional to the width of the character and letter spaces. Adjacent to the scale is an elongated slot or opening, through and along which an indicating device or pointer is adapted to move. With this construction the pointer is at all times visible to the operator, while the actuating mechanism therefor is hidden from view and protected by the casing.

Suitably mounted in the frame beneath the cover, is a shaft which carries mechanism for controlling the movement of the pointer. On the shaft there is loosely mounted a ratchet wheel, provided with a drum and circumferential teeth. The drum is adapted to receive a cord or other flexible connecting member, which may be wound thereon and unwound therefrom, as hereinafter described, to control the movement of the pointer. The cord passes from drum over a guide roller and is secured to one side of the pointer. A suitable energy-storing body, such as a coil spring, is provided, secured at one end to the frame of the perforator by pin. The free end of spring carries a ring through which a second cord

passes. Cord 32 is secured at one end to the frame by a pin 43 and at the other end to the pointer 17 on the side opposite to that to which the cord 24 is attached. If desirable, only one cord may be used which may be secured to the pointer in any suitable manner. It is, therefore, readily apparent that when the wheel 20 is rotated in the direction of the arrow in Fig. 1, as will be hereinafter explained, the cord 24 will be wound on drum 21, pointer 17 will move along the scale 14 from left to right, and spring 29 will be extended to store up energy to be later employed in restoring the apparatus to normal.

Wheel 20 is rotated step by step in the direction of the arrow shown in Fig. 1, upon each complete depression of any of the keys 9 which control functions that cause a spacing operation in the printer. Shaft 12 carries a small crank 38 to which is pivoted a link 39. Link 39 is provided, at its end opposite the crank 38, with a shoulder portion 40 and a coil spring 41. Spring 41 is secured at one end to the link 39 by pin 42, and at the other end to an angle lever 44 by pin 45. The lever 44 is pivoted to the frame of the machine at 46, and is so positioned that its rearwardly extending end can be engaged by the shoulder portion 40 of link 39. Each time shaft 12 and crank 38 are rotated in the direction of the arrow in Fig. 2, which is the direction of rotation when the magnet 11 is energized to actuate the punches, spring 41 forms a flexible coupling between link 39 and lever 44 to actuate this lever. By this means the excessive jar caused by the hammerlike stroke of link 39 is not communicated to the indicator mechanism. When, on the other hand, magnet 11 is deenergized and the spring hereinbefore mentioned causes the armature to return to normal, the shoulder portion 40 of link 39 returns crank 44 to normal position. Lever 44 pivotally carries a long actuating pawl 49, which is provided at its free end with a hook portion 50, adapted, under certain conditions, upon its retraction to engage the teeth 22 on the circumference of the wheel 20. When the magnet 11 is deenergized, the pawl 49 is advanced until the hook portion 50 has passed over the number of teeth desired for each step, and when the magnet is energized, the pawl 49 and the hook portion 50 are retracted and the wheel 20 is rotated in the direction of the arrow, and the pointer 17 is moved one step along the scale.

Beneath the key levers of the keyboard is a rod or supporting member 100, pivotally mounted in supporting brackets 104 and 105, attached to the base of the machine. Each key of the keyboard which controls some auxiliary operation or function which should not be recorded by the indicating

mechanism, such for example as line feed, shift, unshift, etc., in a receiving printer, is associated with an operating lever 101, rigidly secured to the shaft 100. An upwardly extending arm 102 is also rigidly secured to the pivotally mounted shaft 100, which is adapted to be rocked to engage an extension 99 on pawl member 49 to move the pawl and hook portion 50, carried thereby, out of engagement with the ratchet wheel 20 when certain key levers are depressed, as clearly shown in Figs. 1 and 5. A spring member 106 is shown attached to the upright member 102 to prevent actuation of the pawl 49, except when the particular keys for controlling auxiliary operations, which do not effect spacing operations of the printer, are depressed.

When the end of a line is reached or it is otherwise desirable to start a new line of characters, a reset key 54 is depressed. In addition to producing the combination of perforations required for resetting the printer carriage of a receiving printer, which need not be here explained, the reset key 54 causes the pointer 17 to return to the zero point on the scale. The key 54 is provided with a pin 55 adapted to actuate a bell crank lever 56 when the key is depressed. The upper end of lever 56 will then engage the tail of the holding pawl 58 pivoted to the frame at 59. Pawl 58 is normally held by spring 60 so that its forward end 61 is in engagement with teeth 22 of wheel 20 and thus prevents the spring 29 from rotating the wheel 20 in the reverse direction during the advancement of pawl 49. When, however, the holding pawl 58 is moved against the tension of spring 60 by the depression of reset key 54, the end 61 is removed from engagement with the teeth 22, carrying with it the actuating pawl 49, as shown in Fig. 4, and spring 29 is free to return the wheel 20 and pointer 17 to normal position. In order to insure the complete return of the pointer and to arrest this return movement at the proper place, means are provided for the retention of the holding pawl out of operating position until the normal condition is reestablished and then the holding device is caused to again become operative. This safety mechanism comprises a latch 64, loosely mounted on shaft 19 and under tension of a spring 65. Latch 64 has a shoulder portion 66 adapted to engage a pin 67 of pawl 58 under certain conditions as hereinafter explained. When pawl 58 is in position to engage the teeth 22, the pin 67 thereon rests beneath the shoulder 66 on latch 64, and forces the latch back against the post 69. When, however, the pawl 58 is raised by reset key 54, as hereinbefore described, the pin 67 is elevated above the shoulder 66, and spring 65 causes latch 64 to take such a position that when the

key is released, the pawl 58, instead of again engaging the teeth 22, is held out of such engagement because of the coöperation of shoulder 66 and pin 67. The wheel 20 carries a lug 74, projecting laterally, to engage the latch 64 when the pointer has reached the zero position. Latch 64 is thereupon forced backward until pin 67 is released from shoulder 66 and the pawls 58 and 49 are again allowed to assume their operative positions. The reverse movement of the latch 64 and consequently the wheel 20 and pointer 17 is arrested by post 69 which is adjustable, as shown in Fig. 1, to allow for correcting the normal position of the pointer so that it will return exactly to the 0 point of the scale.

In order to give the operator a warning signal to notify her of the approach of the end of the line, the wheel 20 carries a cam 84 which is adapted to engage and close a pair of contact springs 85. These springs may be connected to a suitable source of energy in a circuit including a signal, such as a bell or lamp, and by properly positioning the cam 84, the signal may be operated at any desired distance from the end of the line.

What is claimed is:

1. A keyboard controlled indicator comprising a scale, a pointer adapted to move along said scale, mechanism for advancing the pointer step by step, actuating means for said mechanism, key levers controlling said actuating means to move said pointer, and other key levers controlling said actu-

ating means to prevent movement of said pointer.

2. In an indicator for keyboard mechanism the combination of an indicating device, operating mechanism therefor, keys, a lever adapted to engage and actuate said operating mechanism upon the depression of predetermined ones of said keys, and means controlled by other predetermined keys to prevent engagement of said lever and said operating mechanism.

3. A keyboard controlled indicator comprising a scale, a pointer adapted to move along said scale, a wheel for advancing the pointer step by step, actuating means for said wheel, key levers controlling said actuating means to cause the rotation of said wheel, and other key levers controlling said actuating means to prevent rotation of said wheel.

4. In an indicator for keyboard mechanism, the combination of an indicating device, operating mechanism therefor comprising a ratchet wheel, a pawl adapted to engage said ratchet wheel to actuate said indicator step by step, key levers for controlling and permitting engagement between said pawl and said ratchet wheel, and other key levers arranged when actuated to prevent engagement between said pawl and said ratchet wheel.

In testimony whereof, I have signed my name to this specification this 13th day of August, 1920.

EDWARD F. WATSON.