No. 836,307. PATENTED NOV. 20, 1906.

P. B. DELANY.

CIRCUIT CONTROLLING KEYBOARD APPARATUS.

APPLICATION FILED MAR. 29, 1904.

FIG. 1

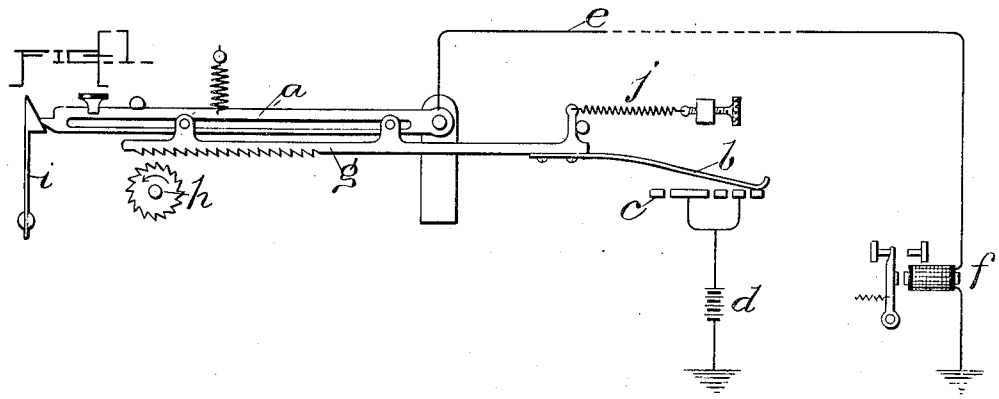


FIG. 2

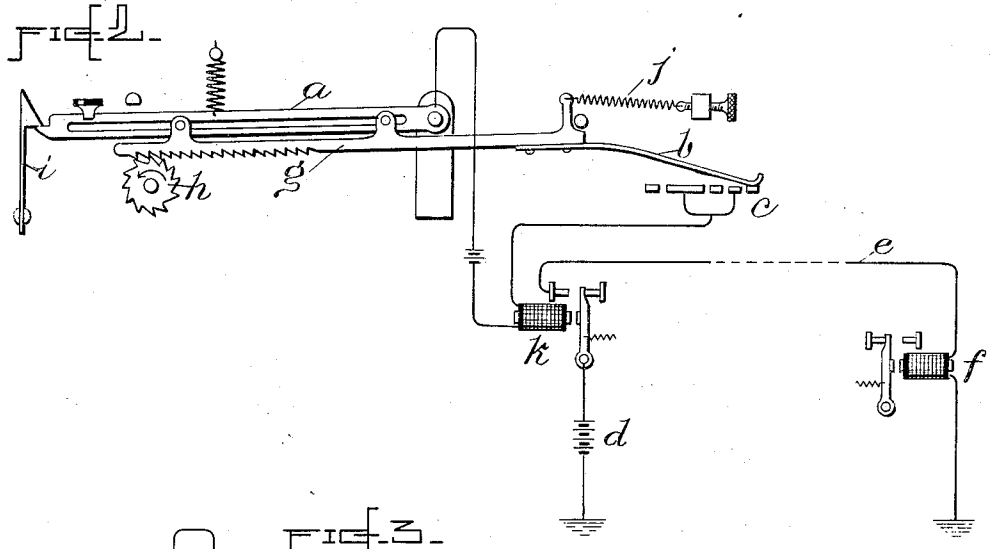
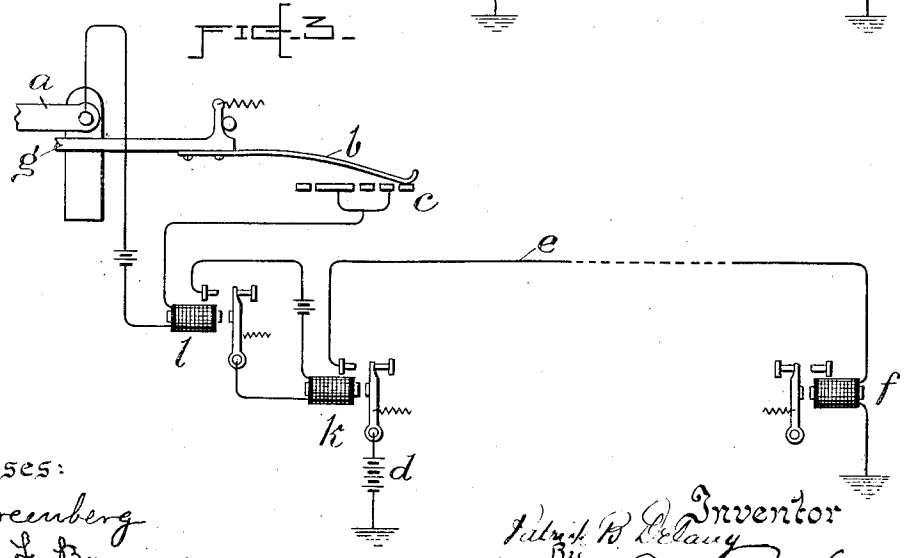


FIG. 3



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UNITED STATES PATENT OFFICE.

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CIRCUIT-CONTROLLING KEYBOARD APPARATUS.

No. 836,307. Specification of Letters Patent. Patented Nov. 20, 1906.

Application filed March 29, 1904. Serial No. 200,580.

To all whom it may concern:

Be it known that I, PATRICK B. DELANY, a citizen of the United States, residing at South Orange, county of Essex, State of New Jersey, have invented certain new and useful Improvements in Circuit-Controlling Keyboard Apparatus, of which the following is a specification.

Heretofore apparatus of this character having contact-makers and contact-pieces representing the letters or signals to be locally made or transmitted into a main line have been provided with means for taking the contact-maker and the signal contact-pieces out of contact with each other after the transmission of a letter and when the movable part returns to normal position, so that in returning to the starting-point the letter would not be repeated reversely. In a pending application, Serial No. 164,999, filed July 10, 1903, I have shown a way of preventing such reverse formation of signals without separating the contact members. This is accomplished by electrically disconnecting or rendering "dead" one of the contact members—*i. e.*, either the contact-finder or the series of signal-contacts over which it traverses during the return movement or to normal position. In the application referred to the segments or signal-contacts are made "live" just before the beginning of a letter and disconnected or made dead upon completion of the letter, so that in returning to the starting-point the contact-maker, although in contact with the signaling-contact, sends no impulses into the circuit.

I have now discovered that if the speed at which the contact-maker traverses the signal-contacts during its return to normal position be sufficiently great the apparatus or instrument connected with the signal-contacts (either locally or at a distance) will not respond. This condition with wide margin is easily established and adjustable by adjusting the tension of the spring or other device that returns the moving contact-maker to the point from which it started upon depression of a key in the keyboard. With the usual retractile tension on a relay-armature signal passing through the relay at the rate of fifty words per minute will be plainly sounded or recorded, the rate being well within the time constant of the relay; but if the contacts are made at the rate of five hundred words per minute the relay-armature will not respond even with its finest adjustment, nor will it be actuated at a speed of two hundred words per minute. Hence it is entirely feasible for perfect working to permit the contact-maker to return over the same path at a speed four or five times above the responding adjustment of the armature, thus avoiding all troublesome intricacies for disengagement or disconnection between the contact-making parts.

Transmission may be made direct from the contacts into a main circuit or into a local circuit comprising a sounder-transmitter; but a wider scope of adjustment for making transmission "heavy" or "light" is obtainable by the use of a relay of, say, one hundred and fifty ohms, in the local circuit of the key-board transmitter, operating a local sounder-transmitter which sends the signals into the main circuit. The advantage of using the relay as a first local instrument is due to its comparatively high resistance, which renders it less susceptible to any slight change of conductivity between the contacting parts than an ordinary sounder would be, and for the same reason a much wider range of adjustment is afforded, while the current power used for its actuation may be very small, reducing sparking at the contacts to a harmless degree. Furthermore, the sounder-lever, working with great positiveness and ample play, insures perfect transmission over the main circuit with any voltage necessary. By adjusting the relay up or down the sounder-transmitter is controlled for heavy or light transmission, according to the circuit conditions. It will be understood also that when a local transmitter is used in connection with the primary keyboard-transmitter no repetition of impulses goes over the second or main circuit.

In the accompanying drawings, Figure 1 is a diagrammatic representation of this invention, showing transmission into the main line direct from the contacts; Fig. 2, a similar view showing a local sounder or relay-circuit controlled at the contacts, transmission into the main line being effected at the sounder-armature; Fig. 3, a similar view showing a relay interposed between the contacts and the sounder which transmits into the main line.

In Fig. 1 *a* is a key in the keyboard-transmitter; *b*, the contact-finger; *c*, the contact; *d*, main battery; *e*, the line, and *f* the distant station. The operation needs no explanation further than to state that when the key

a is pressed down and the rack-bar *g*, carrying finger *b*, is brought into gear with the constantly-revolving toothed cylinder or wheel *h* the finger moves over contacts *c* and sends the signals (letter A being represented) at a rate to which the distant relay *f* readily responds. When *g* is released by throwing off the latch *i* from key *a*, it flies back under the tension of spring *j* so quickly that *f* is unaffected and its armature retracted.

Fig. 2 shows a sounder-transmitter or circuit-controlling device *k* in local circuit of the keyboard-transmitter, the signals being sent to line when armature of *k* makes contact with the main battery *d* in response to the impulses of the keyboard instrument.

Fig. 3 shows the use of relay *l* in the local circuit of the keyboard instrument and controlling a sounder-transmitter *k* in a second local circuit, which operates in the manner already described.

The line *e* instead of being a main line extending to a distant receiver may be local and may contain or control devices for forming or recording the signals locally—as, for instance, for the perforating of the signals in a transmitting-tape for an automatic telegraph system.

It will be understood that this method of signaling is not confined to the arrangement of contacts shown, but applies to any other transmitter regardless of specific operation of its contact-making parts whether disposed in flat plan, in sequence, or on cylinders, wheels, or sun-flowers by pins, projections, segments, or otherwise.

The several figures of the drawings show but one finger-piece or key and its associated parts. The full equipment of keyboard will control currents in the same main line or local circuit.

I claim as my invention—

1. In the formation or transmission of electrical signals the method of sending impulses at a rate which will operate the receiver or electromagnetic instrument, and repeating the impulses reversely at a rate which will not operate such instrument.

2. In the formation or transmission of electrical signals the method of sending impulses at a rate which will operate the receiver with a certain adjustment, and repeating the impulses reversely at a rate which will not operate the receiver at the said adjustment.

3. The method of transmitting impulses in sequence requisite for formation of a letter, then transmitting said impulses in reverse sequence, utilizing the first transmission for producing signals at a receiver and preventing the reverse transmission from being effective to produce signals at such receiver.

4. The method of transmitting into a local or primary circuit signals in sequence requisite for code-letters, then transmitting said signals in reverse sequence, suppressing the reverse signals in the receiver in said local circuit and causing said receiver to repeat or relay the first transmitted signals into another circuit.

In testimony whereof I have hereunto subscribed my name.

PATRICK B. DELANY.

Witnesses:
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