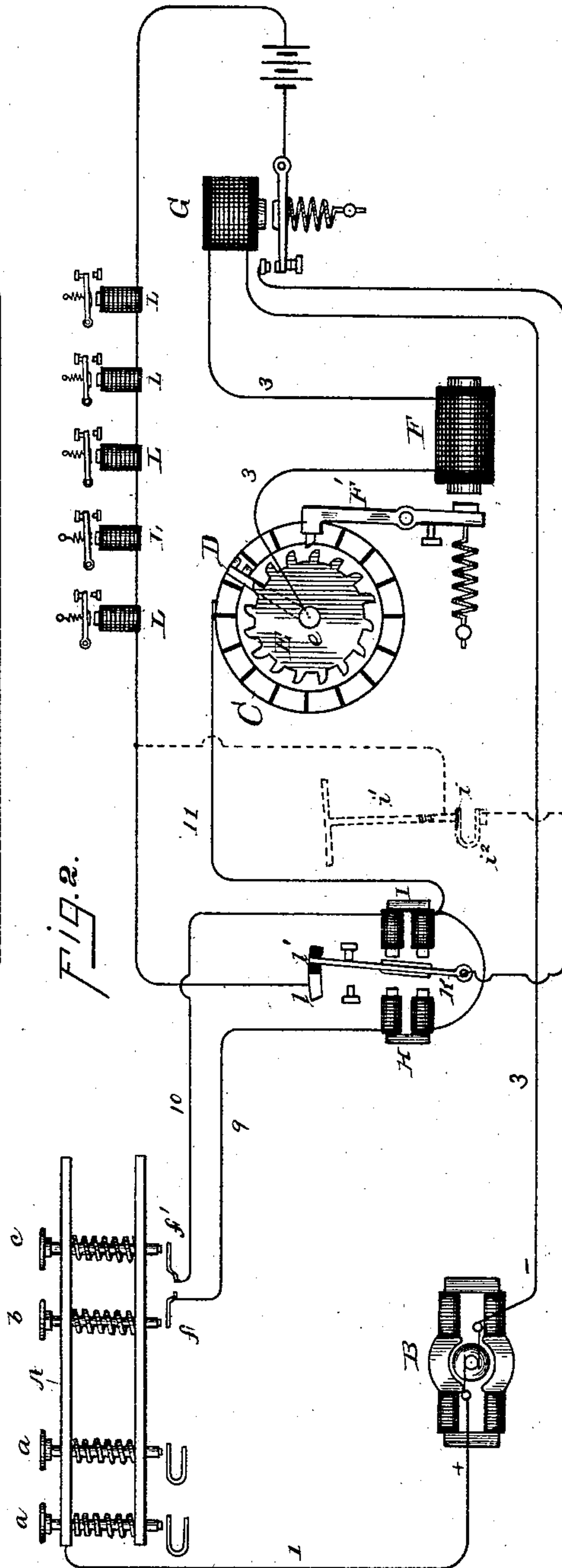


Patented July 23, 1889.



By his Attorneys Ogden & Seely.



# UNITED STATES PATENT OFFICE.

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## PRINTING-TELEGRAPH.

SPECIFICATION forming part of Letters Patent No. 407,730, dated July 23, 1889.

Application filed December 27, 1887. Serial No. 259,139. (No model.)

*To all whom it may concern:*

Be it known that I, CLARENCE L. HEALY, of Brooklyn, in the county of Kings and State of New York, have invented a certain new and useful Improvement in Printing-Telegraphs, of which the following is a specification.

The object I have in view is to produce such an arrangement of circuits and controlling devices at a printing-telegraph transmitter that the shifting-circuit cannot be affected except when the trailing arm of the transmitter is on the shifting-segment of the sunflower.

The invention is applicable to any system of printing-telegraphs employing printers with two type-wheels, the shifting-circuit at the transmitter acting, through relays or directly, to shift the printing-pads of the printers from one type-wheel to the other, or to reverse the current in the printing-circuits of the printers, or for throwing a definite resistance into and out of the type-wheel circuit.

The invention while applicable to any of those well-known systems, will be specifically described in connection with the Field system.

It has heretofore been possible for the key-board operator in transmitting for printers employing two independently-rotating type-wheels to release the locked wheel at other points than the unison-dot, thus throwing the wheel released out of unison. To avoid this it has been necessary that the key-board operator should always wait until the transmitter stops on the last letter or figure before depressing the unison-dot key to shift to the other wheel. This necessity is annoying to the operator and causes some delay in transmitting, unless he fails to observe due care, which results in throwing the released wheel out of unison.

By my invention I introduce an additional circuit-controller for controlling the circuit of the shifting-relays, which circuit-controller is itself controlled at the unison-dot segment of the sunflower as well as at the key-board, so that the shifting-relays are not affected until the trailing arm reaches the unison-dot segment of the sunflower.

In the accompanying drawings, forming a

part hereof, Figure 1 is an illustration, principally in diagram, of the parts of a printing-telegraph transmitter necessary for the understanding of my invention, showing the preferred arrangement when the transmitter has a locking-magnet for locking the circuit independent of the key; and Fig. 2, a similar view showing the preferred arrangement when there is no locking-magnet, and showing also in dotted lines the arrangement heretofore employed.

With reference more particularly to Fig. 1, A is the key-board, having the usual letter or figure printing keys *a*, and having also the shifting-keys *b c*. These keys *b c* in practice are marked, respectively, "figure" and "letter," the former being depressed to release the figure-wheel and the latter to release the letter-wheel. From the base of the key-board a connection 1 runs to the dynamo or other source of electrical energy B, for illustration, to the positive pole thereof, while from insulated contacts *d*, under the points of the printing-keys *a*, connections 2 (shown in dotted lines) run to the segments of the sunflower C.

As will be understood, the sunflower is stationary, its segments being swept over by a trailing contact-arm D, which, with a clutch-wheel E, is fixed to a rotating shaft *e*. From the shaft *e* a circuit-connection 3 is made back to the other or negative pole of the dynamo B, including the clutch-magnet F, which controls the clutch-lever F', and also including the magnet G. The shifting-keys *b c* touch, when depressed, insulated contacts *f f'*, which are connected together and with a sunflower segment by a wire 4.

The shifting-keys *b c* carry two contact-rods *g h*, which are insulated electrically from the keys *b c* and from the base of the key-board, and touch insulated contact-springs *g' h'* at the same time that the stems of the keys *b c* touch the contacts *f f'*. A wire 5 connects the two rods *g h* with the negative pole of the dynamo, while wires 6 and 7 extend from the contacts *g' h'*.

H and I are two electro-magnets, between which plays a pivoted armature-lever K. The lever K at its upper end plays over plates *ll'*, of metal and insulation, respectively. This



lever K and the metal plate *l* are included in the circuit of the shifting-relays L, so that such shifting relay-circuit is closed when the lever K is swung to the left, but is opened 5 when the lever K is swung to the right. This shifting relay-circuit also includes, as shown, the armature-lever of the magnet G and its front contact-point, so that this circuit is also controlled by the magnet G, it being closed 10 when the armature-lever of the magnet G is drawn forward to its front point. The unison-dot segment on the sunflower is divided into two parts *m m'*, insulated from each other, but connected together by the trailing arm D 15 when it passes over this segment. The part *m* is connected with the wire 4 from the key-board contacts *f f'*, while the part *m'* is connected by the wire 8 with the two magnets H I, the other ends of whose coils are connected by the wires 6 and 7 with the contacts 20 *g' h'*.

The drawings show the parts arranged for printing on the letter-wheel, the letter-releasing key *c* having last been depressed and the 25 lever K swung to the right, opening the shifting-relay circuit. Now, if the figure-releasing key *b* is depressed, the contact-rod *g* will touch the contact *g'*, closing circuit to the magnet H at the same time that the stem 30 of the key *b* touches the contact *f*; but this has no effect upon the circuit-controller formed by the magnets H I and the lever K until the trailing arm reaches the unison-dot segment and bridges the parts *m m'* of which such 35 segment is composed. The key *b* being still depressed, as soon as the trailing arm touches the unison-dot segment the operating-circuit of the transmitter will be closed from the positive pole of the dynamo by wire 1 to the 40 base of the key-board by key *b*, contact *f*, and wire 4 to the part *m* of the segment, and by the trailing arm to the shaft *e*, and by wire 3 through the clutch-magnet F and controlling-magnet G. The clutch-magnet will stop the 45 transmitter while the trailing arm is still on this segment, while the magnet G will draw its armature to its front point. At the same time the circuit to wire 8 will be closed by the bridging of the parts *m m'* of the unison-dot 50 segment. This will close the circuit to the magnet H through the contact *g'*, the rod *g*, and the wire 5, which magnet H will attract the lever K, swinging it to the left and making the final closure of the shifting-relay 55 circuit.

To shift back to the position shown in the drawings, the key *c* is depressed, closing the circuit at the transmitter through the rod *h* 60 and contact *h'* to the magnet I. Now, when the trailing arm bridges the parts *m m'* of the sunflower, the magnet I will be energized, swinging the lever K to the right again and opening the shifting-relay circuit at that point.

65 The arrangement shown in Fig. 1 and just described in detail is preferred when the transmitter is provided with the locking-mag-

net M, located in the operating-circuit and acting to shunt the key-board, since when the 70 locker is used the circuit-controller H I K must be arranged to be independent of the locking-magnet; but when no locking-magnet is employed the arrangement may be somewhat simplified, as shown in Fig. 2. 75 With this latter arrangement the rods *g h* and extra contacts *g' h'* are omitted and the magnets H and I are controlled at the contacts *f f'* of the unison-keys *b c*. The contacts *f f'* are not connected together, but separate wires 9 10 run from them to the mag- 80 nets H I, from the other ends of the coils of which a single wire 11 runs to the unison-dot segment of the sunflower, which is a single undivided plate the same as the other segments of the sunflower. If this simple ar- 85 rangement were used with the locking-magnet, the magnets H and I would be shunted by the locking-magnet before they had time to act, and hence they would not operate 90 at all.

Heretofore the shifting-relay circuit extended directly back to the key-board, being there controlled by the insulated tip *i* of the 95 lever *i'* and the spring *i<sup>2</sup>*, as shown, for purposes of explanation, by the dotted lines in Fig. 2. It will be readily seen from this that should a shifting-key be depressed before the transmitter is stopped by the key previously 100 depressed the shifting-relays will act, although the trailing arm is not on the unison-dot segment of the sunflower.

What I claim is—

1. In printing-telegraphs, the combination, with the key-board, the sunflower, the trailing arm, and the clutch, of a shifting-circuit, 105 a switch controlling said shifting-circuit, and two magnets moving said switch in opposite directions, the circuits to such magnets being controlled both at the key-board and at the sunflower, substantially as set forth. 110

2. In printing-telegraphs, the combination, with the key-board, the sunflower, the trailing arm, and the clutch, of a shifting-circuit, a switch controlling said shifting-circuit, two 115 magnets moving said switch in opposite directions, the circuits to such magnets being controlled both at the key-board and at the sunflower, and an electro-magnet in the sunflower-circuit acting to close a break in said shifting-circuit at each stoppage of the trail- 120 ing arm, substantially as set forth.

3. In printing-telegraphs, the combination, with the key-board, the sunflower, the trailing arm, and the clutch, of a shifting-circuit controlled both at the key-board and at the 125 sunflower, substantially as set forth.

4. In printing-telegraphs, the combination, with the sunflower having a divided segment, the parts of which are bridged by the trailing 130 arm, of a circuit broken at the sections of such segment and closed by the trailing arm, substantially as set forth.

5. In printing-telegraphs, the combination, with the sunflower having a divided segment,



the parts of which are bridged by the trailing arm, of a circuit broken at the sections of such segment and closed by the trailing arm, the key-board having contacts also controlling said circuit, an electro-magnetic circuit-controller in said circuit, and the shifting-circuit controlled by said circuit-controller, substantially as set forth.

6. In printing-telegraphs, the combination, with the unison-keys and the separate insulated contact-rods and contacts at the key-board, and the sunflower having a divided segment, of a circuit-controller composed

of two magnets acting oppositely on a circuit-controlling armature-lever, connections through the sections of the divided sunflower-segment to the windings of both magnets, and separate connections from the magnets to the contacts of the insulated rods of the key-board, substantially as set forth.

This specification signed and witnessed this 10th day of December, 1887.

CLARENCE L. HEALY.

Witnesses:

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