G. M. PHELPS.

Printing-Telegraph.

No. 196,476. Patented Oct. 23, 1877.

Fig. 2.

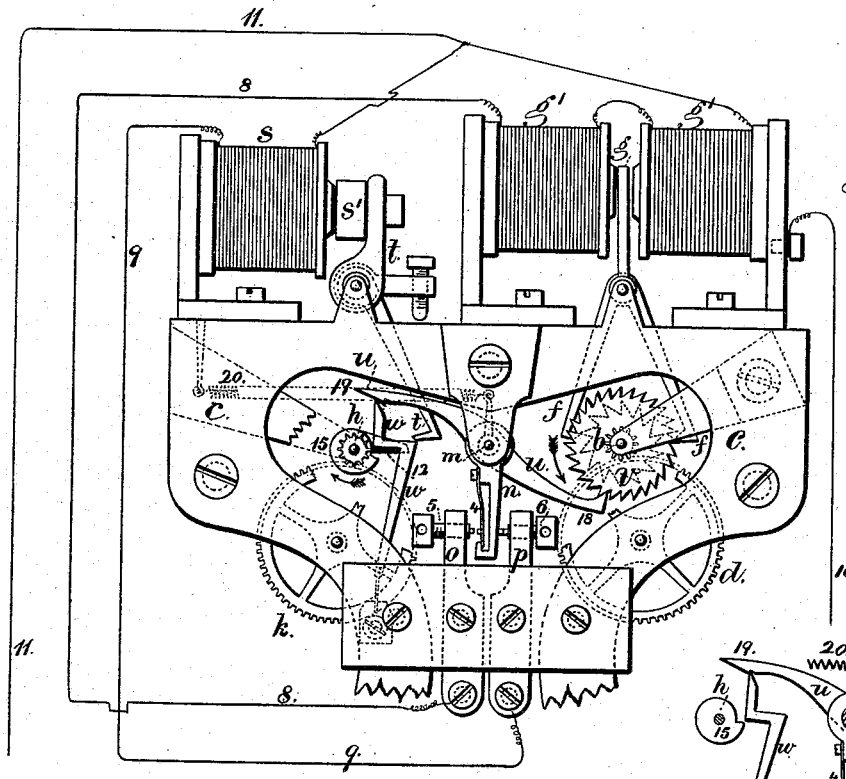


Fig. 4.

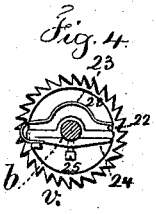


Fig. 3.

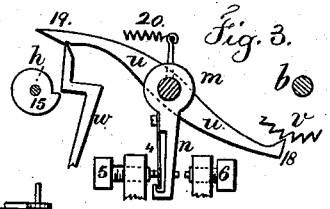
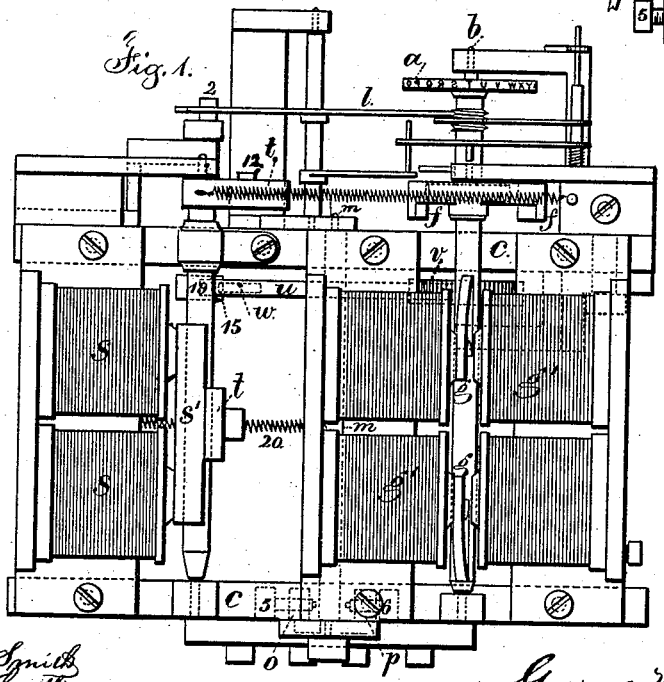


Fig. 1.



Witnesses

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UNITED STATES PATENT OFFICE.

GEORGE M. PHELPS, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN PRINTING-TELEGRAPHS.

Specification forming part of Letters Patent No. **196,476,** dated October 23, 1877; application filed May 9, 1877.

To all whom it may concern:

Be it known that I, GEORGE M. PHELPS, of Brooklyn, in the county of Kings and State of New York, have invented an Improvement in Printing-Telegraphs, of which the following is a specification:

Printing-telegraphs have been made with an escapement that allows the clock-work to turn the type-wheel, such escapement being actuated by an armature and opposing magnets, through which electric currents are passed, of alternate polarity, and the magnet controlling the printing has been brought into action by stopping the type-wheel for the letter desired. In this instance the type-wheel magnets and printing-magnets are in the main-line circuit, and the resistance is great upon lines where there are a number of these instruments in the same circuit.

The object of my invention is to lessen the resistance in the line, and thereby allow for operating the instruments with a less battery-power.

To effect these objects I provide an automatic switch, that becomes self-acting when a pause occurs in the movement of the type-wheel, and cuts out the type-wheel magnets, and simultaneously closes the circuit to the magnet that liberates the printing mechanism; and as this mechanism operates, the circuit is again closed to the type-wheel magnets and broken to the printing-magnet. By this arrangement of devices the resistance of the line-circuit is lessened, because there is only the type-wheel magnets in the circuit or the printing-magnet.

In the drawing, Figure 1 is a plan of the instrument. Fig. 2 is a side view with portions of the gearing and frame removed, and the wire connections of the magnets are also shown. Fig. 3 represents the circuit-changer after the printing mechanism has operated, and Fig. 4 is an elevation of the ratchet-wheel and its spring.

The type-wheel *a* is upon the shaft *b*, that is supported in the frame *c*, and driven by any suitable train of gearing, *d*, and a weight or spring. The escapement *f* and armature *g* are moved, first one way and then the other, by the electro-magnets *g'*, between the cores of which the armature *g* vibrates. The shaft *h* is revolved by a train of gearing, *k*, and at the end of said shaft is a wrist-pin or crank, 2, that gives motion to the printing-lever *l*. These parts are similar to those shown in former patents granted to me, and a reference is made to my Patent No. 144,285 for a more full description and representation of the construction and operation of these parts. I however remark that my improvement, hereinafter described, may be used with other printing-telegraphs wherever available.

The shaft *m* has upon it an arm, *n*, and spring circuit-closer 4, that is between the two screw-points 5 and 6, that are upon the insulated blocks *o* and *p*, to which the circuit-wires 8 and 9 are connected. The line-wire 10 is connected with the frame of the machine, and when the arm *n* is in contact with 5 the current passes through 8 to the type-wheel magnets *g' g'*, and thence to the line 11, to the next instrument, or to the battery, as usual; but when the arm *n* is moved into contact with 6, the current passes from 10, by frame and *n*, to 6 and 9, to the magnet *s*, and to the line 11. This magnet *s* has an armature, *s'*, and lever *t*, that holds the tooth 12 on the shaft *h*, as in my aforesaid patent; but as soon as the electro-magnet *s* is energized, the hooked lever *t* is moved, and the shaft *h* and clock-movement liberated, to print the character from the type-wheels.

The shaft *m* has also upon it the double pawl-lever *u*, one end, 18, of which is near the ratchet-wheel *v* upon the type-wheel shaft *b*, and the other end, 19, is near the spring-finger *w*, that is adjacent to the cam 15 on the shaft *h*.

The operation is, that when the type-wheel is being revolved, the ratchet-wheel *v* constantly presses the end 18 of the lever *u* away, and maintains contact of the spring-arm 4 with the point 5, keeping the circuit through the wire 8 and type-wheel magnets *g'* closed; but as soon as the rotation of the type-wheel is arrested, the spring 20 swings the lever *u* and arm *n*, by partially turning the shaft *m*, so as to press the pawl 18 in between the teeth of *v*, and close the circuit through *n* and 6 to the wire 9 and press-magnet *s*, the energizing of which latter liberates the shaft *h*, which revolves, performing the printing, and, by the cam 15 acting against the spring-finger *w*,

places the same in the position shown in Fig. 3, with its inclined knife-edge end in a shallow notch across the end 19 of the lever *u*. In this movement the inclined end of the spring-finger *w*, acting against the inclined end 19 of the lever *u*, has moved said lever *u* sufficiently to change the circuit-contact from 6 to 5, and restore the line-circuit to the magnets *g'*, so that the instrument is ready for the pulsations that next set the type-wheel. In the movement, however, of the lever *u*, the pawl end 18 is not entirely clear of the teeth of the ratchet-wheel *v*; hence, when the type-wheel starts, the tooth of *v*, Fig. 3, moves the lever *u* enough to unlatch the spring-finger *w*, and that resumes its normal position, (shown in Fig. 2,) and the parts are ready for action, as before described.

I prefer to place the ratchet-wheel *v* loose upon the shaft *b*, and provide a pin, 22, thereon, that is held between the spring 23 and an arm, 24, that is clamped firmly to the shaft by the screw 25. This allows for adjusting the wheel *v* to its correct position, and also allows a slight yielding movement in the direction of its rotation, so that the impact and friction between the point of the pawl 18 and the surface of the teeth may not impede the free rotation of the type-wheel.

I claim as my invention—

1. In a printing-telegraph instrument having a mechanical power for revolving the type-wheel, and an electro-magnet for setting the same, a circuit-changer operated by a connection to the type-wheel shaft, for controlling the printing electrically when the type-wheel stops, substantially as set forth.

2. The combination, in a printing-telegraph instrument, of mechanical power to revolve the type-wheel and to actuate the printing device, an escapement actuated by magnetism to set the type-wheel, an electro-magnet to bring the printing mechanism into action, and a mechanical circuit-changer to connect the type-wheel magnet to the main line and disconnect the impression-magnet, and vice versa, substantially as set forth.

3. The ratchet-wheel *v*, pawl-lever *u*, spring-finger *w*, cam 15, and circuit-changer *n*, in combination with the type-wheel and actuating-shaft, and the impression mechanism and its actuating-shaft, substantially as set forth.

Signed by me this 30th day of April, A. D. 1877.

GEO. M. PHELPS.

Witnesses:

GEO. T. PINCKNEY,

CHAS. H. SMITH.