

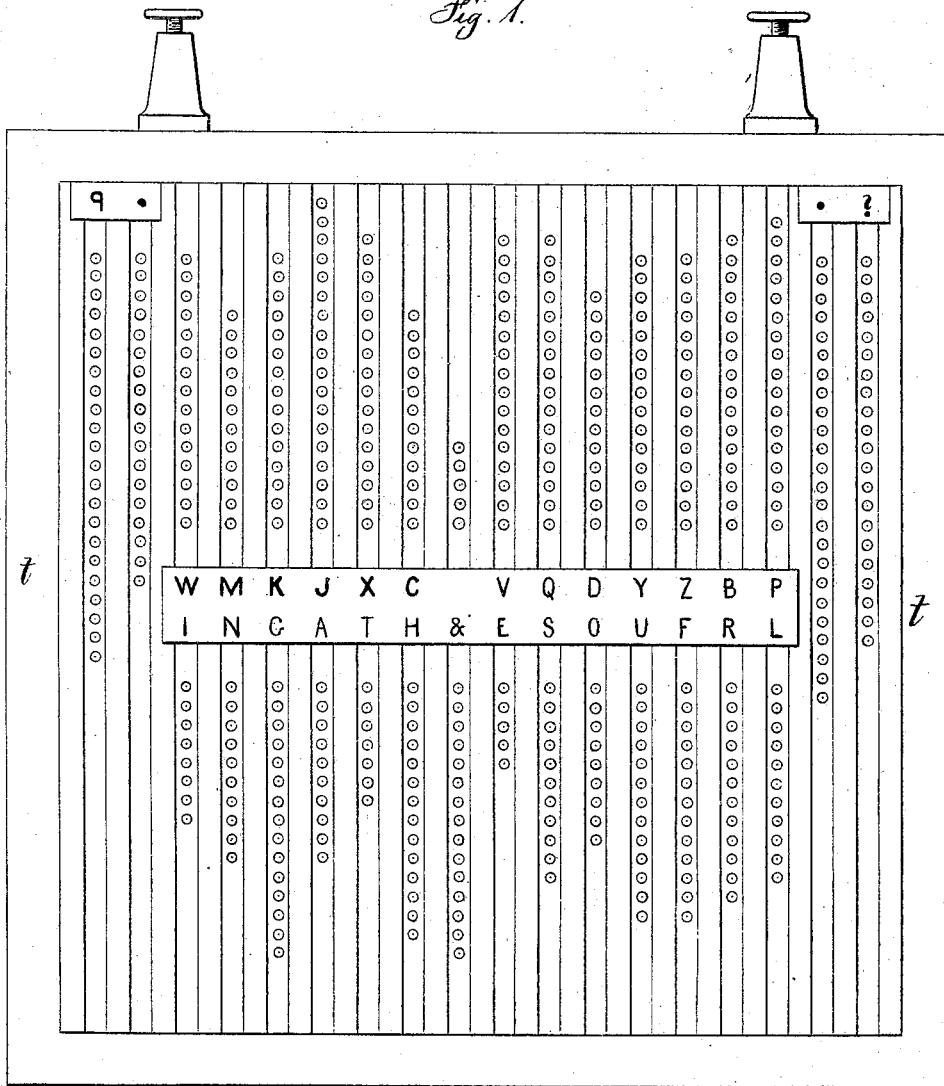
GEORGE LITTLE.

Improvement in Apparatus for Perforating Paper for Telegraphic Purposes.

No. 115,969.

Patented June 13, 1871.

Fig. 1.



Witnesses,

*Chas. Smith
Harold Ferrell*

*George Little
Lemuel W. Ferrell atty*

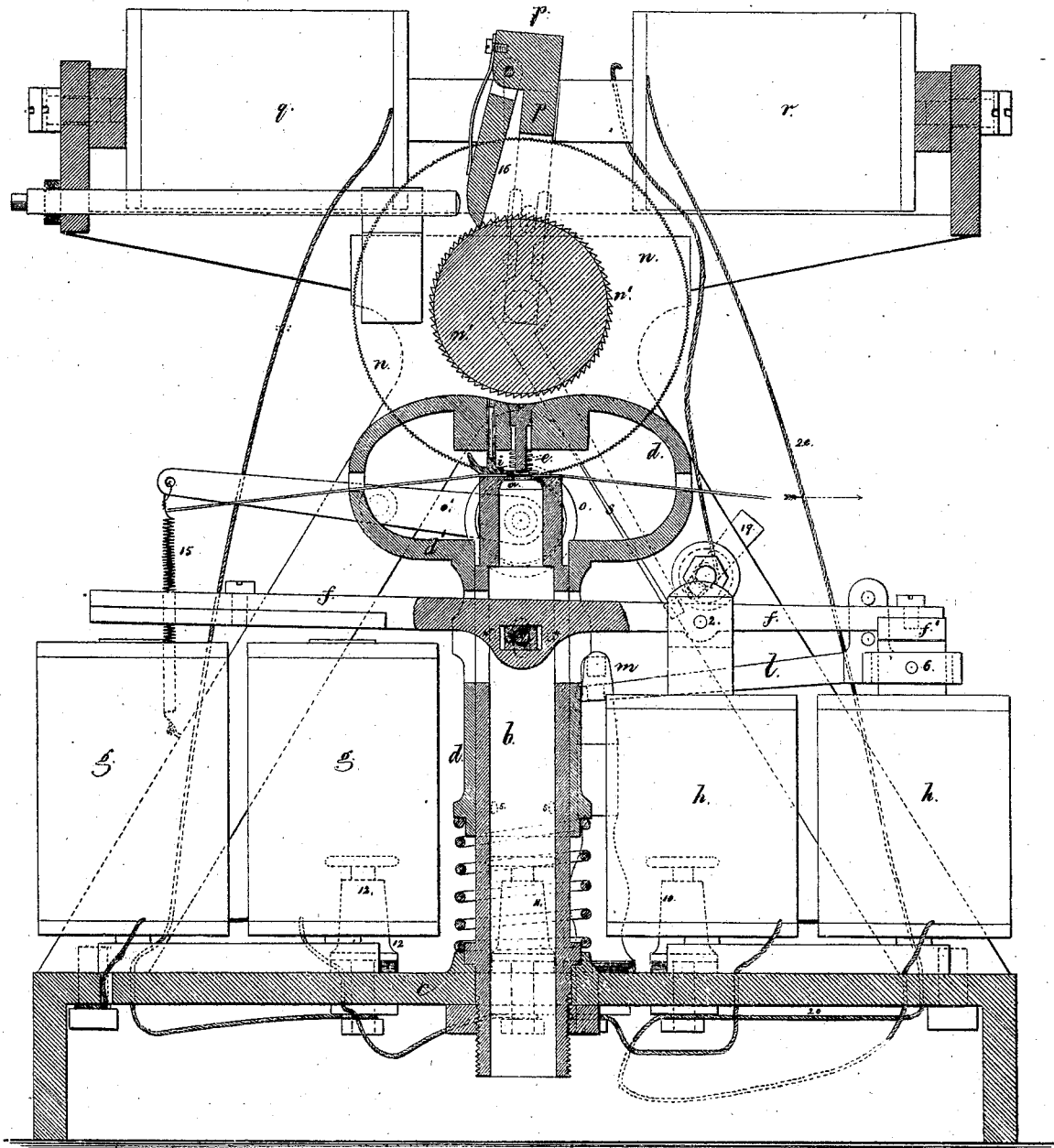
GEORGE LITTLE.

Improvement in Apparatus for Perforating Paper for Telegraphic Purposes.

No. 115,969.

Fig. 2.

Patented June 13, 1871.



Witnesses

Chas. H. Smith
Harold Perrell,

George Little
Lemuel W. Perrell atty

GEORGE LITTLE.

Improvement in Apparatus for Perforating Paper for Telegraphic Purposes.

No. 115,969.

Patented June 13, 1871.

Fig. 3.

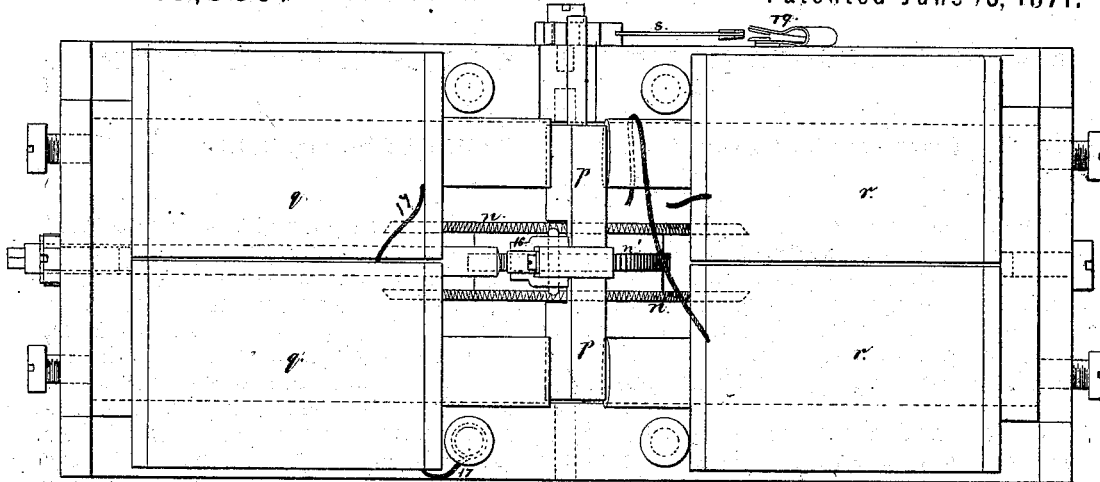


Fig. 4.

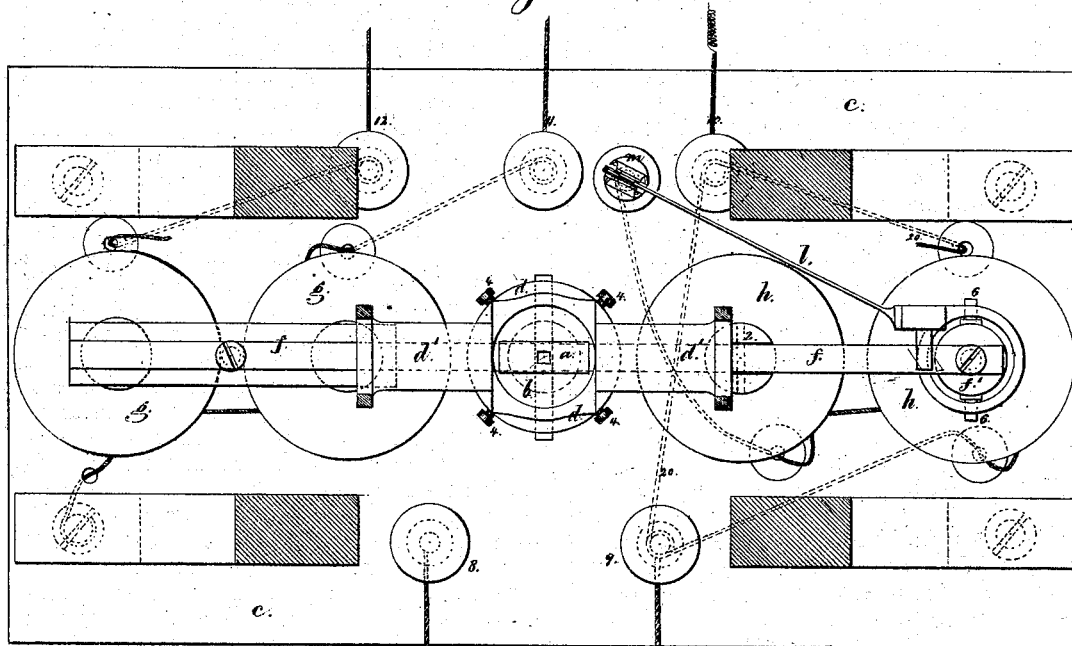


Fig. 6.

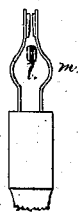
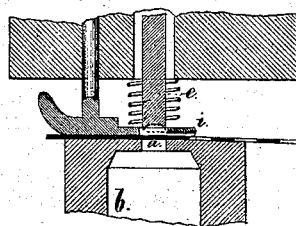


Fig. 5.



George Little
Lemuel W. Perrell
attys

Charles Smith
Harold Perrell

Witnesses

UNITED STATES PATENT OFFICE.

GEORGE LITTLE, OF RUTHERFORD PARK, NEW JERSEY.

IMPROVEMENT IN APPARATUS FOR PERFORATING PAPER FOR TELEGRAPHIC PURPOSES.

Specification forming part of Letters Patent No: 115,969, dated June 13, 1871.

To all whom it may concern:

Be it known that I, GEORGE LITTLE, of Rutherford Park, in the county of Bergen and State of New Jersey, have invented and made an Improvement in Perforating or Embossing Paper for Telegraphic Purposes; and the following is declared to be a correct description thereof.

I make use of a tablet with grooves and conductors and a moving stilus, to be drawn by hand down such grooves to make and break electric circuits to magnets for punching and feeding the paper, as in Letters Patent No. 96,330, granted to me; but I arrange the letters and characters in such tablet with reference to the convenience of the operator and rapidity of action. The feed of the paper is effected by a wheel, ratchet, pawl, and armature, and the magnets are arranged in connection with a circuit-closing lever, so that the movement of the armature in feeding the paper throws the current through a second electro-magnet to give the reverse or return movement to the armature, and thus renders it unnecessary to use springs; hence the feed movement will be more reliable. I also construct the circuit-closers in a manner to avoid risk of inaction by an intervening non-conducting material, such as dust, oil, or other foreign substances; and I make the punch in a peculiar manner to insure a sharp cut of the paper, and to prevent the paper becoming caught in its passage between the punch and die.

In the drawing, Figure 1 is an elevation of the tablet. Fig. 2 is a vertical section of the perforating mechanism. Fig. 3 is a plan of the same. Fig. 4 is a sectional plan below the strip of paper. Fig. 5 is a vertical section, in larger size, of the punch and die for perforating the paper; and Fig. 6 represents the circuit-closing lever and its clips.

A reference is hereby made to the before-named patent for a description of the tablet *t* and the stilus-conductors and connections, the difference between the tablet in said patent and that shown in Fig. 1 relating to the arrangement of the letter-plate in the middle of the tablet with two rows of characters, the upper one applying to the upper row of grooves and the lower row of characters being for the lower row of grooves. This arrangement al-

lows of the extreme right and left hand grooves being allotted to paragraph marks, comma, period, and interrogation-points, or other signs requiring a greater length than half the width of the tablet. Furthermore, I arrange the vowels and letters most in use upon the lower line of the letter-plate and in the order shown, so that combinations of letters most in use will be in the order of their use, thus: "in," "the," "of," "he," "that," "ing," "or," &c. The die *a*, for perforating the paper, is upon the upper end of a column, *b*, the latter being fastened in the bed *c*; and around this column *b* is a sleeve, *d*, carrying the yoke *d'* and punch *e*. The punch *e* is hollowed at the end so that the corners project downward as cutting-points, to facilitate the perforation of the paper by giving a shearing cut, commencing in each corner of the perforation, thereby lessening the force required and cutting the hole with sharp edges. The pressure-foot *i*, that is kept down by a light spring to prevent the paper rising with the punch, is cut away on the under side in line with the perforation of the paper as it passes along from under the punch, so as not to bind any fin or projection at the edge of the perforation, but allow the same to pass on with freedom. This is shown in the enlarged section, Fig. 5. The lever *f* is upon the fulcrum 2, and passes through the column *b* and sleeve *d*, and is connected with the latter by a sliding block and cross-pin, 3; and the sleeve *d* is provided with small set-screws at 4 and 5, that serve to accurately adjust said sleeve and the punch it carries relatively to the die and prevent looseness from wear. The lever *f* becomes the armature for the electro-magnets *g g*, and the fulcrum 2 is on one pole of the electro-magnets *h h*, and the armature *f'* serves to lift the punch immediately after the perforation has been effected by the pulsation of electricity, being automatically directed from the magnets *g* through the magnets *h*, as in aforesaid patent, by means of a circuit-changer. The circuit-changer *l* is upon the fulcrum 6, and the vibrating end of this lever lies below and between the spring-jaws *m*, seen also in Fig. 6, when the parts are in a normal position; but when the lever-armature *f* is depressed by the magnets *g g* the end of this lever *l* rises and comes between the jaws *m*,

and in so doing the connection is made as follows: The binding-screws 8 and 9 receive the battery-wires, and the screw 9 is insulated; but the screw 8 is in metallic contact with the bed and parts of the instrument. The binding-screw 10 receives one end of the flexible conductor that is attached to the stilus, and the pulsations result from drawing said stilus over the tablet, as in aforesaid patent, those pulsations that operate the punch coming from the tablet *t* to the binding-screw 11, and those that operate the feed to the binding-screw 12. The pulsations, therefore, for the magnets *g h* come from 8 through the bed to the magnet *g g*, thence to screw 11 through the tablet, stilus, screw 10, to the screw 9 and to the battery, (or the poles of the battery might be reversed.) As the lever-armature *f* is drawn down the circuit-changer *l* completes the metallic connection indirectly from the bed *c* and screw 8 through *m* to the magnet *h* and binding-screw 9, to raise the lever-armature *f* and punch, and at the same time break its own circuit by the movement of *l*. It will be seen that this circuit-changer is not liable to become inoperative if slightly bent, as is the case where only one spring is used; and the parts coming into contact with a rubbing motion keep the metallic surfaces bright and free from foreign matter that might interfere with the conducting power of the parts. The feed of the paper is effected by the wheels *n*, having serrated edges, and the elastic rollers *o* set at each side of the narrow upper end of the column *d* to press the paper into contact with these serrations. The rollers *o o* are made with disks or flanges to guide the paper, and each roller is mounted upon a lever, *o'*, with a spring, 15, to keep the necessary pressure upon the paper. The armature *p* swings between the poles of the magnets *g* and *r* and moves upon the same center-pin as the wheels *n*, and from the armature *p* a spring pawl, 16, hangs in contact with the teeth of the wheel *n'*, that is between the wheels *n*, and acts to give motion to the parts and feed the paper along when the electromagnet *g* is incited by the electrical pulsations. As the armature *p* is moved to feed the paper it also moves the circuit-changer *s* to direct the pulsation from the magnet *g* and through the magnet *r* to instantly draw back the armature *p* and pawl 16. The circuit-changing lever *s* acts at its moving end in insulated spring-jaws 19, similar to the spring-jaws *m*. These are insulated, and the connections of the parts

and their operation are as follows: When the stilus from the screw 11 forms a connection through the tablet with the screw 12, the pulsation of electricity goes through the wire to the magnet *g*; thence, by the wire 17, to the bed of the machine and the screw 8 to the battery. The movement of the lever *s* makes a connection from the bed of the machine and screw 8, through 19, to the magnet *r*; thence, by the wire 20, to the binding-screw 9, so that the movement of the armature *p* in feeding the paper closes the circuit to *r*, and that instantly returns the armature *p* to its normal position and breaks its own circuit at the jaws 19.

I claim as my invention—

1. The perforating-die *e*, made with a hollowed end and projecting corners so as to perforate the paper in the telegraphic composing-instrument, in the manner set forth.

2. In a punch, die, and pressure-foot employed in perforating paper for telegraphic communications, a space made between the pressure-foot and the end of the die at the delivery side thereof, to allow the perforated paper to pass away without obstruction, substantially as set forth.

3. The pressure-foot *i* upon the paper and the die below such paper, in combination with a punch and an opening or space on the delivery side of the punch, to allow the paper to pass freely away, as set forth.

4. The circuit-closer, made of a pair of spring-jaws, receiving the swinging end of a lever, substantially as set forth.

5. The sliding sleeve *d*, adjusted by the screws 4 5, and connected to the lever *f* by the block and pin 3, in combination with the yoke *d'*, punch *e*, and die, arranged and acting in the manner and for the purposes set forth.

6. The arrangement of the feed-wheels *n*, elastic rollers *o*, levers *o'*, armature *p*, pawl 16, and ratchet-wheel *n'*, substantially as and for the purposes set forth.

7. The arrangement of the tablet *t* with the letter-plate in the middle of the tablet, for the purposes set forth, and the grooves allotted to rows of pins that are of greatest length at the sides of such letter-plate, substantially as set forth.

Signed by me this 11th day of April, A. D. 1871.

GEORGE LITTLE.

Witnesses:

HAROLD SERRELL,
GEO. T. PINCKNEY.