



A.D. 1873, 11th SEPTEMBER. N^o 2988.

SPECIFICATION

OF

THOMAS ALVA EDISON.

PERFORATED TELEGRAPHIC PAPER.

LONDON:

PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,

PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY :

PUBLISHED AT THE GREAT SEAL PATENT OFFICE,

25, SOUTHAMPTON BUILDINGS, HOLBORN.

Price 8d.

1874.



A.D. 1873, 11th SEPTEMBER. N° 2988.

Perforated Telegraphic Paper.

LETTERS PATENT to Thomas Alva Edison, of Newark, in the State of New Jersey, United States of America, for the Invention of
“**IMPROVEMENTS IN PERFORATED PAPER FOR TELEGRAPHIC PURPOSES, AND IN MEANS FOR RECEIVING AND TRANSMITTING WITH THE SAME.**”

Sealed the 3rd March 1874, and dated the 11th September 1873.

PROVISIONAL SPECIFICATION left by the said Thomas Alva Edison at the Office of the Commissioners of Patents, with his Petition, on the 11th September 1873.

I, **THOMAS ALVA EDISON**, of Newark, in the State of New Jersey, United States of America, do hereby declare the nature of the said Invention for “**IMPROVEMENTS IN PERFORATED PAPER FOR TELEGRAPHIC PURPOSES, AND IN MEANS FOR RECEIVING AND TRANSMITTING WITH THE SAME,**” to be as follows:—

The paper instead of being perforated in telegraphic characters is
10 perforated in groups that represent Roman or block letters, or other characters, and the message is received upon chemical paper in dots that either touch each other or are sufficiently close to clearly represent

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by their aggregation the letters or characters transmitted, thus making the automatic telegraph strip as convenient as the printed message, and obtaining the rapidity of the former, and avoiding the risks of the inaccuracies of the latter.

The paper is perforated, one letter or character at a time, by an instrument operated by finger keys substantially similar to that shewn in English Patent, No. 1751, A.D. 1872, except that the punches are massed together, preferably in a square, and the connections between each key and the punches are such as to select and operate such of the punches as will perforate the paper to represent the letter or character upon the finger key. It is preferable to employ twenty-five punches in a square of five each way.

The transmission from the perforated strip may be by as many lines of telegraph wires as there are rows (five) of perforations, so that there may be a transmitting stylus to each row of perforations, and also a pen or wire stylus to mark on the chemical paper, and these pens are to be sufficiently close together to produce the letter transmitted in consequence of the contiguity of the marks. The message can be made through one line wire by having the transmitting paper at one end and the receiving paper at the other, and travelling at proper speed; and a series of spring fingers upon a shaft at right angles to the shaft of the roller for the paper, so that these spring fingers draw across the perforated paper, and make contact through the perforations, and at the same instant the chemical paper is marked in the corresponding spot by the spring, pen, or wire drawn across the same, and moving synchronously. Of course the revolving spring finger styluses and pens revolve very rapidly, and the respective strips of paper are drawn along comparatively slowly, the respective parts moving at the same speed or nearly so.

SPECIFICATION in pursuance of the conditions of the Letters Patent, filed by the said Thomas Alva Edison in the Great Seal Patent Office on the 4th March 1874.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, THOMAS ALVA EDISON, of Newark, in the State of New Jersey, United States of America, send greeting.

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WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Eleventh day of September, in the year of our Lord One thousand eight hundred and seventy-three, in the thirty-seventh year of Her reign, did, for Herself, Her heirs and 5 successors, give and grant unto me, the said Thomas Alva Edison, Her special licence that I, the said Thomas Alva Edison, my executors, administrators, and assigns, or such others as I, the said Thomas Alva Edison, my executors, administrators, and assigns, should at any time agree with, and no others, from time to time and at all times thereafter 10 during the term therein expressed, should and lawfully might make, use, exercise, and vend, within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man, an Invention for "IMPROVEMENTS IN PERFORATED PAPER FOR TELEGRAPHIC PURPOSES, AND IN MEANS FOR RECEIVING AND TRANSMITTING WITH THE SAME," upon the 15 condition (amongst others) that I, the said Thomas Alva Edison, my executors or administrators, by an instrument in writing under my, or their, or one of their hands and seals, should particularly describe and ascertain the nature of the said Invention, and in what manner the same was to be performed, and cause the same to be filed in the Great 20 Seal Patent Office within six calendar months next and immediately after the date of the said Letters Patent.

NOW KNOW YE, that I, the said Thomas Alva Edison, do hereby declare the nature of my said Invention, and in what manner the same is to be performed, to be particularly described and ascertained in 25 and by the following statement, reference being made to the Drawing hereto annexed, and to the letters and figures marked thereon (that is to say) :—

In the Morse system of telegraphy the operator frequently receives the message by sound, and writes the same out as received.

30 In the printing telegraph system the printed slip is usually delivered as received.

In the ordinary automatic system the paper has to be punched or composed, and at the receiving station the message on the chemical paper has to be translated and written out by hand, or printed by a key 35 printing instrument.

Each system has its defects or disadvantages. The Morse system is slow, and requires a large number of wires. The printing telegraphs

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are expensive, liable to inaccuracies and injury, and limited in speed to the fingering of the keys. The automatic system is rapid on the line, but the composing of the message and the writing of it out at the receiving station are comparatively slow operations.

The object I have in view is to print the message chemically, thereby 5 the message, as received upon a strip of paper, is ready to be folded and sent to its destination, and the rapidity is equal to any automatic transmission.

I accomplish this object by perforating the strip of paper used for transmitting with groups of holes, representing by each group a letter 10 or character, the perforations being arranged to produce as nearly as possible the block or Roman letters or characters.

The transmission of the message by the line wires may be in the usual manner by a roller or stylus, and a line wire to each row of perforations, so that if there are five rows of perforations there will be five 15 stylus points or rollers, each connected to a line wire, and at the receiving instrument there will be five pens or stylus points near together; and the letter received will be in dots corresponding to the position of the perforations in the transmitting paper, and by their aggregation in groups the letters will be clearly delineated, and formed 20 almost as perfect as printed characters, so that the strip of chemical paper can be delivered, and the re-writing or printing of the message dispensed with.

The message as received being the counterpart of that transmitted the perforated paper at the transmitting station becomes a perfect record of 25 the message, and the line can be worked up to its utmost capacity, because the paper can be perforated for transmitting about as rapidly as an ordinary printing telegraph can be operated, and as many perforating operators and machines can be used as are necessary for the work that is to be done on the lines. 30

I have herein indicated the mode of using this improvement with five line wires, but I contemplate to use the transmitting paper, perforated as herein described, with transmitting and receiving mechanism that will operate with only one line wire.

In the Drawing Fig. 1 represents a piece of paper with perforations, 35 and adapted to use in transmitting.

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Fig. 2 shows the chemical paper with the same word printed there-upon by the dots running together, or being sufficiently close to each other, to show the respective letters.

Fig. 3 is a plan of a portion of the perforating machine.

5 Fig. 4 is an elevation endwise of the punches, and Fig. 5 is a partial section longitudinally.

I find that five lines of perforations are the most convenient for producing perforations in imitation of block letters or characters, and have shown and described such, but I am not limited in that respect.

10 Reference is hereby made to Letters Patent, No. 1751, granted in Great Britain, June 10th, A.D. 1872, for a machine for perforating paper for telegraphic purposes, which, with the modifications herein set forth, is adapted to punching the characters in the strip of transmitting paper.

15 Instead of having two lines of punches *i, i*, as in aforesaid Patent, these punches *i, i*, are twenty-five in number positioned in a square of five each way, and as close together as convenient. Each punch is connected with its slide plate *k*, and these slide plates *k* are side by side, and supported in the frame of the machine, so that they can be moved
20 endwise with facility, and actuate the punches to which they are connected respectively. The punches slide in the plate *m*, and *n* is the die plate, as in said Patent.

There might be a spring to each slide plate *k* and punch *i*, but I have shown a lever *k*¹ passing through mortices in the plates *k*, and provided
25 with a spring to draw all the punches and slide plates back to their normal position after they have been actuated. If the punches are separate from the slide plates each row may be provided with a lever *l* and spring *o* to return or draw back the punches, and said levers *l* act within notches in the punches, as shown.

30 The shoulders or projections 8 are provided upon the slide plates contiguous to the respective pressers *e*, and these projections 8 are only upon such of the slide plates that require to be moved by the presser to which they are adjacent to operate the punches required to perforate the letter corresponding to the one on the finger key *a*, that is, connected to
35 the particular presser *e*, as in aforesaid Patent; and I remark that the slide bars *c* and connecting cams *f* or forks to move the pressers *e* by

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the finger keys *a* may be similar to those shown in said Patent; and the lever *w*¹, feeding clamp *t*, pawl *u*, rack bar *v*, and pawl 10 are similar to the parts shown, and operate in the manner described in the aforesaid Patent, and therefore do not require further description.

From the illustration given in Fig. 1 the general character of the 5 groups of perforations will be apparent, and in the square of twenty-five punches the proper ones can easily be selected to perforate any given letter or character sufficiently like block letters to be reliably read at the receiving station on the chemical paper.

CLAIMS.

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I claim as my Invention,—

First. A strip of paper containing groups of perforations representing letters or characters for use in transmitting telegraphic messages to be received upon chemical paper in imitation of printed characters.

Second. Mechanism for making groups of perforations in a strip of 15 paper in imitation of letters or characters, the same consisting of punches massed together in a square or nearly so, and mechanism intervening between such punches and the finger keys for selecting from such mass of punches those that are required for perforating characters corresponding with the characters upon the respective finger keys, sub- 20 stantially as set forth.

In witness whereof, I have hereunto set my hand and seal this
Thirteenth day of February, A.D. 1874.

THOMAS ALVA EDISON. (L.S.)

Witnesses,

CHA^s. H. SMITH, 121, Nassau St., New York.

GEO. T. PINCKNEY, ,, ,, ,, ,, ,,

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LONDON:

Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty. 1874.