

A. L. FLAMM.  
Cryptography.

No. 166,761.

Patented Aug. 17, 1875.

FIG: 3.



FIG: 1.

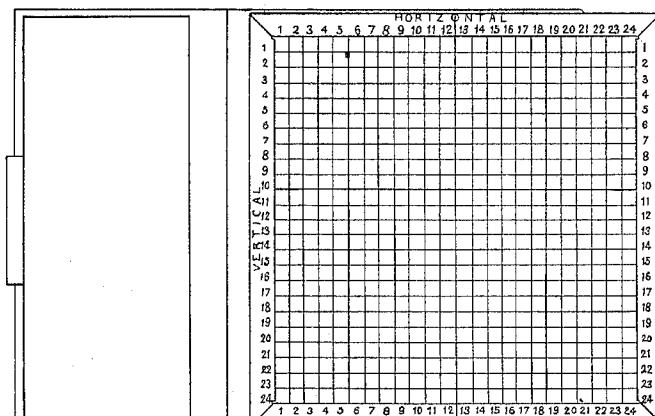


FIG: 2.

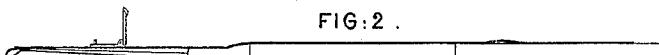


FIG: 5.

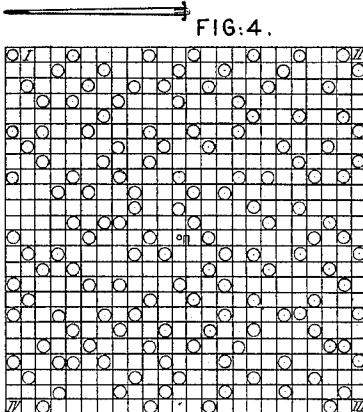
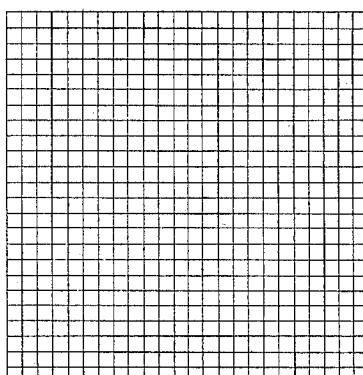


FIG: 6.



Witnesses.

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## IMPROVEMENT IN CRYPTOGRAPHY.

Specification forming part of Letters Patent No. **166,761**, dated August 17, 1875; application filed June 25, 1875.

*To all whom it may concern:*

Be it known that I, ANTHONY LOUIS FLAMM, ex-major of the Ottoman army, of 13 Rue Gaillon, Paris, France, have invented certain new and useful Improvements in Secret Correspondence; and I hereby declare that the following, taken in connection with the drawings which accompany and form part of this specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

My invention consists in an improved system and apparatus by which a secret correspondence, in the shape of letters, postal-cards, telegrams, or otherwise, can be carried out, with the usual letters of the alphabet, rapidly, and yet be unintelligible to all outside parties, by means of a simple and inexpensive apparatus.

In order that my system and apparatus may be clearly understood, I will proceed to describe the same conjointly with the six figures of the accompanying drawing.

My improved cryptograph consists, first, in a tablet, (shown open in plan, Figure 1, in lateral elevation in Fig. 2, and closed in Fig. 3,) divided horizontally and vertically by, say, twenty-five equidistant lines, forming twenty-four vertical and twenty-four horizontal columns, which, by their intersection, produce five hundred and seventy-six squares of equal size—of, say, about one centimeter on a side; secondly, in a folding plate of metal or other appropriate material, (shown open in plan, Fig. 4, and folded in elevation, Fig. 5,) of the same size and divided in the same manner as the tablet, so that the squares of the former correspond exactly with those of the latter; and, thirdly, in sheets of paper or other similar material, Fig. 6, of the same dimensions and divided into squares in the same manner as the tablet and the plate.

An outer frame or border is attached to the tablet, on which are marked, above and below, the figures 1 to 24, corresponding with the vertical columns; and on the two sides are similar figures, corresponding with the horizontal columns, and, above, the word "horizontal," and, on one side, the word "vertical." The plate is marked, in each of its four corners, with one of the Roman letters I II III

IV, and is pierced with one hundred and forty-four holes, which number corresponds with one-quarter of the squares on the tablet, and these holes are made, according to my system, in such a manner that, by placing the plate exactly over the tablet, and by replacing it three times successively, turning it each time one-quarter round, either to the right or to the left, as may be previously agreed upon by the parties using the same for their correspondence, these one hundred and forty-four holes will have covered the five hundred and seventy-six squares of the tablet.

My invention consists in the combination and construction of devices, as hereinafter claimed.

As the distribution of the holes in the plate may be varied to an almost unlimited extent, it follows that millions of parties may use my apparatus without the possibility of one deciphering the composition of the other, since no two parties would use plates similarly pierced. Suffice it to state that the permutations of the holes in a plate containing five hundred and seventy-six squares, as above described, amounts to a number represented by no less than eighty-seven figures.

It is barely necessary to state that the same rule applies to a tablet of smaller or larger dimensions—that is to say, with a greater or smaller number of squares—provided that the number of horizontal and vertical columns are the same, and are both even numbers, thus forming a perfect square.

The manner of using my improved cryptograph for written correspondence, such as letters, postal-cards, &c., is as follows: The sender and receiver being each in possession of an apparatus similar as to size and to distribution of the holes, the sender takes a sheet of paper, prepared as described, of the same size as the tablet, on which he places it. He then covers it with the plate, and writes his epistle from left to right, in the usual manner, letter by letter, on the paper, (or word by word, if desired,) through each successive hole in the plate, commencing with the upper line, and taking all the other lines successively to the bottom of the plate. He then raises the plate, turns it one-quarter round from right to left, or vice

versa, as may have been previously agreed upon, replaces it on the paper, continuing his lettering through the same holes, but on different parts of the paper, and so on, until he has written through the plate four times in four different positions. This written matter, thus prepared for transmission, forms an amalgamation of letters such as it is impossible for any party to decipher, except the receiver, or any other person who is in possession of an apparatus similar to the one by which it was composed. The receiver simply lays the prepared sheet in his tablet in a corresponding manner or position, covers it with the plate, and, beginning with the same edge as the sender, reads off successively the lettering through the holes as seen under the four different positions of the plate. The cross-lines of the paper sheet, corresponding as they do to those of the perforated plate, of themselves insure a correct registering of the two relatively to each other, and afford a sure signal or indication to the eye of the writer or reader of the message, in case the two should accidentally get out of register, so that they may, if desired, be used without the frame or raised border of the tablet. For instance, if the perforated plate be laid upon the cross-lined sheet, and the latter held by pins in its proper relation to the former, and there should be any accidental straining or displacement of the paper upon its pins during the manipulations or turnings of the paper, or if the two should be applied to each other when the light is somewhat dim, and with a consequent liability of not placing all the edges of the paper and the plate so as to register, then the first attempt to write within any perforation, or to read through any and every perforation, would betray, through such perforations, these cross-lines, and thus give visible proof that the registering is incorrect; for when it is correct all the lines of the paper will be hidden beneath the non-perforated parts of the plate. In short, the lines of the paper afford a complete and sure registering-guide, even though the paper be of much larger area than the plate, or be of an irregular shape. The lines, also, much facilitate the reading of the message by the person receiving it, as the alignment of the words and sentences is more readily apparent.

The manner of using my cryptograph for telegraphic purposes is as follows: The sender cuts off from the prepared paper a strip containing such a number of vertical columns as may be required for his telegram, (for the convenience of reckoning it is preferable to adopt rows of five, ten, fifteen, &c.,) writes his dis-

patch thereon from left to right, with one letter on each square, and, when complete, detaches from the bottom thereof any horizontal columns which have not been filled in, and fills in any unoccupied squares of the last column with letters or words having no special signification. He then places his dispatch on such part of the tablet as has been previously agreed upon with his correspondent, covers it with the plate, and retranscribes it on ordinary paper in groups of five letters, for the convenience of reckoning, following the order in which they present themselves successively on the plate, being used four times, and turned one quarter at each application except the first one, continuing thus until the last letter of the last column has been transcribed.

The receiver, who is in possession of an exactly similar apparatus, and acquainted both with the size of paper adopted and its position on the tablet, takes out a similar strip, places it in the same position on his tablet, covers it with the perforated plate, and writes it in, as previously described with regard to the written correspondence. On raising the plate after it has been used in its four different positions, the dispatch will be read correctly transcribed.

I do not claim, broadly, the employment of a square plate marked off into squares, a portion of which are perforated, and arranged to be turned or rotated to be in connection with a plain or unprepared sheet of paper, for cryptographic purposes, as these have been heretofore used; but

What I claim as my invention is—

1. As an improvement in cryptographic apparatus, the combination, with the perforated plate, Fig. 4, cross-lined to form squares, of the paper sheet, Fig. 6, prepared with corresponding squares, substantially as and for the purpose set forth.

2. The folding and framed tablet, provided on its horizontal and vertical margins with the serial numbers, in combination with the perforated plate and prepared-paper sheet, substantially as and for the purpose set forth.

3. In combination with the subject-matter of the above second clause of claim, the exterior wrapper or cover, as described and shown.

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