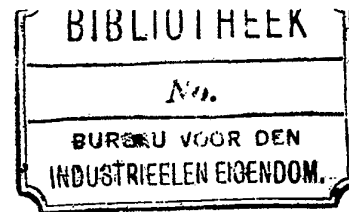


Openbaar gemaakt den

23 AUG. 1923



PATENT SPECIFICATION

Convention Date (Germany): May 23, 1921.

180,653

Application Date (in United Kingdom): May 1, 1922. No. 12,199/22.

Complete Accepted: Aug. 1, 1923.



COMPLETE SPECIFICATION.

Electric Cyphering Apparatus.

I, ARTHUR SCHIERBIUS, of No. 30, Schiffbauerdamm, Berlin, N.W. 6, Germany, of German nationality, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

It is advisable for various reasons to use rows of characters instead of rows of figures in cyphering telegrams.

This invention relates to apparatus designed for this purpose, which is technically simple, easy to manipulate, readable directly and as safe as necessary as regards cyphering technics.

The apparatus is shown in the accompanying drawing. It consists of a switch board (Figure 1) with a number of electric contact buttons and electric incandescent lamps marked with characters and figures. The rows III, IV, VII and VIII are the rows of contact buttons and the rows I, II, V and VI are those of the incandescent electric lamps. The row VII is divided into two groups of contacts 1, 2, 3, 4, 5, and 6, 7, 8, 9, 10. For cyphering a figure-code into a character text contact buttons of the rows VII and VIII are depressed and the characters light up in the rows I and II. There are always depressed simultaneously two figures, one figure in row VII and one figure in row VIII, one of the vowels of the row I and one of the consonants of row II being thus lighted. For decyphering the rows III, IV, V, and VI enter into operation. The characters of the rows III and IV are translated into figures of the rows V and VI.

Figure 2 is a connection diagram from which it can be seen how the contacts and incandescent lamps are connected with one another.

The figures I to VIII in the connection diagram indicate those contacts and

rows of incandescent lamps which are similarly designated in Figure 1.

The boxes 11 and 12 are multiple switch boards which connect each lead coming from above with the corresponding lead coming from below and which are adapted to interchange these connections with the greatest possible capability of variation. These switches can be arranged also in such a manner that the connections are changed constantly, e.g. after each group of two signs and that this change takes place automatically at the depression of the contact buttons. The multiple switch boards 11 and 12 improve considerably the security of the cyphering but they are not of fundamental importance.

The connection diagram shown in Figure 2, in which every lead 13 would be directly connected with every lead 14 and every lead 15 would be directly connected with every lead 16 if a multiple switch were not inserted, is also included in the invention. The constructive details of the multiple switch boards and the control of the same are optional.

The connection will be best explained by way of an example.

If the group of figures "14" has to be cyphered the switches 17, 18 and 19, which are preferably coupled mechanically the one with the other, are brought to the position "cyphering" viz. the position which is indicated in the diagram. In the row VII of the contact buttons the contact 1 and in the row VIII the contact 4 is depressed. The current flows then along the path indicated by the dash line that is to say, from contact "1" in row VII through the switch 12 to the lead 21 (in accordance with the actual position of the switch 12) to the incandescent lamp "i" of row I across the switch 18 through the battery and the switch 17 to contact

- "4" of row VIII across the multiple switch 11 to lead 22 to incandescent lamp "g" row II across the upper lever of the switch 19 back to the contact "1".
- 5 The group of figures "14" has thus been translated into the group of characters "ig". If "6" had to be cyphered instead of "1", viz. the group of figures "64", the contact 6 in row VII and
- 10 contact 4 in row VIII would have had to be depressed. In this case the flow of current from the branching points 23 and 24 downward would be the same as hereinbefore described. Above these points
- 15 the line with long dashes represents the current course. Thus the current flows from contact "6" row VII across incandescent lamp "i" row I across contact "4" row VIII to the incandescent lamp
- 20 "h" row II, across the lower lever of the switch 10 back to contact "6" row VII. From the connections it can be seen that the ten contacts in row VIII do not alone determine the characters of
- 25 the row II but that for the selection of the same it is further decisive whether a contact of the left hand side or of the right hand side group of row VII is depressed, as the contacts of the right
- 30 hand side group and of the left hand side group of row VII act upon the same series of the group of characters I.
- The decyphering of the group of characters "ig" is effected by the depression, after the reversing of the switches
- 35 17, 18 and 19 to the decyphering position, of the contacts "i" or "g" in the rows III and IV. The course of the current is indicated by the dash and dot
- 40 line. In the cyphering mechanism proper the course of the current is the same as at the cyphering with the difference that by the switches the lamps are interchanged with the correspondingly
- 45 situated and similarly designated contacts and inversely (see Figure 1 and Figure 2).
- As can be seen from the diagram of connections always one of the contacts
- 50 in row VII must be at the cyphering depressed simultaneously with one of the buttons of row VIII and at the decyphering one button of each of the rows III and IV must be depressed simultaneously.
- 55 In order to avoid the necessity for working with two hands it is advisable to couple the buttons of the four rows III, IV and VII and VIII the one with the other mechanically in such a manner
- 60 that the buttons remain after the depression in the switching-in position and jump out again only if another button of the same row is being depressed.
- 65 Arrangements of this type are well known in telephone technics. If for instance the button 1 of row VII and the button 4 of row VIII are depressed the two contacts remain closed. The cypher-characters can be read from the incandescent lamps at leisure. If now a new group of two figures is adjusted the buttons 1 and 4 jump back automatically. The arrangement can further be such that the contacts of the upper rows are raised only if those of the lower rows are raised again.
- 70
- The invention is not limited to the use of incandescent lamps as direct registering mechanism may be employed, for instance the incandescent lamps may be replaced by magnets which operate key levers of a typewriting machine. Thus when a contact of any of the contact rows is depressed a character is typed on a sheet of paper by the typewriting machine. Revolving type wheels, or type wheels with limiting stops with or without changing over could be used, as shown by Figure 3. The type wheels 37, 38 may be provided for rotation at uniform speed by a shaft 39 and may for instance carry on the circumference of the one wheel the characters *b, d, g, k, m, p, r, t, w, and y* arranged along an arc of a circle, and on the other wheel arranged along another arc of a circle, parallel to the first, the characters *c, f, h, l, n, q, s, v, x and z*. By electromagnets 40 and 41 inserted in the circuit at 25 and 26 the type wheels 37 and 38 are displaced in the direction of the arrows 42 so that one letter of the one or the other row of letters is printed upon the paper 44 placed upon the paper support 43, when the latter is momentarily moved towards the typewheel.
- 80
- 85
- 90
- 95
- 100
- 105
- Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—
- 110
1. Cyphering and decyphering apparatus for the translation of a pair of figures into a pair of characters, one a vowel and the other a consonant, and conversely, in which the vowels are arranged to correspond to two groups of figures and the consonants are arranged to correspond to one set of figures, the consonant determining the group to which the figure represented by the vowel appertains, characterized in that two rows of electrical contacts are provided for the figures and two series of indicators (for instance rows of suitably marked electric lamps) are provided for the characters, the figure contacts of the first row being divided into two groups and electrically connected in pairs, made
- 115
- 120
- 125
- 130

up of one contact from each group, to a common character indicator of the first row of characters, and the figure contacts of the second figure row being each electrically connected to a pair of character indicators, of the second row of characters each of which pairs has its two character indicators, combined in one group, and electrically connected, one to each of the two groups of the first row of figure contacts.

2. Cyphering and decyphering apparatus according to Claim 1 characterized in that an electrical contact is arranged parallel to each indicator and one pole of each of the indicators and one pole of each of the contacts are connected with a group line, one of these group lines, by means of a switch, being included, when desired in an electrical circuit for changing cyphering into decyphering, and conversely.

3. Cyphering apparatus according to Claim 1 or 2 characterized in that the contacts of the individual rows of contacts are coupled with one another mechanically in such manner that each of the contacts when closed is opened automatically as soon as another contact of the same row is closed.

4. Cyphering and decyphering apparatus according to Claim 1 or 2 wherein the indicators comprise typewheels with different type rows, characterized in that the type wheels are shifted by electromagnets arbitrarily excited by one of the group lines.

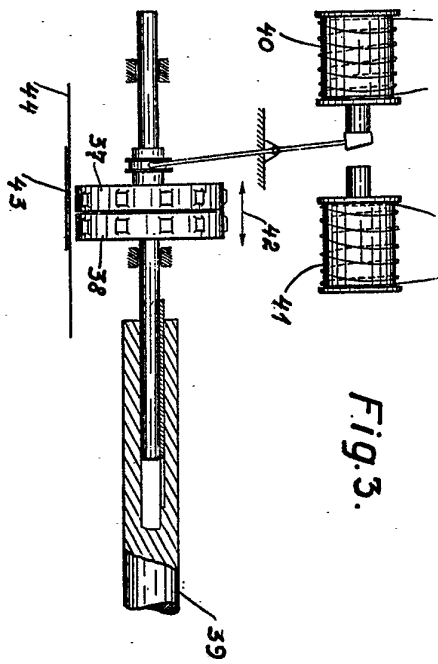
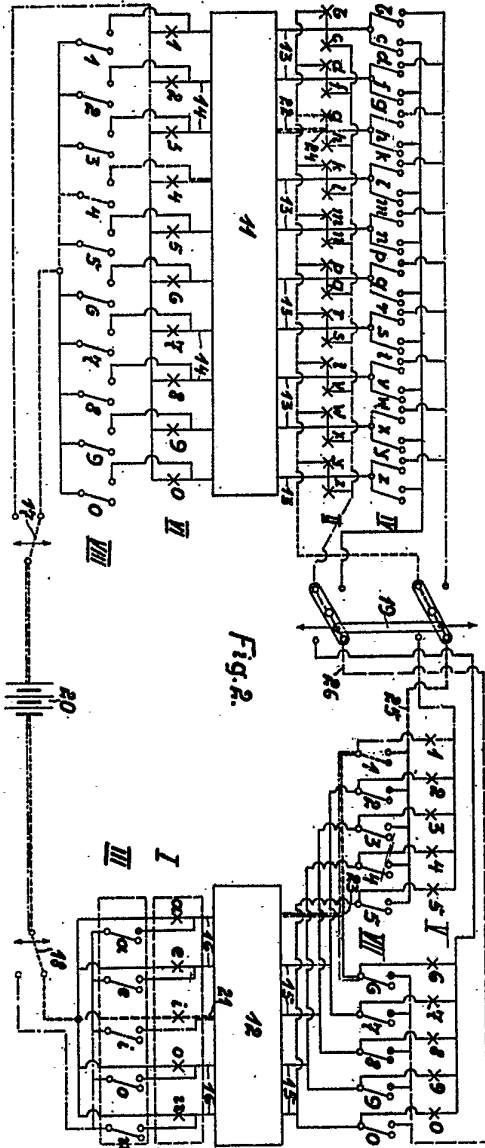
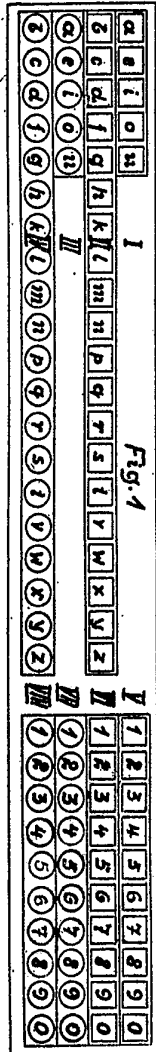
5. The electric cyphering and decyphering apparatus hereinbefore described and illustrated.

Dated this 1st day of May, 1922.

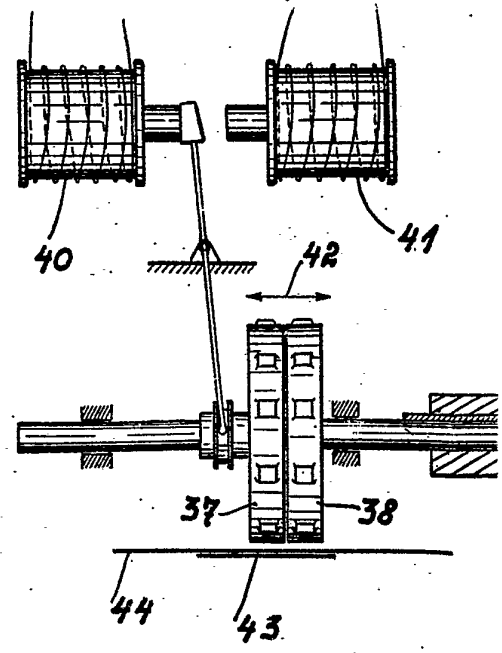
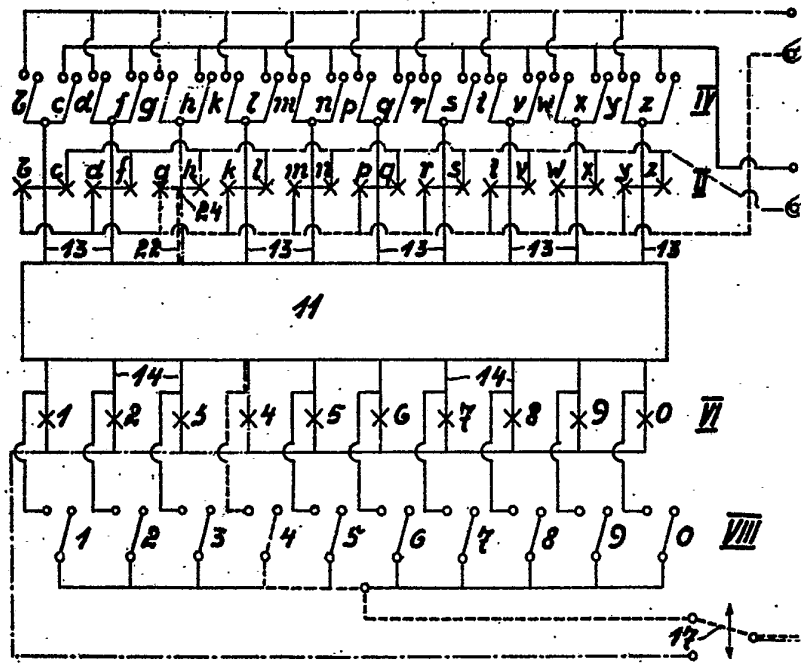
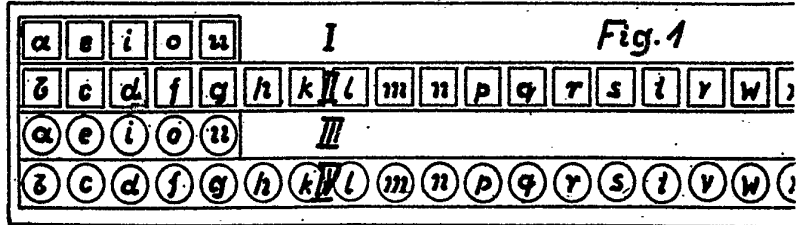
MATHYS & Co.,

Chartered Patent Agents,
52, Chancery Lane, London, W.C.

[This Drawing is a reproduction of the Original on a reduced scale]



[This Drawing is a reproduction of the Original on a reduced scale.]



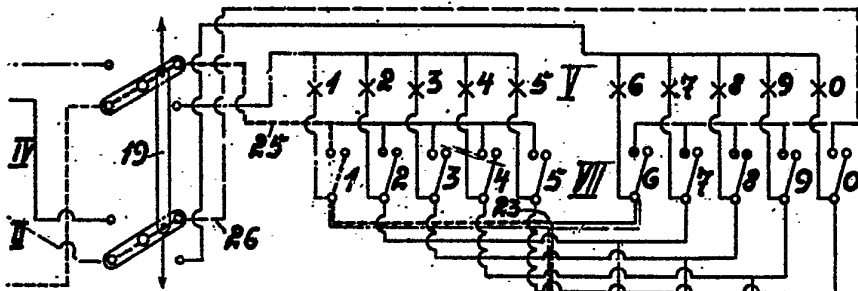
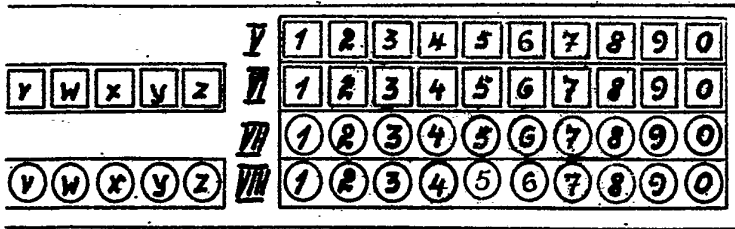


Fig. 2.

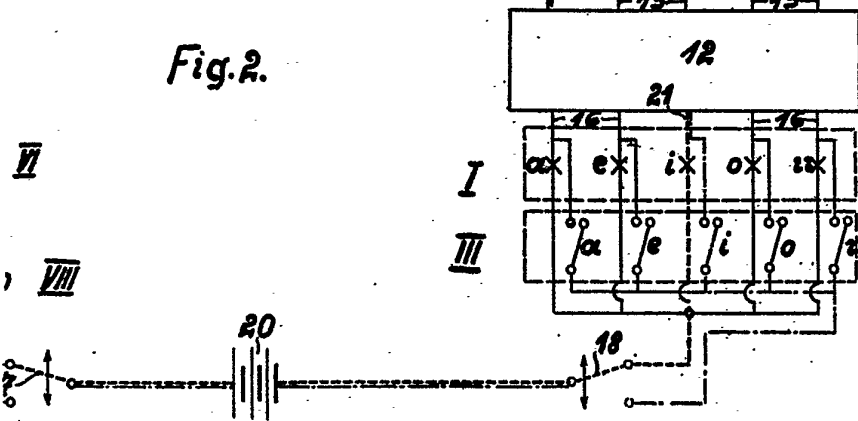
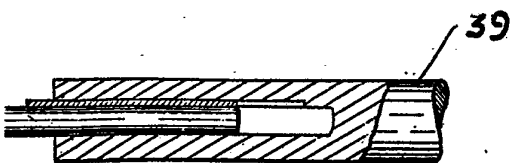


Fig. 3.

41



8