CRYPTOGRAPHIC AND OPERATING ADVANTAGES

The proposed machine contains the possibility of controlling the coding cycle at will, AND making use of factorial 26 alphabets.

The punched cards may be prepared from any source of information which is available to parties with whom communication is desired. They may be serially numbered and used over and over again. They may be destroyed after use. Each card may be tumbled or turned end-for-end to give four different control patterns. They may be changed for every line of a message, or they may be left in for any desired length of time, depending of course on the degree of secrecy desired. The fact that the cards may be punched from any source of information or from any language or random selection, makes it possible to have a machine in which the relay selection is never repetative, except possibly by coincidence, throughout the life of the machine.

There is nothing in the machine itself which would be of any assistance to anyone in aiding the decoding of a message. Obviously, unless the proper card is in place for the line being coded or decoded, and unless the plugboard connections correspond with those at the time the original message was put up, nothing remains of any value to anyone so far as "breaking" a message is concerned.

It would therefore seem possible that the machines could have wide distribution without the possibility of their becoming obsolete for reasons of "insecurity".

The card movement is made equal to the movement of the typewriter carriage, by mechanically tieing the two together and there is therefore no possibility of the card and the letters being typed getting

out of step. This avoids the necessity for resetting mechanism or for returning to a given point in the cycle for the correction of errors.

To correct an error the carriage may be back-spaced, the wrong characters erased and the correct ones typed in.

The relays A to E and 1 to 5 inclusive are energized in combination by means of holes punched in a card. This gives a total of 25 positions for each letter of the alphabet. If the 26th or English position is desired for coding purposes the relay X may be controlled from another hole in the card.

Z and the "equal" sign will decode as spaces. The equal sign may be omitted entirely if desired.

The typewriter keyboard has been changed to a modified Teletypewriter arrangement. All alphabetic characters appear in one case and all numerals and punctuation marks appear in the other. This makes it possible to code all letters, figures and punctuation which are found in general telegraphic communication through one coding means.

One typical block of alphabets is shown to the left of the diagram. A total of factorial 26 are available by plugging.

PROPOSED CODATYPE CIRCUITS

Description of Drawing X-123B

To the left of the diagram are seen the cam switches of the operating typewriter which close each time a character is printed. These switches are plugwire connected to the transfer points of relay X which throws the machines into English position when the relay is energized.

In the un-energized position of relay X the cam switch circuit is to one point each of relays A, B, C, D and E representing one co-ordinate. Relays 1, 2, 3, 4 and 5 represent the other co-ordinate and when one relay of each co-ordinate is energized there is formed a circuit from cam switch to solenoid. The solenoids operate the translating typewriter key levers, causing a character to be printed.

The combinational energization of the two groups of relays allows a total of 25 different letters which every other letter may equal, for example, the letter A may equal every other letter of the alphabet. A can only be equal to A when relay X is energized, etc.

A plugboard has been inserted between the solenoid position leads from the relays 1 to 5 inclusive, so that any solenoid may be plugged to any of the 26 positions shown. This may likewise be done with the cam switches. As it is necessary that cam switch A is plugged to cam switch position 10 and solenoid A plugged to solenoid position 10, etc., dual plugs are used which plugs both circuits at the same time and avoids the possibility of plugging error. It also makes it possible to plug any of the factorial 26 alphabets available by the plugging of but 26 wires.