

*Classified by [unclear] on [unclear] 11/1/51*

1. In a cryptograph, a keyboard comprising a set of character elements; a corresponding set of signaling elements; a cipher rotor for varying the connections between the character elements and the signaling elements, said rotor having a multiplicity of potential ciphering positions and being driven sequentially and repetitively at a uniform angular velocity through all said positions, each complete revolution of said rotor constituting a ciphering cycle and each said ciphering cycle corresponding to the time during which a key of the keyboard is depressed; and means for selecting one of said potential ciphering positions to become the operative ciphering position within a ciphering cycle.

2. In a cryptograph, a keyboard comprising a set of character elements; a corresponding set of signaling elements; a cipher rotor for varying the connections between the character elements and the signaling elements, said rotor having a multiplicity of potential ciphering positions and being driven sequentially and repetitively

at a uniform angular velocity through all said positions, each complete revolution of said rotor constituting a ciphering cycle and each said ciphering cycle corresponding to the time during which a key of the keyboard is depressed; means for selecting one of said potential ciphering positions to become the operating ciphering position within a ciphering cycle and means for varying the selection with successive ciphering cycles, the latter corresponding to successive depressions of the keys of the keyboard.

3. In a cryptograph, a keyboard comprising a set of character elements and corresponding contacts associated therewith; an indicating mechanism comprising a set of signaling elements corresponding in number with the number of character elements; means for establishing and varying the electrical connections between the character elements and the signaling elements, said means consisting of a set of insulated conductors within a cipher rotor which has a multiplicity of potential ciphering positions; means for driving said rotor sequentially and

repetitively at a uniform angular velocity through all said ciphering positions; each complete revolution of said rotor constituting a ciphering cycle and each said ciphering cycle corresponding to the time a key of the keyboard is depressed; means for selecting one of said potential ciphering positions to become the operative ciphering position within a ciphering cycle, said means comprising a distributor and a brush revolving about the face of said distributor synchronously with said rotor; a relay, which when actuated connects the keyboard to battery, said relay being controlled by a circuit in which are placed the brush of said distributor mechanism and a contact closed by a translator, said translator being controlled by a set of cam wheels; and means for angularly displacing the cam wheels of said set of cam wheels.

4. In a cryptograph, a keyboard comprising a set of character elements; an indicating mechanism comprising a set of signaling elements; a cipher rotor for establishing a multiplicity of connections

between the character elements and the signaling elements; means for driving said rotor sequentially and repetitively through the entire series of such connections, the time required for the rotor to pass through said series of connections corresponding to an operating cycle; a distributor the face of which is divided up into insulated segments corresponding in number with the number of character elements and having a brush sweeping said segments synchronously with the rotor; a cam wheel mechanism for establishing a cipher key; a translator mechanism for combining the effects of said cam wheel mechanism; a switchboard for reducing the said effects to a number corresponding with the number of character elements; and a relay controlled by the cam wheel mechanism through the intermediacy of said translator mechanism and distributor for the purpose of connecting the keyboard to battery at a selected instant within the operating cycle.

5. In a cryptograph including a keyboard comprising character elements, an indicating mechanism comprising signaling elements, and

a cipher rotor for establishing and automatically, rhythmically, and sequentially varying the connections between the character elements and the signaling elements, means for selecting one of a set of said connections during the time a key of the keyboard is depressed; and means for varying the selection with successive depressions of the keys of the keyboard.

6. In a cryptograph, a cam-wheel mechanism for establishing a cipher key sequence consisting of permutations of a plural-unit code and means for translating the permutations set up in said code by said cam-wheel mechanism into a limited number of single-unit keying characters.

7. In a cryptograph, a cam-wheel mechanism for establishing a cipher key sequence consisting of permutations of a plural-unit code; means for translating the permutations set up in said code by said cam-wheel mechanism into a limited number of single-unit keying characters; and a switchboard for reducing said keying characters to a smaller number.

8. In a cryptograph, means for producing a relatively long cipher key sequence composed of single-unit keying characters, said means consisting of a cam-wheel mechanism controlling the permutation bars of a translator, a set of contacts controlled by the stunt bars of said translator; and a distributor the segments of which are connected to said contacts.

9. In a cryptograph, means for producing a relatively long cipher key sequence composed of single-unit keying characters, said means consisting of a cam-wheel mechanism for controlling the permutation bars of a translator; a set of contacts controlled by the stunt bars of said translator; and a distributor the segments of which are connected to said contacts through a switchboard for reducing the number of effects obtainable from the translator to the number of segments on the distributor.

10. In a cryptograph, means for producing a relatively long cipher key sequence, said means consisting of a cam-wheel mechanism controlling the permutation bars of a translator; a set of contacts controlled by

the stunt bars of said translator; and a distributor the segments of which are connected to said contacts through a switchboard adapted to reduce the number of effects obtainable from the translator to the number of segments on the distributor and to vary the connections between the contacts of the translator and the segments of the distributor.

11. In a cryptograph, a keyboard comprising a set of character elements; a corresponding set of signaling elements; a set of rotatable ciphering commutators for varying the connections between the character elements and the signaling elements, each of said commutators having a multiplicity of potential ciphering positions; means for selecting one or more of said commutators to become rotors to be driven sequentially and repetitively at a uniform angular velocity through all of their potential ciphering positions, each complete revolution of said selected rotor or rotors constituting a ciphering cycle and each said ciphering cycle corresponding to the time during which a key of the keyboard is depressed; and means for selecting one of said potential ciphering positions to become the operative ciphering position in said ciphering cycle.

12. In a cryptograph, a keyboard comprising a set of character elements; a corresponding set of signaling elements; a set of rotatable ciphering commutators for varying the connections between the character elements and the signaling elements, each of said commutators having a multiplicity of potential ciphering positions; means for selecting one or more of said commutators to become rotors to be driven sequentially and repetitively at a uniform angular velocity through all of their potential ciphering positions, each complete revolution of said selected rotor or rotors constituting a ciphering cycle and each said ciphering cycle corresponding to the time during which a key of the keyboard is depressed; means for selecting one of said potential ciphering positions to become the operative ciphering position in said ciphering cycle; and means for varying the selection of said potential ciphering position with successive ciphering cycles.

13. In a cryptograph, a keyboard comprising a set of character elements and a corresponding set of contacts associated therewith; an indicating mechanism associated with the keyboard and comprising a set



of signaling elements corresponding in number with the number of character elements of the keyboard; means for automatically, rhythmically, and sequentially establishing a multiplicity of sets of different paths for the passage of electric currents from the contacts of the keyboard to the signaling elements of the indicating mechanism; means for momentarily selecting one of said sets of paths and simultaneously connecting the common terminal of the set of contacts of the keyboard to a source of electric potential so that an electric current initiated by depressing one of the keys of the keyboard will flow along one of the paths in said selected set of paths to one of the signaling elements of the indicating mechanism; and means for varying said momentary selection of a set of said paths with successive depressions of the keys of the keyboard.

14. In a cryptograph, a keyboard comprising a set of character elements and a corresponding set of contacts associated with the character elements; an indicating mechanism associated with said keyboard and comprising a corresponding set of signaling elements; means for rhythmically

and sequentially interposing a multiplicity of sets of electric conductors between said keyboard and said indicating mechanism; means for selecting one of said sets of conductors and establishing operative electrical connections between the contacts of said keyboard and the signaling elements of said indicating mechanism; and means for varying said selection irregularly and with successive depressions of the keys of said keyboard.

15. In a cryptograph, a keyboard comprising character elements; a corresponding set of signaling elements in a potentially operative electrical connection with the keyboard; means comprising a rotatable commutator for varying the connections between the keyboard elements and the signaling elements; a motor to rotate the commutator at a constant speed, each complete revolution of the rotor comprising one operating cycle during which the keyboard may be operated in enciphering or deciphering; a cam-wheel mechanism comprising a set of cam-bearing rotatable members; means for angularly displacing the cam-bearing members

upon operation of the keyboard; a set of contact levers and associated contacts controlled by the cam-wheel mechanism; a translator mechanism controlled by the cam-wheel mechanism for combining the effects of the cam-controlled contacts and causing the selection of one of a plurality of cipher-keying circuits; a switchboard for reducing the plurality of cipher-keying circuits to a number of circuits corresponding with the number of character elements of the keyboard; a distributor comprising a plurality of insulated segments corresponding in number with the number of character elements of the keyboard and connected to one side of the switchboard; a brush arm carrying a brush which sweeps over the segments of the distributor, the brush arm being keyed to the same shaft on which the commutator is rotated by the motor so that the commutator and the brush on the distributor face rotate synchronously; and a relay controlled by said distributor for connecting the keyboard to a power source for a specific instant in the operating cycle, said instant being determined by the cipher-key combination established by the cam-wheel mechanism.

16. In a cryptograph, a keyboard comprising a set of character elements with associated contacts; an indicating mechanism associated with the keyboard and comprising a corresponding set of signaling elements; means for connecting the contacts with the signaling elements and for varying said connections sequentially and rhythmically in a multiplicity of ways, said means comprising a set of ciphering rotors which are interposed between two fixed stators and which has a multiplicity of potentially-operative ciphering positions with respect to said stators, said rotors being mounted upon a shaft; means for rotating one or more of said rotors at a constant angular velocity; means for momentarily connecting the common terminal of the contacts of the keyboard to a source of electric potential when said selected rotors of the set of rotors have reached a selected ciphering position, thus causing the selected ciphering position of the rotors to act as the operative ciphering position; and means for varying the selection of the driven rotors and of their operative ciphering position with successive depressions of the keys of the keyboard.

17. In a cryptograph including a keyboard comprising a set of character elements and a corresponding set of signaling elements, means for connecting the keyboard to battery for the purpose of establishing operative electrical connection between the keyboard and the signaling elements, said means being actuated only during a specific time-interval within a set of equal time-intervals into which each cycle of keyboard operation is divisible.