

I claim : -

1. In a cryptograph, a keyboard comprising character elements in operative electrical connection with corresponding signaling elements; means comprising a set of juxtaposed, rotatable commutators for varying the connections between the keyboard elements and said signaling elements; a cipher-key transmitter; and means coordinated with the transmitter to effect permutative, stepwise displacements of the commutators.

2. In a cryptograph, a keyboard comprising character elements in operative electrical connection with corresponding signaling elements; means comprising a set of juxtaposed, rotatable commutators for varying the connections between the keyboard elements and said signaling elements; a cipher-key transmitter mechanism; and means coordinating said mechanism with the commutators to effect permutative, stepwise displacements of the commutators.

3. In a cryptograph, a keyboard comprising character elements in operative electrical connection with corresponding signaling elements; means comprising a set of juxtaposed, rotatable commutators for varying the connections between the keyboard elements and said signaling elements; a cipher-key transmitter mechanism; and a series of commutator stepping mechanisms, the cipher-key transmitter mechanism being operatively associated with the commutator stepping mechanisms to effect permutative, stepwise displacements of the commutators.

4. In a cryptograph, a keyboard comprising character elements in operative electrical connection with corresponding signaling elements; means comprising a set of juxtaposed, rotatable commutators for varying the connections between the keyboard elements and said signaling elements; a plurality of cipher-key transmitters; and means coordinating said transmitters to effect permutative, stepwise displacements of the commutators.

5. In a cryptograph, a keyboard comprising character elements in operative electrical connection with corresponding signaling elements; means comprising a set of juxtaposed, rotatable commutators for varying the connections between the keyboard elements and said signaling elements; a plurality of cipher-key transmitters; a series of commutator stepping mechanisms each comprising a magnet and associated ratchet and pawl, the set of commutator stepping mechanisms being controlled by the said cipher-key transmitters associated as a group and coordinated collectively to effect permutative, stepwise displacements of the commutators.

*(100-100-10-100)*

6. In a cryptograph, a keyboard comprising character elements in operative electrical connection with corresponding signaling elements; means comprising a set of juxtaposed, rotatable commutators for varying the connections between the keyboard elements and said signaling elements; a cipher-key transmitter mechanism; and means coordinating said mechanism with the commutators to effect permutative, stepwise displacements of the commutators, the cipher-key transmitter mechanism being controlled by a keying element

which is independent of the cryptograph, *each element comprising a ratchet and pawl mechanism which is independent of the cryptograph.*

7. In a cryptograph, a keyboard comprising character elements in operative electrical connection with corresponding signaling elements; means comprising a set of juxtaposed, rotatable commutators for varying the connections between the keyboard elements and said signaling elements; a plurality of cipher-key transmitters; and means coordinating the transmitters to effect permutative, stepwise displacements of the commutators, the transmitters being controlled by separate keying elements which are external to and independent of the cryptograph.

8. In a cryptograph, a keyboard comprising character elements in operative electrical connection with corresponding signaling elements; means comprising a set of juxtaposed, rotatable commutators for varying the connections between the keyboard elements and said signaling elements; a cipher-key transmitter mechanism; and means coordinating said mechanism with the commutators to effect permutative, stepwise displacements of the commutators, the cipher-key transmitter mechanism being controlled by a keying element which is external to and independent of <sup>the</sup> cryptograph, and which includes a perforated tape bearing perforations permuted in accordance with a plural-unit code to represent characters in that code.

9. In a cryptograph, a keyboard comprising character elements in operative electrical connection with corresponding signaling elements; means comprising a set of juxtaposed, rotatable commutators for varying the connections between the keyboard elements and said signaling elements; a plurality of cipher-key transmitters; and means coordinating the transmitters to effect permutative, stepwise displacements of the commutators, the said transmitters being controlled by separate keying elements which are external to and independent of the cryptograph, and which include perforated tapes bearing perforations permuted in accordance with a plural-unit code to represent characters in that code.

10. In a cryptograph, a keyboard comprising character elements in operative electrical connection with corresponding signaling elements; means comprising a set of juxtaposed, rotatable commutators for varying the connections between the keyboard elements and said signaling elements; a plurality of cipher-key transmitters; and means coordinating the transmitters to effect permutative, stepwise displacements of the commutators, the said

transmitters being controlled by individual keying elements which are external to and independent of the cryptograph, and which include perforated tapes bearing perforations permuted in accordance with a plural-unit code to represent characters in that code, the numbers of such characters in the respective tapes being prime to one another.

11. In a cryptograph of the character described, the combination of a set of juxtaposed, rotatable commutators; a set of commutator stepping mechanisms; and a plural-unit-code cipher-key transmitter.

12. In a cryptograph of the character described, the combination of a set of juxtaposed, rotatable commutators; a set of commutator stepping mechanisms; and a plural-unit-code cipher-key transmitter for controlling the commutator stepping mechanisms to effect permutative, stepwise displacements of the commutators.

13. In a cryptograph of the character described, the combination of a set of juxtaposed, rotatable commutators; a set of commutator stepping mechanisms; and a plurality of plural-unit-code cipher-key transmitters.

14. In a cryptograph of the character described, the combination of a set of juxtaposed, rotatable commutators; a set of commutator stepping mechanisms; and a plurality of plural-unit-code cipher-key transmitters electrically associated for collectively controlling the commutator stepping mechanisms to effect permutative, stepwise displacements of the commutators.

15. In a cryptograph of the character described, the combination of keyboard elements and signaling elements; a set of juxtaposed, rotatable commutators for varying the connections between the two sets of elements; a series of commutator stepping mechanisms for displacing the respective commutators in a stepwise manner; and a plural-unit-code cipher-key transmitter for controlling the commutator stepping mechanisms to effect the stepwise displacements of the commutators in a permutative manner.

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16. In a cryptograph of the character described, the combination of keyboard elements and signaling elements; a set of juxtaposed, rotatable commutators for varying the connections between the two sets of elements; a set of commutator stepping mechanisms for displacing the respective commutators in a step-wise manner; and a plurality of plural-unit-code cipher-key transmitters for collectively controlling the commutator stepping mechanisms to effect the stepwise displacements of the commutators in a permutative manner.

*same*

17. A mechanism of the character described, comprising a set of elements constituting a keyboard, and a set of elements constituting a signaling bank; *said sets of elements being electrically interrelated*; a set of juxtaposed, rotatable switching devices for varying the *electrical relation* connections between the two sets of elements; and means for effecting step-wise displacements of the switching devices in an aperiodic manner.

18. A mechanism of the character described, comprising a set of elements constituting a keyboard, and a set of elements constituting a signaling bank; *said including electrical connections between said sets of elements*; a set of juxtaposed, rotatable switching devices for varying the connections between the two sets of elements; and means for effecting step-wise displacements of the switching devices in an aperiodic manner, said means being controlled by an element which is external to and independent of the mechanism itself.

19. A mechanism of the character described, comprising a set of elements constituting a keyboard, and a set of elements constituting a signaling bank; *said including electrical connections between said sets of elements*; a set of juxtaposed, rotatable switching devices for varying the connections between the two sets of elements; and means for effecting stepwise displacements of the switching devices in an aperiodic manner, the stepwise displacements of the set of switching devices being permutative in character.

20. A mechanism of the character described, comprising a set of elements constituting a keyboard, ~~and~~ a set of elements constituting a signaling bank; <sup>and including circuit connections between said sets of elements</sup> a series of juxtaposed, rotatable switching devices for varying the connections between the two sets of elements; means for effecting stepwise displacements of the switching devices in an aperiodic manner, the stepwise displacements of the set of switching devices being permutative in character, the permutations of said displacements being determined by an external key.

21. A mechanism of the character described, comprising a set of elements constituting a keyboard, ~~and~~ a set of elements constituting a signaling bank; <sup>and including circuit connections between said sets of elements</sup> a set of juxtaposed, rotatable switching devices for varying the connections between the two sets of elements; means for effecting stepwise displacements of the switching devices in an aperiodic manner, the displacements of the set of switching devices being permutative in character; and means comprising an external key for determining the permutations of said displacements, said key comprising <sup>proximate</sup> a non-repeating <sup>sequence</sup> of ciphering characters arranged in random, unintelligible order. <sup>Said mechanism is represented by descriptive formulae in accordance with a tabular circuit code.</sup>

22. A mechanism of the character described, comprising a set of elements constituting a keyboard and a set of elements constituting a signaling bank; <sup>electrical connections between said sets of elements</sup> a set of juxtaposed, rotatable switching devices for varying the connections between the two sets of elements; means for effecting stepwise displacements of the switching devices in an aperiodic manner, the displacements of the set of switching devices being permutative in character; and means comprising an external key for determining the permutations of said displacements, said key comprising <sup>substantially</sup> a non-repeating <sup>sequence</sup> of ciphering characters arranged in random, unintelligible order, and the said ciphering characters being employed successively to encipher successive characters of the message.

23. A mechanism of the character described, comprising a set of elements constituting a keyboard and a set of elements constituting a signaling bank; <sup>circuit connections between said sets of elements;</sup> a set of juxtaposed, rotatable switching devices for varying the connections between the two sets of elements; means for effecting stepwise displacements of the switching devices in an aperiodic manner, the displacements of the set of switching devices being permutative in character; and means comprising a plurality of independent but interacting external <sup>keys</sup> (bars) for determining the permutations of said displacements.

24. A mechanism of the character described, comprising a set of elements constituting a keyboard and a set of elements constituting a signaling bank; <sup>circuit connections between said sets of elements;</sup> a set of juxtaposed, rotatable switching devices for varying the connections between the two sets of elements; means for effecting stepwise displacements of the switching devices in an aperiodic manner, the displacements of the set of switching devices being permutative in character; and means comprising a plurality of independent but interacting external keys for determining the permutations of said displacements, each of said keys comprising a non-repeating sequence of ciphering characters arranged in random, unintelligible order.

25. A mechanism of the character described, comprising a set of elements constituting a keyboard and a set of elements constituting a signaling bank; <sup>circuit connections between said sets of elements;</sup> a set of juxtaposed, rotatable switching devices for varying the connections between the two sets of elements; means for effecting stepwise displacements of the switching devices in an aperiodic manner, the displacements of the set of switching devices being permutative in character; and means comprising a plurality of independent but interacting external keys

for determining the permutations of said displacements, each of said keys comprising a non-repeating sequence of ciphering characters arranged in random, unintelligible order, and the interaction of the said keys producing a resultant single key consisting of an unintelligible sequence of characters which serves as the cipher key to encipher the successive characters of the message.

26. In a cryptographic system employing an element upon which a plain-text character is established and an element upon which a cipher character is established, and including a set of juxtaposed, rotatable switching devices operatively interposed between said elements; the method of enciphering which consists in continuously varying the cipher resultant of a given plain-text character by externally and aperiodically controlling the displacements of said switching devices permutatively and in a stepwise manner.

27. In a cryptographic system employing an element upon which a plain-text character is established, an element upon which a cipher character is established and a set of juxtaposed, rotatable switching devices operatively interposed between said elements, all coordinated for operation under the control of a cipher-key transmitter; the method of enciphering which consists in continuously varying the cipher resultant of a given plain text character by externally and aperiodically controlling the displacements of said switching devices permutatively and in a stepwise manner, the step of external control involving the operation of the cipher-key transmitter according to an unintelligible, random sequence of keying characters.



28. In a cryptographic system employing an element upon which a plain-text character is established, an element upon which a cipher character is established, and a set of juxtaposed, rotatable switching devices operatively interposed between said elements, all coordinated for operation under the control of a plurality of electrically interacting cipher-key transmitters; the method of enciphering which consists in continuously varying the cipher resultant of a given plain-text character, by externally and aperiodically controlling the displacements of said switching devices, permutatively and in a step-wise manner, the step of external control involving the operation of the individual cipher-key transmitters according to respective, unintelligible random sequences of keying characters.

29. In a cryptographic system employing an element upon which a plain-text character is established, an element upon which a cipher character is established and a set of juxtaposed, rotatable switching devices operatively interposed between said elements, all coordinated for operation under the control of a cipher-key transmitter through which is passed a perforated tape; the method of enciphering which consists in continuously varying the cipher resultant of a given plain-text character by externally and aperiodically controlling the displacements of said switching devices permutatively and in a step-wise manner, the step of external control involving the operation of the cipher-key transmitter according to an unintelligible, random sequence of keying characters, said characters being represented by perforations in said tape.

30. In a cryptographic system employing an element upon which a plain-text character is established, an element upon which a cipher character is established, and a set of juxtaposed, rotatable switching devices operatively interposed between said elements, all coordinated for operation under

the control of a plurality of electrically interacting cipher-key transmitters, through each of which is passed perforated tapes; the method of enciphering which consists in continuously varying the cipher resultant of a given plain-text character, by externally and aperiodically controlling the displacements of said switching devices permutatively and in a stepwise manner, the step of external control involving the operation of the individual cipher-key transmitters according to respective, unintelligible random sequences of keying characters, said characters being respectively represented by perforations in said tapes.

31. In a cryptographic system employing an element upon which a plain-text character is established, an element upon which a cipher character is established, and a set of juxtaposed, rotatable switching devices operatively interposed between said elements, all coordinated for operation under the control of a plurality of electrically interacting cipher-key transmitters, through each of which is passed a perforated tape; the method of enciphering which consists in continuously varying the cipher resultant of a given plain-text character, by externally and aperiodically controlling the displacements of said switching devices permutatively and in a stepwise manner, the step of external control involving the operation of the individual cipher-key transmitters according to respective, unintelligible random sequences of keying characters, said transmitter characters being represented by perforations in said tapes for controlling said transmitters and causing interaction between characters passing simultaneously through said transmitters.

32. In a cryptographic system employing an element upon which a plain-text character is established, an element upon which a cipher character is established, and a set of juxtaposed, rotatable switching devices operatively interposed between said elements, all coordinated for operation under the

control of a plurality of electrically interacting cipher-key transmitters, through each of which is passed a perforated tape; the method of enciphering which consists in continuously varying the cipher resultant of a given plain-text character, by externally and aperiodically controlling the displacements of said switching devices, permutatively and in a stepwise manner, the step of external control involving the operation of the individual cipher-key transmitters according to respective, unintelligible random sequences of keying characters, said characters being represented by perforations in said tapes for controlling said transmitters and causing interaction between characters passing simultaneously through said transmitters whereby the final control exercised by the respective transmitters is collective in character.

33. In a cryptographic system comprising a set of ciphering elements and employing as a keying element a cipher-key transmitter, said transmitter using a cipher-key consisting of keying characters composed of signaling units permuted in accordance with a plural-unit code; the method of eliminating from the final cryptogram those permutations of said code which have no standard equivalents in the conventional twenty-six letter Morse code, said method consisting in causing said cipher-key transmitter to control the permutative, stepwise displacements of the ciphering elements to the exclusion of any direct interaction between the keying characters and the message characters.

34. In a cryptographic system comprising a set of ciphering elements and employing as keying elements a plurality of cipher-key transmitters, said transmitters using cipher keys consisting of keying characters composed of

signaling units permuted in accordance with a plural-unit code; the method of eliminating from the final cryptogram those permutations of said code which have no standard equivalents in the conventional twenty-six letter Morse code, said method consisting in causing said cipher-key transmitters to control collectively the permutative, stepwise displacements of the ciphering elements to the exclusion of any direct interaction between the keying characters and the message characters.

~~Abstract of~~ CLAIMS FOR CONTINUATION CASE

35. ~~35.~~ In combination a set of character elements constituting a key board; a switch individual to each element and operable thereby; a corresponding number of translating devices operable by said elements; a wiring system interposed between said switches and said translating devices rendering available a multiplicity of electrical paths between said switches and said devices, and means operable in response to each key operation *for* selecting a group of said paths, said last named means comprising a variably operable sensing mechanism.

36. ~~36.~~ In combination a set of character elements constituting a keyboard; a switch individual to each element and operable thereby; a corresponding number of translating devices operable by said elements; a wiring system interposed between said switches and said translating devices rendering available a multiplicity of electrical paths between said switches and said devices whereby each switch may become associated with any one of a plurality of said translating devices, said system comprising adjustably movable connectors whereby the wiring system may be given an initial setting providing one electrical path for each switch; and means operable in response to each key operation for changing such setting.

37. ~~4~~ The combination set forth in Claim ~~4~~<sup>36</sup> in which the last named means comprises a sensing mechanism operable by a perforated element.

38. ~~4~~ The combination set forth in Claim ~~4~~<sup>36</sup> in which the last named means comprises a plurality of relays corresponding in number to the number of movable connectors; and a sensing mechanism operable by an element perforated in accordance with a plural unit character code.

39. ~~4~~ In combination a set of character elements constituting a keyboard; a switch individual to each element and operable thereby; a corresponding number of translating devices operable by said elements; a wiring system interposed between said switches and said translating devices rendering available a multiplicity of electrical paths between said switches and said devices whereby each switch may become associated with any one of a plurality of said translating devices, said system comprising a plurality of stationary annular commutator elements and rotatable annular commutator members interposed between each pair of fixed commutator elements, said members having a set of contacts on each face thereof, cooperating with the contacts of the adjacent stationary element, said members also having random cross connections between the contacts on the opposing faces thereof, whereby the wiring system may be given an initial setting at will; and means operable in response to each key operation for changing such setting.

claim:

1. In a cryptograph, a keyboard comprising character elements in operative electrical connection with corresponding signaling elements; means comprising a set of juxtaposed, rotatable commutators for varying the connections between the keyboard elements and said signaling elements; a cipher-key transmitter; and means coordinated with the transmitter to effect permutative, stepwise displacements of the commutators.

2. In a cryptograph, a keyboard comprising character elements in operative electrical connection with corresponding signaling elements; means comprising a set of juxtaposed, rotatable commutators for varying the connections between the keyboard elements and said signaling elements; a cipher-key transmitter mechanism; and means coordinating said mechanism with the commutators to effect permutative, stepwise displacements of the commutators.

3. In a cryptograph, a keyboard comprising character elements in operative electrical connection with corresponding signaling elements; means comprising a set of juxtaposed, rotatable commutators for varying the connections between the keyboard elements and said signaling elements; a cipher-key transmitter mechanism; and a set of commutator stepping mechanisms each comprising a magnet and associated ratchet and pawl, the cipher-key transmitter mechanism being operatively associated with the commutator stepping mechanisms to effect permutative, stepwise displacements of the commutators.

4. In a cryptograph, a keyboard comprising character elements in operative electrical connection with corresponding signaling elements; means comprising a set of juxtaposed, rotatable commutators for varying the connections between the keyboard elements and said signaling elements; a plurality of cipher-key transmitters; and means coordinating said transmitters to effect permutative, stepwise displacements of the commutators.

5. In a cryptograph, a keyboard comprising character elements in operative electrical connection with corresponding signaling elements; means comprising a set of juxtaposed, rotatable commutators for varying the connections between the

keyboard elements and said signaling elements; a plurality of cipher-key transmitters; a ~~set~~<sup>series</sup> of commutator stepping mechanisms each comprising a magnet and associated ratchet and pawl, the set of commutator stepping mechanisms being controlled by the said cipher-key transmitters associated as a group<sup>and</sup> coordinated collectively to effect permutative, stepwise displacements of the commutators.

6. In a cryptograph, a keyboard comprising character elements in operative electrical connection with corresponding signaling elements; means comprising a set of juxtaposed, rotatable commutators for varying the connections between the keyboard elements and said signaling elements; a cipher-key transmitter mechanism; and means coordinating said mechanism with the commutators to effect permutative, stepwise displacements of the commutators, the cipher-key transmitter mechanism being controlled by a keying element which is external to and independent of the cryptograph.

7. In a cryptograph, a keyboard comprising character elements in operative electrical connection with corresponding signaling elements; means comprising a set of juxtaposed, rotatable commutators for varying the connections between the keyboard elements and said signaling elements; a plurality of cipher-key transmitters; and means coordinating the transmitters to effect permutative, stepwise displacements of the commutators, the transmitters being controlled by separate keying elements which are external to and independent of the cryptograph.

8. In a cryptograph, a keyboard comprising character elements in operative electrical connection with corresponding signaling elements; means comprising a set of juxtaposed, rotatable commutators for varying the connections between the keyboard elements and said signaling elements; a cipher-key transmitter mechanism; and means coordinating said mechanism with the commutators to effect permutative, stepwise displacements of the commutators, the cipher-key transmitter mechanism being controlled by a keying element which is external to and independent of the cryptograph,



*includes*  
and which (consists of) a perforated tape bearing perforations permuted in accordance with a plural-unit code to represent characters in that code.

9. In a cryptograph, a keyboard comprising character elements in operative electrical connection with corresponding signaling elements; means comprising a set of juxtaposed, rotatable commutators for varying the connections between the keyboard elements and said signaling elements; a plurality of cipher-key transmitters; and means coordinating the transmitters to effect permutative, stepwise displacements of the commutators, the said transmitters being controlled by separate keying elements which are external to and independent of the cryptograph, and which *include* (consist of) perforated tapes bearing perforations permuted in accordance with a plural-unit code to represent characters in that code.

10. In a cryptograph, a keyboard comprising character elements in operative electrical connection with corresponding signaling elements; means comprising a set of juxtaposed, rotatable commutators for varying the connections between the keyboard elements and said signaling elements; a plurality of cipher-key transmitters; and means coordinating the transmitters to effect permutative, stepwise displacements of the commutators, the said transmitters being controlled by individual keying elements which are external to and independent of the cryptograph, and which *include* (consist of) perforated tapes bearing perforations permuted in accordance with a plural-unit code to represent characters in that code, the numbers of such characters in the respective tapes being prime to one another.

11. In a cryptograph of the character described, the combination of a set of juxtaposed, rotatable commutators; a set of commutator stepping mechanism; and a plural-unit-code cipher-key transmitter.

12. In a cryptograph of the character described, the combination of a set of juxtaposed, rotatable commutators; a set of commutator stepping mechanism; and a plural-unit-code cipher-key transmitter, ~~the latter~~ <sup>for</sup> controlling the commutator stepping mechanism to effect permutative, stepwise displacements of the commutators.

13. In a cryptograph of the character described, the combination of a set of juxtaposed, rotatable commutators; a set of commutator stepping mechanisms; and a plurality of plural-unit-code cipher-key transmitters.

14. In a cryptograph of the character described, the combination of a set of juxtaposed, rotatable commutators; a set of commutator stepping mechanisms; and a plurality of plural-unit-code cipher-key transmitters electrically associated for collectively controlling the commutator stepping mechanisms to effect permutative, stepwise displacements of the commutators.

15. In a cryptograph of the character described, the combination of <sup>Keyboard elements and Signaling elements;</sup> a set of juxtaposed, rotatable commutators for varying the connections <sup>the two sets of</sup> between ~~(a set of keyboard elements and a set of signaling)~~ <sup>series</sup> elements; a set of commutator stepping mechanisms for displacing the respective commutators in a stepwise manner; and a plural-unit-code cipher-key transmitter for controlling the commutator stepping mechanisms to effect the stepwise displacements of the commutators in a permutative manner.

16. In a cryptograph of the character described, the combination of <sup>Keyboard elements and Signaling elements;</sup> a set of juxtaposed, rotatable commutators for varying the connections between <sup>the two sets of</sup> ~~(a set of keyboard elements and a set of signaling)~~ elements; a set of commutator stepping mechanisms for displacing the respective commutators in a stepwise manner; and a plurality of plural-unit-code cipher-key transmitters for collectively controlling the commutator stepping mechanisms to effect the stepwise displacements of the commutators in a permutative manner.

17. A mechanism of the character described, comprising a set of elements constituting a keyboard, and a set of elements constituting a signaling bank; a set of juxtaposed, rotatable switching devices for varying the connections between the two sets of elements; <sup>and</sup> means for effecting stepwise displacements of the switching devices in an aperiodic manner.

18. See below.

19. A mechanism of the character described, comprising a set of elements constituting a keyboard and a set of elements constituting a signaling bank; a set of juxtaposed, rotatable switching devices for varying the connections between the two sets of elements; <sup>and</sup> means for effecting stepwise displacements <sup>(change point other manner as a comma; the etc.)</sup>

18. Same as 17 plus "said means being controlled by an element which is external to the mechanism itself" and independent of

of the switching devices in an aperiodic manner, the stepwise displacements of the set of switching devices being permutative in character.

20. A mechanism of the character described, comprising a set of elements constituting a keyboard and a set of elements constituting a signaling bank; a <sup>series</sup> set of juxtaposed, rotatable switching devices for varying the connections between the two sets of elements; means for effecting stepwise displacements of the switching devices in an aperiodic manner, the stepwise displacements of the set of switching devices being permutative in character, the permutations of <sup>Said</sup> ~~stepwise~~ displacements being ~~determined by an external key~~.

21. A mechanism of the character described, comprising a set of elements constituting a keyboard and a set of elements constituting a signaling bank; a set of juxtaposed, rotatable switching devices for varying the connections between the two sets of elements; means for effecting stepwise displacements of the switching devices in an aperiodic manner, the ~~stepwise~~ displacements of the set of switching devices being permutative in character; <sup>and means comprising an external key for determining</sup> the permutations of <sup>Said</sup> ~~stepwise~~ displacements ~~being determined by an external key~~, said key comprising a nonrepeating sequence of ciphering characters arranged in random, unintelligible order.

22. A mechanism of the character described, comprising a set of elements constituting a keyboard and a set of elements constituting a signaling bank; a set of juxtaposed, rotatable switching devices for varying the connections between the two sets of elements; means for effecting stepwise displacements of the switching devices in an aperiodic manner, the ~~stepwise~~ displacements of the set of switching devices being permutative in character; <sup>and means comprising an external key for determining</sup> the permutations of <sup>Said</sup> ~~stepwise~~ displacements ~~being determined by an external key~~, said key comprising a nonrepeating sequence of ciphering characters arranged in random, unintelligible order, <sup>and</sup> the said ciphering characters being employed successively to encipher successive characters of the message.

23. A mechanism of the character described, comprising a set of elements constituting a keyboard and a set of elements constituting a signaling bank; a set of juxtaposed, rotatable switching devices for varying the connections between the two sets of elements; means for effecting stepwise displacements of the switching devices in an aperiodic manner, the ~~stepwise~~ displacements of the set of switching devices being permutative in character; <sup>and the means comprising a plurality of independent but interacting external keys for determining the permutations of said displacements</sup> ~~the permutations of stepwise displacements being determined by a plurality of independent but interacting external~~ keys.

24. A mechanism of the character described, comprising a set of elements constituting a keyboard and a set of elements constituting a signaling bank; a set of juxtaposed, rotatable switching devices for varying the connections between the two sets of elements; means for effecting stepwise displacements of the switching devices in an aperiodic manner, the ~~stepwise~~ displacements <sup>and means comprising a plurality of independent but interacting external keys</sup> of the set of switching devices being permutative in character; the permutations of <sup>said</sup> ~~stepwise~~ displacements ~~being determined by a plurality of independent but interacting external keys~~, each of said keys comprising a nonrepeating sequence of ciphering characters arranged in random, unintelligible order.

25. A mechanism of the character described, comprising a set of elements constituting a keyboard and a set of elements constituting a signaling bank; a set of juxtaposed, rotatable switching devices for varying the connections between the two sets of elements; means for effecting stepwise displacements of the switching devices in an aperiodic manner, the ~~stepwise~~ displacements <sup>and means comprising a plurality of independent but interacting external keys</sup> of the set of switching devices being permutative in character; the permutations of <sup>said</sup> ~~stepwise~~ displacements ~~being determined by a plurality of independent but interacting external keys~~, each of said keys comprising a nonrepeating sequence of ciphering characters arranged in random, unintelligible order, <sup>and</sup> the interaction of the said keys producing a resultant single key consisting of an unintelligible sequence of characters which serves as the cipher key to encipher the successive characters of the message.

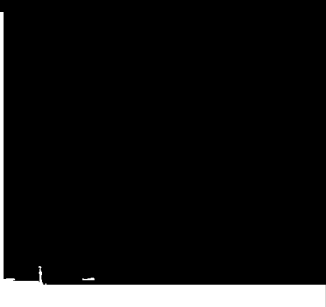
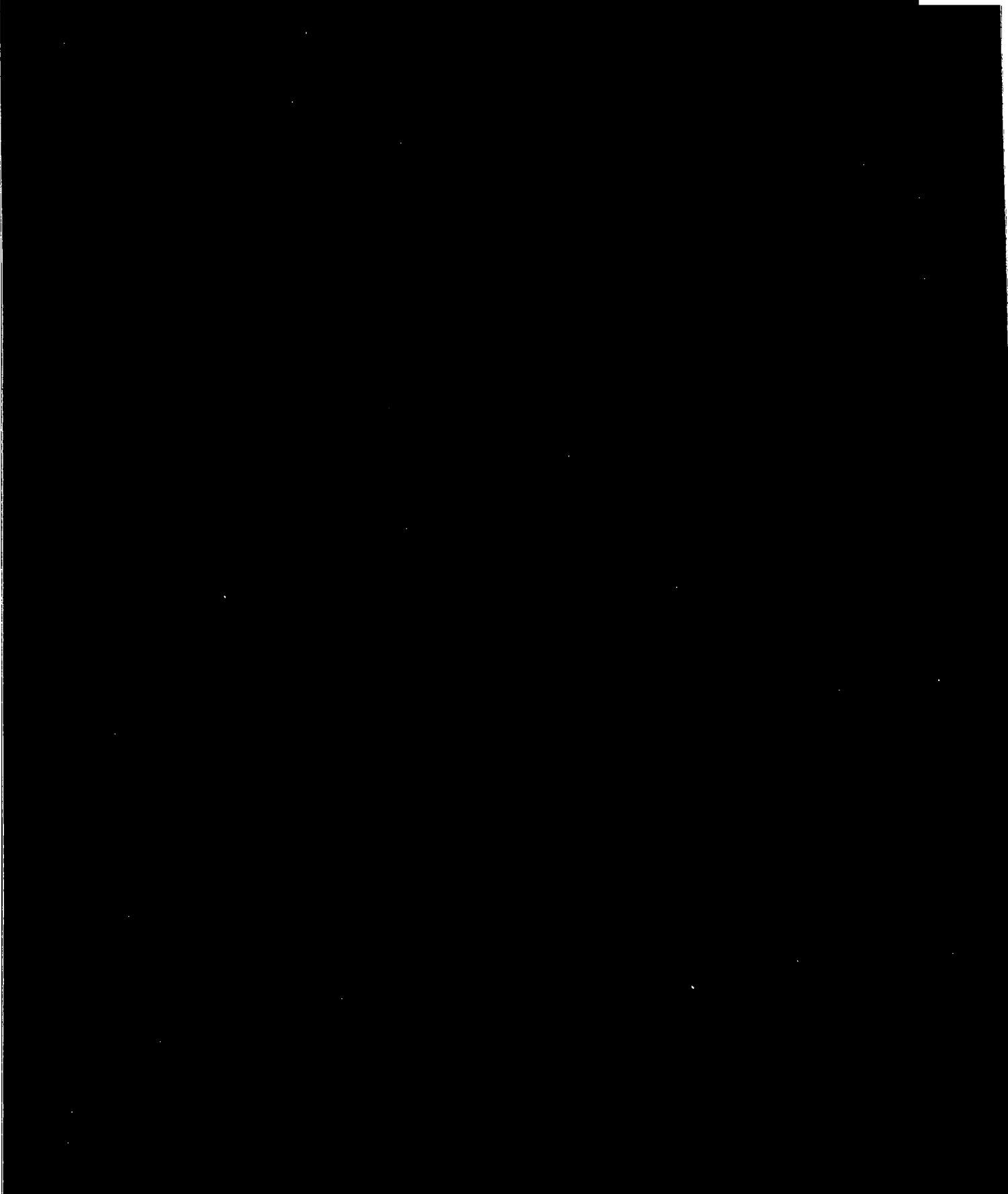
26. In a cryptographic system employing an element upon which a plain-text character is established and an element upon which a cipher character is established, and including a set of juxtaposed, rotatable switching devices operatively interposed between said elements; the method of enciphering which consists in continuously varying the cipher resultant of a given plain-text character by externally <sup>and automatically</sup> controlling the ~~(aperiodic,~~ <sup>aperiodic,</sup> stepwise, permutative displacements of said ~~(set of switching devices.~~ <sup>permutative displacements of said switching devices.</sup>

27. In a cryptographic system employing an element upon which a plain-text character is established, an element upon which a cipher character is established and a set of juxtaposed, rotatable switching devices operatively interposed between said elements, all coordinated for operation under the control of a cipher-key transmitter; the method of enciphering which consists in continuously varying the cipher resultant of a given plain-text character by externally <sup>and stepwise</sup> controlling the ~~(aperiodic, stepwise, permutative~~ <sup>aperiodic, stepwise, permutative</sup> displacements of said switching devices, the step of external control involving the operation of the cipher-key transmitter according to an unintelligible, random sequence of keying characters.

28. In a cryptographic system employing an element upon which a plain-text character is established, an element upon which a cipher character is established, and a set of juxtaposed, rotatable switching devices operatively interposed between said elements, all coordinated for operation under the control of a plurality of electrically interacting cipher-key transmitters; the method of enciphering which consists in continuously varying the cipher resultant of a given plain-text character, by externally <sup>and aperiodically</sup> controlling the ~~(aperiodic, stepwise, permutative~~ <sup>aperiodic, stepwise, permutative</sup> displacements of said switching devices, the step of external control involving the operation of the individual cipher-key transmitters according to respective, unintelligible random sequences of keying characters.

29. In a cryptographic system employing an element upon which a plain-text character is established, an element upon which a cipher character is established and a set of juxtaposed, rotatable switching devices operatively

to the exclusion of any direct interaction between the keying characters and the message characters.



interposed between said elements, all coordinated for operation under the control of a cipher-key transmitter; the method of enciphering which consists in continuously varying the cipher resultant of a given plain-text character by externally controlling the periodic, stepwise, permutative displacements of said switching devices, the step of external control involving the operation of the cipher-key transmitter according to an unintelligible, random sequence of keying characters, said characters being represented by perforations in tapes for controlling said transmitter.

30. In a cryptographic system employing an element upon which a plain-text character is established, an element upon which a cipher character is established, and a set of juxtaposed, rotatable switching devices operatively interposed between said elements, all coordinated for operation under the control of a plurality of electrically interacting cipher-key transmitters; the method of enciphering which consists in continuously varying the cipher resultant of a given plain-text character, by externally controlling the periodic, stepwise, permutative displacements of said switching devices, the step of external control involving the operation of the individual cipher-key transmitters according to respective, unintelligible random sequences of keying characters, said characters being represented by perforations in tapes for controlling said transmitters.

31. In a cryptographic system employing an element upon which a plain-text character is established, an element upon which a cipher character is established, and a set of juxtaposed, rotatable switching devices operatively interposed between said elements, all coordinated for operation under the control of a plurality of electrically interacting cipher-key transmitters; the method of enciphering which consists in continuously varying the cipher resultant of a given plain-text character, by externally controlling the periodic, stepwise, permutative displacements of said switching devices, the step of external control involving the operation of the individual cipher-key transmitters according to respective, unintelligible random sequences of keying characters, said characters being represented by perforations in tapes for controlling said transmitters and causing interaction between characters passing simultaneously through said transmitters.

32. In a cryptographic system employing an element upon which a plain-text character is established, an element upon which a cipher character is established, and a set of juxtaposed, rotatable switching devices operatively interposed between said elements, all coordinated for operation under the control of a plurality of electrically interacting cipher-key transmitters; <sup>through each of which is passed a perforation tape</sup> the method of enciphering which consists in continuously varying the cipher resultant of a given plain-text character, by externally <sup>and periodically</sup> controlling the <sup>displacements</sup> ~~aperiodic, stepwise, permutative~~ <sup>displacements</sup> of said switching devices, <sup>permutative displacements and in a stepwise manner</sup> the step of external control involving the operation of the individual cipher-key transmitters according to respective, unintelligible random sequences of keying characters, said characters being represented by perforations in <sup>said</sup> tapes for controlling said transmitters and causing interaction between characters passing simultaneously through said transmitters <sup>whereby</sup> ~~so that~~ the final control exercised by the respective transmitters is collective in character.

33. In a cryptographic system comprising a set of ciphering elements and employing as <sup>a</sup> keying element a cipher-key transmitter, said transmitter using a cipher-key consisting of keying characters composed of signaling units permuted in accordance with a plural-unit code; the method of eliminating from the final cryptogram those permutations of said code which have no standard equivalents in the conventional twenty-six letter Morse code, said method consisting in causing said cipher-key transmitter to control the permutative, stepwise displacements of the ciphering elements to the exclusion of any direct interaction between the keying characters and the message characters.

34. In a cryptographic system comprising a set of ciphering elements and employing as keying element a plurality of cipher-key transmitters, said transmitters using cipher keys consisting of keying characters composed of signaling units permuted in accordance with a plural-unit code; the method of eliminating from the final cryptogram those permutations of said code which have no standard equivalents in the conventional twenty-six letter Morse code, said method consisting in causing said ciphering transmitters to control collectively the permutative, stepwise displacements of the ciphering elements