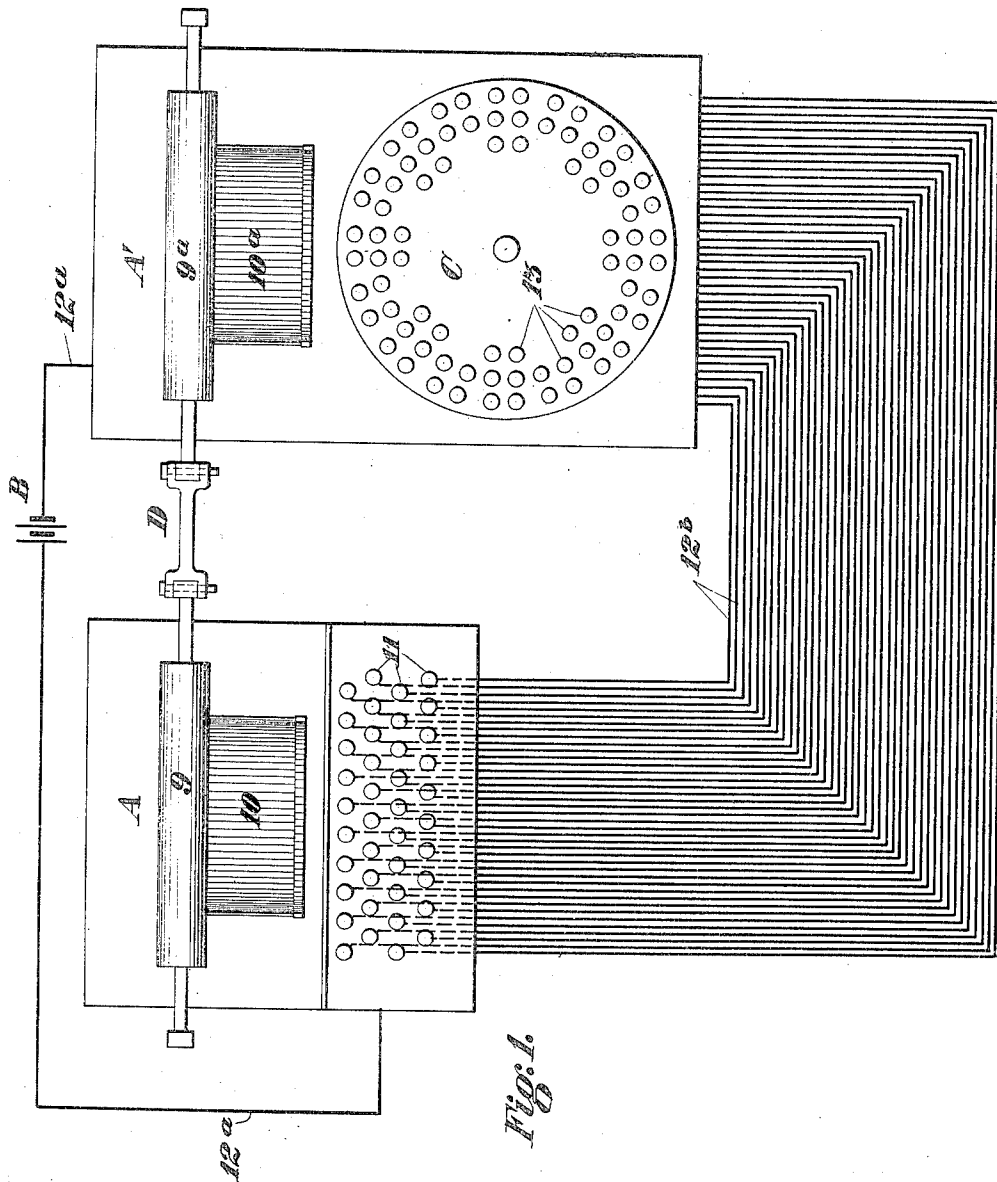


S. M. KINTNER.
 APPARATUS FOR CODING AND DECODING.
 APPLICATION FILED JAN. 12, 1912.

1,210,656.

Patented Jan. 2, 1917.
 5 SHEETS—SHEET 1.



Witnesses:
 S. M. Swenson.
 Fred. J. Seab.

Inventor:
 Samuel M. Kintner
 By F. W. H. Clay his Att'y.

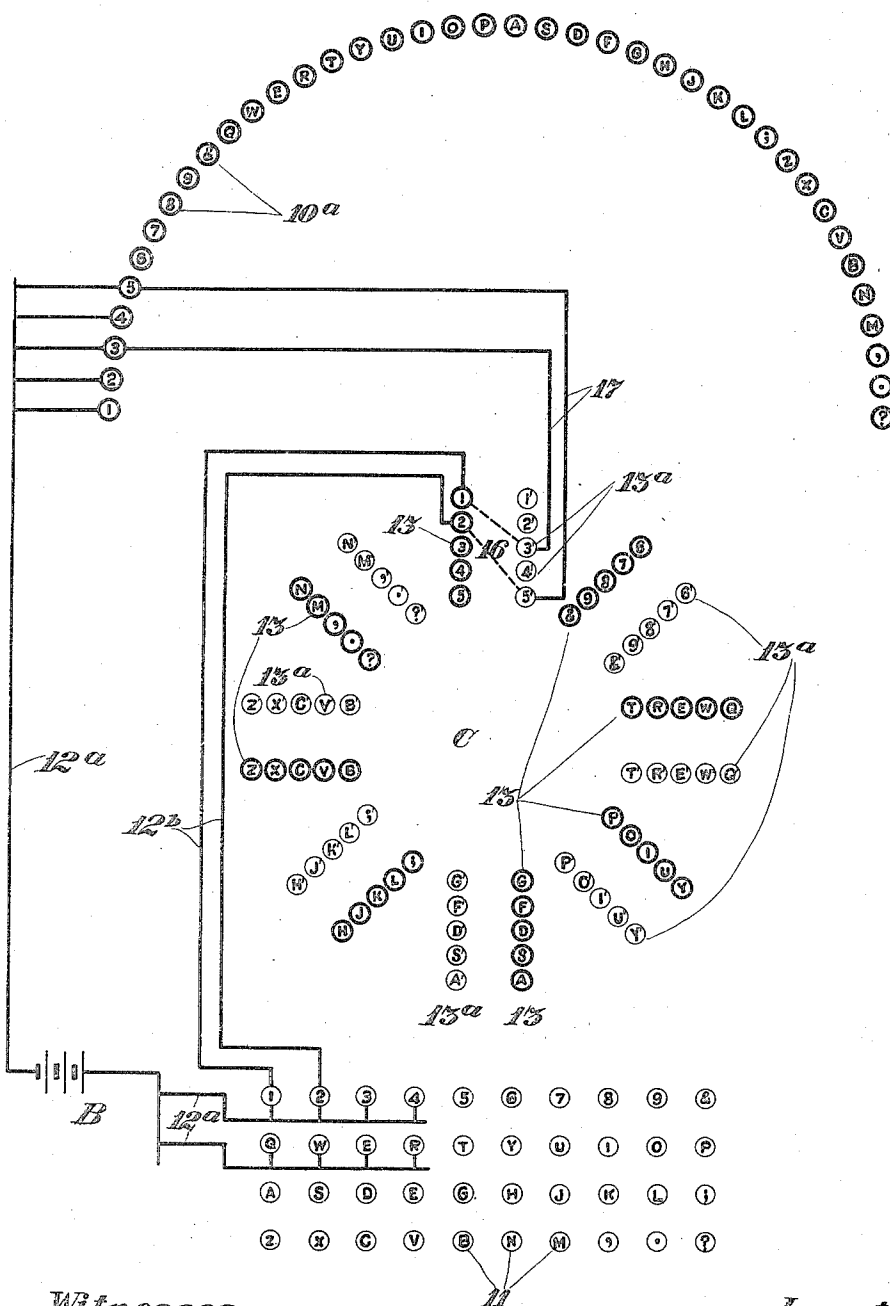
S. M. KINTNER.
 APPARATUS FOR CODING AND DECODING.
 APPLICATION FILED JAN. 12, 1912.

1,210,656.

Patented Jan. 2, 1917.

5 SHEETS—SHEET 2.

Fig. 2.



Witnesses:

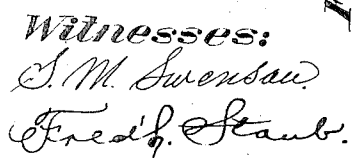
S. M. Swenson.
 Fred. J. Seaub.

Inventor:

Samuel M. Kintner
 By F. M. H. Clay his atty.

1,210,656.

5 SHEETS—SHEET 3.



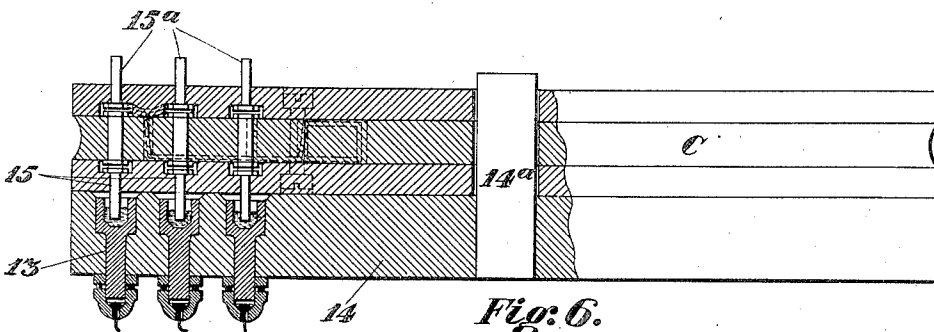
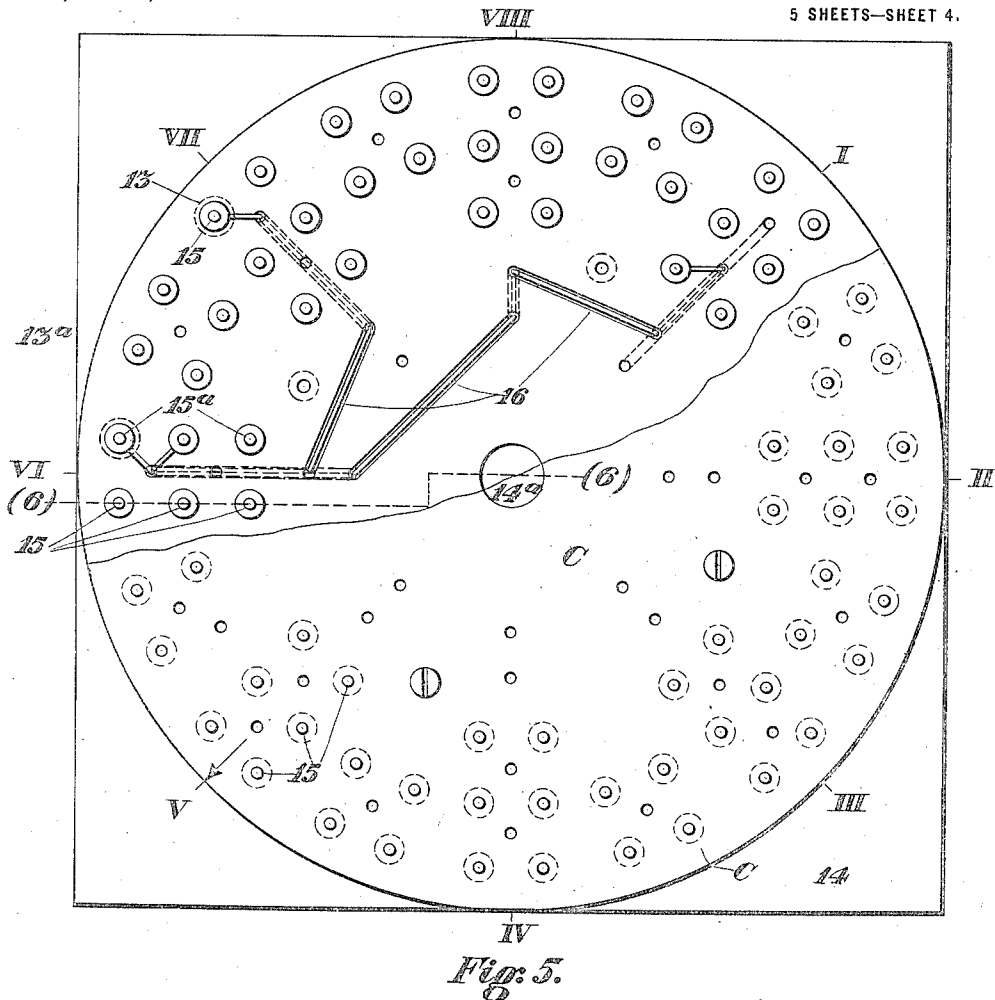
Inventor: 12
Samuel M. Fintner
By *A. W. K. Clay* his Att'y

S. M. KINTNER.
 APPARATUS FOR CODING AND DECODING.
 APPLICATION FILED JAN. 12, 1912.

1,210,656.

Patented Jan. 2, 1917.

5 SHEETS—SHEET 4.



Witnesses:
S. M. Swenson.
Fred. H. Schaub.

Inventor:
Samuel M. Kintner
By F. M. H. Co., his Att.

S. M. KINTNER.
 APPARATUS FOR CODING AND DECODING.
 APPLICATION FILED JAN. 12, 1912.

1,210,656.

Patented Jan. 2, 1917.

5 SHEETS—SHEET 5.

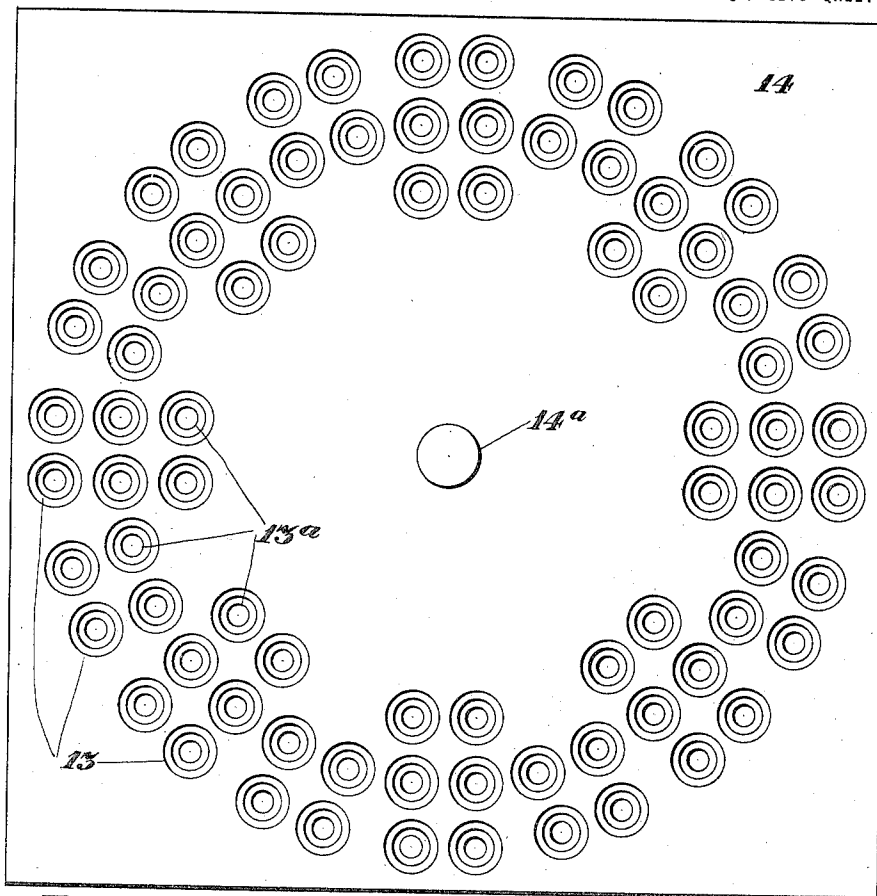


Fig. 7.

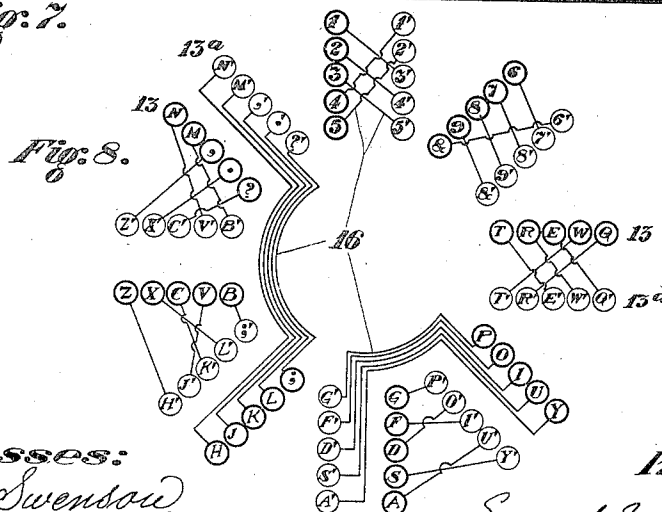


Fig. 8.

Witnesses:
 S. M. Swenson.
 Fred. H. Kaub.

Inventor:
 Samuel M. Kintner
 By F. W. H. Chy his Att.

UNITED STATES PATENT OFFICE.

SAMUEL M. KINTNER, OF PITTSBURGH, PENNSYLVANIA.

APPARATUS FOR CODING AND DECODING.

1,210,656.

Specification of Letters Patent.

Patented Jan. 2, 1917.

Application filed January 12, 1912. Serial No. 670,842.

To all whom it may concern:

Be it known that I, SAMUEL M. KINTNER, a citizen of the United States, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a certain new and useful Improvement in Apparatus for Coding and Decoding, of which the following is a specification.

My invention relates to the art of transmitting messages in cipher and especially to apparatus for making a cipher by transposition of symbols or spaces and deciphering the message by restoring the symbols to proper relative position.

More specifically, the object is to provide efficient mechanism to transpose an intelligible message into a non-intelligible one, in the act of writing the same on a machine, and then by changing a certain intermediate device between the keys and the printing mechanism to retranspose the message into intelligible form. The device determining the character of a code is one capable of innumerable changes, while at the same time the deciphering is all automatic and requires no mental effort.

Another object of my invention is to provide for simultaneously making a copy both of the message in direct form and of the message in modified or coded form, and likewise in decoding the machine produces a copy of both the coded message and the rectified or decoded message. By the use of the intermediate mechanism, which controls the relation of the keys to the printing type, I avoid the necessity of having various sets of type.

The coding of messages may be accomplished by false spelling, preferably the substitution of another letter for the correct one, so that the message as sent and received is undecipherable except through the means employed in carrying out the invention. It is preferable that the message to be sent shall be first written in the ordinary way, on a mechanical writing machine, which, however, is attached to a machine which simultaneously reproduces the message in code. This may be done with a single machine having the ordinary key-board and transposing mechanism, but I preferably employ an assembled equipment embodying twin machines, one for writing the message directly in the usual way in intelligible form, the other coöperating therewith and simultaneously transmuting the message into

coded or unintelligible form. It may be sent to the receiver by any of the usual ways, *i. e.*, by mail, messenger, telegraph, aerogram, etc.

The substitution of the characters may be accomplished by such a mechanism as will spell the words of the intelligible message in substituted characters, by the operation of a keyboard similar to that of an ordinary typewriter, either with a single or duplex machine. The de-coding of the message is accomplished at the receiving end by means of a similar machine, so arranged and controlled by transmuting mechanism as to reverse the code of the sending machine, reproduce the original characters in their original order, by the manipulation of the keys of the receiving or de-coding instrument, the operator writing the code message as received, while the instrument reproduces the translation of it.

In the illustrated embodiment of the invention I have shown apparatus which is both controlled and actuated electrically; but it will be understood that the invention is not limited thereto; as the keys upon which the operator manually writes the message may, by the ordinary mechanical means, write the true copy which is to be coded, or decoded as the case may be, whereas the type bars, whose operation prints the coded message, may be operated by compressed-air, gas, steam or even mechanical forces, though the action of the compressed-air, gas, steam or mechanical force is controlled electrically.

Generally stated, therefore, the invention comprises a mechanism which will during writing, at once transmute the message into code at the sending station, and will translate the coded message into the original message at the receiving station. It involves also the use of apparatus such as is shown in the accompanying drawings, for changing the code at will, through a commutating mechanism, capable of a practically unlimited number of available combinations and permutations.

In the drawings, Figure 1 is a diagram representing an ordinary writing machine combined with an electrically controlled writing machine, and a commutator, arranged for the purposes of my invention. Fig. 2 is a diagram showing electric connections between the operating key-board of the controlled machine and the devices for operating the type keys thereof, together

with the intervening commutator. Fig. 3 is a partial sectional view showing an example of a controlled machine with an available arrangement of commutator and type key-actuating-mechanism. Fig. 4 is a plan view of the commutator. Fig. 5 is a diagram showing in plan, another form of commutator with a sample of wiring connections. Fig. 6 is a partial section on the line (6) (6) of Fig. 5, showing the application of the adjustable commutator contact on the base of the machine. Fig. 7 is a plan view of the commutator base 14 of Fig. 6. Fig. 8 is a wiring arrangement for the commutator in Fig. 4.

I shall first describe the embodiment of the invention which I prefer,—*i. e.*, an apparatus comprising two connected machines, either for coding or de-coding, inasmuch as such a machine enables the operator to check the writing by making simultaneously, in one operation, an ordinary copy and a coded copy. This enables the correction of mistakes and the printing of the message for record in both forms, at once.

The transmitting writing machine A, illustrated at the left side of Fig. 1, may be any ordinary writing machine. It is here shown as a typewriter, having a platen roll 9, a bank of type bars 10 each provided with a character corresponding to those of the keys 11 of the key-board. The transmuting machine A', shown at the right of Fig. 1, is of the same general construction, having a platen 9^a and a bank of type bars 10^a, like those at 10 in the other machine, but operated by electric mechanism to actuate its type bars, such mechanism being controlled by a commutator C, hereinafter described. The platen rolls 9 and 9^a of the two machines are connected to have the same movements both in revolving and lateral shifting, by means of universal joint D.

Referring more particularly to Fig. 3, it will be understood that upon pressing down the key 11 of the machine A, it makes a contact 12 on the wiring between the battery B and the lead 12^b to the transmuting machine shown in Fig. 3. This lead 12^b ends at a particular contact 13 (here shown as a mercury contact), set in the contact base 14 of the transmuting machine.

By means of the commutator C, the circuit is made through a pin 15 therein and wire 16 to a second pin 15^a and contact 13^a in the contact disk 14, from whence by wire 17 the current passes through a solenoid 18 and by lifting the core 19 thereof causes the latter to strike the pin 20 which operates the type bar 10^a of the transmuting machine. Thus the movement of the key 11 results in striking the paper on platen 9^a with a particular character whose identity depends upon the position of the coding commutator C, and the particular commu-

tator being used. (It will be understood that it is most convenient to use a commutator disk C having only a limited number of permutations, and further variations may be obtained by selecting from a plurality of such commutator disks.) The shifting of the commutator is easily accomplished by merely lifting the pins 15 out of the mercury cups 13 and revolving the disks until said pins may drop into different cups.

It will be understood that the invention does not require the duplicate machine, for, when it is not desired to check the operator, the message may be written directly in coded form from the copy. For example, as shown in Fig. 2, the keys on key-board 11 connect directly with the corresponding contacts 13 on the commutator C and these are shown as connecting by wires 16 with the contacts 13^a and the leads 17 go directly to solenoids operating the type bars 10^a. By this means the operator, for example, strikes the key of character 2 and the machine writes the character 5, in the illustration.

A commutator such as above referred to is shown in detail in Figs. 5, 6 and 7. The base of the machine carries a plate 14 in which are set the contact cups 13 and 13^a each containing mercury, and on a center pin 14^a in this plate the commutator C is mounted. This commutator is made up of three disks fastened together by screws and thereby sealing in the wiring 16 which is shown in plan view in Fig. 5. It will be observed that this commutator has two sets of contact pins 15 and 15^a on each side, and it will be understood that the wiring is so arranged that different pairs of the cups 13 are connected together in different positions of the commutator as well as by reversing its position on the plate 14. Such wiring may be arranged to secure an almost indefinite number of combinations, and in Fig. 8, I have shown a diagram of the commutator indicating one of the various arrangements that may be used. The several wires 16 thus place in series, through the commutator, the several key switches 12 of keys 11 with the several solenoids 18 of type bars 10^a, and the particular solenoid actuated depends on the setting of the commutator. To illustrate, the word "Navy," if written by using the keys 11 of the key-board as arranged in Fig. 2, and with the commutator setting of Fig. 8, would be reproduced by the solenoid actuated type bars 10^a, as coded, "Vuja." On the other hand, when the coded word is written on the translating machine, with the decoding commutator set to the same combination or schedule, but in reversed relation, the word will be decoded into its original form, "Navy."

Eight or ten different codes may be secured readily by means of a single commu-

tator so arranged that it can be shifted angularly by definite amounts. If use is made of both sides of the commutating disk or plate double that number of codes can be secured. For larger number of codes use can be made of two or more sets of commutating mechanisms connected in series as that gives a greatly increased number, such as 20 times 19 with single disks similar to those indicated above.

The commutator being capable of being set to any predetermined system or schedule by proper position-identifying marks as I, II, III, IV, V, VI, VII, and VIII on the base and an arrow point on the disk, (Fig. 5) adapted to positively locate it at any desired position on the base, it will be clear that the schedule may be changed each day for a different code, as may be agreed upon between the sending and receiving stations.

It is not necessary that the commutator be arranged as shown in the diagram, as many modifications may be devised in arrangement which will insure the connections to be definitely established according to a designed system and which can be employed in the reverse relation at the de-coding station. Thus in general the various combinations that can be effected will be secured by mounting contacts that will close the circuit between the various contact indicating circles bearing symbols with those bearing prime symbols, upon an insulated form which can be given a certain title as a number or letter which will positively identify the particular code that is employed for every possible position.

It will be noted that by my mechanism I may employ any ordinary typewriting machine and that but one set of type for each machine is necessary; also that the number of automatic codes that may be employed is without limit and that the law of the code need not be known to the operator and that both in coding and decoding the operator may have a complete and immediate check upon his work.

What I claim is:

1. A coding and decoding mechanism comprising a key-board and a printing mechanism, circuit makers provided each with two sets of differing contacts, electric means for operating the type bars of the printing machine, an electric contact member for each bar adapted to coact with the circuit maker, and keys on the board for establishing a circuit including the circuit maker and the said electrical operating means for the type bar.

2. A coding and decoding mechanism, comprising a keyboard and a plurality of printing devices, an operating mechanism for each said device, a circuit controlled by each key of the keyboard and arranged to control one of said operating mechanisms,

and a circuit maker which includes a portion of each of said circuits and is provided with circuit completing contacts arranged according to a predetermined schedule, said circuit maker being adjustable to various positions for changing the operating mechanisms controlled by the several keys.

3. A coding and decoding mechanism, comprising a keyboard and two sets of printing mechanisms, one actuated directly from the keyboard and the other through a circuit maker having a set of contacts arranged according to a predetermined schedule, electric means for controlling actuation of the type bars of the second printing mechanism, an electric contact member for each type bar adapted to co-act with a contact of the circuit maker, and keys on the board for establishing a circuit including the circuit maker and said electric control means.

4. A coding and decoding mechanism, comprising a keyboard and two sets of printing mechanisms, one actuated directly from the keyboard and the other actuated by means controlled by a circuit maker having two sets of contacts arranged according to a predetermined schedule, one set differing from the other, electric means for controlling actuation of the type bars of the printing mechanism, an electric contact member for each bar adapted to co-act with a contact of the circuit maker, and keys on the board for establishing a circuit including the circuit maker and said electric control means.

5. A coding and decoding mechanism, comprising a keyboard and a printing mechanism, a circuit maker having two sets of contacts arranged according to a predetermined schedule, one set differing from the other and being reversely arranged so as to reverse the operation of the other, electric means for controlling actuation of type bars of the printing mechanism, an electric contact member for each bar adapted to co-act with the contact of the circuit maker, and keys on the board for establishing a circuit including the circuit maker and said electric control means.

6. A coding and decoding mechanism, comprising a keyboard and a printing mechanism, a plurality of interchangeable circuit makers each having a set of contacts arranged according to a predetermined schedule, the contacts on the several circuit makers being diversely arranged to secure different codes, electric means for controlling actuation of the type bars of the printing mechanism, an electric contact member for each bar adapted to co-act with a contact of the circuit maker, and keys on the board for establishing a circuit including the circuit maker and said electric control means.

7. A coding and decoding mechanism, comprising a keyboard and a plurality of

printing devices, an operating mechanism for each said device, a circuit controlled by each key of the keyboard and arranged to control one of said operating mechanisms, a circuit maker which includes a portion of each of said circuits and is provided with circuit completing contacts arranged according to a predetermined schedule, a second set of printing devices, and mechanical operating connections for said devices controlled by the keys of the keyboard.

8. A coding and decoding mechanism, comprising a keyboard and a plurality of printing devices, an operating mechanism for each said device, a circuit controlled by each key of the keyboard and arranged to control one of said operating mechanisms, a circuit maker which includes a portion of each of said circuits and is provided with circuit completing contacts arranged according to a predetermined schedule, said circuit maker being adjustable to various positions for changing the operating mechanisms controlled by the several keys, a second set of printing devices, and mechanical operating connections for said devices controlled by the keys of the keyboard.

9. A coding and decoding mechanism, comprising a keyboard and a printing mechanism, a circuit maker having a set of contacts arranged according to a predetermined schedule, electric means for controlling actuation of the type bars of the printing mechanism, an electric contact member for each bar adapted to co-act with a contact of the circuit maker, keys on the board for establishing a circuit including the circuit maker and said electric control means, a second printing mechanism, and mechanical operating connections between said keys and the type bars of the second printing mechanism.

10. A coding and decoding mechanism, comprising a keyboard and a printing mechanism, a circuit maker having two sets of contacts arranged according to a predetermined schedule, one set differing from the other, electric means for controlling actuation of the type bars of the printing mechanism, an electric contact member for each

bar adapted to co-act with a contact of the circuit maker, keys on the board for establishing a circuit including the circuit maker and said electric control means, a second printing mechanism and mechanical operating connections between said keys and the type bars of the second printing mechanism.

11. A coding and decoding mechanism, comprising a keyboard and a printing mechanism, a circuit maker having two sets of contacts arranged according to a predetermined schedule, one set differing from the other and being reversely arranged so as to reverse the operation of the other, electric means for controlling actuation of the printing mechanism, an electric contact member for each key of said keyboard adapted to co-act with a contact connected to the contact of the circuit maker, keys on the board for establishing a circuit including the circuit maker and said electric control means, a second printing mechanism, and mechanical operating connections between the said keys and the type bars of the second printing mechanism.

12. A coding and decoding mechanism, comprising a keyboard and a printing mechanism, a plurality of interchangeable circuit makers each having a set of contacts arranged according to a predetermined schedule, the contacts on the several circuit makers being diversely arranged to secure different codes, electric means for controlling actuation of the type bars of the printing mechanism, an electric contact member for each bar adapted to co-act with a contact of the circuit maker, keys on the board for establishing a circuit including the circuit maker and said electric control means, a second printing mechanism, and mechanical operating connections between the said keys and the type bars of the second printing mechanism.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

SAMUEL M. KINTNER.

Witnesses:

C. M. CLARKE,
FRED'K STAUB.