

Eleven Million Codes Are Made By Single Electrical Machine

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Newly Patented Device Is Capable of 11,881,376 Changes Through Use of Typewriter Key Wheel.

By H. H. DUNN
(Popular Mechanics Magazine.)

New York, Dec. 21.—It is written in the chronicles of the Civil War that a code message sent by General Grant to Washington has not yet been deciphered. It is known that in the naval engagement off Jutland, in the first world war, the code system was dis-

covered after the first hour of use, and some of the code messages were not deciphered for three days after that first hour. In a recent sham battle off San Diego, the records show that it was nearly six months before some of the code messages sent during this naval "engagement" were reduced to understandable English. That is to say, the code as used in written messages during the war of sixty years ago, and the radio codes used during the late war, were not always, nor uniformly, successful.

For this reason, unusual interest attaches to patents recently issued to a Californian, Edward H. Hebern, of Oakland, for a code-sending and receiving machine, for use with either wire or wireless. This machine sends its messages in a code which is capable of 11,881,376 changes, so that it is possible, by working all of these alterations, to obtain and use on this one machine a practically unlimited number of different codes, the key to any one of which is not the key to any other one. The operator of the sending machine writes his message in plain English, on the keyboard, just as he would write them on the typewriter. By means of a "master wheel," or "key wheel," these messages are sent, by wire or radio, in a code which this wheel writes.

The receiving machine at the other end—sending and receiving apparatus being combined into one machine smaller than a typewriter—receives the wire or wireless messages in code, and presents them to the operator at that end spelled out on an illuminated keyboard, in plain English again. That is, the message is written into the machine, put into code by the machine, transmitted in code, decoded by the receiving machine, and presented to the receiving operator as originally written by the sender without possibility of error. If any machine yet devised can think; this one does, or seems so to do. In appearance, it is not unlike one of the early phonographs, records for which were made on wax cylinders, instead of on flat disks. There is, however, no wax cylinder, composition disk, or other recording attachment. Whatever is sent into the machine is buried within it, as soon as the master wheel has coded the message and sent it on its way along the wires or through the ether.

The secret of the invention is in the master wheel, a small spool, not unlike that on which typewriter ribbons are wound, containing twenty-six apertures in either side, and a similar number in the rim, the whole wheel being about three inches in diameter. Each letter is wired in combination with other letters, the whole machine being electrically operated, and it is in this wiring that the secret of the instrument lies. The receiving operator has racked in front of him any number of these spools or wheels, wired to correspond to a similar number of other wheels. Letters common to two spools are first sent; by these the receiving operator knows which wheel is being used to send, and drops into the machine the similarly wired spool from his rack. Only two spools similarly wired will work together.

**CODING IS MADE EASY
BY MECHANICAL DEV.****Capable of Making 12,000,000
Combinations, It Is Said.
Navy to Test It.**

Absolute secrecy of communication and at the same time elimination of the exceedingly slow task of decoding elaborate conventions such as now exist, is claimed for a code machine, final tests of which will be made when the navy holds joint maneuvers in Caribbean waters next month.

The machine is smaller than the standard typewriter and weighs less, but is said to be capable of 12,000,000 different combinations of codes. The most startling thing, those who have seen it say, is that the original message written out on the keyboard in plain English and is received in the same lucid form. While it is being transmitted through the air on wireless waves, however, it is locked by automatic action in a combination which only the receiving machine at the other end can solve.

The inventor of the machine claims message picked up in the air and that even given unlimited time code experts could not work out a simple practical tests have so far backed up his contention.

WAR DEPARTMENT
OFFICE OF THE CHIEF OF STAFF
WASHINGTON

18 Dec 27

Draw Friedman: -

The world do move!

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OFFICE
CHIEF SIGNAL OFFICER