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TELEGRAPHIC CODE CONCENTRATOR.

APPLICATION FILED APR. 1, 1908. RENEWED OCT. 25, 1909.

986,400. Patented Mar. 7, 1911.

ROOT	TERMINAL		
B 0	AB 0000	IB 32	UB 66
	AC 000	IC 33	UC 67
C 1	AD 00	ID 34	UD 68
	AF 01	IF 35	UF 69
D 2	AG 02	IG 36	UG 70
	AJ 03	IJ 37	UJ 71
F 3	AK 04	IK 38	UK 72
	AL 05	IL 39	UL 73
G 4	AM 06	IM 40	UM 74
	AN 07	IN 41	UN 75
H 5	AP 08	IP 42	UR 76
	AR 09	IR 43	UR 77
J 6	AS 10	IS 44	US 78
	AT 11	IT 45	UT 79
K 7	AV 12	IV 46	UV 80
	AW 13	IW 47	UW 81
L 8	AZ 14	IZ 48	UZ 82
	EB 15	OB 49	YB 83
M 9	EC 16	OC 50	YC 84
	ED 17	OD 51	YD 85
N 10	EF 18	OF 52	YF 86
	EG 19	OG 53	YG 87
P 11	EJ 20	OJ 54	YJ 88
	EK 21	OK 55	YK 89
R 12	EL 22	OL 56	YL 90
	EM 23	OM 57	YM 91
S 13	EN 24	ON 58	YN 92
	EP 25	OP 59	YP 93
T 14	ER 26	OR 60	YR 94
	ES 27	OS 61	YS 95
V 15	ET 28	OT 62	YT 96
	EV 29	OV 63	YV 97
W 16	EW 30	OW 64	YW 98
	EZ 31	OZ 65	YZ 99
Z 17			

Fig. 1.

A Serial Numbers.

AB 1.2.3.4.5.6.7.8.9.
AC 1.2.3.4.5.6.7.8.
AD 1.2.3.4.5.6.7.9
AF 1.2.3.4.5.6.7.
AG 1.2.3.4.5.6.8.9.
AJ 1.2.3.4.5.6.8.
AK 1.2.3.4.5.6.9.
AL 1.2.3.4.5.6.
AM 1.2.3.4.5.7.8.9.

Fig. 2.

E Serial Numbers

AB 1.2.5.6.9
AC 1.2.5.6.
AD 1.2.5.7.8.9.
AF 1.2.5.7.8.
AG 1.2.5.7.
AJ 1.2.5.8.9.
AK 1.2.5.8
AL 1.2.5.9.

Fig. 3.

Illustrations

Code words.

Single group: 1234567890 = Ridolusyl

Two groups: 12345 67890 = Oemitjusyl

Three groups: 1234 567 890 = Riahuelyl

Fig. 4.

Witnesses
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UNITED STATES PATENT OFFICE.

CHARLES WOOD McDONALD, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO INTERNATIONAL KEYCODE COMPANY, OF SAN FRANCISCO, CALIFORNIA, A CORPORATION OF CALIFORNIA.

TELEGRAPHIC-CODE CONCENTRATOR.

986,400. Specification of Letters Patent. **Patented Mar. 7, 1911.**

Application filed April 1, 1908, Serial No. 424,575. Renewed October 25, 1909. Serial No. 524,555.

To all whom it may concern:

Be it known that I, CHARLES WOOD McDONALD, a citizen of the United States, residing in the city and county of San Francisco and State of California, have invented a new and useful Improvement in Telegraphic-Code Concentrators, of which the following is a specification in such full and clear terms as will enable those skilled in the art to construct and use the same.

This invention relates to telegraph codes, and has for its object the provision of a means for condensing into small space and into few symbols information to be telegraphed. Such a device I have invented and patented under United States Patent No. 842,106, on January 22, 1907; and the device which is herein described and claimed is an improvement on the aforesaid invention. In the invention patented on January 22, 1907, I used two letter syllables as symbols for numerals, said numerals being attached to sentences, words or phrases in the telegraph codes. It consisted of lettered sheets, the letters whereof were combined with the syllables desired, whereby the corresponding numeral on every sheet could be transmitted, the sheet and the numeral being designated in one syllable. For instance, the first letter of a word would denote the sheet, and the succeeding two letters of the first syllable a numeral on that sheet; while the succeeding syllables of two letters would denote numerals on the same sheet. To transfer the reading to other sheets I used an arbitrary signal Y in the midst of the word.

The object of my improvement is to further condense the space and symbols used for telegraphic code purposes, by substituting a single sheet for the number of sheets shown in my previous invention, and by doing away with the transfer signal.

In transmitting a series of numerals it is customary, when the numerals are long and differ only in the units, first to transmit the long numeral, and then follow it with the series of units indicating the changes desired. For instance, the numbers 123,460, 123,461, 123,462, and 123,463, would be understood by the commercial world if transmitted: 123,460—1. 2. 3.

It is a further object of my invention to utilize this fact for the simplification and economy of coding messages, by providing a list of serial numbers, each series being indicated by a two letter syllable, on sheets or pages lettered for designation; but having means for referring to every sheet otherwise than by a separate signal.

Other objects of my invention will appear more fully hereinafter.

I accomplish my objects by the means illustrated in the accompanying drawing, of which—

Figure 1 is a view in diagram of a sheet containing the condensed code aforesaid; Figs. 2 and 3, broken views of the serial number sheets. Fig. 4 shows by a number of examples the manner of using my invention in transmitting messages.

Referring to Fig. 1 it is to be noted that this sheet contains all the essential elements of my invention, and embodies in compact form all the capabilities of the code referred to which is provided with several sheets. It avoids the necessity of turning from one sheet to another to construct or translate a telegraphic code word. The additional sheets shown are auxiliary, and serve to shorten the work in the specific cases before mentioned.

Generally stated, my invention comprises a root part and a terminal part, both being on the same sheet; and a serial number part consisting of several separate sheets. The root part of my device is separated from the terminal part in any suitable manner, as by the line marked 1, and comprises the consonant letters shown, with a numeral corresponding to every letter. The terminal part comprises classified lists of two letter syllables, each syllable beginning with a vowel, and ending with a consonant, and each syllable having a numeral corresponding therewith. By combining a root part with a terminal part on one sheet I am enabled to write such a message as could be sent from my device shown in the previous patent referred to, without the necessity of turning from page to page, and without the use of a separate signal for indicating transfers. The serial number pages are all marked by a vowel, and the root part of my code consists of a consonant letter designating a number. Bearing this fact in mind, the operation of my code is readily understood, when it is remembered that the contiguity of two consonants marks the beginning of a new number, and the contiguity of two vowels marks a reference to the serial num-

ber sheets. An example will throw further light on my code. Suppose it is desired to transmit the numbers 1645, and 382. We find "WITFUZ" as an arbitrary pronounceable group of syllables signifying the numbers required. Note the contiguity of the two consonants "T" and "F," which shows that the numbers 1645, 382 are not to be taken as one group, but two, divided as shown. To transmit as one group the transmitted word would be "COWOGUZ," which shows no contiguous consonants and therefore means one group of numerals. Suppose now the word received was "Nefoceaj." The first letter "N" refers to 10 in the root column, "ef" to 18 in the terminals, which gives 1018 so far; then follows "oc" in the terminals which adds 50 to the 1018. Now follows two vowels in juxtaposition, which refers to the serial page E and the series thereon marked by "aj," or 1.2.5.8.9. For the beginning of a word the root column may or may not be used as the writer may desire. Sometimes greater economy may be obtained by using a single letter of the root column to signify two figures; but the beginning of a word by a two letter syllable can cause no confusion if the root letter is used within the word to mark a new number, by causing a consonant to be immediately followed by a consonant.

For the transmission of ordinary numbers, my improved device does away with the transfer character used in my former code, and every letter has a value. The transfer character is used only in the transmission of serials.

Where two groups of figures are to be transmitted by one combination of syllables, if the second group contains an even number of digits, its transmission by the described method is limited to numbers below 1800, but groups of odd numbers of digits may be transmitted thereby. For example the two groups, 12345/6789 would have to be transmitted by separate groups of letters. But the numbers 12345/67890 would be transmitted by the word "Cemitjusyl." The first group may contain either an odd or even number of digits, since, as above stated, it may or may not begin with a letter from the root column.

Codes may be constructed based on the system substantially as described, ranging from "AD00" to "YZ99;" from "BAD,000," to "ZYZ1799;" from "ADAD0000," to "YZYZ9999;" and from "BADAD,00000" to "ZYZYZ,179999." Beyond "M9" in the root column, to and include Z17, a gain is made of one figure in each group, *i. e.* two figures are transmissible by one letter, permitting greater scope than is obtainable under Beveridge 724786, April 7, 1903; McDonald 842106, January 22, 1907, and McDonald 841,885, January 22, 1907.

Having described my invention what I claim as new and desire to secure by Letters Patent of the United States, is:

1. In a cipher code, a sheet divided in any suitable manner into a root part and a terminal part, the root part consisting of a series of single consonants and their appropriate numbers, and the terminal part of a series of two letter syllables beginning with a vowel and ending with a consonant, and their appropriate numbers, whereby the contiguity of two consonants signifies the separation of two groups of numbers, and the contiguity of a vowel and a consonant signifies the non-separation thereof.

2. In a cipher code, the combination with a sheet divided in any suitable manner into a root part and a terminal part, the root part consisting of a series of single consonants and their appropriate numbers, and the terminal part of a series of two letter syllables beginning with a vowel and ending with a consonant and their appropriate numbers, of sheets designated by vowels and showing series of two letter syllables beginning with a vowel and ending in a consonant, every syllable having appropriated thereto a series of numbers, whereby the contiguity of two consonants signifies the separation of two groups of numbers, the contiguity of a vowel and a consonant signifies their non-separation, and the contiguity of two vowels signifies a transfer to the sheets carrying said serial numbers.

3. A code system having root letters consisting of consonants, a numeral associated with every one of said root letters, terminal couplets beginning with a vowel and ending with a consonant, and a numeral associated with every one of said couplets.

4. In a code system consonantal root letters for indicating the beginning of a number, every letter having a numeral associated therewith, couplets beginning with a vowel and ending with a consonant, every couplet having a numeral associated therewith, whereby the introduction of a root letter within a letter group is indicated by the adjacency of two consonants.

In testimony whereof I have set my hand this 24th day of March A. D. 1908, in the presence of the two subscribed witnesses.

CHARLES WOOD McDONALD.

Witnesses:
FRANK P. MEDINA,
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