

No. 831,968.

PATENTED SEPT. 25, 1906.

C. J. MITCHELL.
SELF TESTING SAFETY CODE.

APPLICATION FILED OCT. 9, 1905.

1st. 2nd. & 3rd. letters	Options and prices—	4th.	5th.	6th. 7th.	8th. 9th.	10th.
REB — — — — —		B — — — — —	A — — — — —	DI — — — — —	C — — — — —	D — — — — —
REC Buy price not to exceed.		C 50 E Bags Coffee	F Feb.	D 2	E 1	F 1
RED Buy for our account and risk, order good for this day only		D 70 I B's pork		F 3	I 2	H 2
REF Buy for our account and risk, order good till cancelled		F 100		HI Apr.	G 4	J 3
REG Buy at your discretion.		G 150 O Tierceslard	JI May	H 5	U 4	K 4
REH Bought for your account, and risk.		H 200 U Bales wool	KI June	K 6	Y 5	L 5
REK Sell for our account and risk, order good for this day only.		R 600		LI July	L 7	S 6
RES Advise you not to sell.		S 760 Y Bags Sugar	MI Aug.	M 8	D 7	S 4
RET Advise you not to cover.		T 1000 D		NI Sept.	V 14	K 8
REV Would not advise selling.		V 1500		PI Oct.	W 15	L 9
REW Would you advise buying		W 2000 T Bales Cotton	RI Nov.	X 16		W 3/4
REX Would you advise covering our		X 2500		SI Dec.	Z 17	Y 3/8
REZ		Z 5000 S		CI	B 0	X 0
						C 0

WITNESSES:

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INVENTOR.

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Ridout Gaybee
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UNITED STATES PATENT OFFICE.

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SELF-TESTING SAFETY-CODE.

No. 831,968.

Specification of Letters Patent.

Patented Sept. 25, 1906.

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To all whom it may concern:

Be it known that I, CHARLES JUDGE MITCHELL, of the city of Toronto, in the county of York, Province of Ontario, Canada, have invented certain new and useful Improvements in Self-Testing Safety-Codes, of which the following is a specification.

My object is to devise a code for the transmission of messages which permits the user to make up his code-word to convey the desired message and which enables the receiver of the message to apply one or more tests to the code word or words received to determine probable errors in transmission; and my invention consists, essentially, in treating single letters or combinations of letters as symbols and in attaching arbitrary meanings to each symbol and in grouping the symbols in such a manner that any one symbol in the first group, taken with any one symbol from each of the other groups consecutively, will form a coined or made and vocalized word of a predetermined number of letters. The number of letters in the code-word forms the first test the receiver may apply to the word or words received. A further test is provided in that as far as possible each section of the code is so constructed that certain letters occur at predetermined positions in the code-words so made up. For example, it may be arranged that the vowels occur in invariable sequence or in certain fixed positions substantially as hereinafter more specifically described.

The drawing shows a portion of one of the sections of a code constructed in accordance with my invention.

In the drawing I show first a column or group of symbols formed of three letters, to which symbols arbitrary meanings are attached. I next show two columns or groups of symbols composed of one letter each. Next a group of symbols composed of two letters each, and next three columns or groups of symbols composed of single letters, in each and every case arbitrary meanings being attached to the said symbols. It will further be noted that, reading from left to right, the second letter is the vowel "E," the seventh the vowel "I," and the last a consonant, and this order is maintained when any symbol from the first column or group is combined consecutively with any one symbol of each

of the other groups. It will also be seen that each word formed by so combining the symbols must contain ten letters.

Messages are sent by extracting from the columns of meanings the message desired and writing as a single word the symbols found opposite said meanings. The receiver of a word or words so constructed refers to his copy of the table or section of the code and applies his tests to the word or words before attempting to decipher the meaning. For instance, he first counts the number of letters. If the word does not contain the predetermined number of letters—in the present case ten—he knows at once that there is an error, and he may have the message repeated for correction or possibly correct the error on reference to his table. The second test would be as to whether the predetermined letters or vowels occur in their predetermined position. This practically gives for the table in question three tests. For instance, the second letter must be the vowel "E," the seventh the vowel "I," and the last letter a consonant. If the word received stands all these tests, the chances are in favor of the message being correct. It will be found that by means of this system of tests at least fifty per cent. of possible errors in transmission will be detected and can be corrected on the spot without reference to the sender. With ordinary codes no such correction is possible, as, if a word is incorrectly sent, there is no means of ascertaining what the correct word was.

Of course I do not desire to confine myself to the precise arrangement of the symbols shown, as in the construction of a complete code these will necessarily vary widely, both in the order of the letters employed and in the number of letters in any given symbol. The underlying principle of having each symbol in a group composed of the same number of letters must be carried through all. It does not matter, of course, what letters are chosen to occur in set positions in the words coined or made up from the tables or sections of the code, though these are preferably vowels; but it is of course essential (and the system provides) that vowels be introduced into these symbols, so that the words coined or made are vocalized. It is evident also that with a code-section such as is illus-

trated the code-column containing instructions and replies might be used with subsequent columns expressing articles, quantities, prices, quality, shipping instructions, or
 5 other like combinations to give information other than the specific information illustrated. I may, for example, use the first column as a list of commodities with which
 10 sets of the remaining columns to give any desired message relating to the said commodities.

Owing to the great capacity of the code, it provides a check on the correctness of messages impossible with ordinary codes, as will
 15 appear on consideration of examples taken from the section of the code illustrated. A broker may cable the word "Rewsulidit." A reference to the table shows that the word
 20 should contain ten letters, that the second letter should be "E", the seventh "I," and the last a consonant, and if the word stands these tests it is probably correctly sent. Decoded, the word "Rewsulidit" means: "Would
 25 you advise buying seven hundred and sixty bales wool, July, twenty-two and one-half cents?" The reply is sent "Redsulidit," which, decoded, means: "Buy for our account and risk, order good for this day only,
 30 seven hundred and sixty bales wool, July, twenty-two and one-half cents." The original sender replies: "Rehsulidit." This, decoded, means: "Bought for your account and risk seven hundred and sixty bales wool,
 35 July, twenty-two and one-half cents." In each of the subsequent messages the quantity, particulars, and price are exactly repeated, so that absolute safety is provided from any possible misinterpretation of the first message
 40 sent. Ordinary codes cannot provide this safeguard, as it is impossible to provide lists of words sufficient in number to express in connection with the first part of the message all the possible combinations of information relating thereto, such as quantity, particulars,
 45 and price.

It will be seen that at the head of each column is a symbol having a series of dots or dashes after it. This symbol is employed
 50 when it is not desired to include in a message any of the information contained in that particular column.

From the above it will be seen that a code constructed in accordance with my invention
 55 will not only be much safer than those ordinarily employed, owing to the tests provided, but will also be more concise and be adapted to give a much larger range of messages. Owing to the conciseness of the code,
 60 it saves a vast amount of time in coding and

decoding messages over the ordinary type of code.

What I claim as my invention is—

1. A code comprising letters and combinations of letters forming symbols to which arbitrary meanings may be attached, the symbols being formed and grouped so that any symbol from the first group taken with a symbol from each of the other groups consecutively will form a vocalized word containing
 65 a predetermined number of letters, substantially as described. 70

2. A code comprising letters and combinations of letters forming symbols to which arbitrary meanings may be attached, the symbols being formed and grouped so that any symbol from the first group taken with a symbol from each of the other groups consecutively will form a vocalized word; certain letters used being so placed in the symbols that
 75 they each occur in each word formed in a certain predetermined position, substantially as described. 80

3. A code comprising letters and combinations of letters forming symbols to which arbitrary meanings may be attached, the symbols being formed and grouped so that any symbol from the first group taken with a symbol from each of the other groups consecutively will form a vocalized word; certain
 85 vowels used being so placed in the symbols that they each occur in each word formed in a certain predetermined position, substantially as described. 90

4. A code comprising letters and combinations of letters forming symbols to which arbitrary meanings may be attached, the symbols being formed and grouped so that any symbol from the first group taken with a symbol from each of the other groups consecutively will form a vocalized word containing
 95 a predetermined number of letters, certain vowels used being so placed in the symbols that they each occur in each word formed in a certain predetermined position; substantially
 100 as described. 105

5. A code comprising letters and combinations of letters forming symbols to which arbitrary meanings may be attached, the symbols being formed and grouped so that any
 110 symbol from the first group taken with a symbol from each of the other groups consecutively will form a vocalized word, substantially as described.

Toronto, October 28, 1905.

CHARLES JUDGE MITCHELL.

In presence of—

MADGE KATE HUNTER,
 FRANK ROD PHILLIPS.