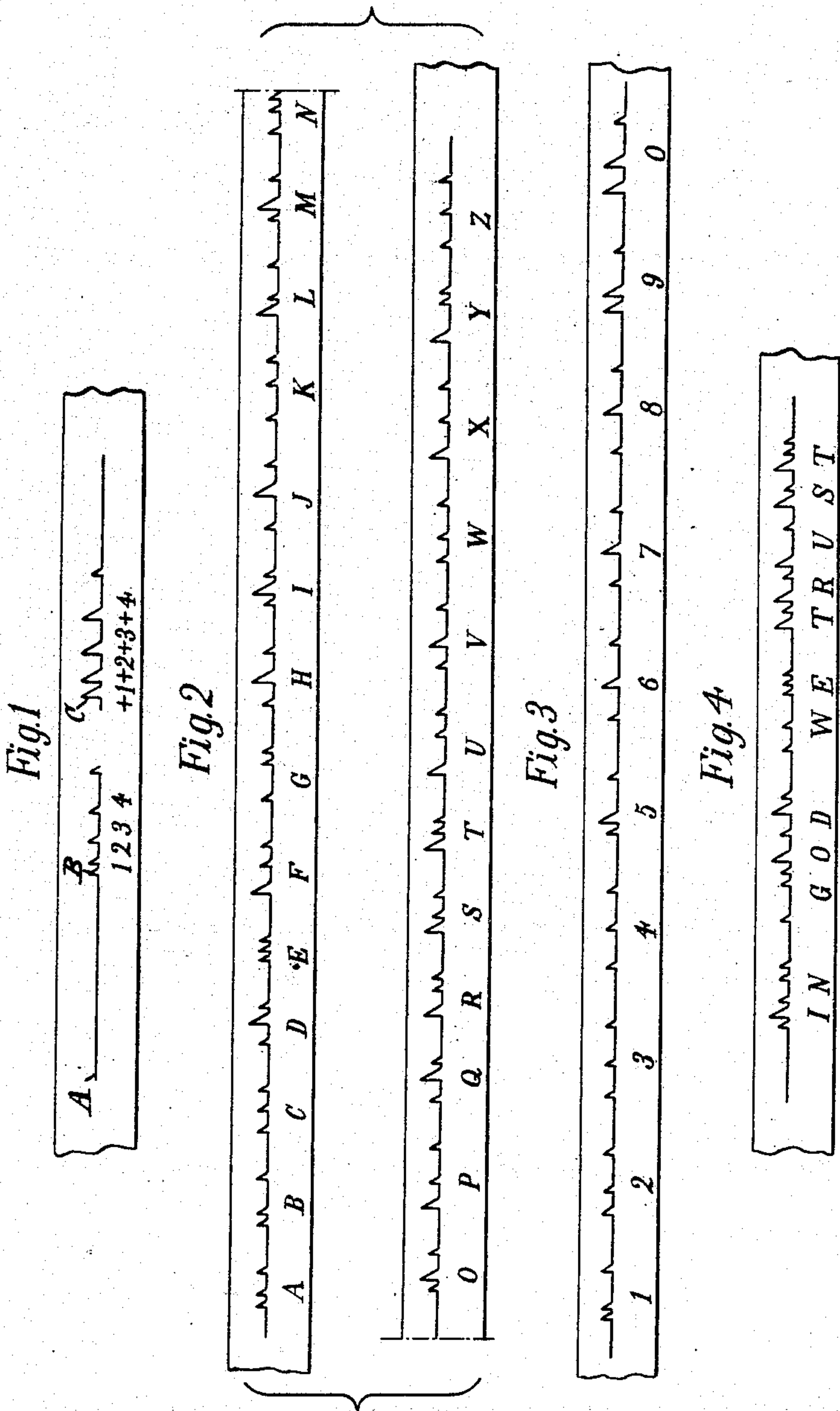


C. G. BURKE.
TELEGRAPHIC CODE.

(Application filed Mar. 29, 1900.)

(No Model.)



Witnesses:

Raphael Ketter
Benjamin Miller

Charles G. Burke, Inventor

by *Henry Page & Cooper* Attys.

UNITED STATES PATENT OFFICE.

CHARLES G. BURKE, OF BROOKLYN, NEW YORK, ASSIGNOR OF ONE-HALF
TO JOHN Q. A. WHITTEMORE, OF BOSTON, MASSACHUSETTS.

TELEGRAPHIC CODE.

SPECIFICATION forming part of Letters Patent No. 676,936, dated June 25, 1901.

Application filed March 29, 1900. Serial No. 10,601. (No model.)

To all whom it may concern:

Be it known that I, CHARLES G. BURKE, a citizen of the United States, residing at the borough of Brooklyn, in the city of New York, county of Kings, and State of New York, have invented certain new and useful Improvements in Telegraphic Codes, of which the following is a specification, reference being had to the drawings accompanying and forming
10 a part of the same.

This invention refers to that class or system of telegraphy wherein telegraphic signals are sent over a telegraph-line and made to act on a receiving instrument so as to produce a record indicating the deviations of a stylus or siphon in opposite directions from a zero point or line. Heretofore it has been usual in operating instruments of this form to designate the deviations from zero in one
15 direction as "dots" and in the other direction as "dashes" and by combinations of these so-formed dots and dashes to indicate the letters of the alphabet, numerals, and other desired significations. As all signals representing letters, &c., under this arrangement have to be composed of these dots and dashes used singly, in multiple, or in combinations, the forming of a code for the twenty-six letters of the alphabet, the numerals, &c., necessitates the employment of deviations in opposite directions for all of the letters except four and all of the numerals except one. As
25 a consequence siphon-recorder signals as now made present a zigzag appearance, and the siphon in producing the record has to be moved over a considerable space while passing to and from the extreme limit of deviation in one direction to the extreme of deviation in the opposite direction in all such cross combinations. These long movements of the
30 siphon are objectionable because of the extra time which is involved. Besides, the record becomes more or less illegible and difficult to decipher and necessitates skill for its correct interpretation. In my improvement I avail myself of the capability of receiving instruments of the kind described to produce a recognizable difference in extent of deviation in either direction, as well as their ability
35 to indicate a difference in length between succeeding deviations in either direction. By

this means I command several unit elemental signals, whereas but two are available under present methods. On account of this increased number of elemental units I am enabled to form a code for the letters of the alphabet, numerals, and other desired significations wherein all complete signals may be on one side of the zero point or line, thus avoiding the necessity of the siphon crossing
40 zero while forming complete signals or any complete combination of signals. Such a record is clear and uniform in character, easily deciphered, and the signals made more rapidly and by fewer electric impulses. In practice I find that eight of these unit-signals give the best general results, and in this specification I will confine myself to describing how I produce these eight units and how they are employed in telegraphy, it being understood that more than eight or less than that number may be produced and used in the same way. As a basis I select four signals distinguishable from each other by a difference in their respective lengths—that is to say, by the evidence of the difference in time
45 between successive impulses. For convenience I designate these four elemental unit-signals as signals Nos. 1, 2, 3, and 4. Unit-signal No. 1 is produced by sending an electric impulse of a given duration and polarity over the line for the purpose of causing the siphon to be moved from zero to a certain extent in a direction depending upon the polarity of the impulse. Thereby I indicate the beginning of the signal. After the lapse of one unit of time a second impulse of the same duration and like polarity is sent, and this completes signal No. 1. Signal No. 2 is produced in the same way, two units of time being permitted to intervene, however, between the impulses. For signals Nos. 3 and 4 three and four units of time, respectively, are made to intervene between their respective initial and finishing impulses. In addition to these four unit-signal elements differing in length I also employ four other signals distinguishable from them by the effects produced in the recording instrument and in the record by a prolongation of the duration of the impulses by which the beginning of signals is indicated. For convenience these additional sig-
50

nals may be designated as signals plus 1, plus 2, plus 3, and plus 4. To produce plus-signal No. 1, the initial electric impulse is given an appreciable longer period of contact than that of elemental signal No. 1. This is followed by one unit of time and the signal completed by one impulse of briefer contact. The effect of this increase in the duration of the initial impulse is to cause a wider deviation from zero than in the case of signal No. 1, so that although signal plus 1 and signal No. 1 agree in length of time elapsing between the initial and finishing impulses they will be distinguishable from each other by a difference in the extent of deviation of their initial impulses from the zero-line. Signals plus 2, 3, and 4 differ from signals Nos. 2, 3, and 4 by only a like increase in the extent of deviation of the initial impulse. In practice I find that an increase of one-third the ordinary period of the electric contact is quite sufficient to make these differences unmistakable. It is obvious that when these signals follow each other, as would be the case in all combinations of two or more of them, the impulse which is required to define the termination of the time unit or units of the first signal will also serve to indicate the beginning of the time unit or units of the next succeeding signal, and so on to the last signal in the combination, which of course requires a final impulse. In practice, therefore, it may be said that the transmission and recording of each symbol or signal, except the last, of a combination of two or more requires but one electric impulse. For example, to transmit a combination of signals corresponding to the figures "2314," I send an initial positive impulse over the line, then after two units of time a second impulse, then after three units of time a third impulse, again after one unit of time a fourth impulse, and then after four units of time the fifth or final impulse. A suitably-constructed receiving apparatus will in response to such signals trace marks on the paper or tape, separated from each other by lines of two, three, one, and four units of length, respectively.

While in my system I discard entirely the use of the usual signals for indicating letters of the alphabet and numerals, I may, and in practice I do, assign to the more simple signals or combinations the letters of the alphabet, numerals, short words in frequent use, punctuation-marks, and the like, so that my system may be operated entirely independently of any of the codes now in use for the transmission of all kinds of messages, and always with the advantage of increased speed, accuracy, and simplicity.

In transmitting messages each complete combination of signals used for indicating different number or figure combinations is separated from adjacent combinations by

space-marks longer than the longest symbol employed.

Referring now to the drawings hereto annexed, Figure 1 shows the record made by a siphon-recorder of the eight signals which I employ. Fig. 2 shows the recorded signals which represent letters. Fig. 3 shows the recorded signals which represent numerals. Fig. 4 shows the record of groups of signals arranged to spell out given words.

In Fig. 1 the zero-line is designated by A, the marks made by the stylus or pen of the recorder when actuated by a primary impulse by B, and those made by an impulse of increased duration by C. The signal for the numeral "1" will therefore be indicated by two of the elemental marks B, separated by one unit of space or time, that for "2" by two of such marks, separated by two space-units, and so on, while the numerals "+ 1," "+ 2," "+ 3," and "+ 4" will be similarly indicated by the plus-marks C, which have greater deviation from the line A. By selected combinations of these signals, as above explained, I may indicate the letters of the alphabet, the signals used, preferably, for this purpose being indicated in Figs. 2 and 3.

As I have stated before, the impulses may be on the opposite side of the zero-line from that illustrated.

The transmission of signals by this means is very much simplified, and the best conditions for rapid working of the line are secured.

What I claim is—

1. A telegraphic code in which the signal elements are distinguished from one another by a difference in length and by their relation to a given zero position, and in which each group or combination of elements which represents a given letter or character is made up of elements having the same relation to such zero position, as set forth.

2. A telegraphic code in which the signal elements are distinguished from one another by a difference in length and form, and by their relation to a given zero position, and in which each group or combination of elements which represents a given letter or character is made up of elements which have the same relation to such zero position, as set forth.

3. A telegraphic code composed of a plurality of groups of signal elements, each group representing a given letter or character, and characterized by the relation of its component elements to a given zero position, the several elements of each group being distinguished by a difference in form corresponding to the strength of the current impulses producing them, as set forth.

CHARLES G. BURKE.

Witnesses:

M. LAWSON DYER,
JOHN C. KERR.