No. 823,176. PATENTED JUNE 12, 1906.

I. KITSEE.

ELECTRIC TELEGRAPHY.

APPLICATION FILED DEC. 15, 1905.

Fig. 1.

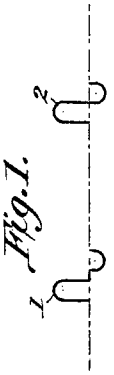


Fig. 2.

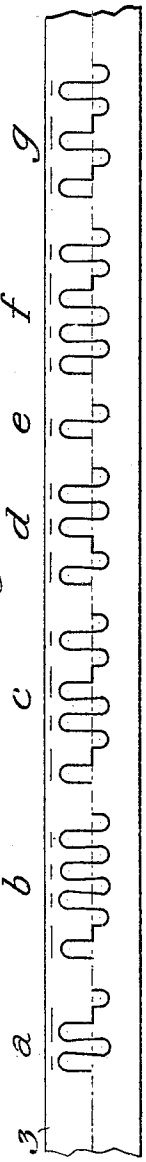


Fig. 3.

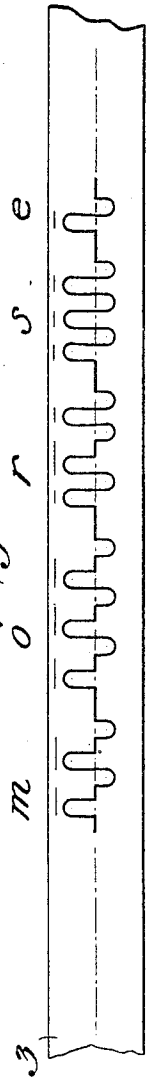
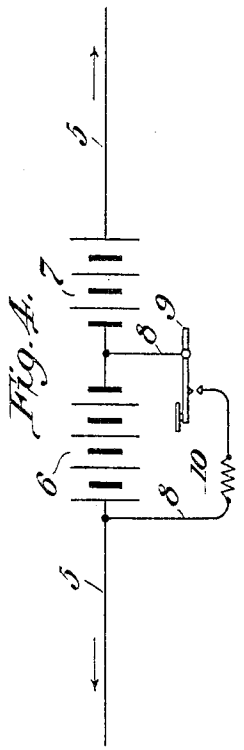


Fig. 4.



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ELECTRIC TELEGRAPHY.

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To all whom it may concern:

Be it known that I, ISIDOR KITSEE, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Electric Telegraphy, of which the following is a specification.

My invention relates to an improvement in electric telegraphy, and has more special reference to the symbols of the telegraphic alphabet.

The universal telegraphic code—Morse alphabet—consists of dots and dashes grouped differently for different letters. On land-lines these dots and dashes are produced through a shorter or longer contact of the transmitting-key with a source of current of one polarity. On submarine cables these dots and dashes are symbolized, one by an impulse of one polarity and the other by an impulse of opposite polarity. In the telegraphing with alternating currents the dot is symbolized by a few complete cycles and the dash is differentiated from the dot by a greater number of cycles. In some methods part of the cycles are depressed or combined with currents of higher intensity. I have found that on lines with great capacity it is advantageous to telegraph with true reversals—that is, with impulses always of substantially the same duration and intensity, but always of opposite polarity.

On submarine cables the so-called "siphon-recorder" is generally used. This instrument has a normal position, which is called the "zero" position and is capable to deflect to the right as well as to the left of this zero position, the characters of the alphabet being symbolized by curves, a curve on one side of the zero-line symbolizing a dot and a curve on the other side of the zero-line symbolizing a dash, an impulse of one polarity being necessary for the recording of a curve on one side and an impulse of opposite polarity for the recording of a curve on the other side of the line. A dot is generally symbolized by a curve to the right or an upper curve and a dash by a curve to the left or a lower curve; but as in the alphabet often two or more dots or two or more dashes follow each other true reversals cannot be practiced with the recording method as is used to-day.

It is my intention to utilize in recording true reversals the siphon-recorder as now organized; but in contradistinction to the system now employed my invention consists therein that one character or symbol is symbolized by an upper and lower curve and the second character or symbol is symbolized by an upper curve followed by a zero-line and ending with the lower curve. In transmitting messages a double key may be used or a single Morse key adapted to transmit an impulse of one polarity when depressed and an impulse of opposite polarity when released, and in the drawings I have illustrated one method of transmitting true reversals in accordance with my invention. It has to be stated that in transmitting impulses over such lines—as, for instance, submarine cables—in which condensers are employed the shorter or longer depression of the key will not send a shorter or longer impulse over the line; but the impulse will always remain substantially of the same short duration till the condensers are filled. If the transmitting operator, therefore, depresses the key for a time equal to a dot or if he depresses the key for a time equal to a dash, the receiving device will always answer in a manner as if the impulses were of the same short duration.

It is now supposed that at the transmitting-station a Morse key is employed adapted to transmit a positive impulse by the depression and a negative impulse when released, and it is also supposed that a positive impulse at the receiving-station will be recorded by an upper curve. When the operator depresses the key for a short time and then releases the key, at the receiving end the siphon will record an upper curve followed by a lower curve; but when the transmitting operator depresses the key for a long time then the siphon at the receiving-station will record an upper curve as before; but as no negative impulse follows the siphon will return to its zero position and will record a zero-line till an impulse of opposite polarity follows, and as such impulse can only follow through the release of the key by the transmitting operator it is obvious that the operator has it in his power to prolong the zero position, and therefore record a zero-line of the desired length. To differentiate, therefore, between a dot and a dash, the transmitting operator needs only to manipulate the key in the usual manner—that is, to depress the same for a short period for a dot and a longer period for a dash—and I select to follow the same method. At the receiving-station where a siphon-recorder is employed the rec-

ord will be as follows: for a dot an upper curve followed by a lower curve and for a dash an upper curve followed by a zero-line and then a lower curve. In reading such characters only the upper curves and zero-lines need to be taken into consideration, the lower curves being always the result of the clearing-current.

In the drawings I have illustrated in Figs. 1, 2, and 3 my improved symbols and in Figs. 2 and 3 the continental Morse in dots and dashes. Fig. 4 illustrates in diagrammatic view one method with which true reversals may be sent by an ordinary Morse key.

In Fig. 1, 1 represents a symbol for one character of the alphabet, and 2 represents a symbol for the second character of the alphabet.

In Fig. 2, 3 represents a paper on which the letters "a, b, c, d, e, f, g," are symbolized by the ordinary Morse and by my improved method.

In Fig. 3 the word "Morse" is symbolized by the continental Morse system as well as by my improved method.

In Fig. 4, 5 is the line proper, in which is inserted the batteries 6 and 7; 8 is a shunt around the battery 6, and 9 the transmitting-key adapted to close and open the shunt. Normally—that is, when no message is transmitted—the shunt around the battery 6 is open, and as the batteries 6 and 7 are in opposition as to each other and the battery 6 consists of more cells than the battery 7 it is obvious that an impulse will flow in the direction of the unfeathered arrow; but as soon as the key 9 is closed the battery 6 will be shunted and an impulse will flow in the direction of the feathered arrow. The operator in transmitting a dot depresses the key for a short time and then releases the same. Through the depression of the key an impulse equal to the strength of three cells will flow over the line in the direction of the feathered arrow, and when the key is released an impulse will flow over the line equal to one cell in the direction of the unfeathered arrow. At the receiving-station the impulse in the direction of the feathered arrow will result in the recording of an upper curve and the impulse in the direction of the unfeathered arrow will result in the recording of a lower curve. If, as is illustrated, the batteries consist of three and four cells, respectively, the upper curve will be larger than the lower curve, and in the drawings I have illustrated such arrangement; but where it is desired to telegraph over very long distances and to clear the line entirely the strength of the batteries may be equal to four and two cells, so that the upper curve may be made through an impulse of the same strength as the lower curves and both curves would then be equal.

The letter "a" consists in the continental code of a dot followed by a dash. The operator depresses the key for a short period, making an upper curve, and releases the key, thereby making the lower curve for the first dot. He then depresses the key again, but this time for a greater length, which will result in an upper curve and in a zero-line, and releases the key again, producing a lower curve, as is clearly illustrated in Fig. 2 at the letter "a." The same method holds good by transmitting the letters "b, c, d, e, f, g," &c.; but when a whole word or series of words are to be transmitted the operator after having transmitted a letter generally allows the key to remain open for a predetermined period. A zero-line will therefore be recorded at the receiving end after the lower curve, and such zero-line will be read by the translation of the message, as spacing. In other words, only the zero-lines before the lower curves are part of the character or symbol, the zero-lines after the lower curves are only symbolizing spaces.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a telegraphic alphabet, one symbol consisting of two curves opposite as to each other, and the second symbol consisting of two curves opposite as to each other, a zero-line between said curves.

2. A telegraphic alphabet comprising two symbols, one symbol consisting of two marks opposite as to each other, the second symbol consisting of two marks opposite as to each other, and a third mark between said two marks.

3. A telegraphic code comprising a different grouping of two symbols, one symbol consisting of one mark at one side of an imaginary zero-line followed by a second mark at the other side of said zero-line, and the second symbol consisting of one mark on one side of the zero-line, one mark at the zero-line, and one mark at the other side of the zero-line.

4. A telegraphic Morse alphabet in which the dash is symbolized by two curves opposite as to each other and connected with each other by a straight line, and in which the dot is symbolized by two connected curves opposite as to each other.

5. A telegraphic alphabet comprising two characters, one character consisting of two elements, one above and one below an imaginary zero-line and the second character consisting of three elements, one above, one at, and one below an imaginary zero-line.

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

ISIDOR KITSEE.

Witnesses:
MARY C. SMITH,
ALVAH RITTENHOUSE.