3 Sheets--Sheet 1.

# V. H. De FORVILLE.

## Portable Telegraph Apparatus

No. 151,102. Patented May 19, 1874.

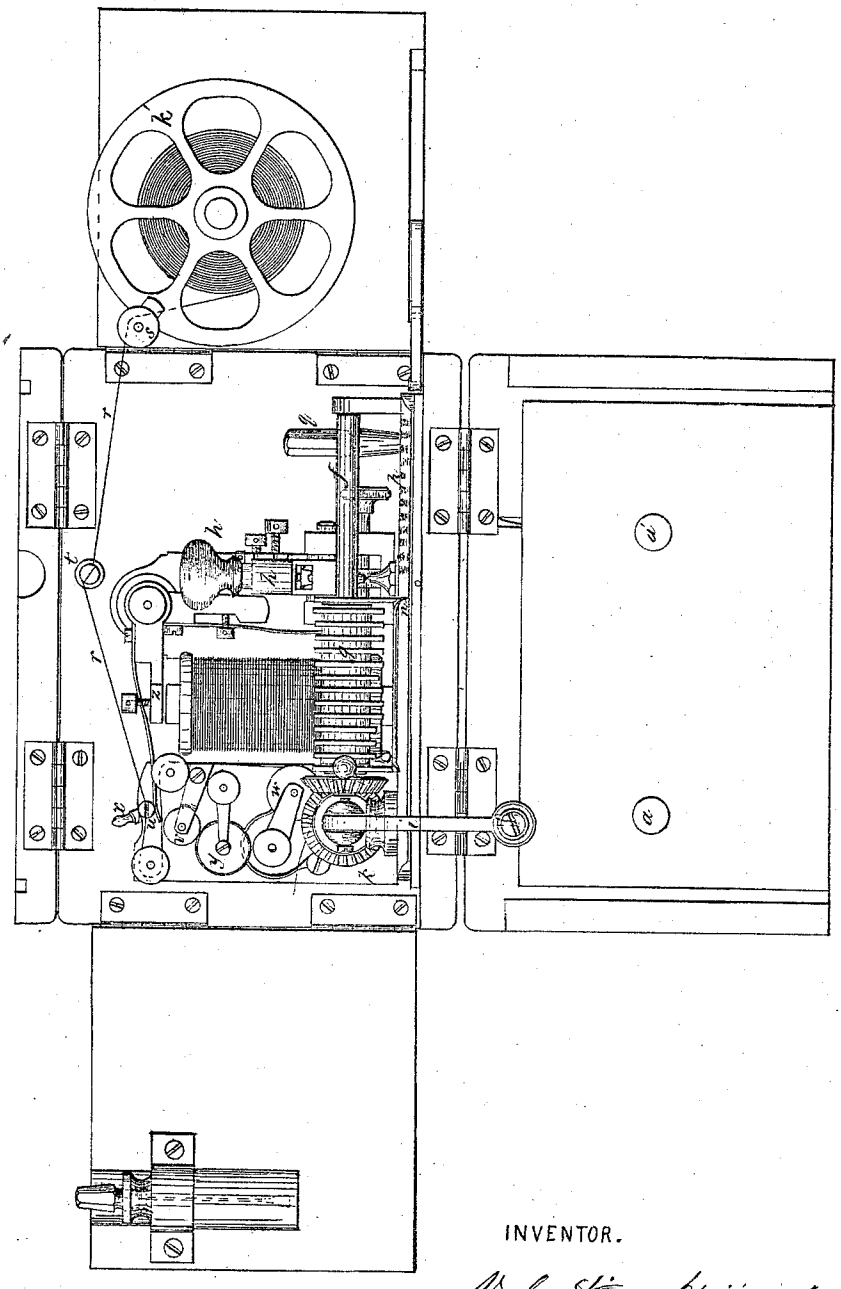

Fig. 1.

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3 Sheets--Sheet 2.

# V. H. De FORVILLE.

## Portable Telegraph Apparatus

No. 151,102. Patented May 19, 1874.

*Fig. 2.*

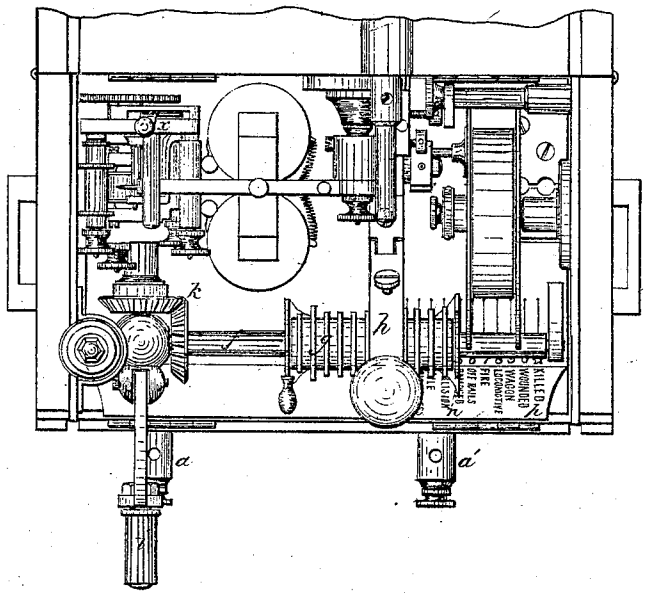
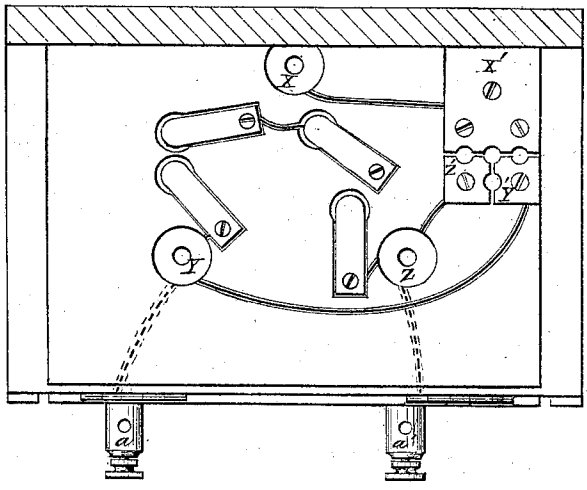



*Fig. 3.*

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3 Sheets--Sheet 3.

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## Portable Telegraph Apparatus

No. 151,102. Patented May 19, 1874.

*Fig. 4.*

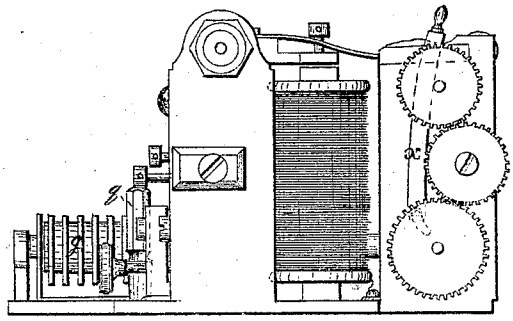
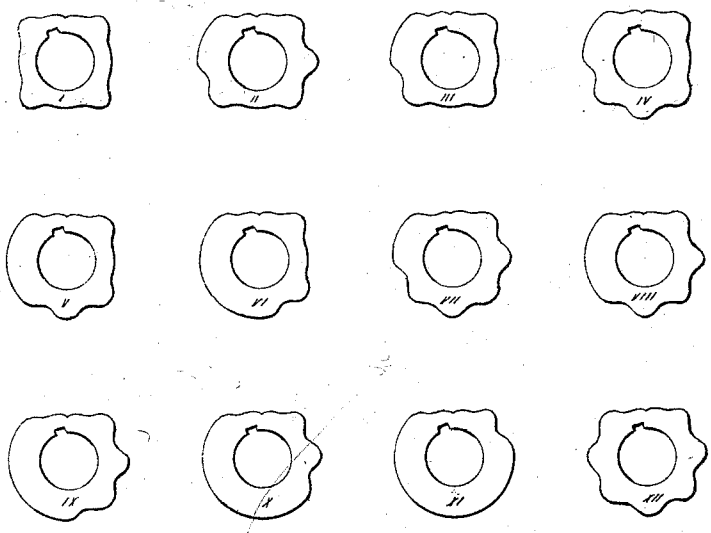



*Fig. 5.*




WITNESSES.

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# UNITED STATES PATENT OFFICE.

VALENTINE HAÜY DE FORVILLE, OF ST. PETERSBURG, RUSSIA.

## IMPROVEMENT IN PORTABLE TELEGRAPH APPARATUS.

Specification forming part of Letters Patent No. **151,102**, dated May 19, 1874; application filed April 9, 1873.

*To all whom it may concern:*

Be it known that I, the Marquis VALENTINE HAÜY DE FORVILLE, of St. Petersburg, in the Empire of Russia, have invented a Portable Telegraphing Apparatus, adapted for use on railroad-trains and wherever telegraph-wires are accessible, of which the following is a specification:

The object of this invention is to provide an instrument or apparatus that is extremely portable, capable of being connected, through the permanently-located wires from any watch-box or station-house provided with a commutator connection with the battery at the telegraph-office, to the right or left, for communicating signals of danger or distress, and that, at the same time, may be operated to transmit such signals by persons entirely unacquainted with the key system of operating the instrument, so that all messages ordinarily required for information of danger may be transmitted by one entirely unschooled in the profession; and it consists in the adaptation of a series of circuit-breaking cams, in combination with the electro-magnet, so constructed as to express words or sentences by rotating in one direction, and numerals by rotation in the other direction.

To enable others to make and use my invention, I will proceed to describe it by reference to the drawings, in which—

Figure 1 represents a front or face view of my portable apparatus, as exposed to view for operation. Fig. 2 is a plan or top view of the same, the cover being thrown back and ends closed, as when out of use. Fig. 3 shows a plan of the connections for the electric current, with the magnet and wires, and the changes of which said current is susceptible. Fig. 4 is a rear elevation of the instrument as detached or removed from its casing, and showing the train of gear-wheels by which the tape-feeding rollers are operated; and Fig. 5 shows a series of twelve cams, which, being rotated in one direction, close and break the circuit of the electric current, to express certain words or sentences, and, when rotated in the reverse direction, to indicate certain figures or numerals.

The same letters of reference appearing on the several figures indicate like parts.

In preparing or adapting the instrument for use, it is to be arranged as represented in Fig. 1, and the connections made, through the thumb-screws *a a'*, with the two ends of the severed telegraph-wire, thus forming a connection with the main line both to the right and left, without destroying the continuity of said line. The connections for the course of the electric circuit are indicated in Fig. 3, through the plates X' Y' Z', which, by the interposition of the plug *q*, forms the connection of the main line when placed between the plates Y' and Z', and with the ground, when between either of those and the plate X', through the foot X, to which, in that case, a ground-wire must be attached, and the main-wire connection made on the right or left, at *a'* or *a*, as desired.

When used with the commutator previously mentioned, and hereafter referred to as the subject-matter of another application, the electric current may be made to traverse the line in either direction, according to the position of the plug *q*, as above described, the connections being formed by the contact of the feet X, Y, and Z with the wires and the ground.

The magnet, armature, tape-reel, and printing devices are all similar to those commonly used in the Morse system, and therefore need no further or particular description here.

That portion of the apparatus which is of positive operation, and requiring no particular instruction, consists of a shaft, *f*, on which is arranged a series of cams, *g*, shown separately in Fig. 5, which have a sliding motion on said shaft and in spline-gear therewith, so that, by sliding said series of cams along the shaft *f* until a particular one is brought under the finger-lever or key *h*, and then rotating the shaft *f*, which is done by means of the crank-handle *i* through the bevel-wheels *k*, it will, when turned to the right, communicate the word, or sign thereof, to which the index *n* points, beginning with a hyphen or dash, and when turned to the left, or in the reverse direction, will indicate the figure or numeral in rear of such word on the plate *p* commencing with a point, thus making a very simple and certain means of transmitting messages even by a person unskilled in telegraphy. The instrument is also provided with a tape-reel, *k'*, and all the usual appendages by which messages may be received, which can be translated by one inex-

perienced in the use of the instrument, if furnished with the telegraphic alphabet for comparison, thus furnishing a most complete portable instrument, capable of transmitting and receiving messages at any point on a line of railroad, although no professional operator might be connected with the train.

The system here adopted is such that a single sign produces a whole word, while with the Morse key system the twelve or more words which are or may be expressed by this instrument would require at least seventy-six signs to indicate them, and which are all liable to inaccuracy, according to the operative ability of the telegraphic agent.

To overcome the necessity of cutting the wires of a telegraph-line where stations and police or watchmen's boxes are not far apart, I have devised a means, to be permanently located at all such places, by or through which, when the portable instrument is attached, the through line will be preserved, but may be temporarily broken by the position of the plug *q* in the portable instrument to control the line in either direction, and on removing the portable instrument the continuity of the line is immediately restored. This portion, however, which I term the commutator, I propose to make the subject of an application for a separate patent, and need not, therefore, describe it more particularly here, as this instrument may be used independently of it, in the manner before described.

There are some peculiarities in the construction of this portable instrument which I will describe more particularly. The means of receiving a message is through the indications on the tape or strip of paper *r*, which, being passed in its proper course over and through the conductors *s t u* and over the impression-wheel *v*, passes between clamping-rollers *w w*, which are rotated by the crank-handle *i* on receipt of a signal for attention. By the rotation of the said rollers the tape is unwound from the reel *k'* at the desired speed, and the message recorded on it may then be deciphered in the usual manner.

The clamping-rollers *w w* are brought into contact or separated by moving the switch-lever *x* to the right or the left, as desired, for operating or freeing the tape when receiving or sending a message, the switch *x* having a cam action, which brings the rollers *w* together or separates them, by moving it to the right or left, for the purpose above named.

What is here claimed, and desired to be secured by Letters Patent, is—

1. The series of circuit-breaking cams *g*, arranged to slide on the rotating shaft *f*, in combination with the operating-key *h*, the index-plate *p*, and the magnet, substantially as shown and described.

2. The guides *s t u* and impression-wheel *v*, in combination with the inking-roller *y*, tape-reel *k*, armature *z*, and clamping-rollers *w w*, all arranged for operation, substantially as shown and described.

3. The cams *g*, constructed to signal words or sentences by rotation in one direction, or numerals when rotated in the reverse direction, in combination with the lever-key of a telegraph-instrument, substantially as shown and described.

4. The switch *x*, in combination with the clamping-rollers *w w* and crank *i*, for operating the tape motion in receiving a message, substantially as specified.

MARQUIS V. HAÜY DE FORVILLE.

Witnesses:
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