(No Model.) 2 Sheets—Sheet 1.

A. L. PARCELLE.

AUTOMATIC TELEGRAPH.

No. 262,105. Patented Aug. 1, 1882.

Fig. 1.

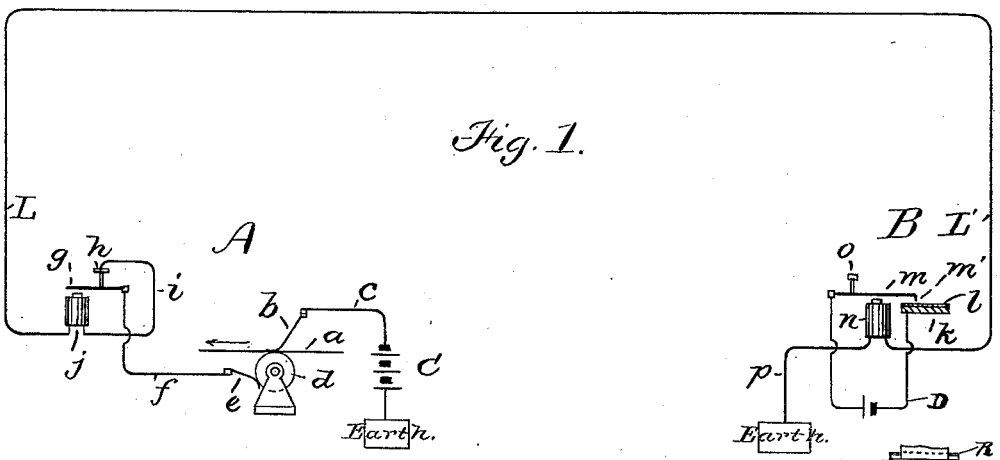


Fig. 2.

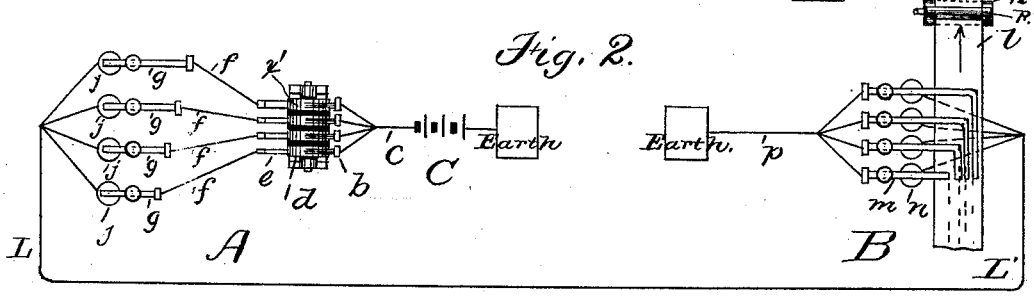


Fig. 3.

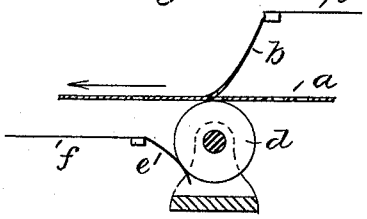


Fig. 8.

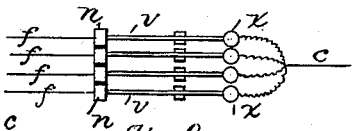


Fig. 4.

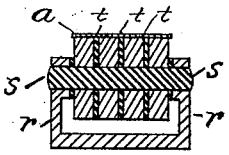


Fig. 5.

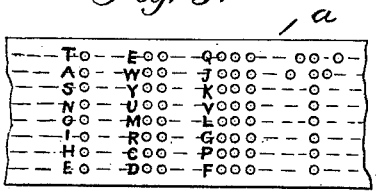
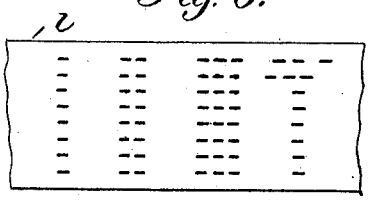
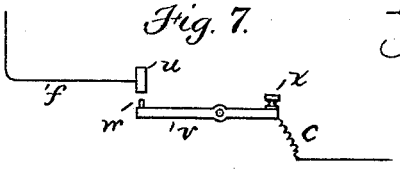


Fig. 6.



Witnesses.
H. G. Bradlee.
J. Brennan

Fig. 7.



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by
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(No Model.) 2 Sheets—Sheet 2.

A. L. PARCELLE.

AUTOMATIC TELEGRAPH.

No. 262,105. Patented Aug. 1, 1882.

Fig. 9.

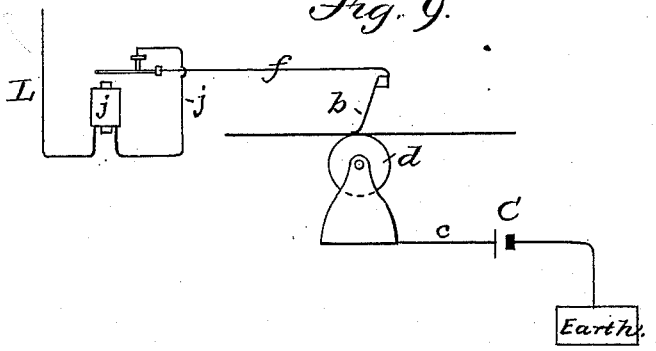


Fig. 10
Key. Transmitting.

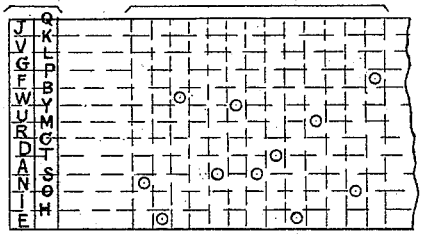


Fig. 11.
Receiving.

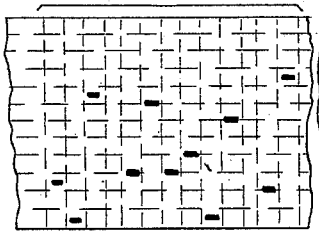


Fig. 12.
Receiving.

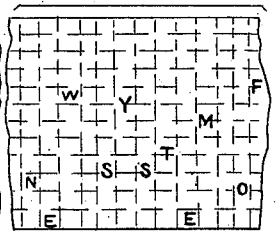


Fig. 13.
Key. Transmitting.

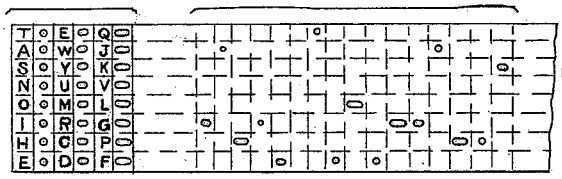
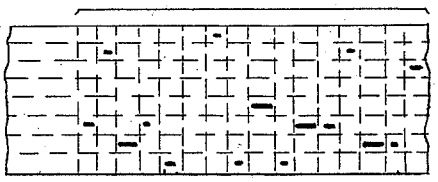


Fig. 14.
Receiving.



Witnesses
H. G. Madlin
J. Brennan.

Inventor.
A. L. Parcelle,
by Wright Brown
Attys

UNITED STATES PATENT OFFICE.

ALBERT L. PARCELLE, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE MERCHANTS UNION TELEGRAPH MACHINE COMPANY, OF MAINE.

AUTOMATIC TELEGRAPH.

SPECIFICATION forming part of Letters Patent No. 262,105, dated August 1, 1882.

Application filed September 27, 1881. (No model.)

To all whom it may concern:

Be it known that I, ALBERT L. PARCELLE, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Automatic Telegraphs, of which the following is a specification.

This invention relates to automatic telegraphs; and it consists in certain improvements which I will now proceed to describe, and point out specifically in the claims.

Of the accompanying drawings, forming part of this specification, Figures 1 and 2 are diagrams showing, respectively in elevation and plan, mechanism for carrying out my invention. Fig. 3 is a detached and enlarged view in section, showing the perforated paper strip in position. Fig. 4 represents a longitudinal section of one form of the contact wheels or disks. Fig. 5 represents a portion of a perforated strip of paper embodying my invention. Fig. 6 represents a portion of the chemical paper strip at the receiving end of the line, showing the characters produced by the arrangement of perforations in the transmitting-strip shown in Fig. 5. Figs. 7, 8, and 9 show modifications of the transmitting mechanism. Fig. 10 represents a portion of a paper strip perforated in accordance with my invention. Fig. 11 represents a portion of the receiving-strip, showing the arrangement of characters produced by the perforations shown in Fig. 10. Fig. 12 represents a portion of the receiving-strip with characters printed thereon. Figs. 13 and 14 represent respectively views of a portion of a transmitting-strip with a different arrangement of perforations and of the corresponding portion of the receiving-strip.

Similar letters refer to similar parts in all the figures.

In the drawings, A represents the transmitting end, and B the receiving end, of the line. *d* represents a disk or drum, which rotates in suitable bearings, *r*. Bearing upon said drum is a series of metal springs, *b*, each preferably composed of several fine strips in the form of a brush bearing with a yielding pressure upon the drum. *g g*, &c., represent a series of metallic reeds or circuit-breakers corresponding in number to the brushes *b*, and arranged over a series of electro-magnets, *j j*.

In the operation of my apparatus a strip of paper, hereinafter described, having as many longitudinal rows or series of perforations as there are brushes *b*, is passed between the drum and the brushes, its rows of perforations being so arranged that each row coincides with one of the brushes, each perforation, as it comes under the point of a brush, permitting the said brush to touch the metal surface of the drum, and thereby close the circuit through one of the reeds *g*. The connection of the reeds *g* to the drum is such that the closing of the circuit through any perforation in a given row in the paper strip will be through only the reed corresponding with said row of perforations, the other reeds remaining inoperative. This result may be accomplished in different ways. In the construction shown in Figs. 1, 2, 3, and 4 said result is accomplished by making the drum *d* of a series of metal disks, *x' x'*—one for each brush *b*—said disks being insulated from each other, and providing a series of springs, *e*, one bearing against each disk, and each connected by a wire, *f*, with one of the reeds *g*. In this construction the brushes *b* are connected by wire *c* with a battery, C, having a ground-connection. It will be seen that when either brush touches its disk of the drum the circuit will be closed only through the reed *g*, which is connected to the spring *e*, bearing on said disk. In the arrangement shown in Fig. 9, the same result is produced by making the drum with a continuous metal surface from end to end, connecting the drum by wire *c* to battery C and ground, and connecting each brush *b* by an independent wire, *f*, to its corresponding reed *g*, so that when a brush *b* is in contact with the drum the circuit is closed only through that brush and its corresponding reed. Each reed *g* has a back contact, *h*, against which it normally rests. From said back contact a wire, *i*, extends to and from a part of the electro-magnet *j*, and then extends to line L. Each reed *g* is adapted to be vibrated when the circuit is closed through it, and each is tuned to a separate and distinctive pitch—that is, each receives a separate and distinctive number of vibrations per second, and by its action on its electro-magnet *j* transmits said vibrations through the line L to the receiving-station B. At the receiving-station the line passes through a series of electro-magnets, *n n*, &c.,

to ground. The magnets *n n*, &c., correspond in number to the magnets *j j*, &c., at the transmitting end, and over said magnets *n n*, &c., are arranged a series of vibrating reeds or circuit-breakers, *m m*, &c., each of which is tuned to vibrate synchronously with one, and only one, of the reeds *g*, so that when any one of the reeds *g* is vibrated the impulses caused thereby will affect only one of the reeds *m*, causing said reed to be drawn to its magnet. Each reed *m* is provided with a stylus or point, *m'*, at its free end. Said points are arranged to project different distances over a metallic table, *k*, on which, when messages are being transmitted, I cause a strip, *l*, of chemically-prepared paper to pass. Whenever a reed *m* is attracted by its magnet its point is brought in contact with the chemical paper *l*, and thus caused to close the local circuit D, the current causing a mark to appear upon the paper. The arrangement of the points *m'* is such that the marks made by each upon the paper will have a different lateral position upon the strip from the others, as shown in Fig. 2, the paper being fed longitudinally by any suitable feeding mechanism—as, for instance, by feed-rolls R R' shown in Fig. 2—so that each point will make its own longitudinal series of marks, which will preferably be composed of dots and dashes, like those of the Morse telegraphic alphabet.

In transmitting messages with this apparatus by the automatic system I employ a paper strip, *a*, having as many longitudinal divisions as there are transmitting-reeds, and in these divisions, or both in and between them, the message-perforations are formed. To a perforation of a given length, or to a given combination of perforations where more than one are used to indicate a single character, I attach a different meaning in each longitudinal division or upon each line—that is to say, the lateral position of a given perforation or combination of perforations upon the paper strip indicated by the division or line on which it is formed determines the letter or character of which it is a symbol. The strip may be divided into any desired number of longitudinal spaces. In Fig. 13 I have shown longitudinal lines dividing the strip into eight spaces. A perforation of a given size in the first space indicates a given character—say the letter E—a perforation of the same size in the next space the letter H, and so on across the strip. Then commencing again at the space first mentioned, a different character—say a longer dash—may indicate the letter D, and so on, the letters most frequently used being preferably arranged nearest one edge of the strip, for convenience. In Fig. 10 a strip is shown having eleven lines and twelve spaces. A perforation in the first space here indicates one letter, a perforation on the line dividing the first from the second space indicates another letter, and so on. The characters may be distinguished from each other in each longitudinal space by the number of perforations comprising them, as shown in Figs. 5 and 6—for instance, E may be indicated by one perforation, D by two perforations, and F by three perforations, all in the same longitudinal space in the transmitting strip *a*, said perforations being reproduced in dots on the receiving-strip *l*, as shown in Fig. 6. In all cases the number of longitudinal rows or series of perforations in the strip *a* is the same as the number of brushes or electrodes *b* and connected transmitting and receiving reeds, the brushes or electrodes *b* being arranged to register with the rows of perforations, so that when the strip *a* is placed between the drum *d* and brushes *b* and moved longitudinally the perforations of each row will coincide with only one of said brushes and each perforation will allow the current to be closed as usual in automatic telegraphy. The transmitting-reeds are thus caused to vibrate, each having its particular number of vibrations per second, and each causing the vibration of its corresponding receiving-reed, so that the lines of marks made by the points *m'* of the receiving-reeds on the chemical-paper strip *l* will have the same significance as the rows of perforations in the strip *a*, the lateral position of each mark indicating its value or meaning.

It will be seen that by the arrangement of perforations in the transmitting-strip in several longitudinal rows or series and the employment of the transmitting and receiving reeds corresponding in numbers to the rows of perforations great rapidity in the transmission of messages can be attained, the letters or characters being sent almost simultaneously. The arrangement of perforations in the strip *a* is such, however, that the letters are not transmitted simultaneously, but in very rapid succession, so that each character on the receiving-strip *l* will have a different longitudinal position from the characters coming before and after it, as shown in Figs. 10 and 11. The order in which the characters are to be read is thus indicated by their longitudinal position. The order in which the characters are recorded on the strip *l* is secured by forming the perforations in the strip *a* in the same order as shown in Figs. 10 and 13. Both the strip *a* and the strip *l* are preferably provided with transverse lines or marks to indicate more clearly the order in which the characters stand and enable the message to be read easily.

I propose to perforate the strip *a* by the use of a perforating-machine operating on the principle of the type-writer, and adapted to form perforations or combinations of perforations by the depression of a corresponding key to feed the paper along after each perforation or combination of perforations is made, and also to feed the paper after the completion of each word, so as to form a space between each word and the next.

I prefer to print, at intervals of a foot or more or less, upon the strips *a* and *l* a key or guide (seen in Figs. 10 and 13) indicating the

letter or character represented by a perforation in a given longitudinal space of the strip *a* and a dash or mark in a given longitudinal space of the strip *l*. Such key or guide is preferably printed in a pale tint, so that it can be seen by the operator without being so conspicuous as to interfere with the reading of the message.

When a brief message is to be sent the circuit may be closed through a series of levers, *v*, (seen in Figs. 7 and 8,) equal in number to the transmitting and receiving reeds, and having at their outer ends knobs *x* marked with the characters they represent. Each lever is connected to a battery, C. Over the inner end of each lever is a metallic insulated anvil-block, *u*, which is connected to one of the reeds *g*. By pressing down one of the levers *v* contact is made with the corresponding anvil-block *u*, and the circuit is closed through the connected reed *g* the same as when the perforated strip *a* is employed.

If desired, the receiving-reeds may be adapted to make the characters on the receiving-strip *l* in ordinary letters, as shown in Fig. 12.

I am aware that it is not new, in a system of telegraphy in which a receiver is put in vibration by electrical impulses sent along the line-wire from the transmitting-station, to combine at the receiving end a local circuit independent of the receiver and a vibratory circuit-breaker in said local circuit acted upon by said receiver to effect a permanent make or break, as the case may be, of the local circuit, which is continued so long as the receiver continues to vibrate and ceases with the cessation of the receiver's vibration, and such combination I do not therefore claim. Neither do I claim a telegraph system comprising the combination of a series of transmitters and transmitting bristles or wires, a single main wire, receivers corresponding in number to the transmitters, tuned to a pitch to vibrate in unison with the succession of electric impulses transmitted from their respective transmitters, vibrating circuit-breakers operated one by each receiver, and a local circuit, electro-magnet, and recording-lever for each circuit-breaker; but

What I do claim as my invention is—

1. In a telegraph system, the combination of a main line and its battery or batteries, a series of differently-toned vibrating reeds or circuit-breakers at the transmitting-station, means for independently putting into vibration any of the said reeds, a series of stylus-pointed vibrating reeds or circuit-breakers at the receiving-station, corresponding in tone to the series of reeds at the transmitting-station, a series of local circuits including the stylus-pointed reeds, a conducting-bed, and local batteries, and means for moving a chemically-prepared receiving-strip between the bed and the stylus-pointed reeds, whereby, by successively putting in vibration the transmitting-reeds, marks or prints are made on the receiving-strip successively and in longitudinal rows, thus producing a condensed message on a short receiving-strip, substantially as described.

2. In an automatic telegraph system, the combination of a main line and its battery or batteries, a series of differently-toned vibrating reeds or circuit-breakers at the transmitting-station, a transmitting-strip having its perforations arranged successively in longitudinal rows, and having as many longitudinal rows of perforations as there are transmitting-reeds, means for making the circuit successively through the perforations of the different rows, so as to cause the vibration of the corresponding transmitting-reeds, a series of stylus-pointed vibrating reeds or circuit-breakers at the receiving-station, corresponding in tone to the reeds at the transmitting-station, a series of local circuits including the stylus-pointed reeds, a conducting-bed, and local batteries, and means for moving a chemically-prepared receiving-strip between the bed and the stylus-pointed reeds, whereby, by the operation of the transmitting-strip, marks or prints are recorded on the receiving-strip successively in longitudinal rows corresponding in relative position to the perforations in the transmitting-strip, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 21st day of September, A. D. 1881.

ALBERT L. PARCELLE.

Witnesses:
FRED FARRON,
H. G. WADLIN.