

L. BRADLEY.
Telegraph.

No. 25,718.

Patented Oct. 11, 1859.

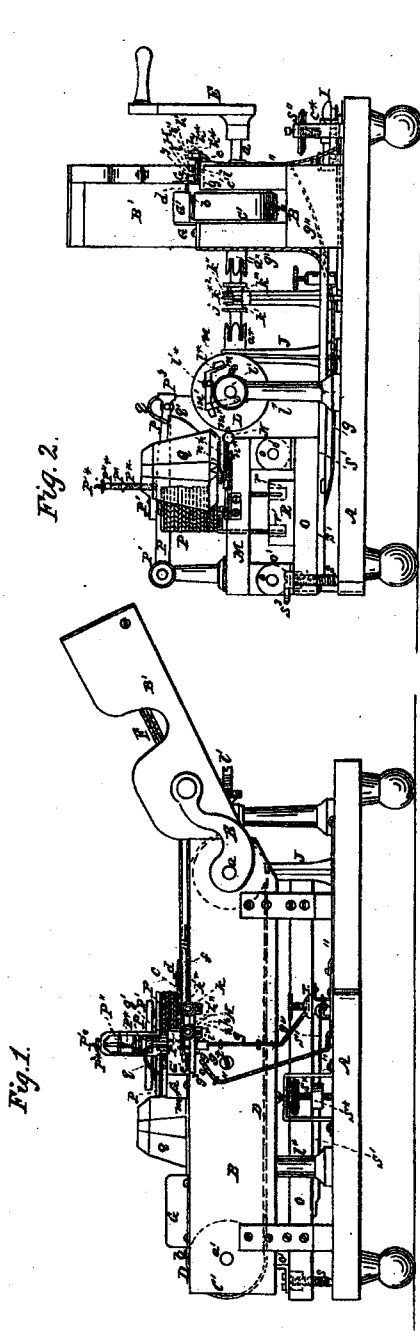


Fig. 2.

Fig. 1.



Fig. 4.

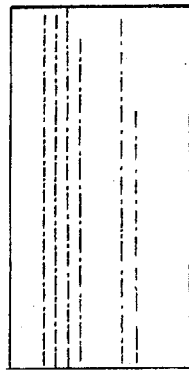


Fig. 5.

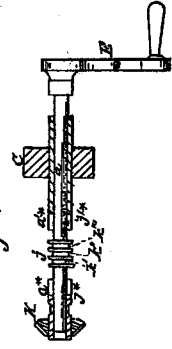


Fig. 6.

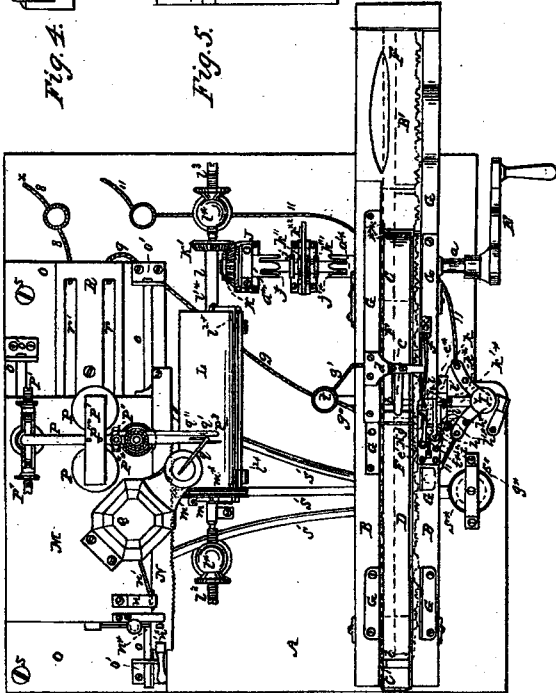


Fig. 3.

Witnesses
Wm. Trench
Chas. Lettie

Inventor
L. Bradley

UNITED STATES PATENT OFFICE.

L. BRADLEY, OF FOLSOM, CALIFORNIA.

IMPROVED TELEGRAPHIC MACHINE.

Specification forming part of Letters Patent No. 25,718, dated October 11, 1859.

To all whom it may concern:

Be it known that I, L. BRADLEY, of Folsom, in the county of Sacramento and State of California, have invented certain new and useful Improvements in Electro-Magnetic Telegraphs; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 represents a front elevation of an electro-magnetic telegraph constructed according to my improvements. Fig. 2 is a side elevation of the same. Fig. 3 is a plan or top view of the same. Fig. 4 represents a full-size face view of one of the composing-sticks and types which I employ for closing and breaking the circuit. Fig. 4* is a transverse vertical section of one of my composing-sticks together with the types. Fig. 5 is a face view of a strip of paper, exhibiting the marks made on the same by my instrument. (Shown full size.) Fig. 6 is a longitudinal central section of the arrangement made for connecting and disconnecting the recording and the transmitting portion of the instrument.

Similar letters of reference indicate corresponding parts in the several figures.

This invention consists in closing and breaking the circuit by means of a circuit-breaker of novel construction, which sweeps over the edge of the composing-sticks containing the several messages expressed by types which represent the several letters of the alphabet, by a combination of dots and longer and shorter strokes, and which are drawn along in front of the circuit-breaker by means of an endless belt, and under a metallic spring which connects with one of the poles—say, the positive pole—of a battery, said circuit-breaker to be so arranged that the hook which sweeps over the edge of the types and which connects with the negative pole of the battery closes the circuit, first, by means of the types themselves and by the spring under which the said types are drawn along; and, secondly, by coming in contact whenever it is pressed back by the types with an arm which is connected with the positive pole, and this circuit is so arranged that it passes through the helix of an electro-magnet, which operates the pen for recording the signs on a piece of paper placed on a revolving cylinder, which is provided at one end with

a screw-thread, which gears into a corresponding toothed rack, which is attached to the platform on which the electro-magnet is arranged, so that the latter, together with the pen, is moved along while the paper-cylinder rotates and that the pen makes its marks on the paper in a spiral line, and the two ends of the wire which constitutes the helix of the electro-magnet extend through the platform into grooves, which are filled with mercury, and one of which is connected with the positive and the other one with the negative pole, so that the circuit is not interrupted by the motion of the platform; and the driving-axle of the instrument is so arranged that the recording part and the transmitting part of the instrument can be connected and disconnected at pleasure.

To enable others skilled in the art to fully understand, construct, and use my telegraph-instrument, I will proceed to describe its construction and operation.

A is a platform, on which a frame, B, is erected, which forms the bearings for the axles a a' of two rollers C C', which serve to give motion to an endless belt, D, and attached to one of the axles a is a crank, E, which serves to operate the instrument. The width of the belt D corresponds to the width of the composing-sticks F, (see Fig. 4,) and it (the band) is provided with slats b , placed crosswise on the same, and at such distances that the composing-sticks, which are all made of uniform length, fit nicely between two of the same. The composing-sticks are constructed of sheet zinc bent over so as to form a recess, r *, for the types F, and the lower end of the types is made thinner, so that the surface of that part of the types which is above the recess r is flush with the upper surface of the composing-sticks. The types lie flat on the lower part of the composing-sticks, and they project sufficiently beyond the same, and their upper edge is composed of a series of dots and longer and shorter strokes, so that they serve to close the circuit, as will be hereinafter described.

Attached to the upper edge of the frame B are the guides G, which serve to keep the composing-sticks in proper line, and one of these guides, G', is bent over so as to extend across the whole width of the band D, leaving only just room enough for the sticks to pass under it, so that the same (the sticks) cannot fail to pass under a spring, c , which is attached to a

cross-bar, *d*, and which slides over the surface of the sticks *F*. These latter, as well as the spring *c*, are constructed of a good conductor, as the spring *c*, together with the composing-sticks *F*, form one way of closing the circuit, as will be hereinafter more fully explained. The end *B'* of the frame *B* forms an inclined plane, on which the several composing-sticks are deposited after they have passed over the band *D*, as represented in Figs. 1 and 3 in red outline, the lower end of the said inclined plane being considerably lower than the top of the band. The sticks are deposited on the inclined plane *B'*, one above the other, in precisely the same order as that in which they were placed on the belt, for the advancing ends of the sticks, as they leave the belt, strike the inclined plane or the stick upon it and slide up it till their other ends pass completely over the roller *C* and drop down out of the way of the succeeding sticks, which are deposited each directly upon its predecessor. By thus collecting the sticks in the same order as that in which they have been set up in the dispatch they may be put away in the same order and so preserved till the dispatch is all set up, or for as long a time as may be desirable to enable any necessary correction to be made in the dispatch, or for any other purpose.

H represents the circuit-breaker, the several parts of which are arranged on a plate, *e*, which is attached to the frame *B* by means of a pivot, *e'*, and the upper surface of the plate *E* is flush with the upper edge of the frame *B*, with the exception of the projection *e**, which rises above the other part of the plate *e*, and which is rounded off at both corners, so that the composing-sticks in passing by do not catch, and which is kept a little in advance of the front edge of the guides *G* by means of a spring, *f*, which presses on its back.

The plate *e'* forms the bearings for two pivots, *g'* and *i'*, and the pivot *g'* serves to retain in its place the hook *g*, which extends through an opening in the projection *e** of the ivory plate *e*, and which is subjected to the action of a weak spring, *g**, and the distance to which the hook *g* projects beyond the front edge of the projection *e** is regulated by means of a hook, *h*, which catches over the arm of the hook *g*, and the screwed end of which passes through an ear, *h'*, so that it can be lengthened or shortened by means of two jam-nuts, *h** and *h'**, which are on opposite sides of the ear *h'*.

Attached to the second pivot *i'*, which is fastened in the ivory plate *e*, is an arm, *i*, which is subjected to the action of a very weak spring, *i**, and which is adjusted by a hook, *R*, which catches over it, and which is shortened or lengthened by means of two jam-nuts, *R** and *R'**, similar in every respect to the hook *h*, which serves to adjust the hook *g*. Small pieces of platina wire *l* *l'* are inserted, one in the back of the hook *g* and the other in the front side of the arm *i*, and just opposite to each other, so that by pressing back the hook *g* the two platina points *l* and *l'* come in con-

tact with each other, whereby the circuit is closed, as will be presently explained.

A key, *I*, is provided, similar in every respect to the key with which the telegraph-instrument known as "Morse's telegraph" is operated, so that the circuit can be closed or broken by means of this key as well as by means of the spring *c* and the composing-sticks, or by the compound circuit-breaker *H*.

The axle *a*, which bears the crank *E*, extends through the frame *B* and to a standard, *J*, which serves for its bearing, and attached to a tube, *a**, in which the axle *a* slides is a bevel-wheel, *K*, which gears into a similar bevel-wheel, *K'*, which is attached to the arbor of the paper-cylinder *L*. This arbor has its bearings on two pivots, *l* *l'*, which are adjustable in standards *l** *l'**, so that the paper-cylinder can be made to turn quite easily. The axle *a* has a longitudinal sliding motion on the tubes or sleeves *a** and *a'**, and the ends of these sleeves are slotted, so that keys *j** and *j'**, which are firmly inserted in the axle *a*, cause both the sleeves (or only one of them) to rotate together with the axle, according to the position of the keys. This position is determined by a collar, *j*, which is rigidly attached to the axle *a*, and which is provided with three grooves, *R* *R'* *R''*, corresponding to the positions of the instrument, and a fall, *R**, which fits in either one of the grooves, retains the axle *a* in the required position. In the position represented in Fig. 3 the fall is placed in the middle groove, *R''*, and the keys *j** and *j'** both fit into one of the grooves in the ends of the sleeves *a** and *a'**. By placing the fall in the groove *R'''* the key *j'** is brought out of the groove in the end of the sleeve *a'**, and the sleeve *a**, only together with the bevel-wheels *K* *K'* and their appendages, are rotated by turning the crank *E*, and the endless band remains stationary; but if the fall be brought into the groove *R'* the endless band only is set in motion, while all that part of the instrument the motion of which depends upon the bevel-wheel *K* remains stationary.

The paper-cylinder *L* is provided with fingers *l** *l'**, which serve to retain on the cylinder the sheets of paper on which the messages are to be recorded, and these fingers are attached to an arbor, *l'*, which extends in a longitudinal direction through the cylinder, and which are pressed down on the surface of the cylinder by means of a spring, *m*, and which are retained in a position so as to clear the cylinder and to release the sheets of paper by means of a spring-catch, *m'*.

One side of the cylinder is provided with a projecting rim, *m**, which forms a screw-thread, which serves to give motion to a sliding platform, *M*, by means of a toothed rack, *N*, which is pivoted to one end of the same in such a manner that its toothed edge can be brought to gear into the screw-thread *m**, in which case the platform is moved in a longitudinal direction over the distance of one tooth of the rack for each revolution of the paper-cylinder. The

rack N slides under a plate, *n*, which is attached to the platform M, and a spring, *n'*, serves to keep the same up against the screw-thread *m**, and a nose, *n**, which fits into an aperture, *n**, serves to retain the rack if it is turned back so as not to mesh into the screw-thread on the projecting rim of the cylinder. The platform M slides on rods *o*, which have their bearings in ears *o'*, which are attached to a table, O, and it (the platform) forms the support for the electro-magnet P and for a self-supplying inkstand, Q.

The electro-magnet is of the usual construction, with the exception that the two ends of its helix, instead of being connected directly to the two poles of the battery, extend down through the platform M into grooves *r r'*, which are made into a block, R, which is rigidly attached to the table O.

P' is the armature, which is attached to an arm, *p*, which turns quite easily between points *p' p'*, and which is supported by a spiral spring, *p**; the power of which can easily be overcome by the attraction of the electro-magnet, and the strain of which can be regulated, to a certain extent, by means of a screw, *p**, and a plate, *p''*, which slides up and down in a framing, *p''**, which forms the bearing for the screw *p**, the spring *p** being attached with one end to the plate *p''* and with the other to the arm *p*. This arm extends to a point right over the center of the cylinder L, where it forms a socket, *p³*, in which a pen, *g*, can be secured by means of a set-screw, *g'*, and right under the pen is a slotted spring-plate, *q''*, which retains the paper smoothly on the cylinder while it passes under the pen. This pen is simply a hollow tube made of fine wire, having its end split open, so as to facilitate the flow of the ink, and it is bent in the form of a siphon, with one of its ends extending down into the inkstand Q. This tube is so fine that the ink does not flow from the same until its point comes in contact with the paper, and this point is so adjusted that it just touches the paper whenever the armature is attracted by the electro-magnet; and in order to adjust the pen in such relation to the paper-cylinder L that its point is kept at an equal distance from the paper as it is moved along with the platform M, the table O is so arranged that it can be brought in proper relation with the paper-cylinder by means of screws *s s*, which screw into the table O, and which rest on points which fit into sockets made in the upper surface of the platform A, and by means of arms *s' s' s'*, which are attached to the under side of the table, and which unite in a boss, *s**, in front of the instrument, which can be raised or lowered by means of a thumb-screw, *s''*.

A thumb-screw, *s³*, which passes freely through the table O, and which screws into the platform A, serves to secure the table in the required position.

The connection of the several parts of the instrument with the battery and its operation

is as follows: An insulated wire, 8, extends from the groove *x'* to the positive pole of the battery, and a second wire, 9, extends from the groove *r* to a clamp, *t*, from which it branches off, one branch, 9', leading to the cross-bar *d*, and the other branch, 9'', to a mercury-cup, *t'*, into which the pivot *i'* extends, to which the arm *i* is attached. Another wire, 11, extends from the negative pole of the battery to the base of the key I, from whence it extends up to a mercury-cup in the inside of the frame B, into which the pivot *g'* extends, on which the hook *g* is arranged. It will be seen that the only interruption of the current is between the two platina points *l l'*, or between the hook *g* and the spring *c*. As soon, therefore, as one of the composing-sticks passes under the spring *c*, and when the point of the hook *g* comes in contact with one of the projections on the edge of the types, the current from the positive pole passes through the wire 8 to the mercury in the groove *r'*, and through the helix of the electro-magnet to the groove *r*, from which it is conducted through the wires 9 and 9' to the spring *c*, and through the composing-sticks F themselves to the hook *g*, from which it returns through the wire 11 to the negative pole; and as soon as the hook *g* is raised so as to bring the point *l* in contact with the point *l'* the connection is also made through the wires 9 and 9'' and through the arm *i* to the hook *g*, and back to the battery. A double connection is thus formed between the two poles of the battery, so that should one fail, by impurities accumulated on the surface of the composing-sticks or by some mechanical imperfection, the other connection still keeps the circuit closed whenever one of the projections which constitute the types comes in contact with the hook *g* so as to bring the platina points *l* and *l'* to touch each other, and so that the circuit is closed through the spring *c* and through the composing-sticks F and hook *g*, or through the arm *i*, the pins *l'* and *l*, and the hook *g*; and whenever the circuit is closed the armature is attracted by the electro-magnet, and the arm *p*, with the pen *g*, is depressed on the paper which revolves with the cylinder L, so that a dot or a longer or shorter stroke is made on the same, according to the time during which the circuit is kept in a closed condition. The dots and strokes made by the pen on the paper will, therefore, correspond to the shape of the projections which constitute the types, and if the hook *g* passes over a sharp point only the pen will be merely depressed for a short moment, and a dot will be the result; but should the hook *g* pass over a longer projection on the edge of the types a longer stroke of the pen will appear on the paper, and, in fact, a message placed in one of the composing-sticks F and passing through my instrument will be recorded on the paper which is rotated with the cylinder L in exactly the same signs in which it is composed. If, therefore, a number of such signs and com-

posing-sticks of the proper size be placed in the hands of the public and the public be made acquainted with the proper signs, anybody will be able to compose his own message, and if sent to the telegraph office all that remains for the operator to do is to pass this message through the instrument, and it will be recorded at the other end of the circuit.

What I claim as new, and desire to secure by Letters Patent, is—

1. Arranging the type and mechanism for closing the circuit substantially as described, or in an equivalent manner, so that a double closing of the circuit is effected as each tooth of the type comes in contact with the closing mechanism.

2. The combination of the type and composing-sticks with a yielding insulating-plate carrying the mechanism for breaking and closing the circuit, whereby the contact of the closing mechanism with the face of the tube is insured.

3. The vibrating hook *g* and bar *i* or their equivalents, in combination with a yielding insulating-plate and type and sticks, for the purpose of closing the circuit.

4. The combination of the composing-stick and type with the spring *c* or its equivalent, arranged substantially as described, so that the types are made to form a portion of the circuit, for the purpose set forth.

5. The combination of the carrying-band and

mechanism for closing the circuit with the composing-sticks and type arranged on the band in relation to each other, substantially as described, so that the sticks are successively carried forward in the order in which they are arranged, brought into the circuit, and the message transmitted without interruption.

6. The combination of the movable platform carrying the recording mechanism with the rotating cylinder carrying the record-paper, arranged substantially as described, so that the message as transmitted is recorded in parallel lines on the paper.

7. Constructing the composing-sticks and types substantially as described, so that the sticks when filled present an even and flat surface on either side.

8. The application of a siphon-pen, constructed and arranged substantially as described, for the purpose of recording the messages.

9. The inclined plane *B*, arranged substantially as described, in combination with the band *D*, whereby the composing-sticks are received from the band in such manner as not to interfere with each other's delivery, and in the same order in which they were placed on the band.

L. BRADLEY.

Witnesses:

WM. TUSCH,
CHS. LEDIE.