

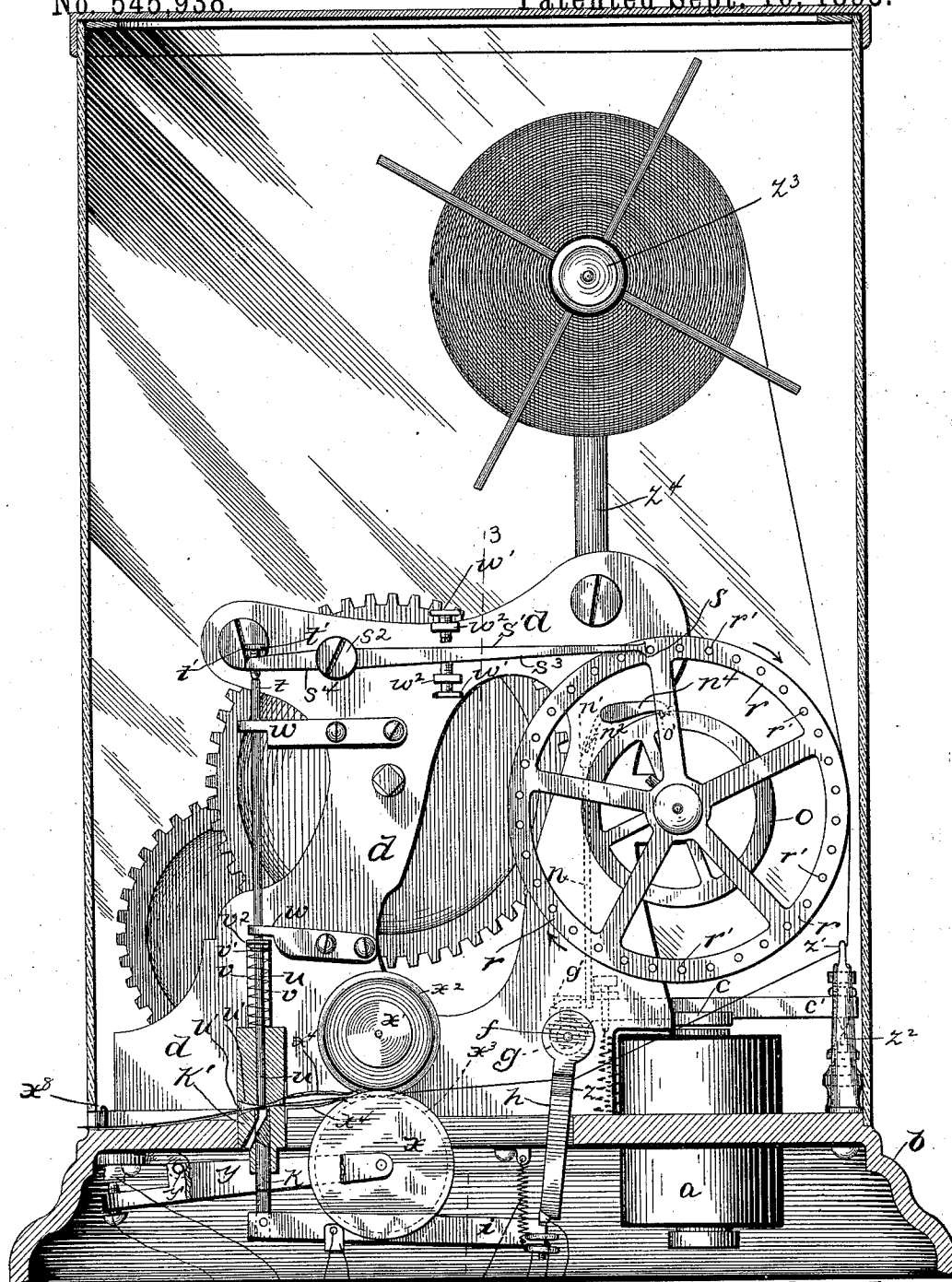
(No Model.)

2 Sheets—Sheet 1.

O. P. BRIGGS & W. R. PATTERSON.
TELEGRAPH RECEIVER.

No. 545,938.

Patented Sept. 10, 1895.



Witnesses:
George L. Cragg
George S. Bull

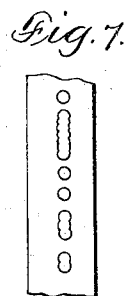
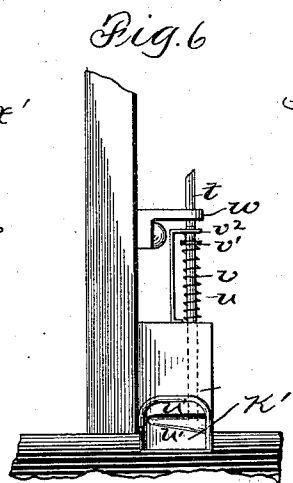
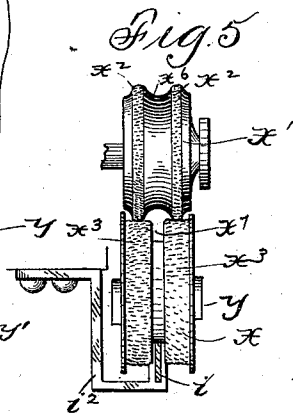
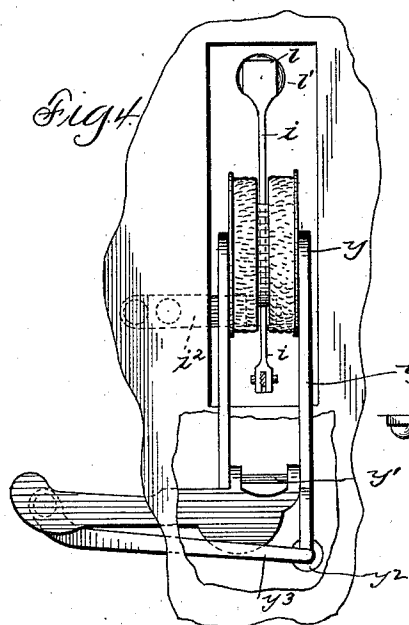
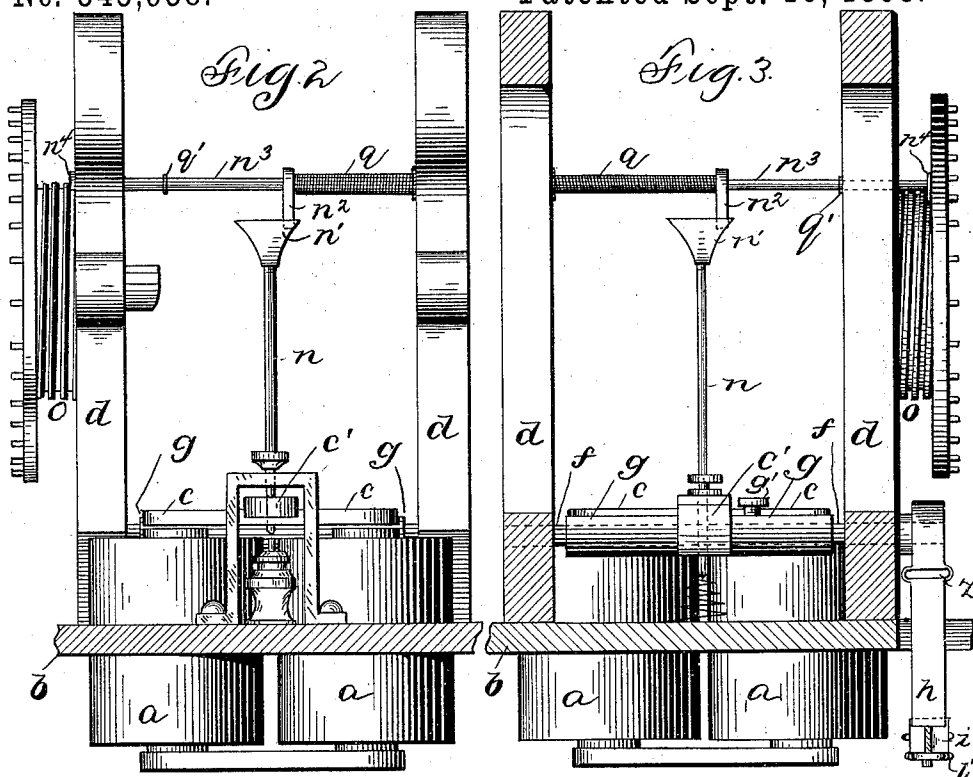
Fig. 1

Inventors:
Orlando P. Briggs
William R. Patterson
By Barton & Brown
Attys

O. P. BRIGGS & W. R. PATTERSON.
TELEGRAPH RECEIVER.

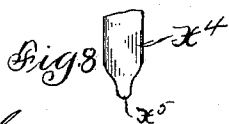
No. 545,938.

Patented Sept. 10, 1895.



Witnesses

George L. Cragg.
George S. Bull



Inventors
Orlando P. Briggs
William R. Patterson
By Barton & Brown Attys

UNITED STATES PATENT OFFICE.

ORLANDO P. BRIGGS AND WILLIAM R. PATTERSON, OF CHICAGO, ILLINOIS,
ASSIGNORS TO THE WESTERN ELECTRIC COMPANY, OF SAME PLACE.

TELEGRAPH-RECEIVER.

SPECIFICATION forming part of Letters Patent No. 545,938, dated September 10, 1895.

Application filed October 11, 1893. Serial No. 487,834. (No model.)

To all whom it may concern:

Be it known that we, ORLANDO P. BRIGGS and WILLIAM R. PATTERSON, citizens of the United States, residing at Chicago, in the
5 county of Cook and State of Illinois, have invented a certain new and useful Improvement in Telegraph-Receivers, (Cases Nos. 6 and 99,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of
10 this specification.

Our invention relates to telegraphic receivers; and it has for its object the construction of a receiver which will give a clear and perfect record of telegraphic messages.
15

Heretofore generally two methods have been employed to record upon paper tape the telegraphic signals as received, one method consisting of printing with ink or by chemical
20 process upon paper tape dots and dashes to correspond with signals transmitted by the sending operator. This method is objectionable, since the signals may be received so rapidly as to cause poor or improper impressions, and, further, the impressions are not
25 permanent.

Another method in use has been the perforation of paper tape as it is fed between a punch and die, said punch and die each being
30 actuated by independent mechanisms upon the transmission of signals. This method is objectionable because of the difficulty of proper adjustment of the two operating mechanisms to work in proper unison and the
35 liability of the apparatus to derangement.

It is the object of our invention to provide a receiver which will perforate paper tape to correspond with the telegraphic signals, whereby a permanent record is secured, and,
40 second, to provide a receiver in which the punch and die used in perforating the paper may be operated by a single mechanism, making the simultaneous action of the punch and die certain.

Briefly speaking, our invention consists in the employment of electromagnets, which are adapted to actuate an armature upon the
45 transmission of each signal, said armature, through the medium of levers, releasing the engagement of a dog with a pin or detent upon

a wheel provided with a thread upon its rim when a telegraphic message is begun, which disengagement allows the motor mechanism of the receiver to be brought into operation. A second wheel, mounted preferably coaxially
55 with the threaded wheel, is provided, which is rotated by the motor mechanism when released. Upon this wheel are mounted a number of pins, which are adapted to successively engage with a lever which depresses a punch,
60 a spring being provided to elevate the punch after each depression. When the aforesaid dog is released from engagement with the pin upon the threaded wheel upon the transmission of the first signal of a message, it is
65 thrust out and allowed to fall in engagement with the extremity of the thread, but is constantly raised from engagement with said thread and thrust out as each signal is received until the last signal of a message is
70 received, when the dog is allowed to resume its engagement with its pin. Thus during the progress of a message the punch is constantly depressed at regular intervals by the lever actuated by the pins upon the second
75 wheel and restored after each depression by its elevating-spring. The paper tape, however, is perforated by the punch only when a die is raised to meet it, which is upon the transmission of each signal.
80

Our invention will be more readily understood by reference to the accompanying drawings, in which—

Figure 1 is a front elevation of our improved receiving and recording apparatus
85 with parts thereof in section to reveal the hidden mechanism. Fig. 2 is a side view of a portion of our apparatus with parts removed to show clearly the mechanism of our invention. Fig. 3 is a sectional view of a portion of our
90 apparatus, taken on line 3 3 of Fig. 1, with parts of the mechanism removed and the dog shown in engagement with the outer end of the thread. Fig. 4 is a plan view of one of a pair of feed-rolls employed to feed the paper tape
95 between the punch and die, showing its mounting and the means of controlling its frictional engagement with the second roll of the pair. Fig. 5 is an elevation of both of the feed-rolls. Fig. 6 is a detail of the mounting
100

of the punch. Fig. 7 is a view of a piece of paper tape with a part of a record that may be produced by our receiving apparatus shown thereon. Fig. 8 is a detail plan view of one of the guides employed to lead the paper tape from the feed-rolls.

Like parts are indicated by similar letters of reference throughout all of the views.

Electromagnets *a a* are mounted upon a suitable base *b* and are provided with an armature *c*, supported by an armature-lever *c'*, journaled to framework *d* upon rod *f*. The armature-lever *c'* is provided with two laterally-extending cylindrical projections *g g*, one of which is secured to rod *f*, preferably, for the purpose of adjustment by thumb-screw *g'*. Rigidly mounted upon that portion of the rod *f* which extends beyond the framework *d* is a lever *h*, adapted to actuate another lever *i* upon the transmission of each telegraphic signal. Lever *i* is fulcrumed upon a pivot *i'*, supported upon a bracket *i''*, mounted under base *b*. Upon the extremity of lever *i*, to the left of its pivot, is pivoted a die *k*, which is allowed vertical excursion within guide-block *k'*, which die is elevated upon the transmission of each signal to meet the reciprocating punch by the engagement of lever *h* with lever *i*, as presently described. At the joint where the lever *h* engages with lever *i* the two levers are provided with sloping contact-surfaces, that upon lever *h* adapted to slide upon that upon lever *i* when lever *h* is given a slight rotary movement through the medium of armature-lever *c'* and rod *f* when the armature is attracted upon the transmission of a telegraphic signal. This action of lever *h* upon lever *i* lowers the portion of lever *i* to the right of its fulcrum, and consequently elevates the portion of said lever to the left of its fulcrum, which causes the elevation of die *k* within lower guide-block *k'*.

For the purpose of adjustment we place the surface on lever *i* which is in contact with the surface on lever *h* upon a small block of metal *l*, whose position may be adjusted by burr-nut *l'*, which adjustment may be secured by jam-nut *l''*.

When the armature is restored to its normal position after the transmission of a signal, the lever *h* is swung away from lever *i*, when the retractile spring elevates the portion of lever *i* to the right of its fulcrum, causing the die *k* to be lowered away from the punch. The retractile spring *m* keeps the sloping surface upon lever *i* in engagement with the sloping surface upon lever *h*, thereby limiting the elevation of die *k*.

Extending upward from the armature-lever *c'* is a rod *n*, upon the upper end of which is mounted a bifurcated guide-block *n'*, between the jaws of which is engaged a tongue *n''*, rigidly secured to a rod *n'''*, securely mounted upon one end of which is a dog *n⁴*, which is in engagement with a threaded wheel *o*, which has motion imparted to it by the motor mechanism of the relay when said dog is released

from its normal engagement with the threaded wheel. This normal engagement of the dog *n⁴* with the wheel *o* is through the medium of a pin *o'*, from which the dog is disengaged upon the transmission of the first signal of a message, as presently described. When this first signal is sent from the operator's station to the receiver, the armature *c* is attracted, which causes the armature-lever *c'* to be rocked sufficiently to release dog *n⁴* from its engagement with pin *o'* through the medium of rod *n'''*, tongue *n''*, bifurcated guide-block *n'*, and rod *n*, thus releasing the motor mechanism. When the dog *n⁴* is thus elevated, the repellent spring *q* presses against the tongue *n''*, and thereby shoves the rod *n'''* and dog *n⁴* outwardly until collar *q'* impinges against the framework *d*, as shown in Fig. 3. When the first signal is completed, the magnets lose their attractive force and allow the armature to assume its normal position, the dog *n⁴*, through the medium of its operating parts, resuming its normal lowered position. In resuming this position the dog *n⁴* comes into engagement with the outer end of the threaded wheel *o*, and, assuming that no additional signal is sent, resumes its engagement with pin *o'*, thereby arresting the further operation of the motor mechanism; but during the progress of a message the dog *n⁴* is lifted from engagement with the thread upon the wheel and shoved outward by the repellent spring *q* as often as signals are sent. A wheel *r* is mounted preferably coaxially with wheel *o*, upon the periphery of which are mounted at regular intervals a suitable number of pins *r' r' r'*, which as the wheel *r* rotates make successive engagement with the cam *s* upon an end of lever *s'*, pivoted at *s''*. As each pin *r'* comes into engagement with cam *s* the portion *s'''* of lever *s'* is elevated and the portion *s⁴* correspondingly lowered. The portion *s⁴* of lever *s'* acts to lower the punch-actuating rod *t*, preferably through the medium of an adjustable set-screw *t'*. The punch-actuating rod *t* depresses punch *u* when it is itself depressed. After the passage of each of the pins *r' r' r'* from engagement with cam *s* the portion *s⁴* is elevated by the overbalancing-weight of portion *s'''*, when the repellent spring *v*, through the medium of collar *v'*, elevates the punch *u* and punch-rod *t*, preparing them for another depression by lever *s'*. Guides *w w* are provided for the punch-rod. The punch is thus kept constantly reciprocating during the progress of a message; but it is only when the die *k* is raised to meet it that the paper tape is perforated. It is obvious that, as the wheel *r* is rotated very rapidly when the motor mechanism is released, if the lever *s'* were not limited in its pivotal motion the impetus given by the impingement of the pins *r' r' r'* upon cam *s* would cause the punch to descend too far, and thus become fast in die *k*, or the overbalancing-weight of portion *s'''* would allow the punch

to be elevated irregularly, which would cause an improper spacing between the punch-marks. For the purpose of properly controlling the pivotal motion of lever s' we provide adjustable stops $w' w'$, mounted in brackets $w^2 w^2$ above and below the lever s' .

When the last signal of a telegraphic message is received, the dog n^4 is shoved out and brought into engagement with the extremity of the thread upon wheel o , and as the rotation of the wheel o continues the dog n^4 is brought into engagement with pin o' , thereby stopping the motor mechanism. This thread is long enough to afford distinctive spaces between separate messages.

To feed the paper tape between the jaws $u' u'$, we provide two feed-rolls, one x arranged below the tape and the other x' arranged above the tape. Feed-roll x' has motion imparted to it by the motor mechanism of the receiver. It is provided with two ridges $x^2 x^2$, which bear upon corresponding but broader surfaces $x^3 x^3$ of feed-roll x . These bearing-surfaces are preferably made rough or knurled to secure good engagement with the paper. To guide the paper tape between the jaws $u' u'$, we provide guides $x^4 x^4$, between which the paper tape passes. These guides are similar in construction, a detail of one being shown in Fig. 8. Their ends are rounded off into noses $x^5 x^5$, which project within the annular spaces $x^6 x^6$ of feed-rolls x' and x . An elliptic space separates the guides, as shown, so that the paper tape may be allowed to bunch and yet be held in proper line when it is retarded by the punch.

The lower feed-roll x is mounted on lever y , fulcrumed at y' , and it is adjustably held in frictional engagement with feed-roll x' by repellent spring y^3 , the adjustment being had by screw y^2 .

To guide the paper tape properly between the feed-rolls, we provide a guide z upon lever h and a guide z' upon standard z^2 . The paper tape may be wound about a reel z^3 , which is supported upon a standard z^4 . The adjustment of the armature may be had in any well-known way.

The motor mechanism we have not deemed it necessary to describe, since any form of motor mechanism may be employed with our invention.

We have shown one means of vibrating lever s' ; but it is obvious that other means may be employed.

We do not desire to limit ourselves to the precise construction shown, as modifications may readily suggest themselves without departing from the spirit of our invention; but, Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a telegraphic register, the combination with a continuously operating punch, of

a die adapted to be brought in engagement with said punch only upon the transmission of a signal, substantially as described.

2. In a telegraphic register, the combination with a continuously operating punch, of a die adapted to be brought in engagement therewith whenever a signal is transmitted, and means for bringing the paper tape between said die and said punch, whereby perforations in said paper tape are made to correspond with messages to be received, substantially as described.

3. In a telegraph instrument, the combination of a wheel adapted to vibrate a lever, a punch adapted to be actuated by said lever, and a movable die adapted to operate in connection with said punch to perforate paper tape upon the transmission of each telegraphic signal, substantially as described.

4. In a telegraph instrument, a lever adapted to be vibrated, a punch adapted to be operated by said lever, and a die adapted to be brought in engagement with said punch upon the transmission of each signal, substantially as described.

5. In a telegraph instrument, the combination with a single motor mechanism, of a punch adapted to be actuated thereby, a movable die adapted to be brought in engagement with said punch by said single motor mechanism and means for feeding paper tape between said die and said punch, and for bringing said die and said punch in engagement when a signal is transmitted, whereby a record is made in said paper tape, substantially as described.

6. In a telegraph instrument, electro-magnets a , an armature c adapted to be actuated thereby, an armature lever c' supporting said armature, rod f , lever h , lever i , die k , retractile spring m , guide block k' , a rod n , guide block n' , tongue n^2 , rod n^3 , dog n^4 , pin o' normally in engagement with said dog, a repellent spring q , a wheel r , pins $r' r' r'$ supported thereon, lever s' adapted to make successive engagement with said pins as said wheel is rotated, rod t adapted to be actuated by said lever, punch u adapted to be operated by rod t , spring v adapted to restore punch u to its elevated position after each successive engagement of lever s' with pins $r' r' r'$, feed rolls $x x'$ adapted to feed the paper tape between the punch and die, substantially as and for the purposes set forth.

7. In a telegraph register, the combination with a continuously acting punch, of an electro-magnet, a lever adapted to be moved by said electro-magnet and to bring the die in engagement with said punch, whereby a record of the message sent is made by the perforations in paper tape, substantially as described.

8. In a telegraph register, the combination with a die adapted to rest against the paper tape upon the transmission of a signal, of a

punch actuated by the lever, and a wheel provided with projections, said wheel being adapted to rotate while a message is being transmitted and to bring said projections
5 against said lever, whereby said punch is made to vibrate continuously during the transmission of a message, substantially as described.

In witness whereof we hereunto subscribe our names this 26th day of June, A. D. 1893.

ORLANDO P. BRIGGS.

WILLIAM R. PATTERSON.

Witnesses:

GEORGE L. CRAGG,

CHARLES A. BROWN.