

TELEGRAPHIC RECORDING INSTRUMENT.

Patented Jan. 21, 1913.

2 SHEETS—SHEET 1.

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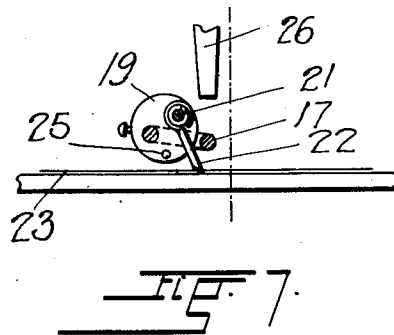
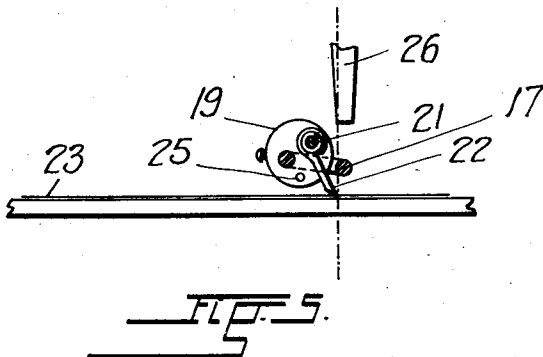
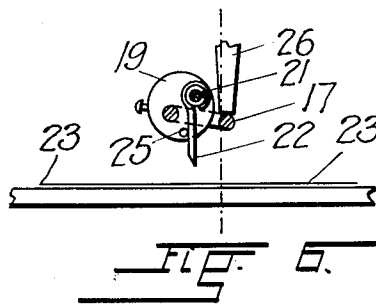
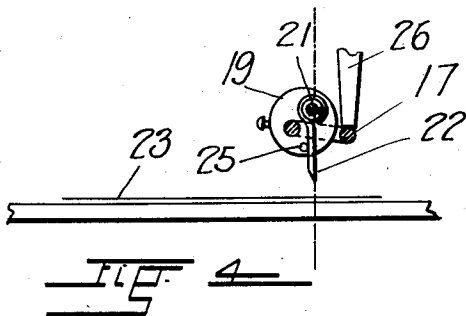
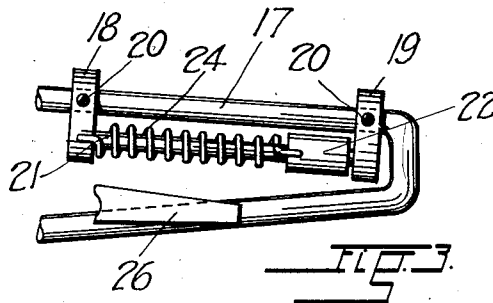
E. T. KEIM & W. W. ALEXANDER.
E. T. KEIM, ADMINISTRATOR OF W. W. ALEXANDER, DEC'D.
TELEGRAPHIC RECORDING INSTRUMENT.

APPLICATION FILED JULY 29, 1911.

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2 SHEETS—SHEET 2.

1,051,118.



WITNESSES:
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UNITED STATES PATENT OFFICE.

EDWARD T. KEIM, OF DENVER, AND WILLIAM W. ALEXANDER, DECEASED, LATE OF DENVER, COLORADO, BY EDWARD T. KEIM, ADMINISTRATOR, OF DENVER, COLORADO; SAID KEIM, FOR HIMSELF AND AS ADMINISTRATOR, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE PROTECTIVE SIGNAL MANUFACTURING COMPANY, A CORPORATION OF COLORADO.

TELEGRAPHIC RECORDING INSTRUMENT.

1,051,118.

Specification of Letters Patent.

Patented Jan. 21, 1913.

Application filed July 29, 1911. Serial No. 641,227.

To all whom it may concern:

Be it known that we, EDWARD T. KEIM, a citizen of the United States of America, residing at Denver, in the county of Denver and State of Colorado, and WILLIAM W. ALEXANDER, deceased, late a citizen of the United States of America, have invented certain new and useful Improvements in Telegraphic Recording Instruments, of which the following is a specification.

This invention relates to improvements in telegraphic recording instruments and its object resides in the provision of a device of simple construction by the use of which series of electric impulses are automatically recorded upon a relatively stationary surface.

While the recording instrument may be effectively employed in different systems of telegraphy, it is more especially adapted to be used in association with a clock-controlled circuit-closing contrivance in a telegraphic system of the character described in our application for Patent Number 622,017.

In the accompanying drawings in the various views of which like parts are similarly designated, Figure 1 represents a side elevation of the instrument, partially in section, Fig. 2, a horizontal section taken along the line 2—2, Fig. 1, Fig. 3 an enlarged view of the front end of the stylus arm included in the construction, and Figs. 4 to 7 transverse sections taken along the line 4—4, Fig. 1, respectively illustrating the positions successively assumed by the stylus while a telegraphic message is being recorded by the instrument.

Referring to the drawings by numerical reference characters, the recording instrument comprises a supporting frame composed of two parallel plates 2 and 3 connected by means of columns 4. An upright spindle 5 which is journaled at its extremities in openings in the plates 2 and 3 carries two parallel bars 6 and 7 which at one of their ends are connected by a poise 8. The upper bar 6 carries at its opposite end a rod 9 for the support of a second poise 10 and the lower bar carries at its corresponding end, an electromagnet 12, the armature 13 of which is articulately mounted upon a block 14 which is rigidly secured to the spindle 5.

A spring 15 which is coiled around the spindle, is connected at its opposite ends to the upper bar 6 and to the plate 2 of the supporting frame for the purpose of yieldingly opposing a movement of the spindle about its axis of rotation, and a second coiled spring 16 is applied between the armature 13 and the superposed portion of the bar 6 to resiliently maintain the former in its normal position.

An arm 17 extending forwardly from the armature is composed of two convergent members which are connected at their forward ends. One of the two members of the arm 17 carries two bearing blocks 18 and 19 which are adjustably attached thereto by means of set screws 20 and which serve to support a rotary shaft 21 in substantially parallel relation to the member upon which they are secured. Rotatably mounted upon the shaft 21 adjacent the forward one, 19, of the two blocks, is a stylus 22 the pointed extremity of which extends downwardly to engage the surface upon which the record is to be produced and which in the drawings is represented by a line which is designated by the numeral 23. A spring 24 which is coiled around the shaft 21 is connected at its opposite ends to the block 18 and to the stylus 22 for the purpose of resiliently maintaining the latter in its normal position in which it slants slightly from the perpendicular in engagement with a stop 25 on the block 19 adjacent to which it is mounted. A second stop 26 secured to the upper bar 6 on the spindle 5 is provided to limit the upward movement of the arm 17.

In the operation of the recording instrument the windings of the magnet 12 are connected in an electric circuit with the transmitting instrument of a system of telegraphy such as, for example, the time controlled circuit-breaking mechanism, described in the above named application for patent, which at regular intervals of predetermined duration, transmits to the magnet series of impulses which vary in number in accordance with a determinate system of progression. Each time an impulse is transmitted to the magnet, its armature is attracted to the core of the coil thereof and during each move-

ment of the armature, the point of the stylus 22 is brought in engagement with the surface 23 which in consequence is punctured. When the point of the stylus enters the recording surface 23 the armature 13 has not yet completed its downward movement so that during continuation of the said movement, the stylus will be deflected about its axis of rotation and against the action of the spring 24, as is shown in Fig. 5. Inasmuch as the sharp point of the stylus is held against displacement in the perforation produced in the surface 23, it follows that its point of connection with the arm 17 must move laterally with relation to the perpendicular passing through its point of contact with the surface or, in other words, that the said arm is compelled to move about its axis of oscillation until the circuit of the magnet is broken when the arm will move upwardly, impelled by the action of the spring 16 while it is momentarily held against lateral motion by the inertia of the poises 8 and 10 (see Fig. 6). Before the spring 15 has been able to overcome this inertial tendency to remain in a state of rest, the magnet is again energized by the action of the circuit-breaking device with which it is associated, with the result that the stylus which during the upward movement of the arm 17 had been returned to its original position by the spring 24, will again engage the surface 23 but this time at a point spaced from the puncture previously produced. During the continued movement of the armature toward the core of the magnet, after the point of the stylus has entered the recording surface, the stylus is again deflected as hereinbefore explained and when during subsequent upward movement of the arm 17 in the period intervening between two electric impulses of the series transmitted to the instrument, the stylus is again returned to its normal position, the arm has once more moved laterally so that when by subsequent energization of the magnet, the armature is again attracted, the point of the stylus will engage the surface at a point spaced from the second puncture (see Fig. 7) and this operation will be repeated until the last one of the series of impulses has been transmitted to the magnet when during continued inaction of the magnet, the spring 15 overcomes the inertia of the poises and returns the arm 17 to its original position.

Having thus described our invention what we claim and desire to secure by Letters-Patent is:

1. A telegraphic recording instrument comprising an electrically actuated impression member, and means to automatically move the said member relative to an impression produced thereby on a relatively stationary surface, by the medium of its contact with said surface.

2. A telegraphic recording instrument comprising an electrically actuated impression-member, and means to automatically move said member step by step when intermittently actuated by a succession of electric impulses, by changing its position relative to each impression it has produced upon a relatively stationary surface, by the medium of its contact with said surface.

3. A telegraphic recording instrument comprising an electro-magnet, an impression-member connected to move with the armature thereof, and means to automatically change the position of the said member in a direction transverse to the movement of the armature, by the medium of its contact with a surface upon which the impression is being made.

4. A telegraphic recording instrument comprising an electro-magnet, an impression-member connected to move with the armature thereof, and means to move said member step by step in a direction transverse to the movement of the armature when the magnet is intermittently energized, by the medium of its contact with a surface upon which the impressions are being made.

5. A telegraphic recording instrument comprising an electro-magnet movable in a plane transverse to the movement of its armature, and an impression-member operatively associated with the latter and connected to be deflected by contact with a surface upon which impressions are being made.

6. A telegraphic recording instrument comprising an oscillatory electro-magnet, an impression member connected with the armature thereof so as to be deflected by contact with a surface upon which impressions are being made, and a poise associated with said magnet to retard movement thereof by its inertia.

7. A telegraphic recording instrument comprising an oscillatory spring-controlled element weighted so that its movement will be retarded by inertia, an electro-magnet mounted upon said element, and an impression-member connected with said armature so as to be deflected by contact with a surface upon which impressions are being made.

8. A telegraphic recording instrument comprising an oscillatory spring-controlled element, weighted so that its movement will be retarded by inertia, an electro-magnet mounted upon said element, an arm projecting from the armature of said magnet, an impression member deflectibly mounted on said arm, and a spring for maintaining said member yieldingly in its operative position.

9. A telegraphic recording instrument comprising a reciprocating element movable in a direction lateral to the plane of its reciprocation, means for imparting a recipro-

cating movement to said element, and an impression member laterally deflectibly connected with said element whereby to move it in the said lateral direction by contact with
5 a surface upon which impressions are being made.

10 10. A telegraphic recording instrument comprising an electrically operated, reciprocating element, movable in a direction lateral to the plane of its reciprocation, an impression member laterally movably connected with said element, and a spring for

maintaining said member yieldingly in its normal position.

In testimony whereof I have affixed my 15 signature in presence of two witnesses.

EDWARD T. KEIM.

[The signature of EDWARD T. KEIM is for himself and as administrator of WILLIAM W. ALEXANDER.]

Witnesses:

L. RHOADES,

G. J. ROLLANDET.