

F. W. SMITH & DE WITT C. CONKLING.
TELEGRAPH KEY.

APPLICATION FILED JUNE 6, 1908.

933,726.

Patented Sept. 7, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

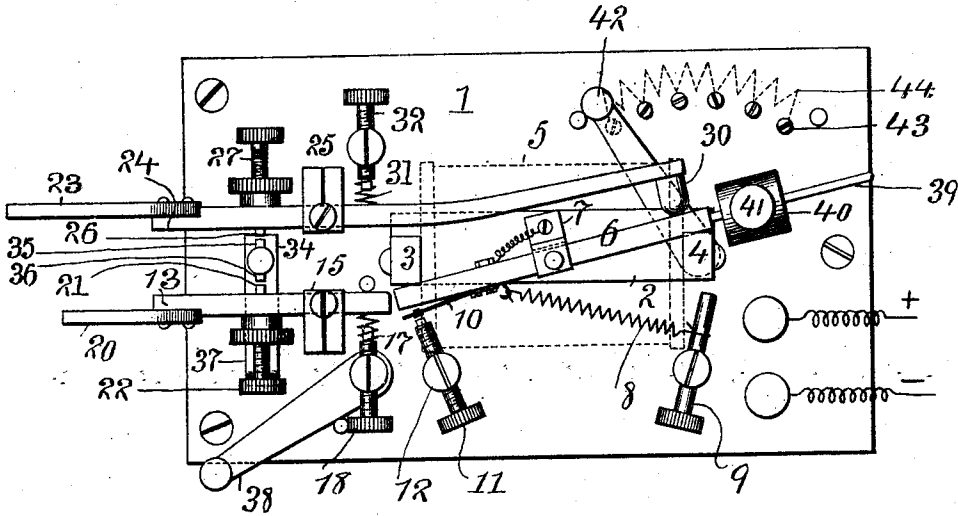
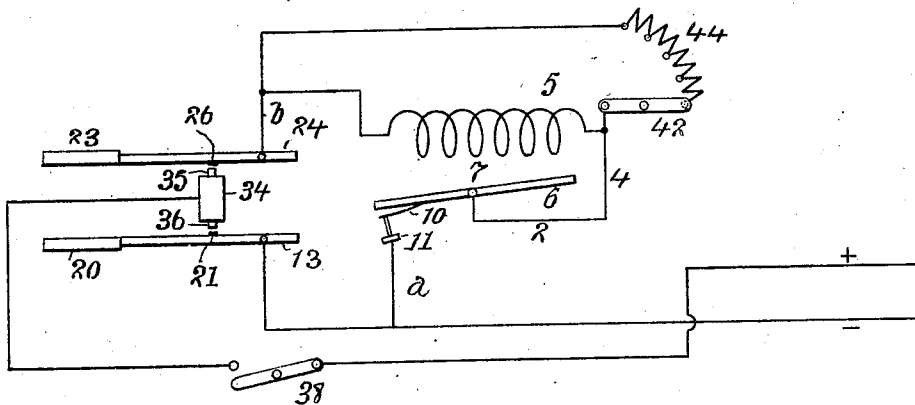


Fig. 3.



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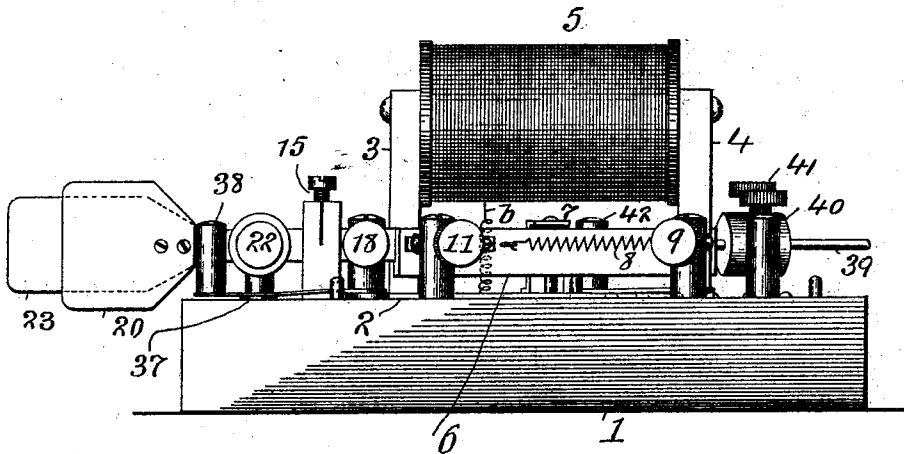
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2 SHEETS—SHEET 2.

Fig. 2



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UNITED STATES PATENT OFFICE.

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TELEGRAPH-KEY.

933,726.

Specification of Letters Patent.

Patented Sept. 7, 1909.

Application filed June 6, 1908. Serial No. 437,077.

To all whom it may concern:

Be it known that we, FRANK W. SMITH and DE WITT C. CONKLING, citizens of the United States, residing at New York, in the county of New York and State of New York, have invented a certain new and useful Improvement in Telegraph-Keys, of which the following is a specification.

The invention relates to that class of telegraph keys or transmitters in which separate manually controlled members or levers are used for the sending respectively of dots and dashes.

The invention consists broadly in the combination in a telegraph key, of a manually controlled member for closing circuit to line and electrically controlled means in said circuit for intermittently interrupting the same: also in the means combined with the foregoing for regulating the periodicity of said interruptions: also in the various combinations more particularly set forth in the claims.

In the accompanying drawings—Figure 1 is a plan view of our improved key with the magnet coil shown in dotted lines in order to exhibit parts otherwise concealed. Fig. 2 is a side elevation, and Fig. 3 is a diagram showing the connections in the instrument. Similar characters of reference indicate like parts.

Upon the base 1, preferably of wood or other insulating material, is disposed a strip 2 of brass from which rise the pole pieces 3, 4, between which is secured the magnet coil 5. The armature 6 is pivoted in standard 7 below the magnet coil to the brass strip 2, and its ends extend in front of respectively opposite sides of said pole pieces, so that when the coil is active, said ends are drawn into contact with the sides of the pole pieces as shown in Fig. 1, against the pull of the helical retracting spring 8. One extremity of spring 8 is secured to said armature and the other extremity to a rotary tension pin 9 disposed in a fixed standard. On the outer face of the armature is a leaf spring 10, the free end portion of which makes contact with a screw 11 disposed in standard 12.

Two operating keys 13 and 24 movable in a horizontal plane, are provided. The key 13 is pivoted in a standard 15 and extends between a fixed stop and a helical spring 17, which is interposed between said key and a screw 18 adjustable in a fixed standard. Be-

tween the pivot standard 15 and the finger piece 20, said key carries a contact 21 formed on the end of the adjusting screw 22, which passes through the body of the key and is provided with a locking nut. The key 24 is pivoted in standard 25 and is provided with a finger piece 23 and with a similar contact 26 carried by screw 27 also having a locking nut. The key 24 extends beyond the armature pivot 7 and carries a block 30 of rubber which is normally pressed against the side of the armature 6 by means of the helical spring 31 interposed between said key and a screw 32, which screw is adjustable in a fixed standard. The armature, when the circuit is not closed at key 24, is thus held against the magnet poles.

Between the keys 13 and 24 is a fixed standard 34 carrying the contacts 35 and 36 which are respectively disposed in front of the key contacts 26 and 21. The helical springs 17 and 31 acting on the keys normally keep the key contacts 21 and 26 from meeting the fixed contacts 35 and 36. Below the standard 34 is a metal plate 37 with which the pivoted cut out lever 38 may close contact.

Extending from the end of the armature 6 is a rod 39 on which is a sliding weight 40 which may be secured in adjusted position on the rod by set screw 41.

Interposed between the pole piece 4 and the brass strip 2 is a pivoted lever 42 which moves over the contacts 43, between which contacts resistances 44 are interposed in the usual way.

The circuit connections, symbolically illustrated in Fig. 3 in which the armature is displaced from beneath the magnet coil for the sake of clearness, are as follows: From + line to cut out switch lever 38 to standard 34 and so to contacts 35, 36. From contact 36 to key 13 to — line. From contact 35 to key 24 (by wire *b*) to electromagnet coil 5, to pole piece 4 to which pole piece the terminal of electromagnet 5 is to connect, to strip 2, pivot standard 7, armature 6, leaf spring 10, screw 11, standard 12, and by branch *a* to — line. In shunt with the electromagnet coil are lever 42 and the resistances 44.

The operation is as follows: The operator resting his hand on the table takes the two finger pieces between his thumb and his forefinger: so that by swinging his hand at the wrist to the right he may cause the key 24

to close circuit at 26 and 35, and by swinging it to the left he may cause key 13 to close circuit at 21 and 36. Key 13 is intended to be used in sending Morse simply as a key for making dashes in the ordinary way through makes and breaks at the contacts. When key 24 is closed, dots are transmitted by reason of makes and breaks between the leaf spring 10 and the end of screw 11; and these makes and breaks are produced by the vibration of the armature 6, due to the energizing of the magnet coil 5. Or in other words, so long as key 24 is caused to close circuit at 26 and 35, the magnet coil keeps the armature in vibration and the circuit is thereby interrupted to produce dots depending in number upon the time the key is kept closed, and upon the rate of speed at which the armature vibrates.

The time during which the key is kept closed is, of course, regulated by the operator. The rate of speed of the armature vibration, and hence, the periodicity of the intermittent interruptions in the circuit to line may be governed in four ways. 1. By moving the weight 40 upon the rod 39 nearer to or farther from the armature pivot. 2. By adjusting, by means of screw 11 the width of the air gap between the end of said screw and leaf spring 10. 3. By adjusting by means of rotary pin 9, the tension of helical retracting spring 8. 4. By moving lever 42 to throw more or less resistance into shunt with the magnet coil. This construction permits of the vibration speed of the armature being regulated with great nicety, so that for a given period of key closure effected by a single movement of the operator, a certain number of dots will automatically be transmitted. Hence in sending Morse signals, the operator while making individual dashes with the key 13 in the ordinary way, produces dots in desired number simply by holding key 24 closed for a shorter or longer period of time. The instrument having now been installed on actual lines and being in commercial use, we have found its working in the manner described to be practical and time saving, and because the motion of the hand is lateral while resting on a firm support, the operator is relieved from the well known troubles incident to the vertical motion of the hand required by the ordinary key.

We claim:

1. In a telegraph key, a manually controlled circuit closing member and in series therewith to line an electromagnet, an armature vibrated thereby and means controlled by said armature for making and breaking circuit, and across the terminals of said magnet, a variable resistance.

2. In a telegraph key, two manually controlled circuit closing members, a fixed contact disposed between said members and connected to a line terminal, one of said members being directly connected to the other line terminal, and the other of said members being connected to said last named terminal through a circuit including in series an electromagnet, an armature vibrated thereby, and means controlled by said armature for making and breaking said circuit.

3. In a telegraph key, a horizontal electromagnet, vertical pole pieces supporting said magnet, an armature pivoted below said magnet and having its end portions disposed in front of relatively opposite sides of said pole pieces, a manually operated circuit closing member and a make and break device controlled by said armature, the said manually operated member, armature and make and break device being in circuit to line.

4. In a telegraph key, an electromagnet, an armature vibrated thereby, means controlled by said armature for making and breaking circuit to line, a manually controlled device for closing circuit to said magnet, and means for normally retaining said armature against the poles of said magnet.

5. In a telegraph key, an electromagnet, an armature vibrated thereby, means controlled by said armature for making and breaking circuit to line, a manually controlled lever for closing circuit to said magnet, and resilient means for pressing said lever normally against said armature to hold the same in contact with the poles of said magnet.

In testimony whereof we have affixed our signatures in presence of two witnesses.

FRANK W. SMITH.
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Witnesses:

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