

D. I. GARRETSON.
 COMBINED AUTOMATIC SENDER AND TELEGRAPH KEY.
 APPLICATION FILED FEB. 15, 1912.

1,059,988.

Patented Apr. 29, 1913.

2 SHEETS—SHEET 1.

Fig. 2.

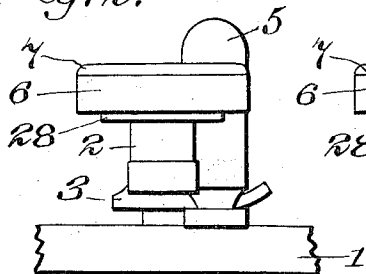


Fig. 1.

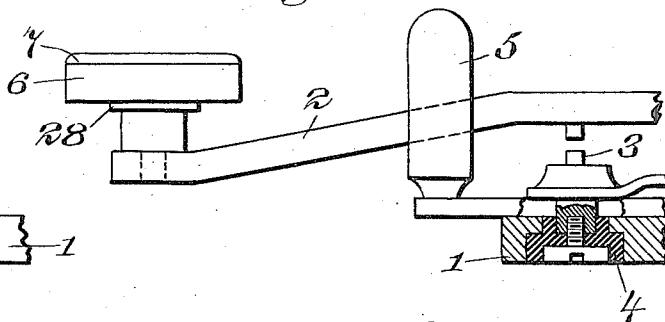


Fig. 6.

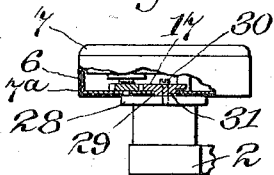


Fig. 3.

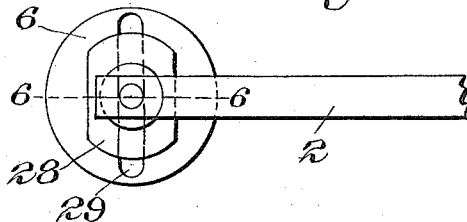
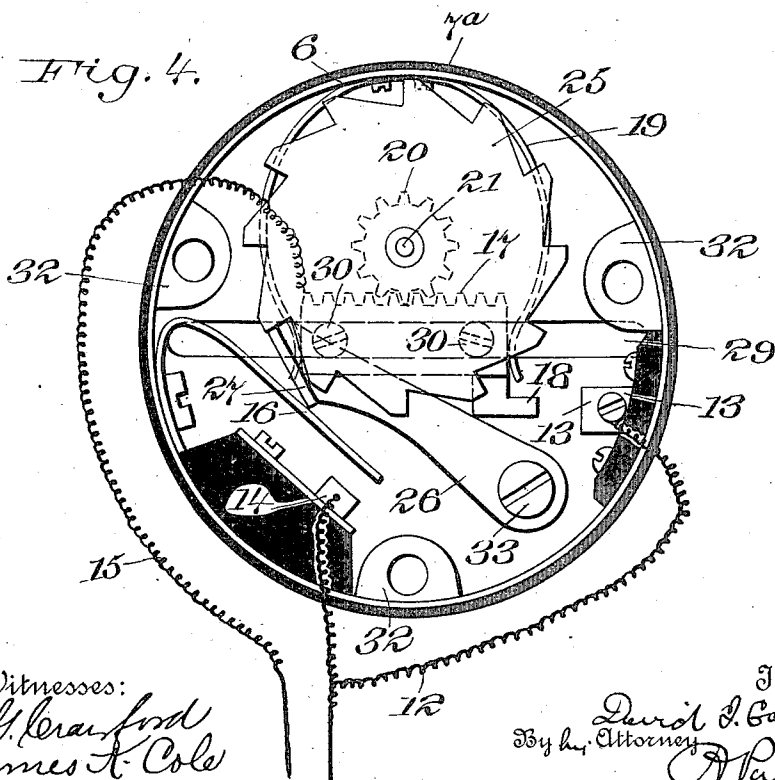


Fig. 4.



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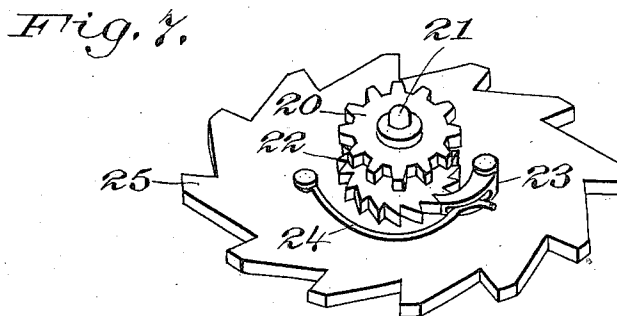
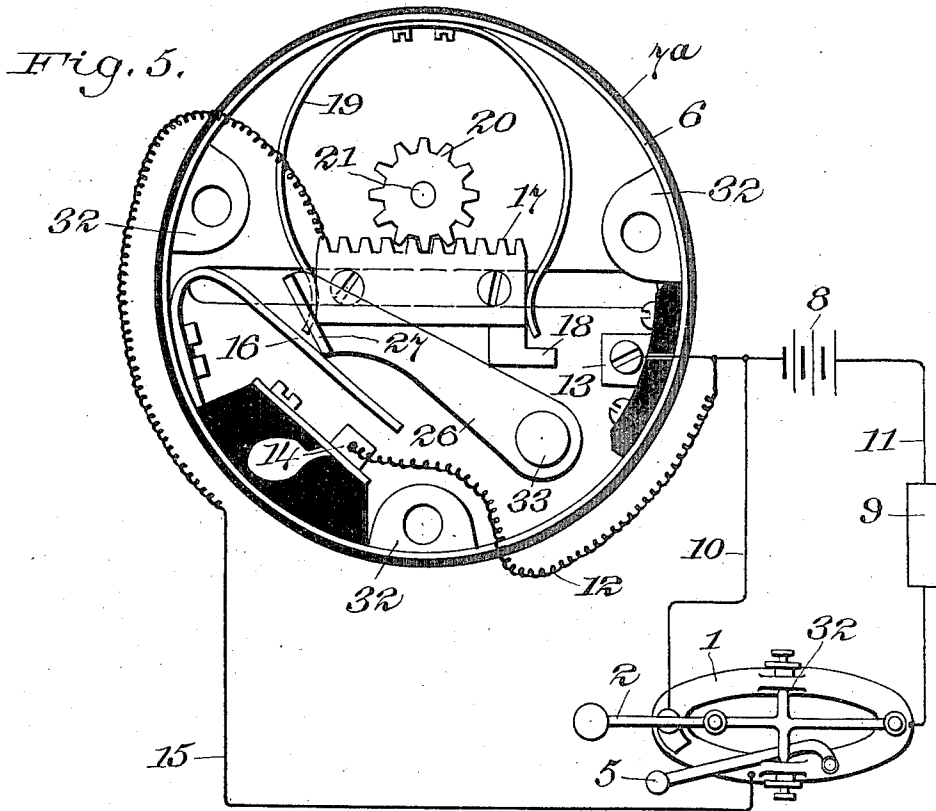
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

DAVID IRWIN GARRETSON, OF NEW YORK, N. Y.

COMBINED AUTOMATIC SENDER AND TELEGRAPH-KEY.

1,059,988.

Specification of Letters Patent.

Patented Apr. 29, 1913.

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To all whom it may concern:

Be it known that I, DAVID I. GARRETSON, a citizen of the United States of America, residing at New York city, borough of Manhattan, county and State of New York, have invented certain new and useful Improvements in Combined Automatic Senders and Telegraph-Keys, of which the following is a specification.

My invention relates to electric telegraph systems and comprises mechanism designed to facilitate the sending of the ordinary Morse code signals over standard systems now in use without further modification of the standard apparatus than the installation of a compact apparatus in what is termed the button of the ordinary telegrapher's key.

As is well known the ordinary key consists of a lever vibrating in a vertical plane to open and close the telegraph circuit. This lever is operated by the hand of the telegrapher to produce pulsations of current in the circuit corresponding to dots and dashes, combined to produce the characters of the Morse alphabet. The continued rapid up and down movement of the hand of a skilled operator, often amounting to upward of a hundred thousand motions in a heavy night's work, is apt to produce in a few years' work a loss of muscular control called telegrapher's paralysis. To prevent this various automatic attachments for producing the dots and dashes by a different set of movements have been designed, which may be used alternately with the old key, thereby resting the operator's muscles in hand and arm without interrupting his work. The devices so far produced for this purpose, however, have been cumbersome substitutes for the old key, and the various collections of dots required have usually been produced in such apparatus by a complicated clockwork driven mechanism involving a time element for determining whether one or more dots shall be produced.

I have invented a simple, compact apparatus which may be placed in the button of the key itself by which dashes are produced by a horizontal movement in one direction and different numbers of dots may be produced by a horizontal movement of greater or less amplitude in the other direction. Thus the operator can change at will from the old system of sending to the new system without changing the circuit connections and without letting go of the key button.

The best form of apparatus at present known to me embodying my invention is illustrated in the accompanying two sheets 60 of drawings in which:

Figure 1 is a side elevation of an ordinary telegraph key to which my invention has been applied, parts being broken away. Fig. 2 is an end elevation. Fig. 3 is a bottom view. Fig. 4 is an enlarged plan view of the interior of the key button, the top plate being removed. Fig. 5 is a similar view with a portion of the mechanism removed, and the circuit connections shown 65 in diagram. Fig. 6 is a detail cross section on line 6—6 of Fig. 3, and Fig. 7 is a detail of the ratchet wheels and spur gear shown in position in Fig. 4, but omitted from Fig. 5. 75

Throughout the drawings like reference characters indicate like parts.

1 is the base of an ordinary key, 2 is the key lever pivoted at 32 (Fig. 5), and cooperating with the contact 3 separated from 80 the key base by insulation 4. The battery 8 and sounder 9 are in a circuit 10 and 11, one terminal or pole of which is connected to the key base 1 and the other to insulated contact 3. The usual switch for opening 85 and closing this circuit by bridging around insulation 4 is shown at 5.

The foregoing is intended to illustrate and describe the standard telegraph system now in use. 90

In my invention the button 6 on the lever 2 is made partly of metal and is hollow, to form a casing or container for inclosing the automatic sending apparatus to be hereinafter described. Said button or casing has 95 a top plate 7, preferably of some insulating material such as gutta percha. Preferably the sides are also protected by external insulation 7^a. The button 6 is movable laterally and horizontally on key lever 2 having its bottom slotted at 29 as shown in Figs. 3, 4 and 5. The button rests on guide plate 28 which is fast on the lever 2 and the rack plate 17, inside the button, having an offset portion 31, located in slot 29, is fastened to 100 plate 28 by any convenient means such as screws 30, 30. The rack 17 being therefore fixed and stationary, the button 6 is free to slide laterally on guide plate 28 under said rack for the purpose now to be described. 105 110

In the interior of the button at one side (the right hand side in Figs. 4 and 5) is an insulated contact piece 13, and at another point in the interior, preferably on the other

side, is a second insulated contact piece 14. These contacts 13 and 14 are connected electrically with the insulated key lever contact 3, as by wire 12, and of course move with the button 6 when it is pushed to one side or the other. The metal portion of button 6 is in electrical connection with key lever 2 and base 1. This is indicated diagrammatically by line 15 in Fig. 5, but in reality this connection is by direct contact of button 6, plate 28, and lever 2.

On rack 17 is a contact face or projection 18 in line with insulated contact 13 and adapted to be struck by contact 13 when the button 6 is moved to the left (looking at Figs. 4 and 5). This will close the circuit through battery and sounder and produce a dash.

Motion of the button 6 to the right produces one or more brief contacts between insulated piece 14 and spring 16 mounted in the interior of the button and in electrical connection therewith. This rapidly makes and breaks the circuit through battery and sounder and produces from one to six dots according to the amplitude of right hand lateral motion given to button 6. The mechanism by which contact spring 16 is vibrated to produce this result consists of escapement or large ratchet pawl 26 driven against spring 16 by rotation of the large ratchet wheel 25. Ratchet pawl 26 is pivoted to button 6 at 33 and has an upturned inclined lip 27 which coöperates with the ratchet teeth on 25. Ratchet 25 is loosely mounted on short shaft 21, which is journaled in button 6. Ratchet wheel 25 has a pawl 23 pivoted on it and held by spring 24 in yielding engagement with small ratchet wheel 22 also mounted on the shaft 21 and rigidly connected with pinion 20. This pinion 20 meshes with rack 17. The centering spring 19 mounted on the interior of button 6 engages both ends of rack 17 and normally holds the button in mid-position with reference to key lever 2. Lugs 32, 32, are provided on the interior of button 6 which are tapped out to receive screws (not shown) which hold the top plate 7 on button 6, thereby inclosing the above described gearing.

In operation the telegraph circuit is closed or opened for operation by manipulation of switch 5 in the usual way. When opened, messages may be sent by moving the key in a vertical plane in the ordinary way, the button being held in mid position by spring 19, and no contacts with the insulated portions of the interior mechanism being produced. At any time, however, without changing any connection, or letting go of the key, the operator can bring the mechanism inside of the button into operation as an automatic sending device by holding the key up and moving the button 6 to one side or

the other. Motion to the left produces a dash by closing the circuit through contacts 13 and 18. No movement of the large ratchet wheel is then produced, small ratchet wheel 22 slipping under pawl 23 and not moving large ratchet 25 which is held by pawl 26, so that contact spring 16 is not vibrated. Return motion of button 6 to the right, however, rotates both small ratchet wheel 22 and large ratchet wheel 25 which are then locked together by pawl 23, and causes one or more of the teeth on 25 to pass under pawl 26, forcing it out against spring 16, and vibrating said spring against insulated contact 14. This makes a series of brief contacts making and breaking the circuit through battery and sounder from one to six times, to produce as many dots, according to the amplitude of the right hand motion given to the button.

The advantages of my invention comprise its compactness, ease and rapidity of manipulation, certainty of action, simplicity of construction, and freedom from clockwork or any other delicate mechanism liable to get out of repair.

Other mechanism for producing the necessary "make and break" action might be substituted for that shown and described without departing from the broad principle of my invention so long as it was located in the interior of the key button, and automatic sending mechanism for producing various series of dots by varying the amplitude of motion might be located elsewhere than inside the key button and still embody the novel principles of said invention.

Having, therefore, described my invention, I claim:—

1. A telegraph transmitting key and circuit connections therefor, said key having the usual button mounted on the key lever adapted to be grasped by the hand of the operator for vibrating the key in a vertical plane, said button also being capable of movement on the key lever; an automatic sending apparatus located in said button, and circuit connections for said automatic sending apparatus in shunt with said key connections.

2. A telegraph transmitting key, and circuit connections therefor, said key having a casing supported thereon, an automatic sending apparatus located in said casing, and circuit connections for said automatic sending apparatus in shunt with the key connections, said casing being capable of motion on the key in a horizontal plane and provided with mechanism for operating said automatic sending apparatus by said horizontal motion.

3. A telegraph transmitting key, and circuit connections therefor, said key having a casing supported thereon, an automatic sending apparatus located in said casing,

and circuit connections for said automatic sending apparatus in shunt with the key connections, said casing being capable of motion on the key in a horizontal plane and

5 provided with mechanism for operating said automatic sending apparatus to produce a dash when moved to one side, and one or more dots when moved in the opposite direction.

10 4. A telegraph transmitting key, and circuit connections therefor, said key having a casing supported thereon, an automatic sending apparatus located in said casing, and circuit connections for said automatic

15 sending apparatus in shunt with the key connections, said casing being capable of motion on the key in a horizontal plane and provided with mechanism for operating said automatic sending apparatus to produce

20 a dash when moved to one side, and one or more dots when moved in the opposite direction, together with a centering spring for holding said casing in mid position.

5 5. A telegraph transmitting key and circuit connections therefor, said key having a casing supported thereon in the position of the ordinary button adapted to be grasped by the operator for purposes of vibrating the key in a vertical plane in the usual manner, an automatic sending apparatus located

30 in said casing, and circuit connections for said automatic sending apparatus, said casing being capable of movement on the key in a horizontal plane and provided with

35 mechanism for operating said automatic sending apparatus through said horizontal motion.

6. A telegraph transmitting key having an auxiliary transmitting apparatus comprising a casing mounted on the key and having a sliding connection therewith along a horizontal line, contact making and breaking mechanism in said casing, adapted to be operated by horizontal sliding movements of the casing, and circuit connections for said

45 make-and-break mechanism.

7. In an automatic sender for electric telegraph system the combination of a stationary horizontal rack, a slotted container

50 mounted to slide thereon, a pawl and ratchet mechanism journaled in said container and geared to said rack, an insulated contact piece mounted on the container and adapted to make electrical connection with the rack

55 when the container is slid in one direction, a second insulated contact piece mounted on the container and adapted to make one or more electrical connections with the ratchet mechanism when the latter is rotated by

60 sliding the container in the other direction, connections from one pole of a telegraph

circuit to the rack and pawl and ratchet mechanism, and from the other pole to the two insulated contacts.

8. In an automatic sender for electric telegraph system the combination of a stationary horizontal rack, a slotted container mounted to slide thereon, a pawl and ratchet mechanism journaled in said container and geared to said rack, an insulated contact

70 piece mounted on the container and adapted to make electrical connection with the rack when the container is slid in one direction, a second insulated contact piece mounted on the container and adapted to make one or

75 more electrical connections with the ratchet mechanism when the latter is rotated by sliding the container in the other direction, connections from one pole of a telegraph circuit to the rack and pawl and ratchet mechanism, and from the other pole to the two

80 insulated contacts, together with a centering spring mounted on the container and engaging the rack to hold the container in a neutral position out of connection with both insulated contacts.

9. In an automatic sending apparatus for electric telegraph systems the combination with a fixed terminal for one pole of the circuit, of a sliding terminal for the other pole, and mechanism by which electrical connection with the fixed terminal for formation of a dash is produced by movement of the sliding terminal in one direction, and mechanism for producing from one to six brief

95 electrical connections, for dots, according to the distance through which the sliding terminal is moved, is operated by movement of the sliding terminal in the other direction.

10. In an automatic sending apparatus for electric telegraph systems, a dot producing apparatus comprising a rack, a pinion meshing with the rack, a shaft on which the pinion is mounted, a small ratchet wheel the teeth of which face in one direction, also

105 rigidly mounted in said shaft a larger ratchet wheel having teeth facing in the opposite direction loosely journaled on said shaft, a pawl engaging the small ratchet wheel mounted on the large ratchet wheel, a

110 frame in which the shaft is journaled, a pawl mounted on said frame engaging said larger ratchet wheel, and contact making and breaking mechanism operatively connected to said last mentioned pawl, the rack

115 and frame being movable relatively one to the other.

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Witnesses:

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