

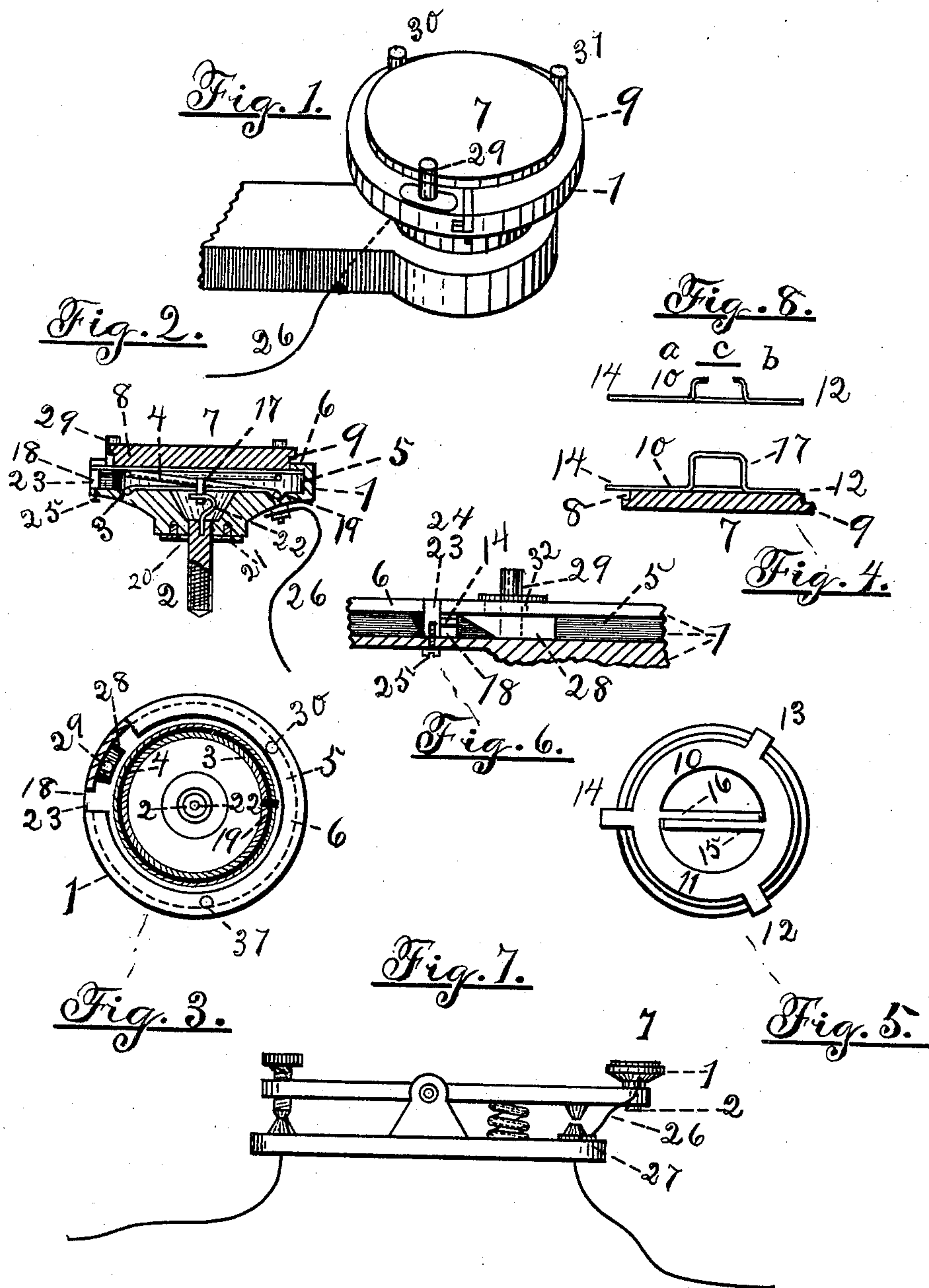
(No Model.)

H. P. THOMPSON.

AUTOMATIC CIRCUIT CLOSER FOR TELEGRAPH KEYS.

No. 322,023.

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Witnesses:  
Milton Dashiell.  
Julius Noelker.

Inventor:  
Homer P. Thompson,  
per E. P. Robbins, M.E.,  
attorney.



# UNITED STATES PATENT OFFICE.

HOMER P. THOMPSON, OF CINCINNATI, OHIO.

## AUTOMATIC CIRCUIT-CLOSER FOR TELEGRAPH-KEYS.

SPECIFICATION forming part of Letters Patent No. 322,023, dated July 14, 1885.

Application filed June 27, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, HOMER P. THOMPSON, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented a new and useful Automatic Circuit-Closer for Telegraph-Keys, of which the following is a specification.

My invention relates to an improvement in telegraph-keys; and it consists of an automatic circuit-closing button.

The object of my invention is to provide a means within the button held or pressed by the fingers in manipulating a telegraph-key whereby the circuit may be automatically opened whenever the button is pressed or clamped by the fingers, and so that the circuit may be maintained open a short interval, when desired, without removing the fingers from the button, and also that a means may be provided for automatically closing the circuit whenever the fingers are removed from the button, and hence provide against the circuit being accidentally or negligently left open, as is often the case at present where the sliding cut-off is used, which is required to be opened or shut each time it is desired to open or close the circuit.

Figure 1 is a perspective view of my improved button, shown attached to the end of the key-lever. Fig. 2 is a sectional view through the center, and Fig. 3 is a top view of the body part 1 of Fig. 2. Fig. 4 is a sectional view, and Fig. 5 is a bottom view, of the button-top and attached parts. Fig. 6 is a detail view of the button-switch or circuit-opening device embodied in the button. Fig. 7 shows my improvement attached to a telegraph-key. Fig. 8 shows a modification of the loop 17.

The essential feature of my invention consists in making the button in two parts, which are held apart by means of a spring, and providing the said two parts with suitable isolating and conducting devices, so that one part shall be connected with one pole of the battery, or one end of the line, and the other part with the other pole, or with the other end of the line, and hence that by pressing the said two parts together the circuit may be opened, while when the fingers are removed from the button the spring presses the two parts apart and brings the contact mechanism into action.

The same numbers designate the same parts in all the figures.

The main body of the button 1 is hollow, and has a downwardly-projecting base, within which and to which the attaching-screw 2 is fixed. The main recess within the button-body has a flat bottom, and is provided with a groove, 3, which forms a bed for the helical spring 4.

Within the periphery of the body 1, and contiguous with the flat bottom of the main recess, is an annular groove, 5, so that the said groove lies directly beneath the annular flat top 6 of the body.

The cap or circuit-plate 7 has a cylindrical body-center, 8, which moves freely and is guided within the cylindrical opening of the main body 1. The cap 7 may have a projecting shoulder, 9, which may come into contact with the top of the body 1 and cause the cap to rest firmly upon the top of the body when the button is held by the fingers.

A helical spring, 4, is embedded in or suitably secured to the bottom of the main recess, and projecting upward supports the cap 7.

On the underside of the cap 7 there is a piece of metal, 10, stamped out of a sheet, and consisting of a central circular body, 11, having two similar projections, 12 and 13, and a longer one, 14, and having the center so cut away as to leave two parallel and contiguous cross-pieces, 15 and 16, cut apart and loose from the circular body 11 at their opposite ends, as seen in Fig. 5. These cross-pieces 15 and 16 are bent away from the surface of the cap-body 8 into the form of a loop, 17, Fig. 4, and are united by soldering.

In Fig. 8 a modification in the construction of the loop 17 is shown. Here a single central cross-piece is cut in two in the middle, and the two parts *a* and *b* are bent upward and inward, as shown, and a connecting-piece, *c*, is soldered to them. The piece *c* should be platinum.

When the cap 7 is in place, the circular part 11 of the piece 10 rests upon the spring 4, and the projections 12 and 13 extend laterally into the groove 5, and the projection 14 extends across the groove 5 and through the opening 18 in the side of the button-body, and the loop 17 extends down into the center of the main recess of the button.



A hole is made through the body of the button from the bottom of the groove 3, and a short piece, 19, having a forked end, is placed therein, with the fork resting in and across the groove 3, and the piece 19 is provided on the exterior of the button with a suitable wire-attaching device, as a thread and nut.

When the spring 4 is in place, it rests in contact with the piece 19. It may be soldered thereto.

A metal disk, 20, to which the attaching-screw 2 is fixed, is secured to the base of the button-body by means of small screws 21.

The attaching-screw 2 has a wire or metal piece, 22, inserted into and soldered to its upper end. This wire 22, before being bent into the form shown in Fig. 2, may be inserted upward through the opening in the base of the button-body, and the disk 22 may then be secured in place by the screws 21. The wire 22 is then bent, as shown in the figures, with its upper end projecting horizontally and into and through the metal loop 17. It is so adjusted with reference to the loop that it can come into contact with the latter at the center of the cross part only, and only when the cap 7 is held up by the spring 4. When the cap 7 is in place and adjustment, the projection 14 extends through the opening 18, and is free to move vertically therein in coincidence with the motion of the cap.

In common with the opening 18 through the side wall of the button-body, there is an opening, 23, cut through the top of the button-body and provided with a plug, 24, which is secured in place by means of a small screw, 25.

When the cap 7 is put in place, it is inclined so that the projections 12 and 13 enter the groove 5, and then the projection 14 is let into the opening 23 through the top side of the button-body, and is pushed sidewise into the hole 18, when the plug 24 is inserted and secured by the screw 25.

All the parts described being in adjustment, the spring 4 keeps the cap 7 up and the attached loop 17 pulling up against the horizontal projection of the wire 22. Now, if the wire 26 is attached to the button 27, Fig. 7, or to the wire communicating therewith, a current may be conducted through the following parts, and hence maintained closed—viz., the key-lever, attaching-screw 2, wire 22, loop 17, plate 10, spring 4, piece 19, and wire 26, to the button 27—so that if the sliding cut-off now in use, and which I deem advisable to use in connection with my improvement, were accidentally opened, or negligently left open, the circuit would still be closed by my automatic circuit-closing button, and hence delays and accidents avoided. I have provided a means within my button, however, for breaking the circuit should it be desired to temporarily open it. This device is best shown in Fig. 6.

A slide, 28, fitted to and sliding within the groove 5, has a wedge-shaped end, which is capable of sliding over and pressing down the

end of the projection 14. A small stud, 29, is attached to the wedge-slide 28, and projects through a slot, 32, in the top of the button-body 1. By pushing the stud 29 toward the projection 14 the wedge-slide is made to press the latter down, and hence the cap 7 and its loop 17, thereby breaking contact between the loop 17 and the wire 22. By pushing the stud 29 in the opposite direction the projection 14 is liberated and contact between loop 17 and wire 22 is again established.

Two other studs, 30 and 31, are placed at about one hundred and twenty degrees from the stud 29, and the three together, projecting above the top of cap 7, prevent anything from falling upon the cap 7, and hence accidentally opening the circuit.

In operating a key having my improved button, the operator grasps the button in the usual manner, pressing his first two fingers upon the cap, and hence compressing the spring 4 and breaking the circuit, which he establishes again as soon as he depresses the key, and makes contact with the button at that end of the lever. He simply grasps the button and manipulates the key in the usual manner. As soon as he removes his fingers from the button the circuit is automatically closed, and it is maintained closed until the button is again grasped and the cap 7 depressed.

Should an operator have control of the line and wish to stop for but a moment, and not wish to have another operator take the circuit, he only needs to keep his fingers on the button and the cap 7 depressed. He is then ready to resume without taking his fingers from the key and consuming extra time in opening and closing the circuit by means of the ordinary cut-off.

This improvement will be found to be of great service to operators in breaking the circuit instantaneously to catch missed words when receiving rapidly.

I claim—

1. In a telegraph-key button, a body fixed to the key-lever and having a recess within which a circuit-closing top is guided and an interposed spring which supports the said top is secured and incased, in combination with the said spring and top, the top being in communication with one end of the line and the body with the other, and the two having suitable intervening apparatus for breaking and closing the circuit.

2. The combination, with the lever of a telegraph-key, of a button-body, 1, suitably attached thereto, of a central conductor, 22, terminating in a cross projection, of a loop, 17, embracing the projection 22 and attached to the cap 7 and communicating with the cap-supporting spring 4, of the cap 7, intervening conductor 10, and the said spring, and of the conductors 19 and 26, whereby a circuit through the line and the said parts may be broken and closed within the button.

3. The button top or cap 7, adapted to the



recessed button-body and having a metallic device, 10, attached thereto, and provided with projections 12 and 13 for holding the cap in place, and the projection 14, extending across the groove 5 and vibrating within the hole 18 in the button-wall.

4. The combination, with the recessed button-body 1, having a groove, 5, and side openings, 18 and 23, and slot 32, of the cap 7 and piece 10, having a projection, 14, adapted to vibrate and be locked within the opening 18, of a plug, 24, and screw 25 for closing the gap

23, and of the wedge-ended slide 28, having a stud, 29, and sliding in the groove 5, and adapted to press down the projection 14, and consequently the cap 7 and the loop 17, and hence maintain a broken circuit.

5. The combination, with the recessed body 1, of projections for protecting the cap 7.

HOMER P. THOMPSON.

Witnesses:

E. P. ROBBINS,

E. L. MCCLAIN.