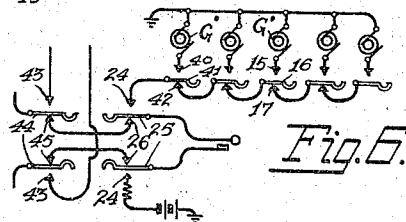
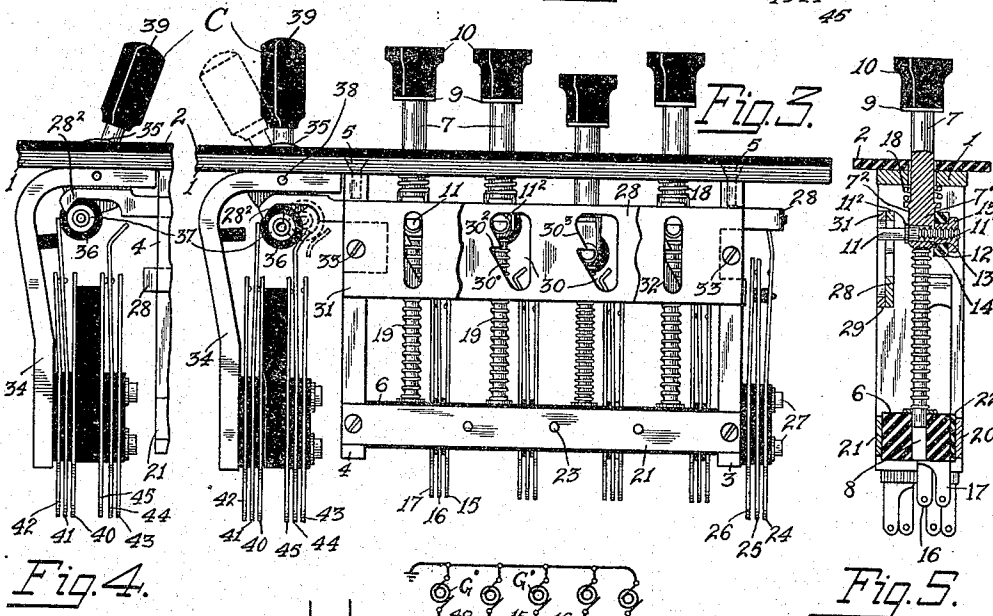
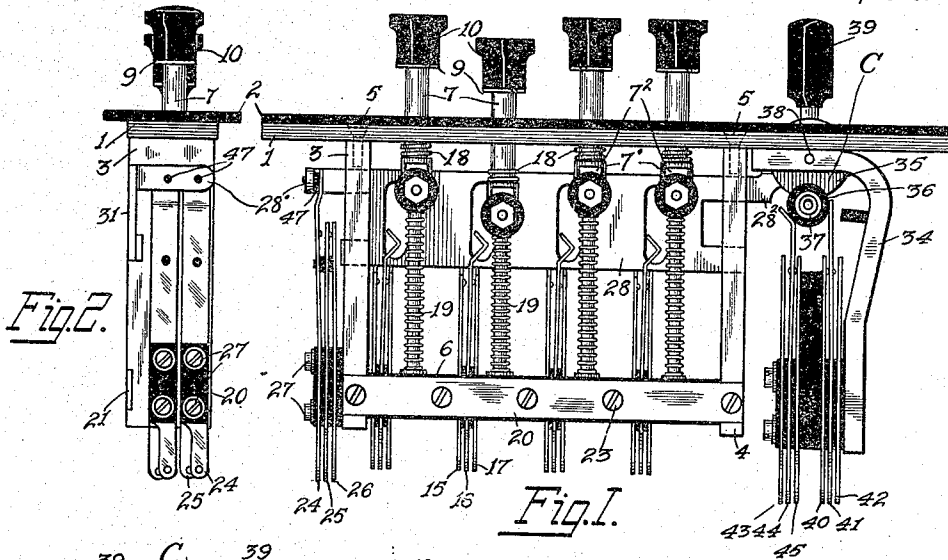


A. J. CARTER,
PARTY LINE KEY.

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UNITED STATES PATENT OFFICE.

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PARTY-LINE KEY.

1,173,095.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ALVA J. CARTER, a citizen of the United States of America, residing in Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Party-Line Keys, of which the following is a specification.

My invention relates to party line ringing keys in which reciprocating and rocking actuating members are provided, a feature being the provision of means whereby the actuation of either type of actuating member can effect the restoration to normal of the last operated member.

In a well-known form of party-line ringing key, a plurality of reciprocating keys and a rocking two-way key are provided, the reciprocating keys or plungers being used for ringing purposes and the rocking key for listening and sometimes for ringing also. Hitherto in keys of this type the plungers were constructed to indicate which one was last operated but no indication was given when the rocking key was last actuated because the actuation of the rocking key for ringing purposes would not restore the plunger keys.

In the present invention, the actuation of the rocking key for ringing purposes will restore any one normal reciprocating key and thus indicating to the operator that the locking key was the last one operated.

For a more complete understanding of my invention reference is to be had to the accompanying drawing in which like reference characters denote like parts and in which—

Figure 1 is a side elevation of a key embodying my invention; Fig. 2 is a left end elevation of Fig. 1; Fig. 3 is a reverse side elevation of Fig. 1; Fig. 4 is a view of the cam or rocking key showing the key thrown into ringing position; Fig. 5 is a sectional view on the line 5, 5 of Fig. 3 looking in the direction of the arrow indicated thereon; and Fig. 6 illustrates a wiring diagram for the key illustrated.

Referring now more in detail to my invention as illustrated, it comprises a plate 1 and a rubber escutcheon plate 2 fastened to it in any suitable manner. End posts 3 and 4 are provided fastened at their upper ends to the plate 1 by the screws 5 as shown

in dotted lines in Figs. 1 and 3, the lower ends of said posts supporting a contact spring mounting block 6 made of any suitable insulation material. Actuating plungers 7 pass through openings in the plate 1 and escutcheon 2, the lower ends of the plungers 7 extending into openings 8 in the spring mounting block 6. The ends of the plunger rods 7 which extend through the plate 1 and escutcheon 2 are threaded to receive buttons 10, a spring washer 9 being placed between the button and rod, whereby said spring washers hold the buttons 10 securely to the plunger rods 7.

Plunger rods 7 have enlarged portions 7¹ which are preferably integral with the plunger rods, the said portions 7¹ having the flattened surfaces 7². The portions 7¹ have a hole 12 through which pins 11 extend, the said pins 11 having their ends 11¹ threaded to receive a nut 13. The nuts 13 have a portion 13¹ which is of a size to receive an insulation roller 14 which operates the contacts 15, 16, 17. Pins 11 have shoulders 11² which rest against the flattened surfaces 7² when the nuts 13 are screwed on to the threaded portion of the pin 11. Springs 18 are placed between the enlarged portions 7¹ and the plate 1, the said springs acting as cushions when any one of the plunger rods are restored to normal by the action of springs 19. Each plunger rod has a set of spring contacts 15, 16, 17 associated with it, the said springs being insulatingly mounted in slots cut into the block 6 and held in place by the clamping plates 20 and 21. A strip of insulation 22 is placed between the block 6 and the plate 20, the clamping screws 23 passing through the plate 20 and block 6 and threading into the plate 21 securely holding the springs 15, 16 and 17 in place.

To move the contacts 15, 16 and 17 to their alternate position pressure is applied to a plunger key 7 and when the roller 14 engages the angular portion of the spring 16, said spring is forced over making contact with the spring 15 and opening its contact with spring 17. When in this position, the plunger is in its fully actuated or ringing position and as the pressure is removed the key is restored to indicating position by the spring 19 allowing the contacts to assume their normal position.

End springs 24, 25, 26 are insulatingly mounted upon post 3 by means of the screws 27 and are operated by a slidably mounted plate 28 supported in slots 29 cut in the posts 3 and 4, the said plate having openings 30 which coöperate with pins 11. A clamping plate 31 for holding the plate 28 in position is placed on top of the plate 28, the said plate 31 having slots 32 of a size to receive the pins 11, the said slots acting as guiding means for the pins 11 and also preventing the plungers from rotating, said plate 31 being fastened to the posts 3 and 4 by means of the screws 33. The right end of plate 28 (as shown in Figs. 1, 2) has its upper portion 28¹ extending out and bent at right angles, this angular portion carrying the rubber buffers 47, the spring 24 of the end springs normally resting against the said buffers. The end springs 24 tend to spring outward thus pressing against the slidably mounted plate 28 so as to return the said plate to normal when the pressure is released from a key plunger, thus allowing the plate 25 to lock an actuated key in its indicating position.

When a key plunger is fully depressed the pin 11 rides upon the angular surface 30¹ of the opening 30. This forces the slidably mounted plate to the left, (Fig. 3) and the end portion 28¹ moves the springs 24, 26 against their normal tension to their alternate position. When pressure is released, springs 24, 26 return to normal moving the plate 28, and thus pin 11 is stopped by engaging the shoulder of tooth 30², holding the actuated key in its indicating position. If another plunger is depressed its pin 11 rides upon the angular surface 30³ of the tooth 40 forcing the plate 28 to the left (Fig. 3) and the plunger that was in indicating position is restored to normal by its restoring spring 19.

The plate 28 has its end 28² (Fig. 3) extended, operating in connection with the cam key C. The cam key C shown at the right of Fig. 1 comprises a frame 34, fastened to the plate 1, an actuating cam 35 and insulating rollers 36 and metal rollers 37 rotatably mounted thereon. The cam 35 is pivoted to the frame 34 by a pivot pin 38, the said cam extending through the frame 34, plate 1 and escutcheon 2. A handle 39 is suitably fastened to the cam so that it may be moved about its pivot into its ringing position as shown in Fig. 4, or listening position as shown in dotted lines in Fig. 3, to operate the sets of ringing contacts 40, 41, 42 or listening contacts 43, 44, 45.

Now when the cam key is moved to its listening position as shown in Fig. 3 and left there, when a key plunger is depressed, its pin 11 rides upon the angular surface 30³ of the opening 30 forcing the plate to the left (Fig. 3) and the extension 28² which

rests against the roller 37 therefore starts the cam key so that the springs 44 restore the key to its normal position.

If the cam key is thrown to its ringing position (Fig. 4) roller 37 engages extension 28² and moves the plate 28 toward the left releasing the actuated key and allowing it to restore.

Fig. 6 illustrates the calling end of a cord circuit which is adapted for operating a grounded cut-off relay when a calling plug P is inserted into a jack of the wanted line. In operating the reciprocating members of the key illustrated in Figs. 1 to 5, the operator depresses a plunger 7 and moves it into its fully actuated or ringing position to connect the proper ringing generator G to the called line. The contact 16 is thus moved to its alternate position, opening contacts 16 and 17 and closing its contacts 15 and 16 to connect the selected ringing current to the tip side of the line. The plate 28 is thereby moved, its extension 28¹ opening the sets of contacts 25 and 26 and closing the sets of contacts 24 and 25 of the end springs as already described. When the operator removes the pressure from the key plunger the key returns to its intermediate or indicating position as already described. The key last used for applying ringing current to a wanted line is restored when another key plunger is depressed, which already has been described.

Now if an individual party is to be rung, or a five party line system operated, the cam key C is used, and when moved to its ringing position as shown in Fig. 4, the roller 36 upon engaging the contact 41 opens the contacts 41 and 42 and closes contacts 40 and 41 to connect the generator G¹. This also closes the common contacts 24 and 25 due to roller 37 engaging extension 28² of the sliding plate 28 and moving said plate toward the left (Fig. 4). This movement of plate 28 also releases any key plunger that is held in indicating position, as already described.

While I have illustrated a particular key structure and spring arrangement, I do not wish to be limited to that specific form as many modifications can be made without departing from the scope of the invention and I aim to cover all such changes and modifications as come within the spirit and scope of the appended claims.

Having described my invention, what I claim as new and desire to secure by United States Letters Patent is:

1. A party line key comprising a rocking actuating member having locking and non-locking operating positions, reciprocating ringing members, having normal and locked operating positions, and means whereby the actuation of said rocking member to a non-locking position will restore a previously actuated ringing member and the actuation

of a ringing member will restore the rocking member if in a locked position.

2. A party line key comprising a two-way rocking actuating member, reciprocating actuating members having normal and locked operating positions, and means whereby when a reciprocating member is in a locked position the subsequent operation of said rocking member one way will effect the restoration thereof, and when said rocking member has been actuated the other way a subsequent actuation of a reciprocating member will restore said rocking member.

3. An operator's listening and ringing key comprising a plurality of actuating buttons each having a normal, an indicating and a ringing position, a rocking actuating member having a normal and a plurality of operating positions, and means whereby the actuation of one of said actuating buttons restores the said actuating member from one of its operating positions and the operation of said actuating member to another of its operating positions restores an actuating button.

4. A party line ringing key comprising a rocking actuating member having a normal and two actuated positions, reciprocating actuating members having normal and off-normal positions, interconnecting mechanism extending between said rocking member and said reciprocating members whereby when a reciprocating member is actuated it will restore the said rocking member from one of its positions and whereby when said rocking member is operated to its opposite actuated position it will restore a previously operated reciprocating member.

5. A party line key comprising a rocking actuating member having a locking and a non-locking operating position, reciprocating actuating members having normal,

indicating and operating positions, and means whereby the actuation of the rocking member to its non-locking position restores a reciprocating member from its indicating position and the actuation of a reciprocating member from indicating to operating position restores the locking member from its locked position.

6. A party line key comprising a two-way rocking actuating member, reciprocating actuating members having normal and indicating positions, and means whereby when the rocking member is operated in one direction it will restore any previously depressed reciprocating actuating member and when a reciprocating member is actuated from its normal to its indicating position it will restore the rocking member if previously operated in its opposite direction.

7. A combined party and straight line ringing and listening key comprising a two-way rocking member and a plurality of reciprocating actuating members, each of said members having a normal and a plurality of off-normal positions, a slidable member associated with said reciprocating members and provided with an extension associated with the said rocking member, means for transmitting motion to said slidable member when any of said reciprocating members are actuated for restoring said rocking member, and means for transmitting motion to said slidable member when said rocking member is actuated to restore an actuated reciprocating member.

Signed by me at Chicago, county of Cook, 80 and State of Illinois, in the presence of two witnesses.

ALVA J. CARTER.

Witnesses:

B. O'BRIEN,

M. R. ROCHFORD.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."