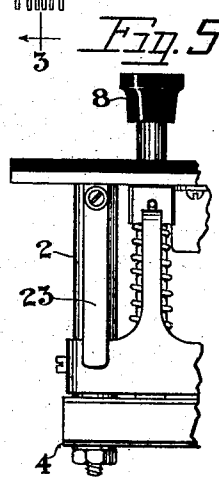
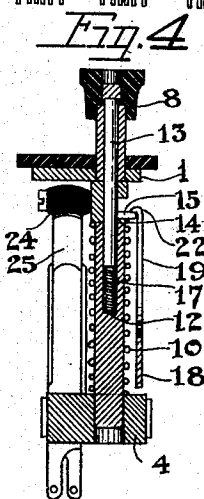
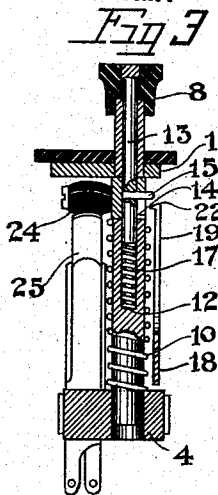
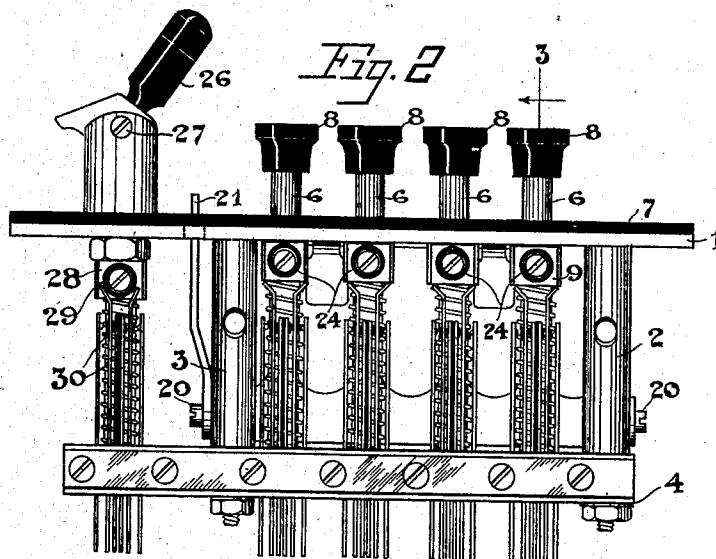
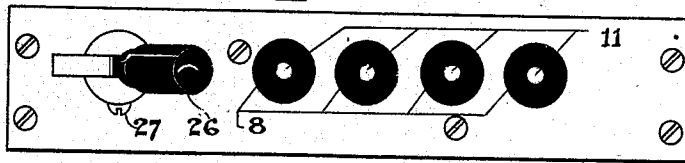


911,377.

Fig. 1



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UNITED STATES PATENT OFFICE.

GUY M. CAMPBELL, OF CHICAGO, ILLINOIS, ASSIGNOR TO KELLOGG SWITCHBOARD AND SUPPLY COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

PARTY-LINE INDICATING-KEY.

No. 911,377.

Specification of Letters Patent.

Patented Feb. 2, 1909.

Application filed April 17, 1908. Serial No. 427,700.

To all whom it may concern:

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

My invention relates to operator's indicating keys or ringing keys used in telephone switchboards for connecting ringing current with telephone lines upon which a plurality of substations are connected.

It has been found desirable to provide some means by which the operator may be informed which one of the parties upon the telephone line with which the key is temporarily connected has been last called, and it is the object of my invention to provide a key which indicates the last key operated in a positive and distinct manner, and in a manner readily perceived either by sight or by touch.

It has been proposed in the past to indicate the last key operated by causing the button itself to remain in a partially depressed position until another button has been actuated, and it has also been proposed to indicate the last button by means of an auxiliary signaling device such as a plunger operating in a position in proximity with the buttons. With the former arrangement a very long stroke is required to the button in order that its three different positions shall be distinct, and in the latter arrangement the operating plungers tend to hide the indicating plungers from the ready view of the operator.

By my present invention I place an auxiliary plunger within the actuating plunger, this auxiliary plunger carrying a target of a color contrasting with the color of the button itself and normally standing on a level with the top surface of the actuating button. When a button is depressed this target is likewise depressed, but when the button is released the target is retained in a depressed position so that not only the appearance of the top of the button is changed but also the feeling of the button is so changed that the operator would realize from the touch whether or not the key was the one last depressed.

It may be found desirable in some instances to cover the face of the button with transparent glass or celluloid in which case the advantage of the touch indication is sacrificed

though it is to be understood that my invention contemplates all modifications within the scope of mechanics' skill.

My invention is illustrated in the accompanying drawing forming a part of this specification, in which—

Figure 1 is a plan view; Fig. 2 is a front elevation; Fig. 3 is a section on the line 3—3 of Fig. 2 showing the indicating plunger in its normal position; Fig. 4 is a section on the line 3—3 of Fig. 2 showing the indicating plunger in its indicating position, and Fig. 5 is a fragmentary rear elevation.

The preferred embodiment of my invention comprises the top plate 1, pillars 2 and 3, and the insulating spring supporting strip 4 which form the key frame. The actuating plungers 6 extend through aligned openings in the spring supporting strip 4, the top plate 1 and the rubber escutcheon 7 and carry the actuating buttons 8 secured to their uppermost ends. These plungers are cylindrical in form and have the enlarged guiding portions 9 which prevent the plungers from turning and also form the abutments which limit the upward movement of the plungers. Coil springs 10 are disposed about the plungers between the abutments 9 and the spring carrying strip 4 and tend to hold the actuating plungers in their uppermost positions. Each actuating plunger has a hole therein extending from the top down to the point 12 and contains the auxiliary plunger 13 so mounted that it is free to reciprocate slightly, the amount of reciprocation being limited by the length of the slot 14 through which the pin 15, which is secured in the plunger 13, extends.

Within the tubular portion of the plunger 6 and below the plunger 13 is a coil spring 17 which tends to hold the auxiliary plunger in its uppermost position within the operating plunger. This spring, however, is much weaker than the spring 10 which raises the actuating plunger. These auxiliary plungers carry targets 11 of a color contrasting with the color of the buttons, their upper surfaces being normally flush with the upper surfaces of the actuating plungers. The plate 18 which carries a plurality of catch fingers 19 is pivotally supported by the screws 20 between the columns 2 and 3. This plate also carries the finger 21 which extends above the face of the key in a position accessible to the operator. The ends of

the fingers 19 are turned inwardly to form the catches 22 which are adapted to engage the ends of the pins 15 when the plungers carrying these pins are depressed to their lowest positions. The spring 23 shown in Fig. 5 gives the top of the plate 18 a normal inward tension so that the catches 22 are in position to engage the pins 15. Each plunger carries a spring actuating knob 24 adapted to be forced between the springs 25 to actuate these springs when the plunger is depressed.

When any actuating plunger is depressed, the pin 15 carried by the auxiliary plunger 13 passes the catch 22 of the finger 19, slightly moving the plate 18 and the catch fingers carried thereby upon its pivots 20, but when the actuating plunger is released the pin 15 of the auxiliary plunger is engaged by the catch 22 and the auxiliary plunger and its indicating target 11 are retained in their depressed position. The appearance of the key is now materially altered in that the target 11 of the last depressed plunger is held at a slight distance below the upper surface of the button, and inasmuch as the key is seldom if ever in practice viewed from directly above, the difference in appearance between this button and the other buttons is very prominent. When any other button is depressed the catch plate 18 is again moved and the auxiliary plunger formerly depressed is released and is returned to its normal position by the expansion of spring 17.

A listening key is usually associated with ringing keys of this class and is preferably mounted in the same structure with the ringing buttons. Such a key is illustrated at the left end of the structure and comprises the operating cam 26 adapted when tilted about the pivot 27 to reciprocate the plunger 28 so that the knob 29 will be forced between the slanting ends of the springs 30 to control the circuit through the contacts carried by said springs.

While I have shown and described my invention with respect to a particular structure, I do not wish to be unduly limited thereto, many alterations being possible without in any way departing from the spirit or scope of my invention.

I claim:

1. In an operator's indicating key, the combination with a plurality of actuating buttons, of a plurality of indicating targets, one carried within each of the actuating buttons, the target associated with the last button actuated being held below the surface of the button to indicate that its associated button was the last actuated, substantially as described.

2. In an operator's indicating key, the combination with a suitable supporting frame, of a plurality of switch actuating buttons, a plurality of vertically reciprocating targets, one located within each of the said

buttons, and adapted by their positions to indicate the last of said buttons actuated, substantially as described.

3. In an operator's indicating key, the combination with a suitable supporting frame, of a plurality of actuating plungers, a plurality of auxiliary plungers, one located within each of said actuating plungers, and means to retain the auxiliary plunger associated with the last operated actuating plunger in a depressed position to indicate that its associated actuating plunger was the last operated, substantially as described.

4. In an operator's indicating key, the combination with a plurality of actuating buttons, each having an opening there-through, of a plurality of indicating targets of contrasting colors, one in each of said openings, and means to move said targets from their normal position to indicate the last button actuated, substantially as described.

5. In an operator's indicating key, the combination with a suitable frame, of a plurality of switch actuating plungers, a plurality of auxiliary plungers, one carried within each of said actuating plungers, and means to retain one of said auxiliary plungers in a depressed position after its associated actuating plunger has been depressed and released, substantially as described.

6. In an operator's indicating key, the combination with a suitable frame, of a plurality of switch actuating plungers, a plurality of auxiliary plungers, one carried within each of said actuating plungers, and a catch plate pivoted on said frame adapted to retain said auxiliary plungers in a depressed position after their associated actuating plungers have been depressed and released, substantially as described.

7. In an operator's indicating key, the combination with a plurality of vertically reciprocating plungers formed of two distinct portions, of means to retain one portion of each of said plungers in a depressed position after the other portion has returned to normal position to indicate the last of said plungers actuated and released, substantially as described.

8. In an operator's indicating key, the combination with a plurality of vertically reciprocating members, of means to displace a portion only of each of said members from its normal position to indicate the last button actuated and released, substantially as described.

9. In an operator's indicating key, the combination with a plurality of actuating means, of means to retain a portion of each of said actuating means in an abnormal position when the rest of the same actuating means is depressed and returned to its normal position, said retained portion being released when any other actuating means is de-

pressed to its actuating position and a spring for returning the released portion to its normal position, substantially as described.

5 10. In an operator's indicating key, the combination with a plurality of sets of switch springs, of a plurality of actuating means, one for each of said sets of switch springs, buttons for said actuating means, each but-
10 ton having portions of contrasting colors, one of said portions of the buttons being adapted to be withdrawn from the ready view of the operator to indicate the last but-
15 ton actuated, substantially as described.

11. In an operator's indicating key, the combination of a plurality of switch actuating means, each normally exposing portions of contrasting colors, and means to remove

one of said portions from the ready view of the operator to indicate the last actuating means operated, substantially as described. 20

12. In an operator's indicating key, the combination with a plurality of actuating means, each exposing portions of contrasting colors, of means to obscure one of said portions from the last actuating means operated and means to display said portion when any other of said actuating means is operated, substantially as described. 25

Signed by me at Chicago, county of Cook, and State of Illinois, in the presence of two witnesses. 30

GUY M. CAMPBELL.

Witnesses:

CLIFFORD C. BRADBURY,
MARJORIE E. GRIER.