

C. H. SMITH.
PARTY LINE INDICATING KEY.
APPLICATION FILED AUG. 5, 1907.

911,339.

Patented Feb. 2, 1909.

3 SHEETS—SHEET 1.

Fig. 1.

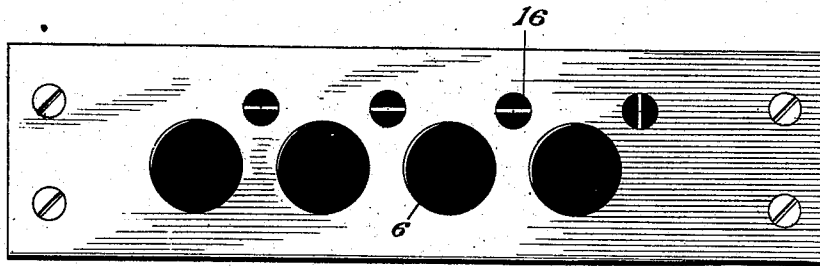
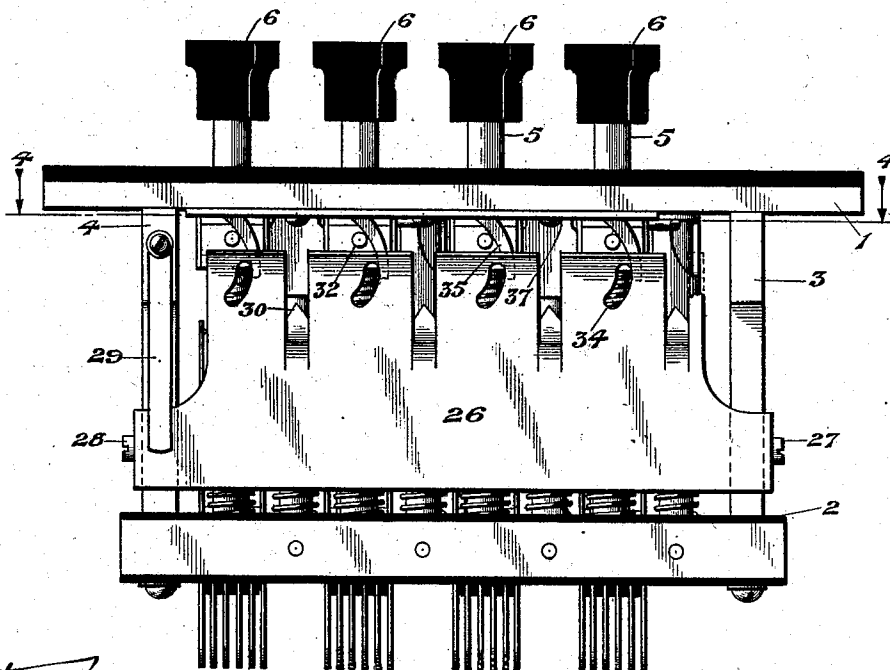


Fig. 2.



Witnesses:
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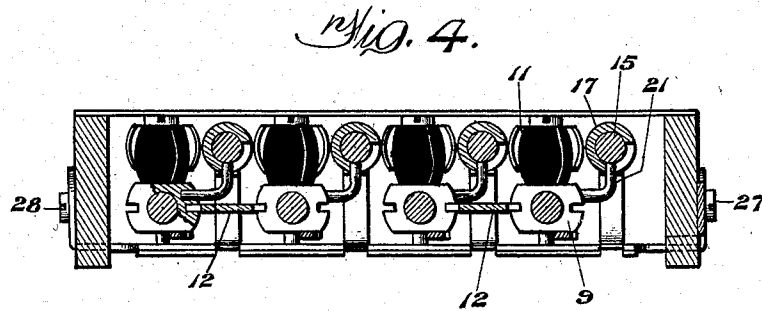
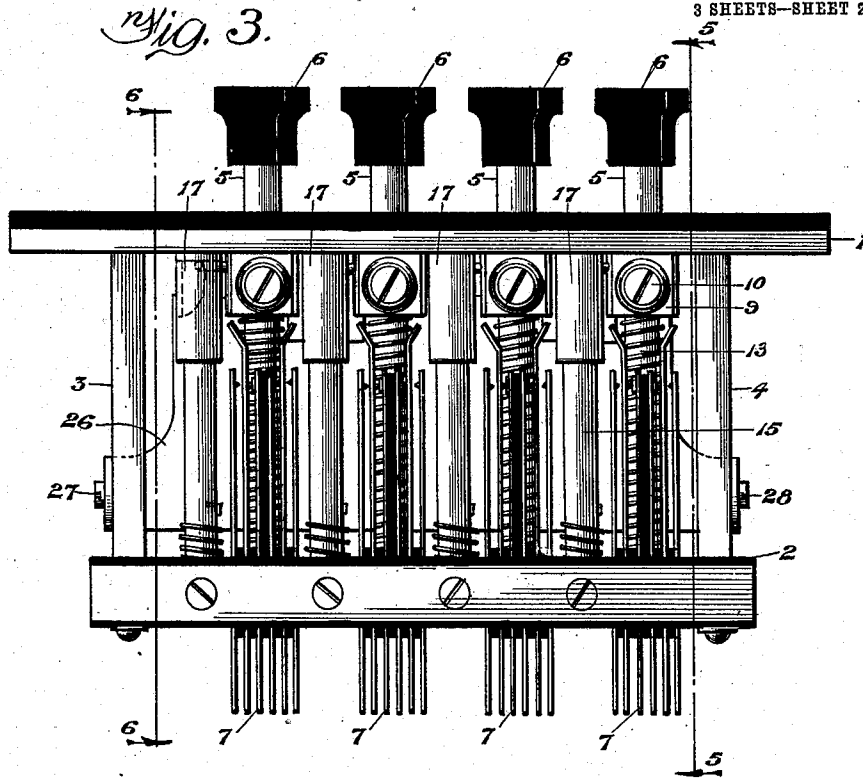
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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

Fig. 5.

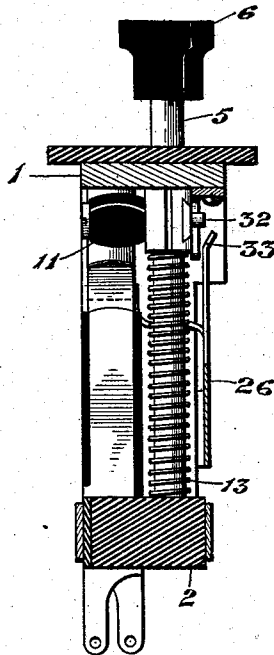


Fig. 6.

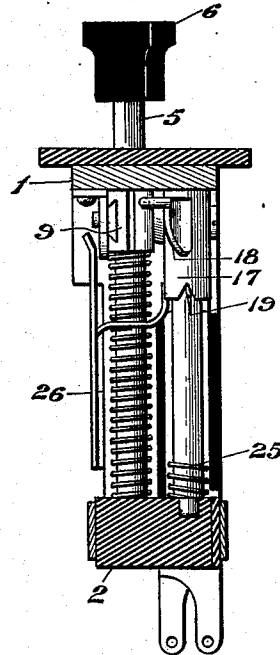


Fig. 7.

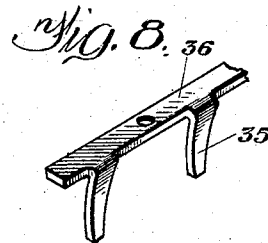
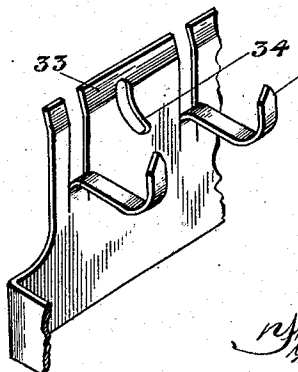
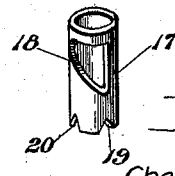
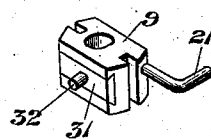


Fig. 9.

Fig. 10.



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UNITED STATES PATENT OFFICE.

CHARLES H. SMITH OF CHICAGO, ILLINOIS, ASSIGNOR TO KELLOGG SWITCHBOARD AND SUPPLY COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

PARTY-LINE INDICATING-KEY.

No. 911,339.

Specification of Letters Patent.

Patented Feb. 2, 1909.

Application filed August 5, 1907. Serial No. 387,020.

To all whom it may concern:

Be it known that I, CHARLES H. SMITH, 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 party line indicating ringing keys for telephone systems and contemplates a key which shall have a distinct and accurate means of indicating to the telephone operator the last button of the key depressed and released.

In a telephone system provided with party line selective ringing it is very desirable for the operator to have some means, other than her memory, of knowing which of the parties upon the line to which her calling cord is connected was last signaled, for the reason that it often occurs that a party does not respond to his first call and the calling subscriber requests the operator to signal again. If this occurs a great deal of annoyance is obviated by the use of an indicating key, whereby the operator will not be required to inquire the desired number a second time from the calling subscriber.

In the present invention I provide small targets, one associated with each of the buttons of the ringing key, each target preferably having a white line across its face which in normal position stands in alignment with the lines of all the targets, but which after its particular key has been depressed and released assumes a position at right angles to its former position, thus indicating that its associated button was the last depressed. By the mechanical construction of the key I cause this small target or indicating device to return to its normal position when any other button of the key is depressed.

My invention is illustrated in the accompanying drawing, in which,—

Figure 1 is a plan view of the key; Fig. 2 is a front elevation; Fig. 3 is a rear elevation; Fig. 4 is a section taken on the line 4—4 of Fig. 2; Fig. 5 is a section taken on the line 5—5 of Fig. 3; Fig. 6 is a section taken on the line 6—6 of Fig. 3; Fig. 7 is an isometric drawing of the pivoted catch plate; Fig. 8 is an isometric drawing of the restoring cams and plate; Fig. 9 is an isometric drawing of the rotating thimble, and

Fig. 10 is an isometric drawing of the guide block showing the rotating pin and the release pin assembled.

The key of my invention in its preferable form is provided with the top plate 1 and spring support 2 rigidly connected together to form a rectangular frame by the pillars 3 and 4. The spring operating plungers 5 are mounted in aligned openings through the upper and lower strips of the frame, these plungers carrying the buttons 6 which are preferably made of different colors to be readily distinguished.

Associated with each of the plungers is a set of switch springs 7 secured in the insulating spring support 2 in such manner as to be changed from normal to actuating position by the depression of the associated plunger 5. Upon this plunger 5 is an enlargement 9 to which the screw 10 secures the rubber spring actuating knob 11. When the plunger is depressed this knob is forced between the long springs of the associated set so as to spread these springs apart, bringing them in contact with the outside normally free springs of the set.

In order to prevent the plunger 5 and its assembled parts from rotating the block 9 is provided with slots along the sides in which the guide plates 12 register, not only preventing the plungers from rotating, but also adding to the stability of the knob support 9. About the lower portion of each of the actuating plungers is a coil spring 13 which presses upon the lower face of the enlargement 9 and upon the upper surface of the spring support 2 to hold the actuating plungers normally in their uppermost positions.

Associated with each of the actuating plungers and likewise mounted in the upper and lower portions of the frame are the indicating shafts 15 which carry the targets 16 visible from the face of the key. Near the upper end of the indicating shaft is a thimble 17 provided with the cam surface 18 and with the notches 19 and 20. The cam surface 18 is engaged by the end of the pin 21 which is carried upon the block 9 of the actuating plunger. When the actuating plunger is depressed this pin is adapted to bear upon the cam surface 9 to rotate the thimble and its associated indicating shaft substantially a fourth revolution, thus mov-

ing the target to a position at right angles to its normal position. About the lower end of this indicating shaft is a torsion spring 25 having sufficient strength to normally maintain the indicating shaft in the position shown in Fig. 6.

After the actuating plunger has been depressed and the indicating shaft rotated to indicating position it is necessary to lock the indicating shaft in this rotated position so that it will continue to indicate after the actuating plunger has returned to its normal position. For this purpose the plate 26 is provided, supported upon the posts 3 and 4 by screws 27 and 28. This plate is normally held in its inner position by the pressure of the spring 29 and has the fingers 30 adapted to register with the notches 19 and 20 of the thimbles 17. Upon the enlargement 9 of each of the actuating plungers is carried the dove-tailed slide plate 31, this plate carrying the pin 32 which is adapted to register with the slanting surface 33 of the catch plate 26 to rock this plate upon its pivots 27 and 28 when any one of the plungers is depressed. As shown in Fig. 2, the pin 32 is adapted to rock the plate 26 outwardly upon the down stroke of the plunger 5, but is adapted to drop into the slot 34 when the plunger has reached its lower position such that upon the return stroke the pin 32 and the slide plate 31 are caused to move slightly to the right and thereby the pin passes up through the slot without again moving the catch plate. It will thereby be seen that the finger 30 of the catch plate which normally stands in notch 20 of the thimble 17 will drop into the notch 19 when the plunger is fully depressed and will hold the thimble and its associated indicating shaft in its partly rotated position until another plunger is depressed, rocking the plate 26 upon its pivots and pulling the finger 30 out of its registry with the notch 19 of the rotated thimble. The cam surfaces 35 formed on the plate 36 and secured to the top plate 1 by screws 37 are adapted to restore the pins 32 and slide 31 to normal position as the plunger returns from its actuating position to its normal position.

While my invention is here shown and described with reference to a specific embodiment, it is to be understood that I do not wish to be so limited, it being very possible to utilize the indicating feature of this key with many other forms of mechanical construction without in any way departing from the spirit or scope of my invention.

What I claim is:

1. In an operator's indicating key, the combination with a suitable frame, of a plurality of vertically reciprocating switch actuating plungers mounted therein, auxiliary targets also mounted in said frame and having a rotary movement controlled by the

movement of the plungers for indicating the last plunger depressed, substantially as described.

2. In an operator's indicating key, the combination with a unitary structure, of a plurality of switch actuating plungers, and auxiliary rotating means for indicating the last plunger depressed forming parts of said structure, substantially as described.

3. In an operator's indicating key, the combination with a plurality of switch actuating means, of a plurality of auxiliary indicators, one mechanically associated with each of said actuating means, the mechanism of said mechanical association being adapted to rotate the indicators to denote the last actuating means depressed and released, substantially as described.

4. In an operator's indicating key, the combination with a suitable frame, of a plurality of switch actuating means mounted therein, a plurality of auxiliary targets, one associated with each of said actuating means, each target having a normal and an indicating angular position, each of said targets being adapted to be moved to its angular position by the operation of its associated actuating means and returned to its normal position by the operation of any other actuating means, substantially as described.

5. In an operator's indicating key, the combination with a plurality of actuating means, of a plurality of indicating means, each located in a position closely associated with its corresponding actuating means, said indicating means having a normal symmetrical appearance, a frame forming a unitary support for said actuating and indicating means and means to rotate any of said indicating means out of symmetry with the others by the operation of its associated actuating means, and means to return said indicating means to its symmetrical position by the operation of any other actuating means, substantially as described.

6. In an operator's indicating key, the combination with a suitable supporting frame, of a plurality of vertically reciprocating switch actuating plungers mounted in the frame, a plurality of indicating shafts also mounted in the frame, one associated with each actuating plunger, cooperating means upon each plunger and its associated indicating shaft for rotating the indicating shaft upon the depression of the operating shaft, and means to maintain the indicating shaft in its rotated position until another actuating shaft is operated, substantially as described.

7. In an operator's indicating key, the combination with a suitable frame, of a plurality of switch actuating plungers mounted in the frame, a plurality of indicating means, one associated with each of the actuating plungers also mounted in the frame, means

to hold the actuating plunger normally in its uppermost position, means to hold the indicating means normally in its non-indicating position, cooperating means upon the actuating plunger and the indicating device associated therewith for rotating the indicating device upon the downward stroke of the actuating plunger, a catch plate for maintaining the indicating device in its rotated position after the actuating plunger has been released, and means for moving the catch plate to release the retained indicating device whenever another actuating plunger is depressed, substantially as described.

8. In an operator's indicating key, the combination with a suitable supporting frame, of actuating and indicating shafts mounted in the frame, the actuating shafts having a reciprocating motion for changing the circuit of the device, the indicating shafts having a rotary motion for indicating purposes, a cam upon the indicating shaft, a projection upon the actuating shaft engaging said cam to rotate the same when the actuating shaft is depressed, a catch plate for maintaining the rotating shaft in its rotated position, and means to move said catch plate to release the rotated shaft whenever another operating shaft is depressed, substantially as described.

9. In an operator's indicating key, the combination with a plurality of actuating means, of a plurality of rotatable indicating means, one associated with each of the actuating means and adapted to be placed in indicating position upon the actuation of the associated actuating means, a catch for maintaining the indicating device in its indicating position after the actuating means has been depressed and released, means to move the catch upon the depression of any other actuating means, whereby the rotated indicating means is released, and means to permit the actuating means to return to its normal position without moving the catch, whereby its own indicating means will not be released upon the return stroke of the actuating means, substantially as described.

10. In an operator's indicating key, the combination with a suitable frame, of a pivoted catch plate mounted in the frame, a plurality of vertically reciprocating switch

actuating plungers, a plurality of indicating devices, the last actuated of which is adapted to be held in indicating position by the catch plate, a projection carried on each of the reciprocating plungers for moving the catch plate upon the downward stroke of the plunger to release the indicating device then retained, said projection having a lateral movement upon the return stroke of the plunger, whereby the catch plate is not engaged and is not moved to release its own indicating device, substantially as described.

11. In an indicating key, the combination with a plurality of switch actuating means, of a plurality of auxiliary indicators, one associated with each actuating means, and mechanical means associated with the actuating means adapted to rotate the indicators to denote the last actuating means depressed, substantially as described.

12. In an indicating key, the combination with a plurality of switch actuating means, of a plurality of auxiliary indicators, one associated with each actuating means, and mechanical means associated with the actuating means adapted to rotate the indicators to denote the last actuating means depressed and released, substantially as described.

13. In an operator's indicating key, the combination with a plurality of sets of switch springs having normal and actuating positions, of operating means therefor having normal and actuating positions, each of said means being adapted when in its actuated position to place its associated set of switch springs in its actuated position, a plurality of auxiliary indicating means, one associated with each of said operating means, said indicating means being adapted to be rotated to an indicating position when its associated operating means is actuated and being adapted to be returned to its normal position when any other operating means is actuated, substantially as described.

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

CHARLES H. SMITH.

Witnesses:

CLIFFORD C. BRADBURY,
EDITH F. GRIER.