

C. E. SCRIBNER & F. R. McBERTY.
INDICATING KEY FOR SELECTIVE SIGNALS.

(No Model.)

(Application filed July 25, 1898.)

2 Sheets—Sheet 1.

Fig. 1

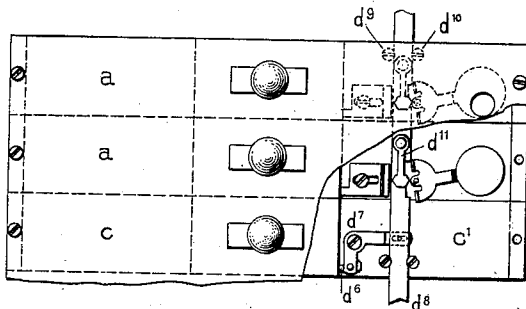


Fig. 2

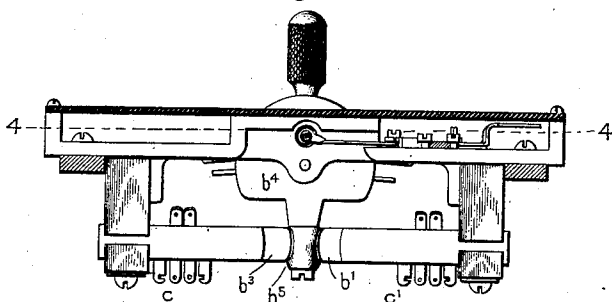


Fig. 3

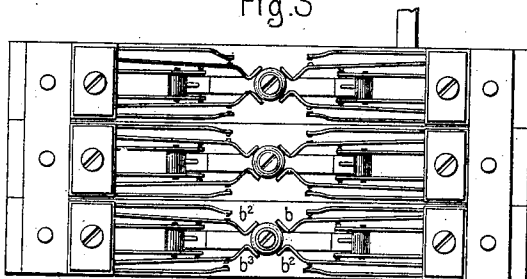
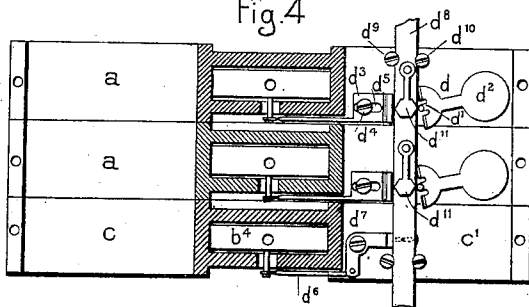


Fig. 4



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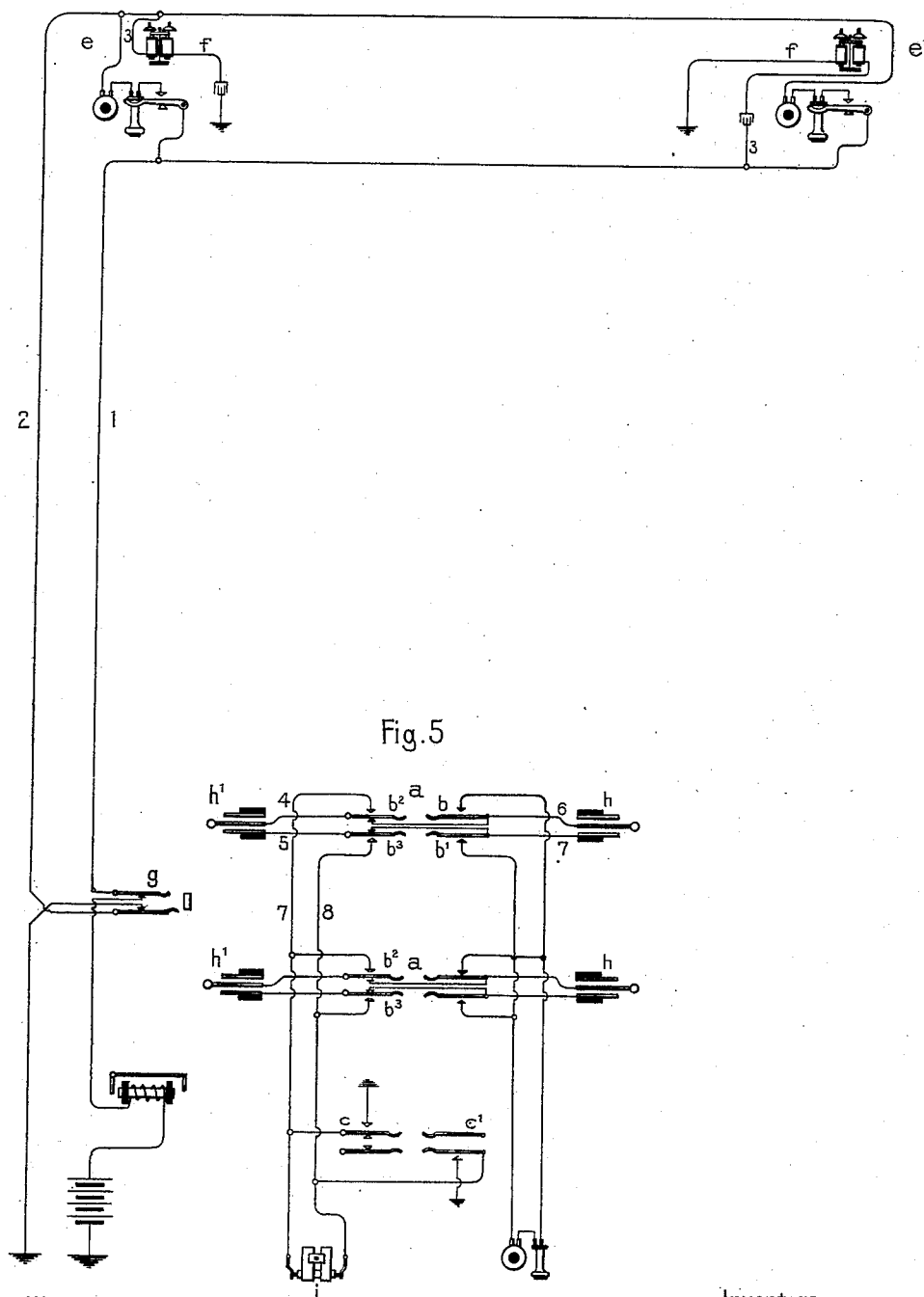
Carston & Brown their Attys

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2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

CHARLES E. SCRIBNER, OF CHICAGO, AND FRANK R. McBERTY, OF EVANSTON, ILLINOIS, ASSIGNORS TO THE WESTERN ELECTRIC COMPANY, OF CHICAGO, ILLINOIS.

INDICATING-KEY FOR SELECTIVE SIGNALS.

SPECIFICATION forming part of Letters Patent No. 651,936, dated June 19, 1900.

Application filed July 25, 1898. Serial No. 686,764. (No model.)

To all whom it may concern:

Be it known that we, CHARLES E. SCRIBNER, residing at Chicago, and FRANK R. McBERTY, residing at Evanston, in the county of Cook and State of Illinois, citizens of the United States, have invented a certain new and useful Improvement in Indicating-Keys for Selective Signals, (Cases Nos. 471 and 472,) of which the following is a full, clear, concise, and exact description.

In the equipment of telephone-switchboards for the selective operation of call-bells on multiple-station or party lines the greatest economy of construction, together with simplicity of operation, is attained by providing for each operator a single calling key for each pair of plugs and a common group of special calling keys for suitably modifying the calling-current to actuate the required selective signal, the special group of keys being brought into connection with a pair of plugs through the agency of the individual calling key of the pair of plugs. It is desirable, however, that some means be provided for indicating to the operator after the transmission of a specialized call-signal the identity of the signal transmitted in association with each of the individual calling keys.

Our invention is a mechanical recording device for association with such groups of individual and common calling keys applicable to keys for transmitting two distinctive call-signals.

It consists in the combination, with a movable target or indicator for each of the individual keys capable of assuming two positions, of means actuated by the corresponding individual key for moving the target to either of its positions from the other and an intermediate device controlled by the common calling keys for determining the position to which the target shall be thrown when actuated by the individual key.

The special form in which we have embodied the invention for commercial use is designed for association with an individual key which is actuated by a pivoted lever, being adapted to apply calling current to the calling plug of a pair when the lever is moved, and a pair of common keys for transmitting

two varieties of specialized current actuated by the movement in either direction of a common pivoted lever. Each individual key is provided with a pivoted target movable in either of two directions and with a plunger linked to the lever of the key adapted to impart movement to the target, and the lever of the common key is linked to a longitudinally-movable rod extending transversely to the direction of movement of the levers of the individual keys, which carries at each key a link or stud which is interposed between the movable plunger and the pivoted target at either side of the pivot, according to the position of the longitudinally-movable rod.

The invention may be more clearly described in connection with the attached drawings.

Of the drawings, Figure 1 represents a plan of two individual listening and ringing keys and a group of two special calling keys fitted with the indicators of this invention. Fig. 2 is a side elevation of the set of keys. Fig. 3 is a view from below. Fig. 4 is a horizontal sectional view on line 4 4 of Fig. 2. Fig. 5 is a diagram showing the circuit connections of two pairs of plugs and of the generator of calling current with these keys, together with the circuit connections of a party telephone-line provided with call-bells adapted for selective operation.

The keys may be of the type described and claimed by us in Patent No. 564,457, issued July 21, 1896. Each individual key *a* consists of two pairs of spring switch-levers *b b'*, each with a normal resting contact and an alternate contact, and a pivoted lever *b²*, carrying a double-faced wedge *b³*, about which the free extremities of the switch-springs are symmetrically disposed. By the movement of the lever this wedge may be thrust between either pair of switch-springs to separate the members of the pair from their normal resting contacts and to force them against their alternate contacts. The pairs of springs *b b'* are designed to connect the operator's telephone with the plug-circuit. The limiting-stops of the lever are adjusted to permit the wedge to enter so far between the extremities of springs *b b'* as to be held by them in a sta-

ble position. The other springs $b^2 b^3$ are designed to sever the plug-circuit and to apply the source of calling current, suitably modified, to the calling plug of the pair, and for this purpose the wedge is adapted to enter only a little distance between the springs $b^2 b^3$, being returned to its normal position as soon as the lever is relieved of the pressure operating it.

The two common calling keys, one for modifying the current to actuate each of the selective signals, are constructed in every respect similarly, excepting that the wedge is permitted to enter only a slight distance between either pair of switch-springs, so that the lever is returned to its normal central position from either of its extreme positions.

The movement of the lever of any of the individual keys a to the left, as viewed in Figs. 1 and 2, connects the operator's telephone with the plug-circuit and the movement of the same lever to the right connects the calling-plug of the corresponding pair of plugs with the special calling keys $c c'$ and with a source of calling current, while the movement of the common lever of these keys to either side modifies the calling current to operate one or the other of the selective call-receiving devices of the line with which the plug may be connected.

Each individual key a is provided with a lever d , pivoted at d' and carrying at the extremity of an extension therefrom a target d^2 . These target-levers should move with some friction. Each target is designed to appear or disappear at an opening in the covering of the keys.

Each lever b^4 is connected with one extremity of a link d^3 , whose other extremity lies near the target-lever d . The link d^3 is retained in its normal position, while being permitted longitudinal movement, by means of studs or screws d^4 , which travel in slots d^5 of the links d^3 .

The lever b^4 of the common keys $c c'$ is connected by a link d^6 with one extremity of a bell-crank lever d^7 , whose other extremity is pivoted to a longitudinally-movable rod d^8 . This rod travels between guides $d^9 d^{10}$, secured in the individual keys. It extends throughout the length of the keyboard, traversing all the individual keys a of the group provided for one operator. This rod carries a number of levers d^{11} , each pivoted at one extremity to the rod and free at its other extremity. One of these levers is provided for each individual key. It is so placed on the sliding rod d^8 that when the rod is in one of its extreme positions each lever d^{11} is brought into a position between the extremity of link d^3 of the corresponding key and one extremity of the target-lever d of the same key, while in the other extreme position of the sliding rod the lever is brought into position to register with the other extremity of the same target-lever. Thus if while the rod d^8 is in one of its extreme positions the lever of an

individual key a be moved to the right to send a calling current the broadened portion of the corresponding lever d^{11} will be thrust against one extremity of the target-lever d and will move the target into one position. If the same operation be repeated when the sliding rod is in its alternate position, the target will be moved into its other position. In other words, if the switch-lever of the calling keys $c c'$ be put in position to send a specialized current of one sort and an individual ringing-key be operated to apply such specialized current to a calling plug, the target of the individual key will be moved into one position, while if the common selective key be placed in condition to send the other variety of current the target of the individual key, by means of which such current is applied to a telephone-line, will be placed in its alternate position. Thus after an operator has manipulated an individual key and the common key to send current of either sort to operate a selective signal an indicator remains set in association with the individual key thus employed, which denotes the character of the specialized calling current transmitted, and thus the identity of the station called.

It will be apparent that the special keys a are independent of each other, inasmuch as the sliding rod may move freely in either direction without altering the position of any target of which the corresponding switch-lever is not simultaneously actuated.

Referring to Fig. 5, the mechanism for selective signaling with which we have chosen to associate our invention comprises, in combination with metallic-circuit party lines, a polarized call-bell at each station of the party line, these bells being in ground branches from the different limbs of the metallic circuit, together with means for applying a grounded source of alternating current to either line conductor of the telephone-line.

Thus the line-circuit 1 2 extends to each of two stations e and e' . At each station a polarized call-bell f is located in a ground branch 3 from one of the line conductors. The line is led to a spring-jack g in a telephone-switchboard. The operator in the switchboard is furnished with a number of pairs of plugs $h h'$ for making connection between lines. Each calling-plug h' is connected by conductors 4 and 5 with the switch-springs b^2 and b^3 , respectively, of one of the keys a . From the resting contacts of these switch-springs the circuits are extended by means of conductors 6 and 7 to the like contacts of the mate plug h . The external or alternate contacts of switch-levers b^2 form multiple terminals of a wire 7, leading to one pole of a source i of alternating calling current. Likewise the alternate contacts of switch-springs b^3 are connected by wire 8 with the other pole of the same generator of current. One switch-spring of the special calling key c is connected with wire 7, its alternate contact being grounded. The

symmetrically-opposite switch-spring of the key *c'* is likewise connected to the wire 8, its alternate contact being also grounded.

When a calling plug *h'* is inserted in the spring-jack of a telephone-line, the operation of any calling key *a* will transmit an alternating calling current in the line, applying both poles of the generator to the line-wires, leaving the target in an unchanged condition. If, however, the lever of the group of common keys be moved to actuate either of the keys *c* or *c'*, current will be applied to the corresponding line conductor of the telephone-line to ring the bell connected with that line conductor. At the same time the target associated with the individual key made use of in transmitting the call will be set in position to indicate the nature of the special calling current thus transmitted.

It will be apparent that other forms of mechanism may be provided to accomplish the same end and that the mechanism is independent of the character of the specialized calling-current.

Our invention is defined in the following claims:

1. The combination with several individual keys and an indicator capable of assuming two positions associated with each key, of a mechanical device for each key actuated in the movement thereof adapted to impart movement to the corresponding indicator, intermediate mechanism between said mechanical device and indicator adapted to alter the relation between said device and said indicator, and means for actuating said intermediate mechanism, as described.

2. The combination with several individual keys, of an indicator associated with each key, a mechanical device for each key actuated in the movement thereof to impart motion to the indicator, intermediate mechanism adapted to determine the character of the movement imparted to said indicator, and a switch-key, said intermediate mechanism being connected to said switch-key, as described.

3. The combination with several individual calling keys, of a target for each calling key, and a mechanical device connected with each key actuated in the movement thereof adapted to impart motion to said target, a common switch-key for modifying the character of the calling current applied through the agency of said individual keys, and intermediate mechanism for each individual key connected with said common key adapted to determine the character of the motion imparted by said mechanical device to said indicator of the same key, as described.

4. The combination with a group of switch-keys, of an indicator for each key, a mechanical device actuated in the use of the key to move the indicator, and means for changing the action of said device on the indicator, as described.

5. The combination with a group of switch-keys, of an indicator for each key, a mechanical device actuated by the key in the use thereof adapted to impart motion to the indicator, mechanism common to all the keys adapted to determine the character of movement imparted by said device to the indicator, a common switch-key, said key being connected with said mechanism to move it in the use of the key, as described.

6. The combination with pairs of plugs, plug-circuits thereof and individual calling keys, one for each plug-circuit, and a key common to the group of individual keys adapted, when actuated, to determine the character of calling current applied through any individual key, of an indicator for each individual key, and a mechanical device impelled by the individual key to impart motion to said indicator, and mechanism controlled by the common key adapted to determine the relation of said mechanical device to the indicator; whereby the movement of the indicator is controlled through the joint action of the common key and an individual key, as described.

7. The combination with a calling key and the pivoted lever thereof, of a plunger connected with the lever, a centrally-pivoted indicator-lever, and a movable device between said plunger and said indicator-lever adapted to be interposed between either extremity of the said lever and the said plunger, and means for moving the said device, as described.

8. The combination with an individual calling key and a key for determining the character of the current applied therethrough, of an indicator for the calling key, and a plunger impelled by the pivoted lever of the individual key, a centrally-pivoted lever for the key and an indicator controlled thereby, and a movable device adapted to be interposed between the plunger and either extremity of the said indicator-controlling lever, said movable device being connected with the lever of the other key, as described.

9. The combination with a group of individual calling keys and a common calling key for modifying the calling current applied thereby, of a plunger connected with the lever of each individual key, a centrally-pivoted indicator-controlling lever for each individual key, and a movable device adapted to be interposed between said plunger and either extremity of said indicator-controlling lever, said movable device being connected with said common key, as described.

In witness whereof we hereunto subscribe our names this 15th day of June, A. D. 1898.

CHARLES E. SCRIBNER.
FRANK R. McBERTY.

Witnesses:

ELLA EDLER,
MYRTA F. GREEN.