

E. R. CORWIN & C. A. BALS.
BANK OF LOCKING SWITCH KEYS.
APPLICATION FILED JAN. 29, 1909.

Patented Nov. 30, 1909.

941,763.

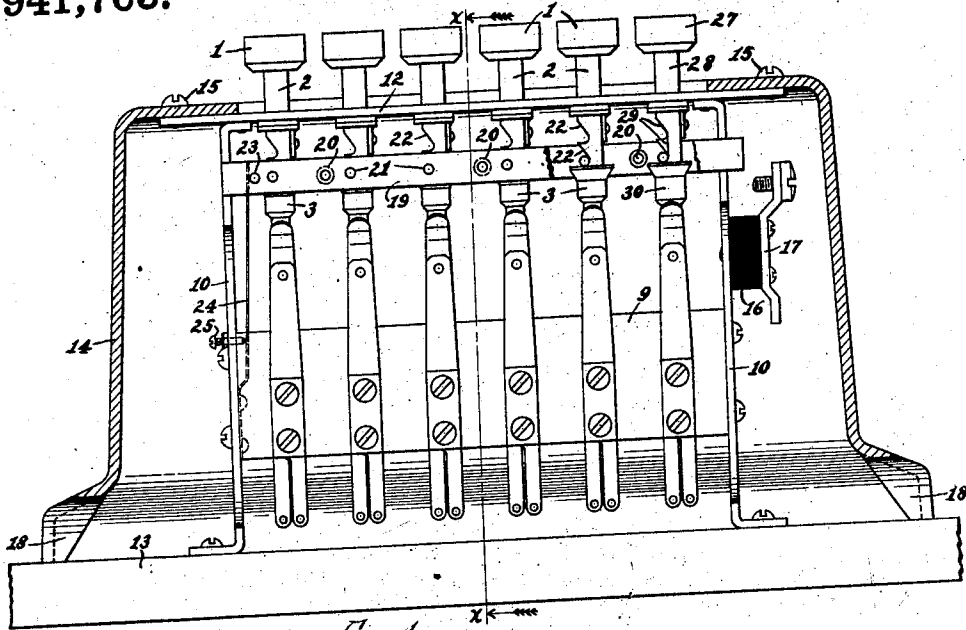


Fig. 1.

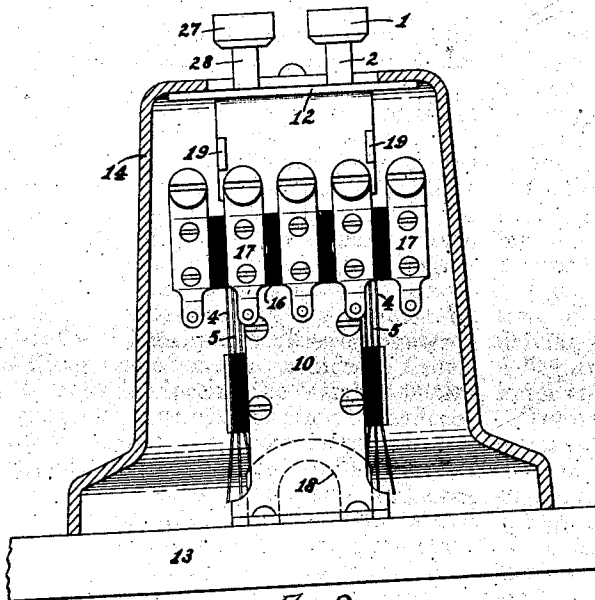


Fig. 2.

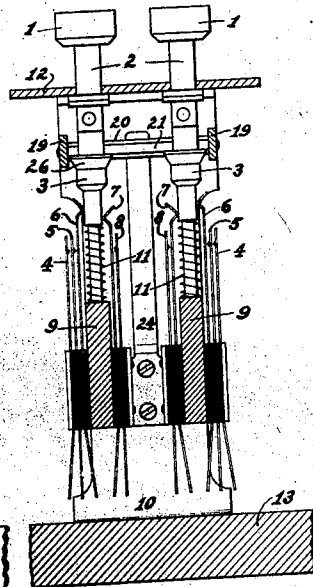


Fig. 3.

WITNESSES:

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UNITED STATES PATENT OFFICE.

ELMER R. CORWIN AND CHARLES A. BALS, OF CHICAGO, ILLINOIS, ASSIGNORS TO CORWIN TELEPHONE MANUFACTURING COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

BANK OF LOCKING SWITCH-KEYS.

941,763.

Specification of Letters Patent. Patented Nov. 30, 1909.

Application filed January 29, 1909. Serial No. 474,968.

To all whom it may concern:

Be it known that we, ELMER R. CORWIN and CHARLES A. BALS, both citizens of the United States of America, and residents of Chicago, Cook county, Illinois, have invented a new and useful Bank of Locking Switch-Keys, of which the following is a specification, reference being had to the accompanying drawings, illustrating same.

10 This present invention is an improvement on our United States Letters Patent No. 902,275, issued October 27, 1908.

Our invention relates to banks of locking switch keys of the push-button type, the principal objects of our invention being to provide improved means for mounting such a bank of switch keys, to provide an improved casing for such a bank of keys, to provide improved means for connecting electrical conductors with the keys, to provide improved means for controlling the switch contacts of the various keys of a bank in intercommunicating or party-line telephone systems, and to provide improved means for releasing the various keys of a bank by the depression of one of the keys.

Other objects will be apparent from the following specification.

In the accompanying drawings illustrating the preferred form of our invention, Figure 1 is a side elevation of a bank of the improved locking switch-keys, with a portion cut away and the inclosing casing shown in vertical cross-section to show the interior construction of the apparatus; Fig. 2 is an end elevation of the bank of locking switch keys shown in Fig. 1, with the inclosing casing shown in vertical cross-section to show the interior construction of the apparatus; and Fig. 3 is a vertical cross-sectional view of the bank of keys shown in Figs. 1 and 2, taken on line *x x* of Fig. 1.

Like characters refer to like parts in the several figures.

In the drawings, 1 1 represent a plurality of push-buttons, each being connected by a stem 2 with a plunger 3 which is adapted and arranged to operate and control a set of switch springs 4, 5, 6, 7 and 8. In the sets of switch springs shown in Fig. 3, the springs of each set are all out of contact with each other when the push-button 1 is raised, the depression of the push-button 1 causing the plunger 3 to engage the switch

55 springs 6 and 7 and thereby cause springs 4, 5 and 6 to contact each other, and spring 7 to contact spring 8. It will readily be understood, however, that the switch springs 6 and 7 of each set may control any combination of springs as desired.

60 The various sets of switch springs are mounted on a plurality of mounting bars 9 9 preferably as shown, the mounting bars 9 9 being held in place by a pair of end plates 10 10 as shown in Fig. 1. A plurality 65 of coil springs 11 11 act on the respective plungers 3 3 to raise the latter and the respective push-buttons 1 1 when they are released.

70 The end plates 10 10 are suitably secured to the top plate 12 which serves as a guide for the various stems 2 2. The end plates 10 10 may be also mounted to a mounting base 13 as shown in Fig. 1, to securely mount the bank of keys as a whole in place. The 75 cover or casing 14 is placed over the bank of keys as shown in Fig. 1 and is securely mounted to the top plate 12 by screws 15 15 so that the cover 14 may be readily removed from the bank of keys when it is desired to have access to the apparatus within the cover 14. On one of the end plates 10 10 is secured a strip of insulating material 16 carrying a plurality of terminal strips 17 17 adapted to accommodate conductors leading 85 from the various switch springs of the bank of keys and also conductors leading to the bank of keys from the exterior of the casing 14 through openings 18 18 in the ends of the casing 14. It will be readily seen 90 that this strip 16 with its terminal portions 17 17 provides a greatly improved arrangement for wiring the bank of keys to external conductors.

95 The end plates 10 10 carry a pair of side bars 19 19 in notches therein, as shown in the drawings, these side bars 19 19 being held together by a plurality of cross bars 20 20. The side bars 19 19 carry another set of cross bars 21 21 adapted to engage notches 22 22 in the stem portions 2 2 as shown. 100 Each of the stem portions 2 2 is provided with a pair of notches 22 22 therein for the reception of a cross bar 21, the pair of notches 22 22 in each stem portion 2 being beveled on their upper faces so that the depression of the corresponding push-button operates the side bars 19 19 and the cross bars 20 20 21 21 as 105

a unit, endwise, so as to release any of the other keys which may have been previously depressed. The beveled surface on each of the upper notches 22 22 in the stem portions 2 2 is for the purpose of causing the release of the various keys of the bank by a further depression of any of the push-buttons 1 1, past locking position, when more than one of the keys, or all of the keys, are locked in locking position, that is, in the position in which the cross bars 21 21 engage the upper notches 22 22 of the stem portions 2 2. In keys heretofore made it was possible to depress all of the push-buttons to locking position at the same time and automatically lock them all in this position without having any means for releasing the various push-buttons, by the further operation of one of them, or without getting at parts of the apparatus of the bank of keys below the top plate 12. In our present invention, however, we have done away with this objection to such banks of locking keys, by providing the upper beveled notches on the various stems 2 2 for the purpose stated. The side bars 19 19 carry still another cross bar 23 against which a leaf spring 24 bears to operate the side bar unit 19 19 20 20 and 21 21 as a whole, endwise, to cause the cross bars 21 21 to engage the various notches 22 22 of the stems 2 2. The leaf spring 24 is carried by one of the end plates 10 preferably as shown, the end plate 10 being provided with an adjustment screw 25 for regulating the tension of the spring 24 against the cross bar 23.

Each of the plungers 3 3 and the notches 22 22 associated therewith, are constructed so that when any of the push-buttons 1 1 is depressed from normal position, it will cause the release of any of the push-buttons which may have been previously depressed to locking position, before it causes the switch springs 6 and 7 thereof to switch any of the contacts of its set of switch springs. This is for the purpose of clearing the telephone circuit of other connections, in an intercommunicating or party-line telephone system, before the telephone is connected with the circuit leading to the key which is being depressed. This is very advantageous in intercommunicating telephone systems. When any of the push buttons 1 1 is depressed to locking position, that is, to the position in which its cross bar 21 rests in the upper notch 22 of the key, the switch springs 6 and 7 are engaged by the enlarged portion 3 of the plunger so as to cause springs 6 and 7 to engage springs 5 and 8 respectively, spring 4 being still out of contact with spring 5. Now a further depression of the push-button, that is, past the locking position, causes the switch spring 6 to engage the upper beveled portion 26 of the plunger and thereby cause the spring 5 to engage the spring 4,

without operating the switch spring 7 further. This construction gives a smooth, easy action to the push-buttons. The contacts 6 5 and 7 8 are generally the talking-circuit contacts in an intercommunicating telephone system, the contact 5 4 being a ringing contact.

The bank of keys is provided with one push-button 27 which is connected with a stem 28 having a single long beveled notch 29 therein as shown in Fig. 1. The plunger 30 on this stem 28 is so constructed that it switches its switch contacts before it releases any of the push-buttons 1 1 which may have been previously depressed. This is for the purpose of holding a trunk line in an intercommunicating telephone system, while a party called by the attendant answers an incoming trunk call; the key 27 establishing a bridge across the incoming common-battery trunk when depressed, before the attendant's telephone is disconnected from the trunk, to avoid giving the operator at the common-battery exchange a disconnect signal. Such a construction greatly improves the handling of incoming trunk calls from a common-battery telephone system to an intercommunicating telephone system. It will readily be seen that the key 27 is not locked in depressed position, because it has but a single notch 29 in the stem portion 28.

We do not wish to limit this invention to all of the exact details of construction herein shown, as various modifications in same may be made without departing from the scope of the appended claims.

What we claim as our invention is:

1. A bank of switch keys comprising a suitable frame and a plurality of push-button switches, adapted to be mounted to a suitable base, a distributing strip having terminals thereon carried by the said frame whereby conductors leading from the said switches may be connected with external conductors leading to the bank of keys, and a removable casing carried by the bank of keys and attached thereto, the said casing inclosing the said switches and distributing strip and having an opening therethrough for accommodating the external conductors leading to the distributing strip.

2. A bank of switch keys having a plurality of plungers and switches adapted to be operated thereby, means for locking some of the plungers in depressed position, means associated with at least one of the plungers whereby the depression thereof from normal position releases any of the other keys which may have been locked in depressed position, before the plunger which is being depressed switches its switch contacts, at least one of the plungers being constructed so that it switches its switch contacts before causing

the release of any of the other plungers which may have been locked in depressed position.

3. A bank of locking switch keys comprising a plurality of plungers and switches adapted to be operated thereby, means for locking the various keys in depressed position, means associated with each of the plungers whereby the depression thereof releases any of the other plungers which may have been locked in depressed position, some of the plungers being constructed so as to cause the release of the other plungers, when depressed, before switching their switch contacts, and at least one of the plungers being constructed so as to switch its switch contacts, when depressed, before causing the release of the other plungers.

4. A bank of switch keys having a plurality of plungers and switches adapted to be

operated thereby, means for locking some of the plungers in depressed position, means whereby the depression of at least one of the plungers causes the release of the other plungers which may have been locked in depressed position, and means associated with at least one of the plungers whereby the depression thereof from normal position switches its switch contacts before causing the release of any of the other plungers which may have been locked in depressed position.

As inventors of the foregoing, we hereunto subscribe our names, this 26th day of January, 1909.

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CHARLES A. BALS.

Witnesses:

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