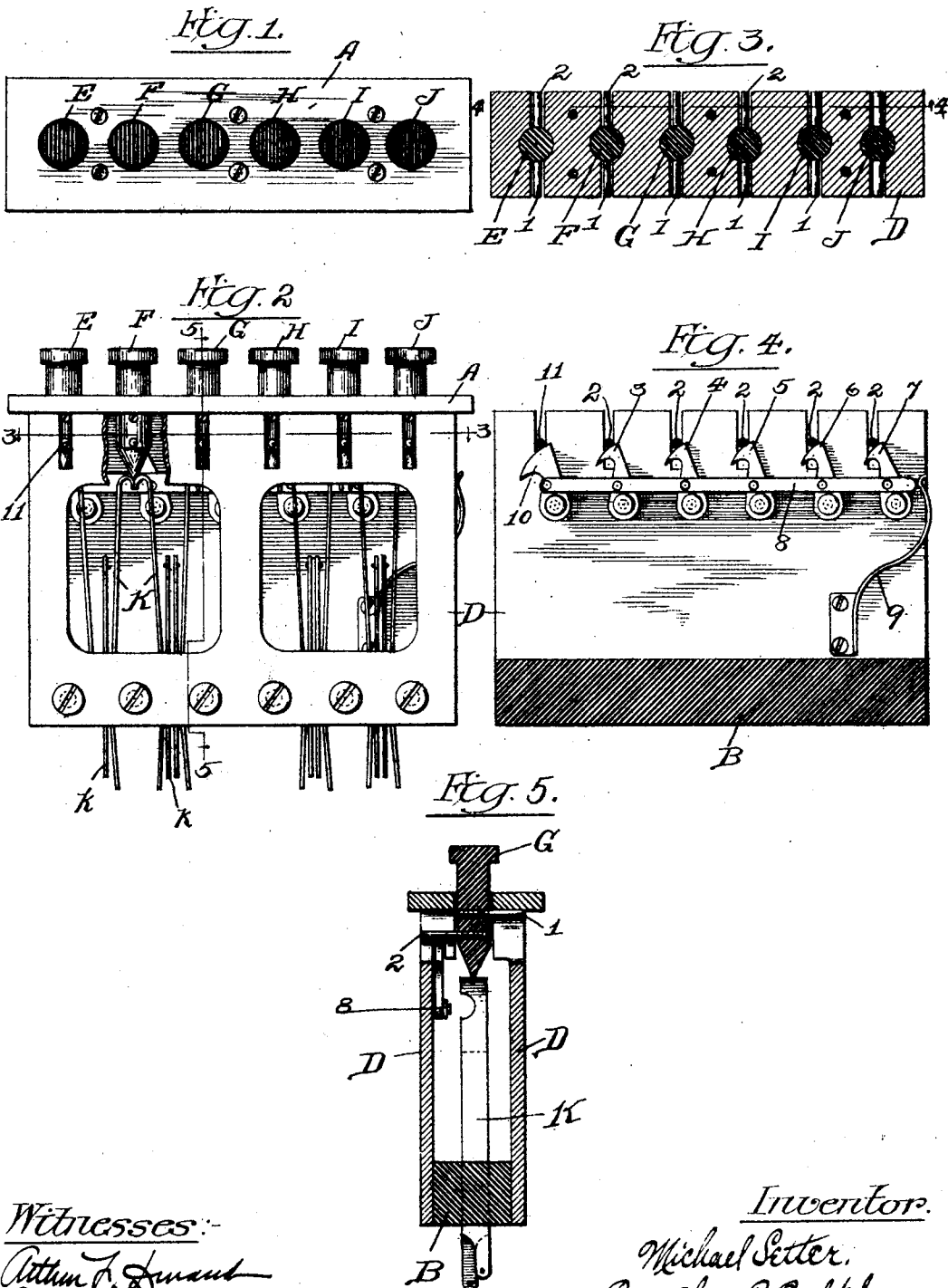


M. SETTER.
TELEPHONE SWITCH.
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UNITED STATES PATENT OFFICE.

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TELEPHONE-SWITCH.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, MICHAEL SETTER, a citizen of the United States of America, and a resident of Chicago, Cook county, Illinois, have invented a certain new and useful Improvement in Telephone-Switches, of which the following is a specification.

My invention relates to electric switches in general, but more particularly to switches adapted for use in electrical signaling systems, and especially to a form of key-switch for use in telephone systems—as, for example, party-line systems.

Generally stated, the object of my invention is to provide a simple, improved, and comparatively inexpensive switch involving in its construction a plurality of keys and switch-springs for controlling a number of different circuits, the arrangement being such that any particular circuit may be closed for any desired purpose by depressing the key allotted to such circuit, and involving also an additional key which may be depressed for the purpose of restoring any of the circuit-keys, the arrangement also being such that no circuit-key can be operated while another circuit-key is depressed without causing the depressed key to return to its normal position, or, in other words, without opening the circuit already closed.

It is also an object of my invention to provide certain details and features of improvement tending to increase the general efficiency and serviceability of a telephone-switch device of this character.

To the foregoing and other useful ends my invention consists in matters hereinafter set forth and claimed.

In the accompanying drawings, Figure 1 is a plan of a telephone-switch embodying the principles of my invention. Fig. 2 is a side elevation of the switching device shown in Fig. 1, a portion of the side plate being broken away for the purpose of showing the lower end of one of the circuit-keys. Fig. 3 is a horizontal section on line 33 in Fig. 2. Fig. 4 is a vertical section on line 44 in Fig. 3. Fig. 5 is a vertical cross-section on line 55 in Fig. 2.

As thus illustrated, my invention contemplates an improved self-contained telephone-switch involving a number of keys and switch-

springs for controlling the opening and closing of circuits and also an additional key and suitable means whereby any circuit-key may be restored when it is desired to open up the circuit which has been closed.

As illustrated, my improved telephone-switch is of a compact and self-contained form and is of such construction that it may be sunk into an opening in a table, switchboard, or any other surface. Accordingly the upper portion of the body-frame consists, preferably, of the plate A, and the latter is preferably connected with the bottom piece B by means of a pair of side plates D. The depressible key E is a restoring-key, while the keys F, G, H, I, and J are circuit-keys. There is a pair of switch-springs K allotted to each circuit-key, it being observed that the switch-springs are inserted upwardly through the bottom piece B and that the members of each pair of switch-springs are adapted to make contact with the stationary contact-springs k.

The lower end of each circuit-key is preferably tapered, whereby any pair of switch-springs may be forced apart by the depression of the circuit-key to which they are allotted. These switch-springs also serve as a means for forcing the circuit-keys upward into their normal positions, as will hereinafter more fully appear. Each key is preferably provided with a stop-pin 1 and also with a catch-pin 2. The dogs 3, 4, 5, 6, and 7 are associated with the circuit-keys and are all positively connected by the connecting-bar 8, which latter is held in its normal position by the spring 9 pressing upon its end. The catch-pins 2 rest upon the beveled upper ends of these dogs, as shown in Fig. 4. An additional dog 10, somewhat larger than the other dogs, but, like the latter, connected with the said connecting-bar, is associated with the restoring-key E. The pin 11 of this restoring-key never acts as a catch-pin, but merely as a cam member for engaging the beveled surface of the dog 10, so as to simultaneously shift all of the dogs, and thereby release any catch-pin which may have been caught and held by the hook-shaped portion of a dog.

It will be readily understood that the various switch-springs can be included in the

electric circuits in any suitable manner and that, if desired, they can be included in the various circuits of a party-line telephone system, or that they can be included in circuits in any electrical signaling system. When thus connected, a depression of any circuit-key will close a circuit, the catch-pin 2 of the key being caught and held by the adjacent dog. Now should another key be depressed it will be seen that the previously-depressed key will be instantly released, inasmuch as no key can be depressed so as to close the circuit without causing all the dogs to swing back out of the path of the catch-pins. In this way it is impossible to close one circuit and then instantly close another circuit without opening the first-closed circuit. When it is desired to open a circuit and restore a circuit-key to its normal position, it is only necessary to press the restoring-key E, so as to cause all of the dogs to shift and release any circuit-key which may have been depressed. It will be seen that when released by its allotted dog each circuit-key is forced to its normal position by the pressure of its allotted switch-spring on its tapered lower end. The restoring-key can never be caught and held in a depressed position, inasmuch as the dog 10 is too large to admit of its ever hooking over and catching the pin 11.

The device thus constructed is simple and self-contained in character, offers opportunity for conveniently controlling a number of electrical circuits, and not only, as stated, insures against the accidental closing of more than one circuit at a time, but also enables the operator to efficiently and with certainty employ a single key for restoring all of the circuit-keys.

What I claim as my invention is—

1. An electrical switching device, comprising a plurality of circuit-closing keys, a single restoring-key, said keys all being mounted for vertical reciprocation and arranged in a row, and a plurality of dogs operated by the restoring-key and adapted to engage the circuit-closing keys, said dogs being all arranged to swing in the same vertical plane and having horizontal parallel axes extending at right angles to said plane, together with a side wall to which the dogs are pivoted, substantially as described.

2. In a switching device, the combination of a plurality of circuit-closing keys, a restoring-key, switch-springs arranged to hold the circuit-closing keys in their normal positions, and a plurality of dogs operated by the restoring-key and adapted to engage the circuit-closing keys, said dogs being all arranged to swing in the same vertical plane and having horizontal parallel axes extending at right angles to said plane, together with a side wall to which the dogs are pivoted, substantially as described.

3. A switching device comprising a plurality of circuit-closing keys, said keys having tapered lower ends, switch-springs engaging said tapered lower ends, said springs being thereby operative to hold the keys in their normal positions, a restoring-key, and a plurality of dogs operated by the restoring-key and adapted to engage the circuit-closing keys, said dogs all being positively connected, whereby the movement of one dog necessitates the movement of all the dogs, in either direction.

4. In a switching device, the combination of a plurality of circuit-closing keys, a restoring-key, said keys all being mounted for vertical reciprocation and arranged in a row, and a plurality of dogs operated by the restoring-key and adapted to engage the circuit-closing keys, said dogs being positively connected, whereby the movement of one dog necessitates the movement of all the dogs, in either direction, said dogs being all arranged to swing in the same vertical plane and having horizontal parallel axes extending at right angles to said plane, together with a side wall to which said dogs are pivoted, substantially as described.

5. A switching device, comprising a plurality of circuit-closing keys, a single restoring-key, said keys all being mounted for reciprocation and arranged in a row, a plurality of dogs operated by the restoring-key and adapted to engage the circuit-closing keys, said dogs having parallel axes, and a bar connecting said dogs and extending at right angles to said axes together with a side wall to which the dogs are pivoted, substantially as described.

6. A switching device, comprising a plurality of circuit-closing keys, said keys having tapered lower ends, switch-springs engaging said tapered lower ends, said springs being thereby operative to hold the keys in their normal positions, a restoring-key, a plurality of dogs operated by the restoring-key and adapted to engage the circuit-closing keys, said dogs being all arranged to swing in the same vertical plane, the separate and parallel axes of the dogs being arranged in the same horizontal plane, and a bar connecting said dogs for simultaneous movement.

7. A switching device comprising a pair of side plates, a horizontal top plate, the side plates being provided with vertical slots and the top plate having a row of openings arranged opposite said slots, keys mounted for vertical reciprocation in said openings and provided with pins adapted to slide in said slots, switch-springs engaging the lower ends of said keys, dogs adapted to engage said pins, and a bar connecting said dogs.

8. A switching device, comprising a plurality of push-buttons whereof some are circuit-closing keys and one is a restoring-key, and a locking device adapted to hold any circuit-closing key in operative position, and adapted

to be shifted to unlocking position by any one of said push-buttons, together with a side wall with which said locking device has a plurality of pivotal connections, substantially as described.

9. A switching device, comprising a plurality of push-buttons whereof some are circuit-closing keys and one is a restoring-key, and a locking device adapted to hold any circuit-closing key in operative position, and adapted to be shifted to unlocking position by any one of said push-buttons, said locking device comprising a plurality of dogs suitably connected and allotted one to each of said push-buttons together with a side wall to which the dogs are pivoted, substantially as described.

10. A switching device, comprising a plurality of push-buttons whereof some are circuit-closing keys and one is a restoring-key, and a locking device adapted to hold any circuit-closing key in operative position, and adapted to be shifted to unlocking position by any one of said push-buttons, said locking device comprising a plurality of dogs suitably connected and allotted one to each of said push-buttons, each of said dogs being adapted to serve as a cam to shift all of the dogs when any key is depressed, but only the dogs allotted to the circuit-closing keys being capable of catching and holding the keys in depressed position together with a side wall to which the dogs are pivoted, substantially as described.

11. A switching device, comprising a plurality of circuit-closing keys, a push-button adapted to act as a restoring-key, and a locking device adapted to hold any circuit-closing key in operative position, and adapted to be shifted to unlocking position by said push-button or any key, together with a side wall with which said locking device has a plurality of pivotal connections, substantially as described.

12. A switching device comprising a plurality of push-buttons whereof some are circuit-closing keys and one is a restoring-key, and a locking device adapted to hold any circuit-closing key in operative position, and adapted to be shifted to unlocking position by any one of said push-buttons, the structure as a whole including switch-springs acting to hold said push-buttons in normal positions, together with a side wall with which said locking device has a plurality of pivotal connections, substantially as described.

13. A switching device, comprising a plurality of push-buttons whereof some are circuit-closing keys and one is a restoring-key, and a locking device adapted to hold any circuit-closing key in operative position, and adapted to be shifted to unlocking position by any one of said push-buttons, said locking device comprising a plurality of dogs suitably connected and allotted one to each of said push-buttons,

the structure as a whole including switch-springs acting to hold said push-buttons in normal positions together with a side wall to which the dogs are pivoted, substantially as described.

14. A switching device, comprising a plurality of push-buttons whereof some are circuit-closing keys and one is a restoring-key, and a locking device adapted to hold any circuit-closing key in operative position, and adapted to be shifted to unlocking position by any one of said push-buttons, said locking device comprising a plurality of dogs suitably connected and allotted one to each of said push-buttons, each of said dogs being adapted to serve as a cam to shift all of the dogs when any key is depressed, but only the dogs allotted to the circuit-closing key being capable of catching and holding the keys in depressed position, the structure as a whole including switch-springs acting to hold said push-buttons in normal positions together with a side wall to which the dogs are pivoted, substantially as described.

15. A switching device, comprising a top plate and parallel side plates, a plurality of push-buttons mounted for vertical reciprocation in said top plate, each push-button having upper and lower and oppositely-projecting pins, said pins working in vertical slots in said side plates, one of said push-buttons being a restoring-key and the other push-buttons being circuit-closing keys, a locking device adapted to hold any one of said circuit-closing keys in a depressed position, but adapted to be shifted to unlocking position by any one of said push-buttons, and switch-springs adapted to be operated by said circuit-closing keys and to maintain all of said push-buttons in normal positions.

16. A switching device, comprising a top plate and side plates, a row of push-buttons mounted to work in openings in said top plate, one of said push-buttons being a restoring-key and the other push-buttons being circuit-closing keys, a row of connected dogs each adapted to act as a cam whereby the depression of any push-button will serve to shift all of the dogs, but only the dogs allotted to the circuit-closing keys being adapted to catch and hold the keys in depressed positions, spring means holding the dogs normally in engagement with the push-buttons, and circuit-closing springs adapted to be operated by said circuit-closing keys together with a side wall to which the dogs are pivoted, substantially as described.

17. A switching device, comprising a plurality of circuit-closing keys, circuit-closing contacts adapted to be operated by said keys, locking means adapted to hold any circuit-closing key in operative position and adapted to be shifted to unlocking position by any

circuit-closing key, a push-button adapted to act as a restoring-key, and a dog connected with said locking means and adapted to be engaged by said push-button and act as a cam for shifting said locking means to unlocking position, whereby any circuit-closing key can be restored to normal position by pressing said push-button together with a side wall to

which the dogs are pivoted, substantially as described. 10

Signed by me at Chicago, Cook county, Illinois, this 4th day of September, 1902.

MICHAEL SETTER.

Witnesses:

ARTHUR F. DURAND,

HARRY P. BAUMGARTNER.