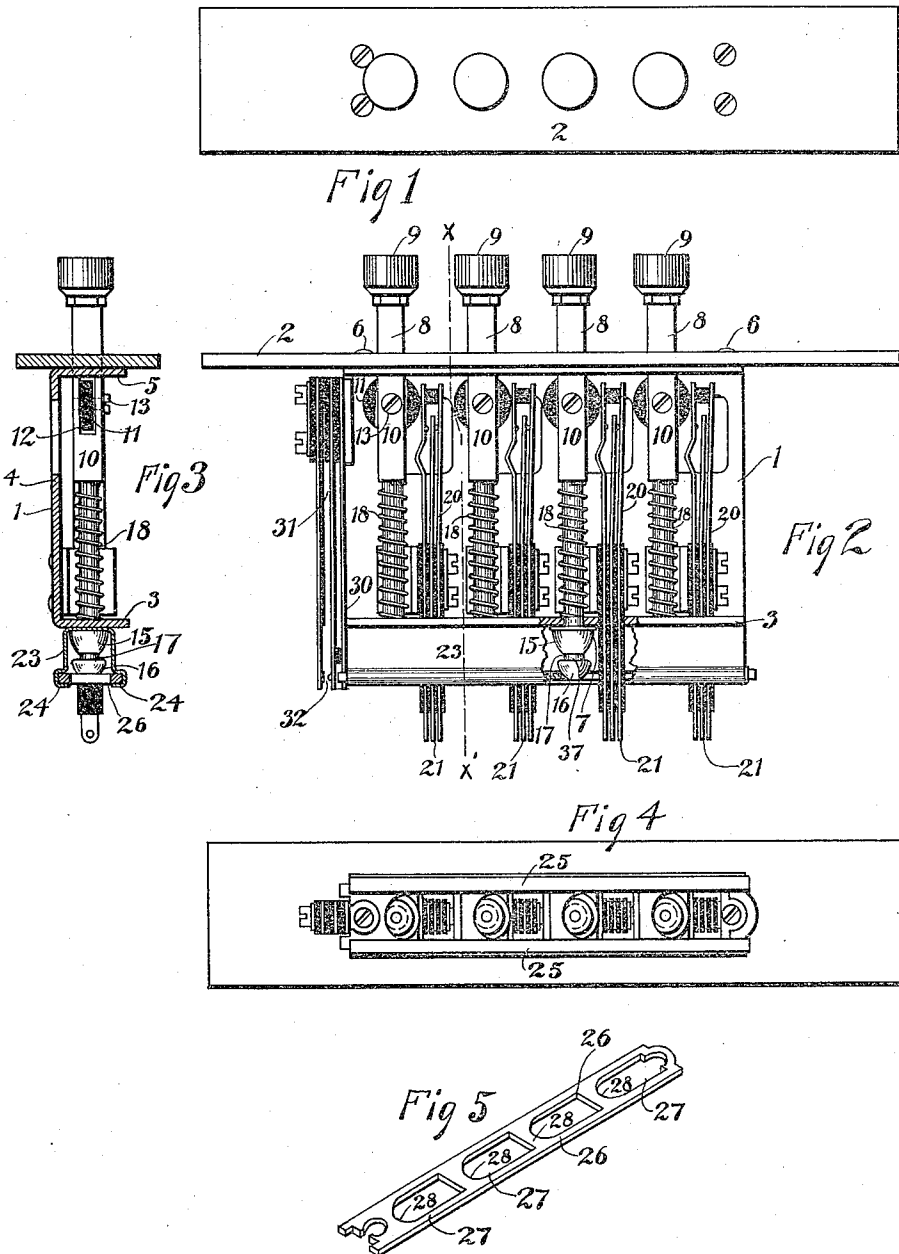


E. W. BRACKETT.
ELECTRICAL SWITCHING APPARATUS.
APPLICATION FILED APR. 3, 1912.

1,176,944.

Patented Mar. 28, 1916.



Witnesses
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UNITED STATES PATENT OFFICE.

ERNEST W. BRACKETT, OF ELYRIA, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE GARFORD MANUFACTURING COMPANY, OF ELYRIA, OHIO, A CORPORATION OF OHIO.

ELECTRICAL SWITCHING APPARATUS.

1,176,944.

Specification of Letters Patent.

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Application filed April 3, 1912. Serial No. 688,139.

To all whom it may concern:

Be it known that I, ERNEST W. BRACKETT, a citizen of the United States, residing at Elyria, in the county of Lorain and State of Ohio, have invented certain new and useful Improvements in Electrical Switching Apparatus; and I do hereby declare the following to be a full, clear, and exact description of my invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to electric switching devices, and more particularly to such as are used in telephone systems, the particular device illustrated being for use in what is known as four-party line selective telephone systems. In systems of this kind it is customary to employ a set of keys, each of which, when depressed, connects a particular character of current to the line and when released, is caught and retained in an intermediate indicating position to indicate to the operator the last subscriber called, should a recall be desired.

I aim to improve the character of electrical switching devices of the character to which my invention relates, making the parts more accessible and more convenient to manufacture and assemble. I also aim to simplify and cheapen the structure as well as to make it more certain in its operation, and thereby to prolong the effective life of the key.

Other objects of my invention and the invention itself will be best understood from the detailed description which is to follow.

Figure 1 is a top view of a structure illustrating my invention. Fig. 2 is a side elevation, partly cut away, of the structure illustrated in Fig. 1. Fig. 3 is a section through X—X' in Fig. 2. Fig. 4 is a bottom plan view. Fig. 5 is a detail.

Referring now to the drawings and to the embodiments of my invention illustrated therein, at 1 is shown a frame which preferably includes a top or escutcheon plate 2, a bottom plate 3 and a side plate 4, which connects the bottom and top plates. The side plate 4 may be folded over at the top as shown at 5 and connected by suitable fastening means 6 to the top plate. I prefer to make the top and side plates integral as illustrated. The top and bottom plates are perforated as shown at 7, in the bottom plate in Fig. 2. A plurality of plungers 8

are mounted in said perforations and adapted to reciprocate therein. The plungers illustrated have buttons 9 mounted on their upper ends and have their upper parts 10 square or rectangular in cross-section to prevent their rotating in the perforations. A switch operating device, such as a roller 11, is mounted in the plungers, preferably in a slot 12 and upon an axle 13, which may consist of an ordinary screw. Cam members 15 and 16 are mounted upon the lower ends of the plungers for a purpose to be described. The sides of the cam 16 are cut off as shown at 17 to form a catch. Coil springs 18 are wound around said plungers and positioned between the bottom plate and the bottom of the parts 10, these springs being adapted to return the plungers to normal position when they are released. A plurality of sets of contact carrying members 20, which may be, as shown, leaf springs carrying the contacts of an electric switch, are mounted in the frame adjacent the plungers, and with their terminal ends 21 at the bottom of the frame. By arranging the terminal ends at the bottom of the frame, I make them accessible to the electrician who connects them with the lead conductors. These terminal ends are also easily inspected when arranged in this position. A channel shaped member 23 is mounted in the bottom of the frame, and guiding ways 24 are formed therein. These ways may be formed by folding over the edges 25 of the channel member or plate. A removable catch member, such as a sliding plate 26, is located in the channel member and slidable within the guiding ways. This plate is perforated as shown at 27 and has catches 28 at the edges of the perforations. When one of the plungers is depressed, this plate will be moved to slide in the guiding ways, and will be returned when released by the spring 30, sliding in behind the catch 17 upon the plunger, and retaining the plunger in depressed position. At 31 I show another set of contact members, preferably contact springs, carrying the contacts of an electric switch 32, which may be a master switch, adapted to be operated by the movable member 26. These springs are mounted with their contact ends at the bottom of the frame, so as to make the contacts accessible.

The objects of my invention and the ap- 110

paratus illustrated in the drawings will probably be better understood from the description of the operation which is as follows: When one of the plungers is depressed, the member 26 will be moved to the left in Fig. 2 by the cam 16, and will drop into the slot 37 behind the cam. None of the switches will be operated during this movement, and should this be the end of the depressing movement of the plunger, the only effect will be to catch the plunger and hold it in this position. Should, however, the plunger be depressed further, the corresponding switch 20 will be operated by the member 11 and the catch plate 26 will be moved by the cam 15 to operate the switch 32. When released, the plunger will return to its intermediate position, in which the catch plate 26 is in the slot 37 and the plunger is caught and held in its half way-down position. Should now a second plunger be depressed, the first plunger will be released when the plate 26 is moved by the second plunger. If any or all plungers are left in intermediate position, the depression of any, either from normal or intermediate position, will release all plungers in intermediate position, whereupon they will be restored to normal. This is effected by the cam 16 when the plunger is depressed from normal and by the cam 15 when depressed from intermediate position.

It will be seen, that I place the parts of the device which most frequently require inspection at the bottom of the frame, so that they are accessible to inspectors and repairmen. This will be better appreciated when it is understood that these switching devices are ordinarily mounted upon a hinged key shelf in a parallel relation to each other, so that when the shelf is turned up upon its hinges the bottoms of the key frames are exposed to the inspector or repairman. He can thus inspect the catch member, easily remove it and supply another, should the plate be worn out. This is accomplished by removing the member 23 which is fastened by some suitable means, such as screws, to the plate 3. The terminal ends of the sets of springs 21 are exposed, so that the leads can be readily soldered thereto, or detached therefrom. The contacts of the set of springs 31 are easily reached by the repairmen when positioned as illustrated in the drawing.

It will also be obvious to those skilled in the art that numerous and extensive departures from the form and details of the apparatus here shown may be made without departing from the spirit of this invention, the same being herein shown solely for the purpose of clearly illustrating one specific embodiment thereof.

I claim:

1. In an electrical switching apparatus,

the combination with a frame including a top plate having a plurality of perforations therein, a bottom plate having a plurality of perforations therein, a side plate connecting said top and bottom plates, a channel plate attached to the bottom of said bottom plate and having guiding ways formed therein, contact springs mounted on said side plate, a plurality of plungers mounted in the perforations in said top and bottom plates and adapted to operate said springs, a sliding catch plate in said guiding ways adapted to catch the ends of said plungers when depressed and retain said plungers in depressed position, and master contact springs having their contact carrying ends adjacent to said sliding plate, and adapted to cause the operation thereof when a plunger is depressed.

2. In an electrical switching apparatus, the combination with a frame, a channel plate attached to the bottom of said frame and having guiding ways formed therein, contact springs mounted in said frame, a plurality of plungers mounted in said frame and adapted when depressed to operate said contact springs, a sliding catch plate mounted in said guiding ways, adapted to catch the ends of said plungers when they are depressed and to retain them in depressed position, and master contact springs controlled by said sliding plate.

3. In an electrical switching apparatus, the combination with a frame, a channel shaped member attached to the bottom of said frame and having guiding ways formed therein, contact carrying members mounted in said frame, a plunger mounted to reciprocate in said frame, adapted to operate said members when depressed, and a sliding catch plate adapted to slide in said guiding ways and to catch the end of said plunger when depressed and retain it in depressed position.

4. In an electrical switching apparatus, the combination with a frame, a channel shaped member mounted on the bottom of said frame and having guiding ways formed therein, contact members carrying the contacts of an electric switch mounted in said frame, a plunger in said frame adapted when depressed to operate said switch and a catch member adapted to move in said guiding ways for catching said plunger and retaining it in depressed position.

5. In an electrical switching apparatus, the combination with a frame, a channel shaped member mounted thereon, guiding ways in said member, a plurality of contact springs carrying the contacts of an electric switch mounted in said frame, a reciprocating member adapted to operate said switch when depressed, and means movable in said guiding ways for catching said plunger and retaining it in depressed position.

6. In an electrical switching apparatus,

the combination with a frame, a member on the bottom of said frame having its edges folded over to form guiding ways, contact members in said frame carrying the contacts of an electric switch, a plunger in said frame adapted when depressed to operate said switch and means movable in said guiding ways for retaining said plunger in depressed position.

7. In an electrical switching apparatus, the combination with a frame, contact springs carrying the contacts of an electric switch mounted in said frame, a plunger in said frame for operating said switch, a channel shaped member upon the bottom of said frame having its edges folded over to form guiding ways and a sliding catch plate slidable in said guiding ways for retaining said plunger in depressed position.

8. In an electrical switching apparatus, the combination with a frame, contact springs carrying the contacts of an electric switch in said frame, a plunger in said frame for operating said switch, a channel shaped member on the bottom of said frame having its edges folded over to form guiding ways, a catch plate slidable in said guiding ways for catching and retaining said plunger in depressed position, and a second set of contact springs carrying the contacts of another electric switch adapted to be operated by said sliding plate when said plunger is depressed.

9. In an electrical switching device, the combination with a frame, a plurality of sets of contact springs, mounted in said frame and each carrying the contacts of an electric switch, a plunger for each switch

adapted when depressed to operate its corresponding switch, a member on the bottom of said frame having its edges folded over to form guiding ways, a catch plate slidable in said guiding ways adapted to catch and retain a depressed plunger and another set of contact springs carrying the contacts of another electric switch adapted to be operated by said plate when a plunger is depressed.

10. In an electrical switching apparatus, the combination with a frame, a plurality of sets of contact members, each set carrying the contacts of an electric switch, a plunger for each of said sets adapted when depressed to operate the corresponding electric switch, a channel shaped member having guiding ways formed therein mounted upon the bottom of said frame, a plate slidable in said guiding ways adapted to catch and retain a depressed plunger and another set of contact springs adapted to be operated by said sliding plate when a plunger is depressed.

11. In an electrical switching device, the combination with a frame, a set of contact springs forming an electric switch, a plunger for operating said switch, a channel plate on the bottom of said frame, means movable in said channel plate for catching and retaining said plunger in depressed position, and means for releasing said plunger.

In testimony whereof I affix my signature in the presence of two witnesses.

E. W. BRACKETT.

Witnesses:

A. D. T. LIBBY,
C. W. LIBBY.