A. H. WEISS.

KEY SWITCH.

APPLICATION FILED MAR. 23, 1905.

1,005,910. Patented Oct. 17, 1911.

Fig. 1

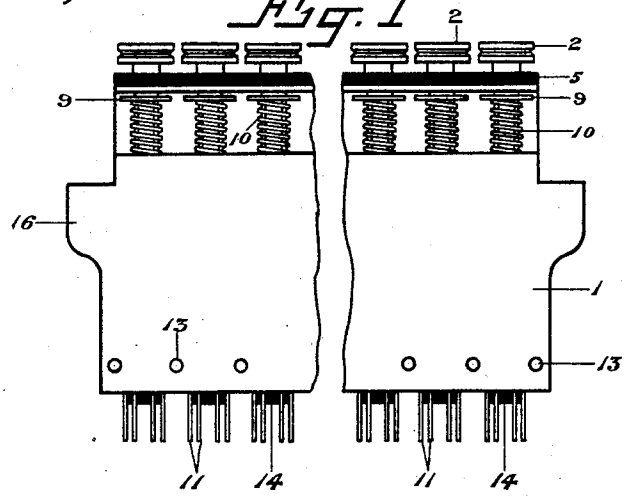


Fig. 3

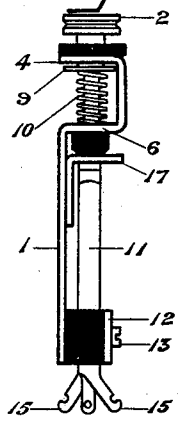


Fig. 2

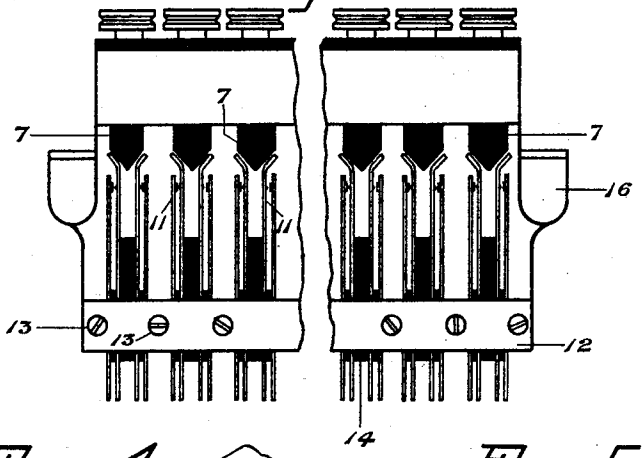


Fig. 5

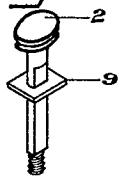


Fig. 4

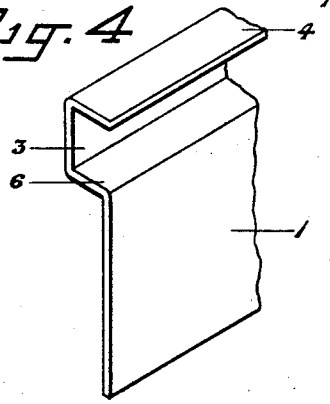
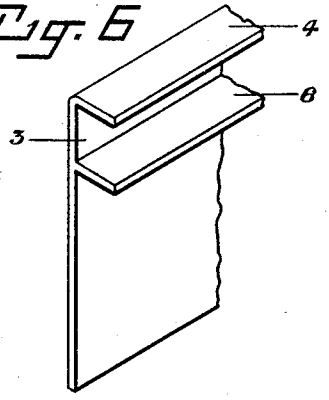


Fig. 6



Witnesses
A. Dahl
Edith F. Grier.

Inventor
Alfred H. Weiss
by Curtis B. Gamp
Attorney

UNITED STATES PATENT OFFICE.

ALFRED H. WEISS, OF CHICAGO, ILLINOIS, ASSIGNOR TO KELLOGG SWITCHBOARD & SUPPLY COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

KEY-SWITCH.

1,005,910. Specification of Letters Patent. **Patented Oct. 17, 1911.**

Application filed March 23, 1905. Serial No. 251,612.

To all whom it may concern:

Be it known that I, ALFRED H. WEISS, a citizen of the United States, residing in Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Key-Switches, of which the following is a specification.

My invention relates to operators' key switches of the type wherein a plurality of keys are mounted in a unitary structure and adapted to make and break the circuit through a plurality of sets of contact springs.

The key switch embodying my invention may be used for talking between different sections of the switchboard, between any section of the switchboard and the chief operator, and as an order wire key, or in any place where it is desired to temporarily connect and control a plurality of circuits.

In key switches of the general type above described it has been customary heretofore to use the contact springs for restoring the keys to normal position after pressure has been removed therefrom. This method of restoring the keys and permitting the circuit to be opened through the springs has been found objectionable, and my invention has for one of its objects the provision of improved means for restoring the individual keys to normal position.

Another object of my invention is the assembling of the contact springs on the frame of the switch in such a manner as to leave said springs and their contact points exposed and readily accessible for the purpose of inspection and repair.

A further object of my invention is to assemble the springs and keys in a manner that is simple and economical of manufacture and durable and highly efficient in use.

The other novel features of my invention will more fully appear from the following description of the accompanying drawing, in which I have illustrated one method of embodying the principles of my invention in a practical device, and in which like reference numerals are used in the several figures to indicate like parts.

Referring to the drawings—Figure 1 is a side elevation of my improved key switch showing the means for restoring the keys to their normal position; Fig. 2 is an elevation of the reverse side of my key switch showing the contact springs and their respective contact points exposed to view; Fig. 3 is an end view of the switch; Fig. 4 is a perspective view of one method of forming the frame upon which the parts of the switch are mounted; Fig. 5 is a perspective view of one of the keys removed from the frame; Fig. 6 is a perspective view of another form of the supporting plate.

Referring to the different figures by reference numerals, a plate 1 of any suitable length is adapted to accommodate any desired number of keys or buttons 2, 2. Said plate is preferably made of sheet metal and may be stamped or drawn into suitable shape for conveniently supporting the contact springs 11 and the coöperating keys 2. I prefer to use a plate formed as shown in Fig. 4, said plate having a depression or longitudinal groove 3 in the upper edge thereof, within which the individual buttons or keys 2 are adapted to be disposed, said keys extending above the upper edge 4 of said plate, said edge preferably carrying a strip of insulating material 5 and being adapted to limit the downward movement of the keys. The shanks of the keys 2 extend transversely through the longitudinal depression 3 and through the parallel walls 4 and 6 thereof, said keys carrying on their lower extremities the insulating tips 7, adapted to engage the contact springs 11 for controlling the circuit therethrough. The plate 1 may have the groove 3 formed therein in any suitable manner and I do not wish to limit my invention to the specific form of plate above described as any method of forming the support for the keys 2, 2, therein may be adopted.

In Fig. 6 I have shown a modification of the supporting plate 1 in which the top surface 4 is formed by turning the upper edge of the plate forward and the bottom support 6 for the keys is formed by drawing a portion of the metal plate parallel therewith.

Coiled springs 10 are preferably disposed upon the shanks of the keys 2, 2, and lugs or plate 9 carried by the keys, are adapted to compress said springs when the keys are operated to make a connection. The springs 10, 10 are adapted to return the keys to normal position after a connection has been made and the pressure upon the keys released, said springs being preferably dis-

posed between the lugs 9 and the bottom plate 6 of the groove 3. The use of the springs 10 for returning the keys to normal position insures a positive return of the keys as soon as the pressure thereon is released, and entirely obviates the tendency of the keys to stick between the contact springs as is the case when the keys are adapted to be returned to normal position by the deflected ends of the contact springs acting against the beveled or conical end of the insulating tip carried by the shanks of the keys, and also permits a lighter and more inexpensive switch spring to be used. Other auxiliary means and other forms of auxiliary springs 10 may be used in lieu of the coiled springs shown and other methods of mounting the auxiliary springs for returning the keys to normal position may be adopted without departing from the spirit of my invention.

The contact springs 11 may be of any desired type, adapted to coöperate with the individual keys, said springs preferably being transversely disposed upon the plate 1, and secured thereon at the lower edge of said plate in any suitable manner, as by the metal strip 12 secured to the plate in the present instance by screws 13, 13, insulating material 14 being disposed between the contact springs 11, the plate 1 and retaining strip 12, and being adapted to insulate the contact springs from each other and from the supporting plates 1 and 12. Any desirable arrangement of contact springs may be used and I have illustrated for the purpose of revealing my invention to others a plurality of sets of superimposed springs, each set comprising a pair of outside springs having contact points and adapted to be connected with the line, and a pair of inside springs carrying coöperating contact points and adapted to form a connection with the line when the individual keys 2, 2, are depressed. The terminals of the contact springs may be staggered as shown in Fig. 3, for convenience in connecting the wires therewith, the outer springs 15, 15 being preferably set to one side, but this is not essential.

It will be noted that the contact springs 11, 11, and their coöperating contact points are exposed and open to inspection and said contacts may be readily repaired without the necessity of disassembling or removing any part of the unitary structure comprising my improved key switch. It will also be noted that the groove or housing 3 for the auxiliary springs 10 adapted to return the individual keys to normal position, is also open on one side and the parts contained therein exposed and accessible for the purpose of inspection and repair.

The body of the switch consists of a single stamping of sheet metal suitably formed for mounting the operative portions of the keys and springs thereon, thus producing an extremely simple, compact and inexpensive device in which the number of parts are reduced to a minimum, the auxiliary springs 10 obviating any tendency of the individual keys to stick in their depressed position, due to a wearing or flattening of the conical or beveled ends of the insulating tips of said keys.

My improved key switch may be secured to the switchboard in any suitable manner as by ears or lugs 16, preferably formed integral with the plate 1 and having secured thereto in any suitable manner a bracket 17 for securing the key switch in position.

I claim:

1. A key switch comprising a supporting plate having a longitudinal groove formed therein, a plurality of individual keys crossing said groove transversely in an exposed position, the lower ends of said keys coöperating with a plurality of sets of contact springs to control the circuit therethrough, said contact springs being disposed upon the side of said plate with their contacts in an exposed position, substantially as described.

2. A key switch comprising a supporting plate having a longitudinal groove formed therein, a plurality of individual keys crossing said groove in an exposed position, the lower ends of said keys coöperating with a plurality of sets of contact springs to control the circuit therethrough, said contact springs being disposed upon the side of said plate opposite from that containing said groove with their contacts in an exposed position, and means independent of said springs associated with each of said keys for returning said keys to normal position, substantially as described.

3. A key switch comprising a supporting plate, a plurality of superposed springs carried by said plate and insulated therefrom and from each other, individual keys having insulating tips for actuating said springs, contact points for said springs mounted thereon in an exposed position, and coiled springs disposed upon the shanks of each of said keys for restoring said keys to normal position, substantially as described.

4. A key switch comprising a mounting plate formed of a main vertical portion, a horizontal portion attached at one edge to said vertical portion, a second vertical portion attached to the other edge of said horizontal portion, and a second horizontal portion attached to the upper edge of the second vertical portion, a plurality of reciprocating plungers passing through alined holes in said horizontal portions, and a plurality of switch springs carried upon the first vertical portion and adapted to be actuated by the reciprocation of said plungers, substantially as described.

5. A key switch comprising a sheet metal

mounting plate, said plate having a plurality of holes therein, plungers adapted to reciprocate in said holes, each plunger passing through two holes in the plate, a plurality of sets of switch springs carried by the plate, each set being adapted to be actuated by the movement of one of said plungers, and a coil spring about said plunger between the points where said plunger passes through the plate, substantially as described.

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

ALFRED H. WEISS.

Witnesses:
EDITH F. GRIER,
C. B. CAMP.