A. F. F. GILSON.

SWITCH KEY.

APPLICATION FILED FEB. 10, 1914.

1,109,919.

Patented Sept. 8, 1914.

Fig. 1.

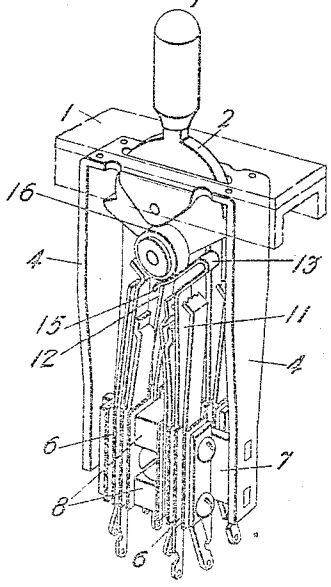


Fig. 2.

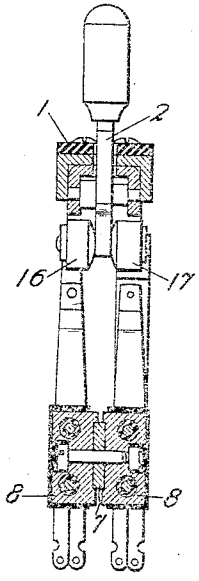


Fig. 3.

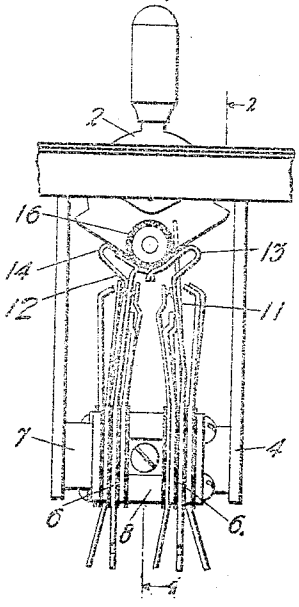


Fig. 4.

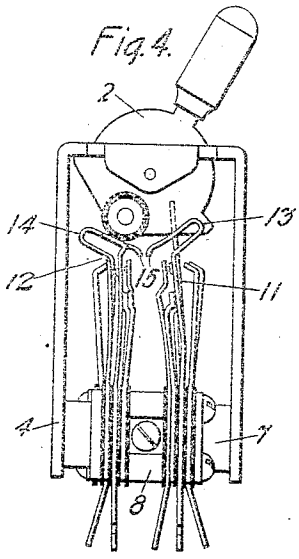
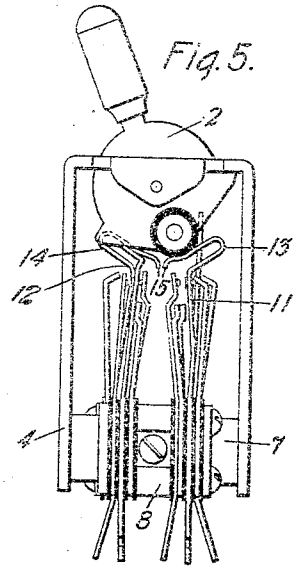


Fig. 5.



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UNITED STATES PATENT OFFICE.

ALBERT F. F. GILSON, OF CLOSTER, NEW JERSEY, ASSIGNOR TO WESTERN ELECTRIC COMPANY, OF NEW YORK, N. Y., A CORPORATION OF ILLINOIS.

SWITCH-KEY.

1,109,919. Specification of Letters Patent. Patented Sept. 8, 1914.

Application filed February 10, 1914. Serial No. 817,832.

To all whom it may concern:

Be it known that I, ALBERT F. F. GILSON, a citizen of the United States, residing at Closter, in the county of Bergen and State of New Jersey, have invented a certain new and useful Improvement in Switch-Keys, of which the following is a full, clear, concise, and exact description.

This invention relates to telephone keys, and more particularly to what are known as listening and ringing keys.

The object of the invention is to provide a cushioning means to prevent the rebound or blow of the key lever when restored to normal position from opening the normally closed contacts of the key.

In accordance with the invention, one or more of the master switch springs, that is, those engaged by the operating means, are provided with a yielding portion which is engaged by the operating roller to prevent the bodily movement of said springs out of contact with their engaging contacts until said lever has been moved a considerable distance out of normal. This resilient means may comprise a loop formed of the ends of the master contact springs, and so shaped that the loop itself is distorted out of normal position when engaged by the actuating roller before the bodily movement of the said master springs begins.

In the accompanying drawings—Figure 1 is a perspective view showing a switch key embodying this invention; Fig. 2 is a vertical section taken on line 2—2 of Fig. 3; Figs. 3, 4 and 5 are side elevations, showing the key in a normal, listening and ringing position, respectively.

Like parts are designated by similar reference characters throughout the several views.

The structure shown comprises a top plate 1, supporting a switch actuating rocking lever 2. Associated with the key is a supporting frame of inverted U-shape, having downwardly extending arms 4, 4, which are united by a bridging member or rib 7, upon either side whereof spring pile-up units 6, 6, are mounted by means of blocks 8, 8. Said units are positioned so as to hold the contact springs in operative relation with the actuating rollers.

The means provided for cushioning the operating lever consists of master spring members 11, 12, formed at the top into flexible loops 13, 14, and so positioned with respect to the operating lever 2 that the knees of said loops 13, 14 extend away from the operating lever 2. The spring ends 15 projecting from the loops bear against the plunger rollers 16, 17, unless the key lever 2 is in an operated position, in which case one or the other of said projecting ends will be disengaged. Upon the actuation of the lever 2 from the normal position, the roller carried thereby engages the projecting end 15 of either of the loops 13 or 14, depending upon the direction said lever is operated, and moves toward the knee of the engaged loop, with the result that the resiliency of said loop is absorbed before the body movement of the spring takes place. Fig. 3 shows the master spring members 11, 12 with the key plunger in a normal position. When the key is in this position, there is a slight pressure exerted against the plunger rollers 16, 17 by the loop shaped ends 13, 14 of said master spring member, which tend to rotate the actuating member 2 about its pivotal point, unless said member has been moved to its extreme position. If the actuating member is moved to its extreme position, it is locked in that position by the pressure of one of the loop shaped ends against the roller. Figs. 4 and 5 show the key in an operated position, whereby one or the other of the master spring members is disengaged.

When the lever 2 is operated it may be moved a considerable distance before contacts that are normally closed are interrupted, and contacts that are normally open become closed. Upon the actuation of the lever, one of the plunger rollers engages the extension of one of the loop shaped top portions, causing said loop shaped portion in contact with the roller to change its angular position in regard to the lever roller until a position is reached where no further change takes place, which in a locking key is a short distance from the end of the stroke. During the time that the lever is returning when released, this same movement is again gone through, except that, of course, it is reversed. The combined action of the spring and roll prevents the lever from quickly releasing until it has been manually moved nearly to its normal position. It is thus possible to obtain a relatively slow release for a major part of

the stroke, and a quick release for the last part, as a result of which the blow of the plunger striking the opposite set of springs is considerably lessened. By the means provided in the invention, whenever the lever 2 is returned from an operated to normal position, a cushioning effect just before the end of the stroke is obtained when the plunger strikes the opposite or unoperated master spring member, and by effecting a slight compression in it. This cushioning effect absorbs the shock of the plunger, thereby preventing the opening of contact springs normally closed, thus eliminating any disagreeable disturbance in the line connection.

What is claimed is:

1. In a key switch, the combination with an operating device, of a pair of normally closed switch springs controlled thereby, one of said springs carrying a resilient portion to be engaged by said operating device, all of the resilience of said portion being taken up after the engagement of said operating device and before the separation of said contacts occurs.

2. In a key switch, the combination with an operating lever, of an insulated spring-actuating member carried thereon, a spring engaged by said member having two resilient portions, one of said resilient portions being flexed upon the first engagement of said insulated actuating member with said spring to absorb the inertia of said operating lever, and the other of said resilient portions being flexed by the manual movement of said operating lever, and circuit controlling contacts actuated by the flexure of the last named resilient portion.

3. In a key switch, the combination with a movable operating device, of a switch spring adapted to be engaged by said device, means for throwing said device into engagement with said switch spring when the device has been manually released, and a resilient member carried on said switch spring to absorb the inertia of said operating member when the latter is thrown into engagement with said switch spring so that the contact portion of said switch spring will not be unduly moved out of its normal position by the inertia of said actuating member in its engagement with said switch spring.

4. In a key switch, a group of contact springs embracing a master contact member, an operating lever, a resilient loop shaped portion on said master contact member having its free end normally engaged by said operating lever and so positioned that said operating lever moves toward the knee of said loop-shaped portion upon being actuated from normal position.

5. In a key switch, a group of contact springs embracing a master contact member, an operating lever, and a compressible loop shaped portion on said master contact member having its free end normally engaged by said operating lever and so positioned that said operating lever moves toward the knee of said loop-shaped portion upon being actuated from normal position.

6. In a key switch, a group of contact springs embracing a master contact member, an operating lever, and a loop shaped portion on said master contact member, said loop having an extending end adapted to be engaged by and extending toward said operating lever.

7. In a key switch, an operating lever, a switch spring having one end secured to the switch frame and having its free end formed into a resilient loop, and so positioned with respect to said operating lever that the knee of said loop extends away from said lever when the latter is in normal position.

In witness whereof, I hereunto subscribe my name this 6th day of February A. D., 1914.

ALBERT F. F. GILSON.

Witnesses:

J. F. EBERT,

NANON E. TUTHILL.