June 24, 1941. H. K. KRANTZ 2,246,919

LATCHING DEVICE

Filed July 11, 1940

FIG. 1

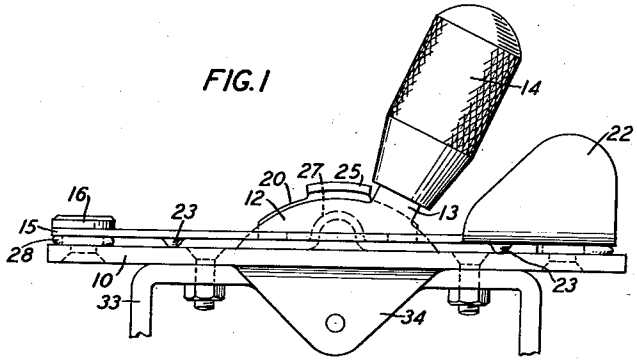


FIG. 2

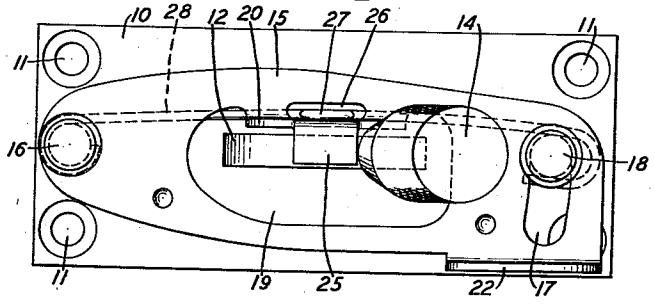


FIG. 4

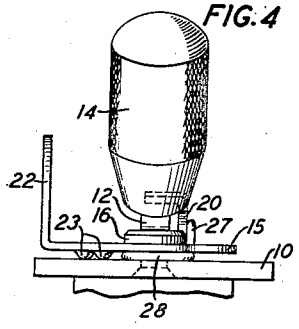


FIG. 3

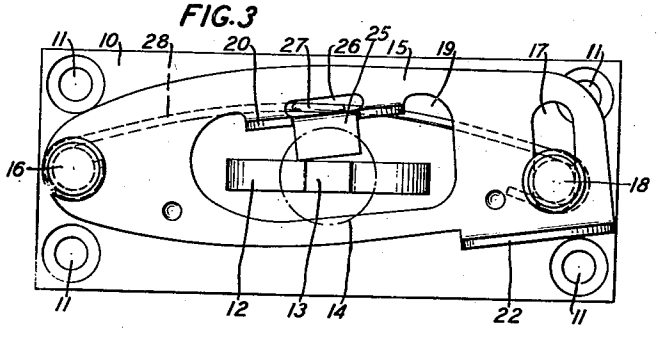
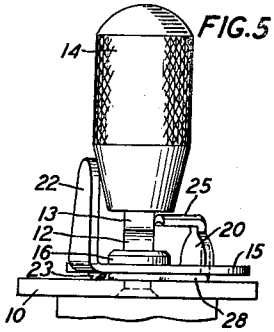


FIG. 5



INVENTOR
H.K. KRANTZ
BY H.O. Krantz
ATTORNEY

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UNITED STATES PATENT OFFICE

2,246,919

LATCHING DEVICE

Hubert K. Krantz, Rockville Centre, N. Y., assignor to Bell Telephone Laboratories, Incorporated, New York, N. Y., a corporation of New York

Application July 11, 1940, Serial No. 344,891

9 Claims. (Cl. 74—532)

This invention relates to latching devices and particularly to latching devices for multiposition switching keys.

The object of the invention is to provide an improved latching device, or guard, for switching keys, particularly for keys of the lever type, which is simple in design, inexpensive to manufacture, which functions to prevent unintended or accidental movements of the key lever from its switching positions, and which can be quickly and conveniently moved from its latching position to permit the lever to be moved from one switching position to another.

This object is attained, in accordance with a feature of the invention, by pivotally mounting a centrally apertured guard member on the face-plate of the switching key and providing thereon an integral bolt or latch which, when the key lever is moved to any of its switching positions, is automatically moved in behind the lever shank to lock the lever in its operated position.

Another feature of the invention resides in a novel type of spring biasing arrangement for maintaining the guard in its latching position.

A further feature of the invention is embodied in a finger-grip, formed integrally with the guard, which facilitates the movement of the guard from its latching position.

These and other features of the invention will be readily understood from the following detailed description made with reference to the accompanying drawing, in which:

Fig. 1 is a side elevation of the key-guard of this invention associated with a three-position lever type key, and shows the guard in its latching position;

Fig. 2 is a top view of the structure disclosed in Fig. 1;

Fig. 3 is a top view, corresponding to Fig. 2, and illustrates the guard in its unlatching position;

Fig. 4 is an end view of the structure shown in Figs. 1 and 2; and

Fig. 5 is an end view of the structure shown in Fig. 3.

In the drawing, the key-guard 15 is shown mounted on the key face-plate 10 by means of the shoulder pins 16 and 18. The shank of shoulder pin 16 passes through a circular hole at one end of the guard and is screwed into, or otherwise permanently associated with the face-plate. The guard is capable of pivotal movement about the pin 16. At its other end, the guard is provided with a slot 17, which is slightly arcuate. The shank of shoulder pin 18 passes through this slot and is fixedly associated with the face-plate 10. The extent to which the guard may be pivotally moved about the pin 16 is limited by the length of slot 17. To permit the movement of the guard by hand, a finger-piece 22 is integrally formed on the guard and located near the slotted end thereof. The bosses 23, formed integrally with, and located on the underside of the guard, provide bearing surfaces for the guard in its movement over the face-plate.

The guard 15 may be stamped or otherwise formed of sheet metal. A substantial portion of the metal is removed from the center of the guard to furnish an aperture 19 through which a portion of the lever 12 and its handle supporting shank 13 protrude when the guard is in position on the key structure. At the upper edge (viewing Figs. 1 and 2) of the aperture 19, the metal is turned up at right angles to form a substantially semi-elliptical integral projection 20, midway of whose curved edge there is formed an inwardly projecting bolt or latch 25. At the junction of the portion 20 and the main portion of the guard 15, a small aperture or slot 26 is provided, through which a humped portion 27 of spring 28 protrudes. The spring 28 is located between the face-plate 10 and the guard 15 and has one end partially encircling the shank of shoulder pin 16, while the other end is terminated in a hook which fits around the shank of shoulder pin 18 and is free to move longitudinally, relative to the pin 18.

In Figs. 1 and 2, the key lever has been actuated to one of its switching positions. Prior to such operation the key lever would occupy the normal position illustrated in Fig. 3. In this position, the front edge of latch 25 abuts the shank 13 of the lever, as clearly shown in Fig. 5, and the spring 28 is bowed due to the action of the back face of projection 20 on the spring hump 27 when the guard is caused to pivot about the pin 16. During this action on the spring 28, the hooked end thereof moves from the position illustrated in Fig. 2 to that shown in Fig. 3. Thus, when in the position shown in Fig. 3, the guard 15 is held, under the tension of spring 28, with the edge of latch 25 abutting the lever shank 13. When the lever is actuated to the right or left from its mid-position, the lever shank 13 rides off the latch 25 and, under the action of spring 28, the latch is snapped into position behind the lever shank to effectively lock the lever in its actuated position.

In the event that the key must be operated from either of its actuated positions to its other actuated position, or to its mid-position, the guard is pivotally moved about the pin 16, the operator or attendant pushing on the finger-grip 22 with one hand and grasping the knurled handle 14 of the key with the other hand and moving it to the new position. Pivotal movement of the guard removes the latch 25 from the operating path of the lever shank 13, thus permitting unimpeded movement of the lever. When the lever is moved to its new position, the guard is released so that, under the action of spring 28, the latch snaps into position behind the lever, if the lever is now in one of its actuated positions, or into engagement with the lever shank 13, should the lever have been moved to its mid-position.

The face-plate 10 is provided with a series of holes 11 through which screws or the like may be passed for engagement with the frame 33 which supports the key structure. It is to be understood that the particular structural details of the key may be of any well-known design. The key which applicant has elected to disclose is of the well-known lever type in which an inverted U-shaped mounting bracket or frame 33 is used, and between the legs of which the circuit controlling springs are mounted. The bridge of the U-shaped bracket 33 is secured to the face-plate 10 in any suitable manner and is provided with two oppositely disposed depending integral lugs 34 upon which the contact operating lever is pivotally mounted, the said lever carrying means for electrically bridging certain of the contact springs or for otherwise actuating the contact springs.

What is claimed is:

1. In combination, a switching key having an operating lever capable of occupying a mid-position and a plurality of alternate positions, a supporting member for said key, and a locking device comprising a guard pivotally supported on said supporting member and arranged to pivot about one end between two extreme positions, means carried by said guard and contacting said lever when said lever is in its mid-position whereby said guard is held in one of its extreme positions, and means effective when said lever is moved to an alternate position to cause said guard to automatically assume its other extreme position whereupon said first-mentioned means locks said lever in its alternate position.

2. In combination, a switching key having an operating lever capable of occupying a mid-position and a plurality of alternate positions, a supporting member for said key, and a locking device comprising a guard pivotally supported on said supporting member and arranged to pivot about one end between two extreme positions, a latch carried by said guard engaging said lever when said lever is in its mid-position whereby said guard is held in one of its extreme positions, and means effective when said lever is moved to an alternate position for causing said guard to automatically assume its other extreme position whereupon said latch engages said lever in its alternate position and locks it therein.

3. In combination, a switching key having an operating lever capable of occupying a mid-position and a plurality of alternate positions, a supporting member for said key, and a locking device comprising a guard supported on said supporting member and arranged to pivot about one end between two extreme positions, a latch carried by said guard engaging said lever when said lever is in its mid-position whereby said guard is held in one of its extreme positions, and a spring effective when said lever is moved to an alternate position for causing said guard to automatically assume its other extreme position whereupon said latch engages said lever in its alternate position and locks it therein.

4. In combination, a switching key having an operating lever capable of occupying a mid-position and a plurality of alternate positions, a supporting member for said key, and a locking device comprising a guard supported on said supporting member and arranged to pivot about one end between two extreme positions, a latch carried by said guard engaging said lever when said lever is in its mid-position whereby said guard is held in one of its extreme positions, a spring effective when said lever is moved to an alternate position for causing said guard to automatically assume its other extreme position whereupon said latch engages and locks said lever in its alternate position, and means for manually moving said guard so as to move said latch in disengaged relation from said lever.

5. In combination, a switching key having an operating lever capable of occupying a mid-position and a plurality of alternate positions, a supporting member for said key, and a locking device comprising a guard supported by said supporting member and arranged to pivot about one end between two extreme positions, a latch carried by said guard engaging said lever when said lever is in its mid-position whereby said guard is held in one of its extreme positions, a spring effective when said lever is moved to an alternate position for causing said guard to automatically assume its other extreme position whereupon said latch is positioned relative to said lever so as to lock said lever in its alternate position, means for manually moving said guard so as to move said latch clear of said lever, and means comprising a slot in said guard and a shoulder pin supported by said supporting member and operating in the slot for defining the two extreme positions of said guard.

6. In combination, a switching key having an operating lever capable of occupying a mid-position and a plurality of alternate positions, a supporting member for said key, a face-plate carried by said supporting member and having a centrally located aperture through which said operating lever protrudes, and a locking device comprising a guard pivotally supported at one end on said face-plate and having an aperture through which said lever protrudes, a latch integrally formed with said guard and extending inwardly from the center of one of the defining edges of the guard aperture and located in the line of travel of said lever when said lever is in an alternate position, means for limiting the pivotal movement of said guard comprising a shoulder pin carried on said face-plate and a slot in the guard in which the shoulder pin functions, an aperture in said guard in alignment with said latch, and means for maintaining said latch in the line of travel of said lever when said lever is in an alternate position, comprising a spring extending between the pivot support of said guard and said shoulder pin and having a portion thereof projecting through said last-mentioned guard aperture and contacting said guard at a point in alignment with said latch.

7. In combination, a multiposition switching

key, a supporting frame, an operating member for said key journaled in the supporting frame and adapted to occupy a normal mid-position and a plurality of alternate positions, and means for locking the operating member in any of its alternate positions comprising a pivotally mounted guard member having an aperture through which the operating member protrudes, a latch integrally formed with said guard and abutting said operating member when the latter is in its mid-position, and means effective when said operating member is moved to any of its alternate positions for causing said guard latch to be moved into a position behind the operating member to effectively lock the operating member in its alternate position.

8. In combination, a multiposition switching key, a supporting frame, an operating member for said key journaled in the supporting frame and adapted to occupy a normal mid-position and a plurality of alternate positions, and means for locking the operating member in any of its alternate positions comprising a guard having a centrally located aperture, means for pivotally supporting said guard at one end in a position such that the operating member protrudes though the aperture, means comprising a slot in one end of said guard and a cooperating pin which limits the extent of the pivotal movement of the guard about its pivot support, a latch carried by said guard and adapted to abut the operating member when the operating member is in its mid-position, and means comprising a spring carried by said pin and said pivot support and arranged to hold said latch and said operating member in abutting relation when the operating member is in its mid-position and to force said latch into a position corresponding to the mid-position of said operating member when said operating member is moved to an alternate position.

9. In combination, a multiposition switching key having an operating member, a mounting plate for said key, a face-plate secured to said mounting plate and having an aperture through which said operating member protrudes, and means for locking the operating member in an operated position, comprising a guard member mounted on and in superposed relation to said face-plate and having an aperture in substantial alignment with the face-plate aperture, a shoulder pin for pivotally supporting one end of said guard on said face-plate, a second shoulder pin cooperating with a slot in the other end of said guard in limiting the pivotal movement of said guard about its pivot support, a latch integrally formed with said guard and occupying a position in the line of travel of said operating member when said operating member is in an operated position, and means comprising a finger-grip integrally formed on said guard at the slotted end thereof for facilitating the manual movement of said guard and to remove the latch from the line of travel of said operating member, whereby said operating member may be moved to another operated position.

HUBERT K. KRANTZ.