

1

3,289,130

**TILTING SWITCH WHICH CAN BE LOCKED IN
A DEPRESSED STATE**

Derk Kleis, Emmasingel, Eindhoven, Netherlands, assignor to North American Philips Company, Inc., New York, N.Y., a corporation of Delaware

Filed Sept. 1, 1965, Ser. No. 484,303

Claims priority, application Netherlands, Sept. 1, 1964, 6410146

3 Claims. (Cl. 335-157)

The invention relates to a switch comprising a push-button, which can be locked in the depressed state and which co-operates with one or more switching contacts, whilst in the rest position the push-button resiliently engages stops in the housing of the switch.

Such switches are particularly suitable for use in a microphone for a dictation apparatus. It is then very important that the operation can be performed rapidly. It is furthermore necessary for the locking to be operable by a slight manipulation, so that the time required thereto is very short. A similar switch is known, in which the push-button can be locked by displacement. However, in practice it has been found that the time required is yet too long.

The invention is characterized in that the push-button is formed by a lever, depression on one end of the lever producing a tilting movement around the place of the stop at the other end and conversely, the switch being closed in both cases, the locking member being arranged at one of said ends of the lever between the ends of said lever and between the lever and the housing there being arranged a resilient member, whilst upon depression at the area of the end of the locking member the closed switch is locked.

The invention has for its object to obviate the aforesaid disadvantage.

With this switch according to the invention the switching contacts are closed when the push-button is depressed, whilst it is not essential to select the place of depressing. However, there is a place for depressing, where the switch is locked. In order to unlock the switch the push-button has to be depressed at the opposite place. The push-button then tilts about the resilient member or the springs arranged near the ends, said member causing the push-button to engage the stops again in the rest position.

One embodiment of the invention comprises a lug arranged at the area of the resilient member between the lever and the housing. It is particularly advantageous to arrange the lug on the bottom side of the push-button. If desired, the lug may be constructed in the form of a switching contact. The lug has the advantage that upon unlocking the push-button can tilt extremely smoothly.

In a further embodiment of the invention the push-button is provided at each end with switching contacts, which are connected in parallel.

In a further embodiment a helical spring is arranged at the area of each end of the lever between the lever and the housing.

A particularly elegant embodiment of the invention comprises a locking member formed by a magnetic holding member consisting of a preferably flat magnet, co-operating with an armature, the magnet being arranged on the housing of the switch and the armature on the

2

button or conversely. This provides the advantage that the depth of depression of the push-button can be very small, so that the switch can be operated even more rapidly.

The invention will be described more fully with reference to the drawing.

In the drawing:

FIG. 1 shows a switch according to the invention.

FIG. 2 shows a similar switch, in which part of the push-button is formed by a switching element and

FIG. 3 shows a switch according to the invention, comprising two press keys.

As is shown in FIG. 1 the housing 1 of a switch, which may form part of a microphone housing, is provided with upright rims 2 and 3, which operate as stops for the push-button 4. The push-button comprises an upper plate 5 and a bottom plate 6, the latter being located inside the housing of the switch. This part is provided with a lug 7, to which a helical spring 8 is secured, which is connected with a contact spring 9. With the switching contact 10 the latter forms the switching contacts. They are both rigidly connected with the housing 1 of the switch. The push-button 4 is provided at the bottom plate 6 at one end with a soft iron plate 11, serving as an armature and co-operating with a permanent magnetic block 12, which is rigidly secured to the housing 1 of the switch.

Whenever the upper plate 5 of the push button 4 is depressed, the switch contacts 9 and 10 are closed. If the force for depressing the button is applied on the left hand side, the elongated plate 6 of the lever 4 tilts about the stop 2, and as soon as this force is withdrawn the contacts reopen. The spring 8 connected to lug 7 forces the plate 6 upwardly until it comes into contact with the stops 2 and 3. When the force for depressing the button is applied on the right hand side, the button tilts about stop 3 and the armature 11 and magnet 12 engage to lock the button in this position. Therefore, when this force is released, the contacts 9, 10 remain closed and the button remains tilted. In order to unlock the button and open the contacts 9, 10, a force is applied on the left hand side of button 5 whereby the plate 6 tilts about the fulcrum provided lug 7 and spring 8 to separate the armature 11 and magnet 12. The spring 8 then returns the plate 6 to its rest position against stops 2 and 3 when this releasing force is withdrawn.

FIG. 2 shows a variant of the switch, in which the lug 7 is not rigidly secured to the helical spring 8. The latter forms part of the switching contact 10. The lug 7 is made of conductive material and is secured to the switching contact 9. The switch comprises furthermore two additional pressure springs 13 and 14, which hold the push-button in the rest position on the stops 2 and 3.

In the switch shown in FIG. 3 the push-button is not provided with a lug but with a cavity 15 on the bottom side, in which a helical spring 8 is operative, said spring being connected with the contact spring 9. The switching knob is different in construction. The upper part is replaced by two press keys 16 and 17, which project from the housing 1 of the switch.

What is claimed is:

1. A push button switch for a microphone comprising a microphone housing member having a cavity therein and at least one slot communicating with said cavity, a lever having a first portion projecting through said slot and a

3

second portion within said cavity, resilient means normally urging said second portion of said lever against the portions of said housing member defining said slot and located at the ends of said second portion of said lever, at least one switch contact means in said cavity, fulcrum means about which said lever tilts, said fulcrum means connecting said lever and said contact means for closing said contact means upon arbitrary tilting movement of said lever, and means coupled with one end of said lever for locking said lever in one of its tilted, contact closed positions, said lever in the other titled position thereof being freely movable between its tilted and non-tilted positions.

2. A push button switch according to claim 1 wherein said fulcrum means connecting said lever and said contact means comprises a lug integral with said resilient means connected with said switch contact means and engaging said lever at a point substantially equi-distant from each end of said second portion of said lever.

4

3. A push button switch according to claim 2 wherein said means for locking said lever in said one of its tilted positions comprises a permanent magnet and associated armature.

References Cited by the Examiner

UNITED STATES PATENTS

2,546,086	3/1951	Brockway	-----	200—159	X
2,587,399	2/1952	Smith	-----	200—159	
2,981,816	4/1961	Cozart	-----	200—159	
3,005,055	10/1961	Matke.			

OTHER REFERENCES

Hauseler et al.: German application No. 1,111,705, August 25, 1958.

BERNARD A. GILHEANY, *Primary Examiner.*

J. J. BAKER, *Assistant Examiner.*