Aug. 13, 1946. G. A. WÅHLSTRÖM 2,405,679

PUSH BUTTON SWITCH

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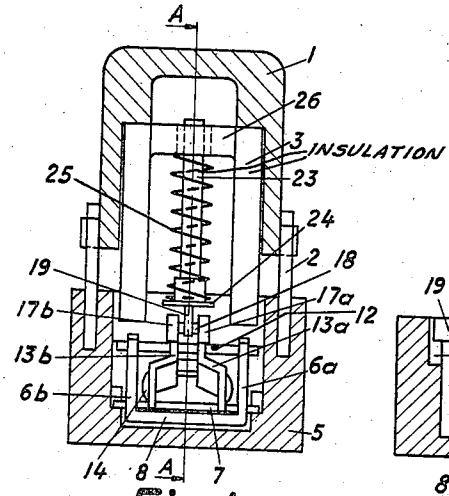


Fig. 1

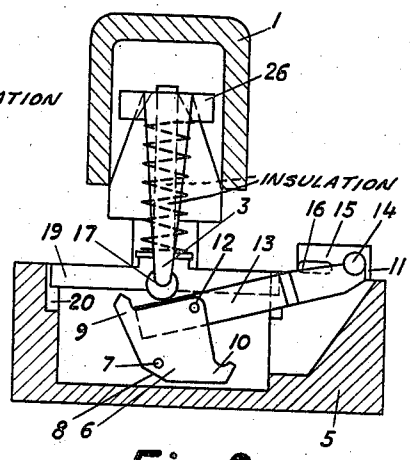


Fig. 2

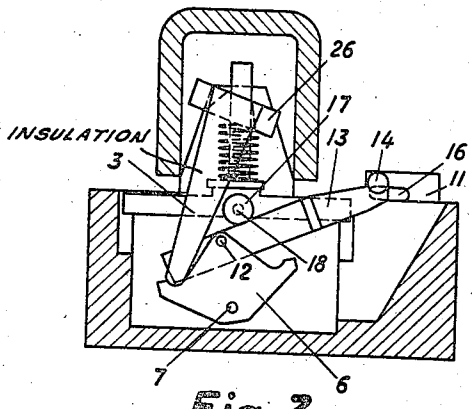


Fig. 3

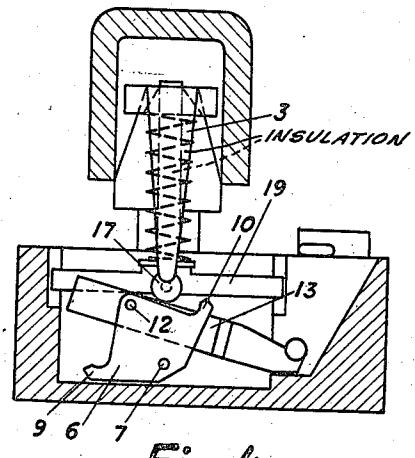


Fig. 4

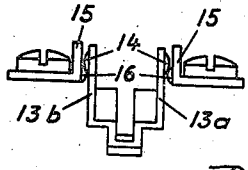


Fig. 5

Inventor
G. A. Wahlstrom
By Glascock Downing Seebold
Attys.

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PUSH-BUTTON SWITCH

Gustaf Adolf Wåhlström, Akeshov, Sweden, assignor to Telefonaktiebolaget L. M. Ericsson, Stockholm, Sweden, a company of Sweden

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4 Claims. (Cl. 200—67)

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The invention relates to a push button switch provided with an operating finger pivoted in the push button, said finger being adapted upon depression of the button alternately to operate a cradle to two different positions, said cradle being pivoted in the base. It is an object of the invention to provide a switch of the present type giving an effective, momentary closing and interruption of the current and preventing the stationary contacts from being burnt when the current is interrupted.

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

Fig. 1 is a vertical section through the push button axis.

Figs. 2–4 are vertical sections along the line A—A in Fig. 1 showing the elements of the switch in different positions. Fig. 5 is a front view of the contact arms and the stationary contacts when the arms are in the position shown in Fig. 2.

A push button 1 is movably arranged in two standards 2, a two-armed operating finger 3 of insulating material being pivoted in the push button. Upon depression of the push button the two arms of the operating finger cooperate with the cradle 6, said cradle being mounted to oscillate on the pivot 7 in the base 5. The cradle 6 consists of two sector-formed plates 6a, 6b and a cross-piece 8. The plates are each provided with cams 9, 10. The cradle is turned in a known manner per se from one end position to the other upon depression of the button 1. A double, two-armed lever 13 is mounted on the pivot 12 in the cradle 6, the arms 13a, 13b thereby being provided with contacts 14 cooperating with stationary contacts 15, each of said contacts being provided with a plane surface 11 for making the circuit ("making-position") and a surface for breaking the circuit ("breaking-position"), said last mentioned surface being provided with a swell 16. The lever 13 is operated by a device 17 consisting of two rollers 17a and 17b fastened on a pivot 18. The pivot 18 is mounted in an arm 19 being movable in the direction of the depression of the button in notches 20 in the base. Said arm 19 also carries a bar 23 of insulating material, a coil spring 25 being arranged around said bar and fixed between the cross-piece 26 of the arm 3 and a flange 24. The rollers 17 consequently engage the lever 13 under spring tension and on movement of the arm 3 the roller 17a will roll on the lever 13a and the roller 17b on the lever 13b.

Fig. 2 shows the lever 13 in the making position, the cradle 6 thereby occupying its right end-

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position. The rollers 17 thereby press against the left portion of the lever 13 and the contact device 14 takes the making position 11. If the button is now pressed down, the cradle 6 is turned round the pivot 7 to the left as shown in Fig. 3 and the rollers 17 thereby roll on the lever 13, pressing against the part of the lever 13 lying to the right of the pivot 12 in such a way that this part of the lever gets a turning moment directed downwards. The contact member 14 on the lever 13 thereby has been brought from the making position 11 to the breaking position 16 as appears from Figs. 2 and 3. This displacement happens immediately before breaking of the circuit. When the different elements have obtained the positions shown in Fig. 3, the part of the lever 13 lying to the right of the pivot 12 will suddenly be turned downwards thereby causing the interruption of the current. The cradle 6 is thereby turned to the position shown in Fig. 4. Said displacement of the contact member 14 from making-to breaking position is very advantageous since the contact plate 15 then can not be burnt in the making position. The lever 13 thus performs an angular movement in relation to the contact plate at the breaking of the circuit. On account of this movement it is possible to provide the contact plate with the above mentioned swell 16 in the breaking position. The contact springs are thereby more tensioned in this position and the breaking of the circuit will occur more quickly. Upon repeated depression of the push button the arm 3 will cooperate with the edge 10 of the cradle thereby turning the cradle to the position shown in Fig. 2. The rollers 17 are thereby rolling along the lever 13 from the position shown in Fig. 4 until they occupy such a position on that part of the lever 13 lying to the left of the pivot 12, that a turning moment is obtained which is sufficient to turn the lever 13 and the cradle 6 to the positions shown in Fig. 2.

Through the combination of the sector-formed cradle 6 and the lever 13 which is carried by a pivot 12, mounted in the upper part of said cradle and being moved on the turning of the cradle 6, it also is rendered possible to make the base very low through maintaining the remaining ordinary dimensions.

I claim:

1. A push button switch comprising a base, a push button, a cradle pivotally mounted in the base, stationary contacts on said base, means operable during successive actuations of said button to alternately turn said cradle into two dif-

ferent positions, a two armed lever, contact members carried by said lever and engageable with said stationary contacts, means mounting said lever to pivot in said cradle about an axis displaced from the pivotal mounting of the cradle, spring means exerting pressure on and tending to turn said lever about its pivot, the point of application of pressure of the spring means on said lever shifting along the lever from one arm to the other arm thereof as said cradle is turned from one position to the other.

2. A push button switch as claimed in claim 1 wherein said spring means normally tends to restore the push button to its initial position.

3. A push button switch as claimed in claim 1 wherein said spring means includes a bar movable in the direction of movement of the push button, a roller on said bar engaging said lever, and a spring operable to apply said roller to said lever and to restore the push button to its initial position.

4. A push button switch as claimed in claim 1 wherein at least said stationary contacts are provided with raised portions coacting with the contact members at the moment the contact between said contacts and contact members is broken.

GUSTAF ADOLF WÅHLSTRÖM.