May 16, 1950 F. G. KRIZE, JR 2,507,637

MOMENTARY CONTACT IMPULSE SWITCH

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Fig. 1

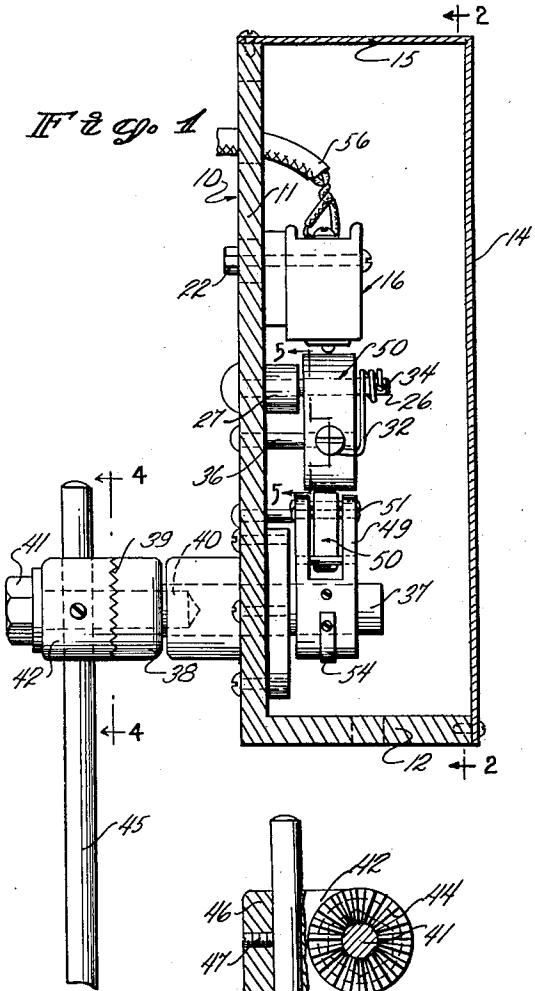


Fig. 2

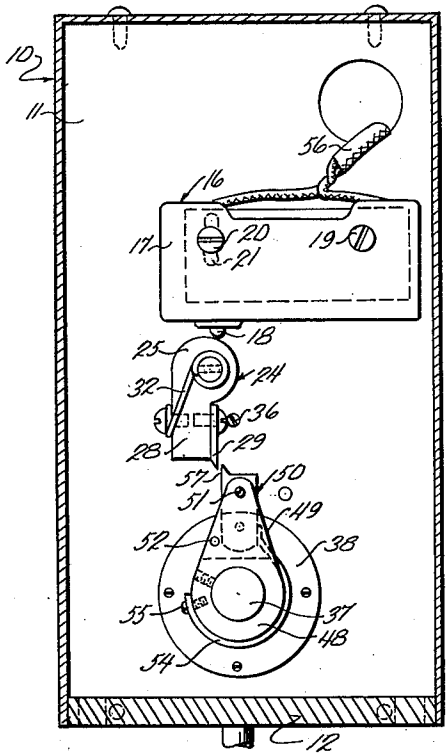


Fig. 4

Fig. 5

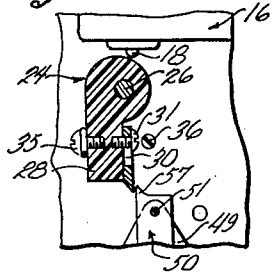
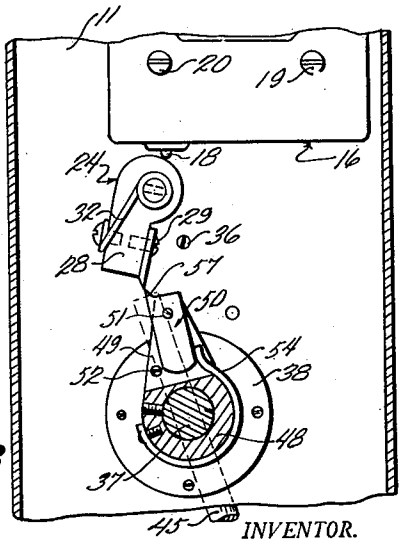


Fig. 3



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MOMENTARY CONTACT IMPULSE SWITCH

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5 Claims. (Cl. 74—470)

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This invention relates to a momentary contact switch and more particularly to a contact operating element for a micro-switch or the like.

It is an object of this invention to provide a switch actuating device of the kind to be more particularly described hereinafter for momentarily closing a micro-switch or relay upon rotation of the actuating element in one direction and slipping past the switch upon rotation in the opposite direction.

Another object of this invention is to provide a momentary contact operating element for a micro-switch which will make or break the circuit upon upward travel of the actuating arm only and will return to its normal position without holding or operating the contacts of the switch upon return of the actuating arm to its normal position.

Still another object of this invention is to provide a momentary contact switch actuating device for momentarily actuating a relay or micro-switch as used on counting devices on conveyors and production machinery, cutoff saws and knives on insulating board, plaster board, cardboard, and wood veneer forming machines.

With the above and other objects in view, my invention consists in the arrangement, combination and details of construction disclosed in the drawings and specification, and then more particularly pointed out in the appended claims.

In the drawings:

Figure 1 is a transverse section, partly broken away, of a momentary contact switch constructed according to an embodiment of my invention.

Figure 2 is a longitudinal section taken on the line 2—2 of Figure 1.

Figure 3 is a fragmentary longitudinal section showing the switch actuating members in the switch closing position.

Figure 4 is a fragmentary detail section taken on the line 4—4 of Figure 1.

Figure 5 is a fragmentary detail section taken on the line 5—5 of Figure 1.

Referring to the drawings the numeral 10 designates generally a housing or casing within which the micro-switch and its operating mechanism are adapted to be housed. The housing 10 is formed with a front wall 11 and a bottom wall 12 preferably formed integral therewith. The back and top of the housing 10 are closed by a rear wall 14 and a top wall 15, formed integral therewith, and formed of flat sheet material.

A micro-switch 16 is supported within the housing 10 and secured to the front wall 11. The switch 16 may be of any conventional type of

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micro-switch or relay having a casing 17 and a contact actuating arm or button 18 extending from one wall of the casing. A bolt or screw 19 engages through one end of the switch casing 17 and engages the front wall 11 of the housing 10 for rockably securing the switch 16 within the housing. A second bolt, as 20, engages through the other end of the housing 17 and engages in an arcuate slot 21 formed in the front wall of the housing 10. A nut 22 is threadably engaged on the outer end of the bolt 20 for securing the micro-switch 16 in a selected pivoted position about the fastening pin 19, within the housing 10.

An eccentric member 24 is rockably mounted within the housing 10 for engagement with the arm or button 18 of the micro-switch. The eccentric member 24 is formed of a substantially cylindrical upper body portion 25 rockably mounted on a pin 26 which extends through the front wall 11 of the housing 10. The eccentric member 24 is spaced inwardly from the inner surface of the front wall 11 by a spacer or washer 27. The bolt 26 is fixed relative to the wall 11 while the eccentric member 24 is rockably mounted on the inner end of the pin. The pin 26 extends through the center of the body 25 eccentric to the axis thereof so that the periphery of the body 25 will engage the button 18 in certain pivoted positions, and will be free from the button in other positions. An arm 28 is formed integral with the body 25 and extends downwardly therefrom substantially at a tangent to the periphery of the body. In other words, the arm 28 is disposed in a vertical plane laterally offset from the vertical plane through the axis of the bolt 26 and offset from the axis of the body 25. A blade or plate 29 is secured to one side of the arm 28 substantially in alignment with the vertical plane through the axis of the body 25. The plate 29 is formed with a vertically extending slot 30 therein. A screw, as 31, engages through the slot 30 and threadably engages in the arm 28 for adjustably supporting the plate 29 thereon. The lower end of the plate 29 extends downwardly below the lower end of the arm 28, for the purposes to be described hereinafter.

A coiled spring 32 engages about the pin 26 adjacent the body 25, and one end of the spring is secured on the pin by the engagement of one end of the spring through an opening 34 in the end of the pin. The other end of the spring 32 is fixed on the arm 28, opposite from the blade 29 by a screw 35 or other suitable fastening devices. The spring 32 is tensioned for moving the eccentric member 24 in a counter-clockwise direc-

tion as viewed in Figure 2, so that the surface of the eccentric member will normally be biased out of engagement with the button 18.

A pin or stop member 36 is fixed on the front wall 11 of the housing 10 and extends inwardly of the casing. The stop member 36 is adapted to abut the arm 28 of the eccentric member 24 for limiting the rocking movement of the eccentric member about the pin 26. While the arm 28 is in engagement with the limit pin 36, the surface of the body 25 is out of engagement with the button 18 so that the button 18 is in its extreme extended position from the micro-switch housing 17.

A shaft 37 extends through the front wall 11 below the micro-switch 16 and below the eccentric member 24. A shaft 37 is rotatably journaled in a bearing 38 carried by the front wall 11. The shaft 37 is adapted to be connected to or actuated by the operating means with which the micro-switch 16 is operatively associated. A cylindrical member 38 is fixed to or formed on the outer end of the shaft 37 and is formed with a serrated front face 39. The cylindrical member 38 is formed with an outwardly opening recess 40 therein within which a bolt 41 is adapted to be threadably engaged. A correlated cylindrical member 42, associated with the cylindrical member 38 is carried by the bolt 41 so that the serrated face 44 of the cylindrical member 42 will be in frictional engagement with the serrated face 39 of the cylindrical member 38. The bolt 41 extends through the cylindrical member 42 and into the recess 40 for securing the cylindrical members 38 and 42 together. A shaft, as 45, is engaged through an arm 46, fixed to or formed integral with the cylindrical member 42, and secured therein by a set screw 47.

A cylindrical cam supporting body 48 is carried by the shaft 37 within the housing 10. The shaft supporting member 48 is formed with a cylindrical body engageable about the shaft 37 and having a pair of upwardly extending, transversely spaced apart arms 49, formed integral therewith. The cam supporting body 48 and arms 49 are disposed in vertical alignment with the eccentric member 24 within the housing 10. A cam 50 is pivotally mounted between the arms 49 on the cam supporting member 48 by a transverse pivot pin 51 between the arms. A stop member or limit pin 52 is fixed between the arms 49 at the lower end thereof, below the pivot pin 51. The cam 50 is rockable about the pivot pin 51 and engageable with the limit pin 52, so that the cam is freely pivotal about the pin 51 in one direction. A flat spring 54 engages about the lower surface of the cam supporting member 48 where it is fixed at one end by a screw 55 or other suitable fastening means. The spring 54 continues about the periphery of the lower body portion of the cam supporting member 48 for engaging the lower end of the cam 50 below the pivot pin 51, for urging the lower end of the cam into engagement with the limit pin 52. While the cam member 50 is pivotally mounted on the pivot pin 51, it is constantly urged into engagement with the limit pin 52 by the free end of the spring 54, so that the cam 50 is normally disposed radially relative to the axis of the shaft 37, on which it is supported.

In the use and operation of the momentary contact switch device, described above, the micro-switch or relay 16 is operatively connected with the electrical means with which it is associated, by a wire or suitable leads 56. The micro-switch 16 may be of the normally open, or the normally closed type, which is particularly adapted to be actuated out of its normal position only momentarily for the proper operation of the devices with which it is operatively connected. For momentarily actuating the relay or micro-switch 16, the shaft 37 will be rotated, either manually or in association with the means which are to be controlled by the micro-switch 16. Rotation of the shaft 37 in a clockwise direction, as viewed in Figure 2, will effect the rotation of the cam 50 about the axis of the shaft 37 to engage the upwardly extending lip 57 of the cam 50 with the downwardly extending portion of the plate 29, carried by the eccentric member 24. The engagement of the lip 57 with the downwardly extending plate 29 will press the eccentric member 24 into engagement with its associated stop pin 36, and as the cam 50 is spring pressed against rotation in a counter-clockwise direction, the lower end of the cam 50 will be moved in a counter-clockwise direction against the tension of the spring 54, so that the cam 50 will be pivoted to pass freely under the eccentric member 24.

In the counter-clockwise rotation of the shaft 37, the lip 57 of the cam will engage the plate 29 of the eccentric member 24, and as the cam 50 is limited against rotation in a clockwise direction by its stop pin 52, the eccentric member 24 will be rocked about its pivot pin 26 so that the surface of the body 25, remote from the center, will engage the button 18 of the micro-switch 16. The movement of the pin or button 18 inwardly of the micro-switch housing 17 will effect the actuation of the micro-switch from its normally set position only momentarily until the cam 50 has moved downwardly to the left, as viewed in Figure 2 out of engagement with the plate 29, of the eccentric member 24. The limit of engagement of the cam 50 with the eccentric member 24 is noted in Figure 3 of the drawing, where the lip 57 has reached a point in its rotation on the shaft 37 where it is moving out of engagement with the lower end of the plate 29. As the cam 50 moves to the left, in Figure 3, the spring 32 will press the eccentric member 24 back to its normal position, in engagement with the stop pin 36. At this time the button or switch actuating member 18 will be spring pressed to its normal position, either open or closed.

I do not mean to confine myself to the exact details of construction herein disclosed, but claim all variations falling within the purview of the appended claims.

I claim:

1. A momentary contact actuating device for a micro-switch having a contact actuating arm comprising an eccentric pivoted member engageable with said contact actuating arm upon rotation in one direction for actuating said switch, a plate on said member extending radially therefrom, resilient means urging said member out of engagement with said arm, a rotatable switch actuating shaft, a cam body fixed on said shaft and extending radially therefrom, a cam rockable on said cam body engageable with said plate for rocking said eccentric member upon rotation of said shaft in one direction.

2. A momentary contact actuating device for a micro-switch having a contact actuating button comprising a rotatable eccentric member engageable with said contact button, a stop pin engageable with said eccentric member for positioning said member out of engagement with said button, resilient means pressing said member into en-

gagement with said stop pin, a rotatable switch actuating shaft, a cam body fixed on said shaft extending radially therefrom, a cam rockable on said cam body and engageable with said eccentric member upon rotation of said shaft, a stop member on said cam body engageable with said cam for holding said cam against rocking in one direction for rocking said eccentric member into engagement with said contact actuating button upon rotation of said shaft in one direction, said cam being rockable out of engagement with said stop member upon rotation of said shaft in the other direction and engagement of said cam with said eccentric member for rocking said eccentric member against said stop pin.

3. A momentary switch actuating device for a switch having a contact actuating member comprising a pivoted eccentric member engageable with said contact actuating member, and biased out of engagement therewith, a rotatable shaft, a cam member on said shaft radially thereof mounted for swinging movement in one direction engageable with said eccentric member upon rotation of said shaft in one direction for rocking said eccentric member into engagement with said contact actuating member and rockable in the other direction upon engagement with said eccentric member upon reverse rotation of said shaft.

4. A switch actuating device for a micro-switch having a contact actuating member comprising an eccentric member rockable into engagement with said contact actuating member and biased out of engagement therewith, an arm on said eccentric member extending from the periphery thereof, a rotatable shaft, a cam supporting

member fixed on said shaft, a cam on said cam supporting member mounted for swinging in one direction, biased for normal radial disposition relative to said shaft and engageable with said arm for rocking said eccentric member to engagement with said contact actuating member upon rotation of said shaft in one direction and for rocking said cam out of engagement with said arm upon reverse rotation of said shaft.

5. A switch actuating device for a micro-switch having a contact actuating member comprising an eccentric member rockable into engagement with said contact actuating member and biased out of engagement therewith, a rotatable shaft, a cam supporting member fixed on said shaft, a cam on said cam supporting member mounted for swinging in one direction and biased for normal radial disposition relative to said shaft and engageable with said eccentric member for rocking said eccentric member to engagement with said contact actuating member upon rotation of said shaft in one direction and for rocking said cam out of engagement with said eccentric member upon reverse rotation of said shaft.

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