Feb. 17, 1970 W. F. WILLIAMS 3,496,314

SWITCH MECHANISM

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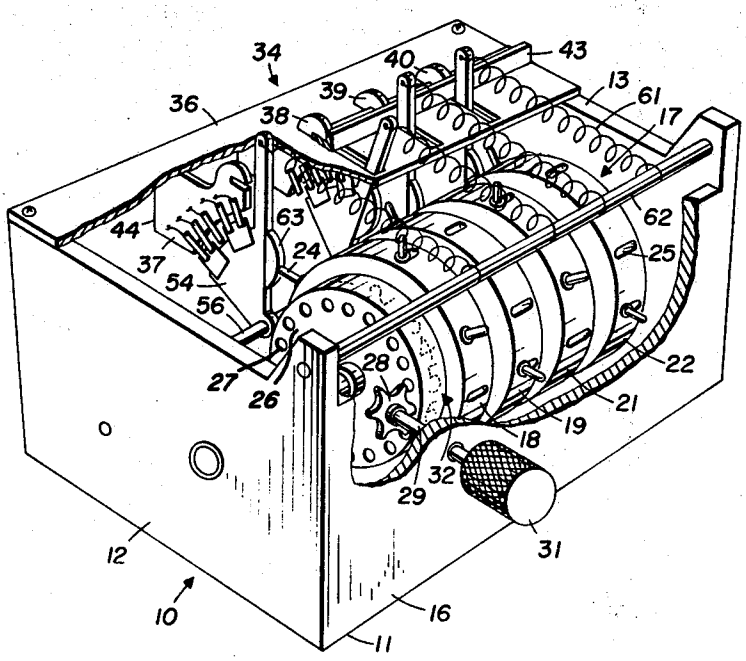

FIG 1

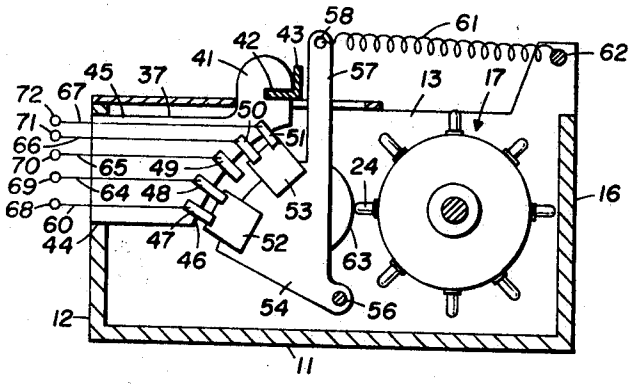

FIG 2

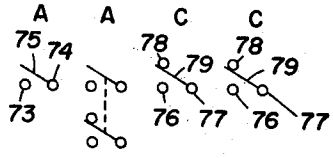

FIG 4

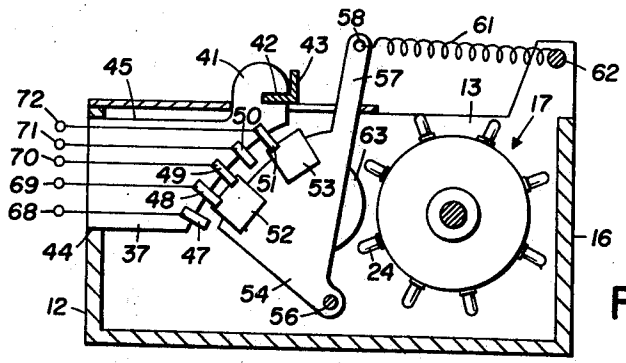

FIG 3

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SWITCH MECHANISM

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U.S. Cl. 200—18 4 Claims

ABSTRACT OF THE DISCLOSURE

Disclosed is a new switch structure in which a pawl means controls a compound switch so as to provide a compact and inexpensive switching structure.

This invention relates in general to a switching means and in particular to a new and novel switch capable of use with binary control systems.

As binary information is used more and more, it has become desirable to use switches which are compact to control remote devices.

It is an object of the present invention, therefore, to provide a switch with multiple contacts on a stator portion which are formed in an arcuate pattern and which are engaged by a movable rotor member having one or more shorting segments. A selector drum engages the rotor and selectively positions it in one of two positions to selectively engage various contacts of the switches.

Further objects, features, and advantages of this invention will become apparent from the following description and claims when read in view of the accompanying drawing, in which:

FIGURE 1 is a perspective view of the switch structure according to this invention;

FIGURE 2 is a sectional view of the switch in the actuated position;

FIGURE 3 is a view of the switch in the unactuated position; and,

FIGURE 4 illustrates a common binary control scheme for which this switch is adaptable.

FIGURE 1 illustrates a frame member **10** which is formed with a base **11** and end walls **12** and **13** and which has a back wall **14** and a front wall **16**.

A switch actuating drum structure is designated generally as **17** and comprises a plurality of selector drums **18**, **19**, **21** and **22**, each of which contains a plurality of pins **24**. The pins **24** are mounted in slots **25** and may be moved from a first to a second position. This may be done manually to set up a particular binary code on the selector drums **18**, **19**, **21** and **22**. When the pins **24** are in the left position relative to FIGURE 1, they actuate the switches of this invention and when they are moved to the right relative to FIGURE 1, they do not actuate the switches.

A disc **26** is attached to the selector drum assembly **17** and is formed with a plurality of openings **27** in which a gear **28** mates. A shaft **29** is mounted in the wall **16** and carries the knob **31** and gear **28**. Thus, rotation of the knob **31** rotates the selector drum. Suitable indicia **32** may be printed about the surface of the drum **26** so as to correlate the position of the drum with the switch code. Thus, the memory drum **17** may be positioned to any one of a number of detented positions by the knob **31**.

A switch assembly structure designated generally as **34** is attached to the rear wall **14** and a top plate **36**. The switch structure comprises a plurality of stator means **37**, **38**, **39** and **40** which are planar members and as best shown in FIGURE 2 have an upwardly extending portion **41** formed with a slot **42**. A locking angle member **43** fits in the slot **42** and is attached to the cover plate

36 to lock the stators **37** through **40** to the frame. The rear portions **45** of the stator members extend through slots **44** formed in the rear wall **14** and are thus firmly locked to the switch structure by the slot **44** and the angle member **43**.

A forward portion **46** of the stator members **37** through **40** is arcuately formed and carries a plurality of electrical contacts **47**, **48**, **49**, **50** and **51** which extend outwardly away from the stator member **37**.

Each of the electrical contacts is bifurcated such that shorting contacts **52** and **53** carried by a rotor **54** may pass through them.

The rotor **54** is rotatably supported by a shaft **56** which is supported by the end plates **12** and **13** and has an upwardly extending arm **57** formed with an opening **58** into which a spring **61** is received. The other end of spring **61** is attached to a shaft **62** which is also supported between the end plates **12** and **13**. The shorting contacts **52** and **53** move in an arc as the rotor **54** is moved.

A cam **63** is attached to the edge of the rotor **54** on the side opposite the contacts **52** and **53** and is adjacent the drum structure **17**. When a pin **24** is in a first position so as to actuate the switch, the pin **24** engages the cam **63** and moves the rotor **54** against the spring **61** to the actuated position shown in FIGURE 2. In the actuated position shown in FIGURE 2, the rotor contact **52** makes electrical contact with the stator contacts **47** and **48** and the contact **53** makes electrical contact between the stator contacts **50** and **51**. The stator contact **49** is in the open circuit position.

As shown in FIGURE 3, when the selector drum **17** is in position such that a pin **24** does not engage the cam **63** of the rotor, the spring **61** moves the rotor to the unactuated position such that the contact **52** makes electrical contact between stator contacts **48** and **49** and the contacts **47**, **50** and **51** are in the open circuit position.

Leads **60**, **64**, **65**, **66** and **67** extend from the switch contacts **47** through **51**, respectively, and provide terminals **68**, **69**, **70**, **71** and **72** at the rear of the switch assembly. These are connected to a utilization circuit, not shown.

As shown in FIGURE 4, a common binary control scheme might comprise switches of the A type which comprise terminals **73** and **74** with a shorting contact **75** and switches of the C type which comprise terminals **76**, **77** and **78** with a shorting contact **79** connected at all times to the contact **77** and movable between contacts **76** and **78**.

A plurality of such A and C type switches as illustrated in FIGURE 4 can, for example, control a conversion from decimal to binary which is a common circuit utilized in present-day equipment. It is seen that the stator contacts **47**, **48** and **49** and the rotor contact **52** comprise a C type switch in that the rotor contact **52** either engages stator contacts **47** and **48** or stator contacts **48** and **49**. The stator contacts **50** and **51** and rotor contact **53** comprise an A type switch in that the rotor contact **53** electrically connects contacts **50** and **51** as shown in FIGURE 2 or they are in the open circuit position as shown in FIGURE 3. Thus, each switch comprises an A and a C switch and the contacts **68** through **72** may be suitably wired into a control circuit such that the desired switching is obtained. It is to be realized, of course, that a plurality of switches my be mounted in a bank as shown in FIGURE 1 and that various coding may be accomplished with the switches. Since the switches are constructed of relatively thin insulating material, such as pressed fiber or a suitable plastic, many switches may be mounted in a very compact manner. The coding of the drums is established by selectively positioning the pins **24**, and once the pins have been placed, the particular combination of switch settings will be remembered by the

drum and the same position will be obtained each time the drum is returned to that particular position.

For an example of a system for utilizing the novel switch assembly of this invention, reference may be made to my copending application entitled, "System for Converting Four Wire Information Into Binary Coded Decimal Information," Ser. No. 627,221, filed Mar. 30, 1967.

It is seen that this invention provides a novel switch assembly and although this invention has been described with respect to particular embodiments thereof, it is not to be so limited, as changes and modifications may be made therein which are within the spirit and scope of the invention as defined by the appended claims.

I claim:

1. An encoder switch mechanism comprising a stator member and a rotor member supported in a common plane with said rotor member rotatably supported with respect to said stator member, a plurality of electrical contacts extending from the stator member toward the rotor member, and a plurality of electrical shorting contacts extending from the rotor member and engageable with contacts on the stator member, biasing means yieldably maintaining said rotor member in a first position, a selector drum means rotatably supported in said common plane, a plurality of pin members on the periphery of said selector drum means and movable to either a first or a second pin position on said periphery, said pin members engageable with said rotor member only when in said first pin position and urging said rotor member to a second position as said selector drum means is rotated.

2. A switch mechanism as defined by claim 1 including a plurality of stator members, rotor members and selector drum means.

3. A switch mechanism as defined by claim 2 wherein said selector drum means is rotatable to positions indicating a decimal reading and said pins cooperatvely function with said rotor member and said stator member to effect a corresponding binary reading.

4. In apparatus according to claim 3, a selector knob operably connected to said selector drum means for rotating said selector drum means.

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U.S. Cl. X.R.

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