

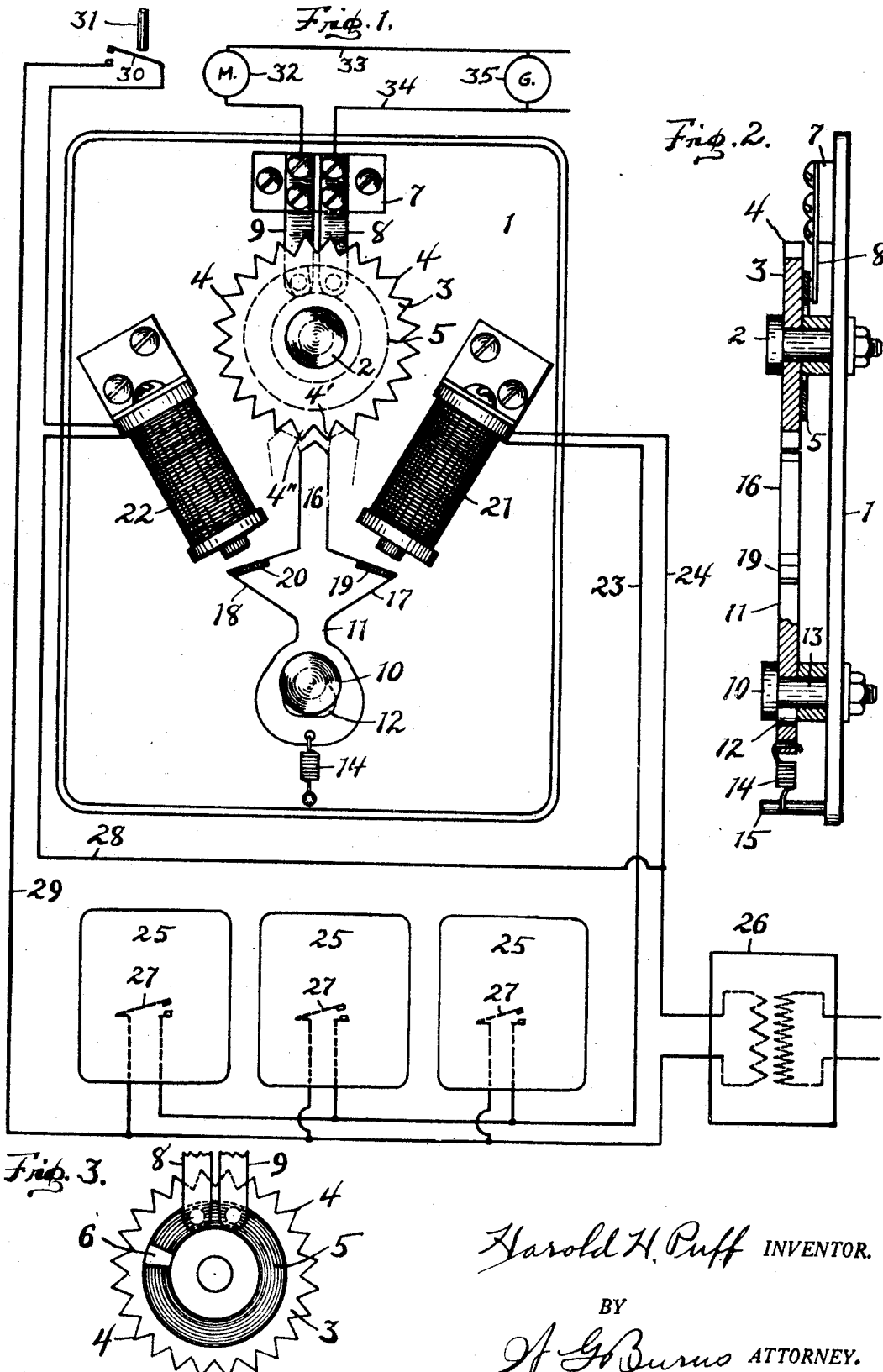
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ACCUMULATIVE ELECTRIC SWITCH

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This invention relates to improvements in an accumulative electric switch of that character adapted to regulate the operation of an electric-motor-driven appliance, such, for example, as a musical instrument or other device that is intended to be operated periodically a predetermined number of times.

Among the objects of the invention is the provision of a switch for use in conjunction with coin controlled means for closing the circuit of a motor that actuates an apparatus, and for subsequently opening said circuit automatically upon completion of each operation of said apparatus; and to so construct said switch that upon a succession of operations of said coin controlled means, said motor circuit will be closed and the apparatus maintained active throughout a series of operations corresponding in number with the operations of said coin controlled means before the motor circuit is automatically opened.

The accompanying drawings are illustrative embodiments of the invention and do not include an instrument or device actuated by the motor that is controlled by the switch, as such instrument or device may be of any character capable of being controlled by the present invention, or for a purpose other than that of a musical instrument. Also, the coin controlled means illustrated in the drawings for operating the switch may be of any suitable character, as the particular construction thereof is immaterial to the present invention, or a substitute means for said coin controlled apparatus may be employed instead for controlling said switch, and therefore, the use of the invention is extensive beyond that herein specifically set forth.

In the drawings,

Fig. 1 is a front elevation of an electrically operated switch in which the invention is embodied, and includes in diagram form parts associated therewith;

Fig. 2 is a side elevation projected from Fig. 1, some parts being in section, or cut away, and other parts being omitted; and

Fig. 3 is a rear view of the accumulator

wheel, the spring contacting members and the segmental contact plate therefor.

The illustrative embodiment of the invention consists of a housing or base 1 having mounted thereon a stationary stud 2 upon which is rotatively mounted a wheel 3 having upon its perimeter an annular series of radially projecting pointed teeth 4 equally spaced and in close formation.

Upon the back of the wheel 3 is concentrically positioned a segmental contact plate 5, there being a void 6 between the opposing ends of the plate.

An insulator 7 on the base has a pair of spring contact members 8 and 9, both of which have electrical contacting engagement with the plate 5 constantly except upon registration with the void 6.

A stationary stud 10 extends from the base 1 and affords support for a jigger 11, that has made therein an opening 12 through which the shank 13 of the stud 10 loosely extends. The opening 12 is wider at its lower end than at its top and is so shaped and proportioned as to admit of vertical and lateral play of the jigger upon the shank of the stud. The jigger has connected at its lower end a retracting spring 14 that is connected to a stationary pin 15 that projects from the base 1, which spring tends to hold the jigger normally centered in vertical position upon the stud 10. The jigger has an upwardly extending actuating finger 16, pointed at its top, and also oppositely extending lateral wings 17 and 18, each being provided with an armature, 19 and 20 respectively, consisting of an iron plate. Above the armatures, on the base 1, are secured a corresponding pair of electro-magnets 21 and 22, radially disposed with respect to the stud 10, or at an upwardly inclined angle that is divergent with respect to the vertical center of the jigger. The lower end of each magnet is spaced from the corresponding armature on the jigger when said jigger is in normal position so as to permit movement of the jigger when one or the other of the magnets is energized and the corresponding armature is magnetically attracted thereby.

The electro-magnet 21 is connected in circuit by conductors 23 and 24 with one or more coin controlled devices 25, and a source of electrical energy, such, for example, as a transformer 26. The coin controlled devices may be of any suitable structure provided with a switch 27 arranged so as to operate upon the reception of a coin in the coin controlled device and momentarily close the circuit of the electro-magnet 21.

The electro-magnet 22 is connected in circuit by means of conductors 28 and 29 with a suitable source of electrical energy, such as said transformer 26, said circuit being controlled by an automatically operated switch 30 which is related to the motor-driven musical instrument or other appliance (not shown) in any suitable manner, whereby the switch 30 is momentarily closed upon the completion of the cycle of operation of said instrument or device, as by a reciprocating member 31 activated thereby upon completion of its operation.

The electrical motor 32 which is operatively related with said instrument or device is connected in circuit by means of conductors 33 and 34, with a suitable source of electrical energy, such as a generator 35, said circuit being controlled through the medium of the contact members 8 and 9 and the contact plate 5, which have connected relation with the conductor 34.

The transformer 26 may, if so desired, be suitably connected with a generator 35 so as to be energized thereby, or may receive current from any other suitable source.

In the operation of the invention, upon closing of the switch 27 by the insertion of a coin in the corresponding coin controlled device, the electro-magnet 21 is momentarily energized by current supplied from the transformer 26 through the conductors 23 and 24, whereupon, the armature 19 is magnetically attached and drawn toward the magnet, which causes the jigger 11 to move upwardly and over toward the magnet, and the finger 16 is thereby raised into contact with the adjacent tooth 4' and exerts lateral pressure against the tooth toward said magnet, causing the wheel 3 to turn in the corresponding direction to a limited extent. When the wheel is thus turned, the contact-plate 5 is likewise moved, so that its void 6 is moved out of registration with the contacting member, whereupon electrical contact is made between the member 9 and the contact plate 5 so that the circuit between the generator 35 and the motor 32 is closed, thereby causing operation of the instrument or other device. Upon re-opening of the switch 27, the electro-magnet 21 becomes de-energized and the jigger, under the influence of the spring 14, becomes again centered upon the stud 10, in its neutral position. Upon completion of the operation of the device that

is driven by the motor 32 and consequent closing of the switch 30 through the medium of the reciprocating member 31, which is automatically operated by said device, the electro-magnet 22 is energized, whereupon, the armature 20 is magnetically attracted and drawn toward said magnet, which causes the jigger 11 to move upwardly and over toward said magnet, and the finger 16 is thereby raised into contact with the adjacent tooth 4' and exerts lateral pressure against said tooth toward said magnet, causing the wheel 3 to turn in the corresponding direction to a limited extent. When the wheel is thus turned, the contact plate 5 is likewise moved so that its void 6 is moved into registration with the contact member 9, whereupon the electrical contact between the member 9 and the plate 5 is opened and operation of the instrument is discontinued.

In the event should the magnet 21 be energized repeatedly, as by the closing of any of the switches 27 a number of times, such as would be occasioned by repeated operations of the coin controlled devices, the jigger 11 will be operated by the magnet 21 a corresponding number of times, and the accumulator wheel 3 will be progressed tooth by tooth to a corresponding extent, and the void in the contact plate will be moved to a point more or less remote from registration with the contacting member 9. In this manner, the motor circuit will remain closed and operation of the instrument or device will continue through successive cycles until the wheel 3 is returned to its normal or open position by the successive operation of the jigger occasioned by the magnet 22 which occur respectively upon the closing of the switch 30 at the completion of each cycle of operation of the instrument. If a number of coins are inserted in successive order in the coin controlled devices, the instrument will be caused to operate continuously throughout a number of its cycles corresponding with the number of coins so inserted, and will automatically cease operation upon completion of the last of said cycles. The wheel 3 is cumulative with respect to the extent of its action when the magnet 21 is repeatedly energized, and is retrieved to its normal position when the magnet 22 is subsequently energized a corresponding number of times. Thus, the switch wheel is rotatively moved in opposite directions selectively by the jigger and to a variable extent dependent upon activity of the opposed magnets.

What I claim is:—

1. A cumulator switch for controlling the energizing circuit of an electrically operated device, consisting of a pair of opposed magnets provided each with a separate switch controlled energizing circuit therefor; a movably mounted jigger having a single finger and provided with means normally hold-

ing it in neutral position and arranged to be actuated in opposite directions respectively by said magnets; a cumulator operatively related with said jigger so as to be moved selectively in opposite directions by said finger accordingly as said magnets are at different times energized; and contacting means related with said cumulator for controlling the circuit of said device.

2. A cumulator switch for controlling an electric circuit, consisting of a cumulator having thereon a contact plate; a movably mounted jigger having a single finger and provided with means tending to hold it in neutral position, arranged to be activated in opposite directions by said finger and to impart movement to said cumulator accordingly; electro-magnetic means related with said jigger so as to actuate it selectively in opposite directions; and contacting members relating said contact-plate with a circuit to be controlled thereby.

In testimony whereof I affix my signature.

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