Aug. 1, 1944. A. BUTTNER 2,354,651

SWITCH CONTROL

Original Filed March 27, 1941

Fig. 1.

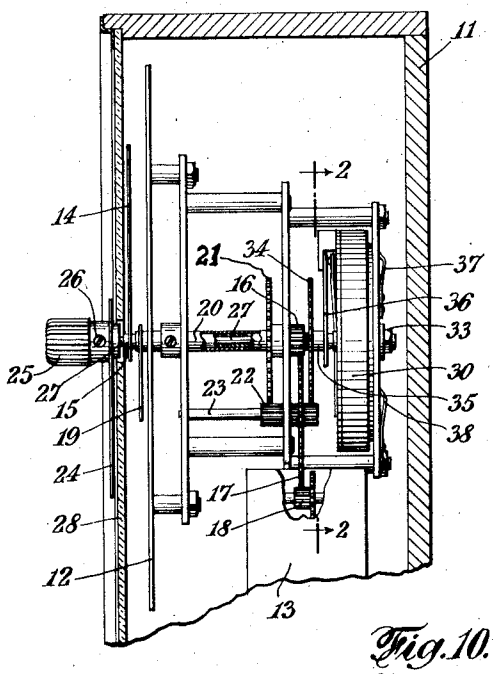


Fig. 2.

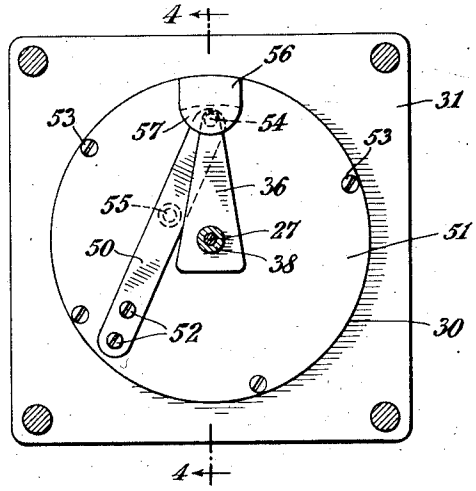


Fig. 4.

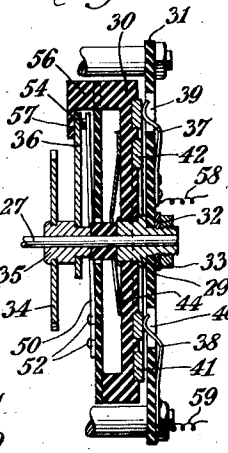


Fig. 6.

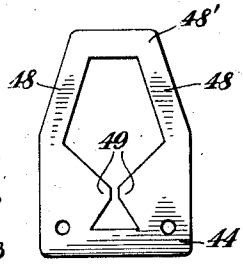


Fig. 10.

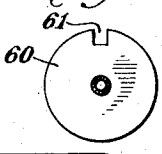


Fig. 3.

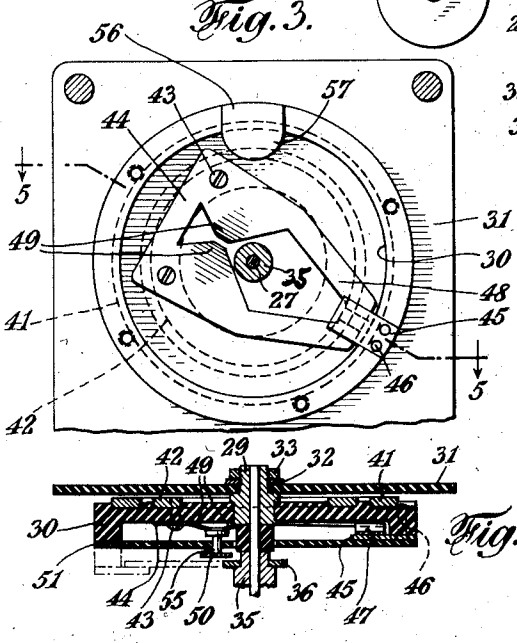


Fig. 8.



Fig. 7.

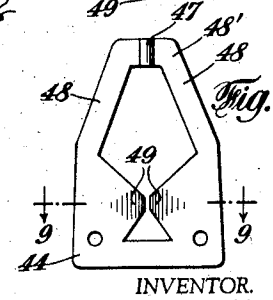


Fig. 9.

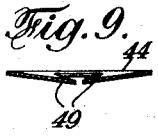


Fig. 5.

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2,354,651

SWITCH CONTROL

Arnold Buttner, Flushing, N. Y.; assignor of one-half to Trump Products Corporation, New York, N. Y.

Substituted for abandoned application Serial No. 385,516, March 27, 1941. This application December 13, 1943, Serial No. 514,133

3 Claims. (Cl. 200—38)

This invention relates to new and useful improvements in switch control means, adaptable for various purposes, the characteristics of which and the application of the same will be hereinafter fully described.

The present application is a substitute for an application filed by the applicant March 27, 1941, under Ser. No. 385,516.

With the above and other objects in view, this invention consists of the novel features of construction, combination and arrangement of parts, hereinafter described, claimed and illustrated in the accompanying drawing, forming part of this specification, and in which similar characters of reference indicate corresponding parts in all views, and in which:

Figure 1 is a transverse, vertical sectional view of a clock mechanism embodying my invention.

Figure 2 is a front view, partly in section, of my switch control mechanism.

Figure 3 is a similar view, as Figure 2, but with parts removed therefrom.

Figure 4 is a transverse, vertical sectional view, taken on the line 4—4 of Figure 2.

Figure 5 is a transverse, longitudinal section, taken on the line 5—5 of Figure 3.

Figure 6 is a front view of a part of my invention in the process of manufacture.

Figure 7 is a front view of the same part at its completed stage.

Figure 8 is a top plan view of Figure 7; while Figure 9 is a transverse, longitudinal section, taken on the line 9—9 of Figure 8; and

Figure 10 is a plan view of a modified form of an operating part of my invention.

Referring more particularly to the drawing, and especially to Figure 1, the numeral 11 indicates the housing of an electric clock, having the usual dial 12, and a motor (not shown), which may be located in a housing 13.

The minute hand 14 is attached to a sleeve 15, which carries a gear 16 cooperating with a gear 17 on a shaft 23, and a train of gears 18, caused to rotate by said motor.

The hour hand 19 is secured to a sleeve 20, which carries a gear 21 meshing with a pinion 22 on the shaft 23 and is caused to rotate by and cooperate with the gear 17 and the train of gears 18.

These gear arrangements, relative to the operation of the minute and hour hands are, however, merely of the conventional construction.

A time indicating hand 24 is secured to a knob 25, which by means of a set screw 26 is securely fixed to a shaft 27 outside of the glass 28 of the clock housing 11.

A gear 34 is secured to a sleeve 35, which is rotatably mounted on the time indicating shaft 27; said gear 34 is operated by the pinion 22 on the shaft 23 in relation with the hour hand 19. The sleeve 35 also carries a fixed arm 36 to cooperate with the switch closing mechanism, hereafter to be more fully described.

Contact springs 37 and 38 are secured to the insulating frame 31 and are protruding through the openings 39 and 40 therein to engage an outer contact ring 41 and an inner contact ring 42, respectively. These contact rings 41 and 42 are secured to or moulded into the switch housing 30.

The inner contact ring 42 is connected by screws 43 to a switch member 44, while the outer contact ring 41 is in conductive connection with a stop 45 by means of screws or rivets 46, this stop 45 is to engage a loop 47 of the switch member 44, when the circuit is closed.

Referring now especially to the Figures 6 through 9, the switch member 44 is tapered towards one end and open at its inside, to form arms 48, the latter extending towards the center to form tongues 49. This switch member, when blanked by a die, is flat, as may be seen in Figure 6.

The end portion 40' of the switch member 44 connecting the arms 48 is then crimped to form the open loop 47, which causes the tongues 49 to bulge out in a belly-like fashion, as may clearly be seen in Figures 7 through 9.

When applying any pressure upon the tongues 49, the arms 48 and loop 47 are caused to move or give in the opposite direction, while, when the pressure is released the arms 48 and loop 47 will move back to their original position. It will also be clearly seen that it requires only a little pressure or a little movement of the tongues 49 to move the loop 47 a relatively large distance in relation to the tongues 49. In order to cooperate with the switch member 44, a spring arm 50 is secured to a cover plate 51 by means of screws 52. The spring arm 50 carries at its end a rounded pin 54 to be engaged by the arm 36 in a contact making position. The middle portion of the arm 50 engages a pin 55 which passes through the cover plate 51 and rests against the tongues 49 to exert the required pressure to bring the switch member 44 in its closed position in relation to the timing arm 36.

The housing 30 is provided with an extension

56, forming a guide 57 for the arm 36, providing at the same time a stop for the spring arm 50.

The operation of my device is now as follows:

The switch housing 30 with its respective mechanism is set to the correct position, when the circuit is to be closed by means of the time hand 24 and the knob 25. The gear 34 rotating in relation with the hour hand 19 through the pinion 22, will cause the arm 36, guided by the projection 57 to engage the pin 54 of the spring arm 50, thus pressing the latter towards the switch housing 30.

The spring arm 50 is also pressing against the pin 55 and the latter against the tongues 49, which will cause the arms 48 and the loop 47 to be brought in contact with the stop 45 (see Figures 4 and 5), thereby closing the circuit between the outer and inner contact rings 41 and 42, respectively, to complete the circuit for the operation of the equipment attached thereto through the contact springs 37 and 38 and wires 58 and 59. The circuit will remain closed for such duration until the arm 36 passes the pin 54, thus releasing the pressure of the spring arm 50 and allowing the latter to return to its normal position against the stop 57. As a consequence, the pressure is also released from the tongues 49, thereby disengaging the loop 47 from the stop 45 and breaking the circuit between the outer ring 41 and inner ring 42.

It may clearly be seen that any desired length of contact may be obtained by changing the width of the end of the arm 36.

Referring now to my modification, as shown in Figure 10, a disk 60 provided with a notch 61 may be substituted for the arm 36. From the foregoing description it will be clearly understood, that the circuit is closed while the pin 54 is engaged by the outer portion of the disk 60, but that the circuit is broken, when the pin 54 enters the notch 61, as would be desirable in the use of such equipment, as electric stoves, etc. The circuit for the timing operating device will also be broken, when the slot 61 reaches the pin 54.

It is obvious that slight changes may be made in the form, construction and arrangement of the several parts, as shown, within the scope of the appended claims, without departing from the spirit of the invention, and I do not, therefore, wish to limit myself to the exact construction and arrangement shown and described herein.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A time switch of the class described, comprising, in combination, a switch housing rotatably mounted in a frame, contact springs secured to said frame, and contact rings disposed in the switch housing and adapted to engage said contact springs, a switch member arranged in the switch housing and cooperating with a contact ring, a stationary contact mounted in said switch housing and cooperating with a second contact ring and the switch member upon closing of the circuit, an extension upon the housing forming a guide for a fixed arm and providing a stop for the spring arm.

2. A time switch of the class described, comprising, in combination, a switch housing rotatably mounted in a frame, contact springs secured to said frame, and contact rings disposed in the switch housing and adapted to engage said contact springs, a switch member arranged in the switch housing and cooperating with a contact ring, said switch member having inwardly extending projections, a stop member mounted in said switch housing and cooperating with a second contact ring and the switch member upon closing of the circuit, an extension upon the housing forming a guide for a fixed arm and providing a stop for a spring arm, a cover-plate closing the switch housing, a pin mounted in said cover-plate and adapted to contact said inwardly extending projections of the switch member, the spring arm being mounted on the cover-plate and made to engage said pin, and a train of gears actuating said switch closing member.

3. In a device, as claimed in claim 2, and wherein a switch member is made with a cut-out portion therein to form inwardly extending projections, said member having a comparatively flat body portion at one end thereof and the other end formed with a crimped loop, whereby to create a bellied shape of the inwardly extending projections, and to obtain a reciprocating movement with respect to said projections and the looped portion.

ARNOLD BUTTNER.