

966,118.

Patented Aug. 2, 1910.

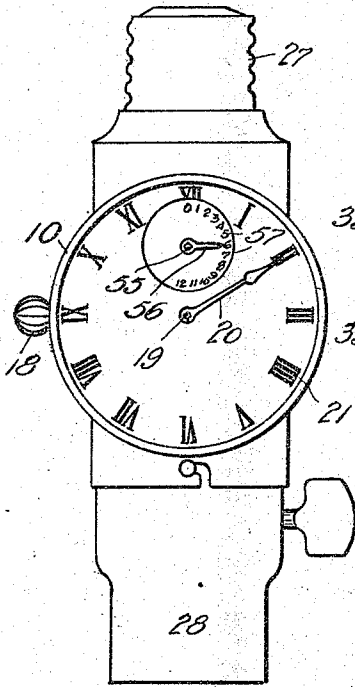


Fig. 1

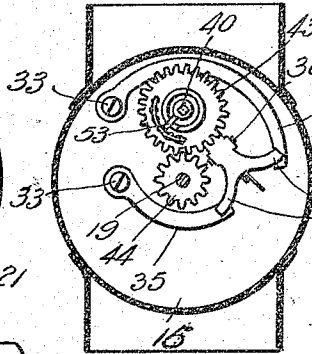


Fig. 2

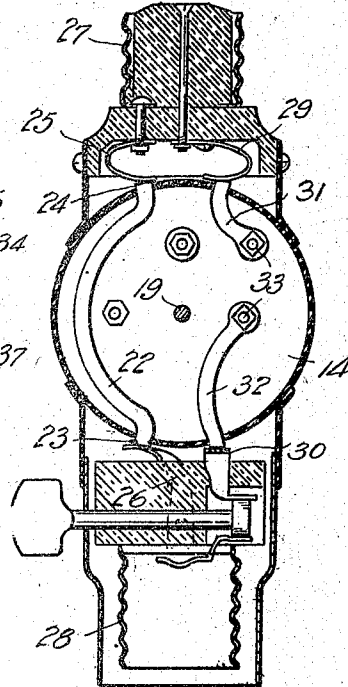


Fig. 3

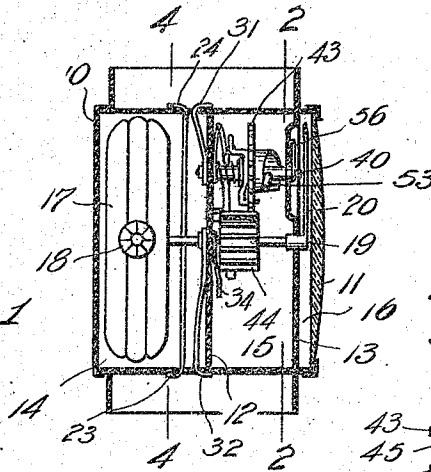


Fig. 4

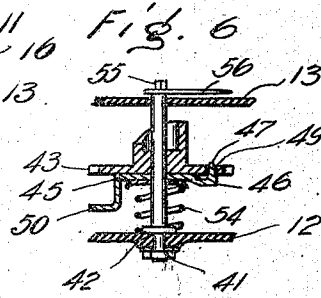


Fig. 5

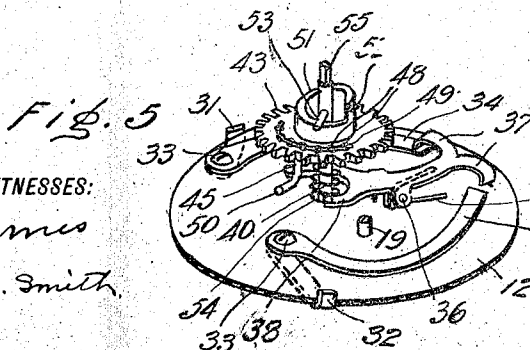


Fig. 6

WITNESSES:
A. Barnes
m. m. Smith.

INVENTOR
Willeston C. Pugh
BY
Pierre Barney
ATTORNEY

UNITED STATES PATENT OFFICE.

WILLESTON C. PUGH, OF SEATTLE, WASHINGTON, ASSIGNOR OF ONE-HALF TO AUGUST GAMBLEE, OF SEATTLE, WASHINGTON.

TIME-SWITCH.

966,118.

Specification of Letters Patent.

Patented Aug. 2, 1910.

Application filed September 4, 1909. Serial No. 516,219.

To all whom it may concern:

Be it known that I, WILLESTON C. PUGH, a subject of the King of England, residing at Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Time-Switches, of which the following is a specification.

This invention relates to certain improvements in electric switches; and its object is to produce a device of this character which is actuated to complete an electrical circuit at a predetermined time and maintaining such connection for a selected period.

The invention consists in the novel construction and combination of elements which will be hereinafter more fully described and claimed.

In the accompanying drawings showing an embodiment of my invention, Figure 1 is a side elevation, with the containing case in section; Fig. 2 is a sectional view taken on line 2-2 of Fig. 1; Fig. 3 is a front elevation with electrical plug and socket connections attached; Fig. 4 is a section taken through Fig. 1 at line 4-4 and including the connections shown in Fig. 3; Fig. 5 is a perspective view of certain working parts of the invention; and Fig. 6 is a detail sectional view.

The reference numeral 10 designates a containing case, which may be of gutta-percha, rubber, or other suitable substance. The case is provided with a transparent front 11, such as of glass. Partitions 12 and 13 are provided to afford compartments 14, 15 and 16 within the case. In the rear-most compartment, 14, is provided a clock-work which may conveniently be in the form of a watch, indicated by 17, and having a stem 18 protruding from the outside of the case for winding and setting purposes. In this instance, however, the minute hand and its driving connections are omitted and the spindle 19 for the hour hand 20 is provided of a length to extend into the front compartment 16 wherein such hour-hand is located. The front face of the partition 13 is marked as a clock-dial by seriate numbers, such as 21.

Extending through the compartment 14 is an electrical conductor 22 having terminals 24 and 23 which are respectively arranged for contact with the conductors 25 and 26 of the plug and socket connections 27 and 28. The complementary conductors 29 and

30 of such connections contact with conductors 31 and 32 which are operatively connected by securing screws 33 with the switch terminals 34 and 35 within the compartment 15. The switch closure consists of a lever 60 fulcrumed at 36 and having branches 37 upon the one side of the fulcrum to provide a bridge for the gap and at the other side terminates in an arc-shaped extremity 38, which may be formed of insulating material. A spring 39 is employed to normally raise the branched arm of said lever out of contact with one or both of said switch terminals. 40 represents a post which is mounted for rotation in the aforesaid partitions and is restrained by a tension nut 41, see Fig. 6, upon the screw-threaded reduced end of the post and serves to draw the shoulder 42 with more or less tightness against the intermediate partition 12.

Mounted for independent rotary motion upon said post 40 is a toothed gear wheel 43 in continuous mesh with a driving pinion 44 which is fixedly secured to the spindle 19. The wheel 43 is desirably twice the diameter of the pinion, hence it is caused to be given a rotation once every twenty four hours from the spindle whose cycle is twelve hours in duration. Subjacent to said wheel is a member 45 through which said post passes and is provided with arms which extend from the latter in diametrically opposite directions. One of these arms, 46, is provided with an upwardly directed conical end 47 which may be socketed in any one of a series of notches 48 extending from an arcuate slot 49 provided in the wheel for the purpose of adjustably coupling the wheel and the member 45 so that they will rotate as a single piece. The other arm of said member has its end offset downwardly to provide a finger 50 directed radially with respect to the post.

Integral with the gear wheel 43 is a crown cam 51 which is characterized by having upon its upper edge a wiping surface which, as best shown in Fig. 5, ascends circumferentially from the lowest to highest elevations at the top and bottom of an upright portion 52.

53 represents a stud extending radially from the post 40 and against which the cam is yieldingly pressed through the agency of a spring 54 acting against the underside of the member 45. Outside of the partition 13

said post is provided with a squared end 55 to accommodate a watch-key, or an equivalent, whereby the post may be turned to adjust the stud thereof as may be required and as will be indicated by a pointer 56 with reference to a series of numbered marks 57 upon the aforementioned dial face.

The operation of the invention may be explained as follows: Assuming that the switch is open, the actuating clock-work rotates the pinion 44 which, in turn, causes the gear-wheel 43 to be rotated together with the cam 51 which moves with the wheel. The rotating cam acting against the stud 53 is thereby pressed rearwardly with the wheel and in opposition to the spring 54 so that the revolving finger passes behind the part 38 of the switch closure. When the cam has moved sufficiently to carry the portion 52 beyond the stud, then the cam is liberated so that the spring 54 can assert itself to thrust the wheel 43 forward and drag the arm 38 of the switch closure therewith through the instrumentality of the finger 50. This effects the closing of the switch by the bridge 37 contacting with the switch terminals 34 and 35. Such conditions will prevail until the continued rotation of the wheel 43 carries the finger 50 beyond the arm 38 when, the latter being unrestrained, permits the switch closure to be pressed from such terminals by the power of the spring 39.

From the foregoing it is evident that the relative circular positions of the stud 53 and the end 52 of the cam operating surface determines the time at which the switch will be closed and which is adjusted by rotating the post 40 by means of a key, as before mentioned, and predeterminately through the corresponding movement of the pointer 56 with respect to the marks 57 upon the dial. It is also evident that the length of time which the switch will remain closed corresponds with the time in which the finger 50 is wiping against the back of the switch closure 38, that is to say, from the circular position of the finger to the point of its leaving the closure in the course of its rotation with the wheel 43. Accordingly, to vary the duration of the time of the switch remaining closed it is merely necessary to adjust the position of the finger 50 with relation to the actuating point of the cam. More particularly, to change the position of the finger the conical end of the member 45 is dislodged from the notch it then occupied in the wheel 43 and swung in one rotary direction or the other to present it to a selected notch wherein it is inserted and held by the spring 54 acting against the member.

What I claim as my invention is:

1. In an electric switch, the switch terminals, a normally open switch closure, a cam,

clock-work, driving connection between said cam and the clock-work, a spring, a member actuated by said spring and cooperating with said cam to cause said closure to become operative and also serving to maintain the closure in such operative condition for a predeterminately variable time.

2. The combination with clock-work and an electric switch, of a spring tending to open and maintain said switch in such open condition, a cam rotated by said clock-work, a second spring, a member connected with said cam and cooperating therewith and with the aforesaid springs to alternatively effect the opening and closing of the switch.

3. In an electric switch, the combination of the switch terminals, a lever circuit closer therefor, a spring tending to maintain said closer in open condition, a rotatably adjustable post, a stud protruding from said post, a toothed wheel mounted for rotation on the post, a pinion in mesh with said wheel, clock-work for rotating said pinion for transmitting rotary motion to said wheel, a cam rotatable with the wheel, and means rotated with said wheel and controlled by the conjoint actions of said cam and stud to close the switch and subsequently to maintain the switch in closed condition for a predetermined length of time.

4. In an electric switch, the combination of the switch terminals, a circuit closer, a spring tending to retain the closer in open condition, a rotatably adjustable post, a stud protruding radially from the post, a toothed wheel mounted for rotation on the post, a crown cam carried by the wheel, a spring acting to maintain the cam in operative connection with said stud, clock-work for driving said wheel, a finger adapted to cooperate with said cam and the stud and through the instrumentality of the second named spring for causing said closer to become operative to close the switch at a predetermined time and for a predetermined period.

5. In an electric switch, the combination of the switch terminals, a circuit closer normally in open condition, a rotatably adjustable post, a stud protruding radially from the post, a wheel mounted for rotation on the post, a crown cam carried by the wheel, a spring tending to maintain the cam in operative connection with said stud, clock-work for effecting the continuous rotation of the wheel, a finger controlled by said cam and stud and actuated by said spring for causing said closer to become operative to close the switch at a predetermined time and for a predetermined period.

WILLESTON C. PUGH.

Witnesses:

H. BARNES,
M. M. SMITH.