

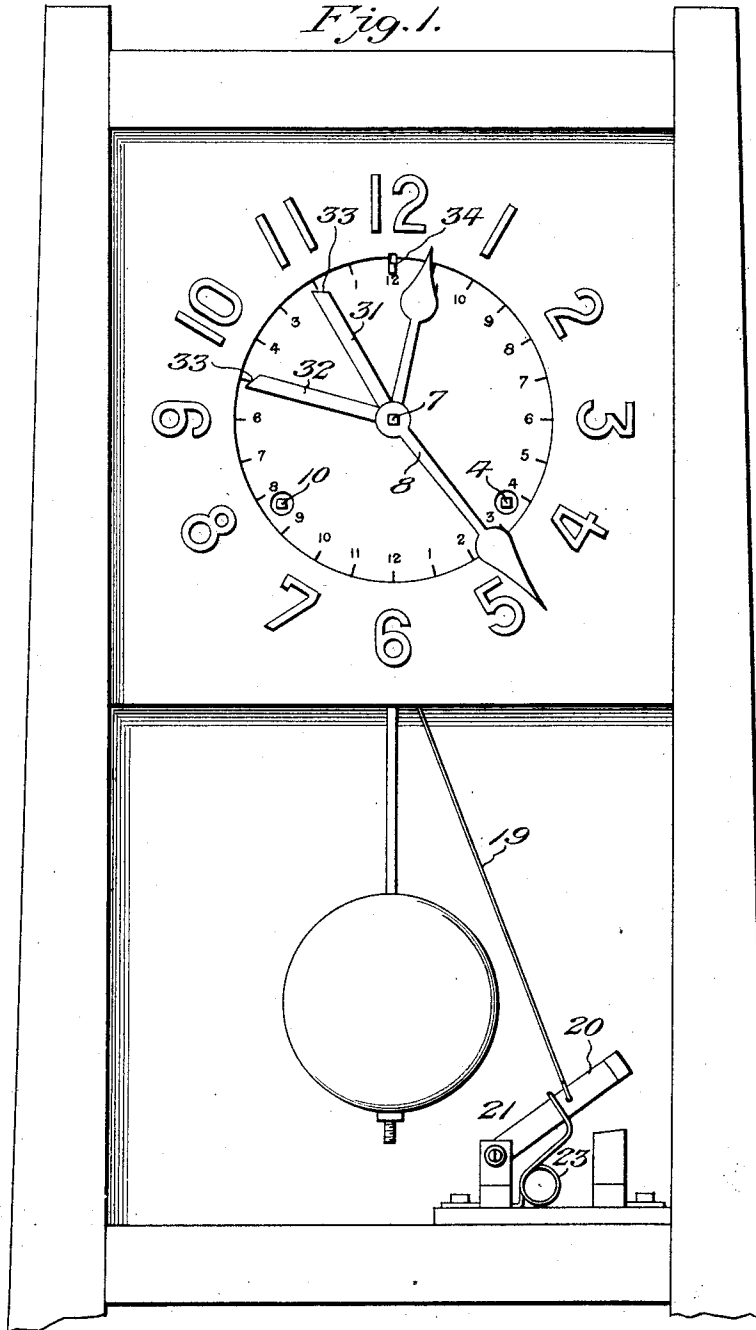
W. J. BROWN.
ELECTRIC TIME SWITCH.
APPLICATION FILED OCT. 6, 1910.

1,037,818.

Patented Sept. 3, 1912.

3 SHEETS—SHEET 1.

Fig. 1.



Inventor

Witnesses

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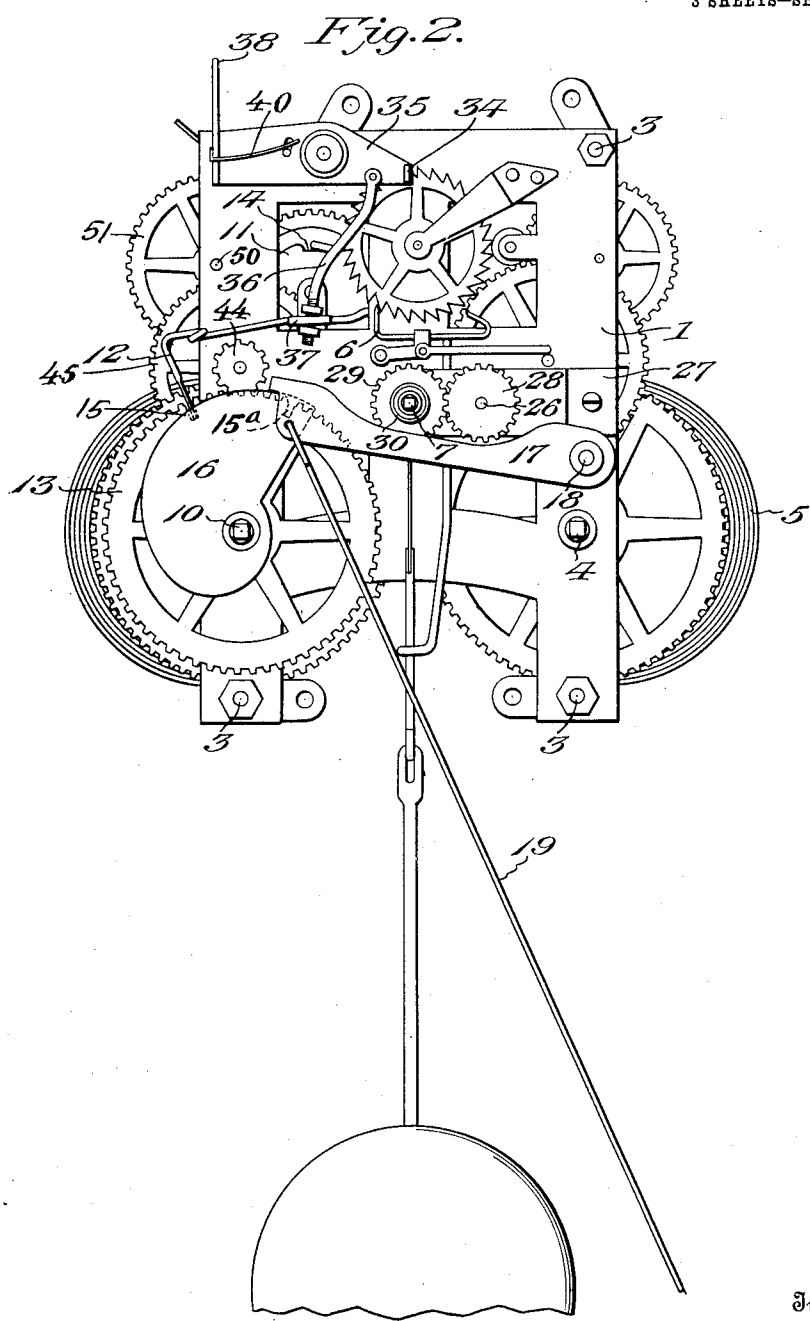
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3 SHEETS—SHEET 3.

Fig. 3.

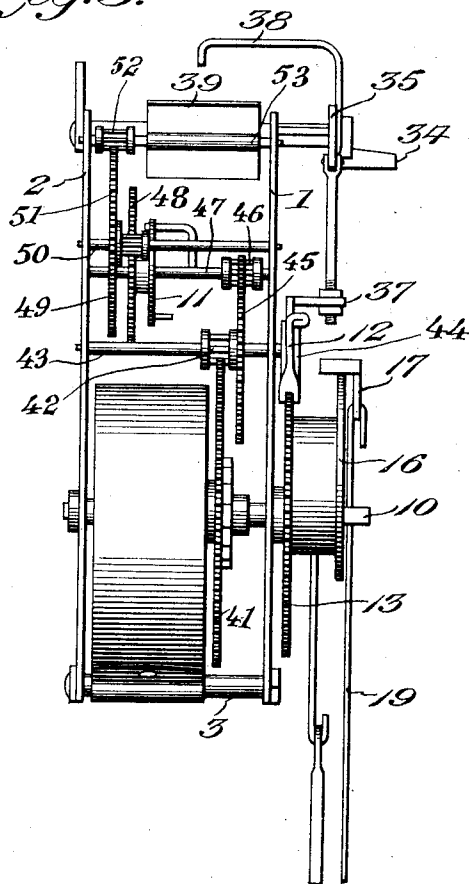


Fig. 5.

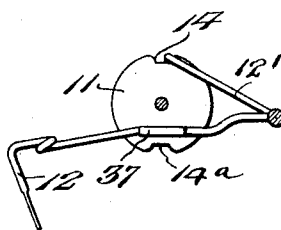
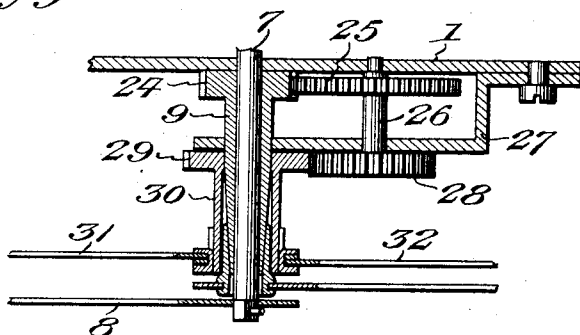


Fig. 4.



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UNITED STATES PATENT OFFICE.

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ELECTRIC TIME-SWITCH.

1,037,818.

Specification of Letters Patent.

Patented Sept. 3, 1912.

Application filed October 6, 1910. Serial No. 585,672.

To all whom it may concern:

Be it known that I, WILLIAM J. BROWN, a citizen of the United States, residing at Boulder, in the county of Boulder and State of Colorado, have invented new and useful Improvements in Electric Time-Switches, of which the following is a specification.

This invention relates to electric time switches and the object of the invention is to utilize the striking mechanism of an ordinary eight-day chronometer for actuating an electric switch at predetermined intervals to control the circuit in which the switch is included.

The primary object of the device is to automatically control a light circuit whereby the lights in a show window may be turned on at a predetermined time and turned off after a certain period has elapsed.

Further objects of the invention will appear as the following specific description is read in connection with the accompanying drawing which forms a part of this application and in which:

Figure 1 is an elevation of the clock. Fig. 2 is a similar view with the dial removed. Fig. 3 is an end elevation. Fig. 4 is a detail sectional view. Fig. 5 is a detail elevation of the striking lever and its associated parts removed from the train.

Referring more particularly to the drawings 1 and 2 represent the separate sides of the frame which are held in spaced relation by means of the posts 3. The frame carries the usual eight-day chronometer mechanism including the winding shaft 4 and main spring 5 and the pendulum escapement 6. Interconnected in the chronometer train is the usual hand arbor 7 upon which is mounted the minute hand 8 and which is intergeared with the train to drive the hour arbor 9 which is sleeved upon the shaft 7. In the opposite side of the frame is journaled the winding shaft 10 of the striking mechanism which includes the usual train of gears and the striking cam 11. This striking cam operates or controls through the arm 12' in the usual manner the striking lever 12 which engages the usual notched wheel 13 and prevents the arm 12' from entering the notches 14 or 14^a in the striking cam except at predetermined points where the notches in the wheel 13 are made deep to receive the end of the striking lever, as shown at 15 and 15^a.

Connected to the toothed wheel 13 is a

cam 16 upon which rides the free end of a lever 17 whose other end is pivoted upon a post 18 projecting from the frame. This lever has connected to it one end of a link 19 whose opposite end is connected to the blade 20 of an electric switch 21. The blade 20 is normally held in engagement with its contacts 22 by means of a spring 23 which is placed under tension when the lever 17 is raised.

The hour arbor 9 in this instance is provided with a pinion 24 which meshes with a gear 25 carried upon a shaft 26 which is journaled in the frame 1 and in an arm 27 secured to the frame 1 and having an offset extension spaced therefrom. The outer end of the shaft 26 has secured thereto a gear 28 which meshes with a similar gear 29 carried upon the lower end of a sleeve 30 which surrounds the hour arbor and has connected to its upper end the tripping arms 31 and 32 frictionally held in adjusted position. These tripping arms are provided at their outer ends with cam faced plates 33 which are adapted to be engaged beneath the under face of a lateral extension 34 upon the tripping lever 35 which is connected to the striking lever 12 by a rod 36 which is pivoted to the tripping lever and has adjustable connection with an ear 37 projecting laterally from the striking lever 12. The gear 25 has twice as many teeth as the gear 24 and the gears 28 and 29 have an equal number of teeth. The hour hand therefore travels around the clock twice as fast as the arms 31 and 32 so that the arm 31 only engages the tripping lever 35 every twenty-four hours and it will be understood that if it is desired to maintain the lamp circuit complete or the switch blade in operation to complete the circuit for a predetermined period, the arms 31 and 32 should be one-half the distance apart that the hour hand will take to travel during that time. In other words, if it was desired to complete the circuit at six o'clock and disconnect it at twelve o'clock, the arms 31 and 32 will be separated so that one would be at twelve and the following one would be at nine upon the dial.

In order that the striking train may not be operated until either one of the arms have passed beyond the tripping lever 35, a laterally extending arm 38 having a hooked end is mounted upon the tripping lever and is adapted to have its hooked end brought into engagement with the retarding fan 39 of the

striking train so that even after the striking lever is raised from the toothed wheel 13, the train cannot operate owing to the contact of the hooked end with the fan until the tripping lever is entirely released by the arms when the spring 40 which operates the tripping lever and controls the striking lever will raise the hooked end of the arm out of engagement with the fan and permit the train to operate.

In order to drive the wheel 13, the cam wheel 11, and the fan 39, there is shown connected to the shaft 10 a gear 41 which meshes with the pinion 42 carried upon the shaft 43 journaled in the frame. This shaft carries a pinion 44 which meshes with and drives the wheel 13 and also carries a gear 45 which meshes with a pinion 46 on a transverse shaft 47 upon which is carried the wheel 11. This shaft also carries a gear 48 which meshes with the pinion 49 on a shaft 50. This shaft in turn carries a gear 51 which meshes with a pinion 52 carried upon the fan shaft 53.

In the operation of the device, we will assume that the parts are in the position as shown in Fig. 2 with the striking lever 12 in the notch 15 of the toothed wheel 13 and with the switch open, as shown in Fig. 1. When the arm 31 brings its cam surface 33 into engagement with the offset end 34 of the tripping lever 35, this end of the tripping lever is raised against the tension of the spring 40 and the arm 38 depressed into the path of the fan 39. This action also raises the arm 12 out of the notch 15 and the arm 12 out of the notch 14 in the cam wheel 11. The slight movement of the train permitted by the release of the arm 12' from the notch 14 until the fan blade engages the arm 38 is sufficient to carry the notch 14 out of the position to be engaged by the arm 12' so that after the arm 31 passes the projection 34 and the spring returns the tripping lever to normal position, the train will be in position to operate immediately that the fan is released. It will be noticed that there is sufficient play between the adjusting nuts upon the end of the link 36 to permit the same to be depressed without forcing the arm 12 into engagement with the toothed wheel 13. As the wheel 11 rotates, the end of the arm 12' being in engagement with the smooth surface of the wheel, the arm 12 will not drop until the arm 12' registers with the notch 14^a on the opposite side of the cam wheel, at which time the arm 12 will be in position to engage the notch 15^a, thereby stopping the rotation of the wheel 13. During the revolution of the wheel 13 from the notch 15 and the notch 15^a, the cam is moved from the position shown an equal distance so that the arm 17 has dropped off the cam and a spring 23 has forced the switch blade 20

into engagement with its contact, thus closing the circuit. When the arm 32 comes into engagement with the projection 34, the same operation is undergone with this exception: When the notches in the wheel 11 present themselves to the arm 12', the arm 12 will drop into one of the short teeth of the wheel which does not permit a sufficient lowering of the arm so that the arm 12' will enter far enough into the notch to hold the train from rotation. The continued rotation of the wheel, therefore, will raise the arm 12 sufficiently to release it from the short teeth until the notch 15 presents itself to the arm 12, at which time the arm 12 will drop into the notch and the arm 12' into the notch 14 of the wheel 11, thus positioning the parts as they are now shown in Fig. 2. During this latter movement, the switch will have been raised from its contact, as shown by the cam. By adjusting the arms 31 and 32, as has been heretofore described, it will be seen that the time of operation between the opening and the closing of the switch, or vice versa, may be properly regulated.

Having thus described the invention, what is claimed is—

1. In an electric time switch, the combination with a chronometer, an arm sleeve intergeared with the hour arbor of said chronometer, arms upon said sleeve, a striking train including a striking cam and a notched striking wheel, a striking lever operating in connection with said notched wheel, to control the striking train, means operated by the arms for intermittently releasing the striking lever from the notched wheel, and means operated by the notched wheel for controlling a circuit.

2. In an electric time switch, the combination with a chronometer, an arm sleeve intergeared with the hour arbor of said chronometer, arms upon said sleeve, a striking train including a striking cam and a notched striking wheel, a striking lever operating in connection with said notched wheel to control the striking train, means operated by the arms for intermittently releasing the striking lever from the notched wheel, a cam connected to said notched wheel, and means operated by the cam for controlling an electric circuit.

3. In an electric time switch, the combination with a chronometer, an arm sleeve intergeared with the hour arbor of said chronometer, hands upon said sleeve, a striking train including a striking cam and a notched striking wheel, a striking lever operating in connection with said toothed wheel to control the striking train, means operated by the arms for intermittently releasing the striking lever from the notched wheel, a cam connected to said toothed wheel, a lever pivoted to the chronometer frame and adapted to be actuated by said

cam, and means operated by the lever for controlling an electric circuit.

4. The combination with an electric switch, of a chronometer comprising a hand
5 operating train, and a striking train, a striking cam included in said striking train, a toothed wheel included in said striking train, a striking lever coacting with the striking cam and toothed wheel to control
10 the operation of the striking train, a tripping lever connected to the striking lever, means controlled through the hand operating train to operate said tripping lever at predetermined intervals, a cam carried by

the toothed wheel, a lever carried by the 15 chronometer frame, and a link connecting the lever and the switch blade and adapted to be operated by the cam, together with means to normally hold the lever down upon the cam and switch blade in engagement with 20 its contact.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM J. BROWN.

Witnesses:

A. D. MCGLOTHLEN,
P. M. NELSON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."