

A. CARPENTER.
TIME CONTROLLED MECHANISM.
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1,003,335.

Patented Sept. 12, 1911.

2 SHEETS—SHEET 1.

Fig. 2

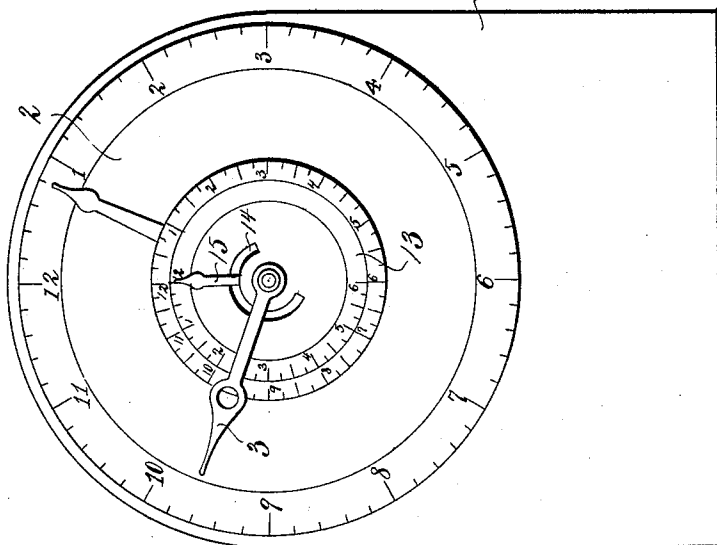
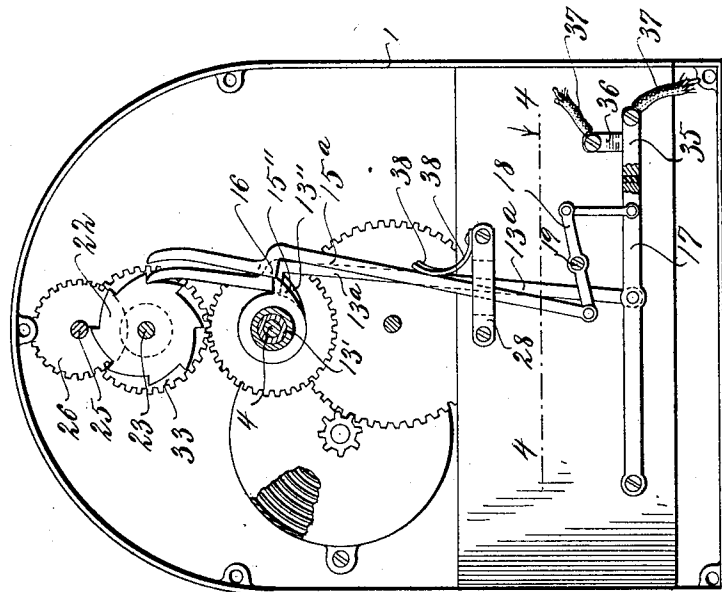


Fig. 1



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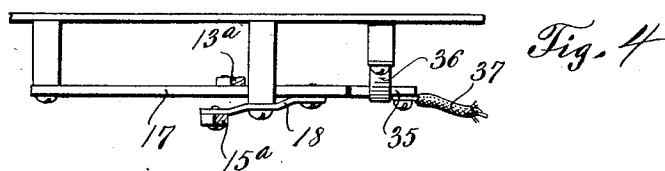
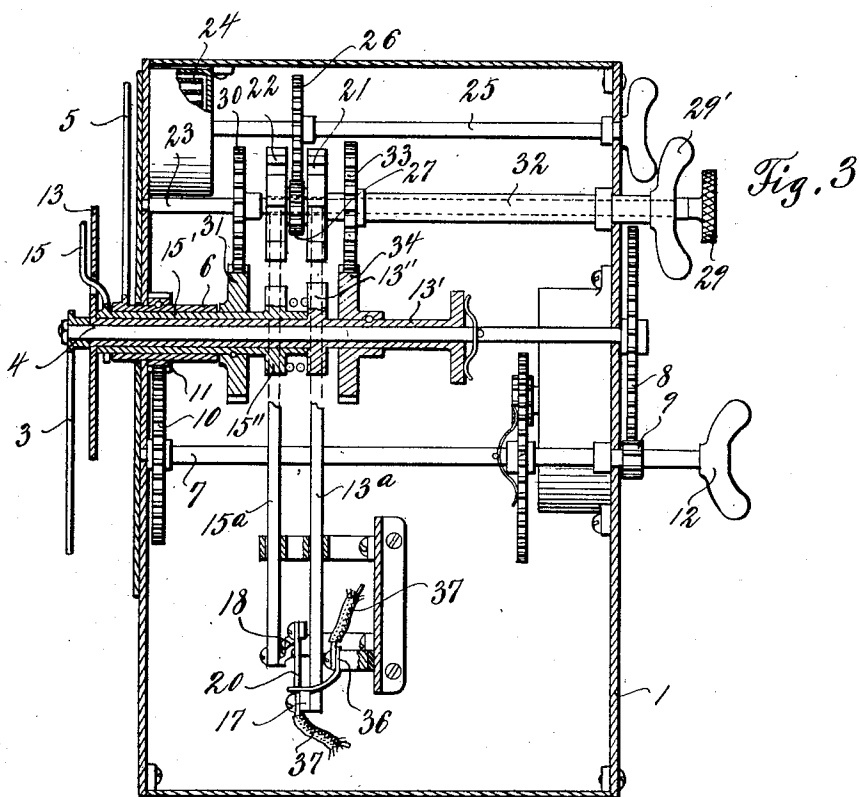
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

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TIME-CONTROLLED MECHANISM.

1,003,335.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ADAM CARPENTER, a citizen of the United States, residing at Tacoma, in the county of Pierce and State of Washington, have invented certain new and useful Improvements in Time-Controlled Mechanism, of which the following is a specification.

The present invention consists of a time operated device designed particularly for use in connection with heaters or the like for controlling the operation of the latter.

The invention involves the association with an operating lever adapted to constitute an electric switch for operable connection with means for turning on and off a gas heater, of a clock adapted to actuate at predetermined times, starting and stopping means for said lever.

The invention resides further in the advantageous arrangement of parts and special details of construction, affording important advantages in the creation of a practical and simple mechanism for the purpose described.

For a full understanding of the invention, reference is to be had to the following description and to the accompanying drawings, in which—

Figure 1 is a vertical sectional view of the device embodying the essential features of the invention; Fig. 2 is a front elevation of the clock face, being shown in connection with the setting dial and pointer; Fig. 3 is a section taken about at a right angle to that illustrated in Fig. 1; Fig. 4 is a transverse section taken about on the line 4—4 of Fig. 1, looking downwardly.

Throughout the following detail description and on the several figures of the drawings, similar parts are referred to by like reference characters.

It is contemplated to provide for the present invention any suitable clock mechanism arranged in a casing 1, said mechanism including an ordinary clock face or dial 2, having thereon indicia containing hours and minutes in the customary manner. An hour hand 3 is provided and is mounted on the hour shaft 4 journaled in suitable bearings in the casing 1. The minute hand 5 is carried by a sleeve 6, and the hands 4 and 5 are operated in any suitable manner for proper relative movement by connection with the main operating shaft 7, actuated by a spring or other suitable

motor. Gears 8 and 9 connect the shaft 7 directly with the shaft 4, and gears 10 and 11 connect said shaft with the sleeve 6 carrying the minute hand 5, the diameters of the respective gears being such as to cause the minute hand to move twelve times as fast as the hour hand. The shaft 7 may have a finger piece 12 for turning the same for the purpose of setting the clock.

The mechanism comprised by the present invention consists of a setting indicator or dial 13 spaced from the face or clock dial 2, and exposed to view, said setting dial 13 having an arc shaped slot 14, through which a setting indicator or pointer 15 passes. The dial 13 is carried by a sleeve 13' mounted on the shaft 4, whereas the setting pointer 15 is carried by a sleeve 15', received on the sleeve 13'. The sleeve 13' fits on the shaft 4 with sufficient friction to cause said sleeve to rotate with said shaft normally, though the sleeve may be moved independently of the shaft in order to set the dial 13 in a predetermined position with respect to the clock dial 2. Mounting of the sleeve 15' on the sleeve 13' is practically the same as the mounting of the sleeve 13' on the shaft 4, for purposes to be hereinafter made clear.

The sleeve 6 is supported on the sleeve 15', being of sufficient diameter to loosely receive the latter. The sleeves 13' and 15' are provided with cams 13'' and 15'' respectively. The cams 13'' and 15'' are arranged to coact with loosely mounted pawls 13^a and 15^a, the latter preferably, though not necessarily, having shoulders 16 intermediate their ends for direct contact with the respective cams aforesaid.

The pawl 13^a is connected at one end with a controlling lever 17, whereas the pawl 15^a is connected at one end with an auxiliary lever 18 pivoted between its ends at 19, said lever 18 being connected by a link 20 with the controlling lever 17. The other ends of the pawls 13^a and 15^a, being the upper ends as shown in the drawing, are arranged for operative engagement by toothed wheels 21 and 22 respectively, the latter being mounted upon a countershaft 23 at the upper portion of the casing 1. The toothed wheels 21 and 22 are normally acted upon by a small spring motor 24, or the like, the operating shaft 25 of which has a gear 26 engaging in mesh with a pinion 27 on the hub portion of the toothed wheels 21 and 22, said wheels being preferably connected for simultaneous

movement by said hub portion, and loosely mounted upon the counter shaft 23. The pawls 13^a and 15^a are guided in their movement by a bracket 28 loosely embracing said pawls intermediate their ends.

While the countershaft 23 forms a support upon which the wheels 21 and 22 are loosely mounted, the primary purpose of the shaft 23 is to carry operating means for turning the sleeves 13' and 15' to correspondingly adjust the positions of the setting dial 13 and setting hand 15, whereby the cams 13'' and 15'' will be placed in certain positions to trip the pawls 13^a and 15^a at predetermined times in the operation of the clock.

Having the above in view, the shaft 23 has at its outer end a finger piece 29 for turning the same and said shaft has a gear 30 meshing with a gear 31 on the sleeve 15'. Loosely supported on the shaft 23 is an adjusting sleeve 32, having a gear 33 rotatable therewith, said gear 33 being in mesh with a gear 34 on the sleeve 13' which carries the setting dial 13. Obviously, by turning the finger piece 29, the gears 30 and 31 will be rotated to turn the hand 15 into a predetermined position simultaneously adjusting the position of the cam 15'' of the sleeve 15'. In like manner, by manipulation of a finger piece 29', rotatable with the sleeve 32, the gears 33 and 34 may be operated to adjust the position of the sleeve 13' and its setting dial 13.

The lever 17 is shown in Fig. 1, pivoted at one end, and at its opposite end is provided with an electric contact 35 movable toward and from a stationary contact 36. Electric circuit wires may be connected with the contacts 35 and 36 and their terminals are shown at 37. Having in view the positions of the parts shown in Fig. 1, should the operator desire to stop the heater controlled by the lever 17, the finger piece 29 will be turned to actuate the shaft 23 and gears 30 and 31 whereby to set the pointer 15 in a predetermined position with reference to the hour hand 3. The hour hand 3 with the pointer 15 of course move together, and when the proper time at which the pointer 15 is set is reached by the hour hand, the cam 15'' controlled by the pointer 15 will strike the pawl 15^a, disengaging said pawl from the toothed wheel 22, whereupon the motor 24, normally tending to turn the wheels 21 and 22, rotates said wheels sufficiently to cause the wheel 21, now in engagement with the pawl 13^a, to move said pawl downwardly and force the lever 17 in a corresponding direction to disconnect the contacts 35 and 36, stopping the operation of the heater, which is assumed to be within the electric circuit of the wires 37. Fig. 1 shows the parts of the invention just as the cam 15'' disengages the pawl 15^a from its

wheel 22, permitting the motor 24 to actuate the other pawl 13^a and the lever 17 which is directly connected with the same. Of course, after the cam 15'' passes the shoulder 16 of the pawl 15^a, said pawl is permitted to reengage its wheel 22 and catches in the next tooth of said wheel, stopping the rotation of the wheels 21 and 22 immediately after actuation of the lever 17.

Assuming now that the operator has adjusted the dial 13 to start the heater again at a predetermined time, it will be obvious that when the cam 13'' turns around into engagement with the pawl 13^a, this pawl will be raised out of engagement with its toothed wheel 21, whereupon the wheels 21 and 22 will be raised for quick rotation by the motor 24, the wheel 22 under such conditions forcing the pawl 15^a downwardly and pulling the lever 17 upwardly through the link connection 20, thereby engaging the contacts 35 and 36, starting the heater again.

In a similar manner to the operation of the cam 15, just as soon as the cam 13'' passes the shoulder 16 of its pawl 13^a, the pawl 13^a will be forced into engagement with its toothed wheel 21 to prevent the turning of the wheels 21 and 22 more than the distance represented by the length of a single tooth on each wheel.

Springs 38 may be utilized to normally hold the pawls 13^a and 15^a in engagement with their respective wheels 21 and 22.

It is to be understood that the controlling lever 17 may be connected mechanically with an operating member adapted to start and stop a gas or other heater, notwithstanding that the invention is illustrated in association with a controlling lever adapted to open and close an electric circuit, including an electric heater.

Having thus described the invention, what is claimed as new is:

1. In a time controlled device, the combination of clock mechanism including an hour shaft, inner and outer sleeves mounted on said shaft for normal movement therewith and adapted for independent movement under positive actuation, setting indicators associated with said sleeves, controlling mechanism, cams carried by the respective sleeves cooperating with the controlling mechanism, and means for adjusting the positions of the sleeves with their cams comprising a countershaft, a gear rotatable with the counter shaft and connecting the same with one of the sleeves, a setting sleeve mounted on the countershaft, a gear connecting the setting sleeve with the other of the first mentioned sleeves, and members for operating the setting sleeve and countershaft, to independently adjust the positions of the setting indicators.

2. In a time controlled device, the com-

5 bination of clock mechanism including an
 hour shaft, inner and outer sleeves mounted
 on said shaft for normal movement there-
 with and adapted for independent move-
 10 ment under positive actuation, setting in-
 dicators associated with said sleeves, con-
 trolling mechanism cams carried by the re-
 spective sleeves coöperating with the con-
 trolling mechanism, and means for adjust-
 15 ing the positions of the sleeves with their
 cams, and comprising a countershaft, a gear
 rotatable with the counter shaft and con-
 necting the same with one of the sleeves, a
 setting sleeve mounted on the countershaft,
 20 a gear connecting the setting sleeve with the
 other of the first mentioned sleeves, and
 members for operating the setting sleeve and
 countershaft, to independently adjust the
 positions of the setting devices, the con-
 25 trolling means aforesaid comprising a lever,
 pawls operably connected with said lever
 for imparting movement thereto in reverse
 directions, and arranged for engagement by
 the cams on said sleeves, and means nor-
 30 mally tending to force said pawls in a pre-
 determined direction to impart correspond-
 ing movement to said lever.

3. In time controlled mechanism, the com-
 bination of clock mechanism, cams, setting
 30 indicators associated with the clock mecha-
 nism for facilitating adjustment of the posi-

tions of said cams, a controlling lever, pawls
 operably connected with said lever for im-
 parting movement thereto in reverse direc-
 tions, and each adapted to be engaged by a 35
 respective one of the cams, toothed wheels
 normally engaging the pawls to force the
 same in a predetermined direction, and
 means for turning said toothed wheels when
 one or the other of the pawls is disengaged 40
 therefrom.

4. In a time controlled device, the com-
 bination with a clock mechanism, setting in-
 dicators associated therewith comprising a
 pair of cams, means for adjusting the posi- 45
 tions of said cams, toothed wheels, means
 for normally turning said wheels in a pre-
 determined direction, a pair of pawls in en-
 gagement with the respective toothed wheels,
 and adapted to be alternately drawn out of 50
 such engagement by said cams, a controlling
 lever, and means connecting the pawls with
 the controlling lever whereby one pawl im-
 parts a movement to the controlling lever in
 a direction reverse to the movement im- 55
 parted by the other pawl when actuated.

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

ADAM CARPENTER.

Witnesses:

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