UNITED STATES PATENT OFFICE.

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AUTOMATIC GAS-LIGHTER.

1,074,728.

 Application filed December 27, 1912. Serial No. 738,888.

To all whom it may concern:

Be it known that I, HENRY MEYER, a subject of the Emperor of Germany, and a resident of New York, borough of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Automatic Gas-Lighters, of which the following is a full, clear, and exact description.

This invention relates to means whereby the gas may be automatically turned on and lighted and the gas again shut off at a fixed time and according to the wishes of the user.

One of the principal objects of the invention is to provide simple and efficient mechanism which may be located adjacent to a gas burner and so connected to the valve or cock that the latter may be moved to open the gas, and means automatically actuated to create a spark sufficient to light the gas at the burner tip and the gas again shut off automatically at a predetermined time without any manipulation whatever on the part of an attendant.

Another object of the invention is to provide a mechanism which may be operated by the usual form of clock mechanism and which may be set at a fixed time to turn on and shut off the gas and to light the gas immediately that it is properly turned on.

Other objects of the invention are to provide simple means for creating a spark and which may be located adjacent to the burner tip; to provide means which may be set in a position to control the time for turning on or shutting off the gas; and to provide simple means, as clock mechanism, for operating the said mechanism.

A further object of the invention is to provide means which is so constructed and arranged that substantially the whole mechanism may be included within a proper casing.

With these and other objects in view, the invention will be hereinafter more particularly described with reference to the accompanying drawings, which form a part of this specification, and will then be pointed out in the claims at the end of the description.

In the drawings, Figure 1 is a vertical section, partly in elevation, showing a part of the mechanism for shutting off and turning on the gas and for lighting the same, the section being taken on the line I—I of Fig. 3. Fig. 2 is a sectional view through the casing taken on the line II—II of Fig. 3, showing the clock driving mechanism; and Fig. 3 is a plan view, partly in section 60 and partly in elevation, of the automatic lighting and turning off mechanism.

The casing 10 may be cylindrical and within the casing may be arranged suitable clock mechanism 11 of the usual or of any preferred kind. This mechanism has the usual escapment 12 and the train of gears 13, and one of the gears, as the gear 14, is secured to a drive shaft or spindle 15. On the shaft or spindle 15 is a pinion 16 and this pinion is in mesh with a gear 17 forming a part of the automatic lighting and gas controlling mechanism 18. The gear 17 is held to a shaft 19 and on the shaft 19 is a pinion 20. The pinion 20 is in mesh with a gear 21 to which is held a dial 22. A stationary pointer 23 is mounted upon the shaft or spindle 24 of the gear 21 and dial 22, about which pointer the dial 22 is adapted to move. The dial 22 may be divided as in the ordinary clock or watch dial and at intervals around the periphery thereof may be openings 25 corresponding to the hours or parts of hours in any one of which openings a pin 26 or other projecting part may be detachably held. The dial as it rotates carries the pin or part 26 therewith and this pin is adapted to engage the end 26 of a link or member 27. The member 27 has a slot 28 through which passes a pin 29 to guide the same, and at its end opposite the end 26 is pivoted at 30 to a lever 31. The lever 31 is pivoted at 32 intermediate its ends and at one end is connected to a rod or link 33. This rod or link 33 is pivoted at 34 to an arm 35 forming operating means for a valve or cock 36. The valve or cock 36 may be of the usual construction employed in connection with gas burners, as the burner 37, which has the usual burner tip 38 and to which burner the gas may be supplied in any suitable way.

It will be evident that as the clock mechanism is set in motion the pinion 16 will rotate the gear 17 and through the pinion 20 rotate the gear 21 and dial 22 and cause the pin 26 to engage the end 26 of the lever or slideable member 27. This will force the slideable member lengthwise to the position shown to throw the lever 31 and rod 33 to a position to close or turn off the gas, permitting in this case the pin to pass by the end...
26 if the dial should again make a complete rotation and without operating the said member 27 as the end 26 at this time will be out of the path of movement of the pin 25.

To automatically open the cock to turn on the gas, a segmental gear 39 is loosely mounted on a shaft 40. The teeth of this gear are adapted to mesh with the teeth of the gear 17 whereby said gear 39 is rotated, and carried by the gear 39 is a projecting arm or element 41 which is adapted to move in the path of the end of the lever 31 thereby forcing the link 33 and member 27 in the opposite direction to that secured by the pin 25 and serving to open the cock to turn on the gas and to throw the end 26 of the member 27 again in the path of the pin 25 to permit the said pin to actuate the member 27 as previously described for the purpose of shutting off the gas at a predetermined time according to the position of the pin 25 on the dial 22. The projection or engaging element 41 may be fixed to the gear 39 and this gear may be divided peripherally to correspond with hours and a suitable stationary pointer 42 may be arranged to indicate the position of the gear 39 and thereby the position of the engaging part or element 41 with respect to the end or lever 31.

The gear 39 may be moved along the shaft 40 to disengage the teeth of the gear 39 from the teeth of the gear 17 and by giving it a partial rotation, the stop 31 may be positioned to shut off the gas at any time desired.

The spindle or shaft 40 has one end of a spring 43 fixed thereto and the other end of the spring is fixed to drive the gear 39. This spring 43 may be independent of the usual main driving spring of the clock mechanism and which is not shown, and tends to drive the gear 39 in the same direction as the clock spring drives the same. A ratchet wheel 44 is secured to the spindle 40 and engaging the teeth of this ratchet wheel is a pawl or dog 45. This construction permits the shaft 40 to be operated by a winding key in the usual way to wind the spring without rotating the gear 39, but the spring as it unwinds tends to force the gear 39 owing to the engagement of the pawl 45 with the ratchet wheel in the direction indicated by the arrow in Fig. 1. The gear 39 has its teeth in mesh with a gear or pinion 46 held to a shaft 47. On the shaft 47 is an igniting member or element 48 which may be in the form of a drum, as steel, having serrations or teeth to provide a roughened surface on the periphery thereof and which surface is adapted to be engaged by a sparking member or element 49. This element 49 may be of special material which can be purchased and which is employed in connection with many forms of igniting devices. The element 49 may be held in a holder 50 and is normally forced by a spring 51 into engagement with the drum or igniting element 48. So long as the teeth of the gear 39 mesh with the teeth of the gear 17, the drum element 48 will rotate slowly therewith, but as soon as the teeth of the gear 39 are out of mesh which occurs during a part of the rotation of the spindle 40, and owing to the teeth only extending around a part of the periphery of said gear making the same segmental in this respect, the spring 43 will then be free to act upon said gear and will impart a quick rotary movement thereto until the teeth of the gear 39 again mesh with the teeth of the gear 17. During this rotation, the part or projection 41 will be caused to act on the lever 31 to open quickly the cock to permit the gas to flow, and at the same time the drum or igniting element 48 will be given a quick rotary movement so as to cause friction between the elements 48 and 49 to create a spark sufficient to light the gas escaping from the burner tip immediately the gas is turned on. The gears are so proportioned with respect to each other that this result may be readily secured.

After the gas has been burning the proper length of time the member 27 will be operated by the pin 25 as already explained to shut off the gas.

It will be evident that under the construction shown, the gas is turned on by a very quick movement of the gear 39 and stop 41 while the turning off of the gas is comparatively slow according to the speed of the dial 22, but the action of the pin 25 on the member or element 27 may be such that the said member 27 may be quickly actuated to turn off the gas as suddenly as it is turned on any suitable means being provided for this purpose.

By the term "cock" it will be understood that any means is included within such term by which the gas or fluid may be turned on or shut off.

From the foregoing, it will be seen that simple and efficient mechanism is provided whereby gas may be automatically turned on or shut off at a predetermined time, and immediately the gas is turned on it will be lighted by means under automatic control; that simple igniting mechanism is provided; that simple means for determining the time when the gas may be turned on or shut off is provided; and that said means may be readily made and assembled and may be attached directly to the burner.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. A device of the character described, comprising clock mechanism, a gas controlling device, means for operating the gas controlling device in one direction, means operated by the clock mechanism for operating
said gas controlling device in the opposite direction, means whereby each of said
means may be set at a predetermined time to determine when the gas controlling device
is to be actuated, and means for automatically creating a spark to ignite the gas.

2. A device of the character described, comprising clock mechanism, a gas controlling
device, means actuated by the clock mechanism for operating the gas controlling
device in one direction, and means operated by independent rotary mechanism for operating
said gas controlling device in the opposite direction.

3. The combination of a gas controlling element, a lever, a connection between the
lever and said gas controlling element, means adapted to operate the controlling
element in one direction, a segmental gear,
a projecting part carried by said gear for moving the lever to actuate the gas controlling
element in the opposite direction, and means for automatically igniting the gas.

4. The combination of a gas controlling element, igniting means, a lever, a connection
between the lever and said gas controlling element, means adapted to operate the
controlling element in one direction, a gear,
and a part carried by said gear for moving the lever to actuate the gas controlling ele-
ment in the opposite direction.

5. The combination of a controlling element, a lever, a connection between the lever
and said controlling element, means connected to said lever and adapted to operate
the controlling element in one direction, a gear, and a part carried by said gear and
adapted to engage said lever for moving the controlling element in the opposite direc-
tion.

6. The combination of a gas controlling element, a gear, clock mechanism for rotating
said gear, a stationary pointer, a rotary dial driven by the gear and movable
about said pointer, a slide connected to the gas controlling means adapted to actuate
the same in one direction, a detachable element movable with the dial adapted to be
fixed at various locations thereon and adapted to engage the slide to actuate the gas
controlling means in the opposite direction, and means adapted to cause the slide to actuate
the gas controlling means in the opposite direction.

7. The combination with a gas controlling element, clock mechanism for actuating said
element in one direction, a gear having a projection adapted to actuate the gas con-
trolling element in the opposite direction, and means for turning said gear independ-
ently of the clock mechanism for this purpose, said gear being slidable axially where-
by it may be adjusted for timing the operation of its projection upon the gas con-
trolling element.

This specification signed and witnessed this 23rd day of December A.D. 1912.
HENRY MEYER.

Witnesses:
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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
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