Oct. 21, 1930. H. G. DRYSDALE 1,778,997

AUTOMATIC EGG BOILER

Filed Dec. 24, 1928

Fig. 1.

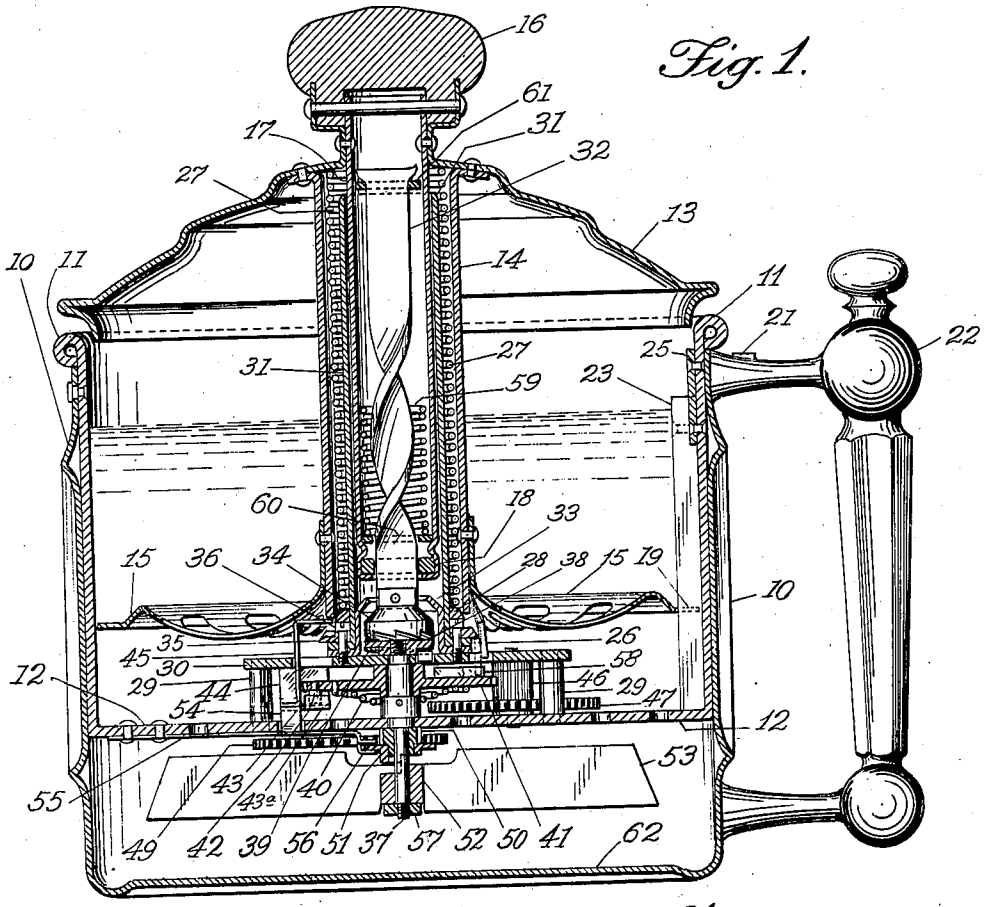
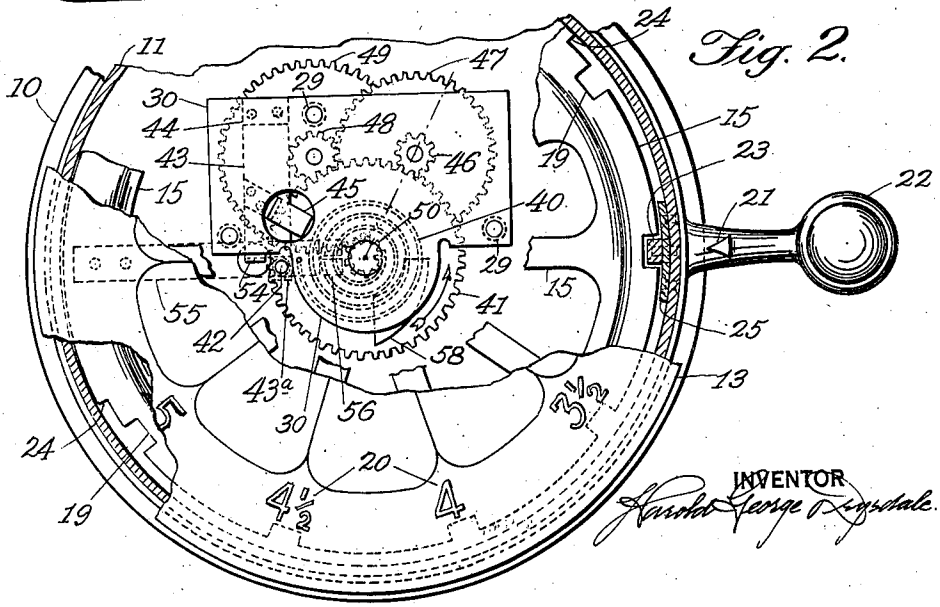


Fig. 2.



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AUTOMATIC EGG BOILER

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This invention pertains to automatic egg-boilers, its object being to provide means for accurately timing eggs to be boiled and for automatically taking the same out of the boiling water after having been immersed for a predetermined period of time for which the device has been set.

This object, in the present invention, is attained by incorporating with the water-container a suitable timing device and by associating with it a movable tray provided with means for actuating the said timing device by the insertion of the tray into the container, means for holding the tray in the immersed position during the operation of the timing device, and means for releasing and expelling the tray after the timing period.

The timing device consists of a spiral spring which through a train of gears acts on a paddle rotating in the water within the container. The device is set by winding the said spring by means of pushing the tray down into the container, the amount of unwinding before the release of the tray being governed by the angular displacement given to the tray before insertion. The insertion of the tray takes place against the upward pressure of a spring, and the tray is held by a latch after being pushed into boiling position. It remains in this position until a cam piece carried by the drive wheel of the gear train engages and trips the latch, thereby releasing the tray and permitting the lifting spring to expel the same.

In the accompanying drawings,—

Fig. 1 is a sectional elevation of the automatic egg-boiler and Fig. 2 is a top view of the same, partly broken away to show the arrangement of the tray and the plan view of the timing device.

Referring to the drawings, 10 is the water-container having the inside casing 11, the perforated bottom 12 of which forms the base of the timing device and other stationary parts of the apparatus. 13 is the cover to which, by means of the tube 14, the tray 15 is attached. To the cover, which has the knob 16, is also fastened the tube 17 which is concentric with tube 14 and in its end carries the nut 18. The tray 15 has notches or slots 19 equally spaced around one-half of its circumference, these slots registering with time-graduations 20 placed at corresponding points of the cover 13. When any one of the graduations 20 is set opposite a registering mark 21 on the handle 22 or other part of the container 10, one of the slots 19 registers with and, when the cover is pushed down, engages the vertical guide-rail 23 attached to casing 11. The slotted half of the circumference of tray 15 is somewhat smaller in diameter than the solid half, the shoulders 24 thereby formed on opposite sides of the dividing diameter engaging the stop-plate 25 attached to casing 11 and confining the turning range of the cover to one-half of a revolution. To the tube 14 is also attached the spring-latch 26 by which the tray is held in the immersed position after being forced into the container against the pressure of the coil spring 27 placed on the beveled washer 28, within the tube 14. The beveled edge of washer 28 guides the tube 14 when near its downmost position and accurately centralizes the same.

To the bottom-plate 12 of the casing 11 is fastened, by the posts 29, the plate 30 to which, in turn, the vertical guide-tube 31 is affixed which surrounds the inside tube 17 of the cover-member and which contains the screw 32 formed by a twisted flat strip fitting into the nut 18 carried by tube 17. The screw 32 is confined by the retaining ferrule 33 attached to plate 30 and carries the clutch-member 34. The flanges of tube 31 and ferrule 33 are held to plate 30 by the beveled washer 35 fastened by the screws 36, this washer constituting the stop for tube 14 in the boiling position of the egg-tray and also acts as the catch for the spring-latch 26, the latter, being bent outward by the beveled edge of the washer, hooking against the under side of the same.

Between the casing-bottom 12 and the plate 30 is mounted the timing mechanism which consists of the vertical main shaft 37 to the top of which is fastened the clutch-member 38 engageable with the member 34 carried by the screw 32. The downward thrust of screw 32 imparted by the insertion of the tray engages clutch-member 34 with clutch

member 38 the under side of which is notched as a ratchet to engage spring-washer 39, the bent-down end of which fits into a hole of plate 30 thus preventing it from turning with clutch-member 38 and causing it to act as a pawl to the same as the turning of the screw 32 through clutch 34, 38 winds the spiral spring 40 one end of which is anchored to shaft 37 while its other end is fastened to main drive wheel 41 of the timing device which is loose on shaft 37. The washer 39 prevents the clutch-member 38 from turning backwards and thus holds the spring 40 in the wound position, thereby driving the wheel 41 which normally is held stationary, but which is released by the downward movement of the tray-unit. For this purpose, the wheel 41 is provided with a stop-pin 42 which, due to an initial tension given to spring 40, engages a small upward extension 43ª of the flat spring 43 attached through spacing block 44 to plate 30 until the lower edge of tube 14 on its immersion presses on post 45 attached to spring 43 and passing through a hole in plate 30. Spring 43 is thereby forced downward and extension 43ª clears pin 42, rendering wheel 41 free to rotate, driving gear train 46, 47, 48, 49 and 50; the latter gear being loose on shaft 37 and having fastened to it the clutch-member 51 engageable with clutch-member 52 forming the hub of the paddle 53. Spring 43 has the downward projection 54 which passes through a hole in plate 12 and makes contact with the flat spring 55 fastened to the under side of plate 12 and having its free end shaped into a fork 56 which embraces the flange of clutch member 51. When spring 43 is pressed down by tube 14, it in turn forces down spring 55, thereby engaging the clutch-members 51 and 52, thus connecting paddle 53 with the gear train, this paddle turning in the water, thereby governing the speed of the gears. Hub 52 being loose on shaft 37, is held in position by end-nut 57.

The cover member in Fig. 1 is shown in nearly its lowermost position, with the tube 14 about to engage the post 45 of spring 43, and the latch 26 held in tension by the edge of washer 35, ready to drop into its locking position, shown in dotted lines, as soon as the tube 14 comes to rest on washer 35.

The gears are so dimensioned that the main wheel 41 of the timing device makes one revolution in five minutes. There are as many notches or teeth in clutch-members 34 and 38 as the angular spacing of the slots in the edge of tray 15 is contained in 360°. With 34 and 38 disengaged, screw 32 is revolved through nut 18, and for any setting of cover 13 selected, there is a tooth in line to engage in clutch-members 34 and 38, and shaft 37 is therefore always given a complete turn by inserting the tray. Upon the engagement of latch 26 and the simultaneous release of stop-pin 42, wheel 41 commences to revolve, thereby driving the timing mechanism. According to the setting of the cover, a cam-piece 58 carried by wheel 41 will trip latch 26 at any one of the timing sub-divisions after the completion of one-half of a revolution, that is, after 2½, 3, 3½, 4, 4½, or 5 minutes, only one-half of the timing-period being subdivided as 2½ minutes is deemed the minimum time of boiling desirable.

The tripping of latch 26 causes the tray-unit to be raised, due to the pressure of spring 27, thereby removing the eggs from the boiling water and lifting the cover of the container and to indicate that the eggs are done, and to dissipate the heat in the container by allowing escape of steam and admission of air.

At the moment of the tripping of latch 26, tube 14 releases its pressure on post 45, allowing spring 43 together with fork 56 of spring 55 to raise, thereby declutching 51 and 52 and paddle 53 comes to rest. The clock-mechanism is no longer restrained, and spring 40 will rapidly unwind until wheel 41 has revolved to the position in which pin 42 again engages spring 43 which is now in the interfering position as originally. This rapid return to original condition provides immediate availability for subsequent use.

To prevent the eggs from being knocked off the tray by the action of spring 27 and to minimize shock to the mechanism, a coil spring 59 placed around screw 32 inside of tube 17 and resting on washer 60 held near the bottom of tube 17 is used as a shock-absorber, its upper end engaging with washer 61 attached to the upper end of screw 32. When compressed, in the uppermost position of the tray-unit, spring 59 exerts pressure on washer 61 thereby lifting screw 32 and causing disengagement of clutch-members 34 and 38.

The space between the paddle 53 and the bottom 62 of the container 10 is reserved for an electric heating unit for boiling the water, the plug for making the connection with the supply socket being suitably arranged in the usual manner. This electrical equipment, however, may be omitted if it is desired to use the automatic egg-boiler in connection with gas or other heating systems.

Having thus described my invention, I make the following claims:

1. An automatic egg-boiler comprising a container partly filled with boiling water and having a movable cover; a tray within said container attached to said cover; and timing means consisting of a spring, a train of gears, and a paddle suspended in the boiling water and driven by said spring through said gear train; means for actuating said timing means by the insertion of the tray into the container; means for holding the said tray in the immersed position during the tim-

ing period; and means operated by the said timing gear for releasing and expelling the tray after the elapse of the timing period.

2. An automatic egg-boiler comprising a water container having a movable cover; a tray within said container attached to said cover; a stationary guide-rail for the insertion of said tray; and a timing device; the said tray being provided with slots and the said cover having graduations corresponding with said slots, the slots being engageable with said guide-rail, thereby setting the timing device according to the graduations on the cover; means for conditioning the timing device for timing action by the insertion of the tray into the container; means for holding the tray in the immersed position during the timing period; and means for releasing and expelling the tray after the elapse of the timing period.

3. An automatic egg-boiler comprising a water-container having a movable cover, a tray within said container attached to said cover, a stationary guide rail within said container, and a timing device; the said tray being provided with slots engageable with said guide-rail; the said movable cover carrying a fixed nut in engagement with a turnable screw adapted to condition the timing device for timing action; the act of moving the cover and tray into closing position along the said guide-rail placing the said screw into actuating engagement with the timing device and causing the said nut to revolve the said screw, thereby winding the spring of the timing device.

4. An automatic egg-boiler comprising a water-container having a movable cover, a tray within said container attached to said cover, and timing means including a main shaft, a spiral spring, a train of gears and a paddle, within said container; a fixed nut carried by the movable cover, a turnable screw held by the container, clutch-members attached to the said screw and to the said main shaft of the timing device, clutch members attached to the said gear-train and the said paddle of the timing device, and resilient connecting means between the movable cover and one member of each of said two pairs of clutch-members; the downward motion of the cover engaging the said pairs of clutch-members and the upward motion of the cover disengaging the same.

5. An automatic egg-boiler comprising a stationary container member and a movable cover-member; the container member comprising a timing spring, a main shaft, a train of gears, a paddle, a turnable screw, clutch members between the main shaft and the turnable screw, clutch-members between the gear-train and the paddle, a guide-rail, a guide tube, a retaining ferrule for the turnable screw, and a compressible spring; and the cover-member comprising a tray having slots corresponding with time-graduations on the cover and adapted to engage with the guide-rail of the container-member, a tube carrying a fixed nut in engagement with the screw of the container member, a spring latch adapted to engage with the container member and to be tripped by the gear-train of the container, and a shock absorbing spring limiting the upward motion of the cover-member and disengaging the clutch-members coupling the spring-winding screw with the main-shaft of the timing device.

Signed at 507 Fifth Avenue, New York city, in the county of New York and State of New York, this fifth day of June, A. D. 1928.

HAROLD GEORGE DRYSDALE.