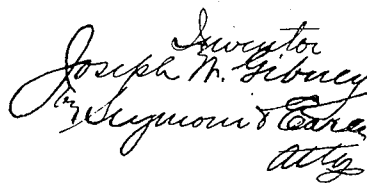


1,176,285.

2 SHEETS—SHEET 1.



J. W. GIBNEY.
TIME CONTROLLED OPERATING MECHANISM.
APPLICATION FILED MAY 4, 1915.

1,176,285.

Patented Mar. 21, 1916.

2 SHEETS—SHEET 2.

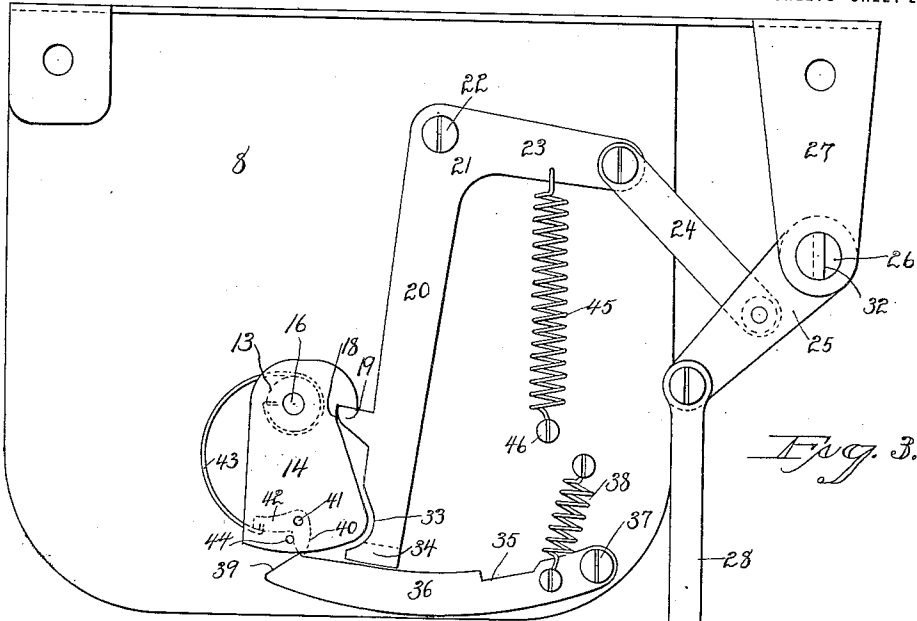


Fig. 3.

Fig. 6.

Fig. 7.

Fig. 8.

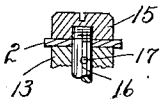
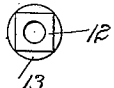
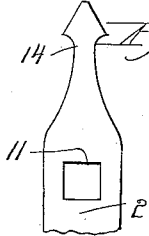
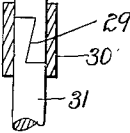
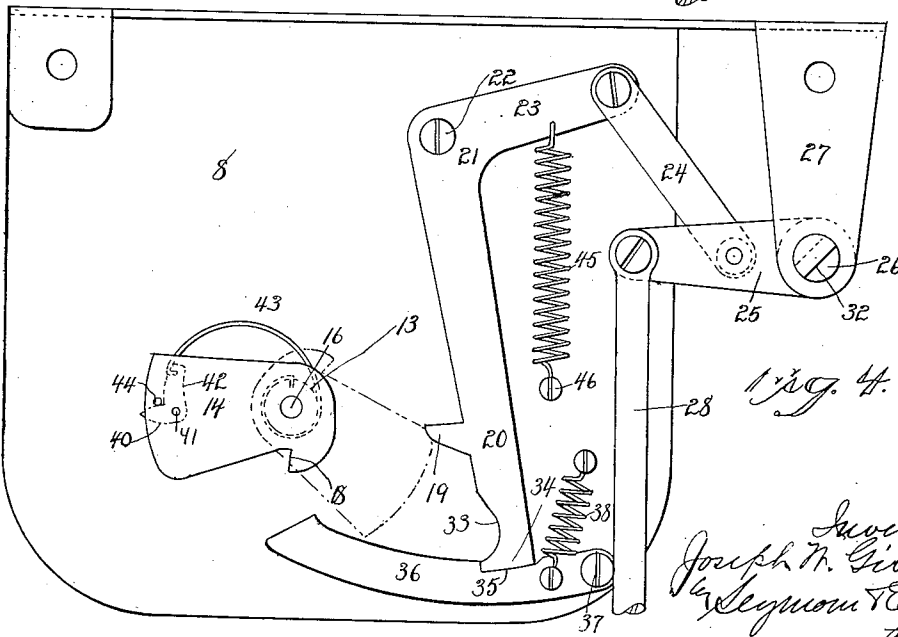


Fig. 4.

Inventor
Joseph W. Gibney
By Seymour T. Cottle
Atty

UNITED STATES PATENT OFFICE.

JOSEPH W. GIBNEY, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO THE SENTINEL MFG. CO., OF NEW HAVEN, CONNECTICUT, A CORPORATION.

TIME-CONTROLLED OPERATING MECHANISM.

1,176,285.

Specification of Letters Patent.

Patented Mar. 21, 1916.

Application filed May 4, 1915. Serial No. 25,762.

To all whom it may concern:

Be it known that I, JOSEPH W. GIBNEY, a citizen of the United States, residing at New Haven, in the county of New Haven and State of Connecticut, have invented a new and useful Improvement in Time-Controlled Operating Mechanism; and I do hereby declare the following, when taken in connection with the accompanying drawings and the characters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this application, and represent in—

Figure 1 a view in front elevation of my improved time-controlled operating mechanism. Fig. 2 a reverse plan view thereof with the case thereof in horizontal section. Fig. 3 a rear view thereof with the case and the timing-mechanism removed to show the trigger and transmitting mechanisms, the parts of the former being shown in their tripped positions. Fig. 4 a corresponding view with the same parts in their cocked and set positions. Fig. 5 a detached view in rear elevation of the timing-mechanism with the rear movement-plate removed. Fig. 6 a broken detail sectional view showing the connection of the setting-lever with the winding-arbor and the hub of the trigger-cam. Fig. 7 a detached end view of the hub of the trigger-cam. Fig. 8 a detached broken plan view showing the upper portion of the setting-lever.

My invention relates to an improved time-controlling operating mechanism adapted to be used in a variety of situations where it is desired to perform an operation at the end of a predetermined period, such as in automatic cooking by gas, oil or electricity, in heating water, in japanning, etc., the object being to produce a compact, convenient and reliable device constructed with particular reference to being operated by a single manually operated lever adapted to discharge the two-fold function of cocking the mechanism preparatory to its being released, and of setting the mechanism to provide for its being automatically released at a predetermined time.

With these ends in view, my invention consists in a self-contained time-controlled operating mechanism having certain details of construction and combinations of parts as will be hereinafter described and pointed out in the claims.

In carrying out my invention, I employ a setting-lever 2 provided at its lower end with a handle 3 and at its upper end with an index-pointer 4 arranged to sweep over a graduated dial 5 and sufficiently set inward from the plane of the lever to engage with a stop-pin 6 which the lever itself clears. The said dial 5 is formed upon a plate 7 secured to the front of the main-frame 8 by means of a screw 9 passing through the sheet-metal case or housing 10. The lever 2 is formed adjacent to the pointer 4, with a square opening 11 fitting over a corresponding shoulder 12 upon the projecting outer end of the hub 13 of a trigger-cam 14 located directly back of the front of the main frame 8 as shown in Fig. 2, the lever being held in place upon the hub 13 by means of a cap-nut 15 screwed upon the projecting outer end of the winding or main arbor 16 to which the hub is secured by a pin 17. The said trigger-cam 14 is formed near its inner or upper end with a stop-notch 18 receiving a lug 19 formed upon the adjacent edge of the depending arm 20 of a bell-crank trigger-lever 21 hung upon a stud 22 and having its upper arm 23 connected by a link 24 with a rocker arm 25 mounted upon a short rocker-shaft 26 journaled in bracket-arms 27 forming a part of the main frame 8.

A coupling-rod 28 secured to the lower end of the rocker-arm 25 has its lower end formed with a dovetail 29 adapting it to be coupled by means of a sleeve 30 or equivalent means, with the dovetailed upper end of an operating-rod 31 forming no part of my present invention but connecting my improved device with the apparatus, whatever its character may be, to be operated. As shown, the rocker-shaft 26 has its projecting rear end formed with a dovetail 32 adapting it to be coupled with a shaft, not shown, leading to the mechanism to be operated. With the rod 28 reciprocating motion is secured, and with the shaft 26 a rotary motion is secured, one answering the same purpose as the other, and one or the other being chosen according to circumstances.

At its lower end the arm 20 of the trigger-lever 21, is cut away as at 33 to clear the adjacent edge of the trigger-cam 14 and to form a nose 34 adapted to enter the notch 35 of a longitudinally bowed trigger 36 hung upon a stud 37 mounted in the frame

8. A helical trigger-spring 38 connected with the trigger exerts a constant effort to lift the same into position for coaction with the nose 34 of the trigger-lever 21. At its outer end the trigger is beveled as at 39 for co-action with a tripping-dog 40 turning upon a pin 41 in the lower end of the trigger-cam 14 and furnished with a tail 42 receiving one end of a spring 43 the opposite end of which is wrapped around and secured to the hub 13 of the trigger-cam. A stop-pin 44 mounted in the said cam 14, limits the movement of the dog 40 in one direction but leaves it free to swing in the opposite direction. A power-spring 45 connected at one end to the arm 23 of the lever 21 and at its opposite end to a stud 46 in the main frame 8, supplies the power for operating the rod 28 and the shaft 26. The said trigger-cam 14, trigger-lever 21 and trigger 36 are the main elements of the "cocking-mechanism", by which term I mean to characterize the mechanism employed to prepare my device for being automatically and effectively released at a predetermined time by the action of the timing-mechanism, it being understood that the said cocking-mechanism is cocked and the timing-mechanism set, by the single, manually operable setting-lever 2 which, under my present invention, discharges this two-fold function; whereas in the prior art the means for cocking and setting such devices have been independent of each other.

As shown the winding-arbor 16 is provided with a friction device 47 whereby it is frictionally connected with the main wheel 47^a of the timing mechanism as more fully shown and described in my co-pending application filed Feb. 4, 1915, Serial No. 6148.

As herein shown, the timing mechanism comprises a front movement-plate 48, a rear movement-plate 49, and pillars 50 uniting the same. The said plates provide bearings for the winding-arbor 16 which is encircled by an ordinary main spring 51 which is wound and also unwound by the said arbor, which is turned for this purpose by the setting-lever 2. The escapement-train consists of a second-wheel pinion 52 meshed into by the said main wheel 47^a and mounted upon an arbor 53 carrying the second-wheel 54 which meshes into a third-wheel pinion 55 mounted upon an arbor 56 carrying the third-wheel 57 which meshes into a pinion 58 on the arbor 59 of an escapement-wheel 60 co-acting with a verge 61 on a verge-arbor 62 mounting an escapement-lever 63 co-acting with a balance-wheel 64 having a balance-spring 65. I do not, however, limit myself to the employment of any particular escapement-train.

By turning the setting-lever 2 counter-clockwise after the mechanism has been initially set, the spring may be unwound

against the resistance of the friction-device 47 which thus permits the time limit to which the device was initially set, to be reduced to any desired extent or nullified altogether.

In the operation of my improved mechanism, the handle 3 of the setting-lever 2 is grasped and the said lever swung clockwise until its index-pointer 4 is brought to a stop upon the pin 6 as indicated by the broken lines A in Fig. 1. In this movement of the lever 2, the trigger-cam 14 is swung from its normal or idle position in which it is shown by full lines in Fig. 3, to its cocking-position in which it is shown by broken lines in Fig. 4. During this movement the edge of the cam by co-acting with the end of the lug 19 on the arm 20 of the bell-crank trigger-lever 21, swings the same upon its stud 22 so as to register the nose 34 of the arm 20 of the said lever with the notch 35 of the trigger 27. At this moment the trigger-spring 38 lifts the trigger 36 into its cocked position as shown in Fig. 4. The operating-spring 45 is at the same time placed under further tension and the rod 28 positively lifted. The mechanism having been cocked, as it were, in the manner described, the lever 2 is by its handle 3 swung counter-clockwise so as to sweep its index-pointer 4 over the graduated dial 5 until the pointer has been brought into registration with the graduation representing the period or length of time which it is desired shall elapse between the setting of the device and its being tripped by the action of the timing-mechanism.

As shown in the drawings, the dotted lines B represent the device as set for a time-limit of thirty minutes. The counter-clockwise movement of the lever 2 just described, winds the mainspring 48 of the timing-mechanism so that the moment the hand is removed from the lever 2, the escapement-train of the said timing-mechanism begins to run, whereby the winding-arbor 13 and hence the trigger-cam 14, are reversely rotated in the clockwise direction. In this connection it may be explained that in the counter clockwise or setting operation of the lever 2, the trigger-tripping dog 40 rides over the end of the trigger 36 without operating the same, the dog turning idly on its pivot 41 against the light tension of its spring 43. When, however, the trigger-cam 14 is turned clockwise by the action of the timing-mechanism, the dog 40 is prevented from yielding by its stop-pin 44 so that when it is brought into engagement with the bevel 39 of the trigger 36 just before the expiration of the predetermined time-limit, it will crowd the said trigger downward against the tension of the trigger-spring 38, until at the expiration of the time-limit, the trigger 36 will have been pushed sufficiently downward to release the

nose 34 of the arm 20 of the bell-crank trigger-lever 21 which will be swung from right to left by the spring 45 the power of which will be transmitted through the link 5 24 and rocker-arm 25 to the operating-rod 28 which will be positively pushed downward for the operation of the apparatus with which my improved device is coupled and which it automatically operates at a 10 predetermined time. The same movement rocks the shaft 26 from which the power may be taken off if desired. When the mechanism is "fired" as described, the lug 19 of the arm 20 of the lever 21 is entered into 15 the stop-notch 18 of the cam 14 as shown in Fig. 3, whereby the right sequence of movements in the operation of the setting-lever 2 is insured, since it prevents the counter clockwise or setting movement of the lever 20 from being effected until after its cocking or clockwise movement. Under the construction described, I dispense with the use of 20 two or more levers or manuals for cocking and setting the mechanism. The arm 23, link 24, shaft 26, rocker-arm 25 and rod 28 forming a train of connected parts, constitute a movement-transmitting mechanism for automatically operating the device, whatever its character may be, with which 30 my improved time-controlled mechanism is connected. As shown, this train is operated by a spring 45 which might, in the device to be operated, be supplemented by a spring or a weight; or the spring 45 or any equivalent therefor might be omitted altogether, the 35 primary function of the said train being for the transmission of movement rather than for the transmission of power.

I claim:—

40 1. In a time-controlled operating mechanism, the combination with cocking and timing-mechanisms, of a single, manually operable lever connected with the said mechanisms and movable in one direction for 45 cocking the cocking-mechanism preparatory to be released by the timing-mechanism and in the opposite direction for setting the timing-mechanism to release the cocking-mechanism at a predetermined time.

50 2. In a time-controlled operating mechanism, the combination with a timing-mechanism having a winding-arbor and a spring connected with the said arbor for being wound and unwound by the reverse rotation

thereof, of a cocking-mechanism including a 55 trigger-cam mounted upon the said arbor for rotation therewith, a trigger-lever operated by the said cam, a trigger, and a trigger-tripping dog carried by the said cam and co-acting with the trigger; a movement-transmitting mechanism connected with the 60 trigger-lever and actuated thereby when the cocking mechanism is released, and a single, manually operable lever connected with the said winding-arbor and discharging the 65 two-fold function of successively cocking the cocking-mechanism and setting the timing-mechanism.

3. In a time-controlled operating mechanism, the combination with a timing-mechanism having a winding-arbor and a main 70 spring connected with the said arbor and wound and unwound by the reverse rotation thereof; of a friction-device interposed between the said arbor and main spring to 75 permit the reverse rotation of the arbor for the unwinding of the said spring, a cocking-mechanism, a movement-transmitting mechanism, and a single, manually operable lever connected with the said winding-arbor and 80 adapted to discharge the two-fold function of cocking the cocking-mechanism and setting the timing-mechanism.

4. In a time-controlled operating mechanism, the combination with cocking and 85 timing-mechanisms, of a single, manually operable lever discharging the two-fold function of cocking the said cocking-mechanism and setting the said timing-mechanism, and means for preventing the said 90 lever from being operated for setting the timing-mechanism prior to cocking the cocking-mechanism.

5. In a time-controlled operating mechanism, the combination with a cocking-mechanism comprising a trigger, a trigger-cam 95 and a trigger-lever; of a timing-mechanism, and a single, manually operable lever connected with the said cocking and timing-mechanisms for successively cocking the 100 cocking-mechanism and setting the timing-mechanism, the said trigger-cam and trigger-lever co-acting to prevent the said single, manually operable lever from being employed to set the timing-mechanism prior to 105 being employed for cocking the cocking-mechanism.

JOSEPH W. GIBNEY.