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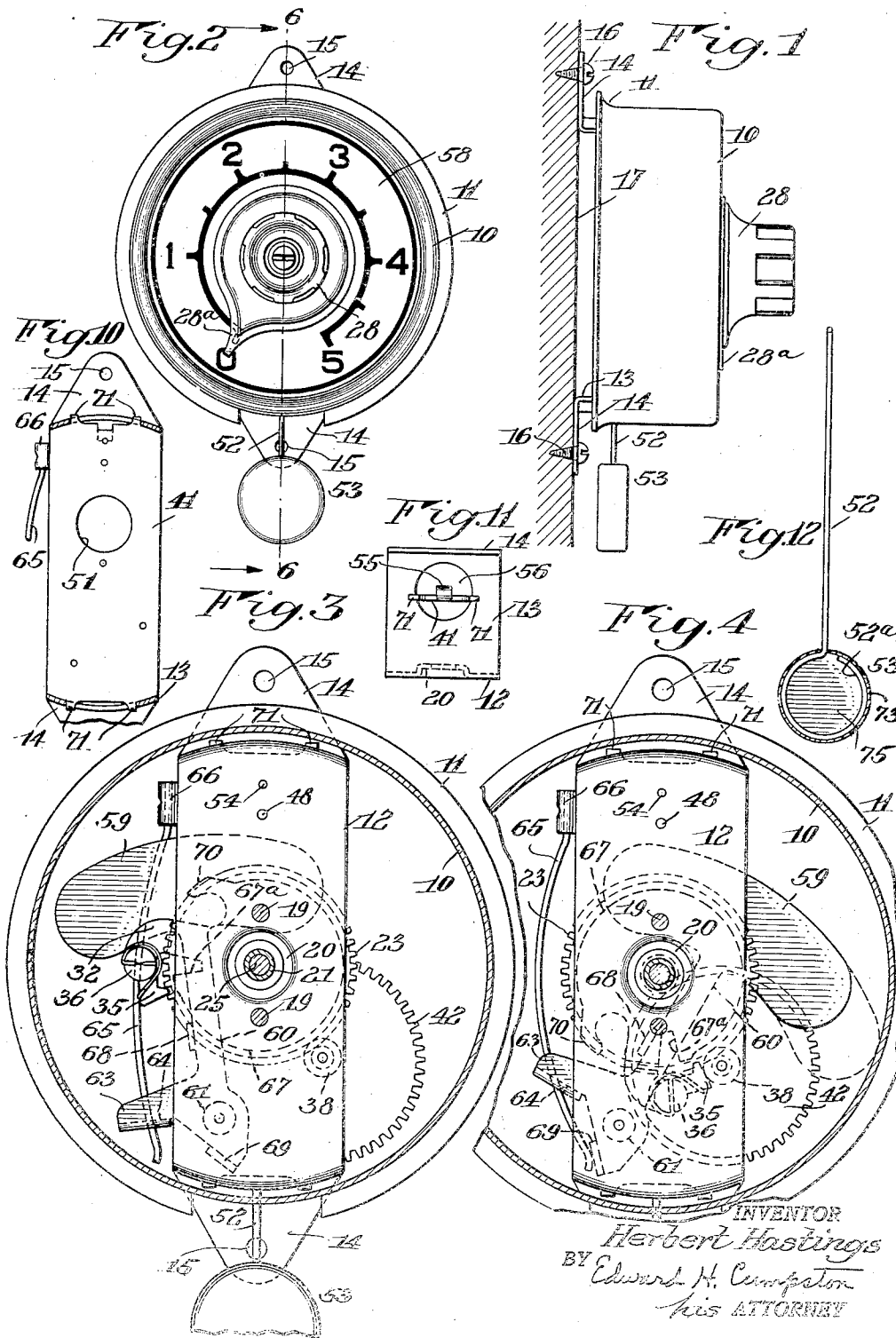
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2,103,257

TIMING DEVICE

Filed Feb. 20, 1935

2 Sheets-Sheet 1



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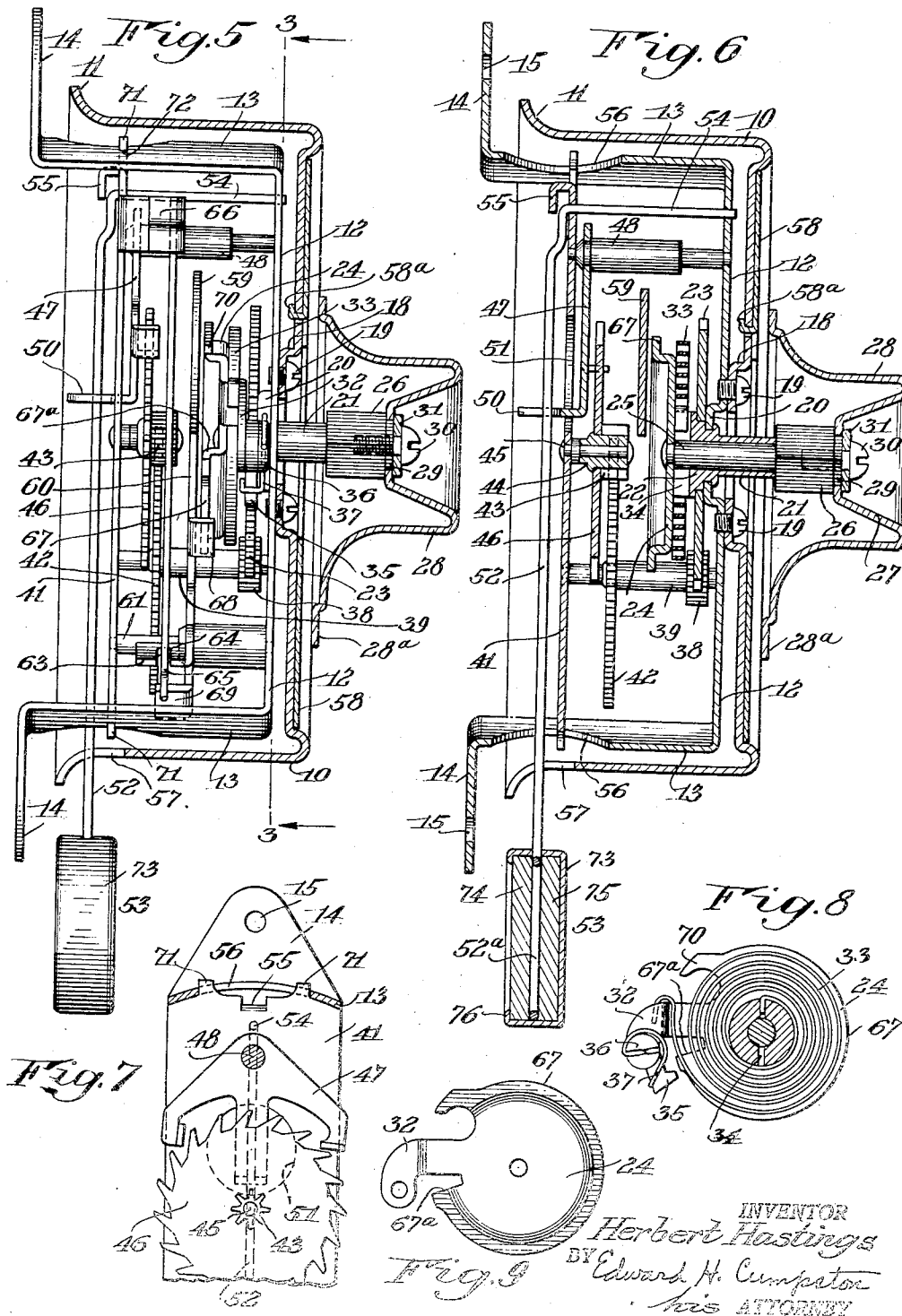
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UNITED STATES PATENT OFFICE

2,103,257

TIMING DEVICE

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10 Claims. (Cl. 161—23)

The present invention relates to a timing device and has for its object to provide an improved device of this class capable of being constructed and operated at a relatively low cost and embodying timing mechanism which can be conveniently set for operation for different periods and which will operate automatically to signal the termination of said periods.

A further object of the invention is to provide an improved timing device having characters corresponding to different intervals of time and also having timing and alarm mechanisms including driving means arranged to be energized and set for operation by the movement of an indicating element for traversing said characters.

A further object of the invention is to provide an improved timing device including a casing having an element for striking the casing to sound a signal, said element being operated by the timing mechanism at the end of each period of operation of the latter.

A further object of the invention is to provide improved supporting means for the casing and the timing mechanism therein in which arrangement the supporting means has a limited contact with the casing to avoid deadening of the sound when the striking element is moved into contact with the casing.

A further object of the invention is to provide an improved pendulum for controlling the operations of the escapement mechanism of the timing device.

A further object of the invention is to provide in a timing device of the present type, improvements in the mounting, setting, and operating mechanisms, and in other parts as well, which are constructed and coordinated in a manner to reduce the time required to assemble the same.

To these and other ends the invention resides in certain improvements and combinations of parts, all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings:

Fig. 1 is a side elevation of a timing device embodying one form of the invention;

Fig. 2 is a front elevation of the same;

Fig. 3 is a sectional elevation substantially on line 3—3 of Fig. 5 showing the relation of the parts after winding or setting the device for operation;

Fig. 4 is a similar view showing the parts in run down position;

Fig. 5 is a side elevation, with the mechanism casing and operating knob shown in section;

Fig. 6 is a sectional elevation taken on line 6—6 of Fig. 2;

Fig. 7 is a fragmentary part sectional elevation showing the escapement mechanism;

Fig. 8 is a part sectional elevation of a portion of the timing mechanism including the driving spring;

Fig. 9 is a detailed view of the driving member with the spring removed;

Fig. 10 is a part sectional elevation showing the mounting element for the escapement mechanism;

Fig. 11 is a plan view of the bracket for supporting the timing mechanism and the casing therefor, and

Fig. 12 is a part sectional elevation illustrating the construction of the pendulum.

The same reference numerals throughout the several views indicate the same parts.

The present invention is adapted for timing the boiling of eggs, or the cooking of different articles of food, where it is desired to definitely indicate the termination of the boiling or cooking period. The instrument includes adjustable setting means whereby the periods of operation may readily be varied, as well as signaling means for indicating the termination of said different periods in order that the attendant may be advised as to when to turn off the heat or to remove the cooking utensil from the stove, range, or other heating means. The device can, of course, be used for timing the operations of various mechanisms or for indicating the termination of different selected periods for whatever purpose desired.

The embodiment of the invention shown in the drawings comprises a metal casing 10 for housing the timing mechanism, as best shown in Figs. 5 and 6, the casing being open at its rear end and flared outwardly, as indicated at 11, to afford a somewhat bell-shaped construction whereby to increase its efficiency as a sounding element when struck by a hammer-like member actuated by the operating or timing mechanism, as described hereinafter.

The casing is suitably attached to a substantially U-shaped supporting bracket or frame comprising a front plate member 12 having rearwardly extending arms 13 provided with outwardly turned parts 14 apertured at 15 to receive the screws 16 or other fastening devices for securing the bracket upon a support 17, such as a wall or upright frame member.

The front wall of the casing has an inwardly offset portion 18 seated upon the vertical portion

12 of the bracket, the remaining portion of the casing being spaced from the bracket, said parts being connected preferably by means of screws 19, as shown in Figs. 5 and 6. The part 12 of the supporting bracket has an inwardly offset portion 20 carrying a sleeve 21 having a bearing 22 on its inner end for the main driving gear 23 which is loosely mounted on the bearing. A driving or operating member 24 is secured on the inner end of a spindle 25, the latter having an enlarged head 26 on its outer end on which is seated the inwardly extending portion 27 of the knob 28 for operating the spindle and other parts, as described hereinafter. The knob is prevented from turning on the head by a rectangular extension 29 thereon which is fitted within a correspondingly shaped opening in the end wall of the portion 27 of the knob. The knob is secured on the head of the spindle by means of a screw 30 extending through a washer 31 into the head, as shown in Figs. 5 and 6. The operating member 24 is preferably of dish-shaped construction as shown in Fig. 6, and has an arm 32 extending outwardly therefrom over which is hooked one end of a driving spring 33 wound between the operating member and the main driving gear 23 and having its inner end secured within a slot 34 formed in the bearing 22, as best shown in Figs. 6 and 8.

The arm 32 of the operating disk 24 has a pawl 35 pivotally secured thereon by means of a screw 36, the pawl being yieldingly held by a spring 37 in driving engagement with the teeth of the main operating gear 23, as shown in Figs. 5 and 8. The pawl is operated by the tension of the spring 33 to drive the gear, under control of the escapement mechanism as described hereinafter.

The driving gear 23 is in mesh with a pinion 38 on a shaft 39 rotatably supported by the front portion 12 of the supporting bracket and a vertically disposed plate or supporting member 41, the ends of which are connected with the arms 13 of the supporting bracket in a manner described hereinafter.

A gear 42 is fixed upon the rear end of the shaft 39 and is in mesh with a pinion 43, the teeth of which are preferably formed integral with a hub 44 rotatably supported on a bearing pin 45 suitably secured on the vertically extending supporting plate 41, as shown in Figs. 5 and 6.

An escapement wheel 46 is suitably secured on the hub 44 and is driven by the pinion 43 when the gearing is being operated by the driving mechanism actuated by the spring 33. Cooperating with the teeth of the wheel in the usual manner are the opposite lugs of the escapement lever 47 which is connected with a shaft 48 rotatably supported at its opposite ends by the front and rear plate members 12 and 41, respectively. The lever is provided with a laterally projecting lug 50 extending through an opening 51 in the supporting plate 41, said lug being slotted to receive the pendulum rod 52 by which the escapement lever is controlled during operation of the pendulum, the weighted portion of which is designated generally by the reference character 53. The upper end of the rod is formed with an offset supporting portion 54 which extends through openings in the front and rear plates 12 and 41. The rod is held in position upon said plate members by a lug 55 struck outwardly from the plate 41 and bent downwardly behind the rod as shown in Fig. 6.

The rod also extends through an opening 56 in the lower arm 13 of the supporting bracket and through an opening 57 in the casing 10 formed by cutting out a portion of the side wall of the casing at a point beneath said arm, as shown in Figs. 5 and 6.

The dial plate is indicated at 58 and is secured upon the front wall of the casing 10 within the recess thereof by striking outwardly one or more lugs 58a from the plate and extending them through openings in the front wall of the casing, after which they are bent down on the rear face of said wall as shown in Fig. 6. The dial plate has a graduated scale thereon preferably divided to correspond with periods of one minute, with half minute subdivisions, as shown in Fig. 2. The one minute divisions extend from zero to 5 inclusive, but the number of divisions may be increased or varied to correspond to a longer period if desired.

The indicator 28a is preferably formed integral with the operating knob 28 as shown in Figs. 2, 5, and 6. The knob is made large enough to conceal the openings in the dial plate and end wall of the casing, as well as the screws connecting said wall with the supporting brackets.

The means for striking the wall of the casing to sound a signal for indicating the termination of each of the different operating periods of the instrument comprises an elongated hammer-like member 59 on the arm of a lever 60 attached to a shaft 61 extending between the front and rear plate members 12 and 41, respectively, and rotatably supported thereby, as shown in Fig. 5.

The lever has an operating arm 63 provided with a laterally extending lug 64 located opposite the pivotal axis of the lever and notched to receive the free end of a spring 65, the opposite end of which is connected with a forwardly extending lug on the rear supporting plate 41 which is bent down upon itself at 66 to rigidly secure the spring upon the lug. The spring, through engagement with the lug 64, serves to hold the lever 60 in the position shown in Fig. 3, to which position it is moved from the normal inoperative position shown in Fig. 4 upon setting the instrument by turning the knob 28 in a clockwise direction as viewed in Fig. 2, whereby to wind up the spring 33. As soon as the timing mechanism is wound up and released it will begin operation immediately and when the operation is completed the lever 60 will be swung to the position shown in Fig. 4, regardless of whether or not the spring is wound for the minimum or maximum period of operation. In the winding operation the shoulder 67a of the operating member 24 will engage a laterally extending lug 68 on the lever 60 and will swing the lever past the dead center position as shown in Fig. 3, in which the lug 64 engaged by the spring 65 will be slightly below the axis of the arbor 61. In this operation the shoulder 67a of the operating member 24 will move past the lug 68 of the lever at which time the lever will assume the position shown in Fig. 3 at which it will remain until it is subsequently released by the lug 70 on the operating member 24 as the timing mechanism approaches the signaling position. As soon as the lever is moved by the lug 70 past the dead center position it will be actuated by the spring 65 to strike the casing whereby to sound the signal for indicating the termination of the period of operation of the mechanism.

In the non-operating position of the mechanism the lever will be held as indicated in Fig. 4 through engagement of the spring 65 with the lug

69 extending laterally from the lever at a point beneath the pivotal axis thereof, the spring at the same time engaging the lug 64 of the lever so that a two point contact is afforded between the spring and the lever upon the rebound of the latter after the signal has been sounded by the striking of the hammer 59 against the wall of the casing when in the position indicated by dotted lines at the right of Fig. 4. It will be apparent that the lever will be balanced at the position shown in Fig. 4 since the spring 65 will exert substantially equal pressure on the lugs 64 and 69 of the lever.

After the driving mechanism has been rewound and set at the position shown in Fig. 3, the lever will remain in said position until the spring again approaches the run down position, which it begins to do immediately upon release of the knob 28, regardless of what position the pointer 28a may have been moved to.

In the unwinding operation in which the operating member 24 is rotated by the spring 33, the rearwardly offset projection 70 of said member will engage the lug 68 of the lever to swing the latter in a clockwise direction as viewed in Fig. 3. This will cause the lug 64 of the arm 63 of the lever to be raised above the axis of the lever and to be moved past the dead center position, at which time the lever, under the pressure exerted by the spring will be swung to operating position at which the hammer 59 will strike the wall of the casing 10 with sufficient force to sound the signal by which the attendant will be notified of the termination of the period of operation of the mechanism.

It will be understood that the period of operation is determined by the extent to which the spring 33 is wound and for each of the different periods indicated on the scale the projection 70 of the spring actuated member 24 will be at a different position with respect to the lug 68 of the lever 60 upon setting the timing mechanism for operation for said different periods.

One of the important features of the invention lies in the manner of constructing and connecting the main supporting bracket of the instrument and the rear plate 41 carrying the escapement mechanism. The bracket is best shown in Fig. 6 and is of a substantially U-shaped construction, in which the side portions or arms 13 are curved in cross section and provided with the previously described openings 56. The supporting plate 41 is provided with correspondingly curved portions at its ends for engaging the inner faces of the curved portions of the bracket arms, as shown in Fig. 7.

The plate or supporting member 41 is also provided at its opposite ends with spaced lugs 71 which extend within the openings 56 and which engage in notches or slots 72 formed in the arms 13 at opposite sides of the openings whereby said member is secured against rearward displacement without the use of additional parts for holding it in position.

The supporting member and the escapement lever and wheel, and other parts as well, can readily be assembled upon the supporting bracket as a unit which can be applied to the bracket merely by inserting the ends of the supporting member within the openings 56 of the arms 13 of the bracket and forcing the lugs 71 into the notches 72 of said arms, the latter being slightly displaced in an outward direction when applying the supporting member thereto and springing back to normal position into clamping engage-

ment with the curved end portions of said supporting member. The remaining parts of the mechanism carried by the U-shaped bracket, can be readily applied thereto before assembling the supporting member 41 and associated parts upon the arms of the bracket.

The pendulum bob 53 is constructed in a manner whereby its weight can be readily varied to compensate for any variation in the tension of the springs 33 which may occur in the manufacture of the same. To this end the bob or weighted portion of the pendulum comprises a casing 73 having disk shaped weights 74 and 75 therein on opposite sides of the ring shaped portion 52a of the pendulum rod as shown in Figs. 6 and 12. The desired results can be accomplished by providing a series of disks varying slightly in weight or thickness and selecting the ones which when added to the casing will insure correct timing of the mechanism according to the time intervals indicated on the scale plate 58. After disks of the proper weight have been selected and placed within the casing, the edge portion 76 of the latter will be spun down upon the outer disk, as shown in Fig. 6.

After applying the disk 75 to the casing the free end of the pendulum rod can be threaded through the opening in the wall of the casing and moved therein to position the ring shaped portion 52a of the rod against the disk 75 where it will serve to hold said disk in position.

The bracket and the mechanisms thereon are supported independently of the casing, the latter being supported by the bracket, out of contact with all parts thereof except the central portion of the part 12 of the bracket whereby to avoid deadening of the sound when the casing is struck by the part 59 of the lever 60.

The instrument is one which comprises relatively few parts, is compact, efficient and dependable, as well as convenient to operate and can be quickly applied to any suitable supporting means, such as a wall or the frame of a door or window.

The advantages of the present timing device will be apparent from the drawings and description of the same, especially when it is borne in mind that the timing and alarm mechanisms and the driving means for each, including all moving parts, are conditioned for operation merely by the setting of the pointer or indicator opposite any one of the characters on the dial plate corresponding to different selected time intervals.

In previously constructed combined timing and alarm mechanisms, it has been necessary when conditioning the same for operation to perform a number of different manual operations such, for example, as winding the alarm mechanism, setting the alarm indicator, winding the clock or timing mechanism and setting the hands of the clock relative to the dial.

As distinguished from these various operations, the present timing device, as previously stated, requires only one manual operation, namely, that of moving the pointer to the desired position on the dial plate.

I claim:

1. In a timing device, the combination of a casing, timing mechanism within the casing, means for setting the timing mechanism for operation for a predetermined period, a movable element within the casing for striking the latter to sound a signal, said element having spaced operating and holding parts thereon, and spring means engaging said operating part for moving said element from a predetermined position to

striking position and engaging said holding part to cushion said element when rebounding upon completion of each striking operation, said timing mechanism operating when being set to move said element to said predetermined position at which it will be held through engagement of the spring means with said operating part during operation of the timing mechanism, said timing mechanism when completing its period of operation effecting movement of said element from said predetermined position to free it for movement by the spring means to striking position.

2. In a timing device, the combination of a casing, timing mechanism within the casing including a spring driven rotary actuating element having spaced operating portions thereon, a member movable within the casing and having an operating part and a part for striking the casing to sound a signal, spring means engaging said operating part for cooperation therewith to move said member from a predetermined position to striking position, one of the operating portions of said rotary element engaging and moving said member to an initial starting position when setting the timing mechanism for operation for a predetermined period at which position said member is held by the spring means during operation of the timing mechanism, the other of said operating portions when the timing mechanism is approaching run down position, engaging said member and moving it from said initial starting position to said predetermined position to free it for movement by the spring means to striking position.

3. In a timing device, the combination of a casing, timing mechanism within the casing, a rotary operating member, an actuating member fixed thereon, a driving spring for said actuating member connected therewith, a gear rotatable about the axis of said operating member, operating means for the gear driven by said actuating member during operation of the latter by said driving spring, escapement mechanism connected with said gear for operation thereby, a pendulum associated with the escapement mechanism for controlling the operations thereof, a striking member movable within the casing having an operating part and a part for engaging the casing to sound a signal, spring means engaging said operating part for cooperation therewith to move said striking member from a predetermined position to striking position, said actuating member upon being rotated from normal inoperative position by the operating member to wind up the driving spring serving to move said striking member from inoperative position to an initial starting position at which it is held by the spring means during return of the actuating member to normal inoperative position, the actuating member upon approaching said inoperative position serving to move the striking member to said predetermined position from which it will be operated by the spring means to striking position.

4. In a timing device, the combination of a casing, a supporting bracket for the casing disposed therein and having rearwardly extending upper and lower arms within the casing, said lower arm having an opening therein, a supporting member extending between said arms and connected therewith, timing mechanism supported by the bracket within the casing including an actuating member, escapement mechanism disposed on said supporting member, means operatively connecting the actuating member with

the escapement mechanism, a pendulum for controlling the operations of the escapement mechanism, said pendulum depending from the supporting member and extending through the opening in said lower arm, and means for setting the timing mechanism and for indicating the extent of its operation.

5. In a timing device, the combination of a casing, a supporting bracket for the casing disposed therein, said bracket having rearwardly extending upper and lower arms, said arms having openings formed therein, a supporting member extending between said arms and having parts on its opposite ends engaging the arms within the openings thereof, timing mechanism supported by the bracket within the casing including an actuating member, escapement mechanism disposed on said supporting member, means operatively connecting the actuating member with the escapement mechanism, a pendulum for controlling the escapement mechanism depending from said supporting member and extending through the opening of said lower arm, and means for setting the timing mechanism for operation for different periods.

6. In a timing mechanism, the combination of a casing, a supporting bracket for the casing disposed therein and including upper and lower spaced members, a plate member extending between said spaced members and provided with an opening, timing mechanism supported by the bracket within the casing including an actuating member and driving means therefor, gearing driven by said actuating member, escapement mechanism driven by said gearing including a lever associated with said plate member, said lever being pivotally supported on one side of said plate member and having an offset slotted portion extending through the opening of said plate member, a pendulum supported by said plate member and extending through the slotted offset portion of the lever, and means for setting the timing mechanism for operation for different periods.

7. A timing device comprising a casing, a bearing member on the casing, a spindle rotatable within the bearing member and operable from the exterior of the casing, cooperating dial and indicating members one fixed relative to the casing and the other movable with the spindle, timing mechanism within the casing including a driving gear, an actuating member within the casing mounted on said spindle for rotation thereby, means operatively connecting the actuating member with said gear, spring means for driving the actuating member connected therewith and conditioned for operation by rotating the spindle in one direction to set the timing mechanism, a movable member for striking the casing to sound a signal, said member having spaced operating and holding parts thereon, spring means engaging said operating part for moving the striking member from a predetermined position to striking position after the timing mechanism has operated for a predetermined period and engaging said holding part to cushion said member when rebounding upon completion of each striking operation, means on said actuating member for engaging and moving the striking member to said predetermined position when the spindle is operated to set the timing mechanism, and means on the actuating member for engaging and moving the striking member from said predetermined position to free it for operation.

tion by said spring means when the timing mechanism approaches run-down position.

5 8. A timing device comprising a casing, a dial fixed on the casing, a rotary spindle extending within the casing and having an operating member disposed exteriorly of the casing and provided with a part forming an index for cooperation with the dial, a bearing member for supporting the spindle, timing mechanism within 10 the casing including a gear free to rotate on said bearing member about the axis of the spindle, an actuating member fixed on the spindle, means operatively connecting the actuating member with the gear, a driving spring for the actuating member having one end connected with said 15 bearing member and the other with the actuating member, said spring being conditioned for operation upon rotating the spindle in one direction when setting the timing mechanism, a 20 pivoted striking lever within the casing having a striking part on one end for engaging the casing to sound a signal, an operating spring engaging the other end of the lever and adapted to move the lever to striking position from a predetermined position at which it will be held by the 25 spring during operation of the timing mechanism, said actuating member when the timing mechanism is being set for operation serving to move the lever to said predetermined position and operating to move it from said position when the 30 timing mechanism is approaching run-down position, whereby to free the lever for operation by said operating spring.

35 9. A timing device comprising a casing, a substantially U-shaped supporting bracket for the timing mechanism secured within the casing and including a front member having rearwardly extending spaced members provided with laterally extending parts projecting from the casing 40 and adapted for attachment to a support for the timing device, a plate member extending between and connecting said spaced members independently of the casing and provided with an opening, timing mechanism supported by the

bracket within the casing including an actuating member and driving means therefor, gearing driven by said actuating member, escapement mechanism driven by said gearing including a 5 pivoted element at the front side of said plate member having a rearwardly projecting part extending through the opening in said plate member, and means connected with the bracket within the casing and extending rearwardly of the 10 plate member and cooperating with said rearwardly projecting part to control operation of the escapement mechanism during operation of the timing mechanism.

10. A timing device comprising a casing, a supporting bracket for the casing disposed therein 15 and including a front member having rearwardly extending spaced members provided with parts for attaching the bracket to a support, a member extending between and connecting said spaced members and provided with an opening 20 between its ends, timing mechanism disposed within the casing and supported by the bracket between said spaced members, means for setting the timing mechanism for operation for a predetermined period, a movable element within the 25 casing for striking the latter to sound a signal, said element having spaced operating and holding parts thereon, and spring means engaging said operating part for moving said element from a predetermined position to striking position and 30 engaging said holding part to cushion said element when rebounding upon completion of each striking operation, said timing mechanism operating when being set to move said element to said predetermined position in which it will be 35 held through engagement of the spring means with the operating part of said movable element during operation of the timing mechanism, said timing mechanism when completing its period of operation effecting movement of said element from said predetermined position to free 40 it for movement by the spring means to striking position.

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