

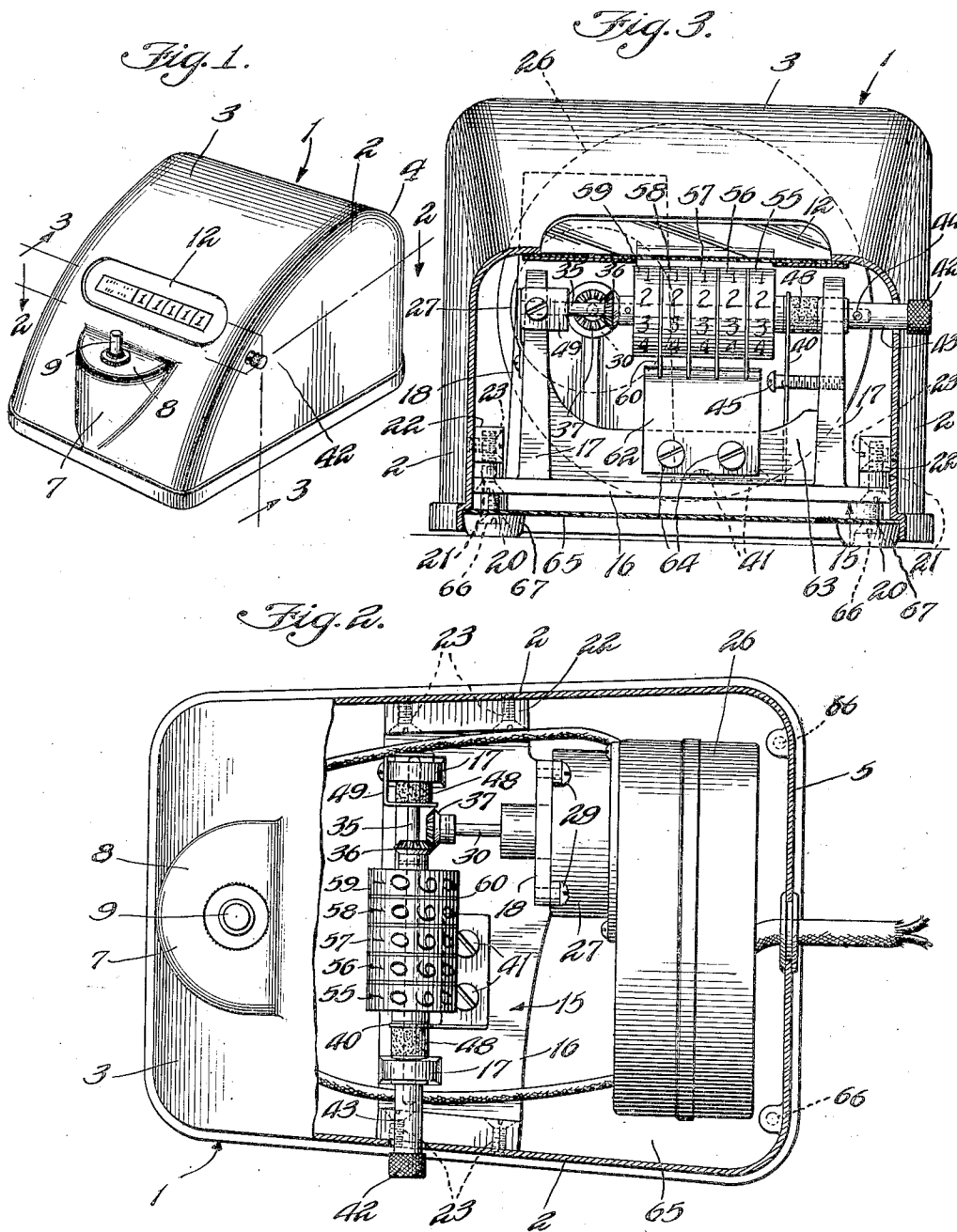
Feb. 25, 1941.

A. I. NEWMAN

2,233,368

ELECTRIC TIMER

Filed Feb. 26, 1940



INVENTOR.
Alexander I. Newman
BY Morris Spector.
ATTORNEY.

UNITED STATES PATENT OFFICE

2,233,368

ELECTRIC TIMER

Alexander I. Newman, Chicago, Ill., assignor to
Precision Scientific Co., Chicago, Ill., a corpora-
tion of Illinois

Application February 26, 1940, Serial No. 320,759

5 Claims. (Cl. 161—15)

This invention relates to timers, and more particularly to electric timers that can be started and stopped at will and will give a summation of the total running time. In its more specific aspects this invention relates to an electric timer for measuring time in seconds and tenths of a second.

It is one of the objects of the present invention to provide an electric timer which can be assembled from parts that are in the main of standard construction, and that requires a minimum number of special castings, and a minimum amount of machining. The timer includes an electric motor and is provided with a brake to prevent coasting. One suitable brake consists of a swinging arm carrying a cork disk at one end which is gently pressed against the armature or armature shaft by a spring. When the switch is operated to start the motor a magnetic field is set up either by the motor field or by a brake relay, which pulls the brake away from the shaft and permits the same to rotate freely. When the switch is again operated to stop the motor the magnetic field is broken, and the spring on the brake presses the brake to its braking position. It is a further object of the present invention to provide an improved bracket upon which the electric motor, speed reducing gearing and timer drums can be assembled for insertion as a unit into a casing.

It is a still further object of the present invention to provide a timer having a casing having a window inclined in such a manner as to facilitate reading of the timer by a person in front of and/or above the timer. By mounting the reading window at an incline, and mounting the timer drums immediately beneath the window, the reading of the instrument is greatly facilitated.

It is a further object of the present invention to provide a timer of the above mentioned character which shall be rigid and sturdy of construction and yet neat and aesthetic in appearance.

The attainment of the above and further objects of the present invention will be apparent from the following specification taken in conjunction with the accompanying drawing forming a part thereof.

In the drawing:

Figure 1 is a perspective view of a timer embodying the present invention;

Figure 2 is a sectional view taken along the line 2—2 of Figure 1; and

Figure 3 is a sectional view taken along the line 3—3 of Figure 1.

Reference may now be had more particularly to the drawing. The timing mechanism is enclosed in a casing 1, which may be a die casting, having side walls 2 and a front and top wall 3 which extends from the bottom of the casing upwardly and toward the rear and then continues downwardly along a smooth curve 4 to constitute the back 5 of the casing. The front of the casing is provided with a projecting part 7 terminating in a flat top surface 8 having an opening through which a push button 9 of an electric switch extends. The front of the casing is also provided with an opening that receives a window 12 that is at an angle to the horizontal and to the vertical. The angle is approximately 45°, although it is to be understood that greater or lesser inclinations may be provided. The bottom of the housing is open to receive the timing mechanism.

The timing mechanism is assembled on a bracket 15 that includes a base 16 having a pair of upstanding arms 17—17 opposite one another and has a third arm 18 extending upwardly from the base 16 between the arms 17—17 and at right angles thereto. The base 16 is extended beyond the arms 17—17 to provide projecting portions 20—20 for mounting the bracket in the housing 2 as by screws 21 extending into lugs 22 that may be cast integrally with the body of the casing but preferably are separate lugs secured to the body of the casing by screws 23.

A constant speed electric motor is indicated at 26. This motor is preferably of the synchronous type, such as the standard "Telechron" motor. A speed reducing gearing 27 is secured to the motor, and the assembled structure, which includes the speed reducing gearing and the motor, is mounted on the arm 18 of the bracket 15 in any desired manner, as by machine screws 29—29. The speed reducing gearing includes a driving shaft 30 journaled in a suitable bearing and driven by the electric motor, through the speed reducing gearing at, preferably, one revolution per second when the electric motor is connected to a source of alternating current of the frequency for which the motor is designed, say sixty cycles alternating current.

A shaft 35 is rotatably mounted in the arms 17—17, suitable bearings being provided for that purpose. The shaft 35 has a bevel gear 36 keyed thereto which is in mesh with a bevel gear 37 keyed to the shaft 30. The shaft 35 is mounted between the arms 17—17 in such a manner as to permit longitudinal movement of the shaft 35 in the bearings to move the gear 36 out of

mesh with the gear 37. A leaf spring 40, which is mounted on the base 16 of the bracket in any desired manner, as by screws 41—41, embraces the shaft 35 and urges it in a direction to the left, as seen in Figure 3, to maintain the gear 36 in mesh with the gear 37. The shaft may be drawn to the right, as seen in Figure 3, against the action of the spring 40, as by a knurled knob 42 at the end of a sleeve 43 keyed to the shaft as by a screw 44. A screw 45 extends through the spring 40 and threads into one of the arms 17 for limiting the movement of the spring 40 in one direction. Oil soaked felt gaskets 48 maintain proper lubrication of the bearings for the shaft 35, said felt gaskets being held in place by angle brackets 49 secured to the respective arms 17.

A counter mechanism, comprising a series of drums 55, 56, 57, 58 and 59, is mounted on the shaft 35. Each of the drums bears the digits zero to nine inclusive thereon, uniformly spaced apart. The drum 55 is keyed to the shaft 35, and each of the subsequent drums 56 to 59 inclusive is arranged to be rotated one stop for each complete revolution of the preceding drum. Each of the drums 56 to 59 inclusive of the counter has associated with it a projecting part 60 which is adapted to remain stationary as the shaft 35 is rotated, and thus prevent rotation of the counter as a unit with the shaft. To maintain the projecting part 60 stationary there is provided a thin metal plate 62 secured to a flange 63 of the bracket 15 as by screws 64. The upper end of the thin metal plate 62 extends into a notch in each of the projecting parts 60 thereby holding the projecting parts against rotation. Upon longitudinal movement of the shaft 35 the counting mechanism, including the projecting parts 60, moves to the right, the projecting parts sliding along the edge of the metal plate 62.

The calibration is such that when the electric motor 26 is connected to a source of sixty cycle current the shaft 35, and with it the drum 55, is operated at a speed of one revolution per second. This means that the digits on the drum 55 pass in front of the window 12 at the rate of one per tenth of a second. One complete revolution of the drum 55 results in the turning of the drum 56 one step, each step bringing a successive digit on the drum 56 in front of the window. The digits on the drum 56 will therefore indicate full seconds interval of time. Likewise the successive digits on the drum 57 will indicate ten seconds elapsed time, the digits on the drum 58 will indicate hundred seconds elapsed time, and the digits on the drum 59 will indicate thousand seconds elapsed time.

To re-set the timer to zero it is merely necessary to pull the knurled ring 42 slightly outwardly of the casing, thus moving the shaft 35 to the right from the position illustrated in Figure 3 and disengaging the gear 36 from the gear 37. The shaft 35 may then be rotated in a direction opposite its direction of rotation by the constant speed motor, to re-set the counter drums to their zero positions.

The switch 9 is an ordinary push button snap switch and is connected in series circuit with the self-starting motor 26 to control the energization and deenergization thereof. The timer drums thus indicate the total operating time of the motor upon successive energizations thereof by the switch 9.

A closure plate 65 is suitably removably secured to and closes the bottom of the housing 1,

as by screws 66 passing through countersunk holes in rubber pads 67.

In compliance with the requirements of the patent statutes I have here shown and described a preferred embodiment of my invention. It is, however, to be understood that the invention is not limited to the precise construction here shown, the same being merely illustrative of the principles of the invention. What I consider new and desire to secure by Letters Patent is:

1. Timing apparatus comprising a frame having a pair of spaced arms, a shaft journaled in said arms, said frame having a third arm between and at right angles to said pair of arms, a self-starting constant speed electric motor and speed reducing gearing both mounted on said third arm, said speed reducing gearing being driven by the motor and including a drive shaft extending towards and at right angles to said first shaft, a driving connection between said two shafts, spring means normally urging the first shaft to a position maintaining the driving connection between the two shafts, said first shaft being axially movable against the action of said spring means to disengage the driving connection, and a drum type counter driven by said first shaft and comprising a plurality of drums.

2. Timing apparatus comprising a frame having a pair of spaced arms, a shaft journaled in said arms, said frame having a third arm between and at right angles to said pair of arms, a self-starting constant speed electric motor and speed reducing gearing both mounted on said third arm, said speed reducing gearing being driven by the motor and including a drive shaft extending towards and at right angles to said first shaft, a driving connection between said two shafts, spring means normally urging the first shaft to a position maintaining the driving connection between the two shafts, said first shaft being axially movable against the action of said spring means to disengage the driving connection, and a drum type counter driven by said first shaft and comprising a plurality of drums mounted on said first shaft, said counter including non-rotatable parts associated with respective ones of the drums and with respect to which the drums rotate, said frame having means thereon against which said non-rotatable parts bear to hold them against rotating with said first shaft.

3. Timing apparatus comprising a frame having a pair of spaced arms, a shaft journaled in said arms, said frame having a third arm between and at right angles to said pair of arms, a self-starting constant speed electric motor and speed reducing gearing both mounted on said third arm, said speed reducing gearing being driven by the motor and including a drive shaft extending towards and at right angles to said first shaft, a driving connection between said two shafts, spring means normally urging the first shaft to a position maintaining the driving connection between the two shafts, said first shaft being axially movable against the action of said spring means to disengage the driving connection, a drum type counter driven by said first shaft and comprising a plurality of drums, and an enclosing casing for said apparatus, said casing having a window adjacent the counter to permit reading of the counter, and said casing having an opening through which the end of the first shaft extends for manipulating the shaft to reset the counter.

4. Timing apparatus comprising a frame having a pair of spaced arms, a shaft journaled in

said arms, said frame having a third arm between and at right angles to said pair of arms, a self-starting constant speed electric motor and speed reducing gearing both mounted on said
5 third arm, said speed reducing gearing being driven by the motor and including a drive shaft extending towards and at right angles to said first shaft, a driving connection between said two shafts, spring means normally urging the first
10 shaft to a position maintaining the driving connection between the two shafts, said first shaft being axially movable against the action of said spring means to disengage the driving connection, and a drum type counter driven by said
15 first shaft and comprising a plurality of drums, said gearing being so proportioned in relation to the speed of the constant speed motor that the first shaft is driven at a speed of one revolution per second, the end drum of the counter being
20 rotated at the same angular speed as the first

shaft and having ten digit markings thereon to indicate tenths of a second, each successive drum of the counter being driven at a speed one tenth that of the preceding drum and each having
5 ten digit markings thereon.

5. Timing apparatus comprising a constant speed self-starting electric motor, a drum type counter driven by the motor and including a plurality of side by side drums rotatable about a common axis, an electric switch for controlling
10 the starting and stopping of the motor, and a housing for the motor, the counter and the switch, said housing having an inclined front wall, and a window in said inclined front wall, said drums being located adjacent said window, said
15 inclined front wall having a ledge extending forwardly thereof adjacent said window, said switch including switch actuating means extending through said ledge.

ALEXANDER I. NEWMAN. 20