

May 15, 1956

L. C. STEWART

2,745,918

TIMERS

Filed March 16, 1953

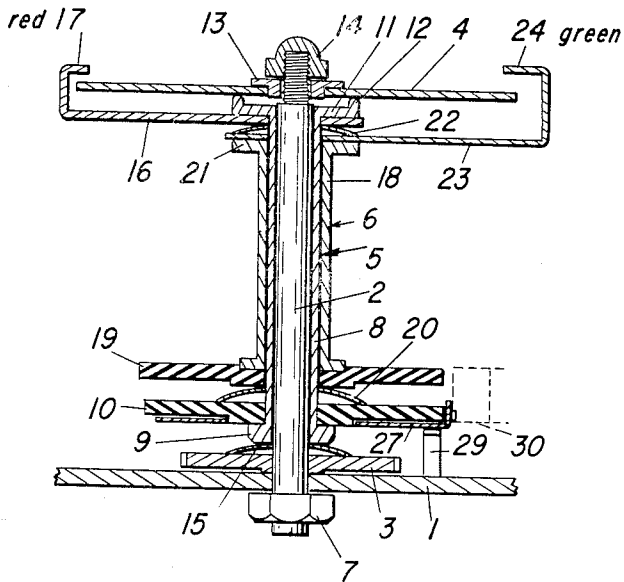


Fig 1

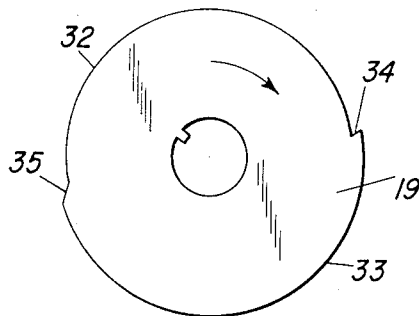


Fig 2

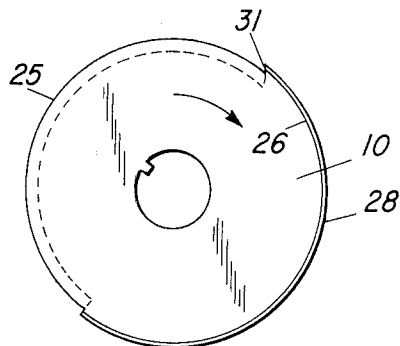


Fig 3

INVENTOR.
Leonard C. Stewart
BY
A. Schaff.
Att'y

1

2,745,918

TIMERS

Leonard C. Stewart, Twain Harte, Calif., assignor to
David W. Henry, Oakland, Calif.

Application March 16, 1953, Serial No. 342,591

5 Claims. (Cl. 200—36)

The present invention relates to improvements in timers, and its principal object is to provide a clock-operated timer particularly adapted for the control of a sprinkling system for turning it on and off at specified times.

More particularly it is proposed to provide a timer of the character described that is simple in construction and efficient in operation, easy to assemble and perfect in its control.

One of the particular features of my invention is to provide a timer of the character described that becomes active immediately in response to its setting, so that it may be made to run the sprinkler for a very small time period, as little as half a minute or less.

Another feature of the invention is to provide two cams cooperating with a contact finger in closing and opening an electric circuit at predetermined times, the circuit again being operative to open and close the sprinkler system at the designated times.

A still further feature of the invention is to provide connections between the cams and a clock dial whereby the three members are held together frictionally for normal rotation as a unit, but in which each cam may be adjusted manually with respect to the dial for desired settings.

A further feature of the invention is to provide a pair of fingers fixed with respect to the cams and projecting over the dial for setting the cams to become operative at desired times indicated by the relative positions of the fingers on the dial for operating the sprinkler system, the fingers being free for adjustment to any desired position with respect to the dial.

And finally, it is proposed to arrange the fingers on the dial in such a manner that they may freely pass each other for reverse setting.

Further objects and advantages of my invention will appear as the specification proceeds, and the new and novel features of my timer will be fully defined in the claims attached hereto.

The preferred form of my invention is illustrated in the accompanying drawing, forming part of this application, in which:

Figure 1 shows a vertical axial section through my timer;

Figure 2, a plan view of one of the cams; and

Figure 3, a plan view of the other cam.

While I have shown only the preferred form of my invention, I wish to have it understood that various changes or modifications may be made within the scope of the claims attached hereto, without departing from the spirit of the invention.

Referring to the drawing in detail, my timer comprises in its principal features a supporting plate 1, a shaft 2 revolvable therein, a gear wheel 3 fixed on the shaft, a dial 4 on the far end of the shaft, a cam assembly 5 revolvable on the shaft, and a second cam assembly 6 revolvable on the first cam assembly.

The shaft 2 may be mounted on the plate in any suit-

2

able manner, as by a nut 7 in cooperation with the gear wheel 3, and the latter, which is fixed to the shaft, is made to rotate, by any suitable clock mechanism, not shown, once for every twelve or twenty-four hours, as the case may be.

The cam assembly 5 comprises a sleeve 8 revolvable on the shaft and terminating, at its lower end, in a head 9. The sleeve has, immediately above the head, a cam 10 secured thereon, and has a disc 11 at its upper end, the latter having an annular flange 12 projecting upwardly therefrom to bear against the bottom face of the clock dial 4. The latter has a central hub section 13, and the extreme end of the shaft has a nut 14 threaded thereon to bear against the hub section of the dial from above.

A concave disc spring 15 is interposed between the head 9 of the cam assembly and the gear wheel 3, so that when the nut 14 is screwed down, it urges the dial upon the flange 12 and the sleeve 8 with its head 9 upon the spring 15 and the latter upon the gear wheel 3, so as to frictionally hold the dial 4, the cam assembly 5 and the gear wheel in assembled relation.

This frictional engagement, however, does not interfere with the manual turning of the cam assembly with respect to the shaft.

The disc 11 of the cam assembly has an arm 16 projecting radially therefrom, the arm being fixed with respect to the disc and terminating in a finger 17 projecting over the rim of the dial. This arm occupies a definite position with respect to the cam surface to bring about the desired operation as hereinafter described.

The second cam assembly 6 comprises a second sleeve 18 revolvable on the first sleeve 8, a second cam 19 at the lower end thereof, in juxtaposition to the first cam 10, and spaced therefrom by a concave disc spring 20, and a flange 21 bearing against the disc 11 through another disc spring 22. Thus, the second cam assembly is held frictionally, between the two springs 20 and 22 to the first cam assembly, with freedom of manual adjustment.

The second cam assembly has an arm 23 projecting radially from the upper end thereof, this arm terminating in a finger 24 projecting over the rim of the dial. It will be noted that the arm 23 with its finger 24 is positioned and dimensioned to be capable of passing the arm 16 with its finger 17.

All of the parts thus far described may be made of metal, for strength and long life, with the exception of the two cams 10 and 19 which are made of insulating material.

The lower cam 10 is illustrated in Figure 3 and comprises a disc of insulating material having a semi-circular lower cam face 25 and a slightly raised, semi-circular cam face 26. The cam has a conducting disc 27 lying against the lower surface thereof, and the latter disc has a semi-circular flange 28 rising along the raised cam face 26 of the cam.

The conducting disc 27 is in permanent contact with a fixed spring contact 29 forming one terminal of the electrical circuit operating the sprinkler system. A second terminal 30 of the same circuit bridges the two cams and is adapted to ride on the highest surface presented by the two cams.

The cams are made to move clockwise, as indicated in Figures 2 and 3, and where the tail end of the flange 28 terminates, the cam 10 is undercut, as at 31, to allow of a sharp drop of the spring terminal 30, as the flange 28 passes away under it.

The upper cam 19 is in the form of a disc made of insulating material and presents a low cam face 32 and a high cam face 33, each extending through 180 degrees. The low cam face may be the same or slightly lower

than the low cam face 25 of the cam 10, while the high cam face 33 is higher than the cam face of the conducting flange 28.

Where the trailing end of the high cam face 33 drops onto the lower cam face, an undercut is provided, as at 34, to provide a sharp drop for the contact 30, while on the opposite side, the lower cam face rises to the higher one on an incline, as at 35.

In operation, be it assumed that it is 8 o'clock in the morning, and the operator wants to set the timer to start the sprinkler system at 12 o'clock noon, and to stop it at 12:30 o'clock, and further, that the dial has been related with respect to the gear wheel 3 and its driving mechanism to indicate, against a fixed index, the proper time of the day.

The operator then sets the finger 24, which may be painted green to indicate "Start," at the numeral 12 of the dial, and the finger 17, which may be painted red to indicate "Stop," at 12:30.

The green finger is positioned with respect to the cam face of the upper cam, so that, if set for 12 o'clock, the contact 30 will ride on the upper section 33 of the upper cam 19, at a point from which it takes the undercut drop 34 of the cam four hours to reach the contact. At that time, that is, at 12 o'clock, the contact will drop upon the flange 28 of the lower cam, thereby closing the circuit and starting the sprinkler system.

The red finger is related to the cam face of the lower cam in such a manner, that when set for 12:30 o'clock, it will take the undercut 31 at the trailing end of the conducting flange 28 thirty minutes to reach the contact 30, with the result that at 12:30, the contact drops from the copper flange 28 upon the surface 25 to break the circuit and to stop the sprinkler system.

The contact 30 then continues to ride on the low sections of both cams, until the inclined face 35 raises it again to the higher section 33 of the upper cam.

It will be noted that each of the two cam assemblies is adjustable, independently of the other, to any point desired, without depending upon any locking arrangement which allows of adjustment only between spaced points.

The setting operation is very simple, merely requiring the movement of the red finger to one position and the green finger to another position.

Since in the arrangement shown the green finger, forming part of the outer cam assembly, normally moves with the red finger, unless prevented manually, it is perfectly feasible to first set the two fingers for the desired time of watering, say one-half of an hour, and then set the red finger 17, only for the desired time to stop, say 12:30 o'clock, since the green finger will automatically follow to start one-half of an hour before the time selected for the stop.

I claim:

1. In a timer of the character described, a base plate, a shaft revoluble therein and projecting therefrom, a gear wheel fixed on the shaft, a cam arrangement revoluble on the shaft adjacent the gear wheel and comprising a sleeve revoluble on the shaft, a cam on the shaft near the gear wheel and a disc on the far end of the sleeve having an annular flange projecting therefrom, a spring interposed between the gear wheel and the cam arrangement, a dial on the shaft adjacent the flange, and a nut threaded on the shaft and adapted for urging the dial upon the flange and the cam arrangement through the spring upon the gear wheel, for frictionally holding the dial to the cam arrangement and the latter to the gear wheel with freedom of manual adjustment of the cam arrangement with respect to the dial and the gear wheel, the disc having an arm projecting radially therefrom and the arm having a finger projecting over the rim of the dial, and the sleeve having a second cam arrangement revoluble thereon, with a second cam arranged near the first cam and a second disc arranged near the first disc, and springs between the two cams and the two discs for frictionally holding the second

cam arrangement to the first cam arrangement with freedom of manual adjustment, the second disc having a second arm projecting radially therefrom and the latter arm having a second finger projecting over the rim of the dial, an electrical circuit and means on the cams for closing and opening the circuit in timed relation depending upon the relative positions of the fingers on the dial, when the gear wheel is revolved, the latter means comprising a high section and a low section on the second cam, a conducting disc secured upon the face of the first cam and having a conducting flange extending partly around the rim of the first cam and having an outer face intermediate the high and low sections of the second cam, means for permanently connecting the conducting disc into the circuit, and a resilient conducting finger forming part of the circuit and bridging both of the cams so as to bear on the highest face thereof presented to the finger.

2. In a timer of the character described, a base plate, a shaft revoluble therein and projecting therefrom, a gear wheel fixed on the shaft for revolving the latter, a dial on the shaft and being spaced from the gear wheel, a sleeve assembly revoluble on the shaft and having a cam adjacent the gear wheel and a finger projecting over the dial, a second sleeve assembly revoluble on the first sleeve assembly and having a second cam adjacent the first cam and having a second finger projecting over the dial, spring means urging the dial, the sleeve assemblies and the gear wheel into frictional relation for common rotation, a conducting disc secured upon the face of the first cam and having a conducting flange extending partly around the rim of the first cam, and an electrical circuit having two terminals, with one terminal in continuous contact with the disc and the second terminal made to bridge the two cams and biased toward the same, the two cams being shaped to cause the second terminal to contact the flange for selected periods depending upon the setting of the fingers with respect to the dial.

3. In a timer of the character described, a base plate, a shaft revoluble therein and projecting therefrom, a gear wheel fixed on the shaft for revolving the latter, a dial on the shaft and being spaced from the gear wheel, a sleeve assembly revoluble on the shaft and having a cam adjacent the gear wheel and a finger projecting over the dial, a second sleeve assembly revoluble on the first sleeve assembly and having a second cam adjacent the first cam and having a second finger projecting over the dial, spring means urging the dial, the sleeve assemblies and the gear wheel into frictional relation for common rotation, a conducting disc secured upon the face of the first cam and having a conducting flange extending partly around the rim of the first cam, and an electrical circuit having two terminals, with one terminal in continuous contact with the disc and the second terminal made to bridge the two cams and biased toward the same, the rim section of the first cam not covered by the flange being concentric with the flange but of less diameter than the latter, and the second cam having a section concentric with the flange but of larger diameter, and the two cams being cooperable with the second terminal in establishing contact between said terminal and the flange for selected periods depending upon the setting of the fingers with respect to the dial.

4. In a timer of the character described, a revoluble shaft having a pair of disc cams revoluble thereon with the cams arranged in adjacent relation, yielding means for urging the cams into driving relation with the shaft for common rotation, the said means being made to allow of manual rotary adjustment of each cam on the shaft, a conducting disc secured upon the face of one of the cams and having a conducting flange extending partly around the rim of the said cam, and an electric circuit having two terminals, with one terminal in continuous contact with the disc and the second terminal made to bridge the two cams and biased toward the same, the two cams being shaped to cause the second terminal to contact the

5

flange for selected periods depending upon the setting of the cams with respect to the shaft.

5. In a timer of the character described, a revoluble shaft having a pair of disc cams revoluble thereon with the cams arranged in adjacent relation, yielding means for urging the cams into driving relation with the shaft for common rotation, the said means being made to allow of manual rotary adjustment of each cam on the shaft, a conducting disc secured upon the face of one of the cams and having a conducting flange extending partly 10 around the rim of the said cam, and an electrical circuit having two terminals, with one terminal in continuous contact with the disc and the second terminal made to bridge the two cams and biased toward the same, the

6

rim of the first cam not covered by the flange being concentric with the flange but of less diameter than the latter, and the second cam having a section concentric with the flange but of larger diameter, and the two cams being cooperable with the second terminal in establishing contact between said terminal and the flange for selected periods depending upon the setting of the cams with respect to the shaft.

References Cited in the file of this patent

UNITED STATES PATENTS

1,679,781	Peyton et al. -----	Aug. 7, 1928
2,032,774	Smith -----	Mar. 3, 1936
2,183,886	Hjulian -----	Dec. 19, 1939