April 6, 1948. B. H. WEBB 2,439,154

DETACHABLE CALENDAR MECHANISM FOR CLOCKS

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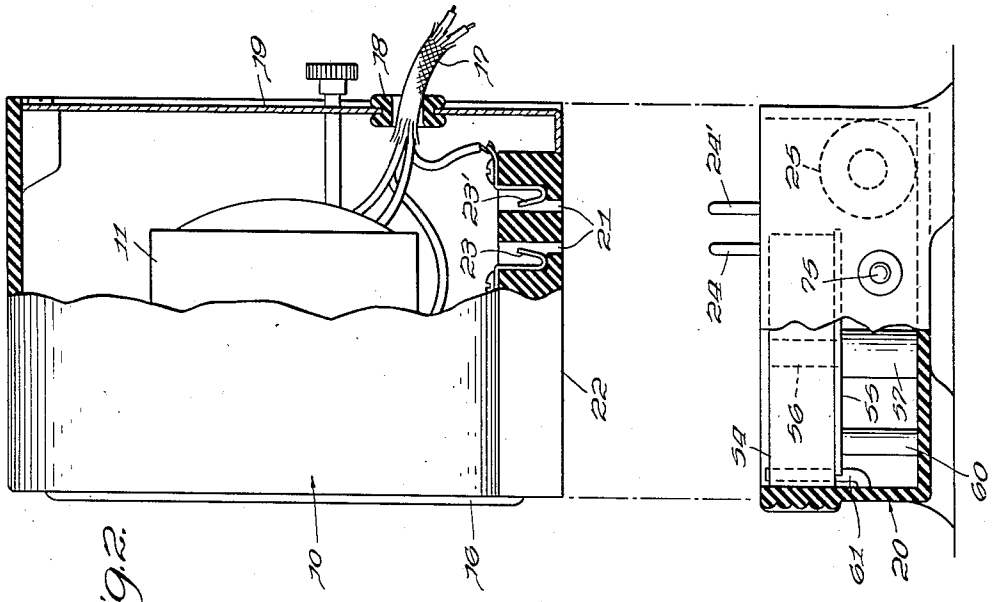


Fig. 2.

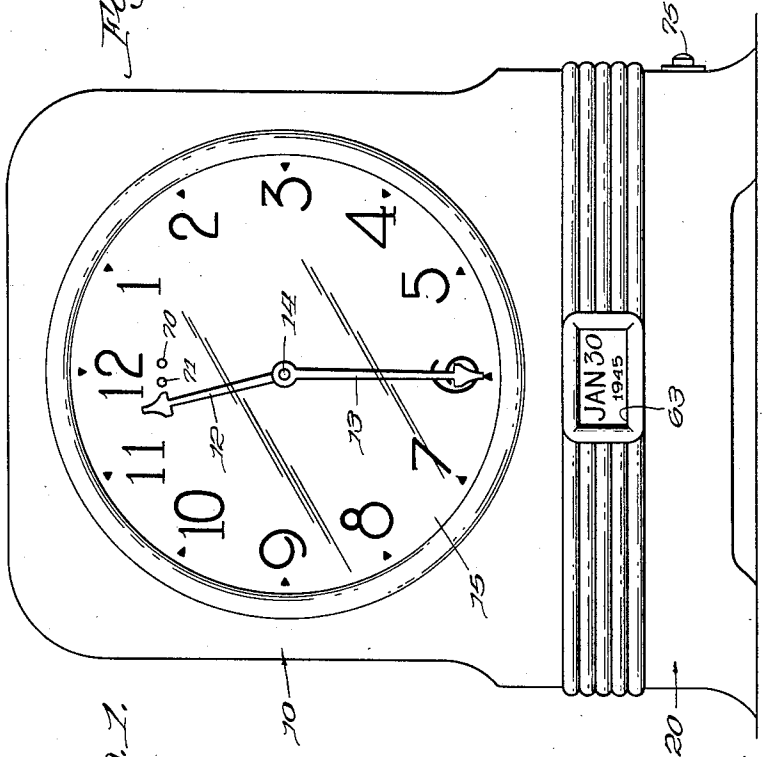


Fig. 1.

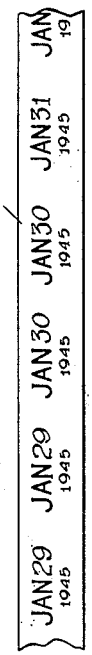


Fig. 3.

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Fig. 4.

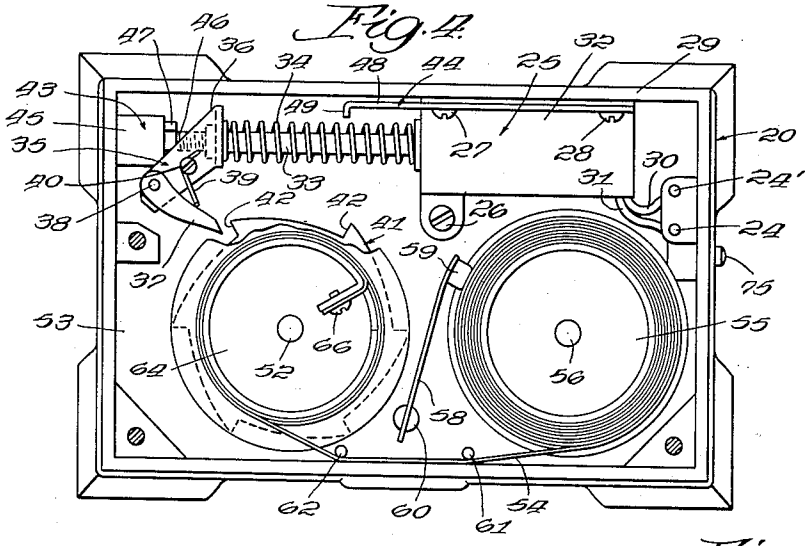


Fig. 5.

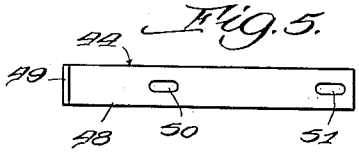
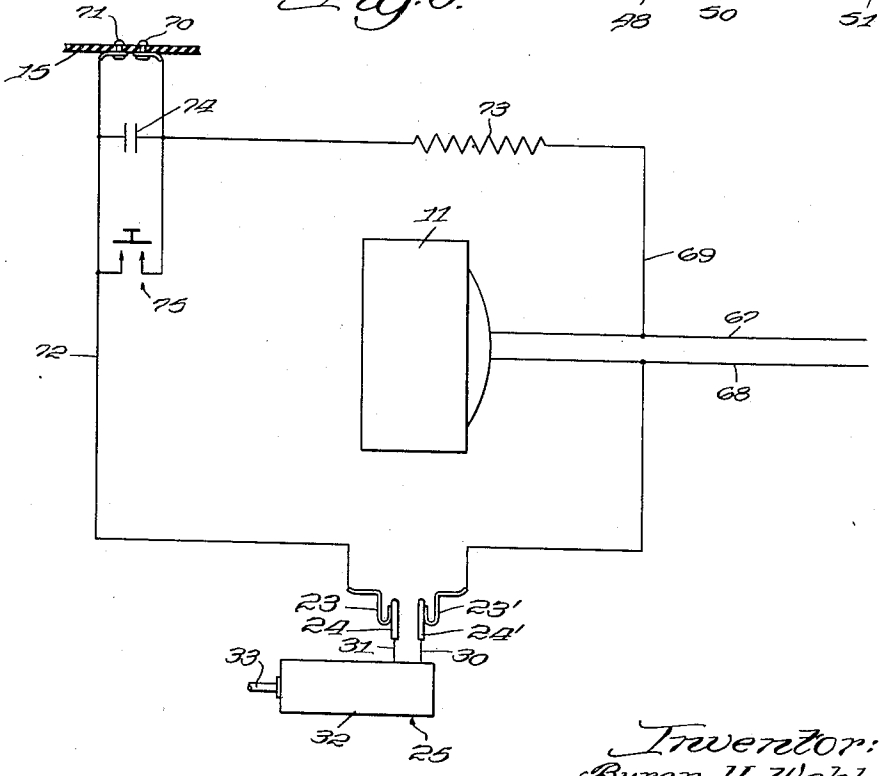


Fig. 6.



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UNITED STATES PATENT OFFICE

2,439,154

DETACHABLE CALENDAR MECHANISM FOR CLOCKS

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Application February 19, 1945, Serial No. 578,685

3 Claims. (Cl. 58—6)

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This invention relates to a new and improved calendar clock.

A principal object of the invention is to provide a clock having a replaceable tape for periods of time, such as a year, and adapted to have a portion of the tape viewed through an aperture in the front of the clock, and further adapted to have the tape moved automatically a short distance at twelve hour intervals.

Numerous calendar clocks have been patented, but none of them have been sufficiently simple to be broadly accepted by the clock buying public. It is therefore an important object of the present invention to provide an economical clock which will immediately acquire general commercial acceptance because of its small initial cost and its simplicity of operation.

Another important object of this invention is the provision of a double dated calendar tape so that although the tape is moved every twelve hours, thereby minimizing the necessary tape moving mechanism, the date only changes every twenty-four hours.

A further important object of the invention resides in the novel method of causing the movement of the calendar tape.

Still another object of the invention relates to the novel means for imparting calendar actuation from actuation of the clock.

A still further object of the present invention is to provide an electric clock and a quickly attachable and detachable automatic calendar actuated by the clock.

Another and still further important object is the provision of means for reducing the variation in calendar tape advance caused by accumulation of tape on the rewind spool.

Other and further important objects will become apparent from the disclosures in the following specification and accompanying drawings, in which:

Figure 1 is a front elevation of the calendar clock of this invention;

Figure 2 is an end view, partially in section, of the calendar clock and showing the clock and calendar separated;

Figure 3 is a detail of the calendar tape employed in the calendar clock of this invention;

Figure 4 is a top plan view of the calendar unit of the clock shown in Figures 1 and 2;

Figure 5 is an elevational detail of an adjustable stop employed in this calendar clock; and,

Figure 6 is an electrical circuit diagram of this calendar clock combination.

As shown in the drawings: The reference numeral 10 indicates generally the clock portion of the calendar clock of this invention. The clock portion consists of a synchronous electric motor 11, as best shown in Figure 2, which is arranged so as to cause regular rotational movement of hour and minute hands 12 and 13 respectively. These clock hands rotate about an axis shaft 14 and on a clock face or dial 15 which includes the regular clock numbers from one to twelve. A transparent covering such as a glass lens 16 is arranged and positioned to cover the clock face 15 and thus keep it free from dirt or unwarranted tampering or handling.

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The electric clock is driven from some source of electro-motive-force which is carried into the motor 11 by means of the cable 17 through a rubber or other insulating bushing 18 in the back wall of the clock portion 10.

As best shown in Figures 1 and 2 the clock portion 10 may be supplemented with a calendar unit 20 which houses mechanism adapted to automatically display the current date. This calendar unit is shown separated from the clock 10 in Figure 2, and it is evident that the clock will run equally well with or without the calendar unit 20. The separable complete units 10 and 20 are quickly attachable and detachable both physically and electrically. Sockets 21 are provided in the base 22 of the clock portion 10. Electrical contacts 23 and 23' are positioned within the sockets 21, and when aligned projections or prongs 24 and 24' on the calendar unit 20 are inserted in the sockets the single electrical source of power for the entire calendar clock is transmitted from the clock portion to the calendar unit for operation of the calendar unit.

The calendar unit 20 is more completely shown in Figure 4. An electrical solenoid 25 is fastened by means of screws or the like 26, 27 and 28 to a housing structure 29. Wires 30 and 31 carry electrical current from the projections 24 and 24' to the solenoid coil 32. A reciprocating core or piston 33 is adapted to be drawn within the coil 32 upon the exciting thereof by electrical energy. The core 33 is maintained extended from the soil 32 by the extension spring 34. When electricity flows through the coil 32 the action of the spring 34 is overcome and the core 33 is drawn into the coil 32.

A pawl unit 35 has an arm 36 fixed to the end of the core 33 against which the spring 34 is permitted to directly exert its extension force. A pawl 37 is hinged to the fixed arm 36 at 38, and is normally held yieldably outwardly by a leaf spring 39. This leaf spring 39 is attached to the

fixed arm 36 by a bolt or stud 40 projecting upwardly from the fixed arm of the pawl unit 35. The pawl 37 projects into the range of a ratchet wheel 41, and upon the solenoid coil 32 drawing the core 33 inwardly the pawl 37 engages the ratchet wheel teeth 42 to cause rotation of the entire ratchet wheel 41. The "throw" or travel of the solenoid core may be controlled by setting adjustable stops 43 and 44.

The stop 43 includes an ear 45 formed internally of the calendar unit 20 in axial alignment with the solenoid core or piston 33. A bolt 46 threadedly engages the ear for adjustment into or out of the ear. The head of the bolt 46 forms the bumper against which the solenoid core 33 strikes. A lock nut 47 is adapted to be screwed tightly against the ear 45 to prevent further adjustment of the bolt 46 without first loosening the lock nut 47.

The adjustable stop 44 consists of a strip member 48 held firmly to the calendar unit housing 29 by the screws 27 and 28 which also hold the solenoid coil 32 in position. This strip 48 is shown in detail in Figure 5. The end of the strip is bent as at 49 to form a ledge against which the fixed pawl arm 36 will strike and thus limit inward movement of the core. Elongated slots 50 and 51 are adapted to receive the screws 27 and 28 respectively and also permit longitudinal adjustment of the strip relative to the solenoid coil 32.

The ratchet wheel 41 is journaled for rotation about a vertical shaft 52 which is preferably fixed in the base 53 of the calendar unit 20. Above the ratchet wheel 41 and fastened thereto for concurrent rotation is a large diameter rewind spool 64 adapted to receive a calendar tape 54 as best shown in Figures 3 and 4. This tape 54 having date indicia at substantially regular intervals is supplied for periods of perhaps one year after which time it may be replaced with a succeeding year tape. A peculiarity of the tape is its repetitious designations of one date. That is, each date is duplicated on adjacent portions on the tape to permit movement of the tape every twelve hours and yet actually only change the date every twenty-four hours. A new tape for some particular period of time preferably comes on a spool 55 adapted to rotatably engage a vertical spindle 56 which is fastened to the base 53 of the calendar unit 20 through an enlarged lug 57. The tape moves in small increments.

A tape retarder consists of a leaf spring 58 and a pad 59 at the end thereof to press against the outer periphery of the spool of tape. The spring 58 is held rigidly by a split stud 60 extending vertically from the base 53 of the calendar unit 20. The tape is unwound from the supply spool 55 and is guided around posts 61 and 62 which are positioned on each side of a viewing aperture 63 in the face or front of the calendar unit 20 of the calendar clock.

The rewind spool 64 is adapted to receive the tape from the supply spool 55 after it has been viewed through the aperture 63. The end of the tape is clamped centrally of the rewind spool. In order to accomplish this clamping the spool has an integral inward projection to which the end of the tape is attached by means of a lock screw 66.

With the aid of the adjustable stops 43 and 44 for the solenoid core 33 it is possible to so regulate the throw of the core that the corresponding movement of the pawl 37 will rotate the ratchet wheel and associated rewind spool just enough to move the calendar tape one date past the aperture on one complete reciprocation of the solenoid core 33.

Actuation of the solenoid coil 32 to move its core 33 is accomplished by completion of the electrical circuit as shown in Figure 6. The cable 17 contains the electrical conducting wires 67 and 68 and both are attached directly to the synchronous clock motor 11. A separate wire 69 is joined to the incoming wire 67 and runs to one switch contact point 70. This point 70 and the separated but closely positioned adjacent contact point 71 are mounted on the face 15 of the clock immediately beneath the numeral 12 at the top thereof. The contact point 71 is joined by a wire 72 which runs down through the projection 24 and socket contact 23 and thence to the solenoid coil 32 and back upwardly through the projection 24' and socket contact 23' where it joins the other incoming wire 68. When joinder of the contact points 70 and 71 is made, the solenoid receives the electro-motive-force carried in by the wires 67 and 68. In order to eliminate the necessity for an excessively large solenoid a resistance 73 is inserted in the electrical wire 69 so that it is in the circuit in series with the solenoid coil 32. The electro-motive-force is thus split between the resistance 73 and the solenoid coil 32 permitting use of a relatively small solenoid coil which will not occupy too much space in the compact calendar unit 20 of this calendar clock. A condenser 74 is placed across the contact points 70 and 71 to prevent undesirable arcs when the contact points are electrically joined to complete the circuit and thus actuate the solenoid 25.

The hour hand 12 completely circles the dial of the clock every twelve hours, and it is this principle on which the operation of the calendar is based. As this hour hand 12 reaches the position at the top of the dial it is arranged to join the contact points 70 and 71 to cause actuation of the solenoid 25 and thus a movement of the calendar tape 54. As previously stated this calendar tape is provided with duplicate date designations and hence completion of the electrical circuit by the hour hand at noon will cause movement of the tape, but as the same date is repeated twice the actual change of date will occur only at midnight.

If for any reason the clock is turned off for some period of time, a manually operable push-button switch 75 is provided to effect movement of the tape to a position where the current date is in position in the viewing aperture. The push-button switch 75 acts to complete the circuit and actuate the solenoid 25 in the same manner as the hour hand completes the circuit across the contact points 70 and 71 on the face of the clock. Each switch forms a part of the dual operating switch means. The push-button projects from the side of the calendar unit for convenient operation.

It is evident that herein is provided a novel calendar clock with numerous advantages and improvements over prior calendar clocks, and it is therefore our intention not to limit the scope of the patent granted hereon otherwise than as necessitated by the appended claims.

I claim:

1. A calendar clock having upper and lower portions, said upper portion comprising a complete electric clock, said lower portion comprising a calendar of the moving tape type and hav-

ing supply and rewind spool spindles separated by an aperture in the front of said lower portion, said upper and lower portions having cooperative means for ready separation thereof, whereby access may be had to the interior of said lower calendar portion for easy renewal of tape spools.

2. A device as set forth in claim 1 in which the cooperative means includes the upper portion having sockets in the under side thereof, and projections extending upwardly from the lower portion.

3. A device as set forth in claim 1 in which the cooperation means includes the upper portion having a pair of spaced sockets in the under side thereof, and a pair of similarly spaced projections on the top side of the lower portion, said sockets and projections arranged and constructed to conduct electricity from the upper clock portion to the lower calendar portion.

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mark

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