June 10, 1941. R. M. THORSON 2,244,924

ALARM CLOCK

Filed Dec. 18, 1939

FIG. 1

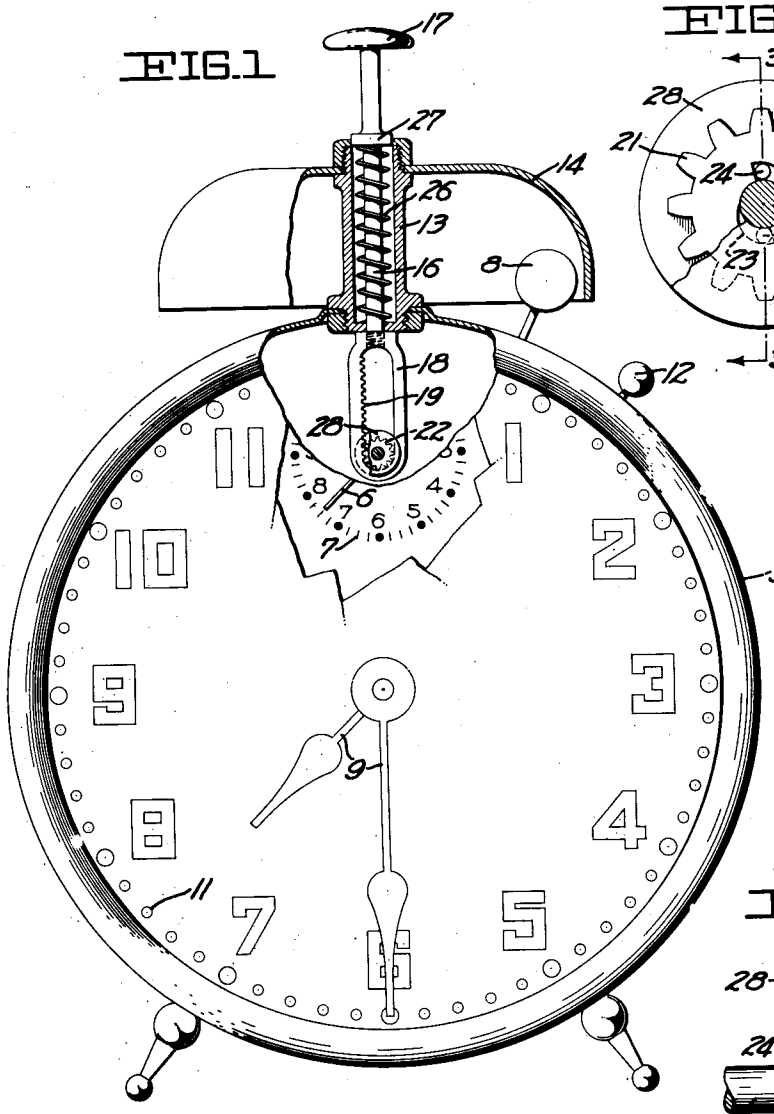
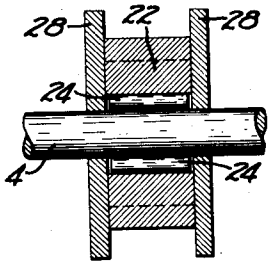



FIG. 2




FIG. 3




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Patented June 10, 1941

2,244,924

# UNITED STATES PATENT OFFICE

2,244,924

## ALARM CLOCK

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Application December 18, 1939, Serial No. 309,793

1 Claim. (Cl. 58—16)

This invention relates to devices for resetting the alarm trip mechanism of clocks so that, after the alarm has been once sounded, it may be quickly conditioned to sound at a later time.

It is an object of the invention to provide a simple and efficient mechanism for producing the result described.

Another object of the invention is to provide mechanism of the class described which may be built into conventional alarm clocks without materially disturbing or rearranging the existing mechanism thereof.

A further object of the invention is to provide mechanism of the class described which is foolproof and not liable to be damaged or get out of order.

The invention possesses other objects and features of advantage, some of which, together with the foregoing, will be specifically brought forth in the detailed description of the invention hereunto annexed. It is to be understood that the invention is not to be limited to the specific form thereof herein shown and described as various other embodiments thereof may be employed within the scope of the appended claims.

Referring to the drawing:

Figure 1 is a front elevational view of an alarm clock showing the reset mechanism of my invention incorporated therein. A portion of the view is broken away so as to more clearly disclose the internal construction of the clock.

Figure 2 is an enlarged front elevational view of that portion of the structure of Figure 1 centered around the alarm shaft pinion.

Figure 3 is a vertical sectional view of the structure shown in Figure 2. The plane of section is indicated by the line 3—3 of the latter figure.

The great majority of persons, upon waking from sleep, enjoy remaining in bed for a short time before arising. Usually the person is awakened by the bell or gong alarm on the clock, which he promptly turns off. Quite often a person lying awake in bed will again fall asleep and, due to the fact that the alarm has been silenced, will oversleep thereby causing him to be late for work or miss an appointment. To protect himself against falling asleep for too long a period the person, if he uses the conventional alarm clock, must re-set the alarm to sound at a later time, this time being the limit that the person can allow himself to remain in bed. This resetting of the alarm, it will be evident, is a bothersome task and, if the person is not wholly awake, is liable to be performed erroneously thereby allowing the person to oversleep. I have provided an improvement for alarm clocks which, by a simple manual movement of the person, enables him to set the alarm ahead so as to allow him a predetermined interval of additional sleep or respite before he must arise.

In detail, my invention may be incorporated in a conventional alarm clock 3 having the usual alarm set shaft 4 connected with the alarm trip cam, not shown, and with the indicator 6 of the alarm set dial 7. The shaft 4 is provided, at the rear of the clock, with the usual knob by means of which the shaft may be rotated to position the alarm indicator 6 at any point on the dial 7 corresponding to the time at which it is desired that the alarm will sound. An alarm release cam, not shown but familiar to those skilled in the art, is connected and rotatable with the shaft 4 and an element driven in synchronism with the clock movement is cooperative with the cam to release the bell clapper 8 when the clock hands 9 reach the time on the clock dial 11 which corresponds with the time indicated by the alarm set indicator 6 on the dial 7. A hand latch 12 is provided on the clock for dogging the bell clapper 8 when it is desired to permanently render the latter inoperative. The post 13 supporting the alarm bell 14 is provided with an axial bore in which is slidably mounted a push rod 16 provided, at its upper or exposed end, with a push button 17 and at its lower end with an integral loop 18 having gear teeth 19 along one inner side thereof. The gear teeth 19 mesh with the teeth 21 of a small pinion 22 which is journaled on the shaft 4 and whose central bore is provided with a plurality of cam notches 23, see Figure 2, containing balls or rollers 24 so as to form an overrunning clutch. A coil spring 26 engaging at its respective ends with a collar 27 formed on the push-rod 16 and the bottom of the bore of the post 13, functions to resiliently retain the push-rod 16 and the loop 18 in their uppermost positions. Washers 28 pressed on the shaft 4 and positioned at opposite sides of the pinion 22 serve to maintain the toothed portion of the loop and the pinion in their respective operative positions.

In conditioning the clock to sound an alarm, the shaft 4, as was described above, is rotated manually so as to position the indicator 6 at the desired time index on the dial 7 which, in the drawing, is shown as 7:30. The hand latch 12 is, of course, released so as to free the bell clapper 8 to allow it to operate when the alarm is set off. When the hands 9 of the clock reach their respective

positions indicating 7:30 the alarm will be set off automatically in the usual manner. If, after being aroused by the ringing alarm, the person desires to arise immediately he reaches for the clock and sets the latch 12 to block the bell clapper 8 in the usual way. If, however, he desires to remain in bed for a time he reaches toward the clock and depresses the push button 17 downwardly as far as it will go. This causes the loop 18 to move downwardly and, in so doing, to rotate the pinion 22 which will then correspondingly rotate the shaft 4 since the overrunning clutch will, in this instance, connect the pinion and the shaft for rotation together. The stroke of the push rod 16 is made of such length that the pinion 22 will be moved through a rotational arc of slightly less than one full revolution. This depends upon the amount of time that it is desired to set the alarm ahead. For example, since the minor divisions of the alarm dial 7 indicate 15 minute intervals, it may be preferable to proportion the length of stroke of the push rod so that the pinion 22 and the shaft 4 will be rotated, in a counter-clockwise direction, through $\frac{47}{48}$ of a full arc. This will re-set the indicator 6 at 7:45 and will correspondingly re-set the alarm trip cam so that an additional $\frac{1}{48}$ of the cycle of its associated trip member must be made before the alarm will again be sounded, this time, as before indicated, at 7:45. Thus the alarm may be set ahead as far as desired in 15 minute increments by simply depressing the pushbutton as many times as the desired time interval, in minutes, is divisible by 15. When the push button is released after reaching the end of its descent, it is returned to its elevated position by the coil spring 26. During recovery movement of the push rod, the pinion 22 will rotate clockwise with respect to the shaft 4 so that the overrunning clutch will be released and therefore no retrograde movement of the shaft 4 will occur, the rotation of the latter being confined to a counter-clockwise direction. The alarm set keys of most alarm clocks are rotatable only in a counterclockwise direction as viewed from the dial end. However it will be apparent that in clocks wherein the shaft is movable only clockwise, the rearrangement of the parts of my structure to conform thereto will not depart from the spirit of the invention.

Having thus described my invention in detail, what I claim as novel and desire to secure by Letters Patent is:

In a clock provided with an automatic alarm system and having a setting shaft connected with and to rotate an alarm release member unidirectionally through a rotary cycle of positions, a tubular guide member mounted on said clock adjacent said setting shaft, a push rod mounted in and movable axially of said tubular guide member through a prescribed stroke, said push rod having at one end thereof, and encircling said setting shaft, an integral loop, one of the side members of said loop having gear teeth thereon, a pinion journaled on said setting shaft and having peripheral gear teeth in mesh with the gear teeth of said loop side member, said toothed side member of the loop and said pinion being relatively positioned so that, when the push rod is depressed, the pinion will be rotated in the direction of rotation of said setting shaft, said pinion, in the internal bore thereof being provided with a plurality of circumferentially inclined notches, rollers in said notches and engageable, upon depression of said push rod, respectively, with surfaces of the pinion and setting shaft to frictionally secure said pinion and setting shaft for movement together, and the stroke of said push rod being only slightly less than the pitch circumference of said pinion whereby, when said push rod is depressed through a complete stroke, said pinion and setting shaft will each be rotated slightly less than one complete revolution.

ROY M. THORSON.