

W. E. PORTER.

ALARM CLOCK.

APPLICATION FILED JUNE 10, 1912.

Patented Apr. 22, 1913.

2 SHEETS—SHEET 1.

1,059,632.

Fig. 1.

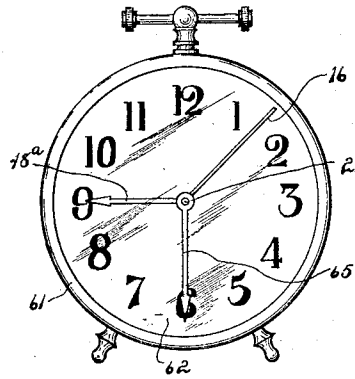


Fig. 2.

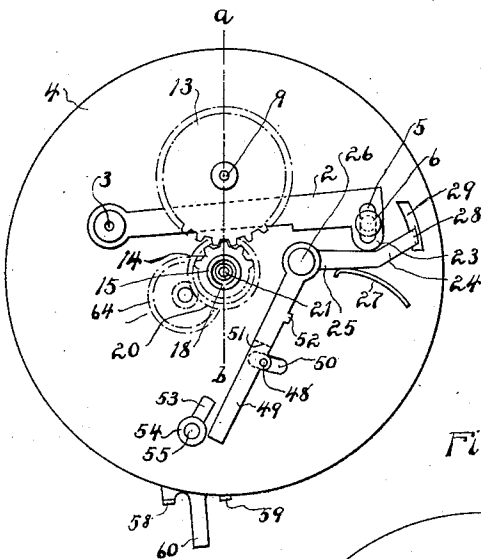


Fig. 3.

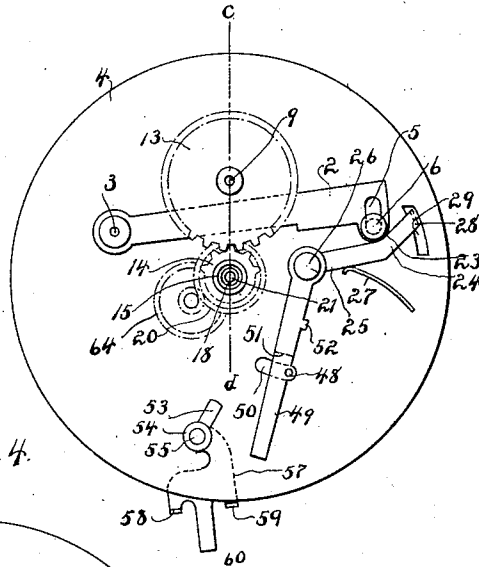
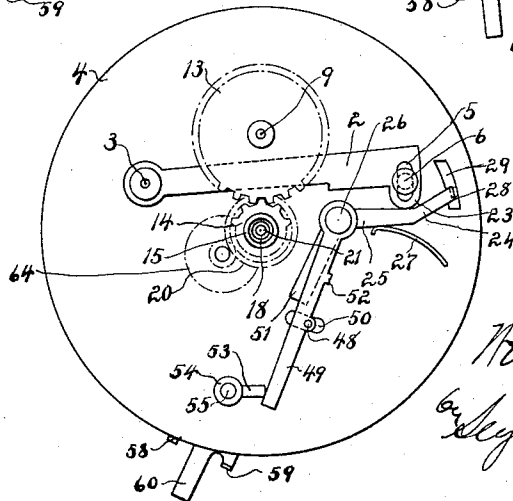


Fig. 4.



Witnesses
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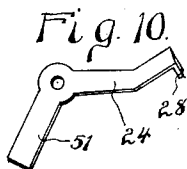
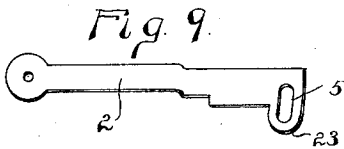
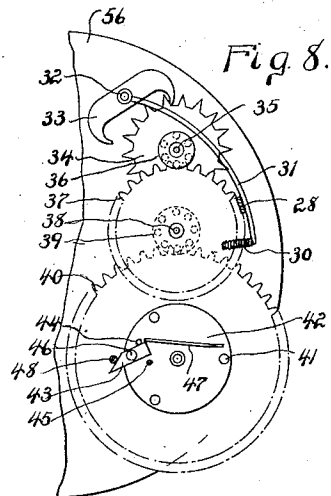
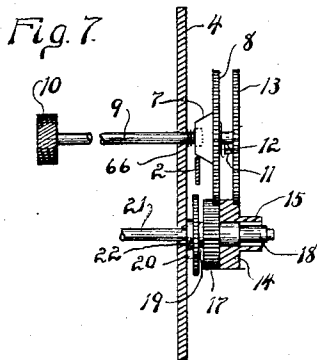
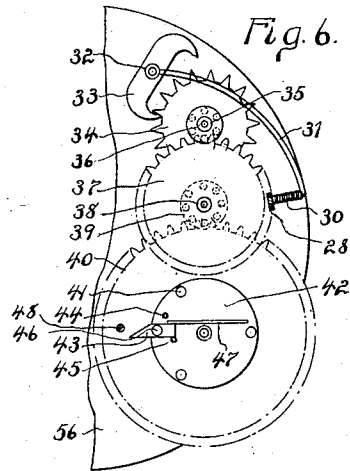
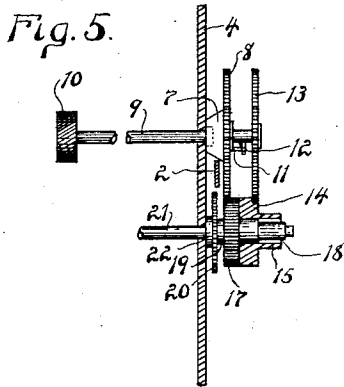
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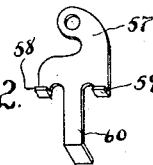
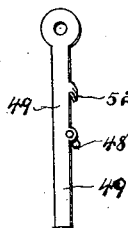
2 SHEETS—SHEET 2.



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Fig. 11.

Fig. 12.



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UNITED STATES PATENT OFFICE.

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ALARM-CLOCK.

1,059,632.

Specification of Letters Patent.

Patented Apr. 22, 1913.

Application filed June 10, 1912. Serial No. 702,749.

To all whom it may concern:

Be it known that I, WILSON E. PORTER, a citizen of the United States, residing at New Haven, in the county of New Haven and State of Connecticut, have invented a new and useful Improvement in Alarm-Clocks; and I do hereby declare the following, when taken in connection with the accompanying drawings and the characters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this application, and represent, in—

Figure 1 a view in front elevation of an alarm-clock constructed in accordance with my invention. Fig. 2 a detached view in front elevation of the clock-movement with the parts of the alarm-mechanism shown in the positions due to them when the alarm is automatically shut off. Fig. 3 a corresponding view with the parts of the alarm-mechanism shown in the positions due to them when the alarm is being sounded. Fig. 4 a corresponding view with the alarm shut-off finger connected with the manual switch, in position to shut-off the alarm. Fig. 5 a broken detail view in vertical section on the line *a-b* of Fig. 2 showing the alarm-cam pin just about to drop off the alarm-cam. Fig. 6 a partial view in elevation of the clock-movement with the front movement-plate broken away to show the alarm-train in the position in which it is illustrated in Figs. 2 and 5. Fig. 7 a broken detail view in vertical section on the line *c-d* of Fig. 3, showing the parts in the positions which they have when the alarm-cam pin drops off the alarm-cam. Fig. 8 a view corresponding to Fig. 6 but showing the parts in the positions they have in Figs. 3, 4, and 7. Fig. 9 a detached perspective view of the alarm-lever. Fig. 10 a corresponding view of the two-armed stop-lever. Fig. 11 a corresponding view of the shut-off lever. Fig. 12 a corresponding view of the manual switch.

My invention relates to an improvement in that class of eight-day alarm clocks in which the alarm-train is automatically stopped after the sounding of the alarm, for the conservation of the alarm-spring so that the same will require winding only once in eight days at the time of winding the time-spring; the object of my present invention being to produce a simple, convenient and

reliable alarm-clock constructed with particular reference to providing a manual cut-off for the alarm-mechanism, whereby the same may be cut out of play in such manner that the alarm will not be allowed to start when the alarm-mechanism is switched on again.

With these ends in view my invention consists in an eight-day alarm-clock having certain details of construction and combinations of parts as will be hereinafter described and pointed out in the claims.

In carrying out my invention as herein shown, I employ an alarm-lever 2 hung upon a pivot 3 projecting forward from the front movement-plate 4, the said lever being formed at its right hand end with a vertical slot 5 for the reception of a headed pin 6 by means of which the lever is held against lateral displacement. At about midway of its length, the upper edge of the lever co-acts with an alarm cone 7 projecting inwardly from the inner face of the alarm-cam wheel 8 with which it is concentric and which is mounted to turn loosely upon the projecting forward end of the alarm-set arbor 9 which at its rear end projects through the rear movement plate (not shown) and which is provided at its extreme rear end with a knurled setting-button 10. The said alarm-wheel 8 is provided upon its forward face with an alarm-cam 11 which co-acts with an alarm-pin 12 mounted in the projecting forward end of the alarm-set arbor 9 upon the extreme forward end of which is mounted the alarm-set wheel 13 which meshes into an alarm-set pinion 14 having a forwardly projecting sleeve 15 carrying an alarm-set hand 16. The alarm-cam wheel 8 meshes into an alarm-cam pinion 17 having a forwardly projecting socket 18 upon which the hour-hand 18^a is mounted. The said pinion 17 is formed in one piece with a socket 19 upon the rear end of which is staked the hour-wheel 20, the said pinion 17, socket 19, and hour-wheel 20 turning loosely as one piece upon the center-arbor 21 to which is fastened at a point between the wheel 20 and the movement-plate 4, a cannon-pinion 22 which is meshed into by the dial-wheel 64, commonly known as the minute-wheel of the dial work.

At its right hand end, the alarm-lever 2 is formed with a depending rounded nose

23 which co-acts with the upper arm 24 of a two-armed or bell-crank stop-lever 25 hung about midway of its length upon a stud 26 in the front movement-plate 4. A flat spring 27 mounted in the front movement-plate 4 engages with the lower edge of the arm 24 and exerts a constant effort to lift the same against the nose 23 of the lever 2 and hence to hold the upper edge of the same against the tapering face of the alarm-cone 7. The outer end of the said arm 24 is bent inward to form a finger 28 passing through a clearance-opening 29 near the right hand edge of the front movement-plate 4. The projecting inner end of the finger 28 co-acts with a flexible finger 30 formed by a coiled spring fastened to and depending from the outer end of an alarm-escapement stop-wire 31 the inner end of which is mounted in the forward end of a verge-arbor 32 carrying a verge 33 co-acting with the teeth of an ordinary escapement-wheel 34 mounted upon an arbor 35 carrying a pinion 36 driven by the intermediate wheel 37 on a shaft 38 carrying a pinion 39 meshed into by the main alarm-wheel 40 which is provided with three studs 41 carrying a disk 42 upon the forward face of which I mount an alarm-stop pawl 43, the beveled outer end of which projects beyond the edge of the disk, while its inner end extends between two stop-pins 44 and 45, the said pawl turning upon a stud 46 located close to the edge of the disk. A flat spring 47 fastened at one end to the disk 42 co-acts with the inner end of the pawl 43 so as to exert a constant effort to hold the pawl in the position in which it is stopped by the pin 45 as shown in Fig. 6. The beveled outer end of the said pawl 43 co-acts with a pin 48 mounted in a shut-off lever 49 and extending inward therefrom through a clearance slot 50 in the front movement-plate 4, the said cut-off lever 49 being located upon the outer face of the said plate 4 and hung upon the stud 26 of the stop-lever 25 the lower arm 51 of which extends downward directly back of the upper end of the said lever 49 which is coupled with the said arm 51 by means of an inwardly turned coupling-finger 52 located upon the outer edge of the lever 49.

Under this construction, when the shut-off lever 49 is swung from right to left with its coupling-finger 52 engaged with the adjacent edge of the arm 51 of the stop-lever, the same is correspondingly swung from right to left. On the other hand the coupling-finger 52 of the shut-off lever 49 in no wise affects the operation of the stop-lever 25 by the alarm-lever 2.

The shut-off lever 49, which is one of the salient features of my present invention, co-acts at its lower end with a shut-off finger 53 made integral with a hub 54 mounted upon the projecting forward end of a rock-

shaft 55 journaled at its forward end in the front movement-plate 4 and at its rear end in the rear movement-plate 56, its projecting rear end having rigidly mounted upon it a plate-like switch 57 located upon the rear face of the rear movement-plate 56 and provided with stop-fingers 58—59 co-acting with the edge of the plate 56, and also provided with an operating arm or handle 60 designed to be extended through the back of the clock-case, which is not shown. When the switch 57 is swung into its normal or retired position which is at the limit of its movement from right to left, its finger 53 occupies a position in which it entirely clears the shut-off lever 49 and in no wise affects the operation of the clock. On the other hand, when the switch 57 is manually swung by its handle 60 into its shut-off or operating position, which is at the extreme limit of its movement from left to right, the finger 53 is thrown into position in which it will be engaged by the lower end of the shut-off lever 49 so as to prevent the same from being swung from right to left by the beveled outer end of the alarm-stop pawl 43 sufficiently to permit the pawl to pass the pin 45 mounted in the lever. Therefore when the finger 53 is in position to curtail the swinging movement of the shut-off lever 49 from right to left, the pin 48 is held in position to block the passage by it of the pawl 43 which must pass the pin 48 before the spring 27 can act to lift the arm 24 of the stop-lever 25 so as to clear the finger 28 of the arm 24 from the flexible finger 30 on the stop-wire 31.

As shown my improved alarm clock is mounted in a standard case 61 having a twelve-hour dial 62 swept by the alarm-set hand 16 and by the hour-hand 18^a aforesaid, and by a minute-hand 65 carried by the center arbor or shaft 21.

In the use of my improved alarm-clock, it is set for the sounding of the alarm at any predetermined time by means of the knurled setting-button 10. Now as the alarm-cam 11 is driven by the time-train of the movement, the alarm-pin 12 will cause the alarm-wheel 8 to be pushed from front to rear upon the alarm-set arbor 9 against the tension of a light spring 66 encircling the same. As the wheel 8 moves from front to rear the alarm-cone 7 will be carried with it and operated to slowly depress the alarm-lever 2 which will in turn swing the stop-lever 25 upon the stud 26 against the tension of the spring 27, whereby the upper arm 24 of the said stop-lever 25 will be moved downward with respect to the flexible stop-finger 30 of the stop-wire 31. As the arm 24 moves downward the arm 51 moves correspondingly from right to left away from the coupling-finger 52, whereby the tension of the spring 27 is removed from the shut-off

lever 49 which is thus left free to be swung from right to left by the tension of the spring 47 acting on the pawl 43 the beveled outer end of which now operates to push the lever from right to left until the nose of the pawl passes the pin 45 mounted in the said lever 49 which is now left free to be swung back from left to right when the time comes, and whereby the disk 42, carrying the pawl 43 is released from the locking-action of the said pawl and left free to be rotated, and with it the main-alarm wheel 40. The alarm-lever 2 continues to be depressed by the alarm-cone 7 until the alarm-pin 12 drops off the high point of the alarm-cam 11. When this takes place the spring 66 pushes the cone 7 forward and the spring 27 lifts the lever 2 and swings the stop-lever 25 on its stud 26, whereby the arm 24 of the stop-lever is lifted and its finger 28 cleared from the stop-finger 30 of the stop-wire 31, thus leaving the alarm-train free to run and sound the alarm during the time occupied by one entire revolution of the main alarm-wheel 40. As the upper arm 24 of the stop-lever 25 is lifted, the lower arm 51 thereof is swung from left to right, and through the medium of the coupling-finger 52 of the lever 49 swings the same from left to right so as to bring its pin 48 into position to be again engaged by the stop-pawl 43 aforesaid. As the said wheel 40 approaches the end of its revolution, the beveled outer end of the stop-pawl 43 engages with the stop-pin 48 mounted in the shut-off lever 49 after which the shut-off lever will be moved from right to left and the pawl 43 turned upon its stud 46 against the tension of its spring 27 until the upper edge of the pawl is brought into contact with the pin 44 which forms a dead stop for it. As the shut-off lever 49 is being positively swung from right to left by the pawl 43 it acts through its coupling-finger 52 to swing the stop-lever 25 against the tension of its spring 27, whereby the finger 28 of the upper arm 24 of the said stop-lever is brought into position to co-act with the flexible stop-finger 30 in stopping and holding the alarm-train. Ordinarily the end of the flexible stop-finger 30 will engage with the face of the finger 28, but in case the edge of the finger 28 should engage with the side of the finger 30, the yielding of the latter will prevent the stopping of the clock which might otherwise take place in the absence of some other flexible connection between the lever 2 and the cone 7. Now as long as the switch 57 is

kept in its retired position, the alarm will be let off and automatically stopped once in twenty-four hours, as above described. But if it is desired to shut off the alarm, the said switch 57 is manually thrown into its active or operating position, whereby its finger 53 is brought into the position shown in Fig. 4 in which it prevents the shut-off lever 49 from being swung from right to left sufficiently to allow the beveled nose of the pawl 43 to clear the pin 46 which must take place before the spring 27 can lift the arm 24 as required for releasing the alarm-train. What I wish to point out in particular is that my improved construction provides for manually cutting off the alarm without releasing the alarm-train and suffering the alarm to sound during one revolution of the main wheel 40 at the time the alarm-mechanism is manually shut off.

I claim:—

1. In an alarm clock, the combination with an alarm-cam wheel, of an alarm-cam and an alarm-cone carried thereby, an alarm-lever operated by the said alarm-cone, a two-armed stop-lever one arm of which co-acts with the said alarm-lever, a shut-off lever co-acting with the other arm of the said two-armed lever, an automatic alarm stop rotated by a member of the alarm-train and co-acting with the said shut-off lever, and a switch co-acting with the said shut-off lever for holding the same in position to block the operation of the shut-off lever under the action of the alarm-stop.

2. In an alarm clock, the combination with an alarm lever and means for the periodical operation of the same by the alarm-train, a two-armed stop-lever one arm of which co-acts with the said alarm-lever, a shut-off lever hung upon the same center as the said two-armed stop-lever and provided with a coupling-finger coöperating with the other arm of the said stop-lever, an automatic alarm stop rotated by a member of the alarm-train and co-acting with the said shut-off lever, an alarm switch, and an alarm shut-off finger operated by the said switch and co-acting with the said shut-off lever for blocking the movement thereof.

In testimony whereof, I have signed this specification in the presence of two subscribing witnesses.

WILSON E. PORTER.

Witnesses:

CLARA L. WEED,
MALCOLM P. NICHOLS.